



Willow Springs  
Water Bank

WATER STORAGE INVESTMENT PROGRAM  
**PROGRESS REPORT**

Willow Springs Water Bank  
Conjunctive Use Project

31 January 2019



Willow Springs  
Water Bank

## PURPOSE OF NARRATIVE

This Narrative explains the items listed in Tables 1 and 2 (Attachment A) of this initial WSIP progress report. The two tables are required components of the initial and quarterly reports to be provided to California Water Commission and staff. This Narrative provides an easy-to-follow explanation of many of the items listed in both tables along with significant, new developments over the past few months that could impact Willow Springs Water Bank (WSWB) and its development.

The major Narrative components are (1) State Water Project Contractor Partnership, (2) Complimentary Grants, (3) CEQA, (4) Facilities Planning, (5) Cost Update, (6) Schedule Update, (7) Financing Plan, (8) Energy, and (9) Emerging groundwater quality issues associated with TCP contamination. **Bold** text indicates new information since the October 30, 2018 Progress Report.

## 1. SWP CONTRACTOR PARTNERSHIP

A partnership with a State Water Project Contractor partner is needed. A partnership will facilitate DWR, DFW, USBR, and SWP Contractor discussions. It is also needed for the DWR turnout discussions. Developing this partnership has been a high priority over the past few months.

Progress has been made. An agreement has been proposed and intensive discussions are ongoing. We are optimistic that this effort will result in an agreement to implement this conjunctive use project.

An additional development in the past few months is progress on a joint water bank between Antelope Valley-East Kern Water Agency (AVEK) and the Metropolitan Water District of Southern California (MWD). It is called the "High Desert Water Bank" and is described in further detail in January 8, 2019 Board Meeting Notes (Attachment B). It will impact the market value of water banking and conveyance capacity availability in the California Aqueduct. WSWB development will need to be coordinated with High Desert Water Bank development.

## 2. COMPLIMENTARY GRANTS

On June 14 of 2018, WSWB successfully obtained a commitment of \$15 M in Federal Emergency Management Agency (FEMA) grant funds from the Hazard Mitigation Grant Program (FEMA-I). The basis of the grant application is WSWB's ability to respond to flood and drought emergencies. A letter was sent from the State Office of Emergency Services (OES) notifying WSWB that its application had been accepted and submitted to FEMA (Attachment C).

This OES/FEMA application leads to a finance agreement with FEMA. The FEMA funds are already allocated to California. Receipt is now dependent upon a signed finance agreement with FEMA. FEMA is preparing an Environmental Assessment, in compliance with the National Environmental Policy Act (NEPA), for the \$15 M grant. Completion of the Environmental Assessment by FEMA is expected in early December. When NEPA is complete, a finance agreement with FEMA will be executed. WSWB will build a 48" diameter pipe connection to existing aqueduct systems and make 16 existing wells operational which enables

additional recharge into WSWB. It is estimated that these facilities will be online by 2020.

Kern County has partnered with WSWB and is the sponsor for the FEMA-I grant. Kern County will also be the sponsor for the FEMA-II grant as well (see the next paragraph). This sponsorship with Kern County to streamline the many permits and approvals that WSWB will need from Kern County. WSWB is primarily located in eastern Kern County, so this partnership is important.

WSWB was notified on September 28 that it is also eligible to apply for a second OES/FEMA grant of \$10 M (FEMA-II) as part of the Pre-Disaster Mitigation program. Again, the basis of the application is WSWB's ability to respond to flood and drought emergencies. Formal applications were due on Dec. 17, 2018. WSWB meets the criteria and appears to be well positioned to receive funding through this program. Formal notification was sent on September 28, 2018 from OES that they accepted WSWB's Notice of Interest (Attachment D).

**WSWB was notified on December 6, 2018 that it is eligible for a third OES/FEMA grant of \$10M as part of the HGMP. This is designated as FEMA-III. It will compliment the FEMA-I and FEMA-II grant programs.**

Awards from both FEMA-I, FEMA-II, and **FEMA III** grants will provide another \$35 M in federal grant funding for WSWB. These federal grants leverage local, state and federal funding. They also demonstrate the multi- purpose benefits of WSWB and its ability to meet statewide emergency goals as well as water storage and supply goals.

Phased facility construction may enable use of additional \$28 M if another Water Storage Infrastructure Project (WSIP) drops out by 2022. The WSWB Eligible Amount of \$123 M can be used to build more wells beyond those possible with the initial \$95 M grant amount. This would reduce the amount of money that must be financed from loans and equity.

WSWB may also pursue grant opportunities that result from California State Proposition (Prop) 68 and other grant funding opportunities. As a conjunctive use project, it can be used jointly with surface reservoirs other than San Luis

and Oroville. If additional state grants are pursued, the commitments made in the August 2017 grant application will take priority over any new grant opportunities.

In summary, WSWB has obtained \$15 M and is expected an additional \$20 M in complementary federal grants, has a plan to use an additional \$28 M in WSIP funds should they become available, and may pursue additional state grant funding for conjunctive use. The project will be ready soon to start spending the \$95 M in WSIP grant funds for the facilities needed to partially build out the bank. Additionally, the EIR Addendum described in the next section means that the state’s storage portfolio will now be able to realize an actual storage volume increase of 1.00 million acre-feet (MAF) rather than the 0.50 MAF specified in the WSWB grant application.

### 3. CEQA

The original EIR was prepared and filed with the state clearinghouse in 2006. It is available online at: [https://cwc.ca.gov/WISPDocs/WSWB\\_EvnDoc\\_1of1.pdf](https://cwc.ca.gov/WISPDocs/WSWB_EvnDoc_1of1.pdf). It was implemented via a 2008 Memorandum of Understanding with Kern County.

An EIR Addendum was started in July of 2017. It was finalized in August 2018 and has been filed with the state clearinghouse (<https://www.rosamondcsd.com/home/showdocument?id=2363>). A copy of the Addendum and Appendices are available on request.

The 2018 Addendum enhances the amount of storage that WSWB will add to California’s storage portfolio by increasing volume from 0.50 to 1.00 MAF. This enables an increase in bank shares to be sold from 100,000 to 225,000. The capacity increase is accomplished primarily by adding more wells. The Addendum also reduces the impact of the project on the environment by altering the alignment of the recharge pipe slightly to avoid Sensitive Environmental Areas (SEAs) that contain Joshua Trees. This reduces the risk that the project

construction and online dates will be delayed due to environmental issues.

The Addendum also enables the full put and take capacity planned for WSWB. Put is 280 thousand acre-feet per year (TAFY). Take is 225 TAFY. The planned volume is 1,000 thousand acre-feet (TAF). This enables 214,000 available bank shares. A share is defined as 1.0 AFY of put and take. One-third of those shares, or 71,000 shares, will be dedicated to WSIP ecosystem needs. This is based on the results of the CalSim modeling in the original grant application.



Additional CEQA work in conjunction with the Water Commission staff will be needed. Capturing unallocated surplus SWP water will need to be vetted under CEQA and other regulatory agencies. The form and extent of required CEQA documentation has not been determined yet. It will also be coordinated with the NEPA documents

being prepared by FEMA. Process and progress on these documents will be described in future quarterly reports.

### 4. FACILITIES PLANNING

Considerable feasibility planning for the new facilities has already been completed. Past studies include the following:

- 2005 initial feasibility study prepared for the 2006 EIR (by Western Development and Storage)
- 2011 master plan for site buildout (by GEI)
- 2016 master plan update (by GEI)
- 2014 groundwater model (by HDR)

Additional planning is needed to start design/build process. Design/build enables a rapid online date. It also controls the risk of cost overruns with the use of a

Guaranteed Maximum Price type of contract. This will reduce project risk. It is assumed that 20% to 30% of design will need to be complete before the design/build process can proceed.

Securing right-of-way for the 84" diameter recharge pipe has already been started because it is a critical path item. Easements and outright ownership of land needed for these facilities has been ongoing to ensure that needed right-of-way is available when construction starts. A phasing plan is also being developed to optimize the online dates for all facilities.

**A Conjunctive Use Feasibility Study is part of the WSIP Regulation. WSWB will conduct its Feasibility Study in 2019. Discussions have been initiated with an engineering firm to conduct this study.**

**5. COST UPDATE**

Capital cost estimates **have been** carried forward from the Prop. 1 application to reflect funding needs and current market conditions. The update will determine how much of the capital cost the grants (Prop 1 and FEMA) can cover and how much must be financed by WSWB. The cost estimates will be adjusted **as**

**the project progresses** to reflect current market conditions.

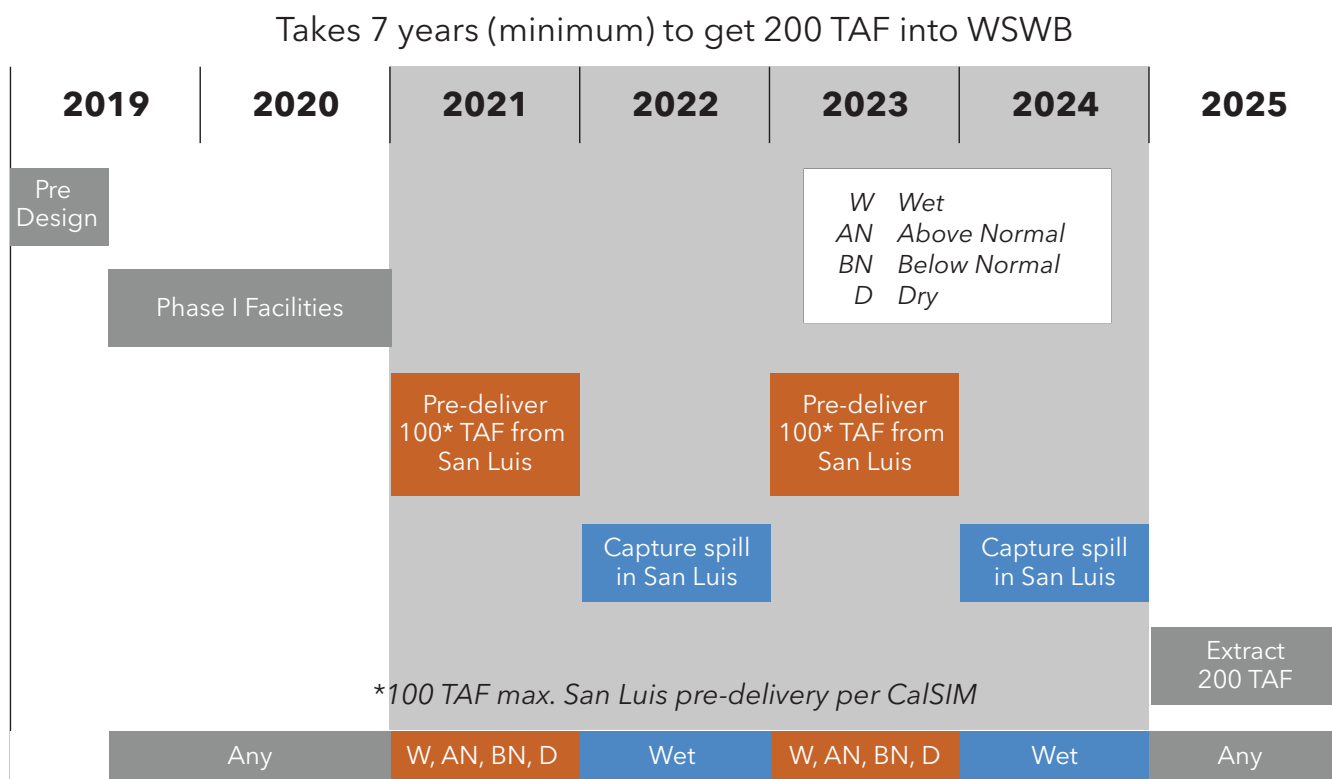
This cost update **was** presented to the Water Commission in the same format as the August, 2017 application ([https://cwc.ca.gov/WISPDocs/WSWB\\_ProjectCosts\\_1of1.pdf](https://cwc.ca.gov/WISPDocs/WSWB_ProjectCosts_1of1.pdf)).

The cost estimate addresses a recent shortage of well drillers in the Antelope Valley. One of two local well drillers in the AV, DRC Pumping Systems, decided to quit the business. This could impact the price to drill a well and the schedule for drilling the 60 to 90 new wells needed for WSWB. It may be possible to rely more on well drillers from the Central Valley who have been preoccupied drilling wells in advance of SGMA implementation until recently.

**6. SCHEDULE UPDATE**

WSWB recharge capability is targeted to be online in 2020. The primary recharge facility is an 84" diameter pipe from the California Aqueduct to WSWB's percolation ponds. WSWB is also developing a backup plan for recharge in case there are delays in building the 84" diameter pipe. The existing 48" diameter

Figure 1. Seven years (min.) required to put 200TAF of water into WSWB



AVEK West Feeder already connects to the WSWB percolation ponds and can be used for recharge under a 2012 Agreement with AVEK and can occur immediately. Also, the 48" diameter pipe planned for construction using FEMA money enables additional recharge. Both 48" diameter pipes represent a backup plan to make sure recharge operations can begin in 2020.

Recharge capacity is the initial priority for facilities. The bank needs to catch the next wet cycle and put it into the ground (Figure 1). A specific combination of creating 100 TAF of empty space in San Luis Reservoir followed by a wet year is needed to capture spills. The process will take seven (7) years or more to put 200 TAF in WSWB. The goal for emergency response is having a total 215 TAF of water in WSWB.

Bringing well capacity online early is not as urgent as providing recharge capability because water cannot be extracted from the bank until it is recharged. Much like a surface reservoir, water cannot be taken out of storage in WSWB until it is banked (see Figure 1). The AV Watermaster enforces this requirement. Unless an agreement to borrow groundwater can be developed, water must be stored before it can be extracted.

Institutional issues and agreements may be difficult to resolve before starting recharge. Agreements are needed with DWR, USBR, and the SWP contractors to initiate pre-delivery of water from San Luis Reservoir into WSWB. The impacted parties must be convinced that there will be no negative impact on them due to the pre-delivery of water.

Well drilling will be phased to optimize production and recognize local drilling limitations. Drilling too many wells too fast can result in poor per well production, poor water quality, or both. This will be detailed in a formal operations and startup plan, which is under development.

**Phase II will provide the 75 TAFY extraction capacity needed to enable pre-delivery and spill capture. Once the Phase II wells and lift station are online, pre-delivery and spill capture from San Luis and Oroville can begin.**

The phasing plan will ensure that the full 75 TAFY of water extraction needed for the ecosystem and for backstopping of San Luis Reservoir is available once it has been stored. 75 TAFY is the amount of water needed for ecosystem (pulsed flows for fish) and

Figure 2. WSWB Potential Construction Schedule

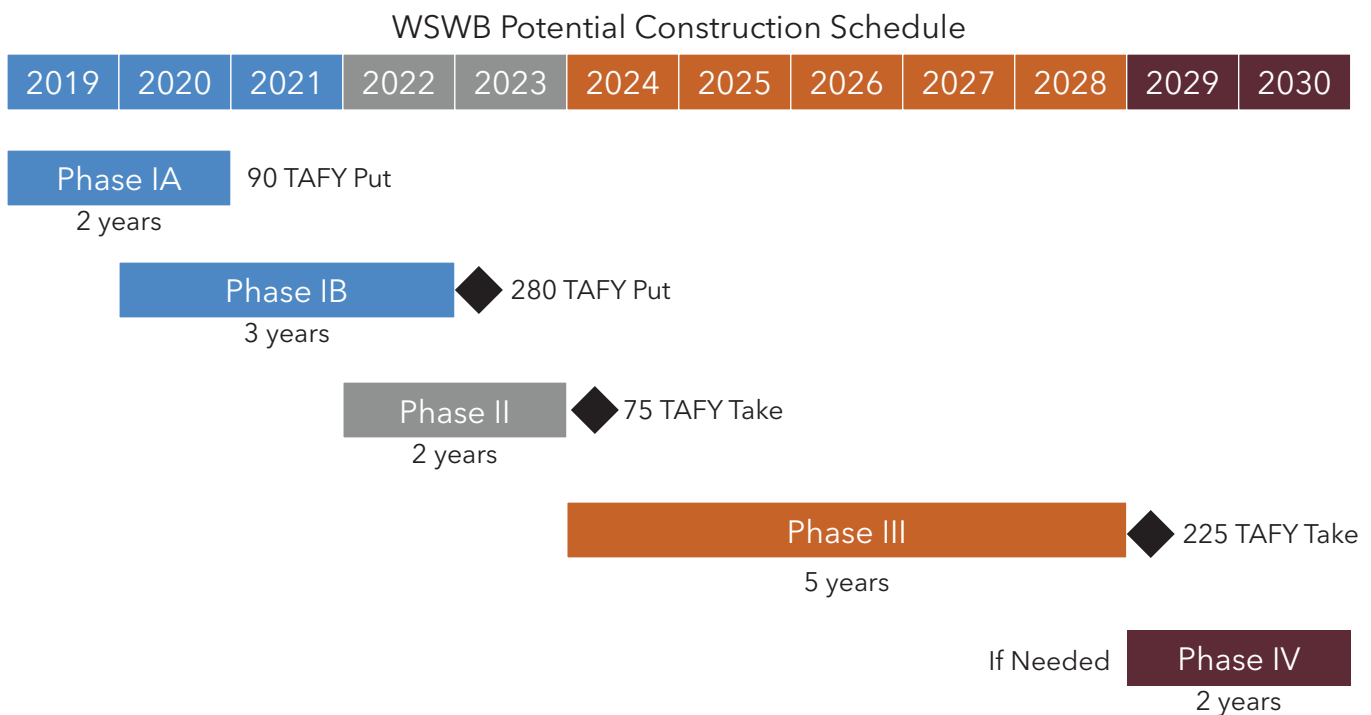
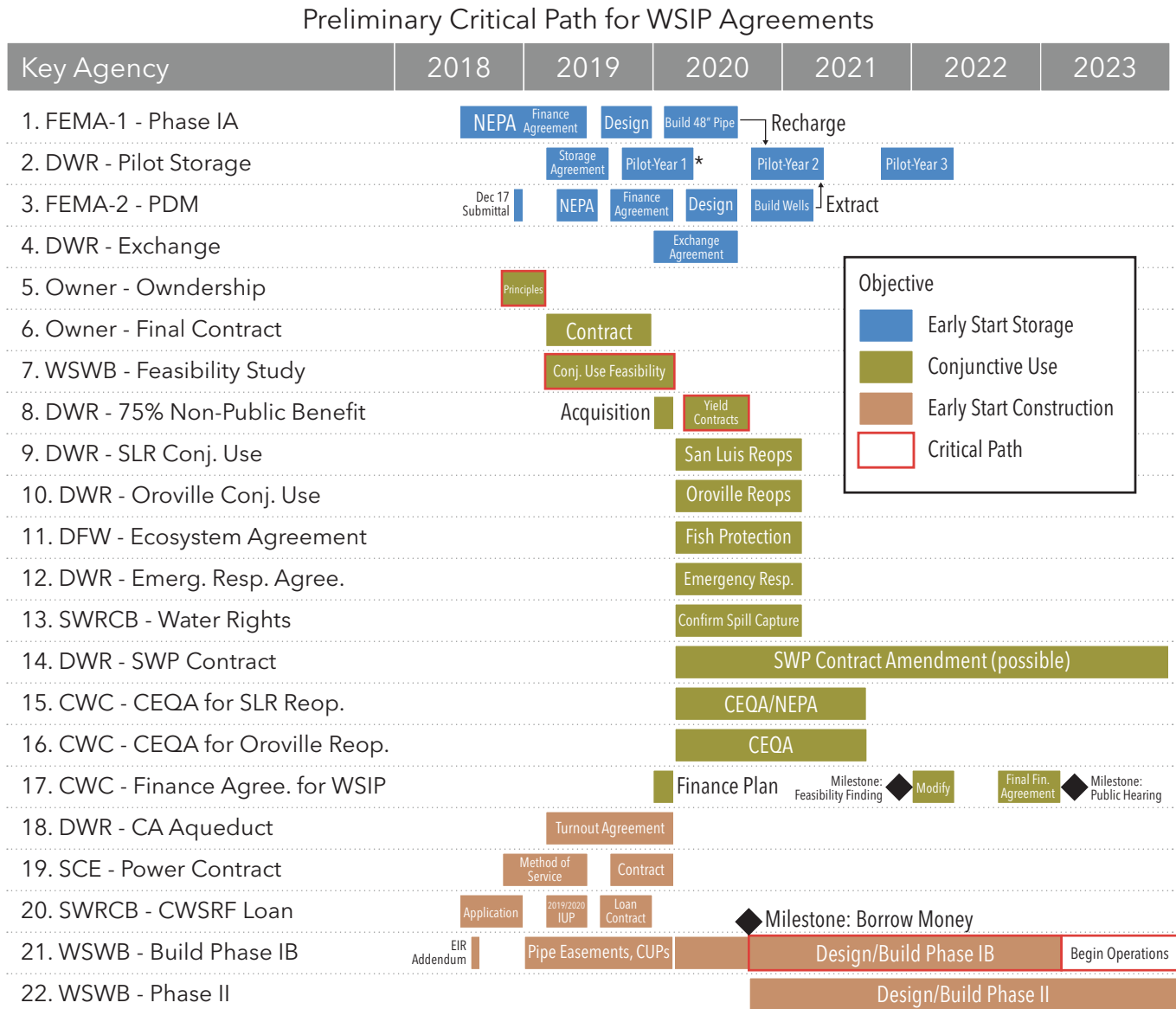


Figure 3. Preliminary Critical Path for WSWB Agreements



\*Pilot storage to begin on October 1, 2019. Makes early use of the expanded 1.0 MAF storage volume of WSWB

backstopping (putting water back into San Luis to avoid the low point issue) from the CalSim-II modeling performed for the original application. The 215 TAFY of emergency response water will take at least seven (7) years to get into the ground. Well drilling can be phased to match this constraint. **The phased construction schedule for the WSWB is shown as Figure 2.**

**Early start storage can also be used to provide new carryover and emergency storage for the state. This will be part of ongoing discussions with various state agencies (Figure 3).**

## 7. FINANCING PLAN

WSWB has invested over \$30 M to date in developing the project. Currently, another roughly \$18 M in cash is on hand to further develop the water bank in anticipation of rapid build out. WSWB would seek to raise additional equity and financing to complete the project as well. WSWB and its partners have ample experience raising debt financing to support projects. A formal financing plan will be prepared once the Prop 1 and FEMA grant amounts are determined. **A draft budget of WSWB Early Start Phasing and Capital Cost is shown in Table 1.** Any capital cost not covered by a grant will be financed through a combination of equity and debt financing.

Table 1. WSWB Early Start Phasing and Capital Cost

WSWB Early Start Phasing and Capital Cost

Phase	Major Facilities	Year Online	Put (cfs)	Take (cfs)	\$M
Existing	AVEK West Feeder, 320 acres of ponds, 7 irrigation wells	Now	100	14	0
IA	FEMA-I: 48" pipe to LAA #2, 50cfs from well equipping	2020	225	50	16
IB	84" recharge pipe, remainder of percolation pods	2022	385	50	94
II	16 new wells, 150cfs lift station (60% of 250cfs)	2024	385	106	67
III	60 new wells, full lift station, substation, 84" and 48" pipes	2028	385	310	129
All					306

**Financing plans include an assessment of federal and state subsidized loan programs. This can reduce project costs and mitigate risks.**

The financing plan will also include an update of the economic plan included in the original application. The economic evaluation will address the potential effect of other conditionally eligible projects on the WSWB benefits. One potential impact could be an additional \$28 M in WSIP grant funds that may become available if another WSIP project drops out. Another potential impact is the market price of new yield created by other storage projects. WSWB will create 34.0 TAFY of new yield from SWP spill capture. If another project that creates new yield has cost increases that must be passed on to participants, that will enable WSWB to increase the price it can charge for new yield. This could impact WSWB’s economics and how to optimize the public benefits it provides.

**8. ENERGY**

A major energy development occurred on September 10, 2018. On that day, the Governor signed Senate Bill (SB) 100 into law ([https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180SB100](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100)). SB 100 commits California to achieving a 100% renewable energy portfolio by the year 2045.

Substantial new renewables penetration and energy storage will be needed to meet this aggressive goal.

An initial WSWB study funded by the California Energy Commission established the ability of WSWB to store

energy. It is titled EPC-15-049 “Groundwater Bank Energy Storage Systems”. It was submitted to CEC in July 2017. The study has been posted online at the CEC website. It shows how WSWB can avoid any on-daily peak use of electricity through use of onsite water storage. It also shows how a 5.2 MW hydropower turbine can be used in combination with onsite storage to generate daily on-peak electricity.

A second WSWB study funded by the California Energy Commission established the ability of WSWB to serve as a water/energy bank. It is titled EPC-16-029 “Water/ Energy Bank Proof-of-Concept” study. A final draft report **was sent to the CEC** in December 2018. The Water/ Energy Bank is aimed at providing over 200 megawatt (MW) of Demand Response benefits for the electric grid. It shifts water deliveries seasonally to shift when electricity is used to pump imported water. This moves electric loads from the peak summer season to the spring when there is a surplus of solar energy, avoiding renewables curtailment. This can help California meet its goal of 100% renewables by 2045.

Both CEC studies establish the ability of WSWB to increase renewables penetration and reduce greenhouse gases. This means that WSWB can play an important role in helping the state meet its new energy goals. The statewide value of this benefit is still being assessed. While not an original goal of the WSWB grant application, recent energy developments make it more important.



An additional benefit of WSWB is that fact that a groundwater bank does not create greenhouse gases (GHG). Surface reservoirs that stratify create methane in their anaerobic bottom layer, which is a potent GHG.

As a conjunctive use project, WSWB will provide a double GHG benefit: reduced GHGs due to increased renewables penetration and avoided GHGs as a groundwater bank. This also avoids the need to mitigate GHGs for 1.00 MAF of new water storage as part of CEQA documentation.

### 9. EMERGING ISSUE OF 1,2,3 TRI-CHLOROPROPANE (TCP)

A new water quality issue emerged in the summer of 2018: 1,2,3 tri-chloropropane (TCP). It is a pesticide used to kill nematode worms. A new California standard for TCP was set in December of 2017. The Maximum Contaminant Level in water was set at 5.0 parts per trillion (ppt). That level is also the detection limit. The Public Health Goal is 0.7 ppt. TCP is a “probable human carcinogen”, is entirely man-made, and is a health concern at extremely low levels. This makes it a serious issue for groundwater banks.

TCP monitoring data for the first quarter of 2018 were posted online by the SWRCB in the late summer of 2018: [https://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/123TCP.html](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/123TCP.html) The data show that TCP contamination is extensive throughout the Central Valley of California. Fortunately, the Antelope Valley has not had any detections of TCP. This appears to be due to the historical crop usage, need for the pesticide, and the geology of the Antelope Valley. Other parts of the state are not so lucky.

TCP is likely to become a more significant problem for Central Valley groundwater banks. It can impair their ability to pump water back into the large aqueduct systems that serve urban areas, particularly the California Aqueduct. This impacts their water supply and emergency response potential. Downstream urban water agencies may not tolerate an increase in the concentration of a man-made, probable carcinogen in the California Aqueduct. WSWB will monitor this issue closely. It may be appropriate to adjust the WSWB emergency response plan to help the state deal with TCP if it impairs the ability to use groundwater banks statewide.



Emerging issues like TCP also highlight the value of a diverse storage portfolio. Conjunctive use projects that are geographically diverse and flexible increase reliability. Too many eggs in one basket can have negative consequences.

### 10. FINANCIAL DATA

The Financial Management Systems (FMS) Questionnaire is a required component of our first progress report. The most recent annual audited financial statements for the Southern California Water Bank Authority **were** provided to the Water Commission in **October 2018**. These will be requested through the existing Joint Powers Authority (JPA), which is the sponsor of the WSWB project.

In addition to audited financial statements, WSWB will need to demonstrate that it has adequate Financial Management Systems in place. This is needed to track costs, invoices, and avoid an audit. The FMS form is as follows: [https://cwc.ca.gov/Documents/2018/WSIP/FinancialQuestionnaire\\_Final.pdf](https://cwc.ca.gov/Documents/2018/WSIP/FinancialQuestionnaire_Final.pdf)

## SUMMARY

The most significant events in the first three (3) months of the WSWB project implementation are as follows:

- Positive developments in the partnership discussions
- Acquisition of **more** FEMA grants to leverage WSIP grants
- Approval of an EIR Addendum, increasing the WSWB capacity to 1.00 MAF
- Passage of SB 100 to achieve 100% renewables, making WSWB energy benefits more important
- Emergence of TCP contamination issue and the fact that WSWB does not have a TCP problem

## ATTACHMENTS

Attachment A: Table 1. Project Schedule

Table 2: Quarterly Reporting Items for Commission Hearing on Final Awards

Attachment B: Board of Directors Meeting Notes

Attachment C: Letter from the California Office of Emergency Services

Attachment D: Email Notification of Eligibility for Pre-Disaster Mitigation Grant

Required Components of Progress Report  
Table 1: Project Schedule

Funding Agreement Milestone	Start Date	Finish Date	% Complete
Non-public benefits cost share contracts - 150,000 shares in WSWB out of 225,000 shares total (67%) <ul style="list-style-type: none"> <li>Executed non-public benefit contract: Rosamond CSD (6,000 shares)</li> <li>Executed non-public benefit contract: San Diego CSD (5,000 shares)</li> <li>Unallocated non-public shares available: 144,000 shares</li> </ul>	Done Done TBD	Done Done TBD	100% 100% 0%
Contracts for Administration of Public Benefits - 71,000 shares in WSWB out of 225,000 shares total (33%)* <ul style="list-style-type: none"> <li>DFW (ecosystem)</li> <li>SWRCB (ecosystem)</li> <li>DWR (emergency response)</li> </ul>	TBD TBD TBD	TBD TBD TBD	0% 0% 0%
Completed Feasibility Studies <ul style="list-style-type: none"> <li>2005 Feasibility Evaluation</li> <li>2011 Master Plan</li> <li>2016 Master Plan Update</li> <li>2014 groundwater hydrologic model</li> <li><b>Conjunctive Use Feasibility Study</b></li> </ul>	2004 2010 2015 2013 <b>2019</b>	2005 2011 2016 2014 <b>2019</b>	100% 100% 100% 100% <b>5%</b>
Environmental documents <ul style="list-style-type: none"> <li>Prior CEQA Environmental Impact Report (2006)</li> <li>Prior CEQA Environmental Impact Report Addendum (2018)</li> <li>New CEQA needed for SWP spill capture</li> <li>New NEPA for FEMA-I grant</li> <li>New NEPA for FEMA-II grant</li> <li><b>New NEPA for FEMA-III grant</b></li> </ul>	2005 7/2017 TBD 8/2018 TBD <b>TBD</b>	2006 8/2018 TBD 12/2018 TBD <b>TBD</b>	100% 100% 0% ~50% 0% <b>0%</b>
Federal, State, and Local Approvals <ul style="list-style-type: none"> <li>Federal: USBR, FEMA</li> <li>State: DFW, DWR, SWRCB, CWC</li> <li>Local: Kern Co. Los Angeles Co., AVEK</li> </ul>	TBD TBD TBD	TBD TBD TBD	0% 0% 0%
Funding Agreement <ul style="list-style-type: none"> <li>Updated budget</li> <li>Updated Schedule</li> <li>Phasing Plan</li> </ul>	TBD TBD TBD	TBD TBD TBD	0% 0% 0%

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Funding Agreement Milestone	Start Date	Finish Date	% Complete
Project Planning for design/build			
• Project planning	Done	Done	100%
• Right-of-way acquisition and pipeline easements	1/2017	TBD	25%
• 20% to 30% design (or sufficient to start design/build)	TBD	TBD	0%
Construction			
• Phase IA facilities to comply with FEMA grant obligations	TBD	TBD	0%
• Phase IB facilities to comply with Prop.1 grant obligations	TBD	TBD	0%
• Phases II, III, and possibly IV: new wells needed to extract the full 225 TAFY extraction capacity	TBD		0%
Begin Operations			
• Recharge pipes online in 2020	TBD	TBD	0%
• Extraction wells online in phases over a 7-year period	TBD	TBD	0%
• Backup plan if recharge facilities are delayed	TBD	TBD	0%
• <b>Early start operations</b>	<b>TBD</b>	<b>TBD</b>	<b>0%</b>

\* WSWB will provide 225,000 shares of bank capacity based on 225 TAFY of extraction. 71,000 shares or 71 TAFY of capacity must be dedicated to ecosystem (fish pulse flows) and backstopping (putting water back into San Luis to avoid the low point problem). This is 1/3 of the WSWB available capacity. Extraction capacity constrains the total number of shares available. 375 TAF of volume (5.0 AF/share) will be dedicated to WSIP needs to store captured SWP spill water. This is consistent with the CalSim modeling presented in the WSWB grant application.

Table 2: Quarterly Reporting Items for Commission Hearing on Final Awards

Description	Instructions	Estimated Completion Date	Percent Complete %
Contracts for non-public cost share	• Existing contract with RCSD (6,000 shares)	Done	100 %
	• Existing contract with SDCWA (5,000 shares)	Done	100 %
	• New contracts	2022	1 %
Contracts for Administration of public benefits	• DFW contract for ecosystem benefits	TBD	0 %
	• DWR contract for San Luis backstopping	TBD	0 %
	• DWR contract for emergency response water	TBD	0 %
Completed feasibility studies	• 2005 initial feasibility evaluation prepared for the 2006 EIR (prepared by WDS)	Done	100 %
	• 2011 master plan for site buildout (prepared by GEI)	Done	100 %
	• 2016 master plan update (prepared by GEI)	Done	100 %
	• 2014 groundwater model (prepared by HDR)	Done	100 %
Final environmental documentation	• Existing 2006 Environmental Impact Report (EIR)	Done	100 %
	• Existing 2018 EIR Addendum	Done	100 %
	• New Environmental Assessment for NEPA compliance for FEMA grant(s)	12/2018	50 %
	• New CEQA documents to secure water rights for SWP spill capture	TBD	0 %
All required federal, state, and local approvals, certifications, and agreements	• USBR approval to draw down San Luis Reservoir	TBD	0 %
	• FEMA approval of finance agreement for grant	TBD	0 %
	• DWR approval to draw down San Luis Reservoir	TBD	0 %
	• DWR approval to draw down Oroville Reservoir	TBD	0 %
	• OES approval of finance agreement for FEMA grant	TBD	0 %
	• Kern County Conditional Use Permit	TBD	0 %
	• Los Angeles County Conditional Use Permit	TBD	0 %
	• AVEK agreement for turnout to CA Aqueduct	TBD	0 %

Permits needed: [https://cwc.ca.gov/WISPDocs/WSWB\\_Permits\\_1of1.pdf](https://cwc.ca.gov/WISPDocs/WSWB_Permits_1of1.pdf). Permits and approvals listed in Table 2 are only the major ones; the link to the application contains the comprehensive list.

## ATTACHMENT B



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

1/8/2019 Board Meeting

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9-2

## **Subject**

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Review of the Antelope Valley-East Kern Water Agency High Desert Water Bank Program

## **Executive Summary**

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This report provides additional information on a potential High Desert Water Bank Program (Water Bank) with Antelope Valley-East Kern Water Agency (AVEK) to store Metropolitan's State Water Project (SWP) supplies. The Water Bank was first brought to the Board's attention in September 2018. Under the Water Bank, Metropolitan could store up to 280,000 acre-feet (AF) of its SWP Table A or other supplies in the Antelope Valley groundwater basin in an account designated for Metropolitan. Metropolitan would pay AVEK for the capital costs for construction of monitoring and production wells, turnouts from the California Aqueduct, underground and aboveground pipelines, recharge basins, water storage, and booster pump facilities. These facilities are estimated to be \$131 million in 2018 dollars. Metropolitan would subsequently pay actual O&M, energy, and recovery usage fees to recover the water in storage. The Water Bank would improve water supply reliability during dry years or emergencies and provide greater operational flexibility to balance supplies and demand.

## **Details**

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### Background

Metropolitan's existing SWP groundwater storage programs provide the region with valuable supply benefits. These programs help Metropolitan manage surplus supplies and provide for dry-year regional reliability. They can also provide increased emergency reliability, particularly with direct pump-back of stored water into the California Aqueduct when needed. Existing SWP groundwater storage programs have performed well during recent droughts, producing more than one million acre-feet of water in the last 24 years. While these storage programs are cost-effective and provide Metropolitan with increased operational flexibility, Metropolitan could further benefit from a more diverse portfolio of storage programs moving into the future.

Some of Metropolitan's existing SWP groundwater storage programs contain risks that need to be managed. During the recent drought, the capacity to return water by exchange was significantly reduced during the low SWP allocations. Water quality has also been an issue with some of Metropolitan's groundwater storage programs. New and changing water quality standards can reduce the amount of water returned to Metropolitan. Lastly, none of the current SWP groundwater storage programs extend beyond year 2035. For continued long-term regional reliability, these programs will need to be extended or new programs developed.

AVEK is a SWP contractor that provides water to the Antelope Valley and represents a new storage program opportunity. Its 2,400 square-mile service area includes northern Los Angeles County, east Kern County and a small portion of Ventura County. AVEK has the third largest Table A contract amount of the 29 SWP contractors with a Table A amount of 144,844 AF. Served by the East Branch of the California Aqueduct, AVEK delivers both treated and untreated water to its customers. The proposed Water Bank's strategic location, downstream of the Edmonston Pumping Plant, provides an additional factor of reliability. If the Edmonston Pumping Plant or facilities upstream are damaged by an earthquake or shut down due to another incident, stored water could be



returned from the Water Bank to help maintain reliable deliveries to Metropolitan. The direct pump-back capacity of the Water Bank, when compared to programs that recover through exchange, can be more reliable and valuable during low supply or emergency conditions when exchange supplies may not be available.

In 2016, Metropolitan entered into a ten-year agreement with AVEK for an exchange/storage program. Under the exchange portion of the program, AVEK provides its unused Table A supplies over ten years to Metropolitan, and Metropolitan returns half of the water later through an uneven exchange at Banks pumping plant. The exchange is initiated by mutual agreement. When AVEK calls the water to meet its consumptive needs, there are no additional costs to Metropolitan. Under the storage portion of the program, Metropolitan is able to store 30,000 AF of its SWP Table A or other supplies in the Antelope Valley groundwater basin at its discretion.

#### Description of Potential Water Bank

To operate the proposed Water Bank, AVEK proposes to build and operate groundwater recharge and recovery facilities located near the bifurcation of the West and East Branch of the California Aqueduct. The Water Bank would have a 280,000 AF capacity to store Metropolitan's SWP or other available supplies. The annual storage and recovery capacities would be up to 70,000 AF per year. Similar to other groundwater storage programs, Metropolitan would be assessed a one-time 10 percent loss when water is placed into storage. A key advantage of the program is that AVEK would be able to return up to 70,000 AF per year by direct pump-back into the East Branch of the California Aqueduct. The program could also be expanded to include direct pump-back to the West Branch of the California Aqueduct. While AVEK would own the facilities, Metropolitan would have first priority to the return capability, which is critical during emergencies or dry years when SWP allocations are low.

Implementation of the Water Bank would require the construction of monitoring and production wells, turnouts from the California Aqueduct, underground and aboveground pipelines, recharge basins, and water storage and booster pump facilities. Metropolitan would pay AVEK for the capital costs of the project, which are now estimated at \$131 million. This estimate is currently under review by Metropolitan's Engineering Services and may be refined. Metropolitan would make payments based on a mutually agreed upon schedule related to construction progress. In addition, Metropolitan would pay for the actual operation, maintenance and power costs for the Water Bank facilities when used for Metropolitan's benefit. There are no costs to store the water. However, Metropolitan would pay AVEK a \$100/AF recovery usage fee on all the recovered water. The recovery usage fee would be escalated every year based on the Consumer Price Index (CPI) starting in 2018. Metropolitan would pay a minimum rolling average of \$2 million towards the recovery usage fee per year, starting after the project construction is complete. Any payments made in excess would be credited in future years to recovery usage fees. In total, staff estimates this storage opportunity would cost approximately \$320/AF (present value) for water stored and subsequently recovered. This revised estimate accounts for the 10 percent loss on deliveries into storage, updated capital cost estimates, estimated operating costs, and returning 70,000 AF in dry years.

Under the Water Bank, Metropolitan would have first priority to store its SWP Table A or other supplies. AVEK retains a secondary priority right to access the groundwater bank. Lower priority users may utilize unused capacity in the groundwater bank. Revenues collected from lower priority users would be shared equally between Metropolitan and AVEK. All program participants must meet all water quality requirements set by the Department of Water Resources. Based on groundwater testing, all constituents are below the maximum contaminant levels. Metropolitan and AVEK are also conducting a value engineering process to ensure the cost-effectiveness of the proposed facilities.

In summary, the potential High Desert Water Bank Program with AVEK would provide Metropolitan with improved water supply reliability for the region consistent with Metropolitan's Integrated Water Resources Plan. Further, this program would protect against the water quality issues now observed with other water banks, nearly double the total direct pump-back capability of current SWP groundwater storage programs, and allow for a contract end date in 2057. The coordination of each water agency's water supply resources would strengthen our ability to respond to future challenges and improves our partnership with a key SWP contractor. The draft terms for the potential Water Bank are included in **Attachment 1**.

**Policy**

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Metropolitan Water District Administrative Code Section 4203: Water Transfer Policy.

By Minute Item 50358, dated January 12, 2016, the Board adopted the 2015 Integrated Water Resources Plan Update

**Fiscal Impact**

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Up to \$131 million in capital costs for the construction of the High Desert Water Bank Program facilities. Payment of the take recovery usage fee of \$100 per AF (escalated by the CPI starting in 2018) and the actual operation, maintenance and power costs for the program facilities. In total, the estimated unit cost would be \$320 per AF.

  
Brad Coffey  
Manager, Water Resource Management

12/19/2018  
Date

  
Jeffrey Kightlinger  
General Manager

12/21/2018  
Date

**Attachment 1 – Contractual Term Sheet**

Ref# wrm12665242

**Term Sheet for the Potential  
Antelope Valley-East Kern and Metropolitan Water District  
High Desert Water Bank Program**

**Program Overview**

- Storage Capacity: 280,000 AF
- Storage Losses: 10%
- Put Capacity: 70,000 AFY
- Take Capacity: 70,000 AFY (Dedicated Well Extraction Capacity)
- Term: September 20, 2037, plus twenty-year, no-cost option to extend the agreement

**Program Costs**

- Estimated Capital costs: \$131 million to fund recharge basins, recovery wells, transmission pipelines, electrical, instrumentation and controls, and other necessary High Desert Water Bank facilities.
- The estimated capital costs include oversized power and transmission facilities. As AVEK develops additional banking capacity that uses the oversized facilities, the capital costs will be reimbursed to Metropolitan, plus interest.
- Capital payments are linked to actual construction costs and paid on a mutually agreed schedule. If capital costs exceed the estimated capital budget, Metropolitan can determine either scaling facilities to keep the costs within budget or paying the additional capital costs. Any unused funds will be returned to Metropolitan.
- Metropolitan is responsible for payment of actual O&M costs. If AVEK or other party uses facilities, AVEK or the other party are required to pay a prorated O&M cost.
- Metropolitan is responsible for paying the actual energy costs incurred to return water.
- Metropolitan shall pay AVEK a \$100 per acre-foot Recovery Usage Fee that will be escalated on the Consumer Price Index (CPI) starting in 2018.
- There is no cost to Metropolitan to put water into storage.
- Metropolitan shall pay a minimum rolling average of \$2,000,000 towards the Recovery Usage Fee (escalated on the CPI) per year, starting upon the earlier of (1) completion of the program facilities, or (2) first return of water to Metropolitan. Any payments made in excess of amounts owed during the year shall be credited in future years to Recovery Usage Fees. During the last five years of the agreement, Metropolitan may also use any available credits towards O&M, Recovery Treatment, or energy costs.
- Recovery Treatment Costs – If applicable, Metropolitan shall reimburse AVEK for actual capital and O&M treatment costs incurred for the return of Metropolitan-stored water.

**Other Key Terms**

- Metropolitan will have an exclusive first priority right to access High Desert Water Bank facilities. AVEK has an exclusive second priority right to unused capacity.
- Metropolitan and AVEK share equally on any lower priority banking by third parties.
- AVEK will enter into the necessary water storage agreements with the Antelope Valley Watermaster.

# ATTACHMENT C

EDMUND G. BROWN JR.  
GOVERNOR

MARK S. GHILARDUCCI  
DIRECTOR



June 14, 2018

Mr. Mark Beuhler  
General Manager  
Willow Springs Water Bank  
1672 Avenue J, Suite 207  
Lancaster, CA 93534

Subject: Subapplication in FEMA Review  
Hazard Mitigation Grant Program  
FEMA-4308-DR-CA, February 2017 Storms  
Cal OES PJ0204, MARPRO Willow Springs Water Bank  
Subapplicant: Kern County, FIPS: 029-00000

Dear Mr. Beuhler:

The California Governor's Office of Emergency Services (Cal OES) received and reviewed your subapplication requesting funds from the Hazard Mitigation Grant Program (HMGP). Cal OES has submitted your grant subapplication to the Federal Emergency Management Agency (FEMA) for grant review and funding consideration.

Please include "FEMA-DR-4308-CA, Cal OES PJ0204" in the subject line of any future written or email correspondence with Cal OES, related to this project, so that we may reference it in our tracking systems.

Should you have any questions, please contact Stephanie Stephens, Hazard Mitigation Grants Specialist at (916) 767-3047 or [stephanie.stephens@caloes.ca.gov](mailto:stephanie.stephens@caloes.ca.gov).

Sincerely,

JASON WILLIAMS  
HMGP Manager



3650 SCHRIEVER AVENUE • MATHER, CA 95655  
RECOVERY SECTION • HAZARD MITIGATION GRANT PROGRAM  
PHONE: (916) 845-8200 • FAX: (916) 845-8388  
[www.CalOES.ca.gov](http://www.CalOES.ca.gov)

# ATTACHMENT D

**From:** Steven Larson <steven.larson@CalOES.ca.gov> on behalf of Governor's Office of Emergency Services <Governor's\_Office\_of\_Emergency\_Services@oes.ca.gov>  
**Sent:** Friday, September 28, 2018 5:11 PM  
**To:** Mark Beuhler  
**Subject:** Your PDM NOI is eligible - Control No. is 18-0069

The California Governor's Office of Emergency Services (Cal OES) has received the Notice of Interest (NOI) submitted by your agency.

Your NOI has been reviewed by the Cal OES Pre-Disaster and Flood Mitigation (PDFM) Division and represents an eligible Pre-Disaster Mitigation (PDM) activity.

Pre-Disaster Mitigation Grant (PDM) Program NOI submitted by your agency is:

Project Number: 18-0069  
Applicant Name: Kern County  
Activity Title: Willow Springs Managed Aquifer Recharge - Resilient Infrastructure Project.  
Federal Share Request: \$10,000,000.00.  
Required Application Match: \$3,330,000.00.

This email confirms the formal invitation for the Kern County to develop a full sub-application for PDM funding.

Your application must meet FEMA's Benefit-Cost Analysis (BCA) requirements to validate cost effectiveness.

Click link for BCA requirements

<https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.fema.gov%2Fbenefit-cost-analysis&data=01%7C01%7CMBuehler%40wswaterbank.com%7Ce5edc3c1bbc843a7994608d625a00ff1%7C3cc65a8220404d49b7ad17e50b5e9841%7C0&mp;sdata=QmbWo7UX6w2fDj%2BU7Bdl4QIX%2FmTTX7uMW%2B%2FETWeMKt4%3D&reserved=0>

Sub-applications will be submitted via FEMA's web-based Mitigation Electronic Grants (eGrants) Management System at <https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fportal.fema.gov&data=01%7C01%7CMBuehler%40wswaterbank.com%7Ce5edc3c1bbc843a7994608d625a00ff1%7C3cc65a8220404d49b7ad17e50b5e9841%7C0&mp;sdata=k4o9wFd2CchJ27QViaj9a6ucvF99frHI8LifuJNCDx8%3D&reserved=0>

A helpful on-line training course for development of sub-grant applications via eGrants can be found at the following link:

<https://na01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.training.fema.gov%2Ffis%2Fcourseoverview.aspx%3Fcode%3DIS-30.a&data=01%7C01%7CMBuehler%40wswaterbank.com%7Ce5edc3c1bbc843a7994608d625a00ff1%7C3cc65a8220404d49b7ad17e50b5e9841%7C0&mp;sdata=lgovdWb0CfCSZb87ubxWC%2BEcMgP0ndfHkQwW%2FIMUPkQ%3D&mp;reserved=0>

You will be contacted by a representative of the PDFM Division for further instructions and deadline for application submittal.

Please direct any immediate questions or concerns to PDFM@caloes.ca.gov.

# About Willow Springs Water Bank Conjunctive Use Project



## CONTACT INFORMATION

Mark Beuhler  
General Manager  
Willow Springs Water Bank  
(323) 860-4829  
mbeuhler@swwaterbank.com