

**AGENDA  
GROUNDWATER BANKING JOINT POWERS AUTHORITY  
BOARD OF DIRECTORS  
REGULAR MEETING**

August 5, 2024  
2:00 PM

Rosedale Rio-Bravo Water Storage District  
849 Allen Road  
Bakersfield, CA 93314

Irvine Ranch Water District  
15600 Sand Canyon Avenue  
Irvine, CA 92618  
2<sup>nd</sup> Floor Committee Room

This meeting will be made available to the public telephonically/electronically.

To virtually attend the meeting and to be able to view any presentations or additional materials provided at the meeting, please join online using the link and information below:

Via Web: <https://zoom.us/j/83815086560>  
Meeting Number (Access Code): 838 1508 6560  
Meeting Password: 982590  
Telephone Dial In: (669) 900-6833

*As a courtesy to the other participants, please mute your phone when you are not speaking.*

**PLEASE NOTE:** Participants joining the meeting will be placed into the lobby when the Board enters closed session. Participants who remain in the “lobby” will automatically be returned to the open session of the Board once the closed session has concluded. Participants who join the meeting while the Board is in closed session will be placed in the waiting room. When the Board has returned to open session, the participants will be automatically added to the meeting.

**CALL TO ORDER**          2:00 p.m.

**ROLL CALL**                Directors Pierucci, Selvidge, Reinhart, Swan

**PUBLIC COMMENT  
NOTICE**

If you wish to address the Board of Directors on any item, please submit a request to speak via the “chat” feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing [mmisuraca@rrbwsd.com](mailto:mmisuraca@rrbwsd.com) before 5:00 p.m. on August 4, 2024.

**ALL VOTES SHALL BE TAKEN BY A ROLL CALL VOTE**

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**1. COMMUNICATIONS TO THE BOARD**

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- a) Written:
- b) Oral:

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**2. ITEMS RECEIVED TOO LATE TO BE AGENDIZED**

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**3. CONSENT ITEMS**

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- a) Consideration of Meeting Minutes May 13, 2024

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**4. JPA ADMINISTRATIVE AND FINANCIAL REPORT**

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- a) Consideration of Quarterly Budget to Actual and Cash Call (Eileen)

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**5. KERN FAN GROUNDWATER STORAGE PROJECT**

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- a) Engineering (Dan)
  - i. Design Update (Dan)
  - ii. Construction Update (Dan)
  - iii. Conveyance Alternative Update (Dan)
- b) Grant Funding Update (Fiona)
- c) Small Storage Funding Concept (Fiona)
- d) State Agreements Update (Fiona)

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**6. GENERAL MANAGER'S REPORT**

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**7. OTHER BUSINESS**

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Pursuant to Government Code Section 54954.2, members of the Board of Directors or staff may ask questions for clarification, make brief announcements, and make brief reports on his/her own activities. The Board or a Board member may provide a reference to staff or other resources for factual information, request staff to report back at a subsequent meeting concerning any matter, or direct staff to place a matter of business on a future agenda. Such matters may be brought up under the General Manager's Report or Directors' Comments.

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**8. CLOSED SESSION**

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**9. OPEN SESSION**

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General Counsel may announce any reportable actions taken during Closed Session.

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**10. ADJOURN**

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Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Board in connection with a matter subject to discussion or consideration at an open meeting of the Board are available for public inspection by contacting Megan Misuraca at [mmisuraca@rbwsd.com](mailto:mmisuraca@rbwsd.com). If such writings are distributed to members of the Board less than 72 hours prior to the meeting, they will be available to the public at the same time as they are distributed to Board Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically during the meeting.

Accommodations: Upon request, the Authority will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at the meeting. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to [mmisuraca@rbwsd.com](mailto:mmisuraca@rbwsd.com). Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

DECLARATION OF POSTING: I, Megan Misuraca, declare under penalty of perjury, that I am employed by the Rosedale-Rio Bravo Water Storage District and I posted the foregoing Agenda at the District Office on or before August 1, 2024. I, Kristine Swan, declare under penalty of perjury, that I am employed by the Irvine Ranch Water District and I posted the foregoing Agenda at the District Office on or before August 1, 2024.

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**BOARD OF DIRECTORS  
GROUNDWATER BANKING JOINT POWERS AUTHORITY  
MINUTES OF THE REGULAR BOARD MEETING**

May 13, 2024  
10:30 AM

**DIRECTORS AND ALTERNATES PRESENT**

Roy Pierucci  
Peer Swan  
Doug Reinhart  
Jason Selvidge

**DIRECTORS ABSENT**

**OTHERS PRESENT**

Doug Gosling- JPA Legal Counsel  
Dan Bartel- RRBWSD  
Trent Taylor- RRBWSD  
Megan Misuraca- RRBWSD  
Paul Cook- IRWD  
Eileen Lin- IRWD  
Paul Weghorst- IRWD  
Neveen Adly- IRWD  
Kellie Welch-IRWD

**CALL TO ORDER**

President Pierucci called the meeting to order at approximately 10:30 a.m.

**PUBLIC COMMENT NOTICE**

There were no public comments.

**1. COMMUNICATIONS TO THE BOARD**

- a). Written: None.
- b). Oral: None.

**2. ITEMS RECEIVED TOO LATE TO BE AGENDIZED**

None.

**3. CONSENT ITEMS**

- a) Meeting Minutes February 5, 2024

A motion was made by Director Selvidge with a second by Director Swan to adopt the consent items. A roll call vote was taken and the motion unanimously passed.

**4. JPA ADMINISTRATIVE AND FINANCIAL REPORT**

- a) Consideration of 3<sup>rd</sup> Quarter Budget to Actual- FYE June 30, 2024 (Lin)  
- Upon the Board's review of Ms. Lin's report a motion was made by Director Swan with a second by Director Selvidge to receive and file the 3<sup>rd</sup> Quarter FYE June 30, 2024 budget to actual report. A roll call vote was taken and the motion unanimously passed.
- b) Consideration of FYE June 30, 2025 (Neveen Aldy) - Upon the Board's review of Ms. Adly's report a motion was made by Director Selvidge with a second by Director Reinhart to receive and file the report and consider a cash call at a future meeting. A roll call vote was taken and the motion unanimously passed.
- c) Consideration of FYE June 30, 2025 Audit Proposal (Lin) - Upon the Board's review of Ms. Lin's report a motion was made by Director Swan with a second by Director Selvidge to employ the firm of DAVIS FARR to prepare the necessary audit. A roll call vote was taken and the motion unanimously passed.

## **5. KERN FAN GROUNDWATER STORAGE PROJECT**

- a) Engineering
  - i. Design Update- Mr. Bartel briefed the Board on the latest design efforts.
  - ii. Conveyance Alternatives Evaluation—Consideration of Budget Augmentation - Mr. Bartel and Mr. Taylor briefed the Board on the latest actions with DWR, Stantec, and Kern County Water Agency regarding Aqueduct Capacity Analysis and KCWA review of Table A requirements and pulse flow expectations and planned meetings for June 2024. Anticipated FAQ from DWR to provide additional information. Mr. Bartel reviewed the proposed budget augmentation for potential environmental reporting as provided in the board report. A motion was made by Director Reinhart with a second by Director Selvidge to approve the augmentation as noted for the budget. A roll call vote was taken and the motion unanimously passed.
  - iii. Construction Update- Mr. Bartel briefed the Board on the latest actions and report provided.
  - iv. Consideration of Bids for West Enos Recharge Facilities- Mr. Bartel briefed the Board on the latest actions with regard to the received bids for the work including but not limited to pipeline, flow controls and crossing and diversions related to Goose Lake Slough. A motion was made by Director Selvidge with a second by Director Swan to accept the lowest responsible bidder (RLH). A roll call vote was taken and the motion unanimously passed.
  - v. Consideration of Change Order—HWY 58 Culvert Casing - Mr. Bartel briefed the Board on the latest actions, permit received, and the efficiency of the change order to utilize the mobilized equipment

to effectuate the crossing. A motion was made by Director Swan with a second by Director Selvidge to approve the change order. A roll call vote was taken and the motion unanimously passed.

- b) Grant Funding Update- Mr. Weghorst briefed the Board on the latest grant funding from the Bureau of Reclamation and future opportunities and reported staff was reviewing potential projects to apply for future funding.
- c) Small Storage Funding Concept- Mr. Weghorst briefed the Board on the latest grant funding and future opportunities and reported staff was reviewing potential projects to apply for future funding.
- d) State Agreements Update- SEIR Pulse Flows- Mr. Weghorst and Mr. Bartel briefed the Board on latest efforts to obtain agreements with the Department of Water Resources and KCWA.

#### **6. GENERAL MANAGER'S REPORT**

No report.

#### **7. OTHER BUSINESS**

None.

#### **8. CLOSED SESSION**

None.

#### **9. OPEN SESSION**

N/A

#### **10. ADJOURN**

Director Pierucci adjourned the meeting.

ATTEST:

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Authority Secretary  
Doug Gosling

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August 5, 2024  
Prepared by: Fiona  
Sanchez/Christopher  
Smithson/Elizabeth  
Pham Agenda Item: 4.

## FY 2023-24 Quarterly Actual to Budget Results

### DISCUSSION:

The quarterly unaudited actual to budget results for capital and operating expenditures for the twelve-month period ending June 30, 2024, is attached as Exhibit "A".

The twelve-month year to date total expenditures were \$649K compared to a budget of \$3.1M. Actual expenditures were \$591K or 19% under budget. This is primarily due to lower expenditures related to the timing of engineering design and construction of the capital project. Construction of the permanent facilities was delayed to establish temporary facilities at West Enos in order to maximize recharge benefits in 2023. Additionally, the GBJPA received \$1.9M in unbudgeted grant revenue from the Bureau of Reclamation's Small Storage Program. Exhibit "A" provides additional comments.

Based on the proposed FY2024-25 first and second quarter budget, a cash call for \$3M is requested in August 2024. Each partner will be requested to fund \$1.5M into the GBJPA bank account in August 2024.

### RECOMMENDATION:

That the Board approve a cash call in the amount of \$3 million.

### LIST OF EXHIBITS:

Exhibit "A" – FY 2023-24 Actual to Budget Results (Unaudited)

## Exhibit "A"

### Groundwater Banking Joint Powers Authority

Actual to Budget Results (Unaudited)

Fiscal Year 2023-24

(in hundreds)

	Actual 06/30/24 (Unaudited)	Budget FY 2023-24	Budget to Actual (Over)/Under	FY 2023-24 Budget Variance/Forecast Comments
<b>Kern Fan Groundwater Capital Project</b>				
Engineering - Planning and Design Staff	\$ 53,600	\$ 104,400	\$ 50,800	Temporary Basins/Timing of Expenditures
Grant Administration and Reporting	6,900	6,700	(200)	
CWC and USBR Feasibility Studies	18,100	-	(18,100)	Federal funding feasibility study
JPA Administration	56,800	57,600	800	
Supplemental Environmental Impact Report	600	15,200	14,600	Timing, moved to FY 2024/25
Agreements with State Agencies	18,200	20,400	2,200	
Engineering Design - Consultants	101,400	310,000	208,600	Temporary Basins/Timing of Expenditures
Engineering CA&I - Outside	41,200	108,400	67,200	Temporary Basins/Timing of Expenditures
Construction	1,730,000	1,993,200	263,200	Temporary Basins/Timing of Expenditures
Legal JPA	9,100	72,300	63,200	Timing, moved to FY 2024/25
Development of Agreement with FWS	-	7,500	7,500	Timing, moved to FY 2024/25
Development of Agreement with DWR	-	10,000	10,000	Timing, moved to FY 2024/25
Environmental	40,500	8,400	(32,100)	NEPA for Phase 1 completed
Permitting	2,700	20,000	17,300	Timing of expenditures
<b>Capital Project Total</b>	<b>2,079,100</b>	<b>2,734,100</b>	<b>655,000</b>	
<b>Operating Expense</b>				
West Enos Recharge Facility	408,900	319,800	(89,100)	Temporary Basins. Complete as of 12/31/23
Administration/Management	46,400	70,900	24,500	Lower staff time than anticipated. More hours anticipated for FY end
Audit	5,800	5,800	-	
Bank Charges	5,700	3,200	(2,500)	Bank fees higher than anticipated.
Insurance	6,200	6,900	700	
Membership	1,000	1,000	-	
Website Maintenance	900	1,000	100	
Utilities	17,000	-	(17,000)	Pumping for temporary basins. Utilities were not budgeted in previous FY
<b>Operating Expense Total</b>	<b>491,900</b>	<b>408,600</b>	<b>(66,300)</b>	
<b>Revenue</b>				
Interest Revenue	(5,700)	(3,200)	2,500	
Grants	(1,916,300)	-	1,916,300	USBR Small Storage Grant
<b>Revenue Total</b>	<b>(1,922,000)</b>	<b>(3,200)</b>	<b>1,918,800</b>	
<b>Total</b>	<b>\$ 649,000</b>	<b>\$ 3,139,500</b>	<b>\$ 2,507,500</b>	

GBJPA  
West Enos Recharge Facilities Emergency Project Contract 1.8.2024

Contract Change Order Number 1

Date: 7/8/24

To: GBJPA  
849 Allen Rd.  
Bakersfield, Ca. 93314

From: Lonnie A. Cross Land Leveling, Inc.  
P.O. Box 10149  
Bakersfield, CA 93389

This Change Order modifies and amends the provisions of the Contract dated 1/8/2024 by and between GBJPA "Owner" and Lonnie A. Cross Land Leveling, Inc. "Contractor". The following items are hereby changed:

1. West Enoe Bore Pit Deepening \$ 23,015.44  
See Attached  
(Billed on upcoming invoice)
2. Extend contract time to 9/1/24

As a result of the changes described above, the amount payable to Contractor is modified as follows:

1. Increase the contract amount from \$ 1,148,849.53 to \$ 1,171,864.97

EXCEPT AS SET FORTH ABOVE, ALL TERMS AND PROVISIONS OF THE CONTRACT REMAIN IN FULL FORCE AND EFFECT.

Execution of this Change Order by both parties constitutes a binding agreement with regard to the direct costs relating to this change order. Subject to Owner's right to approve any additional compensation, Contractor reserves the right to request additional compensation at a later date with regard to the impacts or other indirect costs arising from or related to the work which is subject of this Change Order.

CONTRACTOR  
Lonnie A Cross Landleveling Inc.

Owner  
GBJPA

By:   
Kreg Cross, President

By: 





# Lonnie A. Cross Land Leveling

Mailing Address: P.O. Box 10149 Bakersfield,

CA 93389 Cell 661.809.2644

Fax Line: 661-833-9842

Nathan@crosslandleveling.com

CA #612797 USDOT #3915736 CSLB #547565

## T/M Info Sheet

Attn: Curtis Skaggs  
 West Enos Recharge Facilities Emergency Project  
 Kern Fan Project  
 Contract 1.8.24  
 West Enos Bore Pit Deepening.

### Description:

Deepen bore pit and Receiving pit to new depth of 13.5ft to accommodate for oil pipeline.  
 This project was completed on a Time and Material basis.

Deere 850K bulldozer w/ Slope board

6/10/24 8 hours  
 6/11/24 8 hours  
 6/12/24 8 hours  
 6/13/24 8 hours  
 6/14/24 8 hours

Total 40 Hours @ \$285.00 per hour \$ 11,400.00

Hitachi 330LC excavator w/ 52 inch bucket

6/14/24 8 hours  
 6/17/24 8 hours  
 6/18/24 8 hours  
 6/19/24 8 hours

Total 32 Hours @ \$285.00 per hour \$ 9,210.00

Excavator Mobilization and 2<sup>nd</sup> transport to east side of Enos Ln. \$ 2,000.00

Bond Fees \$ 495.44

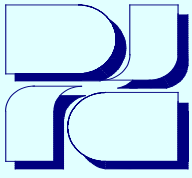
**Time and Material Total \$ 23,015.44**

Nathan Fallgatter

Lonnie A. Cross LandLeveling Inc.

661.809.2644





**DEE JASPAR & ASSOCIATES, INC.**  
CONSULTING CIVIL ENGINEERS  
2730 UNICORN ROAD, BLDG A  
BAKERSFIELD, CA 93308  
PHONE (661) 393-4796  
FAX (661) 393-4799

July 19, 2024

Dan Bartel  
c/o Groundwater Banking Joint Powers Authority (GBJPA)  
849 Allen Road  
Bakersfield, CA 93314

**Re: West Enos Recharge Facilities Project**  
***Weekly Report (Week 23)***

Mr. Bartel,

This serves as a project update for Week 23 of the West Enos Recharge Facilities Project.

<b>Project Status as of:</b>	<b>7-19-24</b>	<b>Contract Totals</b>	
Notice to Proceed <sup>1</sup> :	2-9-24	Contract Amount:	\$1,148,849.53
Contract Duration:	150	Change Orders:	-
Completion Date:	7-8-24	Revised Amount:	-
Elapsed Days:	161	Work Completed:	\$995,981.41
Remaining Days:	-	% Completed:	98%
Change Order – Days:	-		

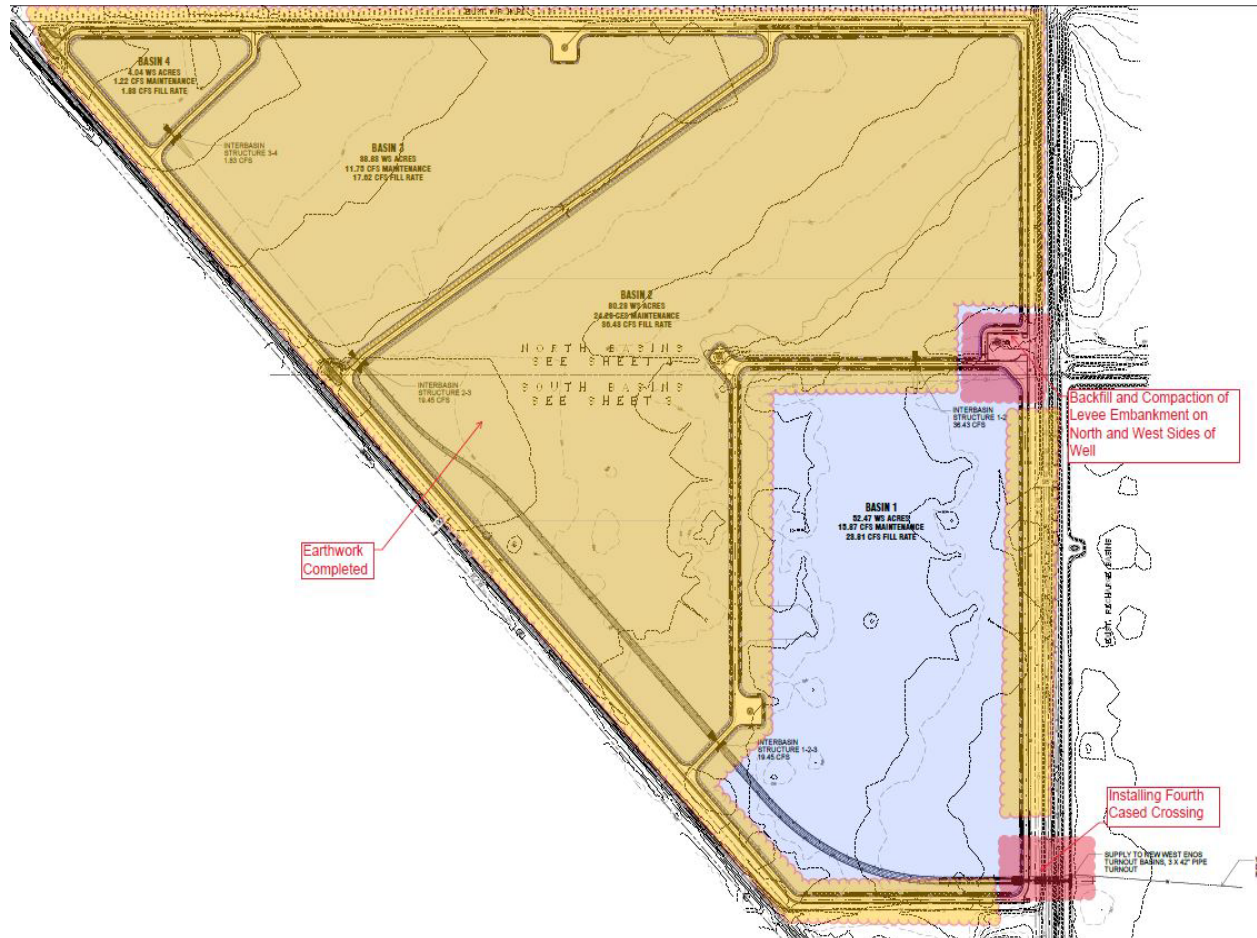
<sup>1</sup>Notice to Proceed was set for January 22, 2024, however the District delayed the start to make sure all provisions of the grant agreement were being followed. Lonnie Cross started work on February 9<sup>th</sup> after the biological clearances and training.

Lonnie Cross Land Leveling and Allstate Boring are on-site. Allstate Boring commenced the casing installation for the northerly most cased crossing on Friday, 6-21-24. They have installed the first three cased crossings beneath Enos Lane and are approximately 50% complete with the fourth cased crossing (southerly most cased crossing). They anticipate completing the casing installation around the middle of next week.

RLH is working on material procurement.

Lonnie Cross Land Leveling continued working on-site. They are currently working on fine grading of levee embankments, leveling and ripping of the basin bottoms, general basin clean up, and the construction of the levee embankment on the north and west sides of the existing water well on the west side of Enos Lane. They have completed the 12-inch over-excavation to 5-ft beyond the toe of levee and the 4-ft deep keyway excavation and backfilled and compacted those sections back to approximate original grade.

Soils Engineering, Inc. (SEI) was on-site for compaction testing of the levee embankment around the well site adjacent to Enos Lane.



**Figure 1: Map of Project Progress**

Sincerely,

*Curtis Skaggs*

Curtis M. Skaggs, P.E.

**Pictures (7-15-24 thru 7-19-24)**



Casing Pipe #3 Installation





Completion of Third Casing

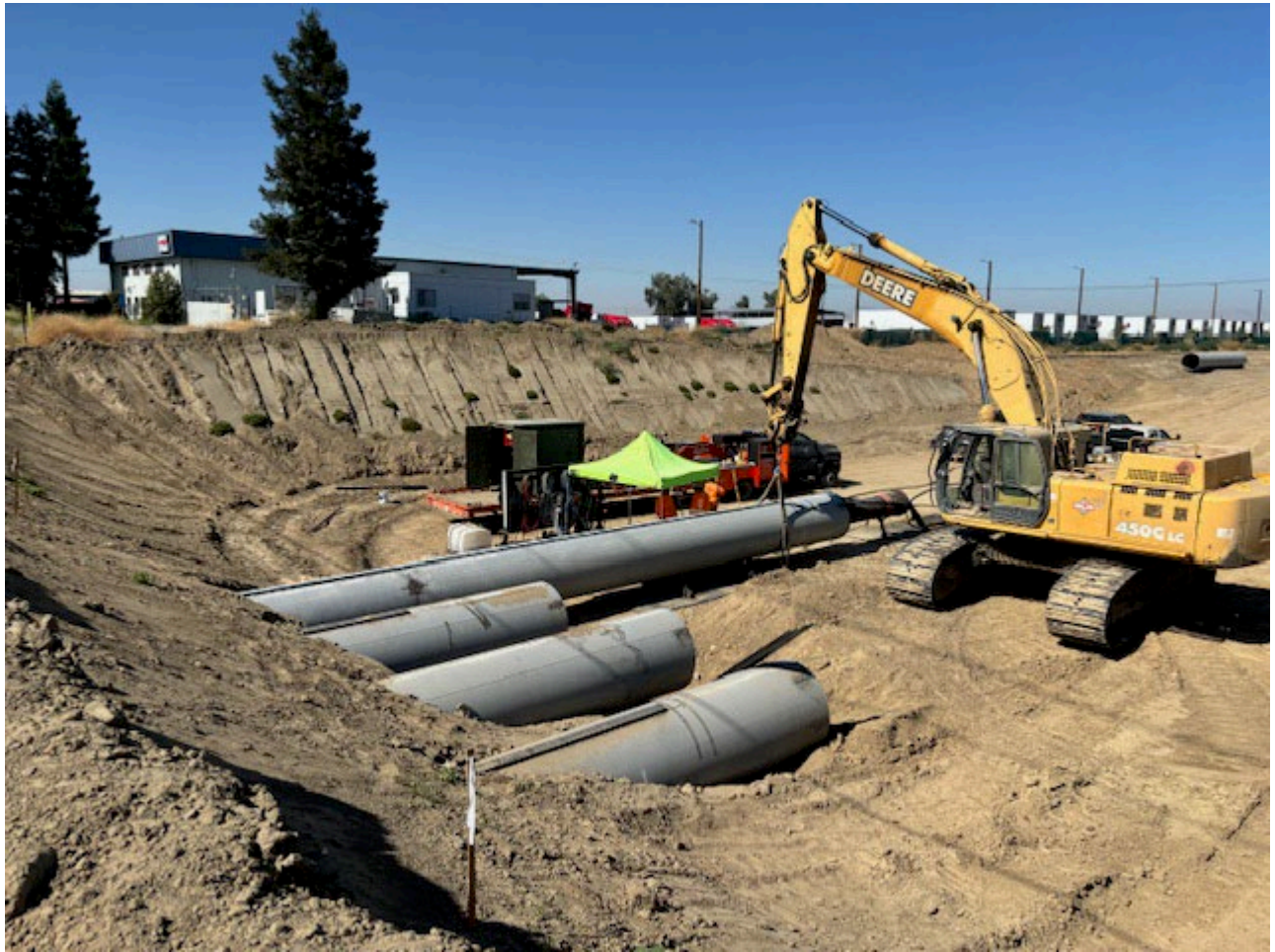


Casing Receiving Pit Entrance





Preparation for Installation of Cased Crossing #4



Casing #4 Installation





Casing #4 Installation





Lined Pond Relocation



Subgrade Preparation for Levee Embankment around Existing Well



Levee Over-Excavation and Recompaction





Levee Over-Excavation and Recompaction



Backfill and Compaction of Levee Embankment Keyway around Existing Well



Backfill and Compaction for Levee Embankment around Well Site back to Original Grade





Fine Grading Levee Embankment Slopes



Levee Embankment Fine Grading





Levee Embankment Fine Grading



**KERN FAN HYDRAULICS SUMMARY -  
DWR/HDR HYDRAULIC ANALYSES  
SUMMARY HYDRAULICS**

June 12, 2024

Prepared for:  
GROUNDWATER BANKING JOINT POWERS  
AUTHORITY

Prepared by:  
JOSEPH LONG, PE, STANTEC

Project Number:  
184031630

**KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES**



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APPENDIX A - HYDRAULICS MODELING PRESENTATION DWR FEBRUARY 2024  
APPENDIX B - ARTICLE 21 WATER SUPPLY SUMMARY DWR



## Acronyms / Abbreviations

af	acre-feet
Aqueduct	California Aqueduct
CASP	California Aqueduct Subsidence Program
CASS	California Aqueduct Subsidence Study
cfs	cubic feet per second
DWR	California Department of Water Resources
ft/s	feet per second
GBJPA	Groundwater Joins Powers Authority
HCC	hydraulic conveyance capacity
in	inch
Max	Maximum
Min	Minimum
NAD 27	North American Datum of 1927
NGVD 29	National Geodetic Vertical Datum of 1929
NAVD 88	North American Vertical Datum of 1988
SOO	Standing Operating Order
SWP	State Water Project
WSE Enter Term	Water Surface Elevation Maximum



## **1 INTRODUCTION**

The Groundwater Banking Joint Powers Authority (GBJPA) Project Team has developed several potential conveyance alternatives to provide water supplies to the Proposed Kern Fan Recharge Facilities. The initial focus of work is to identify solutions that divert State Water Project (SWP) flows into the conveyance facilities for the Kern Fan Groundwater Banking facilities. Two specific conveyance alternatives have been developed that consist of, (1) a stand-alone turnout and open canal conveyance provides water to the Kern Fan Recharge Facilities referred to as the Kern Fan Canal Alternative 3 and (2) a Joint Works Project Alternative 5 that takes advantage of existing turnout infrastructure located at the existing Greater Bakerfield Turnout 1 and 2 then reconfigures the downstream conveyance systems providing a parallel conveyance system for Pool 1 of the Cross Valley Canal (CVC).

Concurrently, the California Department of Water Resources (DWR) is developing hydraulic modeling of the SWP as part of the California Aqueduct Subsidence Program (CASP) evaluating reliability impacts and potential solutions due to regionalized subsidence of the existing aqueduct canal. As part of DWR's hydraulic modeling efforts, the GBJPA provided configuration models for Alternatives 3 and 5 to be incorporated into the overall SWP hydraulic model. This was to evaluate the potential effects of reliability of the SWP and water deliveries to the Cross Valley Canal with the implementation of the Kern Fan Project.

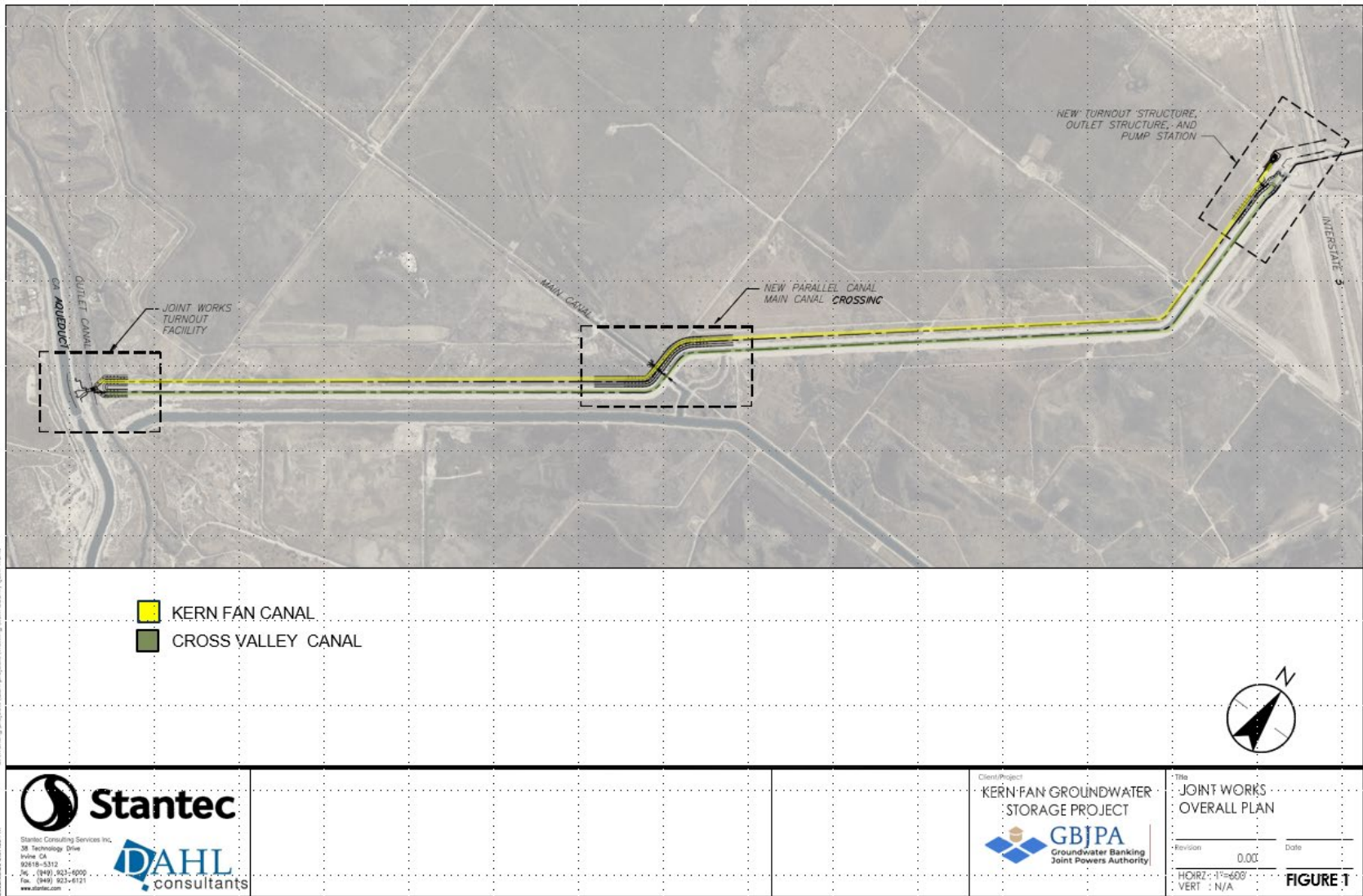
The following is summary of the hydraulic analysis results associated with the implementation of alternatives described above. All hydraulic analyses reflect of the operational parameters for the SWP as described in DWR Standard Operating Order PC 600.22, issued May 8, 2020.

## **2 ALTERNATIVE 5 – JOINT WORKS PROJECT**

Alternative 5 – Joint Works Project provides a parallel canal to the existing Cross Valley Canal Pool No. 1 from the State Water Project to Pumping Plants 1A & 1B. while making use of and modifying the Greater Bakersfield Turnout Facilities. The parallel canal would in combination with the existing Cross Valley Canal have a total capacity of approximately 1,900 cfs. The parallel canal configuration will have a common forebay just downstream of the turnout structures and have an inter-tie to the existing Cross Valley Canal into the forebay for Pumping Plant 1A & 1B. The proposed Joint Works Project would increase the overall reliability of water deliveries into the forebay for Pumping Plant A & B along the Cross Valley Canal equating to the overall design capacity of 1,422 cfs (reference KCWA Website Agency Function, as of June 10, 2024)) with the remaining 450 cfs dedicated to the Kern Fan Project. A new Kern Fan Pumping Station with a capacity of 450 cfs will be included in this alternative being served with a new turnout from the parallel canal. Figure 1 provides a graphical representation of the project configuration.



**KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES**



**Figure 1 - Alternative 5 Joint Works Project Layout**



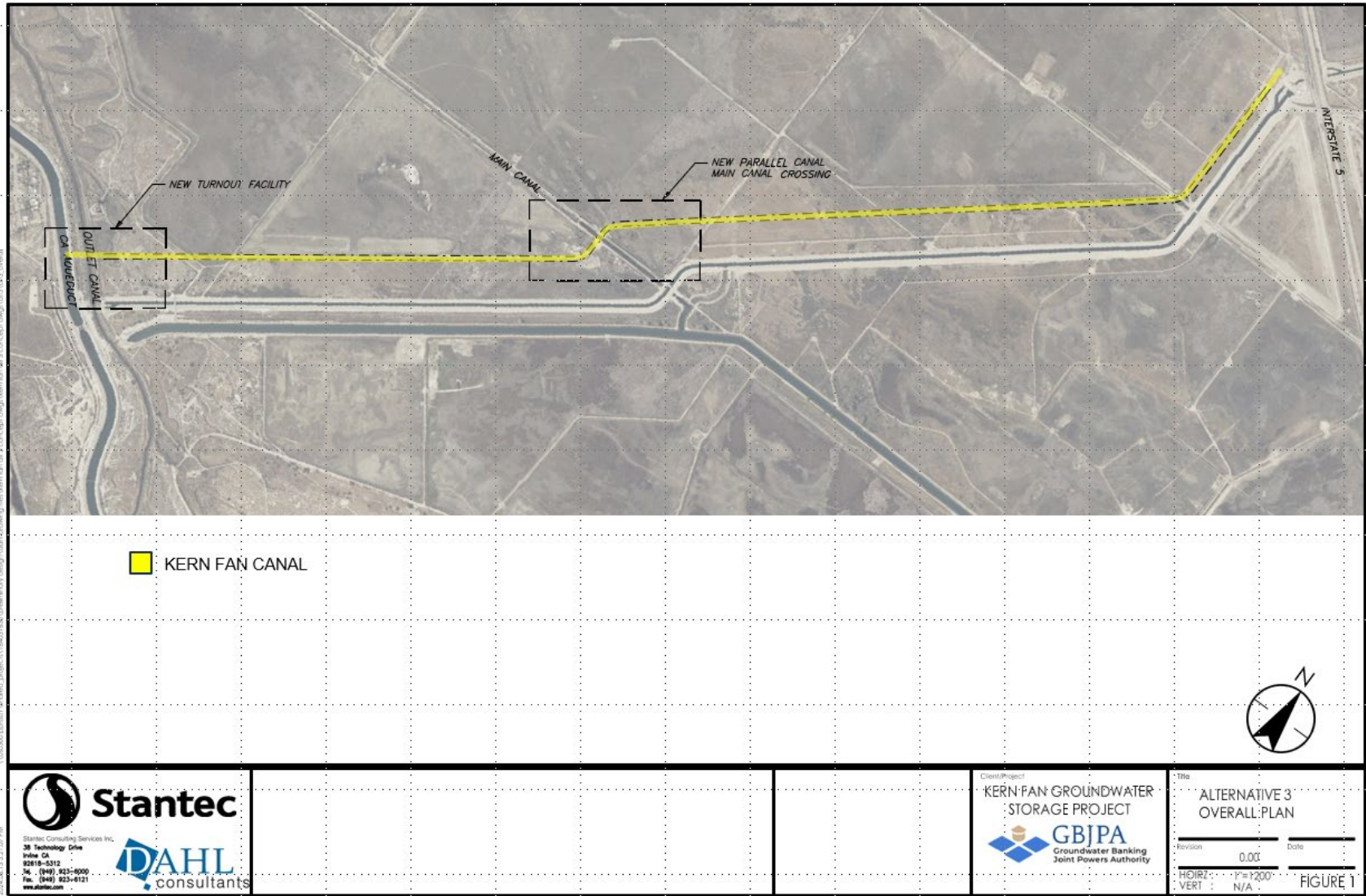
### **3 ALTERNATIVE 3 – KERN FAN CANAL**

Alternative 3 – Kern Fan Canal provides an independent canal from the SWP to the Kern Fan Project Pumping Plant with a minimum hydraulic capacity of 450 cfs. Alternative 3 will construct a new SWP Turnout structure and new pumping plant located southwesterly of Interstate 5. The new turnout structure will be located a minimum 600 feet upstream of the existing Greater Bakersfield Turnouts 1 & 2. No intertie to the Cross Valley Canal is considered as part of this alternative.





**KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES**



**Figure 2 - Alternative No. 3 – Kern Fan Canal Layout**



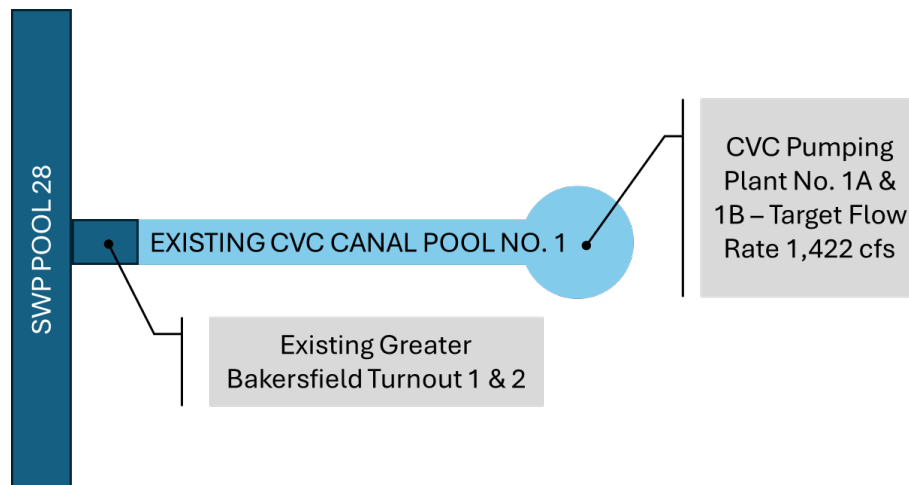
## 4 DEPARTMENT OF WATER RESOURCES - HYDRAULIC ANALYSES

As part of a collaborative effort between DWR and the GBJPA, hydraulic modeling of the two aforementioned alternatives was prepared to evaluate potential impacts to the SWP having the abilities to provide water deliveries while operating under the Standard Operating Order for the SWP system. As part of the hydraulic modeling efforts, the current capacity of the SWP was established, and the turnout capacity at the Cross Valley Canal and the Kern Fan Project evaluated. Upon completing the existing hydraulic capacity analysis, the proposed alternatives were introduced into the hydraulic model to understand, if any, operational degradation occurred to the Cross Valley Canal.

### 4.1 Operational Scenarios

The following flow schematics represents the hydraulic operational scenarios that were hydraulically evaluated:

1 – Existing conditions of the State Water Project and the Cross Valley Canal

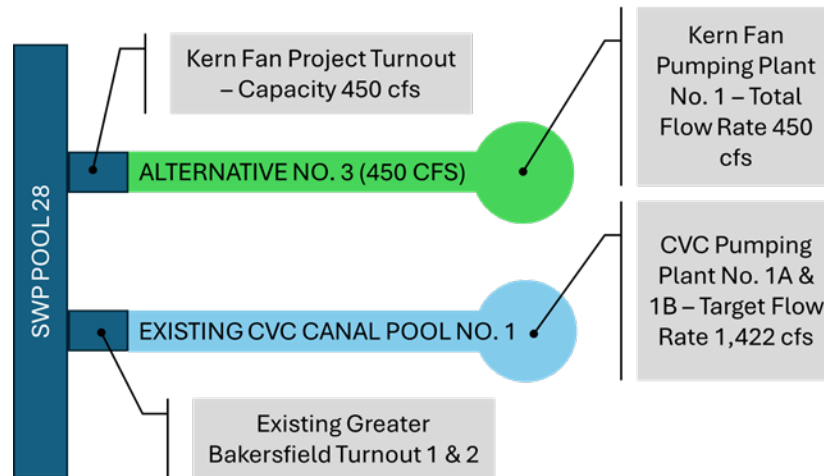


**Figure 3 Existing Condition Flow Schematic**

2 – Alternative 3 Kern Fan Canal upstream of Cross Valley Canal. Assumes delivering 450 cfs to the Kern Fan Canal

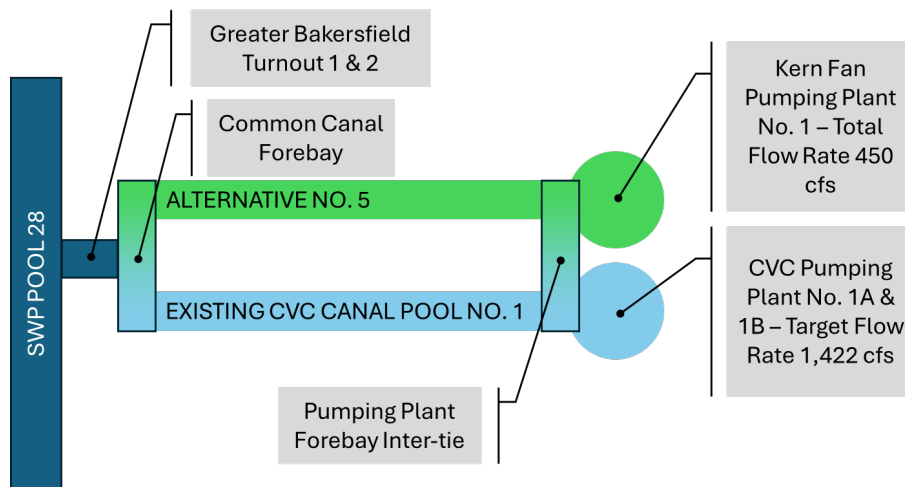


## KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES



**Figure 4 - Alternative 3 Flow Schematic**

3 – Alternative No. 5, Joint Works Project



**Figure 5 Alternative 5 Flow Schematic**

## 4.2 Baseline Assumptions

For the purposes of evaluating capacity conditions in the above scenarios, Standard Operating Order 600.22 was used to establish the operating water surface elevations within SWP Pool 28. The following is the normal operation water surface elevations for Pool 28:



**KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES**

**OPERATIONAL PARAMETER ..... WATER SURFACE ELEVATION**

Absolute Maximum.....	298.6 feet
Absolute Minimum.....	295.6 feet
Normal Maximum .....	297.7 feet
Normal Minimum .....	296.7
Drawdown .....	1.5 feet per day / 0.5 feet first hour

**4.3 Maximum Achievable Flow to Cross Valley Canal (normal operations)**

The DWR Team provided modeling results (as presented February 2024) under the three scenarios that include the Existing CVC Canal, Alternative 3 separate Kern Fan Project Turnout and Conveyance assuming 450 cfs diverted to the Kern Fan Project and Alternative 5 the Joint Works Project that provides a parallel canal along the CVC with a common forebay and inter-tie balancing the overall capacity between the CVC and the Kern Fan Pumping Plants. The following table provide a summary of the modeling results for the three scenarios. All modeling result use normal operating conditions as stated in Standard Operating Orders 600.22.

<b>EXISTING CONDITION</b>	<b>MAXIMUM SUSTAINABLE CVC FLOW RATE (CFS)</b>	<b>KERN FAN FLOW RATE (CFS)</b>
P28 NORMAL MINIMUM WATER SURFACE ELEVATION – 296.7 FEET	950	0
P28 NORMAL MAXIMUM WATER SURFACE ELEVATION – 297.7 FEET	1150	0



**KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES**

<b>ALTERNATIVE 3</b>	<b>MAXIMUM SUSTAINABLE CVC FLOW RATE (CFS)</b>	<b>KERN FAN FLOW RATE (CFS)</b>
P28 NORMAL MINIMUM WATER SURFACE ELEVATION – 296.7 FEET	950	450
P28 NORMAL MAXIMUM WATER SURFACE ELEVATION – 297.7 FEET	1150	450

<b>ALTERNATIVE 5</b>	<b>MAXIMUM SUSTAINABLE COMBINED FLOW RATE (CFS)</b>
P28 NORMAL MINIMUM WATER SURFACE ELEVATION – 296.7 FEET	1850
P28 NORMAL MAXIMUM WATER SURFACE ELEVATION – 297.7 FEET	1850

**4.4 Minimum Water Surface Elevation/Flow Rate at Cross Valley Canal**

The DWR Team expanded the modeling efforts to evaluate differing flow rates being diverted to the CVC Canal and established the minimum water surface elevations required at the SWP Pool 28 relationships. The flow and water surface elevations relationships. The modeling analyses were developed based on a “Stress Test” starting at the absolute minimum water surface elevation within Pool 28 and adjusted by increasing the water surface in 0.50 feet increments to the absolute maximum. The following color coding defines stress level analyses:





## KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES

	OUTSIDE OF SYSTEM CAPABILITIES
	PHYSICAL POSSIBLE, OPERATIONALLY IMPROBABLE
	OUTSIDE OF NORMAL OPERATIONS / WITHIN ABSOLUTE
	LOW STRESS ON THE SYSTEM

The water surface elevations documented in the following figures present the lowest water surface elevations in the SWP to achieve the diversions to the CVC and therefore any elevation above the values shown increase the overall reliability for water deliveries to the CVC.

The following approach and assumptions were used by the DWR team in establishing the diversion – wse relationships:

DWR addressed the question as posed.

- Did not limit analysis with SOO, and
- Did not standardize demands for other users ( $Q_{in} = Q_{out}$ )
- Assumed no deliveries upstream, so delivery “loading” not a constraint.

Start at the lowest WSE we could, Abs Min.

- If target flow wasn’t achieved, incrementally increase Pool 28 WSE by 0.5 ft, then go up or down as needed by smaller increments to find answer.

Color-coded results where operational conditions are out-of-bounds.

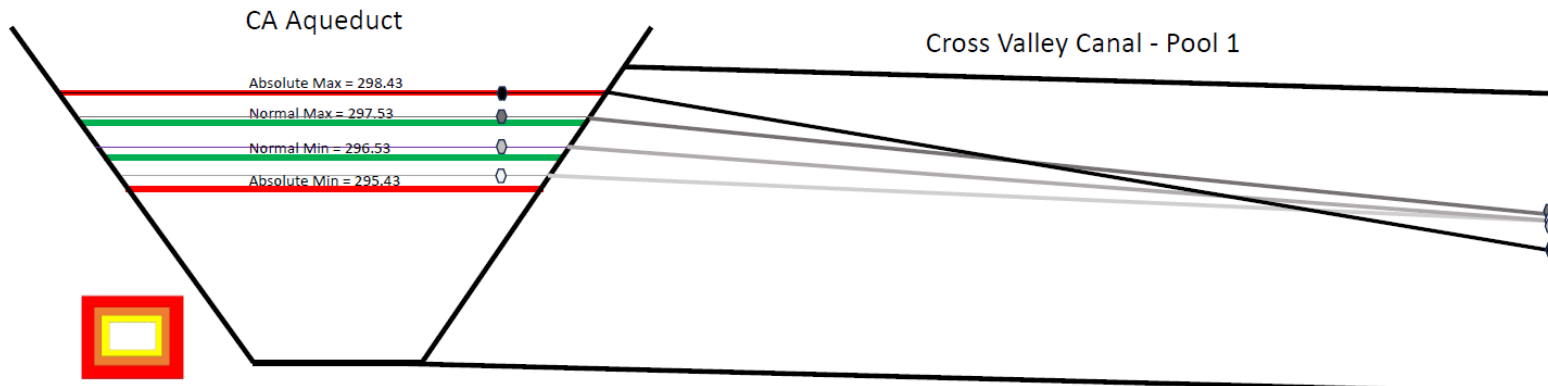
- Fully possible
- Maybe possible
- Not possible





# Min WSE for $Q_{CVC} = x$ Existing conditions

Project Number: 184031630



Flow to CVC PP (cfs)	WSE, Pool 28 (ft)	WSE, CVC US XS (ft)	$\Delta h$ P28/CVC US (ft)	WSE, CVC DS XS (ft)	$\Delta h$ P28/CVC DS (ft)	US XS Freeboard (ft)	DS XS Freeboard (ft)	Depth at CVC PP1** (ft)	Notes
800	295.9*	295.4	0.4	293.7	2.2	5.0	6.7	10.9	Low EI in Aq not probable
1000	296.8	296.1	0.7	293.7	3.1	4.4	6.7	10.9	
1200	297.8	296.7	1.1	293.9	3.9	3.7	6.5	11.1	Exceeds Norm Op
1400	298.4	296.9	1.5	290.9	7.5	3.5	9.5	8.0	Exceeds Abs Ops

\* Flow to BVPP is 2500 cfs except at 800 cfs to CVC. Reduced flow to BVPP was needed to create lower WSE to find the minimum viable operation elevation.

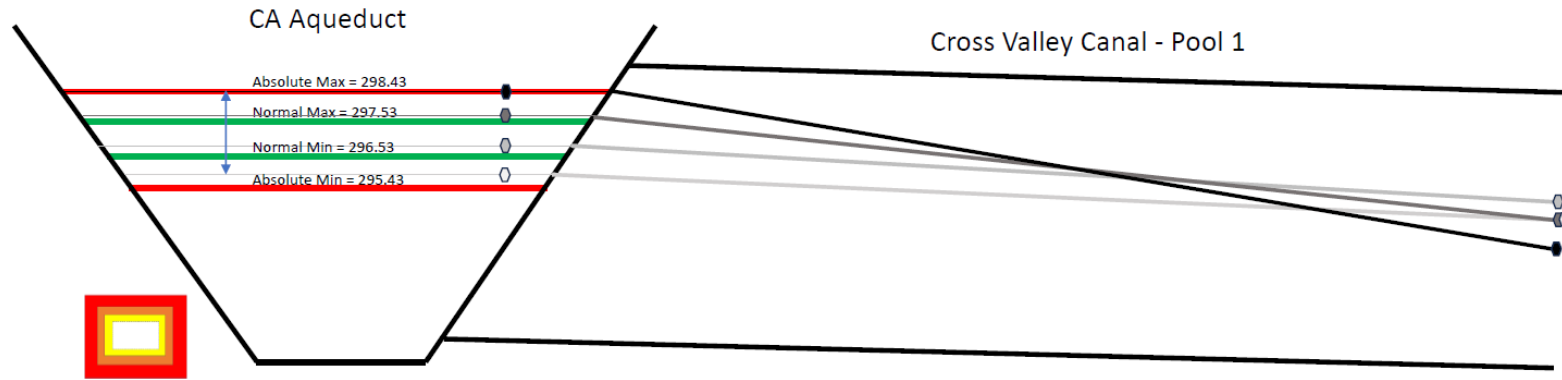
\*\* Acceptable Range = 10.8 – 16.96 ft.

Elevations in NGVD29



# Min WSE for $Q_{CVC} = x$ GBJPA Alt 3

Project Number: 184031630



Flow to CVC PP (cfs)	WSE, Pool 28 (ft)	WSE, CVC US XS (ft)	$\Delta h$ P28/CVC US (ft)	WSE, CVC DS XS (ft)	$\Delta h$ P28/CVC DS (ft)	US XS Freeboard (ft)	DS XS Freeboard (ft)	Depth at CVC PP1** (ft)	Notes
800	295.9	295.4	0.5	293.7	2.2	5.0	6.7	10.9	Low El in Aq not probable
1000	296.8	296.1	0.7	293.8	3.0	4.3	6.6	11.0	
1200	297.7	296.7	1.0	293.7	4.0	3.8	6.7	10.8	Exceeds Norm Op
1400	298.4	297.0	1.4	292.0	6.4	3.4	8.4	9.1	Exceeds Abs Ops

\* Flow to BVPP is 2500 cfs except at 800 cfs to CVC. Reduced flow to BVPP was needed to create lower WSE to find the minimum viable operation elevation

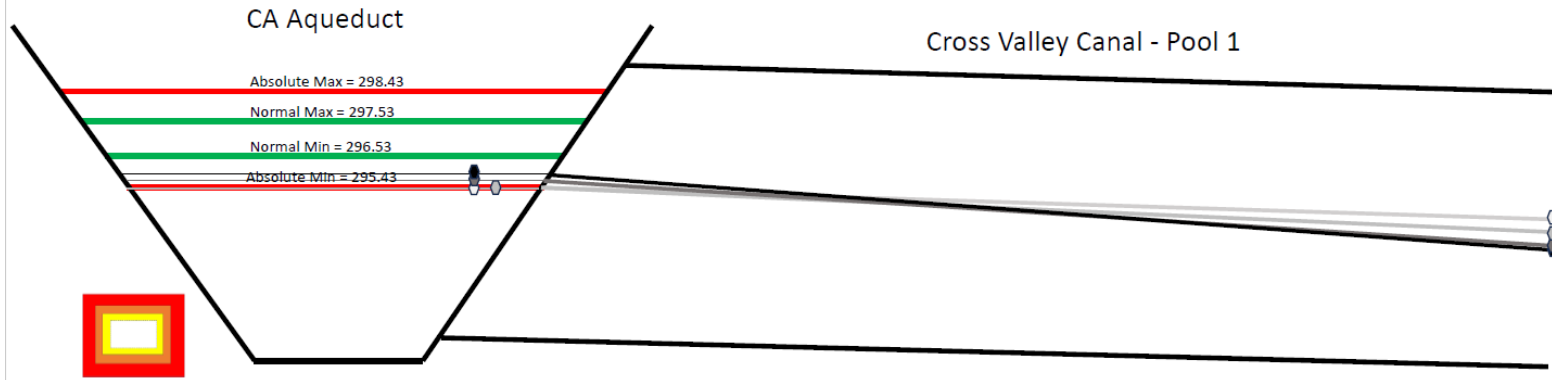
\*\* Acceptable Range = 10.8 – 16.96 ft.

Elevations in NGVD29



# Min WSE for $Q_{CVC} = X$ GBJPA Alt 5

Project Number: 184031630



Flow to CVC PP (cfs)	WSE, Pool 28 (ft)*	WSE, CVC US XS(ft)	WSE, CVC DS XS (ft)	US XS Freeboard (ft)	DS XS Freeboard (ft)	Depth at CVC PP1** (ft)
1250	295.43	295.0	294.5	5.8	5.9	11.7
1450	295.43	294.8	294.1	5.9	6.3	11.3
1650	295.6	294.7	293.7	3.8	6.7	10.9
1850	296.0	294.9	293.6	5.9	6.8	10.8

\* Flow to BVPP is 1530 cfs for all scenarios to create hydraulic conditions to find the minimum viable operation elevation

\*\* Acceptable Range = 10.8 – 16.96 ft.

All elevations are NGVD29

## KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES

The information presented above indicates that the desired flow rates being divert to the CVC as currently configured (existing condition) cannot be achieved under normal operations of the SWP. During periods where the SWP is operated at the Normal High water surface elevation based on SOO 600.22, the maximum flow diverted to the CVC is 1,150 cfs. Ignoring the limitations of SOO 600.22, the achievable diverted flow of 1,200 cfs requires that the SWP Pool 28 be operated outside of the normal operations range. Further, the implementation of Alternative 3 (Kern Fan Turnout Project) has no negative operational effect of water being diverted to the CVC from the State Water Project.

Implementation of Alternative 5 (Joint Works Project) based on the DWR modeling efforts improves the overall reliability of the CVC Pool 1 operations with a target flow rate of 1,422 cfs while also provide the Kern Fan Project with the desired 450 cfs.

### **5 DWR Water Supplies Article 21 Events –**

The intent of the Kern Fan Groundwater Banking Project is to enhance groundwater storage within the southern portions of the Central Valley near the Bakersfield Area. The anticipated source of water is anticipated to be excess water supplies generated during wet years, referred to as Article 21 Supplies. The 2023 water year and more specifically the Article 21 season from March 2023 to June 2023, ten out of fourteen weeks there was available water supplies in excess of 450 cfs throughout the system. The available water supplies had the potential to be delivered to the Kern Fan Groundwater Bank and have no adverse effects on water deliveries to the CVC Canal. The following table demonstrates the available capacity during the 2023 water year. The following information was provided to the GBJPA team through DWR in a summary white paper prepared on April 11, 2024, appended to this document.





<b>Estimated Unused Aqueduct Capacity through Pool 25 in 2023 Article 21 Season</b>						
<b>A21 Week</b>	<b>2023 Dates</b>	<b>Week's Average Foregone Pumping (cfs)<sup>1</sup></b>	<b>Estimated Total Capacity through Pool 25 (cfs)<sup>2</sup></b>	<b>Week's A21 and non-A21 Demand KCWA &amp; Contractors South</b>	<b>Estimated Average Unused P25 Capacity (cfs)</b>	<b>Lesser of Delta Availability and Aqueduct Capacity Availability (cfs)<sup>3</sup></b>
1	3/22-3/28	1054	4200	5,111	0	0
2	3/29-4/4	1345	4200	5,321	0	0
3	4/5-4/11	1615	4200	5,079	0	0
4	4/12-4/18	2829	4200	4,294	0	0
5	4/19-4/25	2190	4200	3,612	588	588
6	4/26-5/2	2688	4200	3,080	1120	1120
7	5/3-5/9	3114	4200	2,982	1218	1218
8	5/10-5/16	4967	4200	2,702	1498	1498
9	5/17-5/23	2394	4200	2,941	1259	1259
10	5/24-5/30	630	4200	2,805	1395	630
11	5/31-6/6	1940	4200	3,352	848	848
12	6/7-6/13	2227	4200	3,430	770	770
13	6/14-6/20	1860	4200	3,522	678	678
14	6/21-6/27	591	4200	3,619	581	581
	Footnotes: <sup>1</sup> Could have been pumped if there were somewhere to put it. From Capacity 2023.xls.					
	<sup>2</sup> From Table 5-5 of California Aqueduct Hydraulic Conveyance Capacity Report, December 2023, developed through CASP <a href="https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Engineering-And-Construction/Files/Subsidence/CASP_2023_HCC_Report_Final.pdf">https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Engineering-And-Construction/Files/Subsidence/CASP_2023_HCC_Report_Final.pdf</a>					
	<sup>3</sup> Assumes capacity is used by Contractor Demand KCWA and South					

## 6 SUMMARY OF RESULTS

Based on the information provided by the DWR hydraulic analyses, the following conclusions can be made:



## KERN FAN HYDRAULICS SUMMARY - DWR/HDR HYDRAULIC ANALYSES

1. Using normal operating criteria for the State Water Project as published in the Standard Operation Order 600.22 the existing condition of the Cross Valley Canal has a capacity range of 950 cfs to 1150 cfs at the Normal Minimum Water Surface Elevation of 296.6 and Normal Maximum Water Surface Elevation of 297.7 feet respectively.
2. Incorporating GBJPA Alternative 3 approximately 600 feet upstream of the existing Greater Bakersfield 1 & 2 Turnout and using the water surface boundaries mentioned above, there is no flow capacity degradation to the Cross Valley Canal. The operating conditions of the CVC are neither degraded nor improved by the Alt 3 project.
3. Incorporating GBJPA Alternative 5 – Joint Work Project configuration the combined Cross Valley Canal and the Parallel Canal capacity meets the targeted flow rate of 1,850 cfs delivered. This significantly improved Pool 1 flow conditions and allows the CVC to achieve flows of 1,400 cfs.
4. Information provided by DWR the overall current capacity of the SWP would have provided approximately 450 cfs during an Article 21 event.

In conclusion, and based on the presented materials, Alternative 5 – Joint Works Project provides the widest operational range for both the Cross Valley Canal and the Kern Fan Project.



**Appendix A HYDRAULICS PRESENTATION – DWR FEBRUARY  
2024**



# CA Aqueduct Delivery Capability Analyses

Kern Fan Meeting

February 13, 2024 (last met Dec 11, 2023)



# Overview

- Purpose: Respond to “Step 1 - Pool 28 Level Analysis” requested in letter dated 12/29/23
  - Assumptions that shaped simulations
  - Findings of requested analysis
- Bigger Picture Insights
- Discussion/Next Steps





# Step 1 – Pool 28 Level Analysis



# Data and analyses requested by GBJPA



## Step 1 – Pool 28 Level Analysis

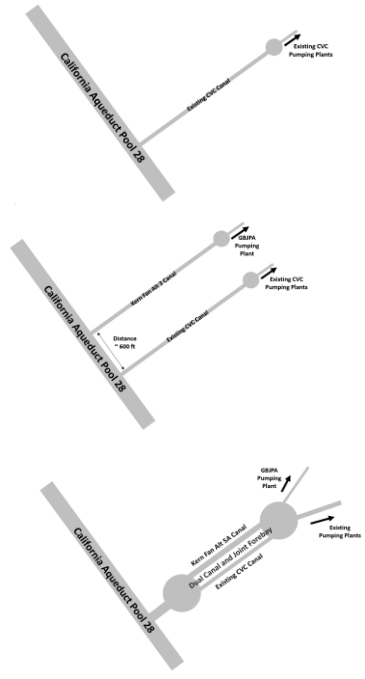
- Pool 28 levels for  $Q(x)$  CVC flow
  - Existing, Alt 3, & Alt 5
- Max Q CVC w/ P28 at
  - Normal Min
  - Normal Max

## Step 2 – Aqueduct Capacity Analysis

- Data Request for 2017 & 2023
  - CA Aqueduct WSEs,
  - Turnout Q, and
  - BVPP Q
- Will request more analysis TBD based on data



# Step 1 Analyses Requested by GBJPA



Scenario	Calculate WSE needed to divert Q(x) to CVC				Norm Min	Norm Max
Existing Conditions	800	1,000	1,200*	1,400*	Max Q <sub>CVC</sub>	Max Q <sub>CVC</sub>
Alt 3 Separate Canal	800 + 450 to K. Fan	1,000 + 450 to K. Fan	1,200* + 450 to K. Fan	1,400* + 450 to K. Fan	Max Q <sub>CVC</sub>	Max Q <sub>CVC</sub>
Alt 5 Joint Works	1,250	1,450	1,650	1,850	Max Q <sub>CVC</sub>	Max Q <sub>CVC</sub>

\*The full requested flow range cannot be achieved within current SOO 600.22 Normal Range in existing CVC configuration.

**Requested Modeling Scenarios, not DWR Commitments**

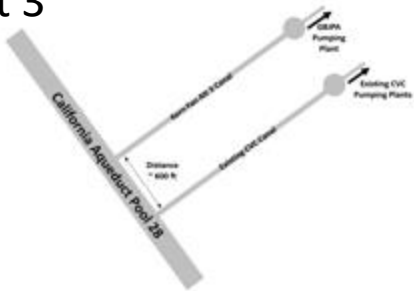
# Max $Q_{CVC}$ within Normal Operating Range

Existing



Using 2020 SOO 600.22	Maximum Sustainable CVC Flow (KCWA only)
P28 Normal Min WSE	950 cfs
P28 Normal Max WSE	1150 cfs

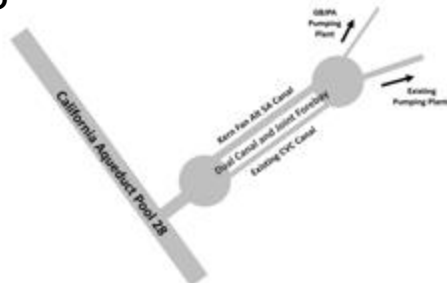
GBJPA Alt 3



Using 2020 SOO 600.22	Maximum Sustainable CVC Flow (KCWA only)
@Normal Min WSE	950 cfs
@Normal Max WSE	1150 cfs

(same as existing)

GBJPA Alt 5



Using 2020 SOO 600.22	Maximum Sustainable CVC Flow (KCWA + Kern Fan)
@Normal Min WSE	1850 cfs
@Normal Max WSE	1850 cfs

(full design flow of KCWA + Kern Fan)

Requested Modeling Scenarios, not DWR Commitments

How Low can Pool 28 WSE be and still achieve a specified CVC Flow?

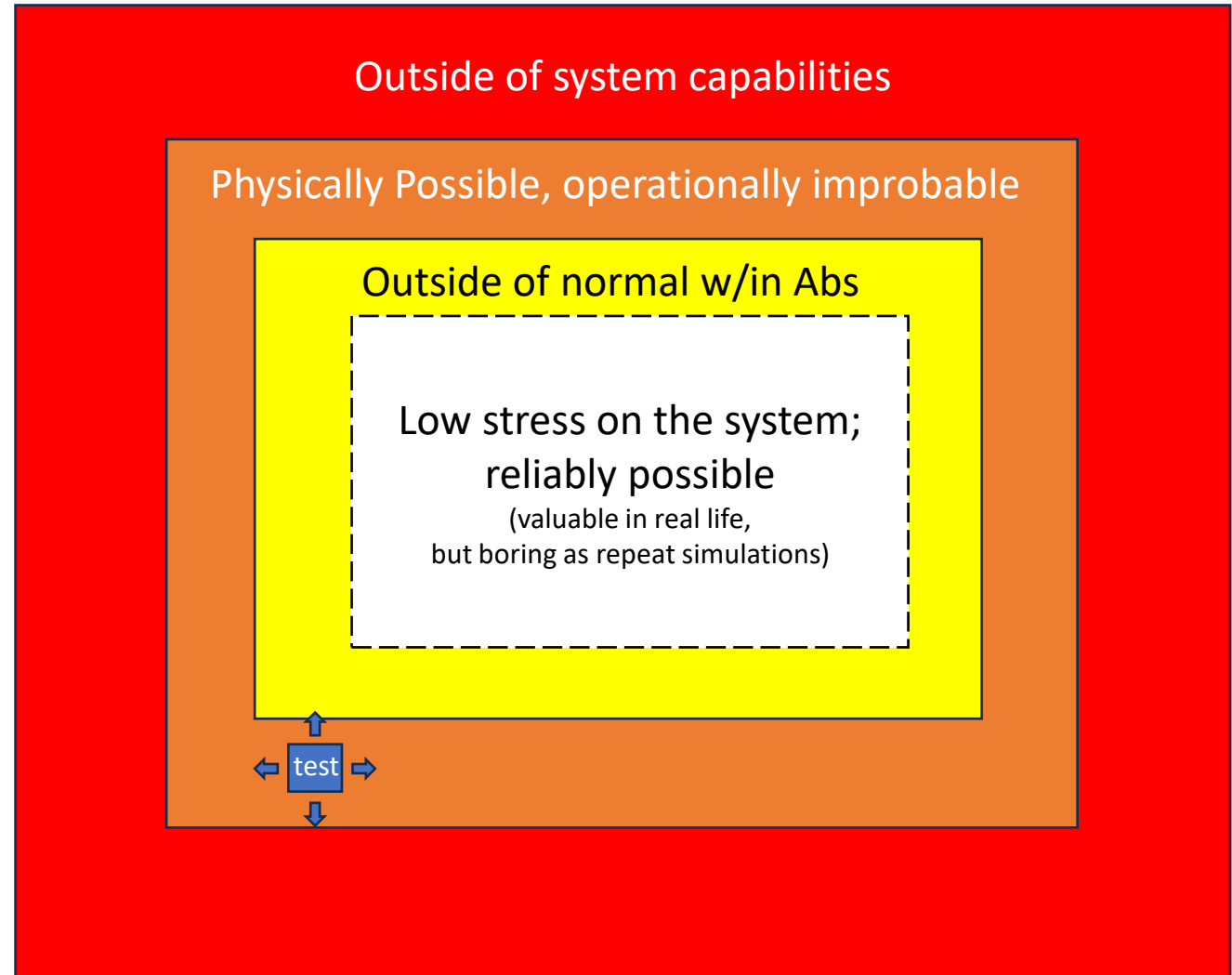


**NOTE:** Analysis assumes flow in equals flow out. This is important because often - sustaining a WSE is the challenge.



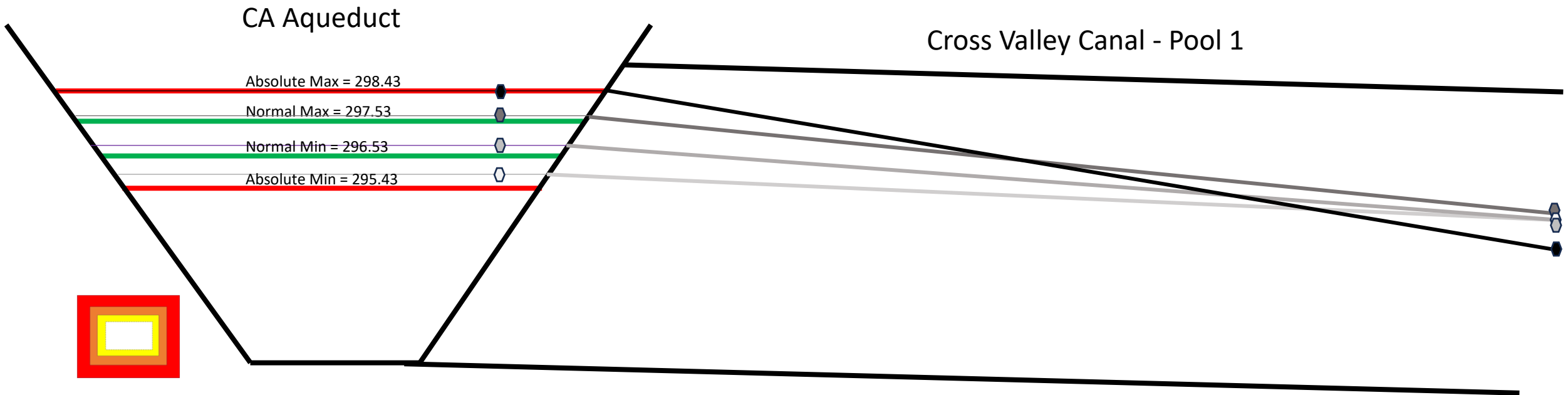
# Approach/Assumptions

- We addressed the question as posed.
  - Did not limit analysis with SOO, and
  - Did not standardize demands for other users ( $Q_{in} = Q_{out}$ )
  - Assumed no deliveries upstream, so delivery “loading” not a constraint
- Start at the lowest WSE we could, Abs Min.
  - If target flow wasn't achieved, incrementally increase Pool 28 WSE by 0.5 ft, then go up or down as needed by smaller increments to find answer.
- Color-coded results where operational conditions are out-of-bounds.
  - Fully possible
  - Maybe possible
  - Not possible



# Min WSE for $Q_{CVC} = X$ Existing conditions

Requested Modeling Evaluations,  
not DWR Commitments



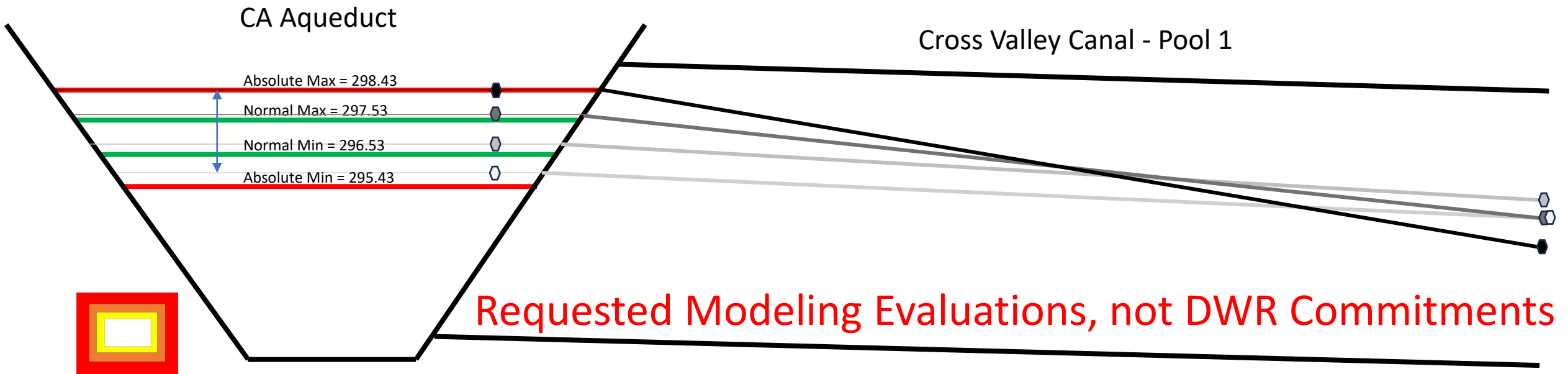
	Flow to CVC PP (cfs)	WSE, Pool 28 (ft)	WSE, CVC US XS (ft)	$\Delta h$ P28/CVC US (ft)	WSE, CVC DS XS (ft)	$\Delta h$ P28/CVC DS (ft)	US XS Freeboard (ft)	DS XS Freeboard (ft)	Depth at CVC PP1** (ft)	Notes
○	800	295.9*	295.4	0.4	293.7	2.2	5.0	6.7	10.9	Low El in Aq not probable
◐	1000	296.8	296.1	0.7	293.7	3.1	4.4	6.7	10.9	
◑	1200	297.8	296.7	1.1	293.9	3.9	3.7	6.5	11.1	Exceeds Norm Op
●	1400	298.4	296.9	1.5	290.9	7.5	3.5	9.5	8.0	Exceeds Abs Ops

\* Flow to BVPP is 2500 cfs except at 800 cfs to CVC. Reduced flow to BVPP was needed to create lower WSE to find the minimum viable operation elevation.

\*\* Acceptable Range = 10.8 – 16.96 ft.

# Min WSE for $Q_{CVC} = X$ GBJPA Alt 3

Requested Modeling Evaluations,  
not DWR Commitments



Flow to CVC PP (cfs)	WSE, Pool 28 (ft)	WSE, CVC US XS (ft)	$\Delta h$ P28/CVC US (ft)	WSE, CVC DS XS (ft)	$\Delta h$ P28/CVC DS (ft)	US XS Freeboard (ft)	DS XS Freeboard (ft)	Depth at CVC PP1** (ft)	Notes
800	295.9	295.4	0.5	293.7	2.2	5.0	6.7	10.9	Low El in Aq not probable
1000	296.8	296.1	0.7	293.8	3.0	4.3	6.6	11.0	
1200	297.7	296.7	1.0	293.7	4.0	3.8	6.7	10.8	Exceeds Norm Op
1400	298.4	297.0	1.4	292.0	6.4	3.4	8.4	9.1	Exceeds Abs Ops

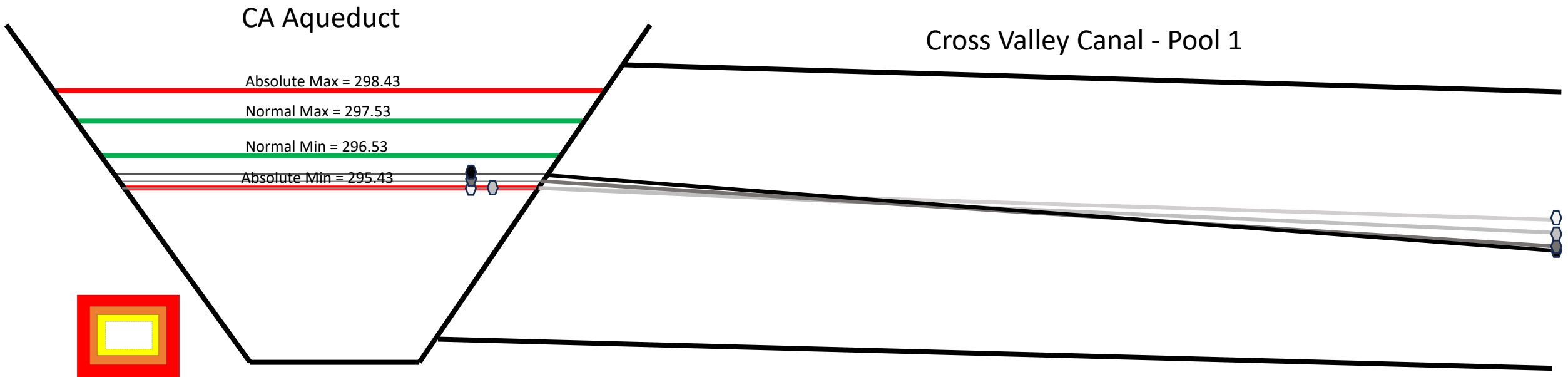
\* Flow to BVPP is 2500 cfs except at 800 cfs to CVC. Reduced flow to BVPP was needed to create lower WSE to find the minimum viable operation elevation

\*\* Acceptable Range = 10.8 – 16.96 ft.

Elevations in NGVD29

# Min WSE for $Q_{CVC} = X$ GBJPA Alt 5

Requested Modeling Evaluations,  
not DWR Commitments



Flow to CVC PP (cfs)	WSE, Pool 28 (ft)*	WSE, CVC US XS (ft)	WSE, CVC DS XS (ft)	US XS Freeboard (ft)	DS XS Freeboard (ft)	Depth at CVC PP1** (ft)
1250	295.43	295.0	294.5	5.8	5.9	11.7
1450	295.43	294.8	294.1	5.9	6.3	11.3
1650	295.6	294.7	293.7	3.8	6.7	10.9
1850	296.0	294.9	293.6	5.9	6.8	10.8

\* Flow to BVPP is 1530 cfs for all scenarios to create hydraulic conditions to find the minimum viable operation elevation

\*\* Acceptable Range = 10.8 – 16.96 ft.

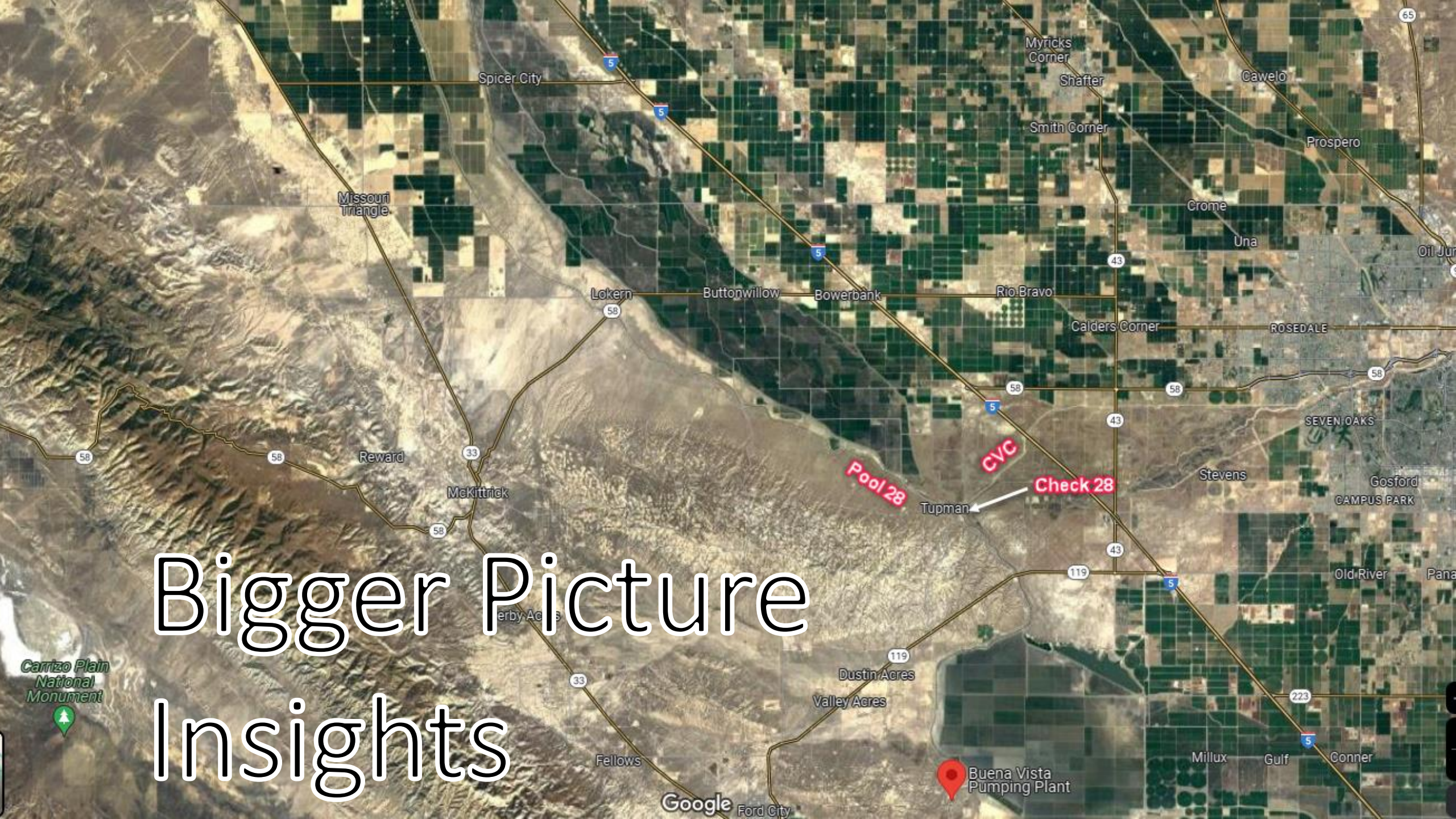
All elevations are NGVD29

# Findings indicate...

- Within this limited analysis framework (i.e., looking at local hydraulics)...
  - Existing CVC can't draw target flowrates at all Pool 28 elevations
  - With Alt 5, expanding the effective conveyance capacity of the CVC, the combined *Pool 28 WSEs and CVC channel capacity* would no longer limit CVC hydraulic capacity.
- These results do not take into account how lower inflow or operational demands would affect ability to sustain WSE
  - To compare apples to apples we need to ask multiple questions, including: “can those WSEs be sustained and under what conditions.”
- DWR operates the Aqueduct as a system, not as isolated pools
  - Expect fluctuation







# Bigger Picture Insights

Carrizo Plain  
National  
Monument

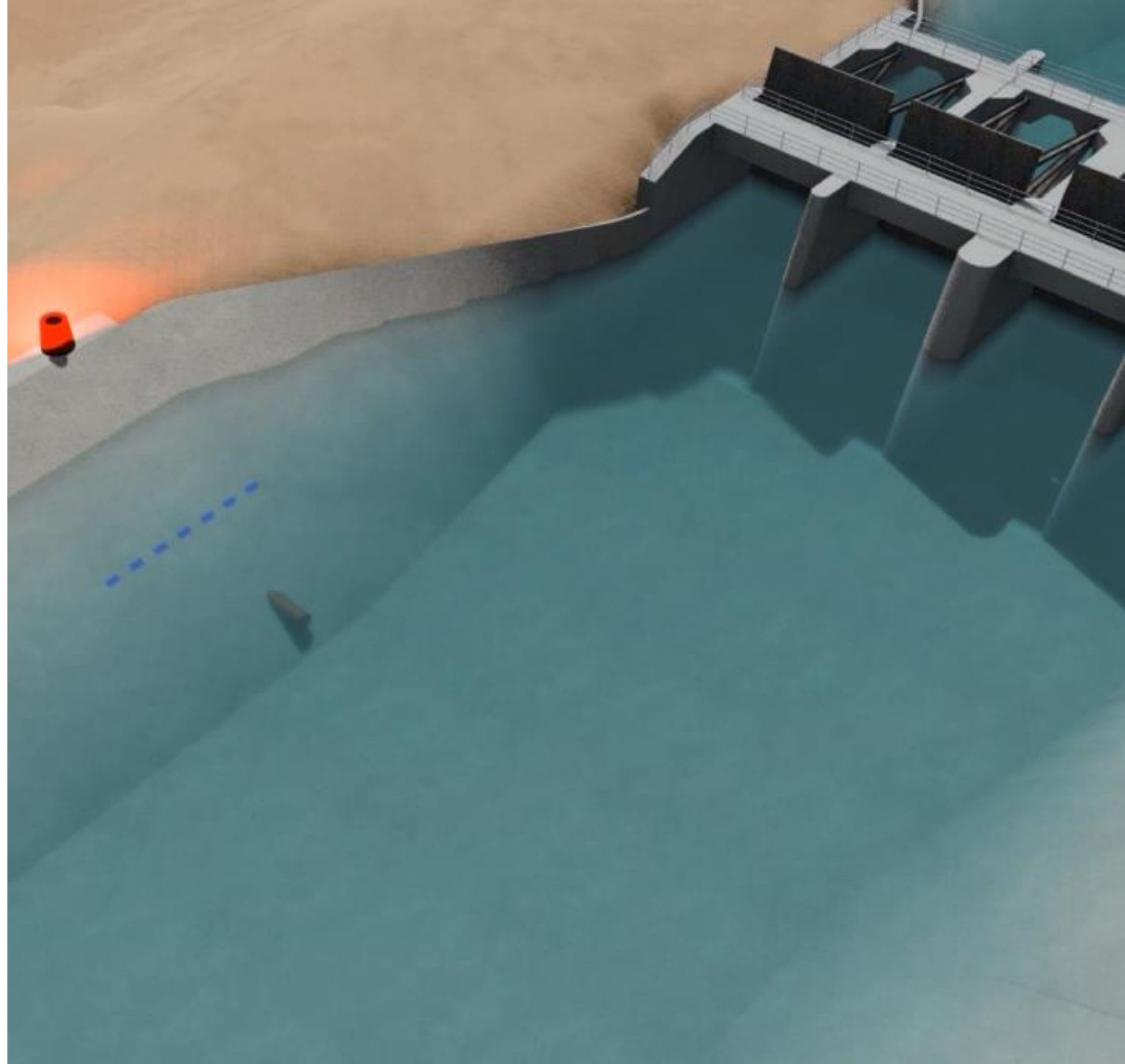
Google

Buena Vista  
Pumping Plant



# Findings & Conclusions

- Model is a powerful tool
  - Analyses need to be carefully designed
    - Assumptions can drive results
    - Some results may only partially reveal the truth and may be misleading if not considered in a broader context
  - Results, particularly of steady state analysis won't perfectly represent real operations



# Findings & Conclusions

- Operations choices are made
  - To limit safety risk
    - SOO 600.22 Operating Range helps prevent overtopping in event of sudden failures.
  - For system-wide operations needs
    - Accommodate varying flowrates
    - Not exceed capacity
    - Manage major pumping plants
    - Limit drawdown
  - Honor contracts
    - Match planned operations to feasible limits





# The Challenge of "Apples to Apples" framing

- Usually, we try to frame simulation sets in a way that we're twisting one "dial" (varying one variable) at a time to facilitate interpretation and explanation
  - These Step 1, Pool 28-Level simulations do not consider larger SWP constraints
- Not Apples to Apple here; just answered specific Kern questions.
  - Additional analyses are needed in order to paint a full picture
- We should consider this for further analyses



# Discussion / Next Steps





**Appendix B DWR SUMMARY WHITE PAPER TO D. BARTEL**



## **Approximation of unused 2023 capacity during Article 21 Season DRAFT April 11, 2024**

### Introduction

In a March 26, 2024 letter to David Okita, Dan Bartel of the GBJPA asked that DWR assess maximum achievable flows from Pool 28 based on 2023 data representing times of large flows downstream of Pool 28, under scenarios of existing conditions and of circumstances with more diversion capacity built into Pool 28. This short paper attempts to answer that question relatively simply, focusing on the 2023 Article 21 season.

### Assumptions

- Mass balance (algebraic) calculations can illustrate this
- In addition to considering limitations of Aqueduct capacity, consider limitations on pumping from the Delta
- Focus on Article 21 Season 2023
- Consider only additional potential diversion from Pool 28 diversion, not addressing that other parties may also wish to divert additional water beyond historical as WSIP projects are built out
- Assume Pool 25 is the constraining segment of the California Aqueduct
- Rely on publicly published Aqueduct Capacity source [California Aqueduct Hydraulic Conveyance Capacity](#) Table 5-5 and therefore assume 4200cfs can flow south to Pool 28
- Use weekly Contractor Demand from KCWA and contractors south as input
- Do not analyze water from SWCs upstream of KCWA that may also seek to send water to Pool 25 or points south for storage concurrently
- Rely on prior modeling that has shown that an additional separate turnout as in GBJPA Alternative 3 would not constrain the CVC and could carry up to 450 cfs if designed for 450 cfs in steady-state conditions with adequate inflow to Pool 28.
- Rely on prior modeling that has shown that a combined facility as described in past characterization of GBJPA Alternative 5 could enable the CVC Pool 1 pumps and the planned GBJPA pumps both to operate at maximum, as well as enable the CVC Pool 1 pumps to operate at their design maximum, 1450 (rounded up from 1422) cfs.

### Analysis

When could export from the Delta and California Aqueduct capacity-limited inflow to Pool 28 potentially have been great enough to support an additional 450 cfs of diversion from Pool 28? What would the maximum achievable mean daily flow have been? As the table below shows based on the foregoing assumptions, there would have been at least 450 cfs capacity or more in Weeks 5 through 14 of the 2023 Article 21 offering period.

### Estimated Unused Aqueduct Capacity through Pool 25 in 2023 Article 21 Season

A21 Week	2023 Dates	Week's Average Foregone Pumping (cfs) <sup>1</sup>	Estimated Total Capacity through Pool 25 (cfs) <sup>2</sup>	Week's A21 and non-A21 Demand KCWA & Contractors South	Estimated Average Unused P25 Capacity (cfs)	Lesser of Delta Availability and Aqueduct Capacity Availability (cfs) <sup>3</sup>
1	3/22-3/28	1054	4200	5,111	0	0
2	3/29-4/4	1345	4200	5,321	0	0
3	4/5-4/11	1615	4200	5,079	0	0
4	4/12-4/18	2829	4200	4,294	0	0
5	4/19-4/25	2190	4200	3,612	588	588
6	4/26-5/2	2688	4200	3,080	1120	1120
7	5/3-5/9	3114	4200	2,982	1218	1218
8	5/10-5/16	4967	4200	2,702	1498	1498
9	5/17-5/23	2394	4200	2,941	1259	1259
10	5/24-5/30	630	4200	2,805	1395	630
11	5/31-6/6	1940	4200	3,352	848	848
12	6/7-6/13	2227	4200	3,430	770	770
13	6/14-6/20	1860	4200	3,522	678	678
14	6/21-6-27	591	4200	3,619	581	581

	Footnotes: <sup>1</sup> Could have been pumped if there were somewhere to put it. From Capacity 2023.xls.
	<sup>2</sup> From Table 5-5 of California Aqueduct Hydraulic Conveyance Capacity Report, December 2023, developed through CASP <a href="https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Engineering-And-Construction/Files/Subsidence/CASP_2023_HCC_Report_Final.pdf">https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Engineering-And-Construction/Files/Subsidence/CASP_2023_HCC_Report_Final.pdf</a>
	<sup>3</sup> Assumes capacity is used by Contractor Demand KCWA and South

It should be noted that this 2023 result is not representative of 'typical' Article 21 conditions for several reasons including ample local supply due to southerly storm centering in California, restricted conditions at the south end of the San Joaquin Valley, and the first 100% Table A allocation for SWP contractors in some time. However, 2023, the requested focus year, clearly is part of the historical record.

## Conclusion

Considering the foregoing, it appears that as long as inflow to Pool 28 could have been sufficient to meet target outflows, which seems to be a reasonable conclusion would have been possible in Weeks 5 through 14, then

Scenario 1: the maximum achievable steady day's flow for the CVC as-is would be as current.

Scenario 2: the maximum achievable steady day's flow for the CVC would be as current. The maximum achievable steady daily flow for GBJPA Alternative 3 would be 450 cfs if designed for 450 cfs.

Scenario 3: A GBJPA Alternative 5 combined facility arrangement, with the new parts of the combined facility sized as described previously by the GBJPA could deliver  $1450 + 450 = 1900$  cfs total.

## Federal Funding Update and South Valley Project

### DISCUSSION:

#### Background:

The Bureau of Reclamation provides grant funding to eligible projects under the Bipartisan Infrastructure Law Small Storage Program. The Groundwater Banking Joint Powers Authority (GBJPA) has already been awarded a total of \$8.6 million in Small Surface Water and Groundwater Storage Projects (Small Storage Program) funding. Staff anticipates a new round of Small Storage Program funding becoming available this fall and has worked with consultant Dee Jaspar and Associates (DJA) to develop the South Valley Project which could be positioned for additional federal funding. At the meeting, Staff will review the proposed South Valley Project with the Board.

#### Background:

The Bureau of Reclamation's Small Storage Program provides up to 25% of the total cost of planning, design and/or construction incurred for storage projects up to a maximum of \$30 million per project. Applicants must fund the other 75% of the project cost. Project storage cannot exceed 30,000 acre-feet.

The GBJPA was selected for a funding award in the amount of \$4.7 million and executed a funding agreement with Reclamation in October 2023 for construction of water banking facilities on the West Enos and North Stockdale properties. Ongoing work includes construction of recharge basins, recovery facilities, pipeline and interconnections to existing Rosedale and IRWD banking facilities. In March 2024, the project was awarded an additional \$3.9 million in a second round of funding.

#### 2024 Small Storage Program Funding

Staff anticipates that Reclamation will release another Small Storage Program funding opportunity in Fall 2024. Staff and consultants at DJA have developed a concept for a new "stand-alone" small storage project that would provide new benefits, and therefore be eligible for funding. The new project, which staff will review at the meeting, includes the following components:

- New conveyance off the California Aqueduct to deliver 450 cfs;
- New turnout from the California Aqueduct, located in Pool 28, to be either a modification of the existing Cross Valley Canal turnout or a new separate turnout;
- 300 acres of new recharge basins;
- 1436 acres of existing Rosedale and IRWD recharge basins; and
- New conveyance to connect existing Rosedale and IRWD facilities with the new conveyance off the California Aqueduct
- New allocated storage of approximately 26,000 AF; and

- Use of 40,000 AF of existing storage.

Staff is preparing a feasibility study for submittal to the Bureau of Reclamation for submittal by August 15. An approved feasibility study is required in order to be eligible for federal funding.

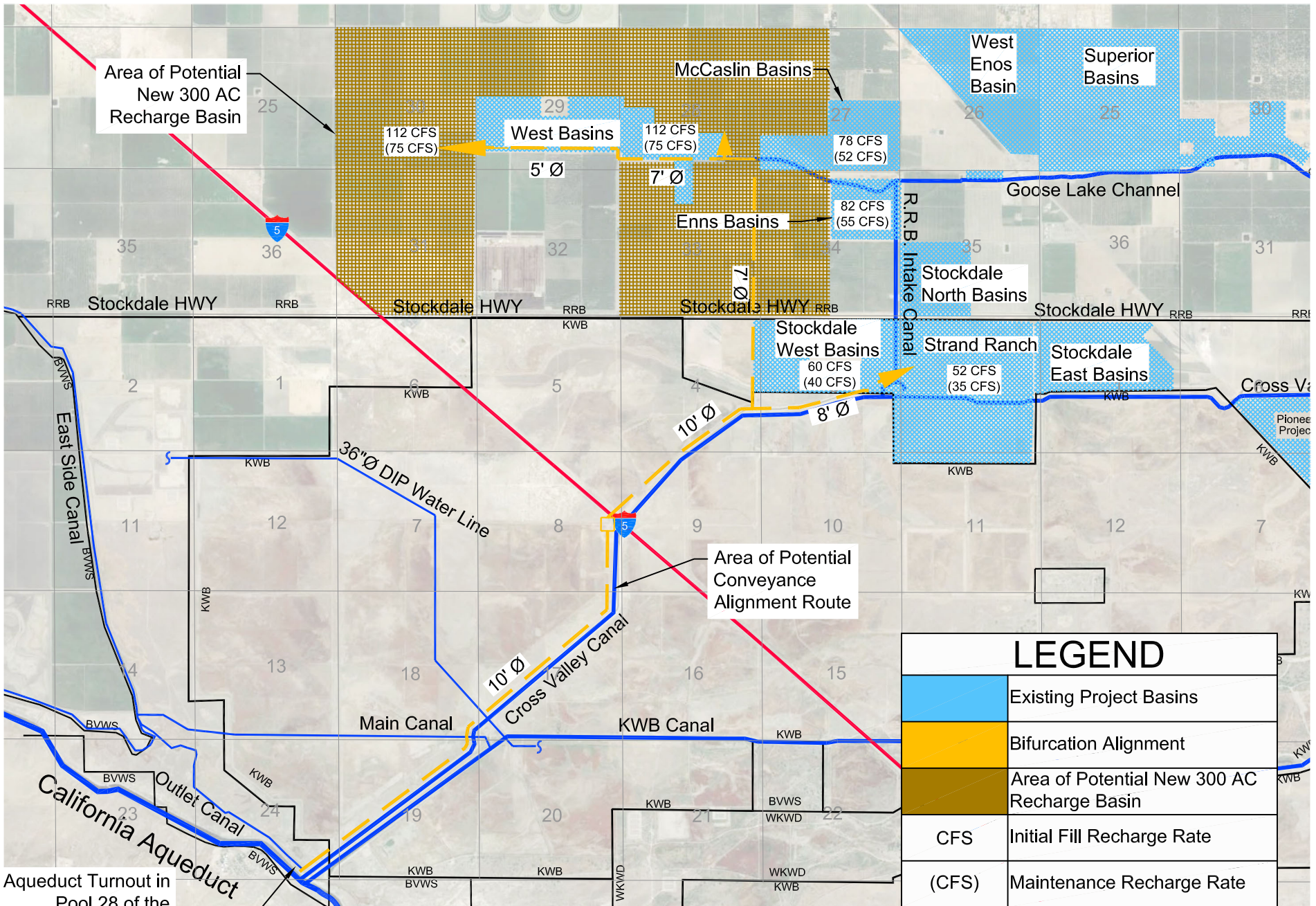
RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

None.

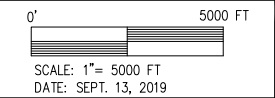




LEGEND	
	Existing Project Basins
	Bifurcation Alignment
	Area of Potential New 300 AC Recharge Basin
CFS	Initial Fill Recharge Rate
(CFS)	Maintenance Recharge Rate

Aqueduct Turnout in Pool 28 of the California Aqueduct

**SOUTH VALLEY CONVEYANCE AND STORAGE PROJECT  
BIFURCATION ALIGNMENT**



**DEE JASPAR & ASSOCIATES, INC.**  
 CIVIL ENGINEERS  
 PORTERVILLE, CALIFORNIA  
 BAKERSFIELD, CALIFORNIA  
 PHONE 559 791-9286  
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## *South Valley Conveyance and Storage Project*

The South Valley Conveyance and Storage Project (South Valley Project, Project) consists of a regional water bank in the Kern County Groundwater Sub-basin of the San Joaquin Groundwater Basin in Kern County, California that will provide water supply, groundwater, agricultural, and intermittent wetland benefits. The project will provide new recharge and storage capacity of 26,000 acre-feet (AF) and will also maximize the use of \_\_\_\_\_ AF of additional recharge and storage capacity to provide these benefits. The Project will be implemented by Irvine Ranch Water District (IRWD) and the Rosedale-Rio Bravo Water Storage District (RRBWS).

The Project will be supplied primarily by the State Water Project's (SWP) supplies that exceed the SWP Contractors allocation during a wet year (Article 21 supplies) and also by other wet-year water supplies as available. In wet years, when it is declared available by the California Department of Water Resources (DWR), IRWD and RRBWS will take delivery of Article 21 supplies to store in the Project. IRWD and RRBWS will equally share the storage associated with the Project.

Other water supplies that could be available for the Project include other SWP supplies diverted from the California Aqueduct, as well as other supply sources including Central Valley Project Section 215 flood water and high-flow Kern River water.

The Project objectives are to cost-efficiently recharge and store excess surface water supplies, that would otherwise be lost to the ocean, in a new groundwater bank for subsequent recovery to address the following:

- Enhance water supply reliability;
- Reduce imported water demands on the San Francisco Bay/Sacramento –San Joaquin Delta Estuary (Delta) to benefit spring and winter-run Chinook salmon;
- Provide water supply during drought conditions;
- Provide water supply for emergency response benefits;
- Establish temporary wetlands through intermittent recharge events that will attract migratory and other water fowl in Kern County;
- Benefit the water levels in the Kern County Groundwater Sub-basin;
- Provide sustainable water supply for local agricultural use and M&I use; and
- Be integrated into other water storage projects and storage reservoirs to provide greater statewide benefits.

Conveyance facilities will be constructed to convey water for recharge from the California Aqueduct to a new property to be purchased, as well as existing recharge

basins referred to as the West Basins, the Enns Basins, McCaslin Basins, Strand Ranch Basins, and Stockdale West Basins. Additional turnouts and connections may be constructed in the future to new recharge properties, as well as turnouts to adjacent lands for in-lieu agricultural water deliveries.

The project objective of the conveyance facility is to deliver approximately 350-500 cubic feet per second (cfs) of water from the California Aqueduct to approximately 1,736-acres of land for groundwater recharge.

<u>Recharge Property</u>	<u>Area of Recharge</u>	<u>Initial Fill Rate</u>	<u>Maintenance Rate</u>
• West Basins	324 Acres	112 cfs	75 cfs
• Enns	175 Acres	82 cfs	55 cfs
• McCaslin Basins	172 Acres	78 cfs	52 cfs
• Strand Ranch Basins	274 Acres	52 cfs	35 cfs
• Stockdale West Basins	259 Acres	60 cfs	40 cfs
• New Property	300 Acres	112 cfs	75 cfs

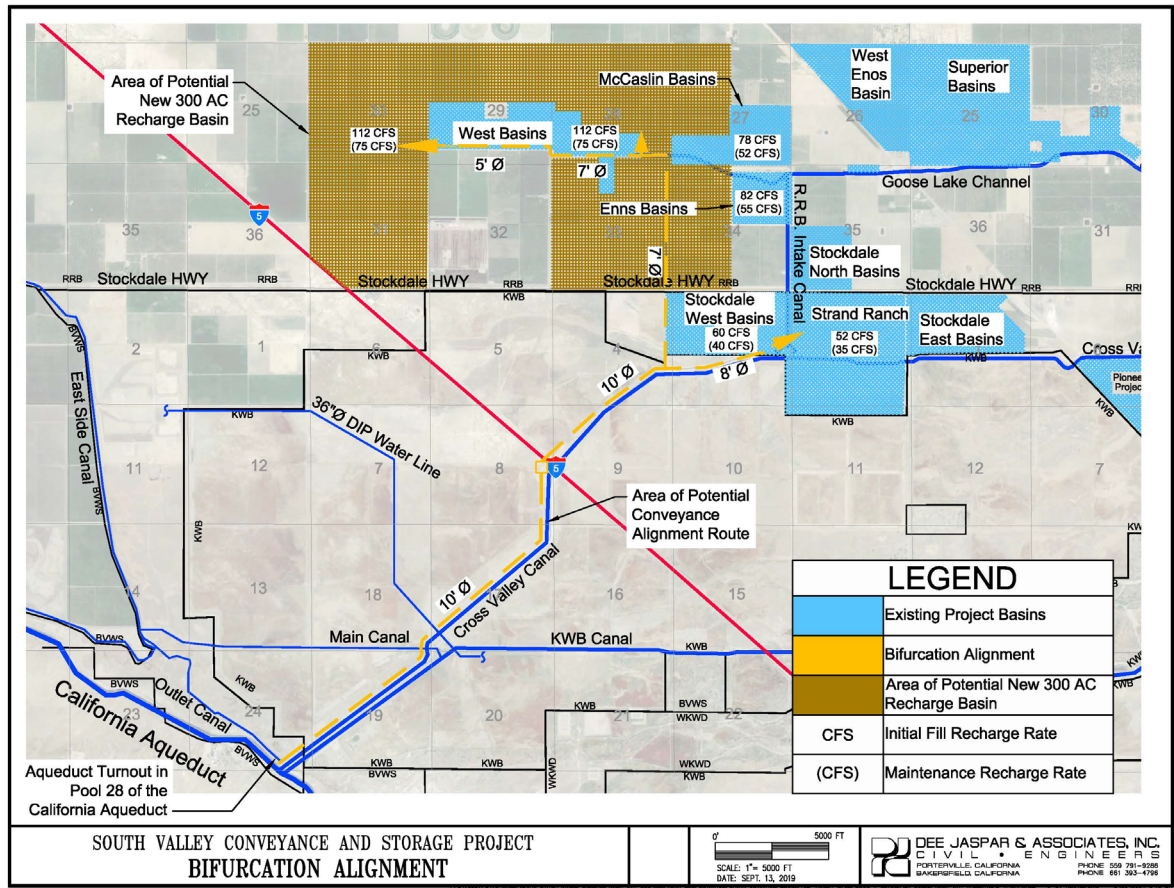
This will allow the project to convey roughly 350 cfs – 500 cfs for recharge for approximately one to two months for delivery into storage in wet years. The initial fill rates range between 0.6 to 0.9 ft/day (450 cfs to 500 cfs) when commencing recharge activities and gradually reduce to approximately 0.3 ft/day to 0.6 ft/day (300 to 350 cfs) as a maintenance rate. The new conveyance facility will not only provide water to the new recharge property (+/- 300 acres), but also convey water to existing recharge basins that have excess capacity due to limitations on conveyances from other sources of water. The remaining conveyance capacity will allow flexibility for future recharge basins. The proposed conveyance will also be designed to allow for reverse flow of recovered water from storage to be conveyed back to the Aqueduct.

The conveyance project includes a new turnout from the California Aqueduct that will be located in Pool 28 or Reach 12E of the California Aqueduct near the existing Kern County Water Agency - Cross Valley Canal Turnout (Greater Bakersfield Turnout No. 1) located at Milepost 238.04 and Check No. 28. The new project turnout may be a modification of the existing Cross Valley Canal Turnout, referred to as the Joint Works Alternative, or it may be a standalone turnout that is located approximately 600-ft north of the existing Cross Valley Canal Turnout. The standalone turnout would be a reinforced concrete structure with galvanized steel trashrack, slide gate, and metering.

The conveyance alignment is supplied by a new Aqueduct Turnout structure with one ten-foot (10-ft) diameter pipe across and beneath the DWR right-of-way and the Outlet Canal. The Joint Works alternative would involve modifying the existing Cross Valley Canal turnout and constructing transition structures and a double box siphon to get under the Outlet Canal. The conveyance alignment then crosses the State of California property for the Tule Elk Reserve (APN 159-180-05) through Section 24 and into Section 19 where the facilities enter Kern Water Bank Authority



property. The conveyance alignment remains on Kern Water Bank Authority property through Section 19, Section 18, Section 7, into Section 6, across the Interstate 5 Freeway, and into Section 9 and 4, where the alignment bifurcates. A branch continues east through Section 3 to the RRBWSD Intake Canal as well as Strand Ranch and Stockdale West. The RRBWSD Intake Canal will be improved by raising the canal lining south of Stockdale Highway and constructing a parallel siphon for the canal at the Stockdale Highway road crossing. This will provide additional capacity in the canal to convey water north to the Enns Basins and McCaslin Basins. In addition, a branch continues north along the west boundary of the Stockdale West Recharge Basins, north across Stockdale Hwy, and onto private property until it reaches the proposed West Basin recharge facilities and a property to be purchased, see Figure 1 below.



**Figure 1: Conveyance Alignment**

The conveyance may be a 10-ft diameter RCP pipeline, an open canal with an approximate cross-section with a 10-ft wide bottom, 12-ft depth, 1.5:1 side slopes, and a top width of 46-ft, or some combination thereof.

The permitting associated with the above alignment will include:



Aqueduct Turnout: DWR Right-of-Entry Permit  
DWR/Owner/KCWA Construction Agreement  
DWR/Owner/KCWA Operations Agreement

Outlet Canal: Army Corp of Engineers Section 404 Permit  
Regional Water Quality Control Board  
Calif. Dept. of Fish & Wildlife Section 1601 Streambed Alteration  
United States Fish & Wildlife Service  
Buena Vista Water Storage District Joint Use of Easement

State Parks: Tule Elk Preserve Crossing Agreement

Interstate 5 Fwy: Caltrans Encroachment Permit

Stockdale Hwy: Caltrans Encroachment Permit

General: State Incidental Take Permit  
Federal Incidental Take Permit (Coverage under KWBA Master Agreement)  
Habitat Conservation Plan Approvals/Fees  
San Joaquin Valley Air Pollution Control District

The Class 3 capital cost estimate for the conveyance alignment has been evaluated. The cost estimate includes the costs of the turnout structure, conveyance facilities, pump stations, recharge and recovery facilities, and all associated appurtenances.

**Table 1**

Conveyance Cost Summary		
Item #	Project Alternative	Cost Estimate
1	Aqueduct Turnout Facility	\$7,500,000
2	Conveyance Right-of-Way & HCP Fees	\$9,900,000
3	Conveyance Facility	\$84,800,000
4	Conveyance Structures/Crossings	\$6,500,000
5	Pump Station Facility	\$21,000,000
6	Recharge Property Purchase (+/- 300 acres)	\$7,500,000
7	Recharge Facility Earthwork & Structures	\$4,800,000
8	Recovery Wells & Pipelines	\$10,500,000
9	SCADA	\$350,000
10	Non-Contract Costs	\$21,650,000
		<b>\$174,500,000</b>

Exhibit A- Proposed Capital Budget  
Exhibit B- Alignment Map  
Exhibit C- Preliminary Project Schedule

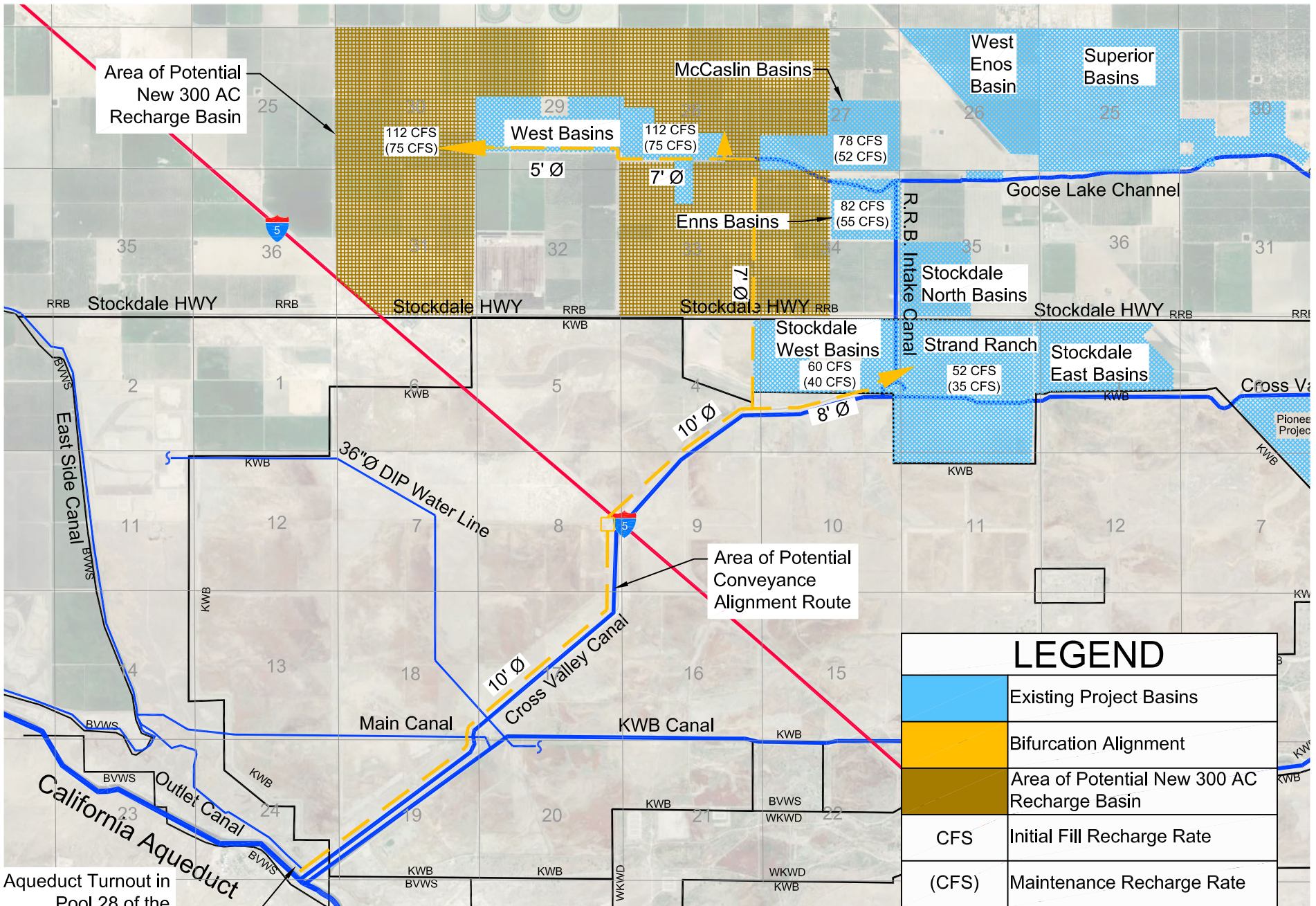
**Exhibit A**  
**Proposed Capital Budget**

Groundwater Banking Joint Powers Authority						
Preliminary Engineer's Estimate (Class 3)						
South Valley Conveyance and Storage Project						
Item No.	Item Description	Unit	Quantity	Unit Cost	Extended Cost	Section Subtotal
1	Aqueduct Cofferdam Assembly and Installation	EA	1	\$ 225,000.00	\$ 225,000.00	
2	Dewatering	EA	1	\$ 50,000.00	\$ 50,000.00	
3	Aqueduct Cofferdam Disassembly and Removal	EA	1	\$ 125,000.00	\$ 125,000.00	
4	Aqueduct Turnout Excavation	CY	2450	\$ 30.00	\$ 73,500.00	
5	Aqueduct Reinforced Concrete Structure - Floor	CY	45	\$ 1,400.00	\$ 63,000.00	
6	Aqueduct Reinforced Concrete Structure - Walls	CY	100	\$ 1,800.00	\$ 180,000.00	
7	Aqueduct Reinforced Concrete Structure - Deck/Beam	CY	5	\$ 2,500.00	\$ 12,500.00	
8	Aqueduct Backfill and Compaction	CY	1850	\$ 40.00	\$ 74,000.00	
9	Aqueduct Turnout Steel Embeds	EA	1	\$ 10,000.00	\$ 10,000.00	
10	Aqueduct Turnout Steel Grating	EA	1	\$ 25,000.00	\$ 25,000.00	
11	Aqueduct Turnout Steel Handrailing	EA	1	\$ 25,000.00	\$ 25,000.00	
12	Aqueduct Trashrack	EA	1	\$ 75,000.00	\$ 75,000.00	
13	Aqueduct Turnout Piping - 10' Diameter RCP	LF	2100	\$ 1,750.00	\$ 3,675,000.00	
14	Aqueduct Turnout Fittings	EA	6	\$ 75,000.00	\$ 450,000.00	
15	Outlet Canal Siphon Earthwork and Canal Restoration	CY	15000	\$ 30.00	\$ 450,000.00	
16	Aqueduct Metering	EA	1	\$ 200,000.00	\$ 200,000.00	
17	Aqueduct Meter Vault	EA	1	\$ 250,000.00	\$ 250,000.00	
18	Aqueduct Slide Gate & Actuator	EA	1	\$ 95,000.00	\$ 95,000.00	
19	Aqueduct Turnout Electrical Panels	EA	1	\$ 175,000.00	\$ 175,000.00	
20	Aqueduct Turnout Electrical Concrete Pad	EA	1	\$ 20,000.00	\$ 20,000.00	
21	Aqueduct Turnout Electrical Service	EA	1	\$ 25,000.00	\$ 25,000.00	
22	Aqueduct Turnout Light Standard	EA	1	\$ 15,000.00	\$ 15,000.00	
23	Aqueduct Turnout PLC Panel & Programming	EA	1	\$ 25,000.00	\$ 25,000.00	
24	Aqueduct Turnout Conduits, Wire, and Grounding	EA	1	\$ 90,000.00	\$ 90,000.00	
25	Electrical Equipment Bollards	EA	1	\$ 1,000.00	\$ 1,000.00	
26	Aqueduct Liner Repair Subgrade Earthwork	EA	1	\$ 15,000.00	\$ 15,000.00	
27	Aqueduct Liner Repair	SF	1500	\$ 6.00	\$ 9,000.00	
28	Levee Road Pavement Restoration	SF	1600	\$ 10.00	\$ 16,000.00	
					<b>Aqueduct Turnout Facility:</b>	\$ 6,449,000.00
29	R/W Clearing & Grubbing	AC	100	\$ 700.00	\$ 70,000.00	
30	Conveyance Pipeline 10-ft Diameter Gravity	LF	25,810	\$ 1,750.00	\$ 45,167,500.00	
31	Conveyance Pipeline 8-ft Diameter Gravity	LF	5,815	\$ 1,250.00	\$ 7,268,750.00	
32	Conveyance Pipeline 7-ft Diameter Gravity	LF	14,910	\$ 1,050.00	\$ 15,655,500.00	
33	Conveyance Pipeline 5-ft Diameter Gravity	LF	5,724	\$ 650.00	\$ 3,720,600.00	
34	Rosedale Intake Canal Improvements	LS	1	\$ 2,500,000.00	\$ 2,500,000.00	
					<b>Conveyance Facility:</b>	\$ 74,382,350.00
35	Main Canal Crossing Excavation	CY	2500	\$ 20.00	\$ 50,000.00	
36	Main Canal Backfill and Compaction	CY	2500	\$ 20.00	\$ 50,000.00	
37	Main Canal Dewatering	EA	1	\$ 20,000.00	\$ 20,000.00	
38	Main Canal Cutoff Walls	EA	2	\$ 25,000.00	\$ 50,000.00	
39	WKWD Pipeline Crossing Excavation	CY	2500	\$ 20.00	\$ 50,000.00	
40	WKWD Pipeline Crossing Backfill and Compaction	CY	2500	\$ 20.00	\$ 50,000.00	
41	Pioneer Canal Crossing Excavation	CY	2500	\$ 20.00	\$ 50,000.00	
42	Pioneer Canal Crossing Backfill and Compaction	CY	2500	\$ 20.00	\$ 50,000.00	
43	Pioneer Canal Dewatering	EA	1	\$ 20,000.00	\$ 20,000.00	
44	Pioneer Canal Cutoff Walls	EA	2	\$ 25,000.00	\$ 50,000.00	
45	Stockdale Hwy Crossing - 10' Diameter Casing with 7' Diameter RCP	LF	150	\$ 5,500.00	\$ 825,000.00	
46	I-5 Fwy Crossing - 13' Diameter Casing with 10' Diameter RCP	LF	280	\$ 6,000.00	\$ 1,680,000.00	
47	Intertie to Stockdale West and Strand Ranch North	EA	1	\$ 350,000.00	\$ 350,000.00	
48	Turnout to New 300 Acre Property	EA	1	\$ 550,000.00	\$ 550,000.00	
49	Turnout to West Basins/Goose Lake Channel	EA	1	\$ 550,000.00	\$ 550,000.00	
50	Turnout to Rosedale Intake Canal	EA	1	\$ 550,000.00	\$ 550,000.00	
51	Pipeline Fittings	EA	14	\$ 50,000.00	\$ 700,000.00	
					<b>Conveyance Structures/Crossings:</b>	\$ 5,645,000.00
52	Lift Station Excavation	CY	11000	\$ 20.00	\$ 220,000.00	
53	Lift Station Reinforced Concrete Structure - Floor	CY	320	\$ 1,400.00	\$ 448,000.00	
54	Lift Station Reinforced Concrete Structure - Walls	CY	800	\$ 1,800.00	\$ 1,440,000.00	
55	Lift Station Reinforced Concrete Structure - Deck	CY	150	\$ 2,500.00	\$ 375,000.00	
56	Pump Fillets and Center Splitter	EA	6	\$ 15,000.00	\$ 90,000.00	
57	Lift Station Pumps - 40 cfs	EA	2	\$ 220,000.00	\$ 440,000.00	
58	Lift Station Pumps - 90 cfs	EA	4	\$ 350,000.00	\$ 1,400,000.00	
59	Lift Station Motors - 350 hp	EA	2	\$ 150,000.00	\$ 300,000.00	
60	Lift Station Motors - 800 hp	EA	4	\$ 325,000.00	\$ 1,300,000.00	
61	30" FBE Steel Discharge Piping	LF	300	\$ 750.00	\$ 225,000.00	
62	6" Air Release Valve	EA	2	\$ 6,750.00	\$ 13,500.00	
63	30" Dresser Coupling	EA	2	\$ 6,750.00	\$ 13,500.00	
64	30" Check Valve with Oil Dashpot	EA	2	\$ 120,000.00	\$ 240,000.00	
65	30" Butterfly Valve	EA	2	\$ 35,000.00	\$ 70,000.00	
66	Flow Meter	EA	2	\$ 35,000.00	\$ 70,000.00	
67	Pipe Supports	EA	8	\$ 2,250.00	\$ 18,000.00	
68	Pipe Excavation and Backfill	LF	200	\$ 270.00	\$ 54,000.00	
69	Painting System	EA	2	\$ 10,000.00	\$ 20,000.00	
70	42" FBE Steel Discharge Piping	LF	600	\$ 1,000.00	\$ 600,000.00	
71	8" Air Release Valve	EA	4	\$ 11,250.00	\$ 45,000.00	
72	42" Dresser Coupling	EA	4	\$ 11,250.00	\$ 45,000.00	
73	42" Check Valve with Oil Dashpot	EA	4	\$ 155,000.00	\$ 620,000.00	
74	42" Butterfly Valve	EA	4	\$ 60,000.00	\$ 240,000.00	
75	Flow Meter	EA	4	\$ 45,000.00	\$ 180,000.00	
76	Pipe Supports	EA	16	\$ 3,150.00	\$ 50,400.00	
77	Pipe Excavation and Backfill	LF	400	\$ 450.00	\$ 180,000.00	
78	Painting System	EA	4	\$ 10,000.00	\$ 40,000.00	
79	Manifold Piping and Appurtenances	LF	1000	\$ 2,250.00	\$ 2,250,000.00	
80	Lift Station 350 hp VFD's	EA	2	\$ 175,000.00	\$ 350,000.00	
81	Lift Station 800 hp VFD's	EA	4	\$ 450,000.00	\$ 1,800,000.00	
82	Lift Station Main Switchboard	EA	1	\$ 250,000.00	\$ 250,000.00	
83	Lift Station Motor Control Center	EA	1	\$ 1,750,000.00	\$ 1,750,000.00	
84	Lift Station PLC & Programming	EA	1	\$ 157,500.00	\$ 157,500.00	
85	Lift Station Transformer & Electrical Service	EA	1	\$ 300,000.00	\$ 300,000.00	
86	Lift Station Site Lighting	EA	4	\$ 9,000.00	\$ 36,000.00	
87	Lift Station Conduits, Wire, & Grounding	EA	1	\$ 1,250,000.00	\$ 1,250,000.00	
88	Lift Station Electrical Control Building Concrete Foundation	CY	60	\$ 1,200.00	\$ 72,000.00	
89	Lift Station Electrical Building & Appurtenances	EA	1	\$ 550,000.00	\$ 550,000.00	
90	Lift Station Backfill & Compaction	CY	6000	\$ 9.00	\$ 54,000.00	
91	Lift Station Slide Gates	EA	1	\$ 60,000.00	\$ 60,000.00	
92	Lift Station Trashracks	EA	6	\$ 20,000.00	\$ 120,000.00	
93	Lift Station Steel Embeds & Ladder Rungs	EA	1	\$ 25,000.00	\$ 25,000.00	
94	Lift Station Steel Grating	EA	1	\$ 45,000.00	\$ 45,000.00	
95	Lift Station Steel Handrailing	EA	1	\$ 25,000.00	\$ 25,000.00	
96	Lift Station Pump Column Pipe Cathodic Protection	EA	1	\$ 11,250.00	\$ 11,250.00	
97	Lift Station Underground Piping Cathodic Protection	EA	1	\$ 11,250.00	\$ 11,250.00	
98	Lift Station Bypass Pipeline	LF	200	\$ 315.00	\$ 63,000.00	
99	Lift Station Bypass Valving	LS	1	\$ 270,000.00	\$ 270,000.00	
100	Lift Station Ground Cover	CY	900	\$ 50.00	\$ 45,000.00	
					<b>Pump Station Facility for Conveyance:</b>	\$ 18,232,400.00
101	300 Acres Clearing & Grubbing	AC	300	\$ 350.00	\$ 105,000.00	
102	300 Acres Levee Over-Excavation and Re-Compaction	CY	65000	\$ 8.00	\$ 520,000.00	
103	300 Acres Levee Keyway	CY	40000	\$ 8.00	\$ 320,000.00	
104	300 Acres Levee Embankment Fill	CY	150000	\$ 10.00	\$ 1,500,000.00	
105	Existing Irrigation Pipe Removal and Disposal	LF	5000	\$ 25.00	\$ 125,000.00	
106	Ripping and Floating Basin Bottoms	AC	300	\$ 350.00	\$ 105,000.00	
107	300 Acres Structure Headwalls	EA	5	\$ 45,000.00	\$ 225,000.00	
108	300 Acres Structure Miscellaneous Steel & Weir Boards	EA	5	\$ 15,000.00	\$ 75,000.00	
109	300 Acres Interbasin Structure Piping	LF	300	\$ 250.00	\$ 75,000.00	
110	300 Acres Interbasin Structure Rip-Rap	EA	5	\$ 75,000.00	\$ 375,000.00	
111	300 Acres Interbasin Structure Cutoff Walls	EA	5	\$ 25,000.00	\$ 125,000.00	
112	300 Acres Site Fencing and Gates	LF	10160	\$ 9.50	\$ 96,520.00	
113	Turn-in Facility and Appurtenances	LS	1	\$ 550,000.00	\$ 550,000.00	
					<b>Recharge Facility Earthwork &amp; Structures:</b>	\$ 4,196,520.00

114	Rig Setup	EA	1	\$	10,000.00	\$	10,000.00		
115	Rig Teardown	EA	1	\$	10,000.00	\$	10,000.00		
116	Final Cleanup	EA	1	\$	5,000.00	\$	5,000.00		
117	Transport and dispose of drill cuttings offsite	EA	1	\$	10,000.00	\$	10,000.00		
118	Three 20,000-gallon temporary water storage tanks and discharge piping	EA	1	\$	10,000.00	\$	10,000.00		
119	Drill 54-inch minimum diameter surface casing/sanitary seal borehole	LF	50	\$	750.00	\$	37,500.00		
120	Drill 17.5-inch minimum diameter pilot borehole from 50 ft to 970 ft bgs	LF	920	\$	100.00	\$	92,000.00		
121	Drill 17.5-inch minimum diameter pilot borehole from 970 ft to 1,400 ft bgs	LF	430	\$	100.00	\$	43,000.00		
122	Conduct downhole geophysical surveys and alignment/deviation survey	EA	1	\$	13,500.00	\$	13,500.00		
123	Conduct isolated aquifer zone test	EA	3	\$	22,500.00	\$	67,500.00		
124	Conduct deep isolated aquifer zone test below 800 ft bgs	EA	3	\$	31,500.00	\$	94,500.00		
125	Enlarge pilot borehole to 36-inch diameter from 50 ft to 330 ft bgs	LF	280	\$	100.00	\$	28,000.00		
126	Enlarge pilot borehole to 32-inch diameter from 330 ft to 970 ft bgs	LF	660	\$	100.00	\$	66,000.00		
127	Conduct alignment/deviation tests in enlarged borehole	EA	1	\$	5,000.00	\$	5,000.00		
128	Conduct a caliper survey of enlarged borehole	EA	1	\$	5,000.00	\$	5,000.00		
129	Furnish and install 20-inch I.D. by 5/16-inch wall HSLA steel blank well casing	LF	424	\$	300.00	\$	127,200.00		
130	Furnish and install HSLA steel blank well casing with reinforced "Bull Nose"	EA	1	\$	4,500.00	\$	4,500.00		
131	Furnish and install 20-inch by 5/16-inch wall Ful Flo louvered, HSLA steel well screen	LF	510	\$	350.00	\$	178,500.00		
132	Furnish and install 3-inch I.D. schedule 40 mild steel sounding/camera access tube	LF	329	\$	45.00	\$	14,805.00		
133	Furnish and install 3-inch I.D. schedule 40 mild steel gravel feed tube	LF	319	\$	35.00	\$	11,165.00		
134	Furnish and install gravel pack in borehole annulus	LF	665	\$	150.00	\$	99,750.00		
135	Furnish and install 10.3-sack sand-cement grout upper annular seal	LF	305	\$	150.00	\$	45,750.00		
136	Perform initial well development	HRS	108	\$	250.00	\$	27,000.00		
137	Provide chlorine solution for chemical development of the well	GAL	255	\$	25.00	\$	6,375.00		
138	Provide polymer dispersant for chemical development of the well	GAL	40	\$	100.00	\$	4,000.00		
139	Mobilize, install, and demobilize test pumping equipment in newly completed wells	EA	1	\$	22,500.00	\$	22,500.00		
140	Conduct final development by pumping and surging	HRS	60	\$	450.00	\$	27,000.00		
141	Conduct step-drawdown pumping test in newly completed wells	HRS	8	\$	450.00	\$	3,600.00		
142	Conduct constant-rate pumping test in newly completed wells	HRS	28	\$	450.00	\$	12,600.00		
143	Conduct a dynamic flow meter survey	EA	1	\$	15,000.00	\$	15,000.00		
144	Conduct a color video camera survey	EA	1	\$	2,500.00	\$	2,500.00		
145	Conduct well alignment/deviation test in newly completed wells	EA	1	\$	4,500.00	\$	4,500.00		
							<b>Recovery Well Drilling and Development:</b>	\$	1,103,745.00
							<b>Cost for Three Recovery Wells:</b>	\$	3,311,235.00
146	Site Cleanup	EA	1	\$	10,000.00	\$	10,000.00		
147	Water Supply	EA	1	\$	15,000.00	\$	15,000.00		
148	Environmental Mitigation	EA	1	\$	20,000.00	\$	20,000.00		
149	Construct well site earthwork	CY	2400	\$	15.00	\$	36,000.00		
150	Furnish and install well concrete foundation	CY	20	\$	1,080.00	\$	21,600.00		
151	Furnish and install electrical concrete foundation	CY	15	\$	1,080.00	\$	16,200.00		
152	Furnish and install discharge pipe concrete pad	CY	5	\$	1,080.00	\$	5,400.00		
153	Furnish and install transformer pad	EA	1	\$	7,500.00	\$	7,500.00		
154	Furnish and install 12" FBE Steel Well Discharge Piping	LF	45	\$	500.00	\$	22,500.00		
155	Furnish and install Deep Well Air Release Valve	EA	1	\$	3,150.00	\$	3,150.00		
156	Furnish and install 12" Dresser Coupling	EA	1	\$	1,800.00	\$	1,800.00		
157	Furnish and install 12" Check Valve	EA	1	\$	4,500.00	\$	4,500.00		
158	Furnish and install 12" Flow Meter	EA	1	\$	8,500.00	\$	8,500.00		
159	Furnish and install 12" FBE Steel Tee	EA	1	\$	2,500.00	\$	2,500.00		
160	Furnish and install 12" Butterfly Valve	EA	1	\$	7,500.00	\$	7,500.00		
161	Furnish and install 2" Air Release Valve	EA	1	\$	5,500.00	\$	5,500.00		
162	Furnish and install Pressure Gauges	EA	2	\$	550.00	\$	1,100.00		
163	Furnish and install Pipe Supports	EA	3	\$	1,000.00	\$	3,000.00		
164	Furnish and install vertical turbine well pump assembly	EA	1	\$	180,000.00	\$	180,000.00		
165	Furnish and install vertical turbine well motor	EA	1	\$	80,000.00	\$	80,000.00		
166	Furnish and install well enclosures and appurtenances	EA	1	\$	35,000.00	\$	35,000.00		
167	Furnish and install electrical Main Switchboard	EA	1	\$	150,000.00	\$	150,000.00		
168	Furnish and install electrical Motor Control Center	EA	1	\$	350,000.00	\$	350,000.00		
169	Furnish and install Electrical Service and Transformer	EA	1	\$	22,500.00	\$	22,500.00		
170	Furnish and install Site Lighting	EA	2	\$	9,000.00	\$	18,000.00		
171	Furnish and install Multi-Lin	EA	1	\$	9,000.00	\$	9,000.00		
172	Furnish and install RTU and HMI	EA	1	\$	9,000.00	\$	9,000.00		
173	Furnish and install Electrical Instrumentation	EA	1	\$	22,500.00	\$	22,500.00		
174	Furnish and install Electrical Conduit, Wires, and Grounding	EA	1	\$	135,000.00	\$	135,000.00		
175	Furnish and install pre-fabricated metal canopy	EA	1	\$	65,000.00	\$	65,000.00		
176	Furnish and install site ground cover	CY	200	\$	100.00	\$	20,000.00		
177	Furnish and install site fencing	LF	400	\$	55.00	\$	22,000.00		
178	Furnish and install site painting	EA	1	\$	15,000.00	\$	15,000.00		
179	Furnish and install VFD's	EA	1	\$	180,000.00	\$	180,000.00		
180	Well Recovery Pipeline - 15" PVC	LF	1000	\$	125.00	\$	125,000.00		
181	Well Recovery Pipeline - 18" PVC	LF	1800	\$	150.00	\$	270,000.00		
182	Intertie Connection to Conveyance Pipeline	LS	1	\$	70,000.00	\$	70,000.00		
							<b>Recovery Well Equipping and Site Development:</b>	\$	1,969,750.00
							<b>Cost for Three Recovery Wells:</b>	\$	5,909,250.00
183	SCADA System Hardware	EA	1	\$	170,000.00	\$	170,000.00		
184	SCADA System Software	EA	1	\$	35,000.00	\$	35,000.00		
185	SCADA System Programming and Screens	EA	1	\$	95,000.00	\$	95,000.00		
							<b>SCADA:</b>	\$	300,000.00
<b>Subtotal:</b>							\$	118,425,755.00	
Mobilization:							1.4%	\$	1,638,000.00
<b>Subtotal with Mobilization:</b>								\$	120,063,755.00
Contract Cost Allowances (Sum of):							2.5%	\$	3,001,593.88
Design Contingencies, 2% (+/-)									
APS (+/-). Type of Procurement: Request for Proposal, Competitive Bid									
<b>Contract Cost:</b>								\$	123,065,348.88
Construction Contingencies:							10.0%	\$	12,306,534.89
<b>Field Cost:</b>								\$	135,371,883.76
Project Management								\$	1,353,718.84
Engineering & Design								\$	8,122,313.03
Environmental								\$	540,000.00
Permitting								\$	50,000.00
Labor Compliance								\$	270,000.00
PG&E Electrical Service								\$	850,000.00
Bid Advertisement & Legal								\$	120,000.00
Project Surveying								\$	250,000.00
Construction Management & Inspection								\$	10,152,891.28
HCP Fees								\$	3,200,000.00
Land Acquisition and Rights of Way								\$	14,200,000.00
<b>Subtotal Non-Contract Cost not including Land and R/W:</b>								\$	24,908,923.15
<b>Subtotal Non-Contract Cost including Land Acquisition and R/W Procurement:</b>								\$	39,108,923.15
<b>Construction Cost (Unit Price Level Mar 2024) including Land Acquisition and Rights of Way:</b>								\$	174,480,806.91
<b>QUANTITIES</b>					<b>PRICES</b>				
BY Curtis M. Skaggs, PE			CHECKED		BY Curtis M. Skaggs, PE			CHECKED	
DATE PREPARED July 30, 2024			PEER REVIEW / DATE		DATE PREPARED July 30, 2024			PEER REVIEW / DATE	



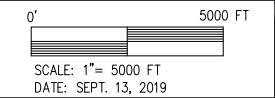
**Exhibit B**  
**Alignment Map**



LEGEND	
	Existing Project Basins
	Bifurcation Alignment
	Area of Potential New 300 AC Recharge Basin
CFS	Initial Fill Recharge Rate
(CFS)	Maintenance Recharge Rate

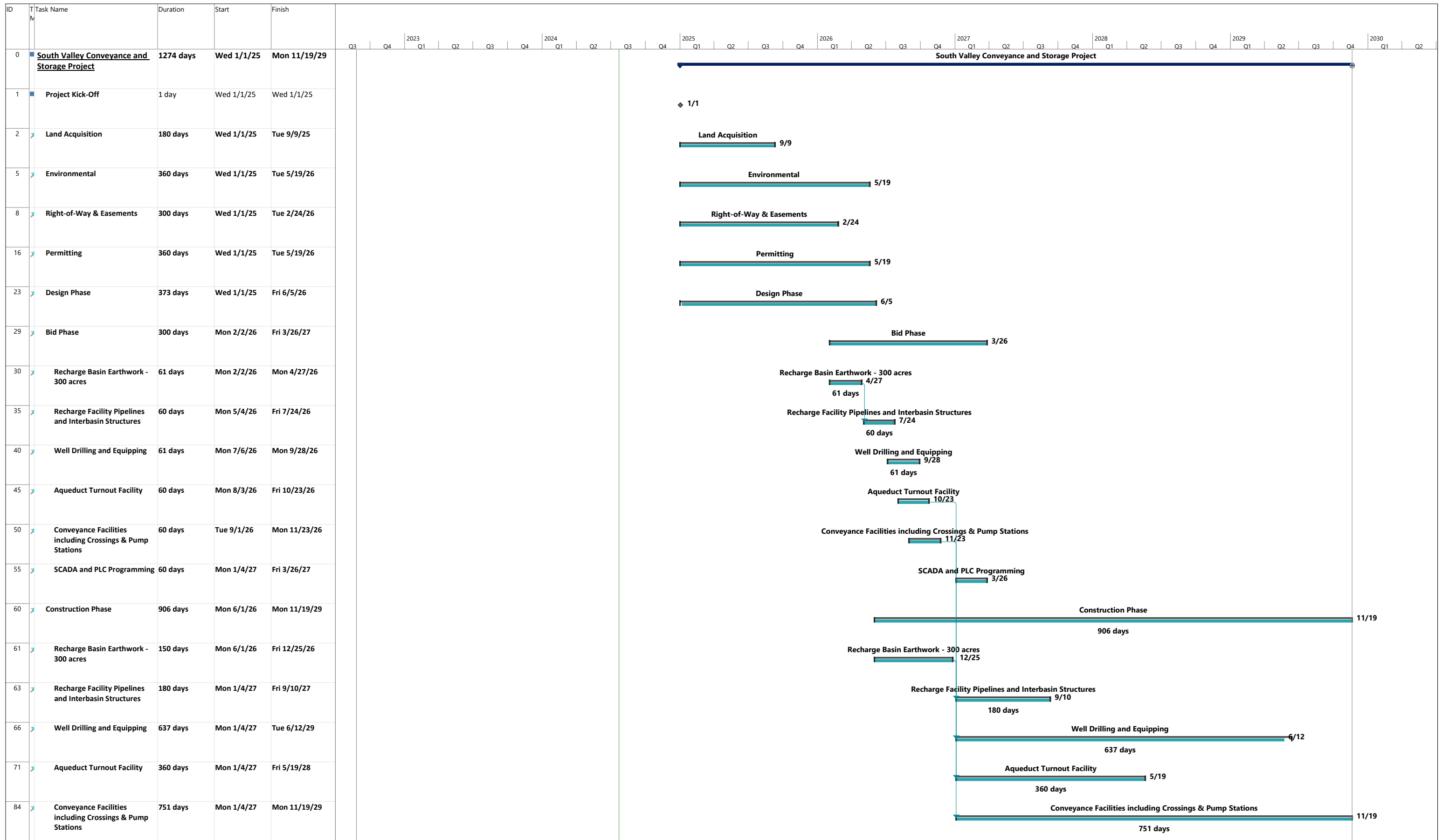
Aqueduct Turnout in Pool 28 of the California Aqueduct

**SOUTH VALLEY CONVEYANCE AND STORAGE PROJECT  
BIFURCATION ALIGNMENT**



**DEE JASPAR & ASSOCIATES, INC.**  
 CIVIL ENGINEERS  
 PORTERVILLE, CALIFORNIA  
 BAKERSFIELD, CALIFORNIA  
 PHONE 559 791-9286  
 PHONE 661 393-4796

**Exhibit C**  
**Preliminary Project Schedule**



Project: South Valley Conveyance  
Date: Tue 7/23/24

Task	Summary	Inactive Milestone	Summary	Duration-only	Start-only	External Milestone	Path Successor Summary Task	Critical Split	Progress
Split	Project Summary	Inactive Summary	Manual Summary Rollup	Finish-only	External Tasks	Deadline	Path Successor Normal Task	Critical	Manual Progress
Milestone	Inactive Task	Manual Task	Manual Summary	External Tasks	Path Successor Milestone Task	Critical	Manual Progress	Manual Progress	Manual Progress