

# INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

Ridgecrest City Hall   100 W California Ave., Ridgecrest, CA 93555   760-499-5002

## BOARD OF DIRECTORS AGENDA

Wednesday, May 13, 2026

**Closed Session – 10:00 a.m.**

**Open Session no earlier than 11:00 a.m.**

Pursuant to California Government Code 54953(b)(1) one additional call-in location has been established for a Board Member who will attend this meeting via teleconference at 14955 Dale Evans Parkway, Apple Valley, CA. 92307

***NOTICE:*** *In accordance with the evolving public health declarations, we will continue to provide live stream video for those wishing to participate virtually. Please see the Public Comment Notice below for detailed instructions on submitting public comment as well as websites for livestream broadcasting.*

*In compliance with the Americans with Disabilities Act, if you are a disabled person and you need a disability-related modification or accommodation to participate in this meeting, please contact April Keigwin at (805) 764-5452. Requests must be made as early as possible and at least one full business day before the start of the meeting. Documents and material relating to an open session agenda items that are provided to the IWVGA Board of Directors prior to a regular meeting will be available for public inspection and copying at Ridgecrest City Hall, 100 W California Ave, Ridgecrest, CA 93555, or online at <https://iwvga.org/>.*

### Statements from the Public

*The public will be allowed to address the Board during Public Comments about subjects within the jurisdiction of the IWVGA Board and that are NOT on the agenda. No action may be taken on off-agenda items unless authorized by law. Questions posed to the Board may be answered after the meeting or at a future meeting. Dialog or extended discussion between the public and the Board or staff will be limited in accordance with the Brown Act. All Public Comment portions of the meeting shall be limited to three (3) minutes per speaker. Each person is limited to one comment during Public Comments.*

### 1. CALL TO ORDER

### 2. ADOPTION OF AGENDA

### 3. PUBLIC COMMENT ON CLOSED SESSION

### 4. CLOSED SESSION

- CONFERENCE WITH REAL PROPERTY NEGOTIATIONS  
(Government Code Section 54956.8) - Property: Purchase of Water Rights; Agency Negotiator: Jeff Simonetti; Negotiating Parties: Westside Ag; Under Negotiation: Price and terms of payment.

- CONFERENCE WITH REAL PROPERTY NEGOTIATIONS  
(Government Code Section 54956.8) - Property: Purchase of Land; Agency Negotiator: April Keigwin / Phillip Hall; Negotiating Parties: Fremont Valley Properties; Under Negotiation: Price and terms of payment.
- CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION  
(Government Code Section 54956.9(d)(1): IWVGA v. Inyokern CSD – Kern County Superior Court BCV-22-100281
- CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION  
(Government Code Section 54956.9(d)(1) - Name of case: Mojave Pistachios, LLC v Indian Wells Valley Water District, et al. Orange County Superior Court Case No. 30-2021-01187275-CU-OR-CJ

**5. CALL TO ORDER – No earlier than 11:00 a.m.**

- a. Report on closed session
- b. Pledge of Allegiance
- c. Roll Call

**6. PUBLIC COMMENT**

This time is reserved for the public to address the Board about matters NOT on the agenda. No action will be taken on non-agenda items unless authorized by law. Comments are limited to three minutes per person.

**7. BOARD MEMBER COMMENTS**

This time is reserved for comments by Board members and/or staff and to identify matters for future Board business.

**8. CONSENT AGENDA**

- a. Approve Minutes of Board Meeting March 11, 2026
- b. Approve Expenditures
  - \*To view itemized invoices please visit <https://iwvga.org/iwvga-meetings>.*
  - \*Invoice totals are for two months*
    - i. \$181,693.84 – Stetson Engineers
    - ii. \$84,952.44 – Regional Government Services – (Replenishment / Extraction)
    - iii. \$70,090.30 – City of Ridgecrest
    - iv. \$28,662.50 – Capitol Core Group – (Replenishment)
    - v. \$26,675.00 – Blue Mountain Development – (SGMA IP / EPA)
    - vi. \$24,913.69 – Indian Wells Valley Water District – (Consolidation)
    - vii. \$24,030.24 – Westbound Communication – (Extraction)
    - viii. \$18,500.00 – Nigro & Nigro – (Extraction / Replenishment)
    - ix. \$6,668.75 – GFT Infrastructure – (SGMA IP / EPA)

**9. APPROVAL OF ALLOCATION OF SHALLOW WELL MITIGATION PROGRAM FUNDS FOR RADEMACHER CONSOLIDATION PROJECT**

**10. APPROVAL OF REPORT AND SUBMISSION OF REPORT TO COURT AS REQUIRED BY CALIFORNIA CODE OF CIVIL PROCEDURE 845**

**11. WATER RESOURCES MANAGER REPORT**

- a. Grant Funding

- b. GSP Implementation Projects/Management Action Updates
  - i. Imported Water Project
  - ii. Shallow Well Mitigation Program
- c. Consolidation Projects
  - i. Rademacher Way
  - ii. Stark Street
- d. Miscellaneous Items
  - i. Data Collection and Monitoring
  - ii. IWVGA Basin Model Configuration Management Plan
  - iii. Rose Valley Subflow Update
  - iv. Response Letter to DWR

## 12. GENERAL MANAGER'S REPORT

- a. Monthly Financial Report
- b. Outreach Update
- c. Report on IWVGA's Water Marketer (Capitol Core Group)

## 13. DATE OF NEXT MEETING – JUNE 10, 2026

## 14. ADJOURN

### PUBLIC COMMENT NOTICE

IWVGA meetings will be open to the public for physical attendance; However, for those who wish to continue using virtual alternatives please follow the directions below for access to live stream video as well as ways to submit public comment.

- **Watch meetings on-line:**  
All of our meetings are streamed live at <https://ridgecrest-ca.gov/369/Watch> (4 second streaming delay) or on YouTube at <https://www.youtube.com/cityofridgecrest/live> (22 second streaming delay) and are also available for playback after the meeting.
- **Call in for public comments:**  
If you wish to make verbal comment, *please call (760) 499-5010*. This phone line will allow only one caller at a time, so if the line is busy, please continue to dial. We will be allowing a 20-30 second pause between callers to give time for media delays and callers to dial in. Due to media delays, please mute your streaming device while making public comment. If you wish to comment on multiple items, you will need to call in as each item is presented.
- **Submit written comments:**  
We encourage submittal of written comments supporting, opposing, or otherwise commenting on an agenda item, for distribution to the Board prior to the meeting. Send emails to [akeigwin@rgs.ca.gov](mailto:akeigwin@rgs.ca.gov) written correspondence may be sent to April Keigwin, Clerk of the Board, 100 W. California Ave., Ridgecrest, CA 93555. Please specify to which agenda item your comment relates.
- **Large Groups:**  
If you are part of a large group that would like to comment on an agenda item, please consider commenting in writing. This will be as impactful to the Board as having a large group in attendance.

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# INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

City of Ridgecrest, Indian Wells Valley Water District, Inyo County, Kern County, San Bernardino County

## BOARD OF DIRECTORS MEETING MARCH 11, 2026

**IWVGA Members Present:**

Chairman Scott Hayman, City of Ridgecrest	Commander Sims, United States Navy
Phillip Peters, Kern County	Dana Stephensen, Bureau of Land Management
David Saint-Amand, Indian Wells Valley Water District	April Keigwin, General Manager
John Vallejo, Inyo County	Steve Johnson, Water Resources Manager
Tim Itnyre, San Bernardino County	Keith Lemieux, Legal Counsel

Attending via teleconference is Steve Johnson.

Meeting recording, public comment letters submitted, and all board meeting related documents are made available at:  
<https://iwvga.org/iwvga-meetings/>

**1. CALL TO ORDER:**

Chairman Hayman calls the meeting to order at 10:06 a.m.

**2. ADOPTION OF AGENDA:**

Motion made by John Vallejo and seconded by David Saint-Amand to approve adoption of the agenda. Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Saint-Amand	Aye
Director Itnyre	Aye
Director Vallejo	Aye

**3. PUBLIC COMMENT ON CLOSED SESSION:**

The Board hears public comment Renee Westa-Lusk.

Chairman Hayman calls the meeting into Closed Session at 10:07 a.m.

**4. CLOSED SESSION:**

- CONFERENCE WITH REAL PROPERTY NEGOTIATIONS  
(Government Code Section 54956.8) - Property: Purchase of Water Rights; Agency Negotiator: Jeff Simonetti; Negotiating Parties: Westside Ag; Under Negotiation: Price and terms of payment.
- CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION  
(Government Code Section 54956.9(d)(1): IWVGA v. Inyokern CSD – Kern County Superior Court BCV-22-100281
- CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION  
(Government Code Section 54956.9(d)(1) - Name of case: Mojave Pistachios, LLC v Indian Wells

Valley Water District, et al. Orange County Superior Court Case No. 30-2021-01187275-CU-OR-CJ

Closed Session adjourns at 10:58 a.m.

**5. OPEN SESSION – no earlier than 11:00 a.m.**

Meeting reconvenes into Open Session at 11:03 p.m.

- a. Report on Closed Session – Counsel Lemieux reports no reportable action was taken that would require disclosure under The Brown Act.
- b. Pledge of Allegiance is led by Chairman Hayman
- c. Roll Call

Chairman Hayman	Present
Vice Chair Peters	Present
Director Saint-Amand	Present
Director Itnyre	Present
Director Vallejo	Present

**6. PUBLIC COMMENT:**

The Board hears public comment from Renee Westa-Lusk and Mike Sinnott.

**7. BOARD MEMBER COMMENTS:**

None.

**8. CONSENT AGENDA:**

- a. Approve Minutes of Board Meeting February 11, 2026
- b. 2026 Insurance Renewal
- c. Approve Expenditures

*\*To view itemized invoices please visit <https://iwvga.org/iwvga-meetings>.*

- i. \$184,433.37 – Stetson Engineers (December and January invoices)
- ii. \$38,446.80 – Regional Government Services – (Replenishment / Extraction)
- iii. \$21,601.00 – CalMutuals JPRIMA – (Extraction)
- iv. \$13,750.00 – Blue Mountain Development – (SGMA IP / EPA)
- v. \$11,056.25 – Capitol Core Group – (Replenishment)
- vi. \$9,825.00 – Westbound Communication – (Extraction)
- vii. \$4,498.80 – Provost & Pritchard – (SGMA IP / EPA)
- viii. \$1,611.00 – Transystems – (SGMA IP / EPA)

The Board hears public comment from Renee Westa-Lusk.

Motion made by Phillip Peters and John Vallejo to approve Minutes of Board Meeting February 11, 2026, 2026 insurance renewal and the following expenditures in the amount of, \$184,433.37 to Stetson Engineers, \$38,446.80 to Regional Government Services, \$21,601.00 to CalMutuals JPRIMA, \$13,750.00 to Blue Mountain Development, \$11,056.25 to Capitol Core, \$9,825.00 to Westbound Communication, \$4,498.80 to Provost & Pritchard, and \$1,611.00 to Transystems (GFT Infrastructure).

Motion carries by the following vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Saint-Amand	Aye
Director Itnyre	Aye
Director Vallejo	Aye

**9. CONTRACT MODIFICATION WITH HAMNER AND JEWELL FOR RIGHT OF WAY ACQUISITION SERVICES:**

April Keigwin presents staff report and amendment.

The Board hears public comment from Renee Westa-Lusk.

Motion made by John Vallejo and seconded by Phillip Peters to approve amendment to agreement with Hamner and Jewell.

Motion carries by the following vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Saint-Amand	Aye
Director Itnyre	Aye
Director Vallejo	Aye

**10. AMENDMENT TO CONTRACT WITH PROVOST & PRITCHARD FOR CEQA/NEPA DOCUMENTS AND PERMIT DOCUMENTATION FOR THE IMPORTED WATER PIPELINE:**

April Keigwin presents staff report and amendment.

Motion made by John Vallejo and seconded by Phillip Peters to approve contract amendment with Provost & Pritchard with the proposed amendment to strike the word “fully” from section 4.3.

Motion carries by the following vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Saint-Amand	Nay
Director Itnyre	Aye
Director Vallejo	Aye

**11. AMENDMENT TO CONTRACT WITH PROVOST & PRITCHARD FOR DESIGN SERVICES FOR THE IMPORTED WATER PIPELINE:**

April Keigwin presents staff report and amendment.

Motion made by Phillip Peters and seconded by John Vallejo to approve contract amendment with Provost & Pritchard with the proposed amendment to strike the word “fully” from section 4.3.

Motion carries by the following vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Saint-Amand	Nay
Director Itnyre	Aye
Director Vallejo	Aye

**12. REQUEST TO THE DEPARTMENT OF WATER RESOURCES FOR REVIEW OF TECHNICAL REPORTS:**

Counsel Lemieux presents staff report.

The Board hears public comment from Mike Sinnott and Judie Decker.

Motion made by John Vallejo and seconded by Phillip Peters to approve request to DWR for review of technical documents.

Motion carries by the following vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye

Director Saint-Amand	Nay
Director Itnyre	Aye
Director Vallejo	Aye

**13. BOARD TO RECEIVE AND FILE THE 2025 WATER YEAR ANNUAL REPORT:**

Heather Steele presents annual report.

The Board hears public comment from Renee Westa-Lusk.

Motion made by and seconded by to approve submission of the 2025 water year annual report.

Motion carries by the following vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Saint-Amand	Nay
Director Itnyre	Aye
Director Vallejo	Aye

**14. WATER RESOURCES MANAGER REPORT:**

Jeff Helsley provides updates on the following items:

- a. Grant Funding
- b. GSP Implementation Projects/Management Action Updates
  - i. Imported Water Project
  - ii. Shallow Well Mitigation Program
- c. Consolidation Projects
  - i. Rademacher Way
  - ii. Stark Street
- d. Miscellaneous Items
  - i. Data Collection and Monitoring
  - ii. IWVGA Basin Model Configuration Management Plan
  - iii. Rose Valley Subflow Update

The Board hears public comment from Renee Westa-Lusk.

**15. GENERAL MANAGER REPORT:**

April Keigwin presents monthly financial report and updates on public outreach. Michael McKinney provides legislative update.

The Board hears public comment from Judie Decker

**16. DATE OF NEXT MEETING – MARCH 11, 2026**

**17. ADJOURN:**

Chairman Hayman adjourns the meeting at 12:21 p.m. on March 11, 2026.

Respectfully submitted,

April Keigwin  
 Clerk of the Board  
 Indian Wells Valley Groundwater Authority

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**Stetson Engineers**

Indian Wells Valley Groundwater Authority  
 100 W. California Ave.  
 Ridgecrest, CA 93555

Invoice number 2652-104  
 Date 04/22/2026

Project **2652 Indian Wells Valley Groundwater Authority**

Professional services through 03/31/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:01 Meetings & Prep**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	18.00	244.00	4,392.00
<b>Supervisor I</b>	17.50	212.00	3,710.00
<b>Senior I</b>	6.00	170.00	1,020.00
<b>Senior III</b>	4.00	138.00	552.00
<b>Associate II</b>	69.50	119.00	8,270.50
<b>Associate III</b>	7.00	114.00	798.00
<b>Assistant I</b>	4.00	101.00	404.00
<b>Administrative I</b>	0.50	74.00	37.00

Reimbursables

	Units	Rate	Billed Amount
<b>Mileage</b>			
<b>Crystal Esparza</b>	10.00	0.725	7.25
Phase subtotal			19,190.75

**2652-2026:02.01 SGMA IP Grant Administration**

Professional Fees

	Hours	Rate	Billed Amount
<b>Senior I</b>	5.00	170.00	850.00
<b>Associate II</b>	4.00	119.00	476.00
<b>Associate III</b>	0.50	114.00	57.00
<b>Assistant I</b>	5.00	101.00	505.00
Phase subtotal			1,888.00

**2652-2026:02.02 Urban Community Drought Relief Funding Administration**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	5.75	119.00	684.25



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority  
 Project 2652 Indian Wells Valley Groundwater Authority

Invoice number 2652-104  
 Date 04/22/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:02.03 EPA Resiliency Grant Administration**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	4.00	119.00	476.00

**2652-2026:04 Data Mgmt System Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor II</b>	2.00	197.00	394.00
<b>Senior III</b>	9.75	138.00	1,345.50

Phase subtotal 1,739.50

**2652-2026:05 General Project Mgmt**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	3.50	212.00	742.00
<b>Supervisor II</b>	20.50	197.00	4,038.50
<b>Senior I</b>	5.50	170.00	935.00
<b>Associate II</b>	7.00	119.00	833.00

Phase subtotal 6,548.50

**2652-2026:07.03 Resiliency Grant: Design**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	2.50	244.00	610.00
<b>Supervisor I</b>	6.00	212.00	1,272.00
<b>Associate II</b>	15.50	119.00	1,844.50

Phase subtotal 3,726.50

**2652-2026:07.04 Resiliency Grant: Environmental**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	2.50	212.00	530.00
<b>Associate II</b>	5.50	119.00	654.50

Phase subtotal 1,184.50

**2652-2026:08 Imported Water: Negotiations & Coordination**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	1.75	212.00	371.00
<b>Associate II</b>	1.00	119.00	119.00

Phase subtotal 490.00



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority  
 Project 2652 Indian Wells Valley Groundwater Authority

Invoice number 2652-104  
 Date 04/22/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:10 Stakeholder Coordination**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	0.75	212.00	159.00
<b>Associate II</b>	0.50	119.00	59.50
<b>Associate III</b>	1.00	114.00	114.00
Phase subtotal			332.50

**2652-2026:11 Data Collection, Monitoring & Data Gaps**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor II</b>	5.00	197.00	985.00
<b>Senior III</b>	4.00	138.00	552.00
<b>Senior Associate</b>	82.00	132.00	10,824.00

Reimbursables

	Units	Rate	Billed Amount
<b>Car Rental and Gas</b>			
<b>Stephan Bork</b>			70.01
			14.67
			862.04
Subtotal			946.72
Subtotal			946.72

**Lodging**

**Stephan Bork**

448.71

**Meals**

**Stephan Bork**

5.12

17.60

8.72

8.28

17.60

8.20

17.60

24.13

8.72

17.68

Subtotal 133.65

Subtotal 133.65

**Mileage**

**Stephan Bork**

11.00 0.725 7.98

11.00 0.725 7.98

Subtotal 15.96

Subtotal 15.96



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority  
 Project 2652 Indian Wells Valley Groundwater Authority

Invoice number 2652-104  
 Date 04/22/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:11 Data Collection, Monitoring & Data Gaps**

Reimbursables

	Units	Rate	Billed Amount
<b>Storage Fee</b>			
<b>Non Vendor Reimbursables</b>			105.60
Phase subtotal			14,011.64

**2652-2026:12 Shallow Well Consolidation Project**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	0.50	212.00	106.00
<b>Associate II</b>	12.25	119.00	1,457.75
Phase subtotal			1,563.75

**2652-2026:13 Planning Assistance to States: Army Corps Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	2.00	244.00	488.00
<b>Associate II</b>	3.00	119.00	357.00
Phase subtotal			845.00

**2652-2026:18 Navy/Coso Royalty Fund: FY21 Rose Valley MW Permitting, Bid Doc Support & Drilli**

Professional Fees

	Hours	Rate	Billed Amount
<b>Senior Associate</b>	3.00	132.00	396.00

**2652-2026:20 Shallow Well Mitigation Program: Outreach & Impacts Evaluation**

Professional Fees

	Hours	Rate	Billed Amount
<b>Assistant I</b>	0.50	101.00	50.50

**2652-2026:21 General Engineering**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	4.25	212.00	901.00
<b>Supervisor II</b>	13.50	197.00	2,659.50
<b>Associate II</b>	0.75	119.00	89.25
Phase subtotal			3,649.75

**2652-2026:23 Annual Report Preparation**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	6.25	212.00	1,325.00
<b>Supervisor II</b>	6.00	197.00	1,182.00



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority  
 Project 2652 Indian Wells Valley Groundwater Authority

Invoice number 2652-104  
 Date 04/22/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:23 Annual Report Preparation**

Professional Fees

	Hours	Rate	Billed Amount
<b>Senior I</b>	9.00	170.00	1,530.00
<b>Associate II</b>	6.50	119.00	773.50
<b>GIS Manager</b>	2.50	126.00	315.00
Phase subtotal			5,125.50

**2652-2026:26 Budget Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	11.50	119.00	1,368.50

**2652-2026:27 Litigation Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	25.00	244.00	6,100.00
<b>Supervisor I</b>	5.75	212.00	1,219.00
<b>Supervisor II</b>	59.50	197.00	11,721.50
<b>Senior I</b>	5.00	170.00	850.00
<b>Associate II</b>	59.00	119.00	7,021.00
<b>Associate III</b>	8.00	114.00	912.00
<b>GIS Manager</b>	5.25	126.00	661.50

Reimbursables

	Units	Rate	Billed Amount
<b>Reproduction (Color)</b>			
<b>Non Vendor Reimbursables</b>	618.00	0.89	550.02
<b>Reproduction (Black and White)</b>			
<b>Non Vendor Reimbursables</b>	699.00	0.15	104.85
Phase subtotal			29,139.87

Water Resources Management 2026 subtotal 92,411.01

Invoice total 92,411.01

*Thank you for your business!*

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**Stetson Engineers**

Indian Wells Valley Groundwater Authority  
 100 W. California Ave.  
 Ridgecrest, CA 93555

Invoice number 2652-103  
 Date 03/31/2026

Project **2652 Indian Wells Valley Groundwater Authority**

Professional services through 02/28/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:01 Meetings & Prep**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	6.50	244.00	1,586.00
<b>Supervisor I</b>	10.00	212.00	2,120.00
<b>Associate II</b>	27.50	119.00	3,272.50
<b>Assistant I</b>	1.00	101.00	101.00
Phase subtotal			7,079.50

**2652-2026:02.01 SGMA IP Grant Administration**

Professional Fees

	Hours	Rate	Billed Amount
<b>Senior I</b>	7.50	170.00	1,275.00
<b>Assistant I</b>	8.00	101.00	808.00
Phase subtotal			2,083.00

**2652-2026:02.02 Urban Community Drought Relief Funding Administration**

Professional Fees

	Hours	Rate	Billed Amount
<b>Senior I</b>	4.50	170.00	765.00
<b>Associate II</b>	2.75	119.00	327.25
<b>Assistant I</b>	2.00	101.00	202.00
Phase subtotal			1,294.25

**2652-2026:02.03 EPA Resiliency Grant Administration**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	22.50	119.00	2,677.50

**2652-2026:04 Data Mgmt System Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor II</b>	79.00	197.00	15,563.00
<b>Senior III</b>	2.50	138.00	345.00



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority  
 Project 2652 Indian Wells Valley Groundwater Authority

Invoice number 2652-103  
 Date 03/31/2026

**2652-2026 Water Resources Management 2026**

Phase subtotal 15,908.00

**2652-2026:07.03 Resiliency Grant: Design**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	2.50	244.00	610.00
<b>Supervisor I</b>	2.50	212.00	530.00
<b>Associate II</b>	15.25	119.00	1,814.75
Phase subtotal			2,954.75

**2652-2026:07.04 Resiliency Grant: Environmental**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	1.50	212.00	318.00
<b>Associate II</b>	7.50	119.00	892.50
Phase subtotal			1,210.50

**2652-2026:11 Data Collection, Monitoring & Data Gaps**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	0.50	212.00	106.00
<b>Senior Associate</b>	16.75	132.00	2,211.00
<b>Associate II</b>	1.50	119.00	178.50

Reimbursables

	Units	Rate	Billed Amount
<b>Other Expenses</b>			
<b>Non Vendor Reimbursables</b>			105.60
Phase subtotal			2,601.10

**2652-2026:12 Shallow Well Consolidation Project**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	1.50	244.00	366.00
<b>Supervisor I</b>	0.25	212.00	53.00
<b>Associate II</b>	13.50	119.00	1,606.50
Phase subtotal			2,025.50

**2652-2026:13 Planning Assistance to States: Army Corps Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	5.00	119.00	595.00



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority

Project 2652 Indian Wells Valley Groundwater Authority

Invoice number 2652-103

Date 03/31/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:14 Production Reporting, Transient Pool & Fee Support**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	0.75	119.00	89.25

**2652-2026:18 Navy/Coso Royalty Fund: FY21 Rose Valley MW Permitting, Bid Doc Support & Drilli**

Professional Fees

	Hours	Rate	Billed Amount
<b>Senior Associate</b>	0.50	132.00	66.00

**2652-2026:18.1 Navy/Coso Cooperative Agreement**

Professional Fees

	Hours	Rate	Billed Amount
<b>Associate II</b>	2.25	119.00	267.75

**2652-2026:21 General Engineering**

Professional Fees

	Hours	Rate	Billed Amount
<b>Supervisor I</b>	0.75	212.00	159.00
<b>Supervisor II</b>	4.00	197.00	788.00
<b>Associate II</b>	1.50	119.00	178.50
<b>GIS Manager</b>	1.50	126.00	189.00

Phase subtotal 1,314.50

**2652-2026:22 GSP 5-Year Update**

Professional Fees

	Hours	Rate	Billed Amount
<b>Principal</b>	2.50	244.00	610.00
<b>Supervisor I</b>	1.00	212.00	212.00
<b>Senior I</b>	1.00	170.00	170.00
<b>Associate II</b>	1.75	119.00	208.25

Phase subtotal 1,200.25

**2652-2026:23 Annual Report Preparation**

Professional Fees

	Hours	Rate	Billed Amount
<b>Special Project Director</b>	3.50	244.00	854.00
<b>Supervisor I</b>	0.25	212.00	53.00
<b>Supervisor II</b>	16.00	197.00	3,152.00
<b>Senior I</b>	25.50	170.00	4,335.00
<b>Associate II</b>	24.25	119.00	2,885.75
<b>GIS Manager</b>	1.50	126.00	189.00

Phase subtotal 11,468.75



**STETSON**  
ENGINEERS INC.

Indian Wells Valley Groundwater Authority

Project **2652 Indian Wells Valley Groundwater Authority**

2171 E. Francisco Blvd., Suite K • San Rafael, California 94901

Phone: (415) 457-0701 • Fax: (415) 457-1638 • Website: [www.stetsonengineers.com](http://www.stetsonengineers.com)

Northern California

• Southern California

• Arizona

• Oregon

Invoice number 2652-103

Date 03/31/2026

**2652-2026 Water Resources Management 2026**

**2652-2026:26 Budget Support**

Professional Fees

**Associate II**

Hours	Rate	Billed Amount
15.75	119.00	1,874.25

**2652-2026:27 Litigation Support**

Professional Fees

**Principal**

Hours	Rate	Billed Amount
23.00	244.00	5,612.00

**Special Project Director**

35.50	244.00	8,662.00
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**Supervisor I**

14.75	212.00	3,127.00
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**Supervisor II**

53.00	197.00	10,441.00
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**Senior I**

1.50	170.00	255.00
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**Senior III**

1.25	138.00	172.50
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**Associate II**

32.50	119.00	3,867.50
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**Associate III**

18.50	114.00	2,109.00
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Reimbursables

**Reproduction (Color)**

Units	Rate	Billed Amount
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**Non Vendor Reimbursables**

347.00	0.89	308.83
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**Reproduction (Black and White)**

**Non Vendor Reimbursables**

121.00	0.15	18.15
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Phase subtotal

34,572.98

Water Resources Management 2026 subtotal

89,282.83

Invoice total **89,282.83**

*Thank you for your business!*

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# Invoice

PO Box 1350  
 Carmel Valley, CA 93924

Date	Invoice #
2/28/2026	19099

Bill To:
Indian Wells Valley Groundwater Authority 100 W California Ave Ridgecrest, CA 93555

P.O. No.	Inv Sent
	3/27/2026

Date	Description	Amount
2/28/2026	Reimbursable Expenses for City of Ridegecrest Monthly Rent and Buraglio (\$300+\$988.40+ \$625.90) - please see attached	1,914.30

Invoice is due 30 days from Inv Sent date	<b>Total \$1,914.30</b>
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**INVOICE**

Regional Government Services  
PO Box 1350  
Carmel Valley, CA 93924  
AR@rgs.ca.gov  
(650) 587-7300 x2



Indian Wells Valley Groundwater Authority  
April Keigwin  
akeigwin@rgs.ca.gov

February 28, 2026  
Invoice No: 20894  
**Total This Invoice \$37,120.60**

Project 04014.C210200000-40 Indian Wells Valley GA -Professional Employer Services  
**Professional Services from February 01, 2026 to February 28, 2026**

Phase IWVGA General Administration  
**Professional Personnel**

	Hours	Rate	Amount	
PES Agency Chief Executive	.50	150.00	75.00	
Senior Advisor	80.20	150.00	12,030.00	
Technical Specialist IWVGA	61.50	116.00	7,134.00	
Totals	142.20		19,239.00	
<b>Total Labor</b>				<b>19,239.00</b>

**Additional Fees**

Technology Fee			600.00	
<b>Total Additional Fees</b>			<b>600.00</b>	<b>600.00</b>
<b>Total this Phase</b>				<b>\$19,839.00</b>

Phase IWVGA Finance  
**Professional Personnel**

	Hours	Rate	Amount	
Strategic Services Consultant	1.40	176.00	246.40	
Senior Advisor	75.10	150.00	10,594.00	
Senior Finance Manager	44.50	140.00	6,230.00	
Totals	121.00		17,070.40	
<b>Total Labor</b>				<b>17,070.40</b>
<b>Total this Phase</b>				<b>\$17,070.40</b>

Phase IWVGA MIP  
**Professional Personnel**

	Hours	Rate	Amount	
Strategic Services Consultant	1.20	176.00	211.20	
Totals	1.20		211.20	
<b>Total Labor</b>				<b>211.20</b>
<b>Total this Phase</b>				<b>\$211.20</b>
<b>Total this Invoice</b>				<b><u><u>\$37,120.60</u></u></b>

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# Invoice

PO Box 1350  
 Carmel Valley, CA 93924

Date	Invoice #
1/31/2026	19083

Bill To:
Indian Wells Valley Groundwater Authority 100 W California Ave Ridgecrest, CA 93555

P.O. No.	Inv Sent
	3/9/2026

Date	Description	Amount
1/31/2026	Reimbursable Expenses for City of Ridegecrest Monthly Rent and Buraglio (\$300+\$60+\$276) - please see attached	636.00

Invoice is due 30 days from Inv Sent date	<b>Total</b> <b>\$636.00</b>
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**INVOICE**

Regional Government Services  
PO Box 1350  
Carmel Valley, CA 93924  
AR@rgs.ca.gov  
(650) 587-7300 x2



Indian Wells Valley Groundwater Authority  
April Keigwin  
akeigwin@rgs.ca.gov

March 31, 2026  
Invoice No: 21090  
**Total This Invoice \$43,987.40**

Project 04014.C210200000-40 Indian Wells Valley GA -Professional Employer Services  
**Professional Services from March 01, 2026 to March 31, 2026**

Phase IWVGA General Administration  
**Professional Personnel**

	<b>Hours</b>	<b>Rate</b>	<b>Amount</b>	
Senior Advisor	173.40	150.00	26,010.00	
Totals	173.40		26,010.00	
<b>Total Labor</b>				<b>26,010.00</b>

**Additional Fees**

Technology Fee			600.00	
<b>Total Additional Fees</b>			<b>600.00</b>	<b>600.00</b>
				<b>Total this Phase \$26,610.00</b>

Phase IWVGA Finance  
**Professional Personnel**

	<b>Hours</b>	<b>Rate</b>	<b>Amount</b>	
Strategic Services Consultant	.40	176.00	70.40	
Senior Advisor	82.80	150.00	11,702.00	
Senior Finance Manager	39.50	140.00	5,530.00	
Totals	122.70		17,302.40	
<b>Total Labor</b>				<b>17,302.40</b>
				<b>Total this Phase \$17,302.40</b>

Phase IWVGA Website  
**Professional Personnel**

	<b>Hours</b>	<b>Rate</b>	<b>Amount</b>	
Senior Advisor	.50	150.00	75.00	
Totals	.50		75.00	
<b>Total Labor</b>				<b>75.00</b>
				<b>Total this Phase \$75.00</b>
				<b>Total this Invoice \$43,987.40</b>

**Total this Project**                      **\$43,987.40**

**Total this Report**                      **\$43,987.40**

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# Invoice

PO Box 1350  
Carmel Valley, CA 93924

Date	Invoice #
3/3/31/2026	1911515

Bill To:
Indian Wells Valley Groundwater Authority 100 W California Ave Ridgecrest, CA 93555

P.O. No.	Inv Sent
	4 4/22/20266

Date	Description	Amount
33/31/2026	Reimbursable Expenses for City of Ridegecrest Monthly Rent and Keigwin((\$300+\$994.31) - please see attached	1,1,294.31.31

Invoice is due 30 days from Inv Sent date	<b>Total \$1,294.31</b>
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# City of Ridgecrest

100 West California Avenue

Ridgecrest, CA 93555

Phone (760) 499-5062 Fax (760) 499-1500

[www.ridgecrest-ca.gov](http://www.ridgecrest-ca.gov)

TO: IWV Groundwater Authority

Invoice Date: 2/11/2026

Re: Invoices Nov - Dec 2025

Description	Unit Price	Total Price
Contractor Invoice		
Nov-25		\$ 27,103.70
Dec-25		\$ 42,622.60
City Council Chambers		
Nov-25		\$ 182.00
Dec-25		\$ 182.00
<b>Total Amount Due</b>		<b>\$ 70,090.30</b>

Received by: \_\_\_\_\_

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

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Please make payable to:

City of Ridgecrest

Mail to:

City of Ridgecrest

ATTN: Ricca Charlon

100 W. California Ave.

Ridgecrest, CA 93555

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**Capitol Core Group**  
 205 Cartwheel Bend (Operations Dept.)  
 Austin, TX 78738 US  
 +15125683084  
 operations@capitolcore.com  
 www.capitolcore.com

**BILL TO**

Indian Wells Valley Groundwater  
 Authority  
 500 West Ridgecrest Blvd.  
 Ridgecrest, California 93555  
 USA

**INVOICE 2026-037**

**DATE** 05/01/2026 **TERMS** Net 45

**DUE DATE** 06/15/2026

**VENDOR ID**  
19553

**INVOICE PERIOD**  
April 2026

DATE	ACCOUNT SUMMARY	AMOUNT
04/03/2026	Balance Forward	26,781.25
	Other payments and credits after 04/03/2026 through 04/30/2026	-11,056.25
05/01/2026	Other invoices from this date	0.00
	New charges (details below)	12,937.50
	Total Amount Due	28,662.50

ACTIVITY	HOURS	RATE	AMOUNT
<b>Charges</b>			
PROJECT 1; IMPORTED WATER SUPPLIES			
P1-A: Negotiations			
<b>Government Relations: Intergovernmental Affairs</b>	4	275.00	1,100.00
A: Pumping Rights Purchase (internal discussions, review with counsel) {McKinney}			
P1-B: Other Required Agreements			
<b>Government Relations: Intergovernmental Affairs</b>	1.50	275.00	412.50
B: AVEK agreement and meeting requirements (internal discussions) {McKinney}			
P1-C: Regulatory Approvals			
P1-D: 2026 Water Marketesing			
<b>Government Relations: Intergovernmental Affairs</b>	7.50	275.00	2,062.50
D: Freemont Valley seller discussion {Tatum}			
<b>Government Relations: Intergovernmental Affairs</b>	5	275.00	1,375.00
D: Internal Discussion over land purchase/pumping rights deal {Tatum}			
<b>Government Relations: Intergovernmental Affairs</b>	1.75	250.00	437.50
D: Staff Calls {Simonetti}			
INVOICE TOTAL PROJECT 1: \$5,387.50			
PROJECT 2: WATER REPLENISHMENT PIPELINE			
P2-A: FY 2027 Energy and Water Development Act			

ACTIVITY	HOURS	RATE	AMOUNT
<b>Government Relations:Federal</b> A: FY2027 E&WD Direct Advocacy -- House and Senate {McKinney}	7	275.00	1,925.00
<b>Government Relations:Federal</b> A: Direct Advocacy -- FY2027 E&WD Senate {Simonetti}	4	250.00	1,000.00
P2-B: Other State/Federal Requirements			
<b>Government Relations:Federal</b> B: Federal Discussion (internal) {Simonetti}	1.25	250.00	312.50
P2-C: Regulatory Support (Pipeline)			
P2-D: USACE Transition			
<b>Government Relations:Federal</b> D: USACE Transition and Future funding plan {McKinney}	2.50	175.00	437.50
INVOICE TOTAL PROJECT 2: \$3,675.00			
PROJECT 3: OTHER PROJECTS SUPPORTING THE GSP			
P3-A: Well Mitigation			
P3-B: Land Repurposing			
P3-C: Other Infrastructure Requirements			
P3-D: Groundwater Adjudication Legislation			
<b>Government Relations:California</b> D: Direct Advocacy -- AB 1413, Senate Leadership, Senate Staff, and Assembly Committee, Chair Papn {McKinney}	4.50	275.00	1,237.50
<b>Government Relations:California</b> D: Direct Advocacy -- Meeting with Committee {Peterson}	2	250.00	500.00
P3-E: General Governmental Affairs			
<b>Government Relations:California</b> E: Review and analysis of CA Legislation and State Budget {McKinney}	3	275.00	825.00
<b>Government Relations:California</b> E: State Legislative Affairs (various bills) -- both Chambers {Simonetti}	3.25	250.00	812.50
<b>Government Relations:California</b> E: State Legislative Affairs (various bills) -- both Chamber {Peterson}	2	250.00	500.00
INVOICE TOTAL PROJECT 3: \$3,875.00			
PROJECT ADMINISTRATION			
PA-A: Monthly Meetings			
PA-B: Ad-Hoc Reports			
PA-C: Milestone Reports			
PA-D: Communications Review			
INVOICE TOTAL PROJECT ADMINISTRATION: \$0.00			
*****			
Federal Reporting for Invoice: \$3,675.00			
State Reporting for Invoice: \$3,875.00			
*****			

On behalf of the entire Capitol Core Group Team, thank you so much for being our client.

SUBTOTAL	12,937.50
TAX	0.00

[View and pay](#)

TOTAL	12,937.50
TOTAL OF NEW CHARGES	12,937.50

<b>TOTAL DUE</b>	<b>\$28,662.50</b>
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# INVOICE

2423 Sebald Ave  
 Redondo Beach, CA 90278  
 Phone 310.993.9555

**DATE:** March 31, 2026  
**INVOICE #** IWVGA 06  
**FOR:** Imported Water Project

CLSB 982332 - A & B

**Bill To:**  
**IWVGA**  
 100 W. California Avenue  
 Ridgecrest, California 93555

**Attn: April Keigwin, Agency Executive**

DESCRIPTION	DURATION	RATE	AMOUNT
<b>IMPORTED WATER PROJECT PROGRAM MANAGEMENT</b>			
3/2/26 IWVGA Staff Meeting, Ad Hoc Committee Meetina	3.0	\$ 275.00	\$825.00
3/3/26 Stetson Project Coordination Meeting	1.0	\$ 275.00	\$275.00
3/4/26 Pipeline Review Meeting, IWVGA Staff Meetina, SCE Coordination Meetina	3.0	\$ 275.00	\$825.00
3/5/26 Project Planning Meeting	2.0	\$ 275.00	\$550.00
3/6/26 P&P Organization Meetings, Program Plannina	5.0	\$ 275.00	\$1,375.00
3/9/26 IWVGA Staff Meeting	1.0	\$ 275.00	\$275.00
3/10/26 Weekly Coordination Meeting & Project Plannina	1.0	\$ 275.00	\$275.00
3/11/26 Project USACE / BLM Letter Preparation	2.0	\$ 275.00	\$550.00
3/12/26 AVEK Term Sheet Planning	2.0	\$ 275.00	\$550.00
3/13/26 P&P Organization Meetings, Program Plannina	4.0	\$ 275.00	\$1,100.00
3/16/26 IWVGA Staff Meeting	1.0	\$ 275.00	\$275.00
3/17/26 Project Development Team Planning	3.0	\$ 275.00	\$825.00
3/18/26 Project Development Team Planning	3.0	\$ 275.00	\$825.00
3/19/26 AVEK Term Sheet Planning	1.0	\$ 275.00	\$275.00
3/20/26 Program Planning, P&P Organization Meetina	3.0	\$ 275.00	\$825.00
3/23/26 IWVGA Staff Meeting, Environmental Plannina Meetina, AVEK / BLM Meetina	4.0	\$ 275.00	\$1,100.00
3/24/26 Weekly Coordination, BLM Meeting, AVEK Meetina	3.0	\$ 275.00	\$825.00
3/30/26 IWVGA Staff Meeting, Environmental Planning Meeting, AVEK Term Sheet Plannina	4.0	\$ 275.00	\$1,100.00
3/31/26 Weekly Coordination Meeting & Project Plannina	2.0	\$ 275.00	\$550.00
<b>TOTAL HOURS</b>	<b>48.0</b>		

See enclosed task detail for the work effort for the month of March 2026

**AMOUNT BILLED THIS INVOICE** \$ **13,200.00**

**CONTRACT SUMMARY:**

DESCRIPTION OF SERVICES	CONTRACT AMOUNT	AMOUNT BILLED THROUGH THIS BILLING CYCLE	% COMPLETE THROUGH THIS BILLING CYCLE	AMOUNT BILLED THIS INVOICE
TASK 1 - PROGRAM MANAGEMENT SERVICES	\$ 220,000.00	\$ 65,724.50	29.9%	\$ 13,200.00

**TOTAL:** \$ 220,000.00 \$ 65,724.50 29.9%

**INVOICE PAYMENTS PAST DUE OVER 30 DAYS:**

Make all checks payable to **Blue Mountain Development, Inc.**  
 If you have any questions concerning this invoice, contact Nick Biro at 310-993-9555

**THANK YOU FOR YOUR BUSINESS!**

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2423 Sebald Ave  
 Redondo Beach, CA 90278  
 Phone 310.993.9555

# INVOICE

**DATE:** April 30, 2026  
**INVOICE #** IWVGA 07  
**FOR:** Imported Water Project

CLSB 982332 - A & B

**Bill To:**  
**IWVGA**  
 100 W. California Avenue  
 Ridgecrest, California 93555

**Attn: April Keigwin, Agency Executive**

DESCRIPTION	DURATION	RATE	AMOUNT
<b>IMPORTED WATER PROJECT PROGRAM MANAGEMENT</b>			
4/1/26 IWVGA Staff Meeting, AVEK Planning Meeting	2.0	\$ 275.00	\$550.00
4/2/26 Engineering Contract Planning Meeting	1.0	\$ 275.00	\$275.00
4/3/26 Project Planning	1.0	\$ 275.00	\$275.00
4/6/26 IWVGA Staff Meeting	1.0	\$ 275.00	\$275.00
4/7/26 Weekly Coordination, GIS Project Planning, Engineering Plann	3.0	\$ 275.00	\$825.00
4/8/26 IWVGA Ad Hoc Meeting, AVEK Term Letter Preparation, USAC	3.0	\$ 275.00	\$825.00
4/9/26 Project Planning	2.0	\$ 275.00	\$550.00
4/10/26 USACE Coordination Meeting, AVEK Coordination Meeting,	6.0	\$ 275.00	\$1,650.00
4/13/26 IWVGA Staff Meeting, Project Planning	3.0	\$ 275.00	\$825.00
4/14/26 Weekly Coordination, Internal Planning Meeting	3.0	\$ 275.00	\$825.00
4/15/26 SCE Coordination Meeting	1.0	\$ 275.00	\$275.00
4/16/26 USACE Planning	1.5	\$ 275.00	\$412.50
4/17/26 Site Review & P&P Project Planning	6.0	\$ 275.00	\$1,650.00
4/20/26 IWVGA Staff Meeting	1.0	\$ 275.00	\$275.00
4/21/26 Weekly Meeting, Project Planning, Project Notes	1.0	\$ 275.00	\$275.00
4/23/26 Project Development Team Meeting	2.0	\$ 275.00	\$550.00
4/24/26 AVEK Connection Meeting	1.0	\$ 275.00	\$275.00
4/27/26 IWVGA Staff Meeting	1.0	\$ 275.00	\$275.00
4/28/26 Weekly Meeting, Navy Engagement Planning	3.0	\$ 275.00	\$825.00
4/29/26 Environmental Surveys Planning Meeting, SCE Planning Review, Budaet Review	3.0	\$ 275.00	\$825.00
4/30/26 BLM Coordination Meeting & Preparation	3.5	\$ 275.00	\$962.50
<b>TOTAL HOURS</b>	<b>49.0</b>		

See enclosed task detail for the work effort for the month of April 2026

**AMOUNT BILLED THIS INVOICE \$ 13,475.00**

**CONTRACT SUMMARY:**

DESCRIPTION OF SERVICES	CONTRACT AMOUNT	AMOUNT BILLED THROUGH THIS BILLING CYCLE	% COMPLETE THROUGH THIS BILLING CYCLE	AMOUNT BILLED THIS INVOICE
TASK 1 - PROGRAM MANAGEMENT SERVICES	\$ 220,000.00	\$ 79,474.50	36.1%	\$ 13,475.00

**TOTAL: \$ 220,000.00 \$ 79,474.50 36.1%**

**INVOICE PAYMENTS PAST DUE OVER 30 DAYS:**

Make all checks payable to **Blue Mountain Development, Inc.**  
 If you have any questions concerning this invoice, contact Nick Biro at 310-993-9555

**THANK YOU FOR YOUR BUSINESS!**

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Indian Wells Valley Water District  
PO Box 1329  
Ridgecrest, CA 93556-1329



**INVOICE DATE**

07/15/2025

**DUE DATE**

08/14/2025

**INVOICE NUMBER**

1276

Indian Wells Valley Groundwater Authority  
100 W. California Avenue  
Ridgecrest, CA  
93555

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1541 S. Rademacher Meter Set Fees

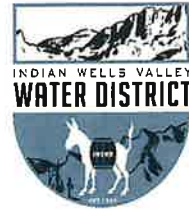
Capital Facility Fee	\$	5,068.00
Meter Fee	\$	382.00
Service Lateral Fee	\$	235.04
<b>Total Due</b>	<b>\$</b>	<b>5,685.04</b>

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**Please make checks payable to Indian Wells Valley Water District and include the invoice number.  
For questions concerning this invoice, contact Renee Morquecho at (760) 384-5520.**

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Indian Wells Valley Water District  
PO Box 1329  
Ridgecrest, CA 93556-1329



**INVOICE DATE**

03/09/2026

**DUE DATE**

05/08/2026

**INVOICE NUMBER**

1291

Indian Wells Valley Groundwater Authority  
100 W. California Avenue  
Ridgecrest, CA  
93555

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Rademacher Way Pipeline Project - February Expenses

Krieger & Stewart \$ 2,198.75

**Total Due \$ 2,198.75**

---

Please make checks payable to Indian Wells Valley Water District and include the invoice number.  
For questions concerning this invoice, contact Renee Morquecho at (760) 384-5520.

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Indian Wells Valley Water District  
PO Box 1329  
Ridgecrest, CA 93556-1329



**INVOICE DATE**  
04/28/2026

**DUE DATE**  
06/27/2026

**INVOICE NUMBER**  
1292

Indian Wells Valley Groundwater Authority  
100 W. California Avenue  
Ridgecrest, CA  
93555

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Rademacher Way Pipeline Project - March Expenses

Krieger & Stewart \$ 1,041.00

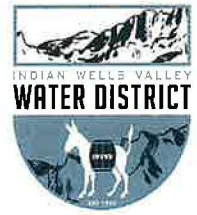
**Total Due \$ 1,041.00**

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**Please make checks payable to Indian Wells Valley Water District and include the invoice number.  
For questions concerning this invoice, contact Renee Morquecho at (760) 384-5520.**

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Indian Wells Valley Water District  
PO Box 1329  
Ridgecrest, CA 93556-1329



**INVOICE DATE**

04/28/2026

**DUE DATE**

06/27/2026

**INVOICE NUMBER**

1293

Indian Wells Valley Groundwater Authority  
100 W. California Avenue  
Ridgecrest, CA  
93555

---

Stark Street Consolidation - March Expenses

Krieger & Stewart	\$	815.75
McMurtrey, Hartsock, Worth, & St. Lawrence	\$	264.00

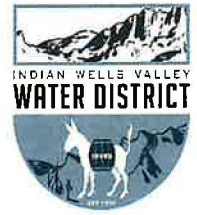
**Total Due \$ 1,079.75**

---

Please make checks payable to Indian Wells Valley Water District and include the invoice number.  
For questions concerning this invoice, contact Renee Morquecho at (760) 384-5520.

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Indian Wells Valley Water District  
PO Box 1329  
Ridgecrest, CA 93556-1329



**INVOICE DATE**

04/28/2026

**DUE DATE**

06/27/2026

**INVOICE NUMBER**

1294

Indian Wells Valley Groundwater Authority  
100 W. California Avenue  
Ridgecrest, CA  
93555

---

**Stark Street Consolidation - April Expenses**

Krieger & Stewart	\$ 13,891.15
McMurtrey, Hartsock, Worth, & St. Lawrence	\$ 50.00
McMurtrey, Hartsock, Worth, & St. Lawrence	\$ 968.00

**Total Due \$ 14,909.15**

---

**Please make checks payable to Indian Wells Valley Water District and include the invoice number.  
For questions concerning this invoice, contact Renee Morquecho at (760) 384-5520.**

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**Westbound Communications, Inc.**  
3649 Mission Inn Ave., First Floor Rotunda  
Riverside, CA 92501 US  
951-462-1106  
tmoran@westboundcommunications.com  
www.westboundcommunications.com



**BILL TO**

April Keigwin  
Indian Wells Valley Groundwater Authority  
100 W California Ave  
Ridgecrest, CA 93555

**INVOICE 6036**

**DATE 03/27/2026 TERMS Net 30**

**DUE DATE 04/26/2026**

**P.O. NUMBER**

February 2026

DESCRIPTION	QTY	RATE	AMOUNT
Professional fees for public relations counsel and services in support of Indian Wells Valley Groundwater Authority. Period of Service: February 2026	46.50	240.00	11,160.00
			Subtotal: 11,160.00
Reimbursable expenses for the billing period:			
Technology Access Fee	1	395.00	395.00
			Subtotal: 395.00
Weekend travel: To City of Ridgecrest for Economic Conference on February 26, 2026 (286.00 miles)			207.35
021326 Maven's Notebook target media outlet monthly subscription ref# 8602503208 (02/01/26 - 02/28/26)			10.00
			Subtotal: 217.35
012926 Registration for Ridgecrest Chamber Economic Forum			500.00
022626 PIP Printing for Economic Forum boards			120.98
			Subtotal: 620.98
Markup @ 15%			93.15

**TOTAL DUE**

**\$12,486.48**

We appreciate your business and look forward to helping you again soon.

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Riverside, CA 92501 US  
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tmoran@westboundcommunications.com  
www.westboundcommunications.com



**BILL TO**

April Keigwin  
Indian Wells Valley Groundwater  
Authority  
100 W California Ave  
Ridgecrest, CA 93555

**INVOICE 6057**

**DATE 04/16/2026 TERMS Net 30**

**DUE DATE 05/16/2026**

**P.O. NUMBER**

March 2026

DESCRIPTION	QTY	RATE	AMOUNT
Professional fees for public relations counsel and services in support of Indian Wells Valley Groundwater Authority. Period of Service: March 2026	41	240.00	9,840.00
			Subtotal: 9,840.00
Reimbursable expenses for the billing period:			
Technology Access Fee	1	395.00	395.00
			Subtotal: 395.00
021126 Ridgecrest Chamber of Commerce: Invoice #1009653 IWV Economic Outlook Conference for Allie.			175.00
022626 Hampton Inns (02/25/26- 02/26/26) Chris's hotel for economic conference			393.05
February- IWVGA presentation board design for Indian Wells Economic Outlook Conference			560.00
030826 Maven's Notebook target media outlet monthly subscription ref# 4958422180 (03/01/26 - 03/31/26)			10.00
			Subtotal: 1,138.05
Markup @ 15%			170.71

**TOTAL DUE**

**\$11,543.76**

We appreciate your business and look forward to helping you again soon.

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**Nigro & Nigro PC**

PO Box 1247  
Murrieta, CA 92564  
(951) 698-8783

**INVOICE**

BILL TO  
Indian Wells Valley Groundwater Authority

INVOICE 23771  
DATE 03/17/2026

DESCRIPTION	AMOUNT
Final Audit Work - December 31, 2024	18,500.00

It's been a pleasure working with you!

BALANCE DUE

**\$18,500.00**

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**Check Payment Information:**

GFT Infrastructure, Inc.  
PO Box 829160, Philadelphia, PA 19182-9160 Federal EIN: 25-1613591

**ACH/EFT Payment Information:**

Account Name: GFT Infrastructure, Inc.  
ABA: 031312738 Account No.: 5003165655 Wire Routing No.: 043000096  
SWIFT: PNCCUS33 (required for international payments)

Send Remit Info: AccountsReivable@gftinc.com  
Send Audit Inquiries: GovtContractAudit@gftinc.com  
All Other Inquires Contact the Project Team

Indian Wells Valley Groundwater Authority  
April Keigwin  
100 W California Ave.  
Ridgecrest, CA 93555

March 30, 2026  
Invoice No: A0230025.601 -  
000005004368  
  
Due Date: April 29, 2026

Project A0230025.601 IWV-Imported Water Pipeline Acq

**Professional Services from January 01, 2026 to January 31, 2026**

**Professional Personnel**

	<b>Hours</b>	<b>Rate</b>	<b>Amount</b>
Cook, Victoria	3.75	250.00	937.50
Guinaldo, Roy	7.00	165.00	1,155.00
Quick, Katie	2.00	135.00	270.00
Totals	12.75		2,362.50
<b>Total Labor</b>			<b>2,362.50</b>

**Amount Due This Bill** 2,362.50

**Outstanding Invoices**

<b>Number</b>	<b>Date</b>	<b>Balance</b>
000005002820	3/5/2026	1,611.00
<b>Total</b>		<b>1,611.00</b>

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**Check Payment Information:**

GFT Infrastructure, Inc.  
PO Box 829160, Philadelphia, PA 19182-9160 Federal EIN: 25-1613591

**ACH/EFT Payment Information:**

Account Name: GFT Infrastructure, Inc.  
ABA: 031312738 Account No.: 5003165655 Wire Routing No.: 043000096  
SWIFT: PNCCUS33 (required for international payments)

Send Remit Info: AccountsReivable@gftinc.com  
Send Audit Inquiries: GovtContractAudit@gftinc.com  
All Other Inquires Contact the Project Team

Indian Wells Valley Groundwater Authority  
April Keigwin  
100 W California Ave.  
Ridgecrest, CA 93555

April 28, 2026  
Invoice No: 5006220  
Due Date: May 28, 2026

Project A0230025.601 IWV-Imported Water Pipeline Acq  
**Professional Services from February 01, 2026 to March 31, 2026**

**Professional Personnel**

	Hours	Rate	Amount
Cook, Victoria	5.00	250.00	1,250.00
Guinaldo, Roy	6.25	165.00	1,031.25
Kinnett, William	13.50	150.00	2,025.00
Totals	24.75		4,306.25
<b>Total Labor</b>			<b>4,306.25</b>

**Amount Due This Bill** 4,306.25

**Outstanding Invoices**

Number	Date	Balance
5002820	3/5/2026	1,611.00
5004368	3/30/2026	2,362.50
<b>Total</b>		<b>3,973.50</b>

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IWVGA ADMINISTRATIVE OFFICE  
*STAFF REPORT*

---

**TO:** IWVGA Board Members **DATE:** May 13, 2026  
**FROM:** IWVGA Staff  
**SUBJECT:** **Agenda Item 10 – Allocation of Shallow Well Mitigation Program Funds for Rademacher Consolidation Project**

**BACKGROUND**

The Indian Wells Valley Groundwater Authority (IWVGA) has been awarded a \$3.3 million grant from the California Department of Water Resources’ Urban Community Drought Relief Grant (UCDRG) Program to implement a Shallow Well Consolidation Project. The UCDRG Program is intended to address impacts to basin water supplies for the benefit of human health and safety. The \$3.3 million grant can be used for planning, designing, and constructing projects to consolidate shallow wells that may be impacted by declining groundwater levels into the Indian Wells Valley Water District’s (IWVWD) water distribution system.

**DISCUSSION**

The consolidation of the Desert Sands Mutual Water Company on Rademacher Way was the first Shallow Well Consolidation Project to be implemented using the grant funds.

This consolidation was broken into two phases. The first phase planned to consolidate the two properties from the Desert Sands Mutual Water Company on Rademacher Way which were experiencing poor groundwater quality due to historical excessive pumping. There were five residences connected to the Desert Sands Mutual Water Company well. Two residences, Jones and Wise, are already connected to the Indian Wells Valley Water District (IWVWD), one residence (Smith) is using a neighbor’s well, another residence (Bassett) was hauling water, and the Sanchez family was the only family actively using the well in their home. Locations of the homes are referenced in the attached Figure. In August 2025, Phase one was completed and the Bassett and Sanchez properties were successfully hooked up to the IWVWD.

The second phase will connect the remaining residence (Smith) on the Desert Sands Mutual Water Company well on Gordon Street. The second phase will also connect any additional residents on Rademacher Way and Gordon Street that would like to consolidate. The second phase also loops the pipeline back to the Springer Avenue pipeline, which will prevent stagnation of water and provide better hydraulic performance for the new pipelines.

The UCDRG grant funds will not cover any work done on private property, which includes meter-to-house connections to hook up residents to the main pipeline in Phase 2 of the Rademacher Consolidation Project. To date, one additional house (Smith) that has been identified to hook up to the pipeline. However, there are an additional 9 parcels along Rademacher Way and Gordon Street that could potentially tie into the completed pipeline.

In recent years, the Shallow Well Mitigation Program (SWMP) funds have been largely unused, with only three (3) approved applications received since the start of the program and two (2) approved reimbursement requests. Currently, the SWMP has one pending application, received in January 2025, that has yet to be finalized by the applicant.

As consolidation projects fall under the SWMP, SWMP funds may be used to cover the meter-to-house installation costs for the Rademacher Consolidation Project that are not eligible for grant funding. Staff will evaluate independent plumbing contractors to complete the meter-to-house service connections on behalf of the IWVGA and return to the Board for approval for a reimbursement agreement. Staff have additionally been developing the Stark Street Consolidation Project, with a Reimbursement Agreement with the IWVWD to design the project approved in February 2026. As the Stark Street Consolidation Project progresses, staff will return to the Board to approve additional SWMP funds under that project.

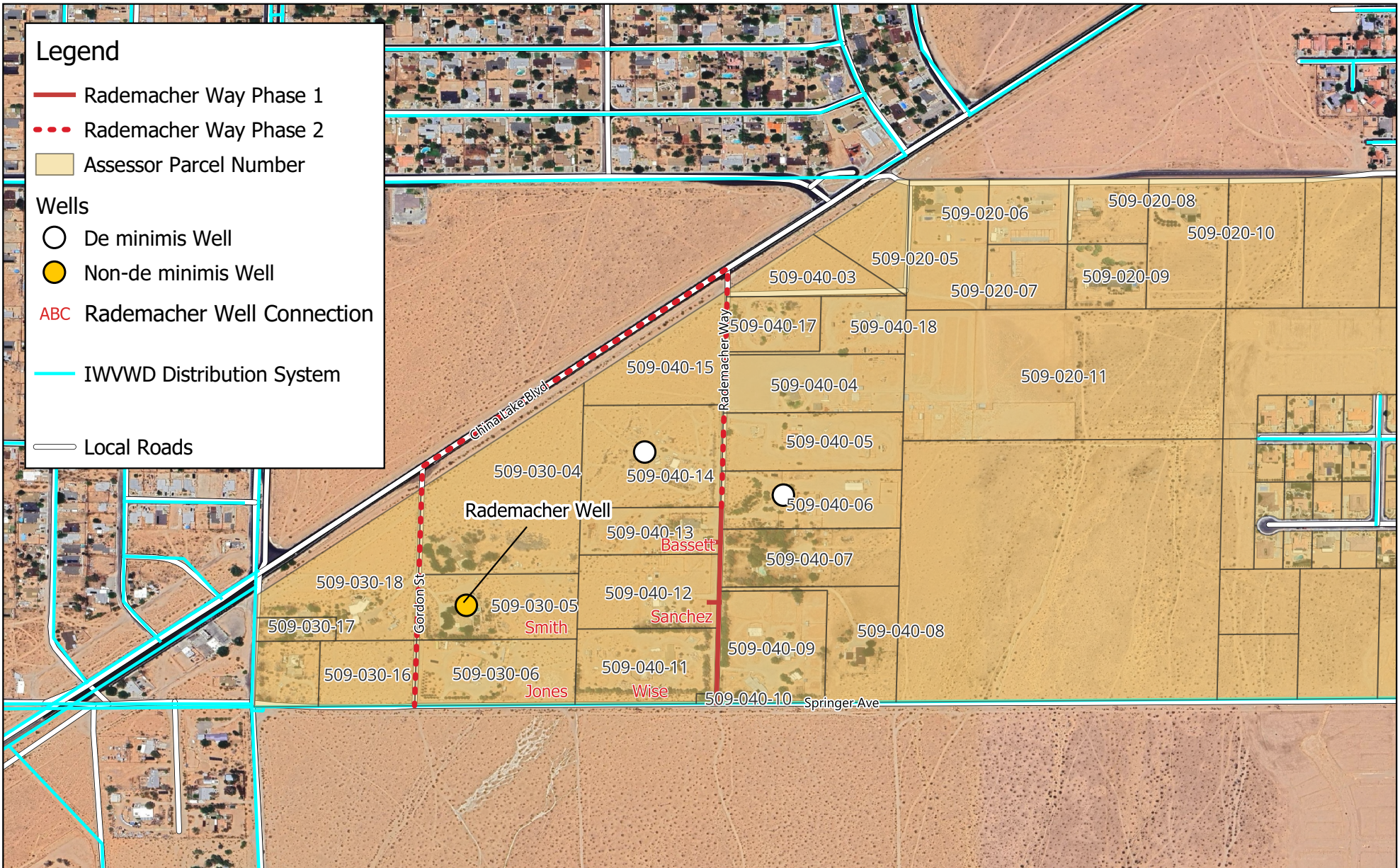
### **FISCAL IMPACT**

The costs associated with installing meter-to-house connections for the Rademacher Consolidation Project will be funded by the SWMP. Sufficient funding is available under the SWMP, with an annual budget of \$115,000 for CY 2026 and approximately \$200 currently expended through March. The estimated average cost to install meter-to-house connections is approximately \$1,500 per property. Assuming all 10 properties connect to the pipeline, it is estimated that total cost of meter-to-house connections is \$15,000.

### **RECOMMENDED ACTION**

Staff recommend that the Board approve allocating \$15,000 of SWMP funds to the Rademacher Consolidation Project to fund meter-to-house connections that are not eligible for funding by the current UCDRG Grant.

FIGURE 1



**Legend**

- Rademacher Way Phase 1
- ... Rademacher Way Phase 2
- Assessor Parcel Number

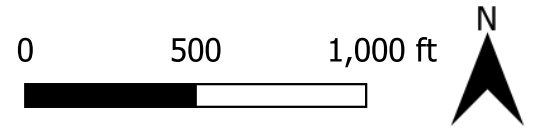
**Wells**

- De minimis Well
- Non-de minimis Well
- ABC Rademacher Well Connection

— IWWWD Distribution System

— Local Roads

**RADEMACHER AREA CONSOLIDATION**



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# IWVGA ADMINISTRATIVE OFFICE

*STAFF REPORT*

---

**TO:** IWVGA Board of Directors  
**FROM:** April Keigwin, General Manager

**DATE:** May 13, 2026

**SUBJECT: Approval of Report and Submission of Report to Court as Required by California Code of Civil Procedure Section 845.**

## **BACKGROUND**

Pursuant to California Code of Civil Procedure Section 845, the Indian Wells Valley Groundwater Authority is required to provide a report to the court as part of the ongoing groundwater adjudication process.

## **DISCUSSION**

To satisfy this requirement, staff coordinated with Stetson Engineers to prepare the attached report for submission to the court. The report has been completed in accordance with the statutory requirements outlined in California Code of Civil Procedure Section 845. Staff has reviewed the report and recommends Board approval authorizing submission of the document to the court.

## **ACTION(S) REQUIRED BY THE BOARD**

Approve the report prepared by Stetson Engineers pursuant to California Code of Civil Procedure Section 845 and authorize staff to submit the report to the court in connection with the Indian Wells Valley Groundwater Basin Adjudication proceedings.

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# INDIAN WELLS VALLEY GROUNDWATER BASIN TECHNICAL REPORT

MAY 2026



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## ATTACHMENTS

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**Attachment A** – Surface Spreading Technical Memorandum

**Attachment B** – Hydrogeologic Zones

**Attachment C** – Hydraulic Conductivity Testing Results

**Attachment D** – Aquifer and Slug Test Results

**Attachment E** – Hydraulic Conductivity Values

**Attachment F** – El Paso Technical Memorandum

**Attachment G** – TDS Data

**Attachment H** – Draft GDE Monitoring Plan

**Attachment I** – Navy GDE Vegetation Monitoring Report

**Attachment J** – 2020 GSP Model Documentation

**Attachment K** – Draft Configuration Management Plan

**Attachment L** – Configuration Item List

**Attachment M** – 2025 GSP Model Documentation

**Attachment N** – Water Production Data

**Attachment O** – Shallow Well Impact Analysis

**Attachment P** – Hydrographs of Wells With Earthquake Signatures

**Attachment Q** – Arsenic Database

**Attachment R** – Land Subsidence Analysis

**Attachment S** – Historical Groundwater Levels at Thiessen Polygon Wells

**Attachment T** – Balanced Hydrology Technical Memorandum

# 1 INTRODUCTION AND BACKGROUND

The Indian Wells Valley Groundwater Basin (IWVGB or Basin) is located in the northwestern part of the Mojave Desert in Southern California, within the South Lahontan hydrologic region and extends across portions of Kern, Inyo, and San Bernardino counties. The IWVGB is isolated from major urban centers and serves as the sole water source for the Indian Wells Valley (IWW).

The California Department of Water Resources (DWR) Bulletin 118, entitled “California’s Groundwater” (CalGW), serves as the State’s official publication on groundwater in California. CalGW provides a comprehensive overview of groundwater resources within the state, integrating statewide information on its characteristics, utilization and distribution, current conditions, and management practices. DWR defined the boundaries of the Indian Wells Valley Groundwater Basin and designated the IWVGB as Basin 06-054 in Bulletin No. 118 (September 1975). Early evaluations in Bulletin No. 118 indicated recharge within the IWVGB averaged approximately 10,000 acre-feet per year (AFY) while groundwater extractions (as of 1968) were estimated to be 12,500 AFY, implying that overdraft conditions have existed since at least the 1960s. Subsequent updates to Bulletin 118 in January 1980 and January 2016 documented continued evidence of IWVGB overdraft conditions.

Historically, the Indian Wells Valley (IWW) does not have any water importation infrastructure with groundwater serving as the primary source of water for the Basin. Available data indicate that long-term groundwater extraction has exceeded natural recharge, resulting in declining groundwater levels and decline in groundwater in storage over time.

This report presents a characterization of the hydrogeologic setting and groundwater resources of the Basin based on available data during the development of the Indian Wells Valley Groundwater Authority’s 2020 Groundwater Sustainability Plan and 2025 Periodic Evaluation development. The information presented herein serves as the technical basis for understanding groundwater use and conditions within the Basin and supporting current ongoing groundwater management and planning efforts.

## 1.1 INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

The IWVGB is currently managed by the Indian Wells Valley Groundwater Authority (IWVGA), a groundwater sustainability agency (GSA) formed as a joint powers authority from Kern County, Inyo County, San Bernardino County, the City of Ridgecrest (City or Ridgecrest), and the Indian Wells Valley Water District (IWWVD or Water District). The IWVGA oversees implementation of the adopted Groundwater Sustainability Plan (GSP) and ensuring sustainable management of the Basin under the Sustainable Groundwater Management Act (SGMA). Additionally, the IWVGA collects and maintains groundwater related data through monitoring programs and compiles data to document groundwater conditions within the Basin.

## 2 BASIN SETTING

### 2.1 GEOGRAPHIC AREA

The IWVGB is located in the northwestern part of the Mojave Desert in southern California (Figure 1) and underlies approximately 382,000 acres or approximately 600 square miles of land area in portions of the Counties of Kern, Inyo, and San Bernardino. The majority of the Basin's area is within northeastern Kern County, with smaller portions extending into northwestern San Bernardino County and southern Inyo County. The City of Ridgecrest, located in the east-central portion of the Basin within northeastern Kern County, is the only incorporated city in the Basin.

A significant amount of land overlying the southwestern IWVGB is largely undeveloped and managed by the United States Bureau of Land Management (BLM). Likewise, a large portion of the lands overlying the northern and northeastern portion of the IWVGB is Federal property owned and managed by the U.S. Navy for Naval Air Weapons Station (NAWS) China Lake. NAWS China Lake consists of two major land areas: the North Range, encompassing 606,926 acres, and the South Range, encompassing 503,510 acres. The North Range lies in portions of Inyo, Kern, and San Bernardino counties and the South Range is located entirely within San Bernardino County. The Navy's Mainsite and Headquarters areas are located along the southern boundary of the North Range, adjacent to the City of Ridgecrest on the south.

The IWVGB is a closed basin bounded by the Sierra Nevada Mountain Range to the west, the Coso Range to the north, the Argus Range to the east, and the El Paso Mountains to the south. Surface water flow from the surrounding mountain ranges drains to China Lake, a large dry lake, or playa, located in the central north-east part of the Basin. U.S. Route 395 and State Route 14 are the major vehicular arteries through the Indian Wells Valley. The IWVGB is in the vicinity of other Bulletin-118 groundwater basins including the Fremont Valley, Salt Wells Valley, Searles Valley, Coso Valley, Rose Valley, and Kern River Valley groundwater basins (Figure 2).

### 2.2 JURISDICTIONS

The Indian Wells Valley land overlying the IWVGB encompasses portions of the Counties of Kern, Inyo, and San Bernardino, with approximately 73% of the Basin area located within Kern County, as shown in Table 1. The City of Ridgecrest covers an area of approximately 20 square miles with a population of approximately 27,000 people. Other unincorporated communities within the Basin include China Lake, China Lake Acres, Indian Wells, Inyokern, Pearsonville, and Ridgecrest Heights.

*Table 1. IWVGB: Distribution of Overlying Land, by County*

<b>County Name</b>	<b>Overlying Land (acres)</b>	<b>Overlying Land (%)</b>
Kern County	277,204	73%
Inyo County	66,519	17%
San Bernardino County	37,985	10%
<b>Total</b>	<b>381,708</b>	<b>100%</b>

As shown in Table 2 and Table 3, approximately 302,000 acres of land overlying the IWVGB are Federal property managed by either the NAWS China Lake or the BLM. The non-federal lands overlying the IWVGB consist of the incorporated City of Ridgecrest and unincorporated lands in the counties of Kern, Inyo, and San Bernardino. A map showing general jurisdictions and boundaries is provided in Figure 3.

*Table 2. IWVGB: Distribution of Federal and Non-Federal Overlying Land, by Entity*

Entity	Overlying Land (acres)	Overlying Land (%)
U.S. Department of the Interior (Bureau of Land Management)	140,184	37%
U.S. Navy (Naval Air Weapons Station China Lake)	161,911	42%
Non-Federal Entities	79,613	21%
<b>Total</b>	<b>381,708</b>	<b>100%</b>

*Table 3. IWVGB: Distribution of Federal and Non-Federal Overlying Land, by County*

Entity	Overlying Land (acres) (%)			
	NAWS China Lake	BLM	Non-Federal	Subtotal
Kern County	71,971 26%	129,032 47%	75,201 27%	277,204 100%
Inyo County	57,413 86%	6,448 10%	2,658 4%	66,519 100%
San Bernardino County	32,527 86%	4,704 12%	754 2%	37,985 100%
<b>Total</b>	<b>161,911</b>	<b>140,184</b>	<b>79,613</b>	<b>381,708</b>

## 2.3 LAND USE

### 2.3.1 Kern County

A total of 277,204 acres of land overlying the IWVGB is located within Kern County. Approximately 73% of the overlying land within Kern County is Federal land managed by the BLM (129,032 acres) or controlled by the NAWS China Lake (71,971 acres). Most of the BLM-managed land in the IWVGB is open space managed for natural and economic resources, including mineral resources and rights-of-way for powerlines and pipelines (Todd Engineers, 2014). The land controlled by the NAWS China Lake is used for weapons research, development, acquisition, testing, and evaluation for the U.S. Navy.

Non-Federal lands within Kern County in the IWVGB include residential, commercial, industrial, and agricultural zoning districts. Zoning in the Kern County portion of the IWVGB (including definitions of each Kern County zoning district and the permitted land uses in each zoning district) is regulated by Title 19 of the Kern County Municipal Code. Near the westerly and southeasterly City of Ridgecrest

boundaries, the permitted zoning consists of residential zoning generally with a minimum lot size at 2.5 acres per dwelling unit, light industrial zoning, open space zoning, etc. The area between the City of Ridgecrest boundaries and the community of Inyokern contains primarily residential zoning districts with varying densities, while the areas northwest of Inyokern are residential and resource (primarily agriculture) zoning districts. Zoning in the southwest portion of the IWVGB, commonly referred to as the El Paso area, consists primarily of open space, recreation (forestry), limited agriculture, and mobile home districts. Lands in the El Paso area are largely uninhabited and are managed by BLM. As a result, significant groundwater extraction does not occur in the El Paso area due to the lack of local water demands in that area. In addition, the limited quantity of mountain-front recharge to the El Paso area limits the potential for groundwater extraction in the El Paso area except through unsustainable Basin mining.

A breakdown of the Kern County lands overlying the IWVGB and their associated land use designations is provided in Table 4 and is shown in Figure 4.

*Table 4. Zoning Districts in Kern County Lands Overlying the IWVGB*

<b>Zoning District</b>	<b>Area (acres)</b>	<b>Area (%)</b>
Estate District 0.25 Acre ( E(1/4) )	344	0.13%
Estate District 0.5 Acre ( E(1/2) )	608	0.23%
Estate District 1 Acre ( E(1) )	1,190	0.46%
Estate District 2.5 Acre ( E(2 ½) )	9,420	3.63%
Estate District 5 Acre ( E(5) )	5,493	2.12%
Estate District 10 Acre ( E(10) )	3,754	1.45%
Estate District 20 Acre ( E(20) )	14,056	5.41%
Estate District 40 Acre ( E(40) )	952	0.37%
Estate District 80 Acre ( E(80) )	922	0.36%
Limited Agriculture (A-1)	72,353	27.86%
Exclusive Agriculture (A)	452	0.17%
General Commercial (C-2)	283	0.11%
Neighborhood Commercial (C-1)	1	< 0.10%
Highway Commercial (CH)	294	0.11%
Light Industrial (M-1)	1,955	0.75%
Medium Industrial (M-2)	1,321	0.51%
Low Density Residential (R-1)	136	< 0.10%
Medium Density Residential (R-2)	14	< 0.10%
Mobile Home Park (MP)	31	< 0.10%
Mobile Home Subdivision (MS)	29	< 0.10%
Floodplain Primary (FPP)	19	< 0.10%
Open Space (OS)	105,462	40.61%
Recreation Forestry (RF)	11,841	4.56%
Other (China Lake)	28,749	11.07%
Other	4	< 0.10%

<b>Total</b>	<b>381,708</b>	<b>100%</b>
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The Kern County General Plan, adopted on September 22, 2009, projects that the population of Kern County will continue to grow at a rate of less than 2 percent annually over the 20 years after publication in 2009. This population growth is attributed to a continuing influx of new residents from outside the County, as well as the natural increase of the population in the County. The City of Ridgecrest General Plan provides the growth trends for the City, which indicate that population growth in the City is anticipated to be lower than that of Kern County. The water demands of the Indian Wells Valley Water District are projected to increase at a rate of 1.0% percent annually (ESA, 2009) over the planning and implementation horizon of this GSP, to account for population growth in the IWVGB.

**2.3.2 Inyo County**

The vast majority of land in Inyo County is owned by either the Federal government (~92%), the City of Los Angeles (~4%), and the State of California (~2.5%) (Inyo County Planning Department, 2013). Approximately 96% of the Inyo County land overlying the IWVGB is either owned by the US Navy as part of NAWS China Lake or managed by the BLM (see Table 3 above). Approximately 98% of the Inyo County land overlying the IWVGB is zoned as open space (see Table 5 below). The community of Pearsonville, occupying approximately four square miles, is zoned for various residential densities as well as some commercial and industrial zoning to complement the community’s highway-oriented businesses. A breakdown of the Inyo County lands overlying the IWVGB and their associated zoning is provided in Table 5 and shown in Figure 5.

*Table 5. Zoning Districts in Inyo County Lands Overlying the IWVGB*

Zoning District	Area (acres)	Area (%)
Commercial Recreation	5	< 0.1%
General Industrial and Extractive	167	0.3%
Heavy Commercial	15	< 0.1%
Highway Servies and Tourist	25	< 0.1%
Commercial	29	< 0.1%
Light Industrial	29	< 0.1%
Multi-Family Residential	23	< 0.1%
Open Space	65,038	98.2%
Public	65	0.1%
Rural Residential	848	1.3%
<b>Total</b>	<b>66,215<sup>1</sup></b>	<b>100%</b>

<sup>1</sup> Inyo County zoning data was obtained from the County of Inyo Public Geographic Information Systems Page. Updated as of January 31, 2019. Note that not all Inyo County lands overlying the IWVGB were given zoning district categories in the dataset.

**2.3.3 San Bernardino County**

The land just adjacent to the City of Ridgecrest’s eastern boundary is designated as Rural Living, allowing for a maximum of one dwelling unit per 2.5 acre lot in San Bernardino County. This area contains less than one square mile of residential lots. Areas with a Resource/Land Management designation span over several miles to the east of China Lake and south of the Inyo County line. A majority of the land overlying the IWVGB within San Bernardino County is within the NAWS China Lake boundaries, as shown above in Table 3. A breakdown of the San Bernardino County lands overlying the IWVGB and their associated zoning is provided in Table 6 and shown in Figure 6.

*Table 6. Zoning Districts in San Bernardino County Lands Overlying the IWVGB*

<b>Zoning District</b>	<b>Area (acres)</b>	<b>Area (%)</b>
Resource Conservation	37,411	98.5%
Rural Living	574	1.5%
<b>Total</b>	<b>37,985<sup>2</sup></b>	<b>100%</b>

**2.3.4 City of Ridgecrest**

The City of Ridgecrest has direct land use jurisdiction within its city limits with the exception of the small northern portion of the City within NAWS China Lake. The community within and surrounding the City of Ridgecrest is strongly linked to supporting NAWS China Lake by providing housing and services for personnel and contractors working at NAWS China Lake. Most of the City’s water use is therefore municipal and domestic use as well as irrigation.

**2.3.5 Agricultural Land Use**

In 2018, there were approximately 3,086 acres of actively farmed land overlying the IWVGB<sup>3</sup>. Typically, each farm has its own well system and water delivery system for its respective crops. The primary crops grown in the Indian Wells Valley are pistachios (2,027 acres) and alfalfa (985 acres), with other miscellaneous crops (74 acres) such as miscellaneous grain and hay constituting a minority of production. A map of actively farmed land overlying the IWVGB is provided in Figure 7. Actively farmed land within the Basin is expected to decrease significantly by 2040, through the implementation of the GSP.

**2.3.6 Industrial Land Use**

There are no large-scale industrial land uses in the Indian Wells Valley. Since the 1920’s, Searles Valley Minerals Inc. (SVM) has exported groundwater from five (5) wells located in Ridgecrest and west of the Ridgecrest city limits to Searles Valley (located outside of the IWVGB) to support both its industrial operations and the domestic needs of the unincorporated communities of Trona, Westend, Argus, and Pioneer Point.

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<sup>2</sup> San Bernardino County zoning data was obtained from the ArcGIS Hub – Open Data, in conjunction with the San Bernardino County Land Services Department. Updated as of May 3, 2018.

<sup>3</sup> Actively farmed land in the IWVGB was determined using the California Department of Water Resources’ Crop Mapping 2014 GIS dataset. Updated as of March 13, 2018.

## 2.4 WATER SUPPLY SOURCE

In general, streams and other surface waters in the IWVGB are ephemeral due to low annual precipitation in the Indian Wells Valley, and Basin recharge occurs as mountain front recharge from the surrounding mountain ranges. Localized infiltration of precipitation and runoff may contribute additional recharge. However, prior investigations on infiltration rates across the valley floor and within the City indicate that actual recharge through infiltration is very limited, due to the presence of fine-grained low-permeability materials and high evapotranspiration (see Attachment A). Consequently, although natural channels for storm water runoff exist in the IWVGB (see Figure 8), surface water resources in the IWVGB are limited. With the absence of imported water supplies and limited surface water availability, groundwater serves as the sole supply of potable water for the Indian Wells Valley.

## 3 HYDROGEOLOGIC CONCEPTUAL MODEL

A hydrogeologic conceptual model (HCM) characterizes the physical components and interaction of the surface water and groundwater systems within a basin. The HCM provides a framework for understanding a Basin's physical characteristics related to hydrology, land use, geology and geologic structure, water quality, and aquifer conditions (DWR 2016b). The HCM shown in Figure 10 provides an illustration of the general structure of the Basin with the primary recharge in and discharge out of the groundwater aquifer. Natural recharge occurs along the mountain- front areas and as subsurface flow from Rose Valley. The main discharge of groundwater occurs from pumping wells, evapotranspiration (ET) at the playa, and estimated (small) subsurface flow to Salt Wells Valley. The general flow direction of the groundwater system is from the mountains (recharge area) towards the playa (discharge area).

### 3.1 GEOLOGY AND HYDROGEOLOGY

The geology and hydrogeology of the IWVGB have been studied since the early 1900's. The California Conservation Commission (Lee, 1912) wrote one of the first reports to estimate available groundwater resources within the IWVGB. The USGS and DWR completed multiple studies of the IWVGB to delineate the geologic and hydraulic features (Moyle, 1963; Kunkel and Chase, 1969; Dutcher and Moyle, 1973; Berenbrock, 1987). Further geologic work was completed by the U.S. Bureau of Reclamation (USBR) in 1993 including the first deep fully characterized Basin borings and installation of multi-level wells. Important recharge investigations<sup>4</sup> were undertaken by the EKCRCD<sup>5</sup> (Tetra Tech EM, 2003b) and Cooperative Group<sup>6</sup> (2008) with AB303 grant funding. In 2014, a comprehensive survey of existing IWV Basin groundwater research and yearly documented water production was undertaken with Kern County funding (Todd, 2014). In 2016 and 2017, the Navy

<sup>4</sup> USBR (1993) recommended the recharge study completed by EKCRCD, 2013

<sup>5</sup> EKCRCD, Eastern Kern County Resources Conservation District managed the AB303 grant in 2003 from State of California Water Resources Department.

<sup>6</sup> IWVCWGM, IWV Cooperative Water Management Group managed the second phase of an AB303 grant in 2008.

funded a groundwater flow model update<sup>7</sup>, performed by the Desert Research Institute (DRI), that is providing key technical support including groundwater level predictions for various pumping scenarios (DRI: McGraw et al., 2016; Garner et al, 2017).

In 2018, a SkyTEM (Transient Electro-Magnetic,) geophysical survey was completed and analyzed (Thorn, et al., 2019) to develop a detailed hydrogeologic conceptual model for the Basin<sup>8</sup>. The airborne electromagnetic (AEM) SkyTEM data was later evaluated by Dr. Ryan Smith of Colorado State University and determined to be useful to include in the HCM. Though the AEM data has limitations such as its lack of deep basin resolution, inability to estimate the bottom of the clay layer, and uncertainty of identifying freshwater source areas in fine-grained sediment layers, the AEM data still proved useful in identifying sharply contrasting sedimentary units at shallow depths, such as between sands/gravels and clays/silts. The AEM data was used to confirm the location of mapped surface faults, and to identify the location of concealed faults, and verified the style of faulting. While the AEM data could not estimate the bottom of the clay layer, it was used to determine the areal extent of the top of the clay layer in conjunction with well logs to verify the depth of the clay layer throughout the Basin to support the development of a 3D model of the deformed clay layer which has been included in the revised HCM and updated 2025 groundwater model to provide a better understanding of the Basin's stratigraphic framework and distribution of hydrogeologic properties. In May 2019, detailed geomorphic landforms were mapped for the Navy<sup>9</sup>.

### **3.1.1 TOPOGRAPHY**

IWV is located in the western edge of the Basin and Range Physiographic Province, characterized by a topography of isolated mountain ranges separated by desert basins (TtEMI, 2003b). IWVGB is bounded by the Sierra Nevada Mountains to the west, the Coso Range to the north, the Argus Range to the east, and the El Paso Mountains and Spangler Hills to the south. The highest elevation in the IWV watershed occurs in the Sierra Nevada reaching 8,452 feet mean sea level (msl) at Owens Peak. Mountain slopes dip steeply to the valley floor that in turn slopes gently to China Lake, which is usually a dry playa, except following significant rainfall. Figure 10 shows the watershed extents, the Basin boundary, land ownership, and existing monitoring wells for reference in this discussion. The elevation of the Valley floor ranges from about 2,790 feet msl at the far southwest El Paso area to approximately 2,150 feet msl at China Lake playa (TtEMI, 2003b). The USGS topographic map shown on Figure 11 displays how the Basin boundary encompasses the Valley floor and alluvial stream channels of the surrounding mountains.

### **3.1.2 GEOLOGY AND HYDROLOGY**

Indian Wells Valley lies within the northern portion of the Eastern California Shear Zone (ECSZ) or the southern Walker Lane Belt, in a transitional zone of east-west extensional faulting of the Great Basin Province and dominant right-lateral strike-slip faulting common to the Sierra Nevada Mountains (TriEcoTt, 2013). From the Late Miocene (11.6 to 5.3 million years ago) through the Pliocene (5.3 to

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<sup>7</sup> DRI updated model structure and input data and re-calibrated the numerical MODFLOW model developed by Brown and Caldwell (2009) for IWWVD.

<sup>8</sup> Thorn et. al., March 2019.

<sup>9</sup> Bullard et. al, May 2019.

2.6 million years ago), IWV was down-faulted along the Sierra Nevada frontal fault resulting in the structural half-graben of present-day (Monastero et. al., 2002; Kunkel & Chase, 1969). Based on historical groundwater levels, the Little Lake fault zone (LLFZ) and El Paso fault (EPF) (mapped by Kunkel and Chase, 1969 and Garner et al., 2017) have been shown to impede movement of groundwater within the Basin. Figure 12 shows the surficial geology in the IWVGB and Figures 13a and 13b show two cross-sections through the valley. The delineation of the lateral and vertical extent of the geologic units and hydrogeologic zones are summarized and shown in the four (4) cross sections AA' through DD' in Attachment B.

During the Pleistocene epoch (2.6 million to 12,000 years ago), the region was much wetter and surrounding basins were all connected via the ancestral Owens River (Bacon, 2006; Bullard et.al., 2019). Active alluvial fan movement from the Sierra Nevada Mountains, deposition of finer material from Owens Valley and subsequent reworking of Basin sediments by the Owens River and mountain streams resulted in a complex distribution of well sorted to poorly sorted deposits within the IWV Basin (Dutcher and Moyle, 1973). Deposition of lacustrine sediments developed in lakes connected by the ancestral Owens River. Drier conditions developed following the Pleistocene and into recent time. Previously connected basins evolved into isolated basins through decreased precipitation and streamflow, subsequent faulting, and volcanic activity.

Because of the low permeability bedrock of surrounding mountain ranges, IWVGB receives no significant recharge from beyond the topographic divides of the watershed boundary, except for subsurface flow from Rose Valley. Large alluvial fan complexes stemming primarily from the Sierra Nevada, and to a lesser degree from other mountain ranges, allow groundwater flow into the Basin as mountain block recharge (Dutcher and Moyle, 1973). Dutcher and Moyle (1973) estimated the depth of water-bearing alluvial deposits could locally reach to 2,000-feet. These sediments consist mainly of gravel and sand in alluvial fans near the mountains and grade to silt and clay beneath the playa. There is significant irregular cemented and relatively impervious shallow zones at different locations within the IWVGB.

In 2018, the USGS (Shah et al., 2018) produced a dataset of depth to basement and thickness of unconsolidated sediments for the Western United States, including the IWVGB. Contours of depth to basement are shown in Figure 14, which illustrates three deposition centers that are well defined. With a maximum depth to basement of more than 9,500 feet, the first deposition center is in the El Paso subarea. The second deposition center is in a broad area between Well #5 and SNORT-1. At Well #5, the maximum depth to basement is more than 9,500 feet, while at SNORT-2, maximum depth to basement is more than 8,000 feet. The third deposition center is roughly in the center of the China Lake playa with a maximum depth to basement of more than 6,000 feet.

The thickness of unconsolidated sediments is shown in Figure 15. Considering its hydrogeologic significance, Figure 15 only shows thickness-contours that are less than 2,000 feet along the margin of the IWVGB. In the center of the main IWVGB and El Paso subarea, the thickness of unconsolidated sediments is greater than 2,000 feet.

According to Dutcher et al. (1973), the IWVGB consists of non-water bearing basement complex rocks of pre-Tertiary age, the volcanic rocks of Tertiary and Quaternary age, and the basalt of

Quaternary age and water bearing continental deposits of Tertiary and Quaternary age, and the alluvium and playa deposits of Quaternary age (Figure 12).

Areas on the northern margin of the IWVGB include Pliocene sedimentary rocks of the White Hills sequence that are locally overlain by thin Quaternary volcanic flow rocks (Jennings et al., 1962; Monastero et al., 2002). These Tertiary sedimentary and volcanic rocks are consolidated and not representative of unconsolidated sedimentary valley fill. The consolidated rock types are not part of the IWVGB unconsolidated sedimentary aquifer system.

Lithologic units were taken from Berenbrock and Martin (1991) who based their work on units mapped by Von Huene (1960), Zbur (1963), and Kunkel and Chase (1969). The geologic units include consolidated bedrock and unconsolidated sediments (Figures 13a and 13b). Bedrock is typically low in permeability and porosity, and may yield some water to wells completed in fractures. These rocks include Mesozoic igneous and metamorphic rocks in the surrounding mountains, as well as Miocene basalts near the El Paso Mountains.

Groundwater depletion that is of concern in the IWVGB is from the water in unconsolidated alluvial deposits. These water-bearing sediments store and transmit water, and are divided into the following hydrostratigraphic features that are important for analyzing sustainability criteria and groundwater budgets. Unconsolidated units are mapped across the project site as alluvium, lacustrine, and playa. Berenbrock and Martin (1991) describe these units as follows:

- Shallow hydrogeologic zone (SHZ): Alluvium consists of moderately to well-sorted gravel, sand, silt, and clay of Pleistocene and Holocene age (12,000 years to present) and is considered to have a high permeability. The percentage of silt and clay tends to increase toward the central portion of the IWVGB, which reduces permeability in most areas. These deposits include both older and younger alluvial deposits, alluvial fans, and elevated pediment veneers and stream terrace deposits. Alluvium extends across the entire IWV and is thickest along the western and southern edges of the Basin (Figures 13a and 13b).
- Intermediate hydrogeologic zone (IHZ): Lacustrine deposits were described by Kunkel and Chase (1969) as containing silt and silty clay of Pleistocene age and exhibiting low permeability. This unit is interbedded with the alluvial deposits in the southeast, western and central portion of the Basin.
- Deep hydrogeologic zone (DHZ): Playa deposits of low permeability are of Holocene and Pleistocene age and contain silt and clay with an occasional sand lens. In the northwest area, an unusually thick and extensive deposit of organic clay and silt of Pleistocene age occurs as a continuous unit.

There are two principal aquifer units defined by Kunkel and Chase (1969). The shallow aquifer contains coarse sediments near the Sierra Nevada with increased interbedded silts and clays towards the center of the Basin associated with the lacustrine and includes China Lake's playa deposits. The best quality of water is at shallow to medium depths in the southwestern part of the valley, closer to the Sierra Nevada (Dutcher and Moyle, 1973). The deeper aquifer is also composed of gravel, sand, silt and clay. It is strongly connected to the shallow aquifer in the west and southwest of the Basin; and is confined in other parts of the Basin. Existing multi-level monitoring wells (USBR,

1993) 21 show semi-confined artesian conditions within the deeper aquifer where it occurs beneath the lacustrine and other fine-grained sediments.

Historical well drilling and aquifer testing results were reviewed and compiled for background hydraulic conductivity data throughout the I WVGB. Hydraulic conductivity has been determined to range from < 5 feet per day (ft/day) to > 50 ft/day based on slug and aquifer testing. The distribution of measured hydraulic conductivity values throughout the IWVGB is shown in Figure 16 and testing results are shown in Attachment C. In general, the shallow and deep aquifer zones are associated with higher hydraulic conductivity. USBR (1993) slug test data<sup>10</sup> show lower hydraulic conductivity that impedes flow within the lacustrine/playa deposits.

### **3.1.3 FAULTS**

There are four primary fault zones and two secondary faults in the IWVGB mapped by the USGS and California Geological Survey (CGS) with surface evidence of historical, Holocene, latest Quaternary, and late Quaternary fault activity (CGS, 2010; Stevens et al., 2013). The four primary fault zones in the IWVGB include the Airport Lake fault, Little Lake fault, Paxton Ranch fault, and Sierra Nevada Frontal fault. Two secondary faults were also identified in the USGS and CGS mapping. These two secondary faults lie in the El Paso Valley subbasin that act as impediments to groundwater flow and are informally named the Freeman and Armistead faults, as shown in Figure 17.

### **3.1.4 SOILS**

Limited surface soil data were publicly accessible and available for IWV. The Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) mapped arid to semi-arid soil types occurring in the southwest El Paso area (Figure 18). Soil data for the main area of IWVGB were not present from NRCS, and are considered a data gap requiring further research of non-public databases. Two additional preliminary soil surveys with limited extents were conducted by NRCS but are not digitally available for mapping: (1) Ridgecrest Part, Northeastern Kern Area (USDA-NRCS, 1995); and (2) Portions of China Lake Weapons Center (USDA-SCS, undated).

Desert soils found in arid<sup>11</sup> regions cover most of the undisturbed land on the valley surface. Arid soils are stabilized by a biological soil crust formed as a veneer on the surface that is important for reducing wind and rain erosion of underlying sediments. This soil crust also increases water retention during sporadic heavy rainfall events. The desert crust can be damaged when disturbed, resulting in clay, silt, and sand being mobilized by wind. One of the minor water uses in IWV is for dust suppression. The IWV natural desert environment also includes active and inactive (vegetated) sand dunes and playa deposits. The Basin's primary discharge area is the China Lake playa, where surface water collects at the lowest elevation in the Basin and evaporates, developing a salt pan. The Navy recently completed a detailed geomorphic survey of surface landforms (Bullard et al, 2019) that provides an indication of soil types that occur on Base. Predominant landforms include alluvial fan, eolian, fluvial, deltaic, lacustrine, and playa features. Other landform features from this study include bedrock and developed land.

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<sup>10</sup> Most of the multi-level monitoring wells are being used to support CASGEM reporting.

<sup>11</sup> Arid regions typically average less than 10 inches/year of precipitation.

Soil data available for the southwest El Paso region of IWV (Figure 18; USDA, 2019) include aridisols on the valley floor, entisols on the steeper sloped alluvial fans and canyons west of the valley floor, and mollisols at higher elevations near the watershed divide. Aridisols are the desert soils of ‘arid’ regions with only enough natural recharge to support adapted desert plants. Entisols occur in environments where erosion or deposition rates are faster than soil development rates and typically occur on dunes, steep slopes, and flood plains (USDA NRCA, 2019). Mollisols occur in semi-arid mountain valleys where detritus from vegetation and organisms (worms, ants) help to develop a rich soil profile. These three soil types develop under different conditions – (1) the valley floor is relatively flat with very limited rainfall (average 4 inches/year) forming a desert soil crust, (2) the steep canyons are reworked unconsolidated sediments/rock that have a very limited to no soil profile, and (3) higher elevations with more rainfall allow for development of vegetation and a limited soil profile.

In 2018, an Airborne Electromagnetic (AEM) pilot study was completed in the IWVGB. The AEM survey data, released in August 2023, showed the distribution of materials in the Basin’s subsurface. The evaluated AEM data was then calibrated to deep well logs to characterize the spatial extent of the fine-grained IHZ (aka “Clay” unit) for inclusion in the Basin Model. This clay layer was determined to have an area of 147.0 mi<sup>2</sup> (380.8 km<sup>2</sup>). The mapped margins of the clay unit are controlled by faults and have depositional boundaries. The areal extent of the clay layer is shown in Figure 19.

### 3.1.5 HYDRAULIC CONDUCTIVITY

Three aquifer tests were conducted to better characterize the hydrogeologic properties of the unconfined basin-fill aquifer in Indian Wells Valley (DRI, 2020). Results for these three tests are summarized in Attachment D, along with earlier data used in the 2020 GSP (Krieger & Stewart (1989), Houghton (1996), USBR (1993)).

Well completion reports (lithology logs) were obtained from California Department of Water Resources Online System of Well Completion Reports (<https://gis.water.ca.gov/app/wcr>). In addition, Meadowbrook Dairy, Mojave Pistachio, a few small agricultural and irrigational well owners, IWVWD, over 40 mutual-water well owners, SVM and the Navy have provided well logs, well location and pumping records to IWVGA. A total of 1,170 well logs are summarized by Township and Range location in Table 7. Excluding logs for well destruction and a few logs for shallow monitoring wells, more than 1,000 well logs were reviewed and analyzed. Logged information such as latitude, longitude, street address, APN, well location sketch was used to locate these wells. If none of the above information was available, it was assumed the well is located in the center of the section.

Table 7. Summary of Well Logs Reviewed

Township/ Range	Number of Well Logs	Township/ Range	Number of Well Logs
23S40E	1	26S40E	300
24S38E	11	26S41E	3
25S38E	144	27S38E	11
25S39E	9	27S39E	38
25S40E	10	27S40E	143
25S41E	8	28S37E	1

26S37E	11	28S38E	1
26S38E	101	28S40E	8
26S39E	370		
<b>TOTAL</b>			1,170

Note that not all the well logs summarized in Table 7 have recorded well yield, drawdown and screen interval. Calculated hydraulic conductivity estimates are summarized in Attachment E. Most of the data sources are from DWR’s well completion report and well logs provided by owners. Including the data reported by Moyle (1963), Kunkel et al. (1969) and Layne (2010), a total number of 137 hydraulic conductivity values were calculated and included in Attachment E.

### **3.1.6 INTER- AND INTRA-BASIN FLOW**

Previous studies on the IWVGB have primarily considered the IWVGB to be a closed basin with little to no subsurface outflow to Salt Wells Valley. Nonetheless, DRI concluded “the absence of a large accumulation of salinity in Indian Wells Valley suggests that the basin may not be hydrologically closed” (McGraw et al., 2016). Furthermore, DRI noted that water levels within IWV “are higher than in Salt Wells Valley, which indicates that interbasin groundwater flow is a possibility given large enough transmissivities” (McGraw et al., 2016). DRI performed a hydraulic analysis of the Salt Wells Valley and concluded that it is possible that currently approximately 50 AFY of the groundwater flow in the Salt Wells Valley originates as underflow from the IWV as distinguished from mountain front recharge from the Argus Range.

As discussed in Section 3.1.2, Rose Valley is the only significant source of inter-basin subsurface flow into the IWVGB due to the low permeability bedrock of the surrounding mountain ranges. However, the extent to which Rose Valley contributes to recharge within the Basin is highly uncertain. Historical estimates have ranged widely, from a high of 10,000 AFY (Thompson, 1929) to as low as approximately 40 AFY (Berenbrock and Martin, 1991). However, more recent studies appear to converge on a range of approximately 1,000 to 4,000 AFY. See Table 10 in Section 3.2.2. The El Paso Subarea is hydraulically separated from the main Basin by the Freeman Fault, where a steep hydraulic gradient zone is observed. Groundwater elevations on either side of the fault show a difference of approximately 520 feet over a 3.6-mile stretch across the fault, indicating that the fault acts as a significant barrier to groundwater flow. Several monitoring wells within the El Paso Subarea have also shown stable groundwater levels since 2005, indicating that the El Paso Subarea aquifer is in a quasi-steady state condition and is not affected by pumping that occurs in the main basin. Additionally, there are differences in the groundwater geochemistry between the two areas, further supporting the limited intra-basin flow between the Main Basin and the El Paso Subarea. Further discussion of the El Paso Subarea evaluation is detailed in Attachment F.

## **3.2 HYDROLOGY**

### **3.2.1 CLIMATE AND PRECIPITATION**

The IWVGB is part of the Mojave Desert and has an arid, high desert climate characterized by hot summers, cold winters, and irregular and sparse precipitation. The Basin is bounded by mountains

to the north, south, and west, which drain internally to the China Lake playa. Summer high temperatures on the China Lake playa are typically greater than 100 degrees Fahrenheit (°F) and winter lows are typically in the 20s and 30s °F.

Precipitation on the valley floor ranges from 2 to 5 inches per year (in/yr); snowfall, if any, typically occurs in December and January, with an average of less than 1 inch per year (WRCC, 2018c; PRISM, 2012). Mountain areas receive more precipitation than the China Lake playa and are the primary source of recharge for the Basin. The average annual precipitation for the IWVGB and mountain areas ranges from about 4 in/yr up to about 20 inches per year (PRISM, 2012)<sup>12</sup> (Figure 20). The annual precipitation by water year (WY)<sup>13</sup> and cumulative departure from mean at two stations near the IWW are shown in Figure 22.

With high temperatures, high winds, and low humidity the IWWGB has high ET rates. Average annual evaporation from a shallow water body in the playa is about 80 in/yr (Farnsworth et al, 1982). NOAA maps of evaporation (Farnsworth et al 1982) show that, in general, annual evaporation from a free water surface is greater on the valley floor than in mountainous areas of the Basin. For example, in the Sierra Nevada mountains on the west side of the IWWGB, annual evaporation from a free water surface ranges from about 45 in/yr to 65 in/yr (Farnsworth et al, 1982).

### **3.2.2 STREAMFLOW AND MOUNTAIN FRONT RECHARGE**

Streamflow gaging stations in and near the IWWGB are shown on the map in Figure 21. The USGS historically collected data at three Sierra canyon streams. The stations were active starting in the 1960's and 1970's and have more than twenty years of observations. The daily hydrograph at Ninemile Creek (USGS gage 10264878), which drains a 10.4 square mile area of the Sierra Nevada, is shown in Figure 22. The discharge record for Ninemile Creek is characterized by sharp peaks with little to zero discharge in between storm events. The largest peaks occurred during winter months, with negligible discharge in the summer. During two calendar years, 1964 and 1968, there was no significant discharge measured at this gage for the entire year.

Streamflow observations at Sand Canyon and Grapevine Canyon have been collected through a monitoring effort by the EKRC (Ribble and Haslebacher, 2000; Haslebacher, 2018). Sand Canyon has a drainage area of about 18 square miles. Flow is measured with a compound rectangular weir and datalogger, with recent records dating back to 1999. The annual gaged streamflow at Sand Canyon is given in Table 8 and ranges from dry during drought conditions to 3,783 AFY. The average annual streamflow is 647 AFY and the median is 209 AFY. Grapevine Canyon, with a drainage area of about 10 square miles, is gaged with a v-notch weir and datalogger, with recent records dating back to 1997. As shown in Table 8, annual flows at Grapevine Canyon range from 4 AF to 2,275 AF, with average annual streamflow of 237 AFY and a median of 90 AFY. At both gages, flow during wet years, i.e. 1998 and 2005, skews the average toward high flows.

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<sup>12</sup> The spatial data set in Figure 3-8 is from a 30-year climate normal data set prepared by the PRISM Climate Group. These data are based on calendar years and are not available in water year format.

<sup>13</sup> Water years ranges from October 1st through September 30th.

Table 8. Annual Gaged Streamflow at Sand Canyon and Grapevine Canyon

Calendar Year	Sand Canyon Gaged Streamflow (AF)	Grapevine Canyon Gaged Streamflow (AF)
1997	-- <sup>1</sup>	2,275
1998	200	394
1999	217	95
2001	150	43
2002	69	19
2003	329	16
2004	102	4
2005	3,783	1,160
2006	585	193
2007	171	35
2008	-- <sup>2</sup>	-- <sup>2</sup>
2009	-- <sup>2</sup>	-- <sup>2</sup>
2010	-- <sup>2</sup>	-- <sup>2</sup>
2011	184	-- <sup>2</sup>
2012	286	90
2013	-- <sup>2</sup>	-- <sup>2</sup>
2014	-- <sup>2</sup>	-- <sup>2</sup>
2015	-- <sup>2</sup>	-- <sup>2</sup>
2016	-- <sup>2</sup>	-- <sup>2</sup>
2017	1,683	563
2018*	86	32
<b>Complete Years</b>	12	13
<b>Average</b>	647	237
<b>Median</b>	209	90

Source: Haslebacher, 2018

<sup>1</sup> No data available; gage not yet active

<sup>2</sup> No data available; measurements were not reported for these years

\*Total through March 2018; value for 2018 not included in statistics

Mountain front recharge is the dominant source of inflow to the Basin. In 2014, Todd Engineers prepared a study that reviewed previous recharge studies and made new estimates (Todd Engineers, 2014). In 2016, DRI conducted a comprehensive review of recharge estimates for the Basin (McGraw et al, 2016). DRI reviewed fourteen previous studies and then updated the recharge estimates using an empirical relationship between precipitation and groundwater recharge. The average annual recharge developed by DRI is 7,650 AF per year (McGraw et al, 2016; Garner et al, 2017). The recharge zones identified by DRI are shown in Figure 23. The total area of recharge is about 770 square miles. The area and estimated annual recharge in each zone are shown in Table 9

*Table 9. Recharge Zones and Estimated Annual Recharge*

<b>Recharge Zone</b>	<b>Area (sq miles)</b>	<b>Annual Recharge<sup>1</sup> (AFY)</b>
Rose Valley	193	2,400
Sierra Nevada N	116	2,100
Sierra Nevada S	101	1,500
El Paso	56	50
Argus and Coso	302	1,600
Total	768	7,650

<sup>1</sup> Recharge areas and annual volumes as developed by DRI (McGraw et al, 2016; Garner et al, 2017)

Numerous Basin studies have been prepared to estimate natural recharge to the IWVGB with various methods and with varying results. The methodology used in selected previous studies is described in Todd Engineers (2014), McGraw et al. (2016), Reitz (2017), and Saleh et al. (2026). The historical natural recharge estimates from selected previous recharge studies are shown below in

Table **10**.

Table 10. Natural Recharge Estimates from Historical Recharge Studies (AFY)

Recharge Study	Surface and Subsurface Inflow		Leakage from Los Angeles Aqueduct	Leakage from IWWWD Water Distribution System	Irrigation Deep Percolation (Ag and Muni.)	Wastewater Pond Percolation	Total Recharge
	Indian Wells Valley	Rose Valley					
Lee (1913)	27,000						
Thompson (1929)	39,000	10,000					49,000
Kunkel and Chase (1969)	11,000 - 15,000						11,000 - 15,000
Bloyd and Robson (1971)	9,800	45					9,845
Dutcher and Moyle (1973)	11,000						11,000
DWR Bulletin No. 118 (1975)	10,000						10,000
St. Amand (1986)	11,000						11,000
Bean (1989)	9,700	400	900	500		1,000	12,500
Berenbrock and Martin (1991)	9,806	43			100	1,001	10,950
Anderson et al. (1992)	700 - 15,000						700 - 15,000
Watt (1993)	9,851						9,851
Thyne and others (1999)	8,026	1,297					
Bauer (2002)		3,300					
Daniel B. Stephens (2011)		3,500 - 3,900					
Brown and Caldwell (2013)	7,860	1,000					8,860
Todd Engineers (2014)	5,040 - 7,840	1,000		80	1,600 - 2,100		6,040 - 8,840
Epstein et al. (2010)	5,800 - 12,000						5,800 - 12,000
McGraw et al. (2016)	5,250	2,400					7,650
Reitz et al. (2017) 2000-2013	7,329						7,329
USGS (2018) 1981-2010	8,680						8,680
USGS (2018) 2000-2013	5,980						5,980
USGS (2026) 1981-2010	8,675						

Early studies by Lee (1913) and Thompson (1929) estimated recharge to the Basin at 27,000 and 39,000 acre-foot per year (AFY), respectively. Today, these early estimates are considered too large due to the limited data to support the evapotranspiration rates. However, Lee (1913) did highlight evapotranspiration (ET) as the primary discharge mechanism within the valley.

Subsequent studies produced lower recharge estimates as additional data became available. Kunkel and Chase (1969) estimated total groundwater discharge from evapotranspiration range between 11,000 to 15,000 AFY. A calibrated groundwater flow model by Bloyd and Robson (1971) estimated recharge at 9,845 AFY, including a subsurface flow from Rose Valley, further reducing recharge estimates. Later studies by Dutcher and Moyle (1973), St. Amand (1986) and Berenbrock and Martin (1991) maintained the 11,000 AFY recharge estimates of Kunkel and Chase (1969) without modification. The California Department of Water Resources (DWR) Bulletin 118 (1975) similarly noted that recharge in the Basin averaged about 10,000 AFY.

Additional studies incorporated anthropogenic contribution to recharge. Bean (1989) estimated a total recharge of 12,500 AFY, including leakage from the Los Angeles Aqueduct and IWWWD water distribution system and wastewater pond percolation. Anderson et al. (1992) developed a relationship between annual precipitation volume and groundwater recharge, which was used to determine upper and lower bounds of Basin recharge to range between 700 and 15,000 AFY. Based on different recharge distribution procedures, Watt (1993) obtained the same recharge total as by Bloyd and Robson (1971).

Recharge estimates continued to be refined with improved hydrogeologic understanding and modeling approaches. Thyne and others (1999) estimated that groundwater recharge from the Sierra Nevada was 8,026 AFY and subsurface outflow from Rose Valley to the Basin 1,297 AFY. Hydrogeologic studies in Rose Valley by Bauer (2002) and Daniel B. Stephens (2011) indicated that subsurface outflow to the Basin was approximately 3,300 AFY, and ranged from 3,500 to 3,900 AFY, respectively. The Brown and Caldwell (2009) model, which included 1,000 AFY of subsurface inflow from Rose Valley estimated total recharge within the Basin to be 8,860 AFY.

More recent studies have generally converged on lower recharge estimates. Todd Engineers (2014) developed a detailed summary of groundwater recharge estimates and reported their own estimates as well, with estimated total recharge ranging from 6,040 to 8,840 AFY. Using the relationship between precipitation and groundwater recharge developed by Epstein et al. (2010), total recharge was estimated to range between 5,800 to 12,000 AFY. The recharge distribution developed by McGraw et al. (2016), as shown in Table 9. *Recharge Zones and Estimated Annual Recharge*, was incorporated into the GSP Model, and subsequently reviewed and confirmed during model calibration. The recharge estimates by McGraw et al. (2016) were discussed and confirmed by the IWWGA Technical Advisory Committee (TAC) Model Ad Hoc Group, and use of the McGraw et al. (2016) estimates was unanimously approved by the TAC.

Reitz et al. (2017) developed annual estimates for water budget components of recharge, quick-flow runoff, and evapotranspiration (ET) at the 800 m spatial scale across the contiguous United States (CONUS). Based on this dataset, an annual recharge of 7,329 AFY for calendar year 2000 to 2013 was estimated. Using an existing Basin Characterization Model, the USGS (2018) estimated that

annual average recharge to the Basin was 8,680 AFY during 1981 to 2010 and 5,980 AFY during 2000 to 2013. The most recent recharge study by Saleh et al. (2026) reported a total recharge of 8,675 AFY for water year 1981 to 2010.

There are no significant interconnected surface water systems which interact with groundwater in IWVGB. Streams in the valley are ephemeral and recharge occurs as mountain block recharge. Surface water in Little Lake, located in the Rose Valley recharge area, is thought to infiltrate into groundwater and then contribute as subsurface flow into the Basin. Estimates of losses from Little Lake are included in the annual recharge amount in

Table **10** (McGraw et al, 2016).

As shown in Table 10, the USGS has estimated between 5,980 AFY and 8,680 AFY of recharge from mountain front recharge. The USGS Study (2026) attributes no recharge from Rose Valley and approximately 1,865 AFY to the White Hills/Volcanics area, southeast of Rose Valley, which is significantly larger than estimated in other studies. However, when comparing more recent DRI estimates of recharge from both Rose Valley and the White Hills/Volcanics area, as described in Section 4.2, the combined recharge of approximately 2,220 AFY is generally consistent with the combined recharge from the USGS Study. This suggests that the estimates of total recharge from the north and northwest portion of the Basin have relatively converged, though the distribution of the recharge in that area has some uncertainty. A new monitoring well was drilled in 2021, south of Little Lake to help fill this data gap.

The IWVGB has many natural springs, shown in Figure 23, generally located in the mountain areas, that contribute to the ephemeral streams and mountain block recharge. Each point represents a spring or seep as mapped by the USGS in the National Hydrographic Dataset (NHD) (USGS, 2019). Springs in the IWVGB have historically been used for human water supply, cattle, and wildlife. Spring water quality and geochemistry have been studied previously (Stoner et al, 1995; Houghton HydroGeo-Logic, 1996). The water quality of the spring/surface water samples collected is relatively good. Although total dissolved solids (TDS) concentrations range from 199 mg/L to 1,300 mg/L, the average TDS concentration for these samples is 533 mg/L. The majority of samples collected from springs/surface water sources fall within the recommended TDS Secondary maximum contaminant level (MCL) and the upper TDS Secondary MCL for potable water, 500 mg/l and 1,000 mg/L, respectively. Data are included in Attachment G.

### **3.2.3 EVAPOTRANSPIRATION**

Mapping of DWR's Natural Communities Commonly Associated with Groundwater (NCCAG) dataset indicates the vast majority of groundwater dependent ecosystems (GDEs) within the IWV are located on NAWS China Lake, supported by the vertical upward gradient under the China Lake Playa which causes groundwater to discharge to the surface. Smaller and scattered communities of GDEs may be present in the canyons along the Sierra Nevada, in the El Paso area along the ephemeral streams, and in the southwest region of the IWV. A map of the different vegetative species comprising the GDEs within the IWV is shown in Figure 24. Although phreatophytes are not mapped by DWR, they are present in the surrounding mountain canyons. The U.S. Navy has mapping of GDEs on NAWS China Lake with variations to the NCCAG dataset; however, the spatial extent of GDEs is similar to the extent mapped by the NCCAG. A field visit on November 1, 2018 verified the significant presence of GDEs in the China Lake Playa region on the NAWS China Lake.

The evapotranspiration (ET) that occurs at the China Lake Playa and nearby phreatophytic area is the primary natural discharge for the IWVGB. Prior to development of well fields around the 1920s, ET from the China Lake Playa was the predominant outflow from the IWVGB. Lee (1913) estimated total evaporation loss from the valley to be as high as 31,630 AFY in 1912 and was later re-estimated by Kunkel and Chase (1969) to 11,000 AFY for that same period, noting that Lee's (1913) estimate was far too high given more recent understanding of ET rates. Kunkel and Chase (1969) also stated ET

further decreased to approximately 8,00 AFY due to increased groundwater pumping in the Basin. Todd Engineers (2014) noted that estimates of ET have decreased over time, as shown in Table 11; “[some] of the decrease is attributable to revised estimates of recharge based on model calibration, but most of it reflects the interception of playa outflow by wells.” Declines in water levels alter and reduce bare surface evaporation rates and phreatophyte vegetation, thereby reducing transpiration, and reduce bare surface evaporation rates. Though Dutcher and Moyle (1973) did not provide their own estimate of ET, they reported that natural ET losses could not be reduced below 1,000 AFY, as water managers maintain a slight hydraulic gradient toward areas of poorer water quality groundwater near China Lake and east of Ridgecrest. Furthermore, maintaining and controlling this gradient is difficult under active pumping conditions, resulting in continued ET at the playa.

*Table 11. Historical ET Estimates*

ET Estimate (AFY)	Year	Source	Note
31,600	1912	Lee (1913)	Based on poor maps and no aerial photographs
11,000	1912	Kunkel and Chase (1969)	Predevelopment groundwater condition
8,000	1953	Kunkel and Chase (1969)	Decrease in ET is due to increase in groundwater pumping
9,850	1920	Berenbrock and Martin (1991)	Predevelopment groundwater condition
6,570	1985	Berenbrock and Martin (1991)	Decrease in ET is due to increase in groundwater pumping
7,450	Steady state	McGraw et al. (2016)	Predevelopment groundwater condition

Vegetation changes have been assessed by comparing maps of the current vegetation distribution to the pre-development vegetation map of Lee (1913). The major difference is the addition of greasewood in areas north and east of the playa, and also in a small area to the southwest, where pickleweed and saltgrass occurred previously (McGraw et al., 2016). The pickleweed and saltgrass vegetation zone is associated with a shallower water table with a maximum ET rate of 5.7 ft/yr, and ET effectively terminates when the water table is greater than 10 ft bgs. The greasewood unit that develops as water levels decline has a maximum ET rate of 2.4 ft/yr and a maximum rooting depth of 33 ft. Current bare playa evaporation rates have been estimated from data from an eddy covariance station at the south end of China Lake playa and suggest annual ET of 4.5 inches for the adjacent bare playa area (McGraw et al., 2016). This measurement removes rainy days from the calculation, but bare playa groundwater ET could be as low as 2.4 inches per year, if ET is included after significant precipitation events.

In 2022, additional potential GDE areas were identified through field surveys conducted by IWVGA and the Navy (Attachments H and I) . Vegetated and unvegetated areas were defined through review of the mapping of landforms in the Basin in conjunction with data from California Department of Fish and Wildlife (CDFW) on vegetation types to determine evapotranspiration zones. Additional landform and vegetation map datasets were evaluated to better characterize the zones of

evapotranspiration from three types of vegetated areas, as well as from bare soil evaporation from playa and alluvial plain surfaces. Revised mapping based on landforms has identified a larger area in which GDEs potentially reside on the playa in NAWS China Lake. The CDFW data on vegetation types were used to assign a landform type, which were discretized in the China Lake Playa area into 11 zones, where different ET rate and extinction depth were assigned to each zone. The evapotranspiration zones are listed below and shown in Figure 25.

Evapotranspiration Zones:

- Channel
- Delta Plain
- Flood Plain
- Flood Plain Playa
- Playa
- Playa Margin
- Playa Wet
- Sandsheet
- Dune
- Vegetated Dune
- Vegetated Sandsheet

## 4 NUMERICAL GROUNDWATER FLOW MODEL

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### 4.1 2020 GSP MODEL

#### 4.1.1 INITIAL MODEL DEVELOPMENT

The 2020 GSP groundwater flow model (2020 Model) of the IWV was developed on a foundation of decades of hydrogeologic investigations of the Basin. Early numerical modeling efforts focused on the Ridgecrest and Inyokern areas and used a simplified aquifer geometry (Bloyd and Robson, 1971). Subsequent work by Berenbrock and Martin (1991) incorporated a more sophisticated representation of aquifer geometry, but the system was simulated only in a quasi-three-dimensional manner. These early models provided foundational information on the Basin's hydraulic properties, however estimates of recharge, evapotranspiration, and predevelopment groundwater use have since been refined based on more recent data. The USBR (1993) further developed knowledge of the hydrogeology of the IWV through the drilling, testing, and analysis of 10 deep wells (approximately 2,000 feet) on the western side of the valley to evaluate mountain front recharge. Additional investigations by Tetra Tech EM, Inc. (2003a, b), expanded datasets regarding groundwater quality and isotopic composition, particularly near the China Lake playa.

The 2020 Model was built upon the Brown and Caldwell model published in 2009. The Brown and Caldwell model successfully replicated some of the regional hydrogeologic features and was used to explore overdraft conditions. However, the model exhibited limitations in reproduction observed

drawdown rates, including underestimating drawdown in the Ridgecrest area and southwestern area of the Basin and overestimating drawdown northeast of Ridgecrest, indicating spatial bias. Additionally, the model errors generally increased over time.

Recharge and ET values were later revised for the 2009 model, and other conceptual model features were added, including a fine-grained sediment plug in the western valley, a gravel zone, and a high gradient zone between the El Paso Subbasin and IWV. In 2011, Layne Hydrologic (2011) further refined the model by improving grid spacing and the solver configuration and updating initial conditions and pumping rates. In 2016, DRI developed a significantly improved groundwater flow model (McGraw et al., 2016) for the U.S. Navy to support planning for NAWS China Lake in response to declining groundwater levels and concerns about water quality degradation and subsidence. Starting with the Brown and Caldwell (2009) platform, mountain front recharge and playa evaporation rates were refined, the grid resolution was increased in the horizontal and vertical directions, model layering was refined to better represent aquifer units, boundary conditions were modified to allow flow to Salt Wells Valley and a pilot-point hydraulic parameterization was performed to improve calibration to water levels and, importantly, to drawdown rates. A solute transport model and subsidence model were linked to the flow model to allow simulations of the impact of pumping on groundwater quality and land subsidence. Alternative conceptual models were analyzed, as were alternative future conditions. During 2017, DRI revised the model for the Navy by incorporating regional faults as groundwater barriers (Garner et al., 2017). This change corrected underprediction of water levels in El Paso sub-basin by including the informally named EPF in the southwestern sector of the valley. The LLFZ was similarly added as a horizontal flow barrier trending northwesterly across the middle of the IWV.

Following peer review<sup>14</sup>, the Navy retained DRI to update the existing models (McGraw et al., 2016 and Garner et al., 2017), address SGMA concerns, and recalibrate to historical 1922-2017 conditions. The IWVGA's Technical Advisory Committee (TAC) provided a model ad hoc group to participate in two model workshops and multiple conference calls for model review and comments during the IWVGA model's historical calibration. Model assumptions, construction, and performance are detailed in the 2020 Model Documentation (Attachment J).

## **4.1.2 FLOW MODEL REVIEW AND RECALIBRATION**

### **4.1.2.1 MODEL REVIEW**

The IWVGA TAC review of the model included evaluating model assumptions and documentation (McGraw et al., 2016; Garner et al., 2017), meetings with DRI modelers and Navy personnel, a hydrogeologic site visit, and assessment of model output files. Guidelines used to evaluate the model included GSP Emergency Regulations, DWR best management practices for modeling (DWR, 2016c), and USGS's recommendations for evaluating groundwater models (Reilly and Harbaugh, 2004). The DRI groundwater flow model was reviewed to evaluate its accuracy in describing the groundwater Basin structure, hydrogeologic characteristics, and inflows/outflows. The model review also evaluated the hydrogeologic representation of available historical data and conceptual

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<sup>14</sup> See Section 4.1.2.1.

model, model construction, boundary conditions, aquifer properties, and fluxes (recharge, pumping, ET). Model performance was assessed based on water budget consistency and numerical convergence criteria. Steady state and transient model calibration were evaluated based on the Hydrogeologic Conceptual Basin Model.

This review prompted additional changes to the flow model and a full recalibration. Changes to the flow model incorporated additional hydraulic conductivity data, revisions to the conceptual model in several areas including the northwest and southwest, and sensitivity analyses for recharge, hydraulic conductivity, specific storage and specific yield. Conceptual model changes include representation of a zone of low hydraulic conductivity in the northern Brown Road area, extension of the zone of low hydraulic conductivity playa sediments southward, and increased vertical variability in hydraulic properties. The transport model was also updated to include a revised salinity database and revised boundary conditions for the recharge salinity.

#### **4.1.2.2 MODEL CALIBRATION**

The 2020 Model was calibrated in three phases. Calibration of the model involved adjusting selected hydrogeologic parameters using manual and automated calibration processes to improve convergence of the model's simulated results with observed historic trends in IWV and the El Paso sub-basin. The flow model was calibrated in two stages, steady state and transient, with comparisons made to observed water levels and water budgets in both cases. The calibration methods and results were reviewed and approved by the IWVGA TAC and its Model Ad-Hoc Committee during a series of meetings held in 2018 and 2019.

The steady-state groundwater flow model represents predevelopment hydrologic conditions before large-scale groundwater pumping began in 1921. This model is calibrated to steady-state water levels measured in 132 wells in IWV in 1920 and four wells in the El Paso sub-basin. Pre-development water levels are not available in El Paso sub-basin, so recent stable water levels are used instead. During calibration, the values of two model parameters were varied: (1) horizontal hydraulic conductivity of the six model layers and (2) hydraulic characteristics (fault transmissivity divided by barrier width) of the two major faults included in the model. These parameters were chosen because in general they have significant effects on simulated water levels and because measurements of their values in IWV are limited and therefore are considered more uncertain than other parameters. Ranges of hydraulic conductivity were developed for the four primary subsurface hydrogeologic units in the valley by Brown and Caldwell (2009). The ranges of the parameters used for the DRI model calibration and their calibrated values are described in the 2020 model documentation. The results of calibration show that the steady-state flow model provides a good simulation of observed water levels in IWV (Figure 27). The mean absolute error (MAE) between simulated and observed water levels is 6 feet. The relative error in water levels, which is the MAE divided by the range in observed water levels, is 0.84 percent, which is far below the 10-percent threshold that is generally considered an acceptable maximum relative error for predictive models.

Groundwater conditions during the period 1921 through 2016 were simulated by the transient flow model. This model was calibrated to water budget terms and historic water-level trends and water levels observed in 36 wells (Figure 28) by adjusting values of the transient storage parameters

specific storage and specific yield. The values of the hydraulic conductivity and fault hydraulic characteristic parameters determined during calibration of the steady-state model were adopted unchanged in the transient model.

Model results were found to be insensitive to specific storage so this parameter was assigned a constant value of  $3 \times 10^{-7} \text{ ft}^{-1}$  for all confined model layers. The transient model uses observed rates of water-level drawdown that resulted from groundwater pumping as a calibration metric to supplement the Mean Absolute Error (MAE) of water level elevations. This approach was taken because the rate of drawdown is the critical factor for simulating the effect of overdraft conditions.

The water-level elevation is generally controlled by hydraulic conductivity and recharge, parameters that were determined in the steady-state model, while drawdown rates are strongly affected by storage parameters. This approach minimizes errors in the transient calibration that might result from the model attempting to resolve offsets in water level elevations simulated by the steady-state model. A robust regression slope-fitting approach was used to remove observation outliers and compute the differences in slope of the simulated and observed water-level trends at the 36 observation locations. An example of the slope-fitting approach is shown in Figure 29. The results of both calibration metrics as they relate to specific yield values are shown in Figure 30. The optimal solution using drawdown slope as the metric is obtained for a specific yield value of 0.225, whereas an optimum specific yield of 0.25 results when using MAE of water levels as the metric. Although these values are very close in magnitude, the value of 0.225 was selected because the drawdown-slope approach more accurately represents how the model is applied for predictive pumping scenarios. The transient model was also calibrated to water budget terms and demonstrated excellent agreement with measured ET rates.

#### **4.1.3 TRANSPORT MODEL**

Saline groundwater that underlies several areas of Indian Wells Valley may reduce water quality in production wells if this poorer-quality groundwater is drawn toward pumping centers. Solutes in groundwater within Indian Wells Valley are conceptualized as originating from recharge from surrounding mountain ranges, groundwater subsurface flow from Rose Valley, mixing with remnant evaporative brines and geothermal fluids, and concentration by evaporation. Solutes are removed from the groundwater system by precipitation of minerals and discharge to Salt Wells Valley to the east. McGraw et al. (2016) summarized historical studies that together identify areas of generally higher salinity groundwater to the east near China Lake Playa, to the northwest toward Rose Valley, around eastern Ridgecrest, and in other locations associated with clay horizons or geothermal zones. Evidence of increasing salinity in wells in the Ridgecrest area have been documented by Berenbrock and Schroeder (1994) and Todd Engineers (2014).

A three-dimensional solute transport model was developed to address the effects of pumping on groundwater quality over time. The transport model is coupled with the groundwater flow model of IWV, utilizing the same model domain, grid structure, and layers. TDS concentrations are used in the transport model as a surrogate for groundwater salinity to forecast TDS concentrations from the present to the year 2070 by incorporating the volumetric groundwater flow rates simulated by the flow model for the SGMA management scenario. The results are presented as time-series plots

showing forecasted TDS concentrations at selected locations of interest, maps showing the spatial distribution of forecasted TDS concentrations for selected times, and maps showing rates of change of TDS concentration as selected times. The TDS initial conditions for the transport model were developed from historical groundwater TDS measurements as described in Attachment G. From the Groundwater Ambient Monitoring and Assessment Program (GAMA) database (California Water Board, 2018), publications by the USGS (such as Moyle, 1963; Berenbrock, 1987, and Berenbrock and Schroeder, 1994), and a database by the Kern County Water Agency (2018). The resultant database includes 563 locations with data collected over a 70-year period, though only wells with known depths were utilized for the model. The most-recent TDS concentration for each location (if multiple values were available) at the time of 2020 GSP development provided the framework for interpolation to a continuous TDS distribution over all model cells.

The transport model was vertically partitioned into three TDS zones to represent the TDS distributions at shallow, intermediate, and deep depth intervals as indicated by the measurements. The Shallow TDS zone includes measurements within the depth range of flow model layer 1, the Intermediate TDS zone corresponds to flow model layers 2 and 3, and the Deep TDS zone includes measurements within the depth ranges of flow model layers 4, 5, and 6. The deeper flow model layers were combined for the transport model because the TDS data are sparse (Figure 31). For cases where measurements at multiple depths at a single well location occur in the same TDS zone, their average TDS value was used, resulting in an initial condition dataset of 391 TDS data points. The measured data were supplemented by manually assigned control points in regions of sparse data to ensure that the interpolated TDS distributions were consistent with conceptualized TDS distributions. The initial TDS concentrations (both measured and control points) for the three TDS zones are shown in Figure 31.

A quantitative calibration of the transport model was not performed because the initial TDS distribution integrates available measurements that span many decades; thus, a single historic simulation period could not be developed for calibration. Instead, a qualitative calibration compared the forecasts of TDS trends simulated by the transport model to general historic trends and spatial distributions represented by the conceptual model of groundwater salinity. The values of transport parameters (e.g. dispersivity and porosity) were based on those used in DRI's groundwater transport model for the Navy (McGraw et al., 2016) and were adjusted as needed during model calibration. TDS concentrations of recharge at the model boundaries were also revised from the DRI groundwater transport model. Detailed descriptions of the assumptions, configuration, and results of the Indian Wells Valley transport model are contained in the 2020 Model Documentation (Attachment J).

## 4.2 MODEL UPDATE

In 2018, the Navy supported the transfer of responsibility of the Basin Model's maintenance, use, development and upgrade to the IWVGA. As part of this transfer of responsibility, a Configuration Management Plan (CMP) was developed outlining the processes for development, maintenance, upgrade, and use of the Basin Model. The CMP, included as Attachment K, outlined the establishment of a Technical Modeling Group (TMG) to review new and existing data for recommending upgrades to the Basin Model and HCM. The TMG is also tasked with documenting

model changes and configuration items to be considered for use in the Model. The TMG has recorded configuration items and model changes for both inclusion in the Basin Model update and future investigation in the Configuration Item (CI) List, which is provided in Attachment L. This CI List also outlines several configuration items that have been identified as data gaps for inclusion in future model updates.

The CMP was established in 2021 to maintain and upgrade the existing 2020 GSP Model. The CMP process provided a structure for technical review of new data, and methods for updating the groundwater model as necessary over time. The current 2025 Model Update was conducted between 2021 and 2024 using this CMP process.

The existing 2025 GSP Model incorporates new data and a revised HCM. The revised model domain is approximately 21% smaller than the 2020 GSP Model domain area. The reduction in area is related to more realistically defining the basin margins using a combination of evaluating depth to bedrock and identifying areas of unsaturated valley fill with a minimum thickness of 100 m based on available groundwater levels. The margins of the model domain are also partially controlled by the distribution of range-front faults, especially in the northwestern sector of the model domain. Additionally, the total steady-state inflow (recharge) of 7,650 AFY did not change between the 2020 and 2025 GSP Models (Figures 32 and 33), however the spatial and vertical distributions of mountain-front recharge were revised in the 2025 GSP Model.

According to Dutcher et al. (1973), the IWVGB consists of non-water bearing basement complex rocks of pre-Tertiary age, the volcanic rocks of Tertiary and Quaternary age, and the basalt of Quaternary age and water bearing continental deposits of Tertiary and Quaternary age, and the alluvium and playa deposits of Quaternary age (Figure 12). Areas on the northern margin of the IWVGB include Pliocene sedimentary rocks of the White Hills sequence that are locally overlain by thin Quaternary volcanic flow rocks (Jennings et al., 1962; Monastero et al., 2002). These Tertiary sedimentary and volcanic rocks are consolidated and not representative of unconsolidated sedimentary valley fill. The consolidated rock types are not part of the IWVGB unconsolidated sedimentary aquifer system. The 2025 recharge distribution included an additional recharge area associated with White Hills formation in the northern sector of the Basin (Figure 12).

Additional faults from the Little Lake Fault and El Paso Fault included in the 2020 Model were identified in USGS and CGS mapping and included in the updated model (Figure 17). The distribution of hydraulic conductivity estimates discussed in Section 3.1.5 were reviewed by the TMG and incorporated into the 2025 GSP Model. Additionally, the 2018 SkyTEM AEM data, detailed in Section 3.1, was used to define the depth and extent of the thick clay unit. The evaluated AEM data was calibrated to deep well logs to characterize the spatial extent of the fine-grained IHZ (aka "Clay" unit) for inclusion in the Basin Model. This clay layer (shown in Figure 19) was determined to have an area of 147 square miles or about 41% of the total area of the 2025 GSP Basin Model domain.

In the 2020 GSP Model, vegetative ET and bare soil evaporation were not separately simulated, whereas the 2025 GSP Model simulates both vegetative ET and bare soil evaporation separately. Additionally, the extent of outflow from evapotranspiration was refined in the 2025 GSP Model by using detailed landform and vegetation map datasets, as described in Section 3.2.3, to better

characterize the zones of evapotranspiration from three types of vegetated areas, as well as from bare soil evaporation from playa and alluvial plain surfaces (Figure 25).

Time steps were also revised from the 2020 GSP Model, which simulated annual calendar years (CY) from 1921-2016. The 2025 GSP Model time steps were based on annual WY stress periods from 1921-1995, and monthly stress periods for WY 1996-2022. A comparison of transient-historical model error statistics for the 2020 GSP Model and 2025 GSP Model, as shown in the 2025 Model Documentation (Attachment M) show that the 2025 GSP Model improved model error statistics, indicating that the updated model has improved accuracy.

More detailed revisions and updates to the 2020 Model are documented in the Attachment M.

## 5 CURRENT AND HISTORICAL GROUNDWATER CONDITIONS AND HYDROLOGY

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### 5.1 HISTORY OF WATER USE IN THE INDIAN WELLS VALLEY

The first water use in the IWV corresponds with the first habitation of the valley by Native Americans more than 10,000 years ago (Giambastiani, 2017). Evidence of prehistoric village sites in the IWV suggest a stable, long-term resident population. During that time, the region was different than it is today, characterized by a cooler and wetter climate with numerous springs, lakes, and streams. The valley was surrounded by conifer forests similar to the forests seen today along the Sierra Crest, in areas above the elevation at Walker Pass (Harris, 2013).

Approximately 7,000 years ago, the region's climate started to warm and dry, causing the gradual appearance of the present-day Mojave Desert landscape (Bacon, 2006 and Bacon, 2014). Research indicates the creosote bush, which is prevalent in the IWV today, had arrived around that time.

The first Europeans arrived in the valley in the first half of the 1800s, consisting of trappers, adventurers and explorers. Joseph Walker passed through in the early 1830s, and then returned with the Fremont party in 1845, which included famous explorers Kit Carson, Richard Owens, and Ed Kern. These early European arrivals in the IWV were transient, with many of these parties making use of the perennial Indian Wells Spring, where the restaurant and brewery along Highway 14 are today, as they passed through the IWV. Travelers during the California Gold Rush, the infamous Death Valley 49'ers Parties, and the Whitney Geological Party are all thought to have utilized perennial springs during their travels (Farquhar, 1946).

The second half of the 19th century brought more permanent settlements along the Eastern Sierra with the development of mining operations. Given the arid climate, fresh water was a valuable commodity and exclusively came from surface flows at springs and streams. Sites such as Coyote Holes near Freeman Junction, Indian Wells, and Little Lake became noted water stops. Borax and soda deposits were mined along Searles Lake and China Lake, gold and silver in the Panamint and Coso Ranges, creating additional freight and stagecoach routes running between water sources.

Basque sheepherders also arrived in the IWW during the late 1800's and drove their sheep through the valley every year in route to their summer ranges north of Bishop (Harris, 2013).

The composition of the community and water landscape changed toward the end of the 1800s when a large gold discovery in Randsburg attracted thousands of people into regions surrounding the IWW. Additional mines were developed in the Rademacher Hills at the south edge of the IWW, and many operations required ground or spring water to supply the milling needs. The infrastructure became part of the support for the future construction of the Los Angeles Aqueduct that supplies water from the Owens Valley to the City of Los Angeles. The "Jawbone" branch of the Southern Pacific Railway was constructed in 1910 partly to aid in the construction of the LA Aqueduct (Complete Report on the Construction of the Los Angeles Aqueduct, 1916). These projects and operations encouraged an influx of miners, farmers and teamsters into the valley for work, which led to land and farming promotions that fostered the establishment of the communities of Inyokern and Brown.

The beginning of the 20th century saw an even greater migration of people into the IWW to homestead and farm. As a significant number of government land titles were issued, agriculture land use increased, which resulted in an estimated 1,000 acre-feet (AF) of groundwater use to support local farms by 1912 (Lee, 1912). Typically, alfalfa and oats were grown in the IWW for dairy cattle and for horses and mules for the extensive freighting operations.

Industrial groundwater uses also increased during the first decades of the 20th century. Westend Chemical Company (previously Pacific Coast Borax Company) began transporting water from the IWW in the 1920's. A pipeline was built in 1930 to transport water from a well at the Windy Acres Ranch location to Searles Valley. In 1942, an additional pipeline was constructed by American Potash and Chemical Company (previously known as American Trona Corporation) to transport water from its wells in the IWW to Searles Valley. After multiple acquisitions, the mining company in Trona became Searles Valley Minerals Incorporated in 2004, as it is known today. Searles Valley Minerals Inc continues to be the largest industrial user and only exporter of water from the IWWGB.

World War II brought permanent changes to the IWW by introducing the U.S. Navy into the region. In 1943, the U.S. Navy began development of the Naval Ordnance Test Station, which included construction of hundreds of industrial and residential buildings, roads, runways, and other necessary infrastructure. As development by the U.S. Navy continued, more groundwater wells were drilled to supply the increased water demands. Most of the IWW's new permanent residents were associated with the naval operations and lived on Navy property during the 1940s and into the 1970s. The growth of naval operations led to the incorporation of the City of Ridgecrest in 1963. In the 1970s and 1980s, Navy personnel began shifting to off-Base housing in the City of Ridgecrest, which transferred water demands from the U.S. Navy service area to the IWWWD.

Water use in the IWW over the past 70 years has been documented, first by the U.S. Geological Survey (USGS) with U.S. Navy participation and then by the U.S. Bureau of Reclamation (USBR). For a period of about 20 years starting in the mid 1990's annual production record keeping was maintained by the IWW Cooperative Group, comprised of the Basin's major water producers, and local, county, and Federal agencies. Groundwater production estimates provided from the IWW Cooperative Group starting in 1975 is shown in Attachment N.

Available water use data show total groundwater production of 15,980 AF in 1975, with the U.S. Navy accounting for 31% of pumping (Table 12). Available production data estimated that groundwater production exceeded 29,000 AF in 1984 (29,521 AF), 1985 (29,730 AF), 2006 (29,316 AF), and 2007 (29,433 AF). By 2015, total groundwater production had decreased to approximately 25,300 AF due to conservation efforts primarily by the Navy and the IWVWD. Relative to 1975, agricultural pumping represented a far greater proportion of total production by 2015, while Navy’s proportion of total production declined significantly.

*Table 12. Historical Pumping Distribution by Water Use (Calendar Year)*

<b>Water Use</b>	<b>1975</b> 15,980 AF	<b>1985</b> 29,730 AF	<b>2007</b> 29,433 AF	<b>2015</b> 25,285 AF
Agriculture, Irrigation <sup>1</sup>	22%	48%	42%	52%
Industrial	17%	8%	9%	10%
Municipal/Domestic <sup>2</sup>	29%	31%	41%	33%
U.S. Navy	31%	9%	9%	6%

*Note: individual percentages have been rounded to the nearest 1%, and the sum of the numbers may not equal 100% due to this summation rounding error.*

<sup>1</sup> *Agriculture, Irrigation includes Meadowbrook Farms, Simons Ranch, City of Ridgecrest, Neal Ranch, Quist Farms, S. Leroy, and other Orchards estimated on the Cooperative Group’s Pumping Table included in Attachment N.*

<sup>2</sup> *City/Municipal/Domestic includes China Lake Acres, IWVWD, Inyokern CSD, Private Wells and R/C Heights estimated on the Cooperative Group’s Pumping Table included in Attachment N.*

**5.2 GROUNDWATER PRODUCTION**

Groundwater production within the IWVGB supports municipal, domestic, agricultural, industrial, and federal users. Within Ridgecrest, the IWVWD is the primary municipal water supplier that serves potable water to the residents of Ridgecrest and certain areas outside of Ridgecrest’s jurisdiction through its own groundwater wells. Residents of Indian Wells Valley not supplied by the Water District, are served groundwater through private domestic wells, small cooperative groups sharing wells, small mutual water companies, and the Inyokern Community Services District (Inyokern CSD).

The Navy produces and distributes groundwater for the on-station water uses at the NAWS China Lake. However, more recently, the majority of Navy-affiliated staff reside off-station, and the water supply needs of the off-station Navy-affiliated staff and their dependents are supplied by either the Water District, Inyokern CSD, or by privately-owned domestic wells. SVM produces groundwater from the IWVGB for use in its minerals recovery and processing operations in the Searles Valley (located east of the IWVGB) and for potable use in the small communities of Trona, Westend, Argus, and Pioneer Point in the Searles Valley. In addition, a number of farms located in the Indian Wells Valley rely on the IWVGB’s groundwater supplies for their agricultural operations, including Meadowbrook Dairy, Mojave Pistachios, Simmons Ranch, Quist Farms, and other smaller farms. The crops grown in the Indian Wells Valley are primarily alfalfa and pistachios.

The IWVGA, in conjunction with Desert Research Institute (DRI), has developed a groundwater pumping database containing a compiled list of active wells in the IWVGB as well as their respective uses of groundwater and approximate well locations, which have been cross-referenced using existing published databases and aerial photographs. Monthly volume of pumping was reported to the GA from 2020 through 2023 by agriculture, irrigation, municipal, and navy groundwater pumpers. The Navy provided more detailed historical pumping records for refining the historical model from 1945 to present. In addition, court documents were received with updated historical agricultural irrigation pumping. These new data were used to develop monthly pumping curves for estimating historical calibration and future baseline monthly pumping.

As shown on Figure 33A, there are an estimated 946 groundwater production wells located in the IWVGB with an average well density of approximately 1.6 wells per square mile. The NAWS China Lake's groundwater production wells for on-station water uses are not included in Figure 33. Figure 33B displays a bar graph showing the estimated annual pumping by water year and pumping group for the Historical Calibration (WY 1921-2022). A summary of groundwater production wells by type of use is provided in Table 13 below *Table 13*.

Approximately 90% of all groundwater production wells in the IWVGB support domestic/private uses. It is estimated that approximately 832 domestic/private wells in the IWVGB produced approximately 832 AF in 2015, or approximately 3% of total groundwater production in 2015.

*Table 13. Summary of Groundwater Production Wells in the IWVGB*

<b>Well Use</b>	<b>Number of Wells</b>
Domestic/Private	832
Mutuals and Co-ops	44
Navy	6
Industrial	5
Landscape Irrigation	6
Large Agriculture	30
Municipal	11
Small Agriculture	12
<b>Total</b>	<b>946</b>

A shallow well impact analysis conducted in 2019 (Attachment O) identified approximately 872 of the wells within the IWVGB to be shallow. To estimate well construction details, available well logs and permits from the Kern County Health Department's permit database were reviewed for 188 wells. This review found that approximately 95% of those wells had a total depth of 200 feet or less, making these wells very susceptible to impacts of groundwater elevation decreases as groundwater in storage is depleted. As more domestic wells were registered with the IWVGA, some well registration forms have indicated well depths to range approximately between 50 and 500 feet, though the majority of well depths lie between 250-350 feet.

Groundwater production in the IWVGB has decreased since adoption of the 2020 GSP. The water use sectors that saw the largest decrease in annual pumping were urban and agriculture water

users, as shown in Table 14. Though the general trend for groundwater pumping in the IWVGB has decreased, domestic and rural water production saw slight increases in pumping since WY 2019, likely due to population growth. However, this water sector has the most uncertainty, due to limited reported data. Most recent estimates for domestic and rural water production indicate that production has decreased back to WY 2019 production. The IWVWD, which is included in the urban water sector, has implemented water conservation measures that have allowed the IWVWD to reduce their pumping significantly, despite population growth. Agricultural production shows a general decline, with future production expected to decrease further through implementation of the GSP. The Navy’s production has fluctuated mildly since WY 2019; however the Navy retains its Federally Reserved Water Rights (FRWR) of 2,008 AFY<sup>15</sup>.

*Table 14. Estimated Annual Water Year Pumping*

<b>Water Use Sector</b>	<b>WY 2019</b>	<b>WY 2020</b>	<b>WY 2021</b>	<b>WY 2022</b>	<b>WY 2023</b>	<b>WY 2024</b>	<b>WY 2025</b>
Urban	6,360	6,510	6,530	6,060	5,620	6,190	5,980
Industrial	2,690	2,820	2,180	2,370	2,570	2,810	2,820
Agriculture	10,920	9,850	8,900	9,570	8,110	8,760	8,700
Federal	1,460	1,410	1,770	1,710	1,380	1,620	1,330
Domestic and Rural	1,380	1,410	1,420	1,450	1,470	1,460	1,370
<b>Total</b>	<b>22,810</b>	<b>22,000</b>	<b>20,800</b>	<b>21,160</b>	<b>19,150</b>	<b>20,840</b>	<b>20,200</b>

**5.2.1 DOMESTIC AND RURAL PUMPING**

Domestic and rural groundwater pumping within the Basin represents a relatively small, but uncertain portion of total groundwater use, due to limited tracking and reporting of groundwater use from private wells. Additionally, water use at individual properties can vary significantly depending on factors such as occupancy, use of evaporative cooling systems, and seasonal irrigation and landscaping practices. In addition, some wells serve multiple residences through a shared or multiple hookup system. As shown in Table 14, domestic and rural pumping have consistently been estimated to be around 1,400 AFY.

Todd Engineers (2014) estimated that approximately 1,588 rural residences in the Basin were supplied by private groundwater wells based on parcel mapping and aerial imagery analysis. Through aerial photography combined with some field reconnaissance, the IWVGA identified 832 of the residences as obtaining water from individual private domestic wells, with the remaining residences assumed to be part of mutual water systems (Mutuals), small groups of domestic water users sharing wells (co-ops), or small water systems (SWS), including Inyokern CSD. Todd Engineers (2014) assumed that the average water use per single-family home would be comparable to the IWVWD’s water use per connection, of approximately 0.5 AFY per home. The IWVGA assumed an average water consumption of 1 AFY well based on guidance from the IWVGA TAC and on the fact

<sup>15</sup> Determined in preliminary ruling in Orange County during Phase 1 trial of Mojave Pistachios, LLC; et al., v. Indian Wells Valley Water District; et al (July 28,2025)

that some rural homes may use more water due to use of swamp coolers or irrigation of landscaping, whereas other rural homes may use less water, are only occupied in the cooler months, or are smaller households.

Prior to required groundwater production reporting to the IWVGA, the IWVGA estimated an average 0.72 AFY per metered water supply from Mutuals, co-ops, and SWSs. Groundwater production by Mutuals, co-ops, and SWSs have since been reported monthly to the IWVGA starting in 2020, and reported pumping from metered water supplies show this estimate to be very close. However, the IWVGA relies on self-reported groundwater use and not all wells within the Basin have registered their wells with the IWVGA. Additionally, de minimis water users using less than 2 AFY are not required to report groundwater production to the IWVGA. Therefore, accurate quantification of domestic water use in the Basin remains highly uncertain.

In general, domestic and rural pumping has not been projected to increase significantly. While there have been some increases in water use as new rural homes have been built, increases have been partially offset by water conservation practices by residences or consolidation with the IWWWD.

### **5.2.2 SMALL AGRICULTURAL PUMPING**

In addition to larger agricultural operations such as Meadowbrook Dairy and Mojave Pistachios, several smaller agricultural (Small Ag) groundwater users operate within the Basin. Known small agricultural groundwater users include Simmons Farms, Sierra Shadows, Quist Farms, Amberglow Ranch, Hickle, Bellino, McGee, Schiller, Shacklett, and MEK/Terese Farms. While many of these users have historically self-reported groundwater production to the IWVGA, groundwater production estimates in more recent years have relied on previously reported pumping data, land use observations, and irrigation trends due to limited reporting. Excluding Meadowbrook Dairy and Mojave Pistachios, groundwater production for other agricultural users has generally been estimated at approximately 1,000 AFY. In recent years, some agricultural operations have reduced or discontinued farming activities in response to changing economic conditions, reduced water availability, and implementation of groundwater management actions within the Basin.

## **5.3 GROUNDWATER ELEVATIONS**

Groundwater levels within the IWVGB are monitored through a network of production wells and dedicated monitoring wells distributed throughout the Basin. The IWVGA collects groundwater elevation data in coordination with the Navy and Kern County Water Agency (KCWA). To date, the IWVGB's monitoring network, includes approximately 190 monitoring wells, including 30 nested monitoring wells and 28 wells with telemetry. The monitoring network used to evaluate groundwater elevations is shown on Figure 34. Wells equipped with telemetry for continuous groundwater level monitoring are shown in Figure 35. Groundwater elevations are measured twice per year, in the Spring and the Fall, to capture seasonal variability. Following each measuring event and when incorporating historical groundwater elevation data, all data is carefully reviewed to remove discrepancies or anomalous data points that are not characteristic of actual groundwater conditions in the Basin. Groundwater elevation data that are properly vetted and reviewed are then uploaded to

the IWVGA's Data Management System (DMS)<sup>16</sup> and submitted to DWR, and serve as the accepted dataset for all Basin analysis and modeling.

Groundwater elevation contour maps from 2010, 2015, and 2023 are presented in Figures 36 to 38. The spring 2010 groundwater contour map (Figure 36) indicates two drawdown cones. One of the drawdown cones is in the intermediate area west of Ridgecrest and the other is a roughly north-south elongated shape wedged between the NAVY boundary to the east and Hwy 395 to the west. The spring 2015 groundwater contour map (Figure 37) shows three drawdown cones with a new drawdown cone shown in the southwest area. The spring 2023 groundwater contour map (Figure 38) shows the northwest and southwest drawdown cones increasing in size, with a significant increase in the northwest from 5,423 acres to 10,120 acres. The drawdown cone in the intermediate area is shown to have decreased slightly. Contour lines at the center of each drawdown cone were used to represent the size of drawdown cones and to determine the changes to the size of drawdown cones between years, however the actual size of the drawdown cones encompass larger areas.

Two large earthquakes occurred in the Indian Wells Valley in July 2019 with effects observed in multiple groundwater monitoring wells within the Basin and in several USGS continuous groundwater level monitoring sites in California, Nevada, and Arizona (California Water Center, 2019). Shifts in groundwater elevations from the earthquakes are visible in select hydrographs in Attachment P. Additionally, water levels changes between March and October 2019 were compared to identify areas with significant groundwater level shifts following the earthquake (Attachment P). While earthquake induced groundwater elevation shifts can be recovered instantaneously, it may take as long as days or months to recover, or the groundwater levels may not recover at all. Though most groundwater levels in the wells appear to have largely stabilized, any analysis utilizing groundwater level data from these wells should account for these shifts in groundwater levels, particularly when using data collected around the time of the earthquake.

## 5.4 WATER QUALITY

Currently, substantial groundwater in the IWVGB is of good quality; however, there are regions with poorer water quality due to high concentrations of total dissolved solids (TDS) and/or arsenic. These constituents and resulting water quality conditions are discussed below.

### 5.4.1.1 Total Dissolved Solids

TDS is a measure of all dissolved solids in water including organic and inorganic components. Sources of TDS in groundwater include interaction of groundwater with the minerals that comprise the aquifer matrix material. Over time, TDS will increase as more minerals in contact with groundwater dissolve. In desert basins, evaporative enrichment is known to naturally increase TDS in groundwater. This process also occurs in plants, both in agricultural and natural systems. Anthropogenic sources include synthetic fertilizers, manure, wastewater treatment facilities, and septic effluent.

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<sup>16</sup> IWVGA DMS Website: <https://iwwgsp.com/>

Repeated irrigation is also a known cause of elevated TDS, as minerals concentrate in the soil column with repeated evaporation. These increased concentrations can then, under certain conditions, be mobilized into the underlying groundwater table. The concentration of TDS in groundwater within the IWVGB has been studied and documented for many decades. For most locations in the Basin, cementation in surface soils and deeper fine alluvium prevents migration of surface waters to the aquifer itself.

Within the IWVGB, groundwater moves from the mountains toward the China Lake playa, through coarse-grained alluvial deposits into fine-grained lacustrine deposits. This groundwater movement can cause dissolution of evaporites (caused by high evaporation rates at earlier times), resulting in high TDS concentrations (TriEcoTt, 2013; Berenbrock and Schroeder, 1994). Increased pumping can exacerbate the process described above causing ions to be leached from clay and lacustrine deposits resulting in increased TDS concentrations.

TDS samples indicate concentrations have increased over time in some of the northwest area wells where high rates of pumping may have migrated naturally occurring saline water. The most recent TDS concentrations in 2020 for wells sampled in the IWVGB are shown in Figure 39. Lab results for a number of wells sampled in the U.S. Navy/China Lake and northwestern areas show TDS concentrations considerably above the SMCL (ranging from 1,001 mg/L to >5,000 mg/L). Groundwater below the SMCL occurs in the southern area of the Basin. Degraded water quality has caused groundwater producers in the Basin to relocate pumping to areas with higher water quality.

TDS is the main groundwater quality constituent of concern within the Basin. TDS data within the Basin were provided in Attachment G. The IWVGA used the historical TDS concentrations in the database and the results of water quality sampling conducted by the IWVGA in 2021 and 2022 to prepare the generalized TDS concentration contours, shown in Figure 40. A total of 478 TDS concentrations were used to prepare the TDS contours. Contour values above 1,000 mg/L are not shown as the TDS concentrations vary from 140 to 8,390 mg/L. Wells with TDS measurements include all production wells owned by the NAVY, IWVWD, Meadowbrook, Mojave Pistachio and other major agricultural wells, as well as a select few domestic wells and shallow monitoring wells that have a well depth of more than 100 feet or the known screen interval is below 100 feet below ground surface. At locations of nested monitoring wells, TDS values from the shallow monitoring well were used. Figure 40 also includes the clay layer, which results in higher TDS concentrations in the area.

In 2019, the IWVGA collected surface water and groundwater samples in and around IWVGB to analyze for hydrogen, oxygen, and carbon isotopes. The data collected were combined with similar analyses published during the previous decades to evaluate the hydrologic conceptual model in terms of sources of groundwater recharge and the flow paths and ages of the groundwater (Chapman et al., 2020, 2022).

The results of 227 sets of groundwater quality sampling results, shown in Figure 41, suggest that there are ten major water groups in the IWVGB (Table 15). The age of the water types are shown as years before present (YBP), which defines “present” as January 1, 1950, around the time when radiocarbon dating began.

*Table 15. Summary of Water Type, TDS and Isotope Dating Results*

Group	Water Type	TDS (mg/L)	Age (YBP)
Rose Valley	sodium-bicarbonate	428-1,857	modern-6,100
NW Canyons	calcium-bicarbonate	574-1,099	modern-2,200
Indian Wells Canyon	sodium-calcium-bicarbonate-sulfate	320-690	4,100-10,800
El Paso	calcium-bicarbonate	240-672	8,000 at AB303-03
Little Dixie	sodium-bicarbonate	212-425	modern-13,000
Deep and Old	sodium-chloride	339-66,720	modern-66,000
Mixing	sodium-bicarbonate	291-14,396	modern-30,000
Gypsum	sodium-calcium-sulfate, sodium-chloride	1,631-2,759	5,800 at TTIWV-MW13
Other	sodium-sulfate, magnesium-bicarbonate sodium-bicarbonate, sodium-sulfate-chloride	366-9,918	modern-15,000

#### **5.4.1.2 Arsenic**

In semi-arid and arid groundwater basins, groundwater recharge is limited due to low precipitation and high residence time of groundwater in the Basin. The long residence time of groundwater in the Basin allows for more interaction between groundwater and minerals that comprise the aquifer matrix material. With time, naturally occurring arsenic desorbs from sediments and enters groundwater.

Historically, some wells sampled within the IWVGB have shown arsenic concentrations in groundwater above California’s current arsenic MCL (10 µg/L). Existing arsenic data were assembled from earlier field and Basin studies (TriEcoTt, 2013; Tetra Tech EM Inc., 2003; Houghton HydroGeo-Logic, 1996; USBR, 1993; Berenbrock, 1987), and DWR’s GAMA program. Figure 42 displays the most recent groundwater quality measurements for arsenic at 209 wells with laboratory data at the time of GSP development. The groundwater most strongly affected by arsenic above the MCL (shown as red dots on Figure 42 map) occurs in the southeast area of the IWVGB and beneath the Navy Base. The arsenic database is included as Attachment Q and incorporates GAMA data from production wells monitored by IWWWD, Navy, Searles Valley Minerals, mutual water companies, and the Inyokern CSD. Where arsenic occurs above the MCL of 10 µg/L, potable water is treated by water suppliers before it is distributed.

## **5.5 LAND SUBSIDENCE**

The Basin includes relatively coarse-grained alluvial aquifers with clay and silt interbeds, and low permeability thick clay and silt deposits associated with lacustrine and playa depositional environments. These fine-grained materials are prone to inelastic compaction when the groundwater table is lowered below historical levels. As a result, areas underlain by extensive fine-grained materials have a high to very high susceptibility to land subsidence. Differential land subsidence across the valley is expected given the variability in the distribution of the fine-grained units and the presence of faults. The Basin is located within the tectonically active eastern California

shear zone, and subject to direct tectonic changes in ground elevation, as well as soft sediment deformation and compaction of fine-grained units due to seismic activity.

Geologic and hydrogeologic information, high-resolution level-line surveys of the Supersonic Naval Ordnance Research Track (SNORT) alignment within NAWS China Lake, and satellite based Interferometric Synthetic Aperture Radar (InSAR) remote sensing data are evaluated to assess subsidence in IWV. Comparison of the SNORT and InSAR data found comparable results, providing confidence in both types of measurements. The data identify cyclic elevation changes caused by tectonic stress buildup and subsequent release associated with earthquakes. Uplift and subsidence changes of 40 to 50 mm have been measured over a 34-year period at SNORT and can be attributed to tectonic processes. InSAR recorded positive and negative elevation changes ranging from 38 to 64 mm (1.5 to 2.52 inches) for an 8-year period. The higher rate of change found with InSAR reflects the effect of both tectonic and non-tectonic subsidence, as well as a wider area of subsidence, in comparison to the SNORT analysis.

A northern subsidence zone identified by InSAR is coincident with the 1995 Ridgecrest earthquake and attributed primarily to tectonic effects. An area in the southern valley experienced subsidence during an InSAR measurement period coinciding with low tectonic activity. The southern subsidence area experienced 25 mm (0.98 inches) of subsidence in the 8 years between 1992 and 2000, for a rate of 3.1 mm/year (0.12 inches/year). The same area for the five years from 2005-2010 had 15 mm (0.59 inches) of subsidence (3.0 mm/year or 0.12 inches/year). The subsidence rate over the entire 18-year period of InSAR data is up to 2.2 mm/year (0.09 inches/year). Analysis of groundwater drawdown at pumping wells and land-surface changes detected by InSAR demonstrates a temporal correspondence between the magnitude of drawdown calculated at the wells and the observed land-surface changes. Subsidence rates calculated for the well sites range from 0.3 to 1.1 mm/year (0.01 to 0.04 inches/year).

Data for IWV indicates that the valley has aquifer materials susceptible to compaction as groundwater levels decline, but that compaction and other mechanisms of land elevation change also occur in the valley due to tectonic processes. For the period through 2010, the relative magnitude of subsidence observed due to tectonic processes is roughly equivalent to that observed from groundwater withdrawals in various parts of the valley and is on the order of 1 to 2 mm/year (0.04 to 0.08 inches/year).

Testing and laboratory facilities on NAWS China Lake are finely calibrated and thus are particularly susceptible to undesirable results due to land subsidence, even at relatively small land subsidence rates as compared to what would typically be acceptable for other infrastructure. In particular, the SNORT alignment on NAWS China Lake, located within the southern subsidence area, has been impacted and has experienced undesirable results due to land subsidence caused by declining groundwater levels. The extent of land subsidence from southern subsidence area radiates northward and westward and can impact areas in Ridgecrest and into the neighboring unincorporated communities, especially if groundwater levels continue to decline. Additional analysis on land subsidence is included in Attachment R.

New land subsidence InSAR data was made available in a technical report produced for DWR in March 2021 (Tre Altamira Inc., 2021a) and has since been updated quarterly. The dataset provided groundwater displacement measurements derived from InSAR data in California groundwater basins and showed that the vast majority of the Basin experienced a displacement between -2 and 2 feet from 2015 to 2024, as shown in Figure 43.

## 6 LOSS OF GROUNDWATER IN STORAGE AND WATER BUDGETS

### 6.1 LOSS OF GROUNDWATER IN STORAGE

DWR designated Indian Wells Valley as a SGMA critically overdrafted basin due to decades of declining groundwater levels which equate to unsustainable loss of groundwater in storage (i.e. mining groundwater). The lowering of groundwater level within the IWVGB is directly related to pumping being greater than the natural recharge within the basin. The 2025 GSP Model simulated annual average loss of groundwater in storage of 19,510 AFY from WY1953 when pumping started to exceed natural recharge (7,650 AFY) through WY 2022 (70 years). Storage loss during these 70 years ranged from 7,760 AFY in WY 1967 to 30,870 AFY in WY 2007.

DWR's annual reporting requirements for the adopted GSP included calculating annual water year change of groundwater in storage. This becomes a measure for managing the basin towards sustainability during different hydrologic conditions. Typically, a groundwater model is used to calculate a Basin's change in storage over time accounting for all of the elements of the water budget. A well-calibrated model can simulate the occurrence and movement of groundwater over time from recharge areas, through heterogeneous aquifer sediments and structural faults, toward pumping wells and vegetative evapotranspiration. Initially, the 2020 GSP Model was not available<sup>17</sup> to be updated annually for the DWR reporting requirements. In lieu of a numerical model, an analytical method based on Thiessen polygons (Thiessen, 1911; Dinne et.al., 1978) was developed estimating annual groundwater change in storage for the IWV annual reports to DWR.

The TP Method was developed in the early 1900's to estimate aerial precipitation from discrete precipitation stations to apply over larger areas. The Thiessen Polygon Method developed for Indian Wells Valley is best applied as a relative indication for estimated annual storage changes. Some limitations to using this precipitation averaging technique to estimate changes of groundwater in storage include:

- Assuming homogeneity of heterogeneous sediments
- Uncertainty in specific yield estimates

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<sup>17</sup> The Navy provided the 2020 GSP Model (developed by DRI) as in-kind service to the GA. CDR Benson issued a letter in 2018 outlining the management, updating, and use of the model. A Configuration Management Plan (CMP) structure was put in place to develop the modeling work for the 2025 5-year update. The 2025 GSP Model is now available for calculating annual change of groundwater in storage.

- Monitoring wells are sometimes not accessible to measure spring groundwater levels, and estimates are interpolated for the polygon
- Nearby pumping wells may affect the groundwater level measurement
- Given many years of over pumping in the basin, the groundwater table is not in steady state, there are areas of the aquifer where groundwater levels are rebounding and filling in the pumping cone of depression, and other areas where the cone of depression is widening.
- This is a tectonically active basin that can affect groundwater levels

Initially, the TP Method was applied to estimate the change of groundwater in storage within the IWVGB based on observed spring water levels at 41 wells from WY 2016 through WY 2019. The wells, listed in Table 16, were chosen based on their period of record and distributed location throughout the basin to form the Thiessen Polygons, shown in Figure 44. Each polygon was developed using a geographical information system (GIS) to contain only a single monitoring well.

*Table 16. Thiessen Polygon Wells*

Polygon	State ID T/R-S	Basin Area	Specific Yield	Surface Area (Acres)
1	24S/38E-21A01	NW	0.21	11,675
2	24S/38E-19H	NW	0.21	2,840
3	25S/38E-03B	NW	0.21	4,655
4	25S/38E-12L01	NW	0.21	6,627
5	25S/38E-14Q01	NW	0.21	3,641
6	25S/38E-25J01	NW	0.21	4,192
7	25S/38E-34G01	NW	0.21	3,859
8	26S/38E-02R01	NW	0.21	3,511
9	26S/39E-08F	NVY	0.21	3,721
10	26S/39E-20C02	NW	0.18	4,359
11	26S/38E-22B	SW	0.21	3,350
12	27S/38E-02C01	EP	0.21	4,116
13	26S/39E-31R03	SW	0.08	5,119
14	27S/39E-08P02	SW	0.08	3,760
15	27S/39E-28L01	SW	0.08	10,847
16	27S/39E-19E01	SW	0.08	3,474
17	27S/38E-23F01	EP	0.21	3,475
18	27S/38E-09C01	EP	0.21	4,533
19	27S/38E-21L01	EP	0.21	10,409
20	28S/38E-18F01	EP	0.21	31,788
21	28S/38E-18R	EP	0.21	12,317
22	24S/40E-21K02	NVY	0.21	36,916
23	24S/39E-34D01	NVY	0.21	13,194
24	25S/39E-12R01	NVY	0.21	10,162
25	25S/41E-18R01	NVY	0.21	13,523

26	25S/40E-30E01	NVY	0.21	5,445
27	25S/39E-28P01	NVY	0.21	7,615
28	26S/39E-11E01	NVY	0.21	4,642
29	26S/39E-01A01	NVY	0.21	3,308
30	25S/40E-31P	NVY	0.21	3,581
31	26S/40E-12C	NVY	0.21	9,875
32	26S/40E-22H03	NVY	0.21	4,338
33	26S/40E-21K03	NVY	0.21	3,065
34	26S/39E-13R03	NVY	0.21	2,662
35	26S/39E-26A03	SE	0.18	2,690
36	26S/39E-34C01	SE	0.08	3,713
37	27S/39E-11D01	SE	0.08	7,907
38	27S/40E-06F01	SE	0.08	8,376
39	26S/40E-17Q01	NVY	0.21	6,769
40	26S/40E-28J01	SE	0.21	4,048
41	27S/40E-01K02	SE	0.21	10,631

The change in groundwater storage for each polygon was calculated from the change in groundwater levels and the aquifer’s specific yield (Sy) using the following equation:

$$\text{Change of Groundwater in Storage (ft}^3\text{)} = [\text{area (ft}^2\text{)}] \times [\text{Sy (unitless)}] \times [\text{change in DTW (ft)}]$$

- Where:
- area      acreage of polygon (1 acre = 43,560 square feet)
  - Sy        from calibrated groundwater model (2020 Model Documentation, Attachment J)
  - DTW     depth to water from IWV Groundwater Monitoring Program

The TP Method was determined to be an appropriate tool for estimating changes in groundwater storage and would be applied to estimate the annual change of storage in the Basin. However, changes in storage could not be calculated for WY 2020 and 2021 due to insufficient groundwater level data. Due to COVID-19 policy restrictions, changes in U.S. Navy personnel, and domestic well ownership changes, groundwater data at key TP wells were either unavailable or not collected at times in the year consistent with previous groundwater level measurements. As some wells used in the calculation can be influenced by seasonal agricultural pumping, it is important to use groundwater elevation data taken at the same time each year, as to reflect accurate static water level conditions.

In WY 2021, the IWVGA TAC reviewed the data and methodology and developed a Modified Thiessen Polygon Method, utilizing data from WY 2016 through WY 2022 from 77 wells, as shown in Table 17. Groundwater elevations for these wells are also shown in Attachment S.

*Table 17. Modified Thiessen Polygon Wells*

Polygon	State ID T/R-S	Common Name	Basin Area	Specific Yield	Surface Area (acres)
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1	28S/38E-18R	Black Hills Well	EP	0.21	14,609
2	27S/38E-27M01	USNS-03	EP	0.21	2,987
3	27S/38E-23F01	USBR 1-S	EP	0.08	1,967
4	27S/38E-21L01	AB303-05	EP	0.21	5,344
5	27S/38E-15R01	AB303-06	EP	0.21	1,497
6	27S/38E-09P01	Father Crowley	EP	0.21	849
7	27S/38E-08R01		EP	0.21	3,525
8	27S/38E-10B02	AB303-03	EP	0.21	1,588
9	27S/38E-09C01	AB303-04	EP	0.21	1,645
10	27S/39E-19E01	IWV MW #3	IWV	0.08	2,275
11	27S/38E-13A01	Sea Bee Well	IWV	0.08	1,517
12	27S/39E-08P02	IWV MW # 2	IWV	0.21	3,341
13	27S/39E-07R01	Inyo	IWV	0.21	631
14	27S/39E-08M02	IWV MW #1	IWV	0.21	468
15	27S/39E-11D01	USBR 3-S	IWV	0.08	5,027
16	27S/40E-06N02		IWV	0.08	4,727
17	27S/40E-01K02	George Air Corr.	IWV	0.21	1,001
18	27S/40E-06E01		IWV	0.08	975
19	27S/39E-04C01		IWV	0.21	1,116
20	27S/38E-02C01	USBR 2-S	IWV	0.21	1,109
21	26S/39E-34R02		IWV	0.21	1,379
22	26S/40E-31K01		IWV	0.21	1,791
23	26S/39E-32L01		IWV	0.21	3,171
24	26S/39E-31R03		IWV	0.21	1,376
25	26S/40E-35H02	Satellite Lake2(e)	IWV	0.21	2,609
26	26S/39E-26P02		IWV	0.18	1,070
27	26S/39E-27D04	MW 32-D	IWV	0.18	1,459
28	26S/39E-26A03	USBR 4	IWV	0.18	1,694
29	26S/40E-22P04	PW Substation 2	IWV	0.21	705
30	26S/40E-19N02		IWV	0.21	448
31	26S/40E-21K03		IWV	0.21	706
32	26S/40E-20L01		IWV	0.21	812
33	26S/40E-22H03		IWV	0.21	2,397
34	26S/39E-20C02		IWV	0.18	1,025
35	26S/39E-13R04		IWV	0.21	1,793
36	26S/40E-17N01		IWV	0.21	1,039
37	26S/40E-15N01		IWV	0.21	2,894
38	26S/39E-15J		IWV	0.18	1,688
39	26S/39E-14E01		IWV	0.21	864
40	26S/39E-17G02	Kerr McGee	IWV	0.18	1,957
41	26S/39E-11E02	Sandquist Spa	IWV	0.21	987

42	26S/39E-09E		IWV	0.21	1,733
43	26S/40E-12C		IWV	0.21	8,284
44	26S/39E-02N01		IWV	0.21	2,103
45	26S/38E-02Q01		IWV	0.21	1,509
46	26S/38E-01M05		IWV	0.21	1,520
47	26S/39E-05F01		IWV	0.21	1,247
48	26S/38E-02B01		IWV	0.21	519
49	26S/39E-01A01		IWV	0.21	2,482
50	25S/40E-31P		IWV	0.21	3,817
51	25S/39E-31R01		IWV	0.21	1,139
52	25S/38E-34G03	USBR 05-S	IWV	0.21	983
53	25S/38E-36G03	NR-2 (Deep)	IWV	0.21	766
54	25S/38E-34A01		IWV	0.21	1,973
55	25S/38E-35B01		IWV	0.21	907
56	25S/39E-28P01	Baker 4-NE	IWV	0.21	2,504
57	25S/39E-29M01		IWV	0.21	2,556
58	25S/38E-25J03	NR 1-D	IWV	0.21	1,475
59	25S/38E-14Q01		IWV	0.21	3,621
60	25S/39E-12R01	Charley Tower	IWV	0.21	12,232
61	25S/38E-12L03	USBR 6-D	IWV	0.21	6,289
62	25S/39E-03R01	Baker Range	IWV	0.21	6,159
63	24S/38E-21A04	USBR 10-D	IWV	0.21	4,060
64	25S/38E-03B		IWV	0.21	2,291
65	25S/40E-30E01	TTBK MW14	IWV	0.21	6,169
66	26S/38E-22B	Ostrich Ranch	IWV	0.21	2,465
67	26S/38E-35B		IWV	0.21	1,714
68	26S/38E-35D		IWV	0.21	1,869
69	26S/40E-28J01	Hospital	IWV	0.21	569
70	26S/40E-29M01		IWV	0.21	2,837
71	27S/38E-01C		IWV	0.08	1,268
72	27S/39E-02K	Asphalt Constr.	IWV	0.21	2,387
73	27S/39E-08A01		IWV	0.21	1,190
74	24S/38E-33J02		IWV	0.21	3,435
75	25S/39E-22J01	S. Baker Ranch	IWV	0.21	3,600
76	26S/40E-34F01	City of Ridgecrest	IWV	0.21	926
77	27S/40E-02J01	DMP Cemetery	IWV	0.21	2,308

The following modifications were made to the Thiessen Polygon Method and are reflected in Figure 45 (comparison of early and modified extents) and Figure 46:

- The basin was first separated into two distinct areas - the El Paso Subarea and the IWV main basin. The boundary between these two areas was determined using groundwater

hydrographs in the vicinity of the steep groundwater gradient that exists between the two areas and the Freeman Fault.

- The next modification was to constrain the analysis to where there are groundwater measurements to interpret changes in storage. In most areas this was determined by the KCWA groundwater level contour extents.
- The number of monitoring wells used in the initial analysis increased from 41 wells (used in previous annual reports) to 77 wells, shown in Table 17.
- The fourth modification was to incorporate major faults that dissect the groundwater basin.

Using the Modified Thiessen Polygon Method, annual groundwater storage change for water years 2020 through 2025 have been calculated and included in each respective annual report. For comparison, these estimated annual groundwater storage changes are summarized in Table 18. The significant annual variation in Table 188 is the result of transient hydrologic condition, shown in Table 19, and fluctuation of groundwater pumping. The continued decline in groundwater in storage is visualized in Figure 47.

*Table 18. WY 2020-2025 Estimated Groundwater Storage Change, Modified TP Method*

	<b>Thiessen Area (acres)</b>	<b>Average Annual WY2020-2022<sup>1</sup>(AF)</b>	<b>WY 2023 (AF)</b>	<b>WY 2024 (AF)</b>	<b>WY 2025 (AF)</b>	<b>6-Year Cumulative Change (AF)</b>
<b>IWV Main Basin</b>	154,960	-15,883	-12,370	-9,931	-23,366	-93,314
<b>El Paso Subarea</b>	34,010	2,390	-5,513	737	5,310	7,705
<b>Total</b>	188,971	-13,492	-17,883	-9,194	-18,056	-85,609

<sup>1</sup> Due to lack of available groundwater level measurements, WY 2020, 2021, and 2022 values reflect the average annual storage change calculated from the cumulative 3-year change in storage from Spring 2019 to Spring 2022.

*Table 19. IWV Basin Hydrologic Condition*

<b>Hydrologic Condition</b>	<b>WY 2020</b>	<b>WY 2021</b>	<b>WY 2022</b>	<b>WY 2023</b>	<b>WY 2024</b>	<b>WY 2025</b>
	Above Normal	Dry	Below Normal	Wet	Normal	Normal

Due to insufficient groundwater level data in WY 2020 and WY 2021, individual annual storage changes could not be calculated for those years. Instead, the cumulative 3-year change in storage from Spring 2019 to Spring 2022 was calculated and divided equally across WY 2020, 2021, and 2022 to estimate an average annual storage change for each year. Over the 3-year period, storage change was estimated as a 47,650 AF loss in the IWV Main Basin and 7,170 AF gain in the El Paso Subarea, resulting in an average annual storage change of 15,883 AF loss in the IWV Main Basin and 2,390 AF gain in the El Paso Subarea.

## 6.2 WATER BUDGETS

Under DWR Water Budget Best Management Practices (BMPs), sustainable yields should be representative of long-term conditions in the basin. Historical water budgets used to determine sustainable yields should be chosen from a base period that is representative of a balanced long-term hydrologic conditions within a basin. To achieve this, water budgets are typically developed over a defined base period that captures the full range of hydrologic variability within the basin.

Desert basins are characterized by extended multi-year droughts as well as episodically wet years with disproportionately high precipitation. To accurately capture this variability in a base period, the selected period must be long enough to represent both the prolonged dry periods and the peak wet-year recharge that are typical of desert basin hydrology. Water budgets using shorter base periods that only capture part of a hydrologic cycle, could trend more wet or dry, depending on how wet or dry the basin hydrologic conditions were in the chosen base period. Additionally, base periods should not begin or end at the endcaps of available data, as periods anchored at either end of the datasets are more likely to reflect anomalous wet or dry trends rather than balanced long-term conditions.

Due to limited streamflow data within the Basin, precipitation data was used to assess hydrologic trends in determining an appropriate base period for the Basin. Available long-term records from the Haiwee and China Lake Naval Air Facility (NAF) weather stations were reviewed in conjunction with nearby weather stations and cumulative departure from mean precipitation curves for each station was evaluated, with greater emphasis placed on the Haiwee station due to its location within the recharge area. Based on the cumulative departure analysis, a 26-year period from 1990 to 2015 was selected as a balanced hydrologic base period and applied in the GSP Model for projected recharge estimates, as described in Attachment T.

As discussed previously in Section 3.2, groundwater extractions began around the 1910s (Lee , 1913) when farmers and industrial users began large scale operations in the IWV. Prior to the development of well fields, it is assumed the IWVGB was in hydraulic equilibrium, with inflows in balance with outflows. Table 20 provides the estimated water budget during pre-development conditions<sup>18</sup> (i.e. prior to the 1920s), summarizing the inflow and outflow of water within the basin using both the 2020 and 2025 GSP Models. Pre-development conditions illustrate what the available natural recharge of the basin is. The total steady-state inflow (recharge) and outflow of 7,650 AFY did not change between the 2020 and 2025 GSP Models. The fraction of outflow related to ET and bare soil evaporation, as well as interbasin flow, however, did change between the two models with the 2025 GSP Model yielding 7,601 AFY from ET and bare soil evaporation and 49 AFY from interbasin flow, with ET and bare soil evaporation having increased. Pre-development conditions were also used to establish steady state conditions for model calibration.

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<sup>18</sup> Originally developed by DRI (McGraw et al., 2016), and confirmed during recalibration for the IWVGA. Recharge estimates were discussed and confirmed by the IWV TAC Model Ad Hoc Group.

Table 20. Steady State Water Budget (Pre-Development Conditions)

Water Budget Element	2020 GSP Basin Model (AFY)	2025 GSP Basin Model (AFY)
<b>Inflows</b>		
Mountain Front Recharge		
Sierra Nevada North	2,100	2,995
Sierra Nevada South	1,500	377
Rose Valley	2,400	1,919
White Hills	-	296
Argus	1,600	1,739
El Paso	50	324
<b>Total Inflow</b>	<b>7,650</b>	<b>7,650</b>
<b>Outflows</b>		
Evapotranspiration	7,450	7,601
Interbasin Subsurface Flow	200	49
Groundwater Extractions	0	0
<b>Total Outflow</b>	<b>7,650</b>	<b>7,650</b>
<b>Change of Groundwater in Storage</b>	<b>0</b>	<b>0</b>

As industrial, agricultural, and residential development expanded beginning in the 1920s, groundwater extractions increased which reduced the ET occurring at China Lake Playa and reduced subsurface flow to the Salt Wells Valley. The historical average post 1920 estimated water budget since IWV was developed, for both the 2020 and 2025 GSP Models, is shown below in Table 21 and illustrates the effects of pumping on the IWVGB and basin storage. The change in groundwater in storage was simulated to be slightly higher with the 2025 GSP Model, as groundwater extractions and ET and bare soil evaporation are greater than in the 2020 GSP Model.

Table 21. Water Budget - Historical Average Post 1920 Basin Model Comparison

Water Budget Element	2020 GSP Model (AFY, CY 1922 to CY 2016)	2025 GSP Model (AFY, WY 1922 to WY 2016)
<b>Inflows</b>		
Mountain Front Recharge	7,650	7,659
<b>Total Inflow</b>	<b>7,650</b>	<b>7,659</b>
<b>Outflows</b>		
ET + Bare Soil Evaporation	6,580	6,737
Interbasin Subsurface Flow	60	36
Groundwater Extractions	15,240	15,368
<b>Total Outflow</b>	<b>21,880</b>	<b>22,141</b>
<b>Change of Groundwater in Storage</b>	<b>-14,230</b>	<b>-14,482</b>

As stated above, water budgets used in determination of sustainable yields should be chosen from a base period representative of balanced hydrologic conditions, which was determined to be the 26-

year period from 1990 to 2015. The water budget shown in Table 22, using the 2025 GSP Model, illustrates the critically overdraft conditions within the IWVGB under balanced hydrologic conditions.

Table 22. Water Budget - 1990-2015 Average Balanced Hydrologic Period (2025 GSP Model)

Water Budget Element	2025 GSP Basin Model (AFY, WY 1990 to WY 2015)
Mountain Front Recharge	7,665
<b>Total Inflow</b>	<b>7,665</b>
ET + Bare Soil Evaporation	5,584
Interbasin Subsurface Flow	22
Groundwater Extractions	26,705
<b>Total Outflow</b>	<b>26,705</b>
<b>Change of Groundwater in Storage</b>	<b>-24,636</b>

The 2025 GSP Model is considered to be a more accurate tool in evaluating change of groundwater in storage in comparison to the Modified Thiessen Polygon Method. Due to the significant costs associated with updating the model yearly, the Modified Thiessen Polygon Method has been used to estimate annual changes to groundwater in storage for purposes of the Annual Report. However, the IWVGA will continue to use the 2025 GSP Model to estimate groundwater changes in storage at the 5-year Periodic Evaluation intervals.

## 7 SUMMARY

The IWVGB, located in the northwestern Mojave Desert spans approximately 382,000 acres across portions of Kern, Inyo, and San Bernardino counties. The IWVGB is a closed basin bounded by the Sierra Nevada, Coso Range, Argus Range, and El Paso Mountains, with groundwater serving as the sole source of potable water for the IWW. The IWVGB's aquifer system consists of shallow, intermediate, and deep hydrogeologic zones within unconsolidated alluvial, lacustrine, and playa deposit of Quaternary age, with a thick fine-grained clay unit covering approximately 147 square miles. Mountain front recharge is the main natural source of recharge to the IWVGB, estimated at approximately 7,650 AFY, while evapotranspiration at the China Lake Playa is the main source of natural discharge. Groundwater production has consistently exceeded natural recharge since at least the 1960s, with historical pumping peaking near 29,000 AFY in the 1980s, and declining to approximately 20,200 AFY in WY 2025.

Two numerical groundwater flow models, the 2020 GSP Model and the updated 2025 GSP Model, have been developed and calibrated for the IWVGA to support Basin management, with the 2025 Model providing key updates to the 2020 GSP Model, incorporating refined hydrogeologic data including AEM-derived clay layer mapping, updated fault representations, revised evapotranspiration zones, and monthly stress periods. Under the balanced hydrologic base period of 1990–2015, the 2025 GSP Model water budget reflects total inflows of approximately 7,665 AFY compared to groundwater extractions of 26,705 AFY and ET losses of 5,584 AFY, yielding a net

average annual storage deficit of approximately 24,636 AFY during these 26 years. A similar analysis of groundwater storage change using the Modified Thiessen Polygon Method, developed for annual reporting of groundwater storage change, estimates a groundwater storage deficit of approximately 18,056 AFY for WY 2025, confirming the Basin's continued overdraft conditions.

## REFERENCES

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# IWVGA ADMINISTRATIVE OFFICE

*STAFF REPORT*

**TO:** IWVGA Board Members

**DATE:** May 13, 2026

**FROM:** IWVGA Water Resources Manager

**SUBJECT: AGENDA ITEM 12 – WATER RESOURCES MANAGER’S REPORT**

## **AGENDA ITEM 12a – GRANT FUNDING UPDATE**

### SGMA Implementation Round 1 Update

- Invoice #13
  - Covers July 2025 to September 2025
  - Total requested payment: \$32,759.14
  - Status: Submitted to DWR, awaiting payment.
- Invoice #14
  - Covers October 2025 to December 2025
  - Total requested payment: \$377,862.25
  - Status: Submitted to DWR, awaiting payment.
- Invoice #15 (Final)
  - Covers January 2026 to March 2026
  - Total requested payment: \$753,756.64
  - Status: Submitted to DWR, awaiting payment.
- Grant Completion Report submitted to DWR on December 31, 2025

### Urban Community Drought Relief Program Update

- The IWVGA has been awarded \$3,345,000 to consolidate shallow well system(s) into a public water system.
  - Rademacher consolidation currently underway
  - Stark Street consolidation development underway
- Invoice #7
  - Covers July 2025 to September 2025
  - Total requested payment: \$15,080.72
  - Status: Submitted to DWR, received payment.
- Invoice #8
  - Covers October 2025 to December 2025
  - Total requested payment: \$9,247.50
  - Status: Submitted to DWR, awaiting payment.
- Invoice #9
  - Covers January 2026 to March 2026
  - Due to DWR by end of May 2026

## AGENDA ITEM 12b – GSP IMPLEMENTATION PROJECTS/MANAGEMENT ACTION UPDATES

### Imported Water Project

- Imported Water Pipeline Design Services
  - Continuing coordination with BLM for a Special Use Permit for pipeline construction
    - Coordinating feedback from BLM on the extent existing roads can be used within the Spangler Hills Off-Highway Vehicle Area
    - Authority providing BLM additional \$25,000 deposit under their existing Reimbursement Agreement with the Authority for review
  - March 19 and April 23, 2026: Monthly coordination meeting with all Project consultants and WRM Staff to coordinate pathway forward for the Project
  - March 23, 2026: Coordination meeting with WRM Staff and Blue Mountain Development regarding SCE and the Hwy 395 crossing
  - April 7, 2026: Coordination meeting with all Planning consultants, WRM Staff, and Blue Mountain Development regarding GIS mapping
  - Scheduling next Strategy Meeting to discuss scour design approach
  - Continuing ongoing coordination with Caltrans, California Department of Parks and Recreation (Cal Parks), and Southern California Edison (SCE)
    - SCE Staff continuing design of the powerlines between Pump Station No. 2 and Pump Station No. 3
      - Coordinating meeting with SCE Public Affairs to structure SCE Project Team with IWVGA Project Team
    - Coordinating meeting with Cal Trans to discuss temporary and permanent access routes off Hwy 395 and the Hwy 395 jack and bore crossing.
  - Coordinating finalization of the location of the Hwy 395 crossing
    - Bennett Trenchless will finalize the Draft TM for the trenchless crossings (30% submittal deliverable) to include results of borings into the hydrofracturing analysis that were delayed due to obtaining the California Department of Fish and Wildlife Lake and Streambed Alternation Permit after finalizing the location of the Hwy 395 crossing
  - P&P and Blue Mountain Development continuing analyzing results and design recommendations pursuant to AVEK and Kennedy Jenks's updated hydraulic modeling of the California City Feeder and North Feeder's
  - Blue Mountain reviewing draft current progress print Design Plans
  - IWVGA Board approved extension of P&P's contract terms through December 31, 2026 at the March 11 Board Meeting
  - Coordinating on creating a GIS platform database for the Project's Design, Environmental, and ROW components
  - Next Steps:
    - Finalize the following after analyzing updated AVEK (Kennedy/Jenks) hydraulic modeling results:
      - Tank TM (a 30% submittal deliverable)
      - Electrical Systems and Instrumentation and Controls TM (a 30% submittal deliverable)
      - Refined System Hydraulics and Transient Mitigation Analysis TM (a 30% submittal deliverable)
      - Draft Mechanical Pump Selection (a 30% submittal deliverable)

- Provide the updated Preliminary Permitting Requirements TM
      - Provide Draft Corrosion Design TM
      - Incorporate additional SCE power infrastructure into design plans after SCE provides preliminary design for power infrastructure
      - Next Milestones
        - Provide 90% Design Submittal after completing the Next Steps above
        - Provide 100% Design Submittal
  - Imported Water Pipeline Environmental Services
    - Coordination Meetings
      - Continuing coordination with the BLM
      - Continued to engage with SCE environmental staff and the Project’s design consultant on the potential requirements for incorporating the new SCE infrastructure into the Environmental documents
      - March 19 and April 23, 2026: Monthly coordination meeting with all Project consultants and WRM Staff to coordinate pathway forward for the Project
      - March 30, 2026: Coordination meeting with WRM Staff and Blue Mountain Development regarding BLM comments on the Environmental document
      - April 30, 2026: Coordination meeting with BLM, WRM Staff, and Project Planning Consultant Scheduling next Strategy Meeting to discuss regulatory permitting
    - Coordinating finalization of the location of the Hwy 395 crossing with Design consultant for consideration into the EA/ EIR
    - Coordinating any additional surveys required
    - Draft EA/ EIR joint document to be updated per additional SCE components
    - Draft Biological Evaluation to be updated for additional SCE components
    - Draft Biological Assessment to be updated for additional SCE component
    - Air Quality, Greenhouse Gas, Energy, and Noise reports to be updated for additional SCE components
    - IWVGA Board approved extension of P&P’s contract terms through December 31, 2026 at the March 11 Board Meeting
    - Next Steps:
      - Incorporate additional SCE components into EA/EIR after design plans include SCE preliminary design for power infrastructure
      - Provide updated schedule after SCE provides preliminary design to Design consultants
      - Provide draft EA for 45- day Public Comment Period after incorporating SCE into EA/EIR
    - Next Milestones:
      - Provide Final EA/ EIR
- Imported Water Pipeline Right-of-Way Services
  - March 19 and April 23, 2026: Monthly coordination meeting with all Project consultants and WRM Staff to coordinate pathway forward for the Project
  - Continuing Acquisition Services Task, Preliminary Title Report and Appraisal Report tasks
    - Researched roadway and easement rights along the pipeline alignment

- Provided team a list of all APN's adjacent to Highway 395, City and, County roads
    - Coordinating plats and legal descriptions with Design team
  - Next Milestone:
    - Provide a final Right of Way Acquisition Plan
    - Complete plats and legal descriptions
- Blue Mountain Development (BMD) Program Management Services
  - March 19 and April 23, 2026: Monthly coordination meeting with all Project consultants and WRM Staff to coordinate pathway forward for the Project
  - March 24, 2026: Held coordination meeting with BLM and WRM Staff regarding Project status
    - April 30, 2026: Follow-up coordination meeting with BLM, WRM Staff, and Project Planning Consultants
  - BMD identifying risk factors with focus on technical, environmental, regulatory, fiscal, project phasing, and schedule impacts
    - Evaluating completeness of environmental documents prior to publication relative to current design technical issues, construction phasing, and long term operations.
    - Evaluating key biological surveys relative to current design, SCE alignment, and BLM requirements
    - Evaluating current design technical issues including AVEK connection, terminus receiving tank, scour issues, Caltrans crossing, and SCE power distribution for lift stations.
    - Evaluating property acquisition strategy integrating construction phasing, and appropriation annual funding
  - BMD coordinating central project document repository with IWVGA WRM Staff
  - Coordinating agreement with AVEK
  - Updated monthly Consultant coordination meeting agenda and minute template for more efficient project tracking
  - Next Steps:
    - Identify risk factors and planning strategies to address and mitigate areas of concern.
    - Develop Project Completion Action Plan & Recommendations
- Submittals to DWR
  - Continuing monthly coordination meetings with DWR on IP Grant progress, including coordination on Grant closeout
    - Final deliverables provided by due date of April 30, 2026, including the Final Invoice and the Final Completion Report
- National Environmental Protection Agency (EPA) Drinking Water System Infrastructure Resilience and Sustainability Program (Resiliency Grant)
  - In August 2024, the EPA announced their grant of \$2.79 million to the IWVGA for Imported Water Project planning activities
  - Grant will be used as additional funding to complete planning tasks
  - Performance Evaluation No. 1 submitted to EPA on January 30, 2026.
  - Preparation of first reimbursement request underway.
- US Army Corps of Engineers Planning Assistance to States (PAS) Program
  - GA Staff is coordinating with USACE on tasks

- April 10, 2026: Coordination meeting with the Army Corps to discuss scope of work and updated draft Letter of Intent
- Provided updated Letter of Intent to PAS Program Manager

### Shallow Well Mitigation Program

There are currently no active applications.

### Periodic Evaluation

- DWR Periodic Review Engagement Meeting on February 10, 2026 with GA staff
  - DWR to present questions from their review of the 2025 Periodic Evaluation.
- DWR staff have requested the IWVGA address the following:
  - Basin continued overdraft with proposed Projects and Management Actions
  - Contingency Plan
  - SVM Settlement
  - Mojave Pistachios and Meadowbrook Dairy Lawsuits
- Staff submitted a letter to DWR on May 1, 2026, attached, in response to DWR's request for additional information for DWR's evaluation of the Periodic Evaluation submitted by the IWVGA.

## **AGENDA ITEM 12c – CONSOLIDATION PROJECTS**

- The IWVGA has been awarded \$3,345,000 to consolidate shallow well system(s) into a public water system.
- Two consolidation projects, Rademacher Way and Stark Street, have been identified and are currently in the process of being implemented.
- Remaining grant funds after submittal of Progress Report 8: \$3,015,497.94
- Right-of-Way consultants
  - Contract Service Agreement executed
- Request for Amendment to Grant Agreement underway
  - Reallocation of funds under Category A: Project Administration and Category B: Land Purchase/Easement to Category C: Planning, Design, Engineering, Environmental Documentation

### Rademacher Way

- Phase 1 complete
  - Two properties hooked up to completed pipeline
- Phase 2 design completed and approved by Division of Drinking Water
- Phase 2 construction pending obtainment of easements

### Stark Street

- IWVWD Reimbursement Agreement executed.
- Emergency LAFCO process underway
- CEQA exemption filed as part of Dune 3
- Dune 3 bidding approved by State
- Awaiting response from Self-Help on hauled water delivery end date
- Staff drafted Notice of Consolidation letter for Stark Street residents

## **AGENDA ITEM 12d – MISCELLANEOUS ITEMS**

### **Data Collection and Monitoring**

- Stetson, the Navy, and KCWA performed Spring 2026 water level measurement field work during week of March 9.
- Data from Spring 2026 water level measurements are being processed.
- Staff have identified and are investigating an additional monitoring location involving a City of Ridgecrest detention pond adjacent to Little Lake fault.
- Staff have prepared a technical memo on potential monitoring locations and priority for potential funding opportunities.

### **Subflow from Rose Valley to IWV**

- Ongoing work with BLM regarding Cultural Survey and Permitting for second monitoring well
- Next steps: (1) obtain BLM concurrence on the scope of the cultural/archeological field survey, (2) conduct a cultural/archeological field survey, and (3) BLM Right-of-Way grant
- Periodic correspondence with BLM regarding delayed authorization of archeological survey at proposed RVS-2 well site.
- Continued coordination with BLM on permit to install next RVS Monitoring Well
  - In late October, the new BLM Archeologist, Liz Gonzalez Negrete, contacted Stetson regarding next steps on authorization to complete archeological field survey.
    - BLM requested an updated Request for Work Authorization via email and committed to moving the project forward
    - Updated Request for Work Authorization submitted to BLM
  - Epsilon met with BLM to discuss the planned archaeological survey to be scheduled
  - Following meeting with Epsilon and BLM, permit materials and supporting documents were provided.
- Navy/Coso contract deadline extended to August 31, 2026 for completing the RVS Monitoring Well project.
  - Navy/Coso no-cost extension executed July 8, 2025.
- Reimbursement of RVS-1 well underway
  - Need to cancel “Grants Voucher” submitted in January 2024
  - Grants Voucher rejected by Navy on February 4, 2026
  - Invoice for RVS-1 to be resubmitted for reimbursement

## **ACTION(S) REQUIRED BY THE BOARD**

There are no actions required by the Board.

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# BUDGET TO ACTUAL REPORT

ACTUALS BY REVENUE ALLOCATION										
	Restricted Extraction	Restricted Second	Restricted	Restricted Shallow	Restricted	Restricted	Restricted Navy/COSO	\$	(A-B) \$	(B/A) %
	Transient Pool	Transient Pool	Augmentation	Well Mitigation	SGMA IP	EPA Grant	Fund	Total	REMAINING	COMPLETED
ORIGINAL										
<b>1 REVENUE</b>										
2 Extraction Fee - Restricted	900,000	30,385	-	-	-	-	-	30,385	869,615	3%
3 <b>Transfer In/Loan from Augmentation Fund</b>	570,230	-	-	-	-	-	-	-	588,701	0%
4 <b>Prior Year Fund Balance</b>	-	-	-	-	-	-	-	-	283,409	0%
5 Augmentation Fee	3,243,315	-	-	-	-	-	-	-	2,180,781	0%
6 <b>Transfer In/Loan Repayment from Extraction Fund</b>	-	-	-	-	-	-	-	-	-	0%
7 Shallow Well Mitigation Fee	115,000	-	-	204	-	-	-	204	114,796	0%
8 Second Transient Pool Fee - Unrestricted	633,000	-	-	-	-	-	-	-	-	0%
9 Department of Water Resources (DWR) Grants -IP Grant	249,500	-	-	-	-	-	-	-	731,870	0%
10 Urban Community Drought Relief Grant Program	2,117,200	-	-	-	-	-	-	-	1,625,700	0%
11 EPA Resilience Grant	1,889,860	-	-	-	-	-	-	-	2,678,434	0%
12 Navy/COSO Royalty Fund	151,000	-	-	-	-	-	-	-	345,000	0%
13 Miscellaneous Revenue	-	-	-	-	-	-	-	-	-	0%
14										0%
15 <b>TOTAL REVENUES</b>	9,869,105	30,385	-	204	-	-	-	30,589	9,418,306	0%
<b>16 EXPENSES</b>										
17 <b>Administration</b>										
18 Administration (RGS)	340,000	19,223	19,223	-	-	-	-	38,447	301,553	11%
19 Office Rent (City of Ridgecrest)	3,600	-	-	-	-	-	-	-	3,600	0%
20 Office Supplies	1,000	-	-	-	-	-	-	-	1,000	0%
21 Postage and Delivery	360	-	-	-	-	-	-	-	360	0%
22 External Audit	18,500	-	-	-	-	-	-	-	37,000	0%
23 Council Chambers/IT Services (City of Ridgecrest)	2,500	-	-	-	-	-	-	-	8,500	0%
24 General Counsel (Aleshire & Wynder/City of Ridgecrest)	428,000	200,090	-	-	-	-	-	200,090	108,910	65%
25 Additional Legal Services (Aleshire & Wynder/City of Ridgecrest)	60,000	-	-	-	-	-	-	-	10,000	0%
26 Additional Legal Services-Imported Water Pipeline (Aleshire & Wynder)	-	-	-	-	-	-	-	-	-	0%
27 Insurance Premium	20,000	21,601	-	-	-	-	-	21,601	(1,601)	108%
28 Legal Notices (Daily Independent)	2,000	-	-	-	-	-	-	-	2,000	0%
29 Memberships (Cal. Assoc.Mutual Water Co)	100	-	-	-	-	-	-	-	100	0%
30 Printing and Reproduction	-	-	-	-	-	-	-	-	-	0%
31 Bank Service Charges	100	-	-	-	-	-	-	-	100	0%
32										
33 <b>Non-Departmental</b>										
34 Other Legal Services (RWG Law)	1,500,000	-	90,139	-	-	-	-	90,139	409,861	18%
35 Lobbying Services (Capitol Core)	229,350	3,503	19,197	-	-	-	-	22,700	193,925	10%
36 Other Professional Services (Garrison Brothers)	-	-	-	-	-	-	-	-	-	0%
37 California State Lands Commission	140	-	-	-	-	-	-	-	140	0%
38 Miscellaneous- IWVWD Grant Repayment	-	-	-	-	-	-	-	-	-	0%
39 Repayment of City of Ridgecrest In-Kind Services	132,270	-	-	-	-	-	-	-	500,000	0%
40 <b>Transfer Out from Second Transient Pool</b>	570,230	-	-	-	-	-	-	-	-	0%
41 <b>Transfer Out/Loan to Extraction Fund</b>	-	-	-	-	-	-	-	-	588,701	0%
42										
43 <b>Community Engagement</b>										
44 Design Services	180,000	-	-	-	-	-	-	-	25,000	0%
45 Printing and Reproduction	10,000	-	-	-	-	-	-	-	10,000	0%
46 Website Services	-	-	-	-	-	-	-	-	15,000	0%
47 Website	315	-	-	-	-	-	-	-	315	0%
48										
49 <b>Shallow Well Mitigation Program</b>										
50 Shallow Well Mitigation Emergency Assistance Program	50,000	-	-	-	-	-	-	-	50,000	0%

# BUDGET TO ACTUAL REPORT

## ACTUALS BY REVENUE ALLOCATION

	ORIGINAL	ACTUALS BY REVENUE ALLOCATION						\$	(A-B) \$	(B/A) %	
		Restricted Extraction	Restricted Second	Restricted	Restricted Shallow	Restricted	Restricted Navy/COSO				
		Transient Pool	Transient Pool	Augmentation	Well Mitigation	SGMA IP	EPA Grant	Fund	Total	REMAINING	COMPLETED
51	Shallow Well Mitigation Program: Outreach and Impacts Eval.(Stetson)	30,000	-	-	-	-	-	-	-	15,000	0%
52											
53	<b>NAVY/COSO Program</b>										
54	Navy/Coso Royalty Fund: Rose Valley MW Permitting, Bid, Drilling (Stetson)	120,000	99	-	-	-	-	-	99	44,901	0%
55	Navy/Coso Royalty Fund: Develop Projects & Secure Funding (Stetson)	25,000	-	-	-	-	-	-	-	15,000	0%
56	Navy/Coso Royalty Fund: Cooperative Agreement	10,000	53	-	-	-	-	-	53	9,947	1%
57	Rose Valley Construction	151,000	-	-	-	-	-	-	-	300,000	0%
58											
59	<b>Basin Management Administration</b>										
60	Production Reporting, Transient Pool, and Fee Support (Stetson)	45,000	-	-	-	-	-	-	-	35,000	0%
61	Meetings and Prep (Stetson)	215,000	7,178	7,178	-	-	-	-	14,357	155,643	8%
62	Budget Support (Stetson)	15,000	1,517	-	-	-	-	-	1,517	13,483	10%
63	Stakeholder Coordination (Stetson)	5,000	-	-	-	-	-	-	-	5,000	0%
64	Litigation Support (Stetson)	140,000	-	62,840	-	-	-	-	62,840	27,160	70%
65											
66	<b>Basin Management</b>										
67	General Engineering (Stetson)	30,000	318	-	-	-	-	-	318	49,682	1%
68	TSS: El Paso Well Drilling Support (Stetson)	-	-	-	-	-	-	-	-	-	0%
69	TSS: General Coordination/Application Support (Stetson)	2,500	-	-	-	-	-	-	-	10,000	0%
70	Coordination with DWR on GSP Review (Stetson)	-	-	-	-	-	-	-	-	-	0%
71	GSP 5-Year Update (Stetson)	25,000	-	-	-	-	-	-	-	100,000	0%
72	Annual Report Preparation (Stetson)	75,000	3,732	-	-	-	-	-	3,732	71,268	5%
73	Data Management System Support (Stetson)	40,000	1,824	-	-	-	-	-	1,824	38,177	5%
74	Allocation Plan: Allocation Process & Transient Pool Support (Stetson)	-	-	-	-	-	-	-	-	-	0%
75	Allocation Plan and Rules & Regs on Pumping/Restrictions (Stetson)	10,000	-	-	-	-	-	-	-	10,000	0%
76	Allocation Plan: Following & Transient Pool Transfer Program (Stetson)	-	-	-	-	-	-	-	-	-	0%
77	Configuration Management Plan (Stetson)	20,000	-	-	-	-	-	-	-	100,000	0%
78	General Project Management (Stetson)	40,000	1,273	-	-	-	-	-	1,273	38,728	3%
79	Model Transfer and Upgrade (Stetson)	-	-	-	-	-	-	-	-	-	0%
80	Data Collection, Monitoring, and Data Gaps (Stetson)	225,000	3,849	-	-	-	-	-	3,849	221,151	2%
81	Imported Water: Negotiations and Coordination(Stetson)	10,000	-	843	-	-	-	-	843	9,157	8%
82	Imported Water: Engineering and Analysis(Stetson)	-	-	-	-	-	-	-	-	-	0%
83	Recycled Water (Stetson)	10,000	-	-	-	-	-	-	-	25,000	0%
84	Planning Assistance to States: Army Corps Support (Stetson)	50,000	-	-	-	-	-	-	-	50,000	0%
85	Review of Outside Studies and Coordination (Stetson)	15,000	-	-	-	-	-	-	-	-	
86	Well Monitoring Services (WellIntel Inc.)	1,700	-	-	-	-	-	-	-	-	
87	<b>Basin Management (Cont'd)</b>										
88	Review of Outside Studies and Coordination (Stetson)	-	-	-	-	-	-	-	-	15,000	0%
89	Well Monitoring Services (WellIntel Inc.)	-	-	-	-	-	-	-	-	1,700	0%
90											
91	<b>Grant Management</b>										
92	Grant Review and Application Preparation (Stetson)	75,000	-	-	-	-	-	-	-	75,000	0%
93	<b>IP Grant Management</b>										
94	IP Grant Administration	27,000	-	-	-	1,775	-	-	1,775	9,490	16%
95	Bureau of Land Management	200,000	-	-	-	25,000	-	-	25,000	25,000	50%
96	Southern California Edison	22,500	-	-	-	-	-	-	-	-	
97	Imported Water :Planning/Design/Environmental (Provost & Pritchard)	-	-	-	-	-	-	-	-	520,605	0%
98	Imported Water :Planning/Design/Environmental (Blue Mountain)	-	-	-	-	-	-	-	-	520,605	0%
99	Pipeline Design	-	-	-	-	-	-	-	-	-	0%
100	Mojave Tank Farm	-	-	-	-	-	-	-	-	-	0%

# BUDGET TO ACTUAL REPORT

		ACTUALS BY REVENUE ALLOCATION								(A-B)	(B/A)	
		Restricted Extraction	Restricted Second	Restricted	Restricted Shallow	Restricted	Restricted	Restricted Navy/COSO	\$	\$	%	
	ORIGINAL	Transient Pool	Transient Pool	Augmentation	Well Mitigation	SGMA IP	EPA Grant	Fund	Total	REMAINING	COMPLETED	
101	CEQ/NEPA	-	-	-	-	-	-	-	-	-	0%	
102	Imported Water :Planning/Design/Environmental (Transystems)	-	-	-	-	-	-	-	-	150,000	0%	
103	Imported Water :Planning/Design/Environmental (Not Grant Reimb)	-	-	-	-	-	-	-	-	37,630	0%	
104	Antelope Valley East Kern Water Agency -Reimb Agreement	-	-	-	-	-	-	-	-	-	0%	
105												
106	<b>Urban Community Drought Relief Grant Program</b>											
107	Urban Community Drought Relief Funding Administration (Stetson)	10,000	-	-	-	-	190	-	190	19,810	1%	
108	Shallow Well Consolidation Project (Stetson)- Plan/Design/Engin	50,000	-	-	-	-	3,811	-	3,811	36,189	10%	
109	Shallow Well Consolidation Project (IWVWD)-Planning/Design/Engineerir	195,300	-	-	-	-	-	-	-	1,615,700	0%	
110	Shallow Well Consolidation Project (IWVWD)-Construction	1,861,900	-	-	-	-	-	-	-	-		
111	Shallow Well Consolidation Project (IWVWD)-NonReimb	5,000	-	-	-	-	-	-	-	-		
112											0%	
113	<b>EPA Resilience Grant</b>											
114	EPA Grant Administration	27,000	-	-	-	-	8,365	-	8,365	17,901	32%	
115	Resilience Grant -Design/Environmental/ROW (Stetson)	-	-	-	-	-	-	-	-	116,667	0%	
116	Resilience Grant-Design (Stetson)	100,000	-	-	-	-	6,282	-	6,282	1,865,748	0%	
117	Resilience Grant-Environmental (Stetson)	29,000	-	-	-	-	1,019	-	1,019	215,786	0%	
118	Resilience Grant --Right of Way (Stetson)	14,000	-	-	-	-	616	-	616	91,567	1%	
119	Resilience Grant - Design (Provost & Pritchard)	990,500	-	-	-	-	-	-	-	-	0%	
120	Resilience Grant - Environmental (Provost & Pritchard)	132,610	-	-	-	-	4,499	-	4,499	(4,499)	0%	
121	Resilience Grant - ROW (Transystems)	231,500	-	-	-	-	-	-	-	-	0%	
122	Resilience Grant - Project Management (Blue Mountain)	123,750	-	-	-	-	25,713	-	25,713	(25,713)	0%	
123	Resilience Grant - Mojave Tank Analysis (Provost & Pritchard)	-	-	-	-	-	-	-	-	150,000	0%	
124	City of California City	1,000	-	-	-	-	-	-	-	1,000	0%	
125	Southern California Edison	100,000	-	-	-	-	-	-	-	115,000	0%	
126	Cal Trans	15,000	-	-	-	-	-	-	-	15,000	0%	
127	State Water Resources Control Board	15,000	-	-	-	-	-	-	-	2,985	0%	
128	California Department of Fish & Wildlife	69,500	-	-	-	-	-	-	-	69,500	0%	
129	California Department of Parks & Recreation	20,000	-	-	-	-	-	-	-	-		
130	CalOSHA	1,000	-	-	-	-	-	-	-	1,000	0%	
131	Union Pacific Railroad	20,000	-	-	-	-	-	-	-	-		
132	Planning/Design/Env - (Not Grant Reimbursable)	39,565	-	-	-	-	-	-	-	161,120	0%	
133												
134	<b>TOTAL EXPENSES</b>	<u>9,234,790</u>	<u>264,260</u>	<u>-</u>	<u>199,420</u>	<u>-</u>	<u>26,775</u>	<u>50,493</u>	<u>-</u>	<u>540,949</u>	<u>4,963,790</u>	<u>5%</u>
135												
136	<b>Surplus (Deficit)</b>	<u>634,315</u>	<u>(233,876)</u>	<u>-</u>	<u>(199,420)</u>	<u>204</u>	<u>(26,775)</u>	<u>(50,493)</u>	<u>-</u>	<u>(510,360)</u>		

## CASH BALANCE

### March 2026 Activity

Cash Receipts (Receipts over \$50,000 and all grants are detailed)

<u>IWVWD Augmentation/Extraction/SWM</u>	
Second Transient Pool	
Consolidation	
All Other Cash Receipts	
Total Cash Receipts	<u>\$ -</u>

Cash Disbursements (Obligation payments are detailed)

<u>Warrants - N/A</u>	
Total Cash Disbursements	<u>\$ -</u>

### Cash Balance

Prior Month to Current Month Ending Balance Reconciliation

March Cash Balance By Investment

Kern County Treasurer	\$ 7,170,523.81
AltaOne Credit Union	<u>2,466,105.37</u>
Total End of Month Cash Balance	\$ 9,636,629.18

March Activity

Cash Receipts	
Cash Disbursements	-
Banking Adjustment Pending	-
Total End of Month Activity	<u>\$ -</u>

March Ending Cash Balance	\$ 9,636,629.18
---------------------------	-----------------

Less: Outstanding Warrants Approved-Pending Processing

Less: Outstanding Warrants -Pending Approval 2025	(554,924.86)
---	--------------

Less: Outstanding Warrants -Pending Approval 2026	(317,252.14)
---	--------------

Total Available Cash By Activity	<u>\$ 8,764,452.18</u>
----------------------------------	------------------------

March Cash Balance by Investment

Kern County Treasurer	\$ 7,170,523.81
AltaOne - In Transit to Kern County	<u>2,466,105.37</u>
Total End of Month Balance	\$ 9,636,629.18
Less: Outstanding Warrants	<u>(872,177.00)</u>
Total Available Cash by Investment	<u>\$ 8,764,452.18</u>

*Cash Receipts are deposited in AltaOne Credit Union and sent electronically to Kern County Treasurer. Cash in Transit at month end will be reflected in the Kern County Treasurer balance. Warrants are approved by IWVGA Board and administratively processed by IWVGA staff. Warrants are executed by Kern County staff. Outstanding Warrants are vendor invoices received and not yet paid.*

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Public Relations + Communications

# Monthly Activity Report

April 2026

Prepared by Westbound Communications

# Media Coverage

**Press Release: "The Pipeline Reality: Living in a Desert Region Requires Importing Water"**

## Ridgecrest Daily Independent

The screenshot shows the article's title, author (Submitted by WWSA), and a list of tags including 'Ridgecrest', 'Water', 'IWVGA', and 'Desert'. Below the article text, there is a 'Recommended for you' section with four featured articles: 'Shelterbox aids most vulnerable at Cero Cone', 'Fong routable at Cero Cone', 'REALMS gives interim superintendent the job, approves share events for busy spring at monthly', and 'Chamber members share events for busy spring at monthly'.

## Maven's Notebook

The screenshot shows the article title and a sub-headline: 'Delaying the inevitable increases costs for Indian Wells Valley residents'. The article text discusses the challenges of water importation in a desert region. Below the main text, there is a section titled 'DESERT COMMUNITIES DEPEND ON IMPORTED WATER' which states that the Indian Wells Valley is not unique in facing water sustainability challenges.



April 23, 2026  
The Pipeline Reality: Living in a Desert Region Requires Importing Water

**RIDGECREST, Calif. (April 23, 2026)** –California’s desert communities share a common challenge: they exist in arid regions with minimal natural water sources. And the common solution has been to import water through pipelines to sustain their communities.

From Lancaster to Palm Springs, from Yucca Valley to Imperial County, every major desert water district in California has made the same determination the Indian Wells Valley Groundwater Authority has reached: that importing water is essential to long-term sustainability.

“The reality about pipelines is straightforward,” said Scott Hayman, chair of the Indian Wells Valley Groundwater Authority. “We live in a desert. The Indian Wells Valley Basin is an isolated groundwater basin with no natural runoff for replenishment. After decades of overdraft, importing water isn’t one option among many, it’s the only proven path to sustainability.”

### Desert Communities Depend on Imported Water

The Indian Wells Valley is not unique in facing water sustainability challenges. What makes it notable is that the Indian Wells Valley Water District remains one of the only desert water agencies in California that has not yet taken steps to ensure a water source for future generations.

★ Ridgecrest Daily Independent amplified the story across Instagram + Facebook

# Public Workshop — April 30

## Display Boards

Created + printed for event

## Fact Sheet

Designed as flyer; printed for event

## Postcard

Created + printed for event

## Ad Graphic

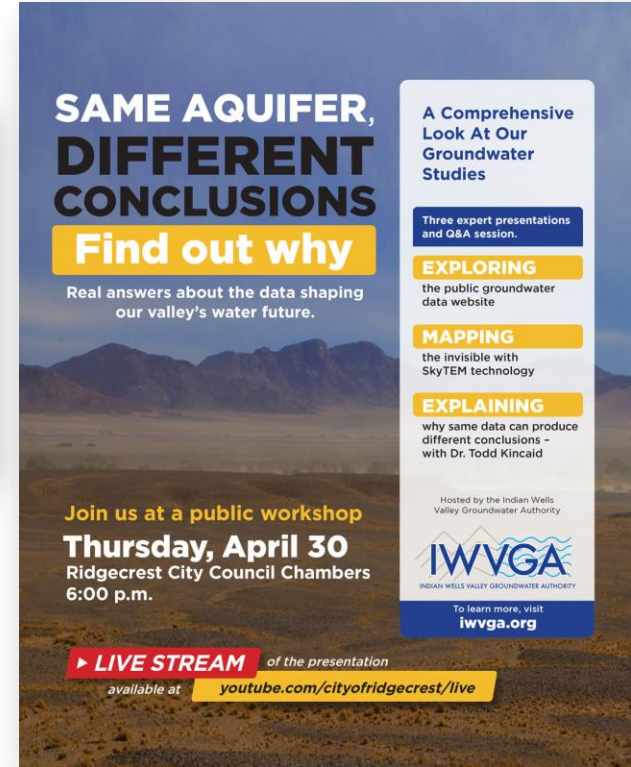
Designed as flyer; posted on social



Postcard

## DIGITAL RESULTS

- › Facebook Event: 24 'Interested' · 2,000 views
- › Geotargeted Facebook Ad: Reach 5,621 · Impressions 6,783
- › Daily Independent Print Ad: Impressions 7,000



Ad Graphic

# Public Workshop — April 30

## THE INDIAN WELLS VALLEY GROUNDWATER BASIN



## DESERT WATER DISTRICTS KNOW

### Imported Water is Necessary



Water Agency	Imported Water	No Imported Water
Antelope Valley-East Kern Water Agency	SWP, CRA	
Calleguas Municipal Water District	SWP, CRA	
Cocheila Water District	SWP, CRA	
Desert Water Agency	SWP, CRA	
Eastern Municipal Water District	SWP, CRA	
Hi-Desert Water District	SWP	
Imperial Irrigation District	CRA	
Indian Wells Valley Water District		NONE
Metropolitan Water District	SWP, CRA	
Mojave Water Agency	SWP	

**Blue Drop:** Many of these desert water districts have been using imported water for 30-60+ years.

**Red Drop:** Despite facing drier and more severe sustainability challenges than regions that proactively secured imported water decades ago, the Indian Wells Valley Water District stands virtually alone in opposing imported water solutions.

**These CIDs and water department in our region also rely on imported water:**

- Community Services District/Water Dept.
- Baton Community Services District
- Rosamond Community Services District
- California City Water Department

**Imported Water Source:** State Water Project through AVEK, State Water Project through AVEK, State Water Project through AVEK

## THE REALITY OF PIPELINES

Why imported water is essential for the Indian Wells Valley

The Indian Wells Valley sits in one of the driest parts of California. Just fear to its (basin of) each fall here in an average year. No more flow into our basin. No meaningful mountain runoff reaches it.

For generations, the valley has drawn its water from a single source: the groundwater beneath our feet. And for decades, we have pumped out far more than nature can replace. Other major desert water districts in California have faced the same reality and reached the same conclusion: long-term sustainability requires imported water.

**9 out of 10** Prominent California desert water agencies rely on imported water. **The Indian Wells Valley is the exception.**

### MATH CONFIRMS THE DILEMMA

No matter whose estimate you accept, the basin is being pumped faster than it can recover.

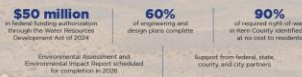
### WHAT THE NUMBERS SHOW (2024)



**BOTTOM LINE:** The basin is running out of water.

### THE PATH FORWARD IS ALREADY UNDERWAY

Indian Wells Valley Pipeline Project — Where We Stand Today



## What Our Desert Neighbors Have Done

California's major desert water agencies have relied on imported water through a pipeline for decades

Water Agency	Imports Since	Imported Water Source
Metropolitan Water District	1961	State Water Project / Colorado River
Antelope Valley-East Kern Water Agency (AVEK)	1972	State Water Project
Cocheila Valley Water District	1973	State Water Project / Colorado River
Desert Water Agency (DWA/Sage)g	1973	State Water Project / Colorado River
Huachuca Water Agency	1984	State Water Project
Hi-Desert Water District	1985	State Water Project
California Municipal Water District	1992	State Water Project / Colorado River
Eastern Municipal Water District	1993	State Water Project / Colorado River
Imperial Irrigation District	1993	Colorado River
Indian Wells Valley Water District	None	Groundwater only

These CIDs and water department in our region also rely on imported water:	Community Services District/Water Dept.	Imported Water Source
	Baton Community Services District	State Water Project through AVEK
	Rosamond Community Services District	State Water Project through AVEK
	California City Water Department	State Water Project through AVEK

### LESSONS FROM OUR NEIGHBORS



### UNDERSTANDING WATER RATES IN CONTEXT

For many years, our water rates have been compared to heavily diked, but that is a misleading comparison. Other desert districts have clearly raised their rates over decades to pay for modern infrastructure, recycling, and a reliable water supply. There, we have kept our rates low by overly pumping water out of the ground without investing in new sources. This cannot last forever.

The longer we wait to fix the problem, the more expensive it will be.

# Website Launch

## MILESTONE | IWVGA.org officially relaunched in April 2026



The Indian Wells Groundwater Authority (IWVGA) works to protect, manage, and sustain the shared groundwater resources that support the communities and ecosystems in the 597 square mile Indian Wells Valley groundwater basin.

— What is the Indian Wells Valley Groundwater Authority?

The **Indian Wells Valley Groundwater Authority (IWVGA)** is a groundwater sustainability agency (GSA) responsible for managing the 597 square mile Indian Wells Valley groundwater basin.

The Indian Wells Valley Groundwater Authority was established as part of the state's **Sustainable Groundwater Management Act (SGMA)** established in 2014. The IWVGA's mission is to address local water resource challenges, specifically decades of unchecked withdrawals of the Indian Wells Valley groundwater basin. The IWVGA is required by law to focus on sustainable groundwater management, long-term water security for our area, the pursuit of funding for requisite water projects, local economic stability and growth, and to help maintain the viability of the Naval Air Weapons Station China Lake, a major economic engine for the area.


The IWVGA comprises representatives from the Indian Wells Valley Water District (IWWVD), the City of Ridgecrest, Kern County, Inyo County, and San Bernardino County. The U.S. Navy and the Bureau of Land Management serve as ex officio (non-voting) members of the IWVGA Board of Directors.

- + What is the Sustainable Groundwater Management Act?
- + Why did the state believe SGMA was necessary?
- + What are the current conditions of the Indian Wells Valley groundwater basin? How serious are the challenges?
- + What are the facts and studies backing up the claims of "critical overdrafting"?
- + Orci varius natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus.
- + How was our Groundwater Sustainability Plan (GSP) developed?
- + What did the approved GSP recommend?

Stay informed with the latest updates from the Indian Wells Valley Groundwater Authority, including news releases, policy updates, and key developments related to groundwater management in our region.

PRESS RELEASES

Filter by Date Search all Press Releases




April 23, 2026

**The Pipeline Reality: Living in a Desert Region Requires Importing Water**

Delaying the inevitable increases costs for Indian Wells Valley residents

[READ MORE](#)




February 12, 2026

**Ridgecrest Can't Afford Further Delay, Sustainability Requires an Imported Water Option**

More than 25 million Californians, will over two-thirds of the state's population, rely on water...

[READ MORE](#)



December 19, 2025

**IWVGA Supports Navy's "Request for Relief" Related to Phase 2 Safe Yield Pre-Trial Discoveries Timing but Water District Files Formal Opposition**

The Indian Wells Valley Groundwater Authority supports the U.S. Navy's request for relief regarding Phase 2 discovery deadlines...

[READ MORE](#)



**Ridgecrest Can't Afford Further Delay, Sustainability Requires an Imported Water Option**

February 12, 2026

[LEARN MORE](#)



**IWVGA Supports Navy's "Request for Relief" Related to Phase 2 Safe Yield Pre-Trial Discoveries Timing but Water District Files Formal Opposition**

December 19, 2025

[LEARN MORE](#)



**IWVGA & Searles Valley Minerals Announce Comprehensive Settlement and Mutual Release Agreement**

November 20, 2025

[LEARN MORE](#)

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