Indian Wells Valley Water District

Celebrating more than 60 Years of Service

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Special Board Workshop
July 18, 2024

July Workshop

1. Call to Order

2. Pledge of Allegiance

3. Roll Call

4. Posting of Agenda Declaration

5. Conflict of Interest Declaration

6. Public Questions and Comments

This portion of the meeting is reserved for persons desiring to address the Board on any matter not on the agenda and over which the Board has jurisdiction. However, no action may be taken by the Board of Directors on any item not appearing on the agenda. Non-agenda speakers are asked to limit their presentation to five minutes. Public questions and comments on items listed on the agenda will be accepted at any time the item is brought forth for consideration by the Board. When you are recognized by the chairperson, please state your name and address for the record.

Board Workshop

7. Board Workshop

(This meeting is a planning session for the IWV Water District Board of Directors and the Water District Staff to discuss, consider, and prioritize present and/or future operations and projects for the year, which may also include but not be limited to matters relating to finances, management, and those items listed below. The intent of this meeting is to set forth a plan and a schedule to keep all of us on track. The goal is to have the agreed upon projects assigned to the appropriate committee with an assigned chairperson.)

Workshop Items

A. Workshop Issues, Goals and Priorities

Board discussion on the following items:

1. Options for Concealed Carry Weapon Policy (CCW)

2. Brown Act Refresher, Communication Improvement Discussion

Brown Act: Communication

The Brown Act "Meeting" Section 45952.2(b)

A **majority** of the Members shall not, outside a regular meeting, use a **series of communication** of any kind, directly or through intermediaries to (1) discuss, (2) deliberate, or (3) **take action on** any item of business that is **within the subject matter jurisdiction of the District.**

When is Communicating a Meeting?

Think of four key concepts when considering your own communications

1. Are you "**hearing**", with two or more other Board members, an item or issue that is within the subject matter jurisdiction of the District?
2. Are you **discussing**, with 2 or more other Board members, an item that is within the subject matter jurisdiction of the District?
3. Are you **deliberating**, with 2 or more other Board members, on an item that is within the subject matter jurisdiction of the District?
4. Are you developing a collective concurrence, with 2 or more other Board members, on an item that is within the subject matter jurisdiction of the District?
5. Are you as part of a Board majority **taking action** on an item that is within the subject matter jurisdiction of the District?

Meeting vs. Non-Meeting

- Communications Outside of a Noticed Meeting that Are Not Authorized by the Brown Act and that May Constitute a “Meeting”:
- 1. The Serial “Meeting”
- 2. The Hub and Spoke “Meeting”
- 3. Social Media Posts and Communications

Serial Meeting

- The Brown Act prohibits serial communications that lead to a concurrence among the majority of the members of the legislative body.
- Any type of communication is prohibited if that communication allows the majority of the members of the body to engage in a communication that should instead occur at a public meeling.
- The serial communication may involve a series of communications, each communication involving less than a quorum of the board, but when taken as a whole, involve a majority of the board.

Examples – Serial Meeting

• If one board member contacts/emials all or a majority of the other board members that discuss or argue a member's opinion or point of view, has a Serial meeting occurred?	Yes
• If Board Member A contacts Member B about District business, and B contacts member C, has a Serial meeting occurred?	Yes
• If a board member's representative, agent, or intermediary diretly or indirectly contacts the other board members, spouse, messenger, or an alternate board member communicates with the majority of the other board members., has a serial communication occurred?	Yes
• If Board Member A contacts Member B about District business, and B does not contact member C, has a Serial meeting occurred?	No!!!
• Circulation of minutes or other documents for approval by the board outside of a public meeting.	Yes

Proper Communication

- The board or committee members may discuss their availability for an upcoming meeting, e.g., the dates and times of an upcoming meeting.
- Providing information to the other members on an upcoming matter on the agenda by distributing reading materials, information necessary to prepare for a meeting,
- Distributing legal advice to the board/committee from the legal counsel.
- Distributing general public announcements. For example, notifying the other board members of a meeting or a community event.

Penalties for engaging in Serial Communications?

- Violations of the Brown Act may result in civil and criminal penalties. There are a number of civil remedies that a person may pursue if it is believed that there are impermissible serial communications occurring by the board members, including making a demand to cure upon the District. A demand to cure might include requesting that a meeting item be set aside and re-hear that item with a disclosure of the improper communications. Also, a decision made in violation of the Brown Act is subject to being set aside as void. The District may be required to remedy its improper actions and pay attorney fees and costs from its own funds to a person who brings a challenge. In addition, individuals may be criminally prosecuted for misdemeanor violations of the law.

“Hub and Spoke”

- An intermediary contacts or communicates with at least a majority of the Board members to develop a collective concurrence on an issue to be considered or action to be taken by the Board.

Social Media

- Until AB 992, the Brown Act did not directly or specifically address issues raised by social media. AB 992 amended the Brown Act to clarify what kind of communications a member of a legislative body may have via social media and what kind of communications are prohibited.
  - A member of a legislative body member may communicate on internet-based social media platforms to **answer questions**, **provide information** to the public or to **solicit information** from the public regarding a matter within the legislative body's subject matter jurisdiction, provided that:
    - a majority of the members of the legislative body do not use the social media platform to "discuss among themselves"business" of a specific nature" that is within the legislative body's jurisdiction.
  - Also, "A member of the legislative body shall not respond directly to any communication on an internet-based social media platform regarding a matter that is within the subject matter jurisdiction of the legislative body that is made, posted, or shared by any other member of the legislative body

AB 992 -Continued

- “Discuss among themselves” is defined broadly, and includes “communications made, posted, or shared” on social media between members, “including comments or use of digital icons that express reactions to communications made by other members” of the Board.
- “Internet-based social media platform” means an online service that is open and accessible to the public.
- “Open and accessible to the public” means that members of the general public have the ability to access and participate, free of charge, in the social media platform without the approval by the social media platform or a person or entity other than the social media platform, including any forum and chatroom, and cannot be blocked from doing so, except when the internet-based social media platform determines that an individual violated its protocols or rules. (Based on the language of AB 992, this would appear to include Facebook, TikTok, Instagram, SnapChat, and similar social media platforms, and also blogs, on-line forums and chat rooms such as Reddit, etc.)

AB 992- Do's and Don'ts

- You may use your internet-based social media to answer questions, provide information to the public or to solicit information from the public regarding matters within the District's jurisdiction.
- You should not use digital icons – e.g., the "thumbs up" (or similar symbols suggesting agreement), "thumbs down" (or similar symbols suggesting disagreement), "angry", and the "care" icons or emojis – to "react" or respond to other Board members' social media posts, comments, reactions or shares.
- You should not respond or reply directly to another Board member's post on social media involving any subject matter within the subject matter jurisdiction of the District.

Quick Recap

- “A majority of the members of a legislative body shall not, outside a meeting authorized by this chapter, use a series of communications of any kind, directly or through intermediaries, to discuss, deliberate, or take action onany item of business that is within the subject matter jurisdiction of the legislative body.” Section 54952.2(b)
- A “a series of communications of any kind” is BROAD. It means verbal discussions, email, text messages or other written communications, certain social media posts, the use of intermediaries, etc.
- Beware the “reply all” email.

When is Communicating NOT a Meeting?

What is NOT a Meeting?

Individual contacts or conversations between a Board member and any other private individual that are not part of a serial, spoke and hub, or prohibited social media communication.

What about “one-on-one” communications between Board members and staff?

- An employee or official of a local agency may engage in separate conversations or communications outside of a meeting with members of the Board in order to answer questions or provide information regarding a matter that is within the subject matter jurisdiction of the District, if that person does not communicate to members of the legislative body the comments or position of any other member or members of the legislative body.

What else isn't a "Meeting"

- Attendance by a majority of the members of the legislative body at:

1. A conference or similar gathering open to the public that involves a discussion of issues of general interest to the public or to public agencies of the type represented by the legislative body; or
2. An open and publicized meeting organized to address a topic of local community concern by a person or organization other than the District; or
3. An open and noticed meeting of another body of the District; or
4. An open and noticed meeting of a legislative body of another local agency; or
5. An open and noticed meeting of a standing committee of the Board, provided that the members of the legislative body who are not members of the standing committee attend only as observers; or
6. A purely social or ceremonial occasion.

is not a Brown Act violation, PROVIDED THAT that a majority of the members do not discuss among themselves, other than as part of the scheduled programs above, business of a specific nature that is within the subject matter jurisdiction of the District.

Thank you

Workshop Items

A. Workshop Issues, Goals and Priorities

Board discussion on the following items:

3. Review of Elections, dos and don'ts

Workshop Items

B. **Presentations (9:00 a.m.):**

1. State Water Resources Control Board (SWRCB) and Local Agency Formation Committee (LAFCo) presentation on Inyokern Community Services District (CSD)

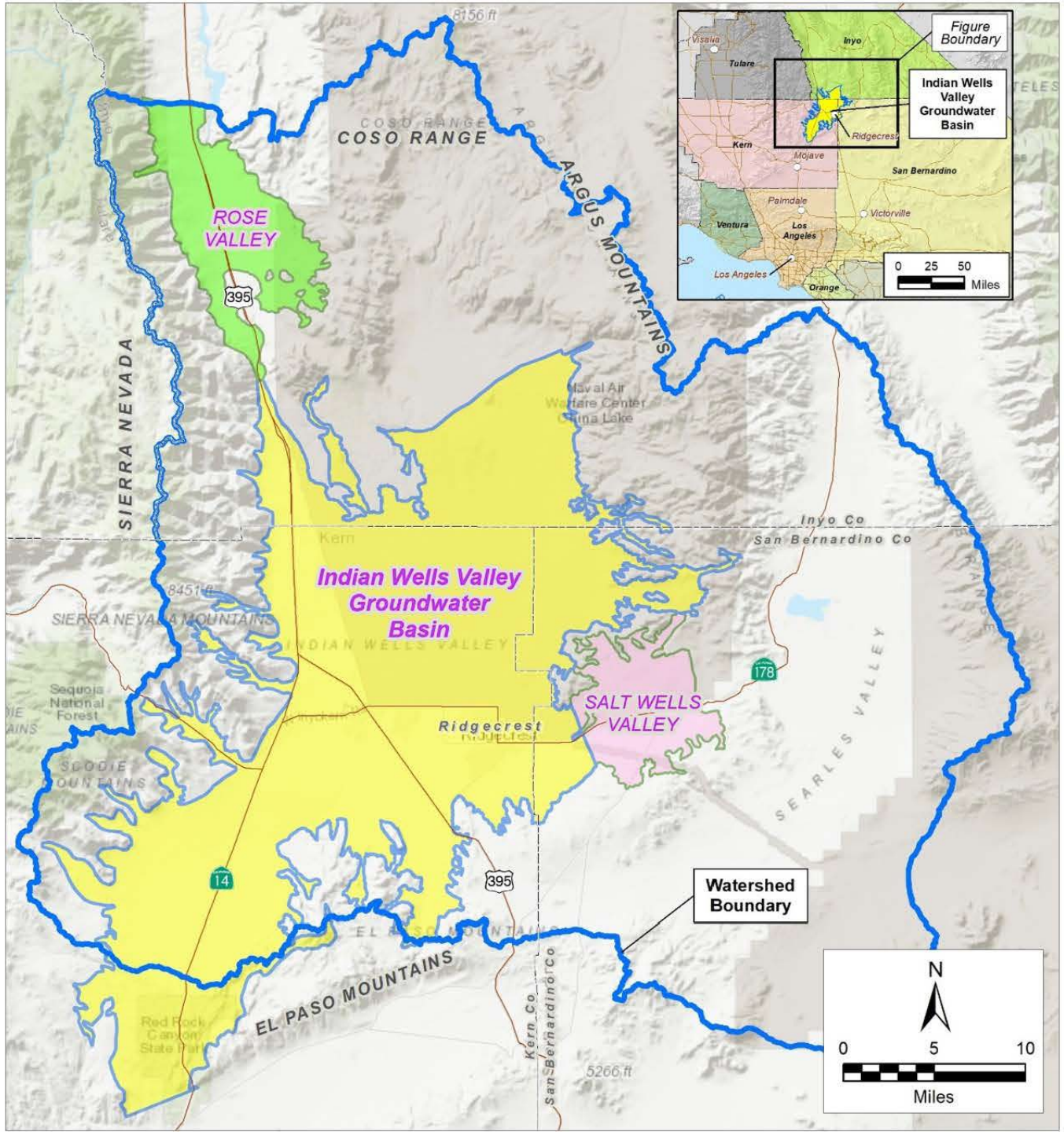
2. Presentation by Tim Parker - Technical Working Group: Assessment of Groundwater Storage for the Indian Wells Valley Groundwater Basin

Indian Wells Valley Technical Work Group White Paper

Indian Wells Valley Basin New Groundwater in Storage Estimate

IWVWD Board Workshop July 18, 2024

Timothy K. Parker, PG, CEG, CHG
IWVWD Consulting Hydrogeologist



IWV Technical Work Group (TWG)

- Indian Wells Valley Water District
  - Krieger & Stewart, Parker Groundwater and Ramboll
- Meadowbrook Dairies
  - Luhdorf Scalmanini Consulting Engineers
- Mojave Pistachios
  - Aquilogic
- Searles Valley Minerals
  - Geoscience Support Services

Presentation Outline - IWV TWG New Groundwater in Storage Estimate

- Importance of Groundwater in Storage
- IWV GSP Groundwater Storage Summary Slide
- Technical Work Group Approach
  - Literature Review
  - Estimate 1
  - Estimate 2
  - Estimate 3
- Comparative Analysis
- Conclusions

Why is the Amount of Groundwater in Storage Important?

- Groundwater levels have been declining relatively steadily in the basin since at least the 1960's
- SGMA was written specifically to allow 20 to 30 years to achieve groundwater sustainability and minimize socioeconomic impacts
- Groundwater in Storage directly relates to the amount of time you have for SGMA projects to be implemented to address groundwater level declines
  - *Small amount in storage* – demand management and project execution focus
  - *Large amount in storage* – new data collection/analysis and project prioritization focus
- In basin recycled water recharge is the high priority, low hanging fruit and will help reduce the groundwater depressions and lessen wells going dry
  - **Prioritize/accelerate this project** going forward to recharge the aquifer system
  - Put the wastewater to beneficial use now instead of waiting

IWV GSP 2020
Groundwater in Storage Estimate

GSP did not include any new work to estimate groundwater in storage and instead used 30-year old existing work:

- USBR (1993) estimated *1,020,000 to 3,020,000 AF groundwater in storage* underlying 59,200 acres of IWV 384,000 acre basin area to a depth of 100-300 feet below water table and specific yield (Sy) of 0.20
- GSP applied a uniform Sy of 0.20 and 200 feet of dewatering to the 1993 USBR 59,200 acres to calculate 2,370,000 AF in storage in 1992
- GSP estimated 1,750,000 AF remains available in groundwater storage in the IWV basin in 2017
  - (2,370,000 AF minus 620,000 AF pumped since 1992)
- GSP storage estimate is limited to **15 percent of the 384,000 acres IWV basin area** and **assumes 200 feet of groundwater is all that is available**
- GSP Desert Research Institute (DRI) groundwater flow model was used to *simulate annual groundwater in storage changes* ***but not to estimate groundwater in storage***

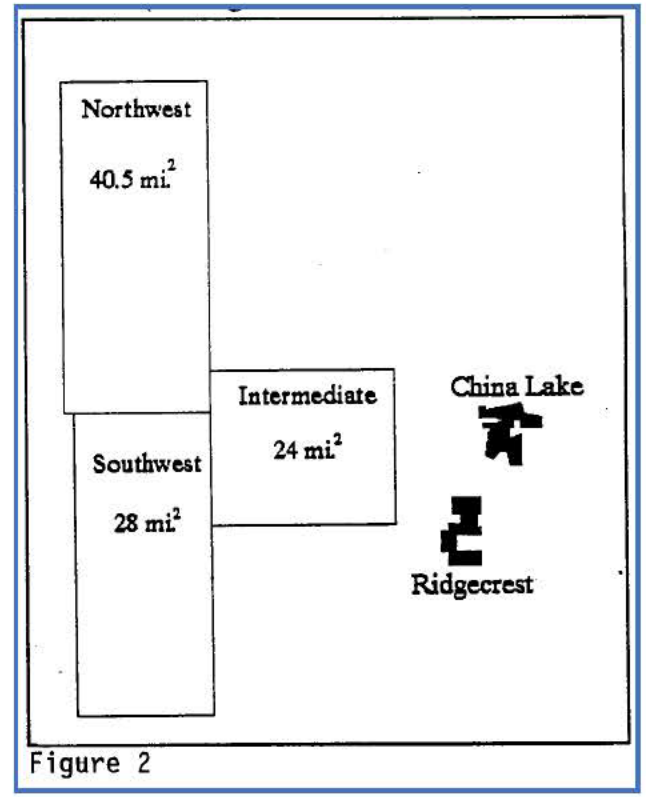


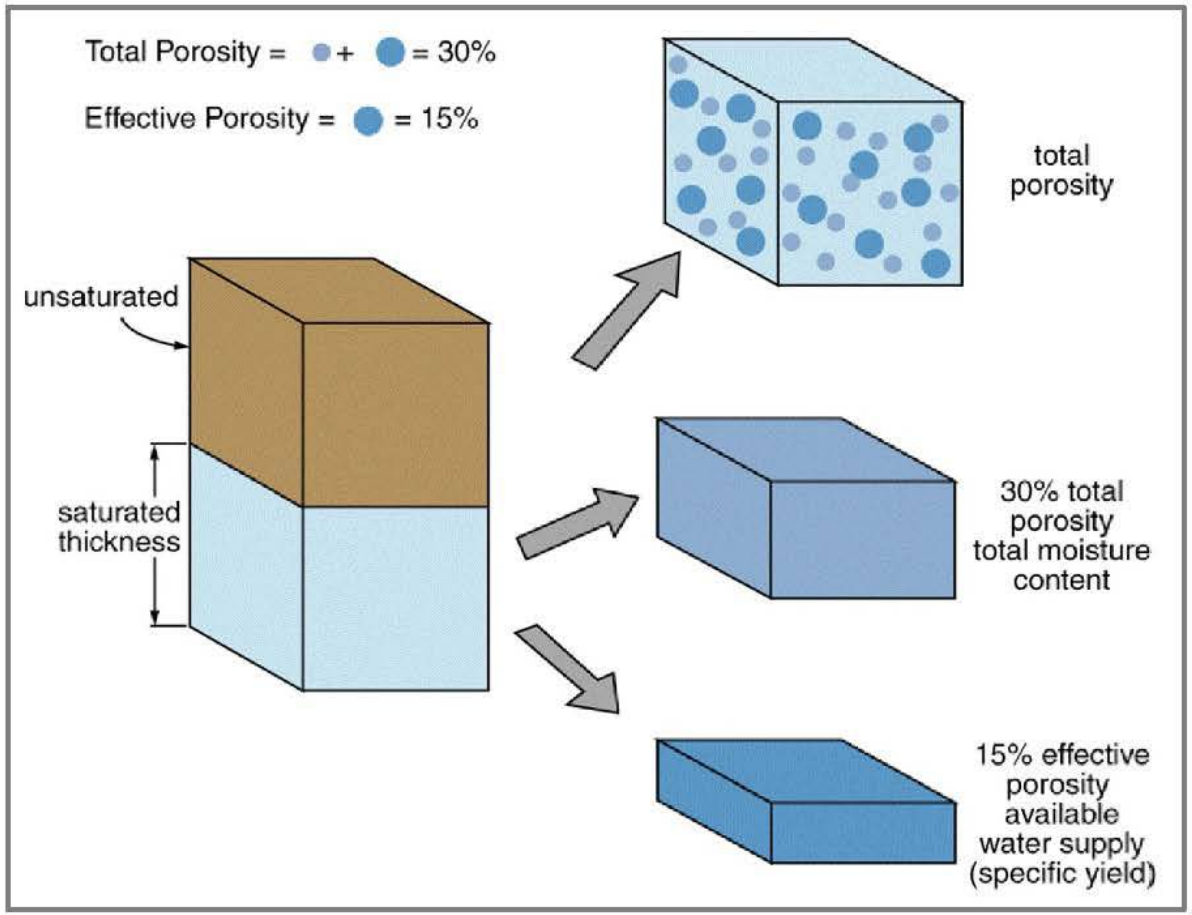
Figure 2

Reference: Section C – Estimate of Water Resource Life, Indian Wells Valley Groundwater Project, Volume II Technical Report, December 1993, Department of the Interior, Bureau of Reclamation

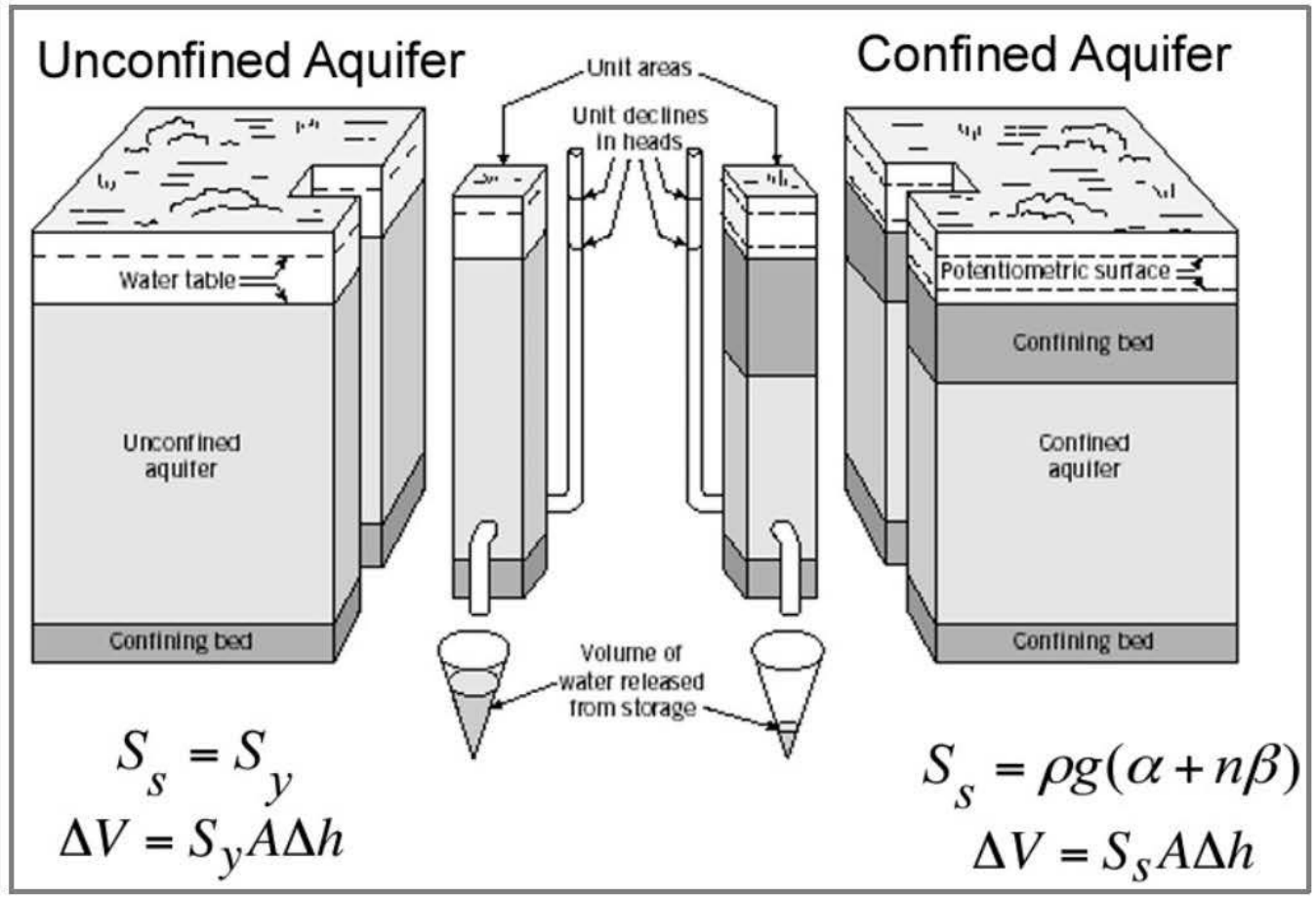
92.5 mi^2 = 59,200 acres

Why is Specific Yield Important?

Total and Effective Porosity **RELATES TO** Specific Yield and Specific Storage



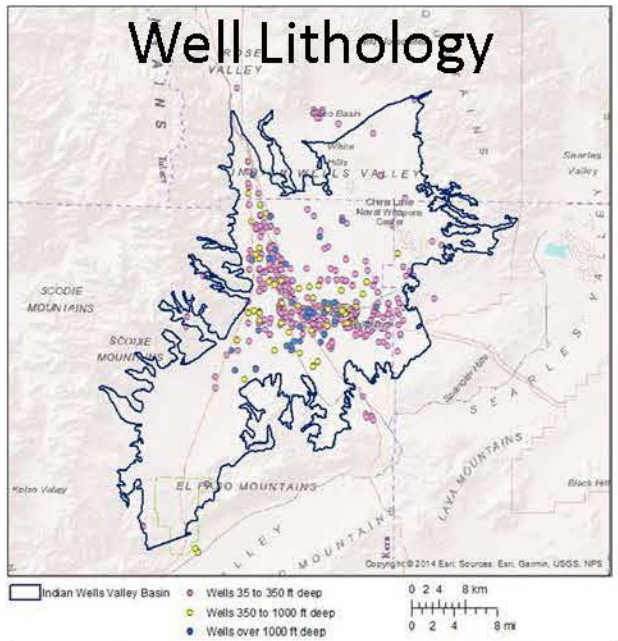
Kansas Geological Survey, Buddenmeier and Schloss, 2000.



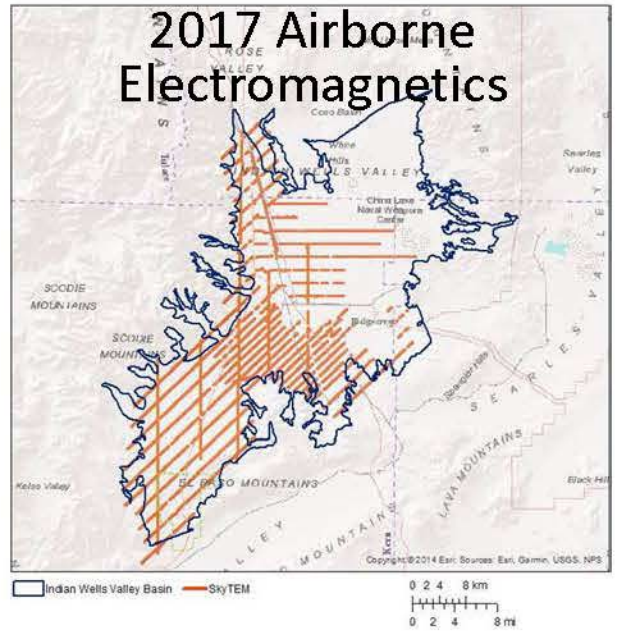
Heath, 1983, modified by McKinney & Savistsky 2014.

Datasets Used - TWG New Groundwater in Storage Estimate

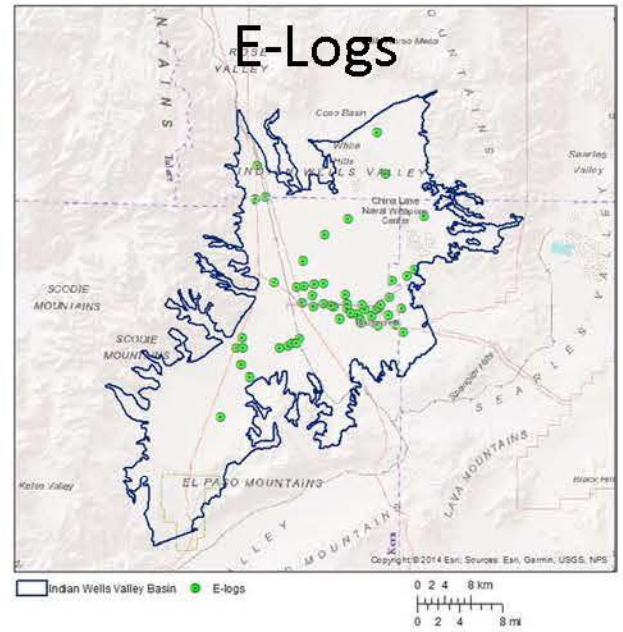
Well Lithology



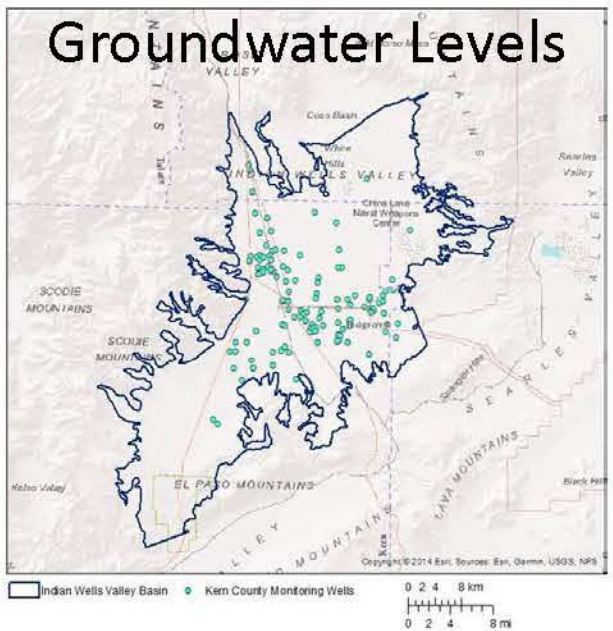
2017 Airborne Electromagnetics



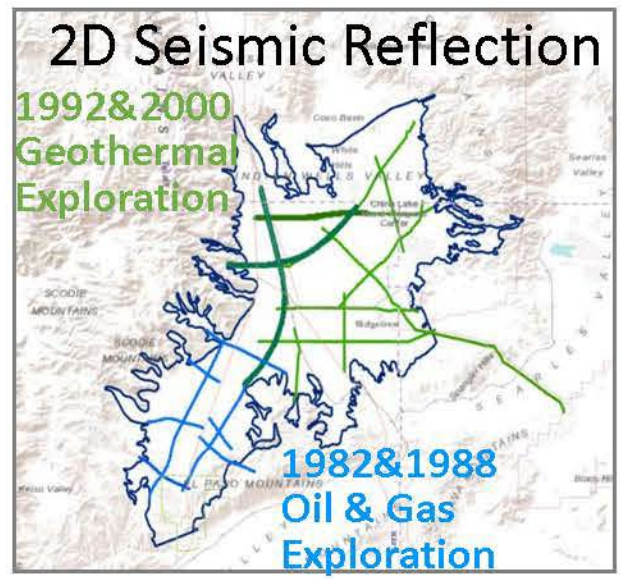
E-Logs



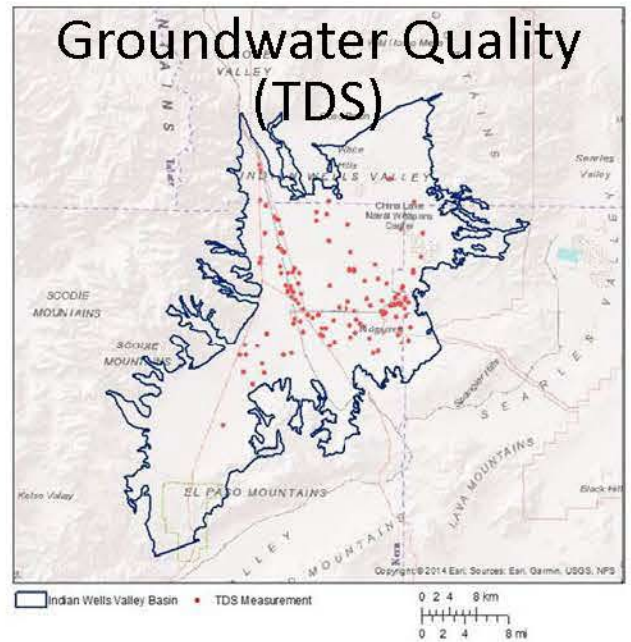
Groundwater Levels



2D Seismic Reflection



Groundwater Quality (TDS)



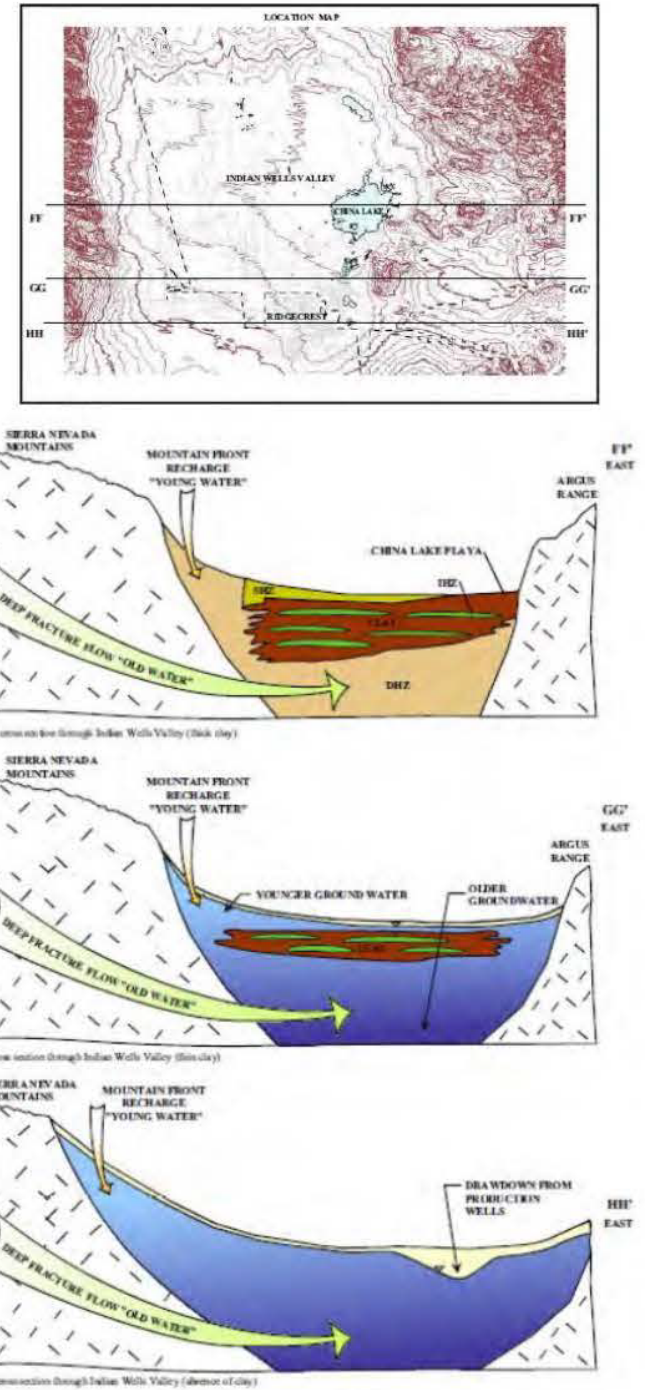
TWG Approach
New Groundwater in Storage Estimate

1. **Literature Review** of previous IWV basin study conceptualizations and hydraulic properties
2. **Three Groundwater Storage Volume Estimates**
   i. DRI groundwater flow model documentation
   ii. Ramboll HCF excluding the El Paso Area
   iii. Ramboll updated HCF for the entire basin, including consideration of water quality
3. **Comparison of Three Methods and to the GSP**

Literature Review

3. Tetra Tech EMI (2003)

- Drilled/cored more wells, reviewed data from nearly 300 wells in the IWV Basin to create maps, cross-sections, and geochemical plots to identify three discrete hydrogeologic water-bearing zones in the IWV Basin
- Designated these three zones the Shallow Hydrogeologic Zone (SHZ), the Intermediate Hydrogeologic Zone (IHZ), and the Deep Hydrogeologic Zone (DHZ)
- Extensive Pleistocene lake-deposited clay in the northern portion of the IWV Basin that thins and tapers out to the south



Literature Review

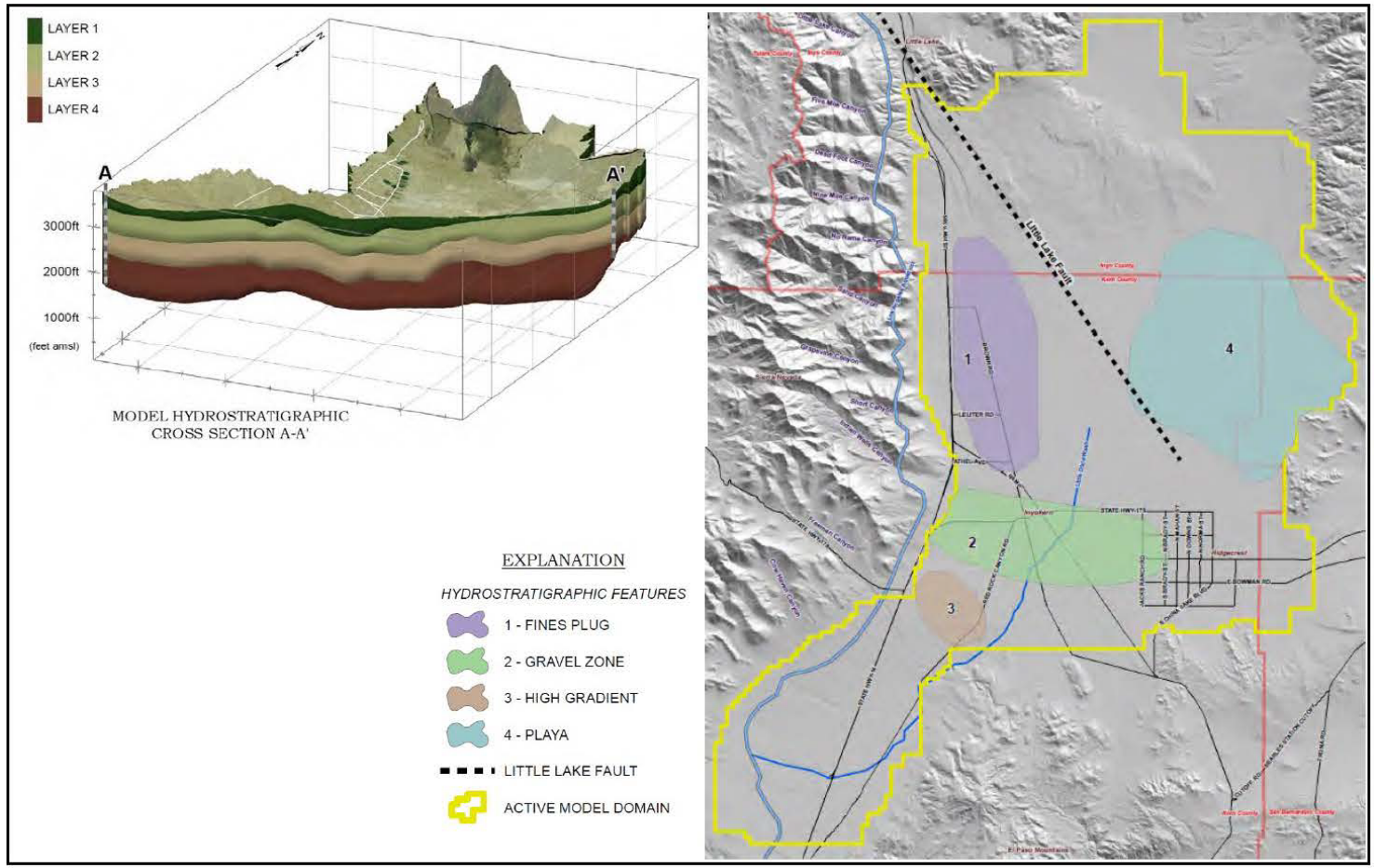
5. Brown & Caldwell Flow Model (2009)

Layer 1 – Playa, lacustrine and eolian, alluvial silt and clay deposits as an unconfined aquifer

Layer 2 – Unconsolidated young alluvium, playa/lacustrine, and alluvial fan deposits as an unconfined / confined aquifer with variable transmissivity

Layer 3 – Older alluvium, more consolidated alluvial fan and basin fill deposits as an unconfined / confined aquifer with variable transmissivity

Layer 4 – Older continental basin fill, heavily cemented, low permeability deposits of the Goler and Ricardo Formations as an unconfined / confined aquifer with variable transmissivity



Reference: Brown and Caldwell, 2009. Final Report: Indian Wells Valley Basin Groundwater Flow Model and Hydrogeologic Study. Prepared for Indian Wells Valley Water District, dated March 27.

Indian Wells Valley Technical Working Group

Indian Wells Valley

Brown & Caldwell CHM Geometry

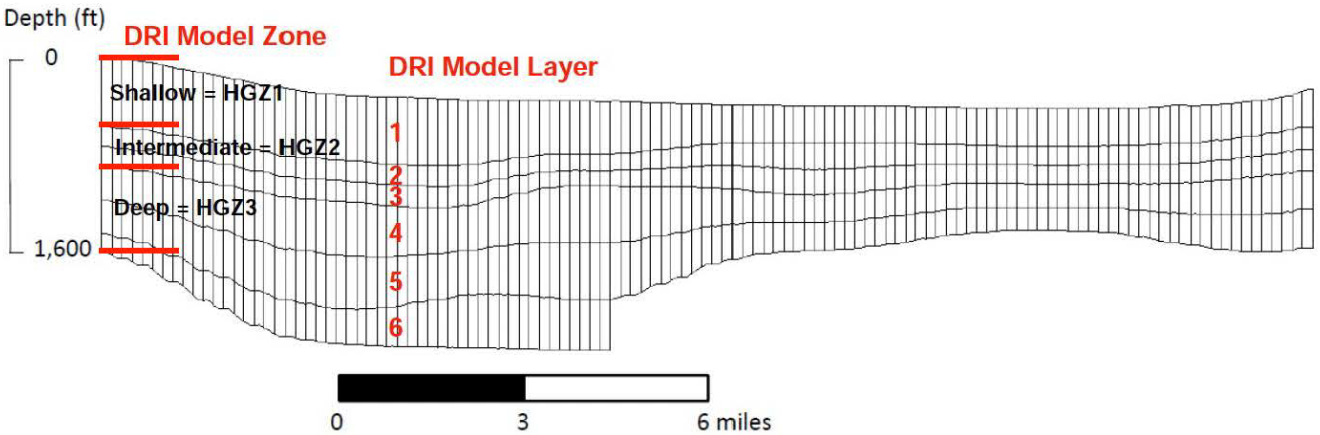
Date: 03/30/2023

Figure 10

Literature Review

6. DRI Flow Model (2016 & 2017)

- Incorporated revised estimates of playa evaporation rates and mountain front recharge while increasing the grid resolution of the model in both the vertical and horizontal directions
- Refined the model layering, by adding two additional layers, to better represent the aquifer units, which increased the number of layers in the model from four to six
- An additional layer was added to the unconsolidated, younger alluvium, and one was added to the older basin fill, to allow more vertical heterogeneity and better average pore velocity estimates
- Set groundwater recharge to 7,650 AFY based on two-dimensional model and set average specific yield at 0.225
- Incorporated faults in 2017



DRI Model Zone	Hydrogeologic Zone	Model Layers
Shallow	HGZ1	1
Intermediate	HGZ2	2 and 3
Deep	HGZ3	4, 5, and 6

Reference: DRI, 2018. Indian Wells Valley Groundwater Model. Presentation to TAC. Slide 16 – Flow Model, dated October 4.

Modified to include explanatory labels.

Indian Wells Valley Technical Working Group

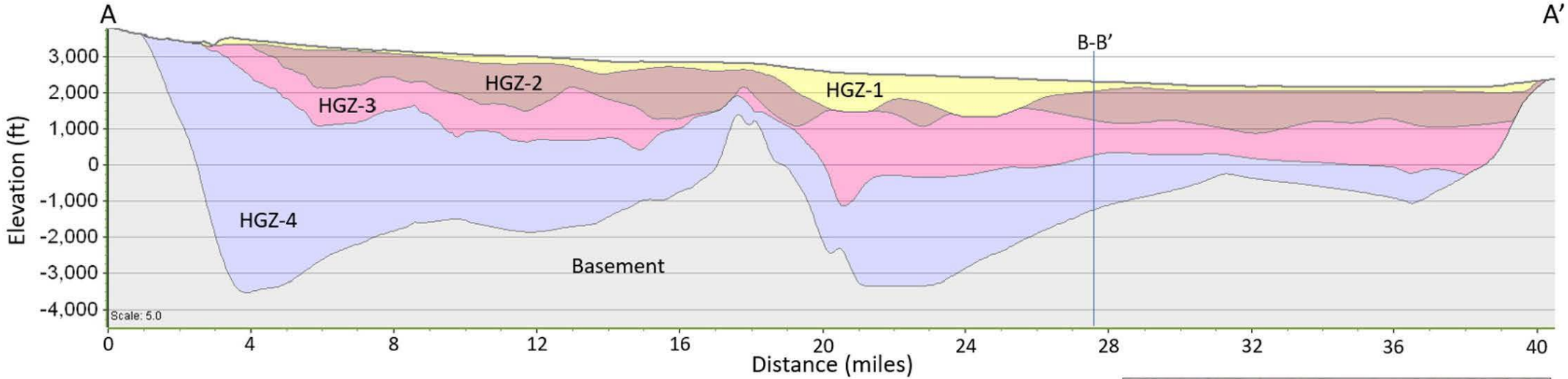
Indian Wells Valley **DRI Model Layers'**

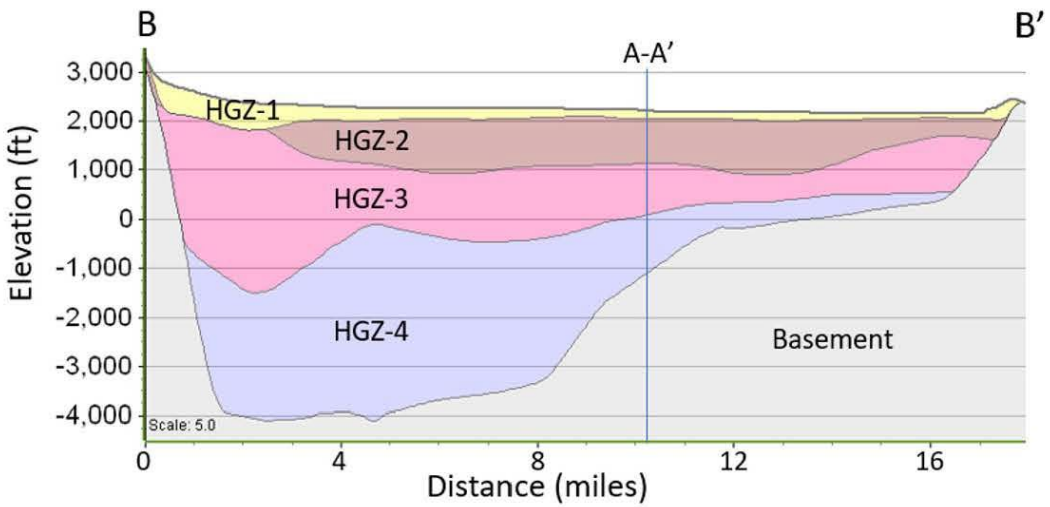
Date: 9/18/2023

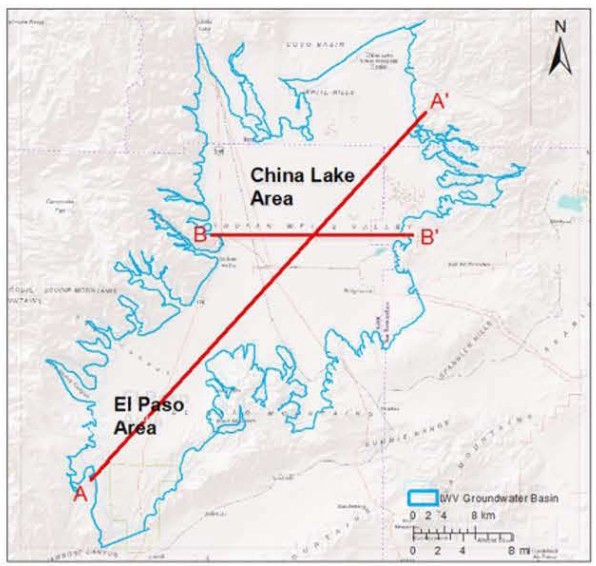
Figure 11

Literature Review

6. Ramboll (2019, Revised 2024)





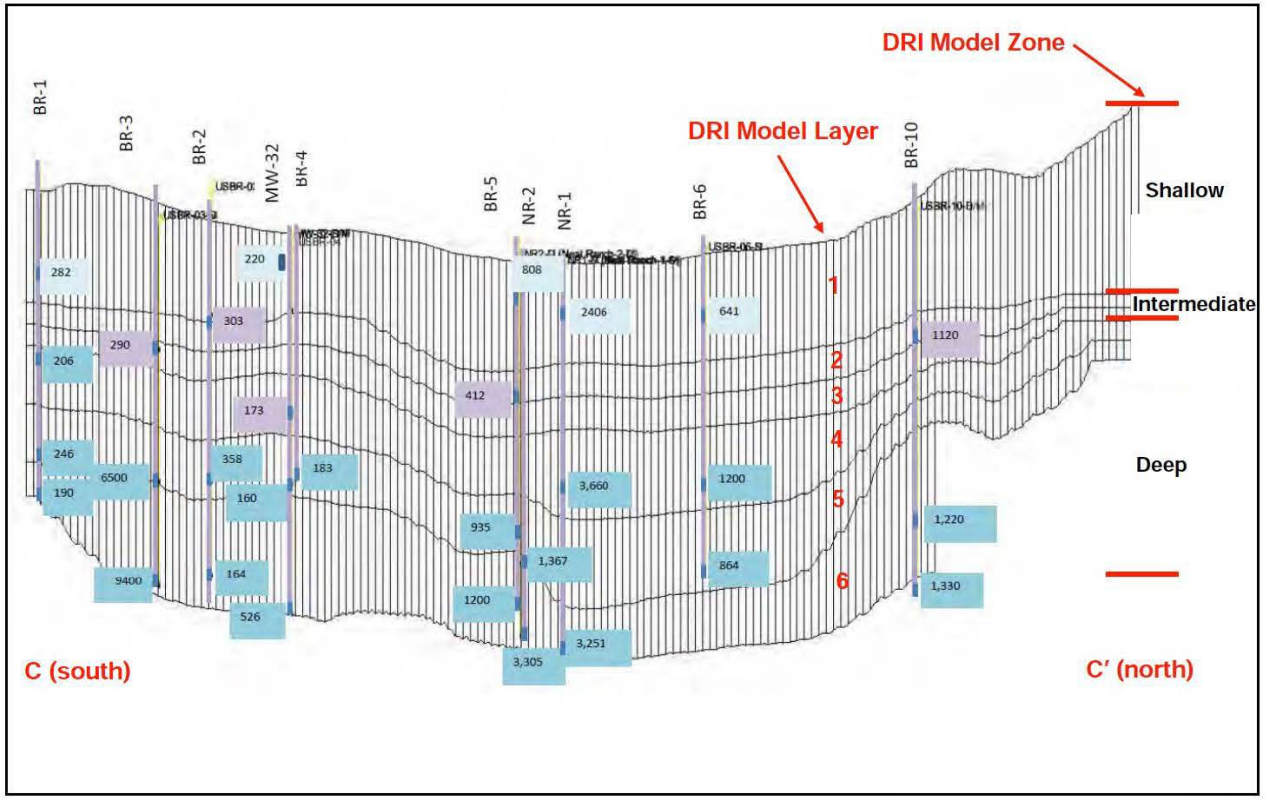


TWG New Groundwater in Storage Estimate 1 Use of DRI Model Available Information

Built 3-dimensional IWV basin volumetric model with the following key features/assumptions:

- DRI model boundary (lateral extent) (DRI, 2018; McGraw et al., 2016), although it should be noted that the DRI model boundary does not cover the entire IWV Basin
- Kern County Water Agency (KCWA) groundwater levels from 2015 (the most recent data available at the time the model was built)
- Five DRI vertical cross-sections to estimate the shape of the IWV Basin and the DRI model layers (DRI, 2019b; McGraw et al., 2016)
- DRI TDS concentration distributions in the shallow, intermediate, and deep layers of the DRI model (DRI, 2019; McGraw et al., 2016)
- DRI Sy = 0.225 distributed within the lateral extent of the model boundary (DRI assumed no vertical variation) (DRI, 2019; McGraw et al., 2016).

TWG New Groundwater in Storage Estimate 1
Use of DRI Model Available Information



Reference: DRI, 2019. Indian Wells Valley Draft TDS Transport Model Baseline Pumping Conditions. Presentation to IWV TAC. Slide 7, dated February 7.

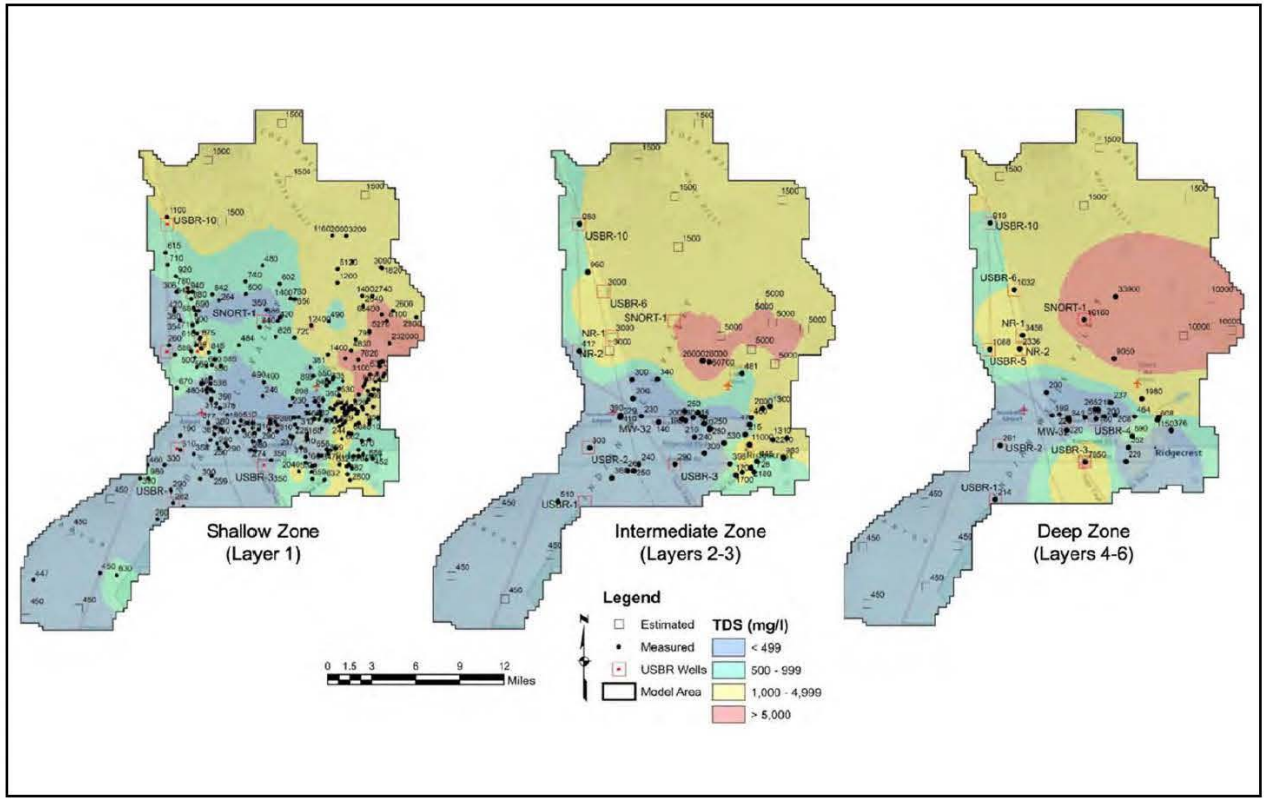
Modified to include explanatory labels.

Indian Wells Valley Technical Working Group

Indian Wells Valley

DRI Model Cross-Section C-C′

Date: 9/18/2023 | | Figure 18



Reference: Stetson Engineers, 2020. Groundwater Sustainability Plan for the Indian Wells Valley Groundwater Basin. Bulletin 118 Basin No. 6-054. Indian Wells Groundwater Authority. Appendix 3-H – Model Documentation. DRI Figure 40, dated January.

Modified to include explanatory labels.

Indian Wells Valley Technical Working Group

Indian Wells Valley

DRI Model Distribution of Total Dissolved Solids (TDS)

Date: 9/18/2023 | | Figure 22

TWG New Groundwater in Storage Estimate 1

DRI Model Zone	DRI Model Layer	Volume of Fresh Water in Storage (AF)	Volume of Brackish Water in Storage (AF)	Total Volume of Water in Storage (AF)
Shallow (HGZ1)	**Layer 1**	**10,970,000**	**5,810,000**	**16,780,000**
Intermediate (HGZ2)	Layer 2	3,170,000	5,080,000	8,250,000
	Layer 3	3,160,000	5,080,000	8,240,000
	Layer 2 + 3	**6,330,000**	**10,160,000**	**16,490,000**
Deep (HGZ3)	Layer 4	6,290,000	7,780,000	14,070,000
	Layer 5	6,320,000	7,720,000	14,040,000
	Layer 6	12,060,000	19,980,000	32,050,000
	Layer 4 + 5 + 6	**24,670,000**	**35,480,000**	**60,160,000**
Total	**All 6 Layers**	**41,970,000**	**51,450,000**	**93,430,000**

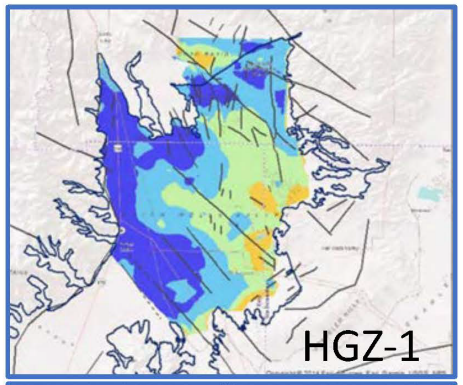
TWG New Groundwater in Storage Estimate 2

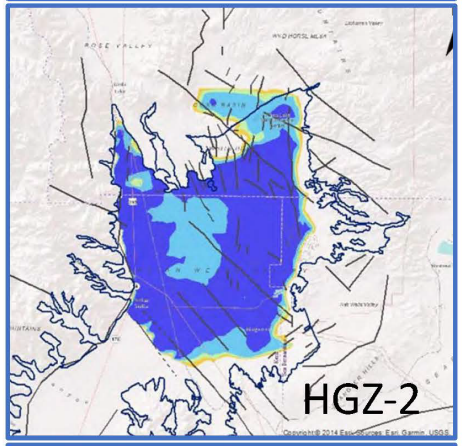
TWG developed a second estimate of the total volume of groundwater in the China Lake Area of the IWV Basin utilizing data from the following sources:

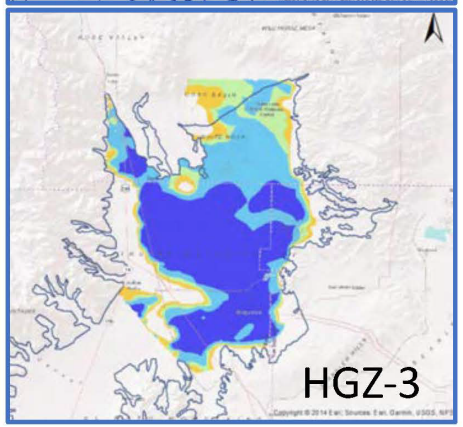
- Department of Water Resources (DWR, 2022a) IWV Basin boundary (lateral extent)
- Hydrogeologic unit lateral and vertical extents developed by Ramboll as part of the Hydrogeologic Conceptual Framework (HCF) for IWV (Ramboll, 2019)
- Groundwater levels from spring 2017 California Statewide Groundwater Elevation Monitoring (CASGEM) Network (DWR, 2022b) Sy distributions from several published sources including:
  - Kunkel and Chase (1969)
  - Johnson (1967)
  - Heath (1983)

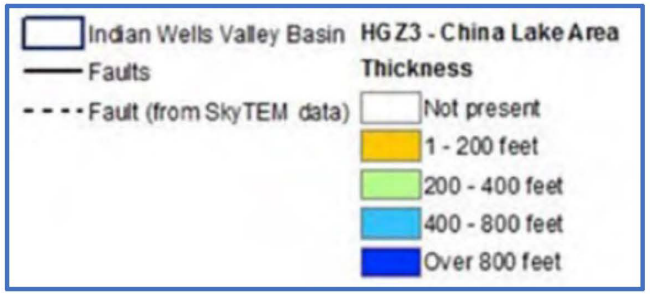
TWG New Groundwater in Storage Estimate 2

- Surface areas for each thickness interval were determined by georeferencing figures from Ramboll's HCF report (Ramboll, 2019), and then creating GIS shapefiles to calculate the area of each thickness interval
- For HGZ1, the average depth to water level within each of the thickness intervals was determined using the Spring 2017 CASGEM data to estimate saturated zone
- **Sy values** within HGZ1 were estimated from **Kunkel and Chase (1969)** ranging from a **low of 0.09 to a high of 0.13**.
- HGZ2 was assumed to be saturated and described as finer lacustrine sediments, primarily clays and silts, with interbedded sands and gravels, with average Sy values of 0.02 for clays, and 0.08 for silts
- For HGZ3, the entire unit was assumed to be saturated and Sy values were determined based on Heath (1983) with 0.22 for sand and 0.19 for gravel









TWG New Groundwater in Storage Estimate 2

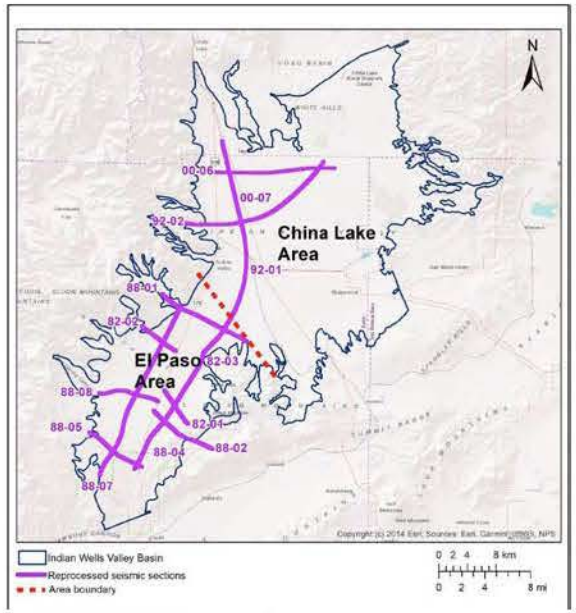
HGZ	Area (acres)	Storage – Low (AF)	Storage – High (AF)
1	283,000	1,130,000	6,610,000
2	197,000	2,240,000	12,510,000
3	196,000	26,730,000	38,250,000
Total	**676,000**	**30,100,000**	**57,370,000**

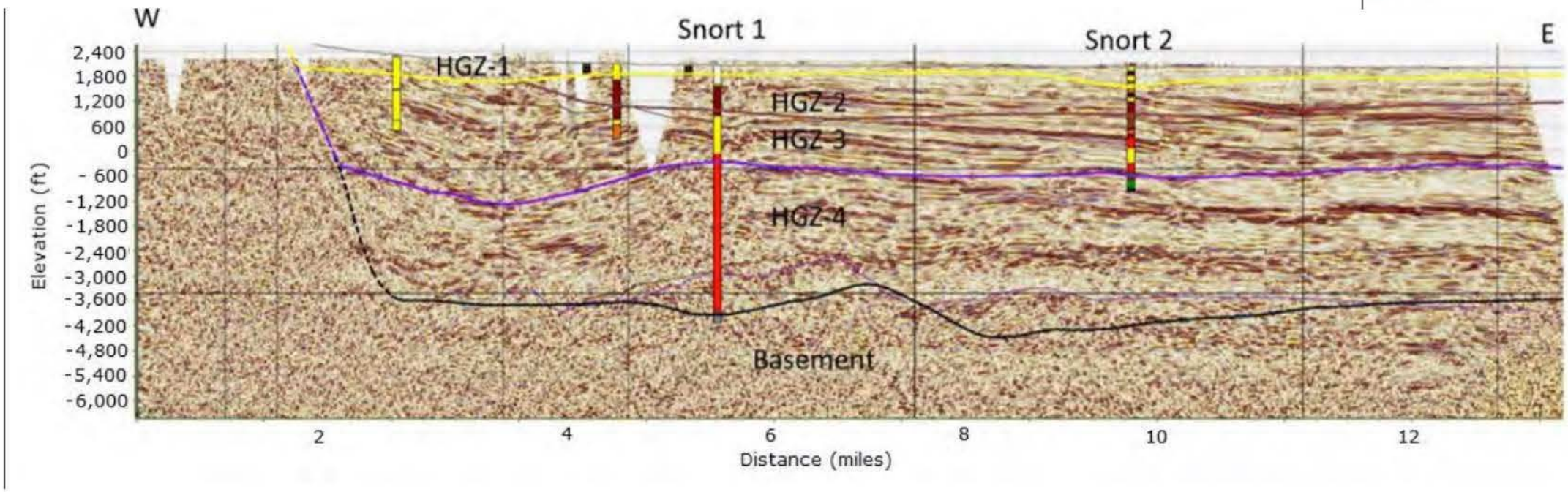
Only includes the China Lake Area of the IWV Basin

TWG New Groundwater in Storage Estimate 3

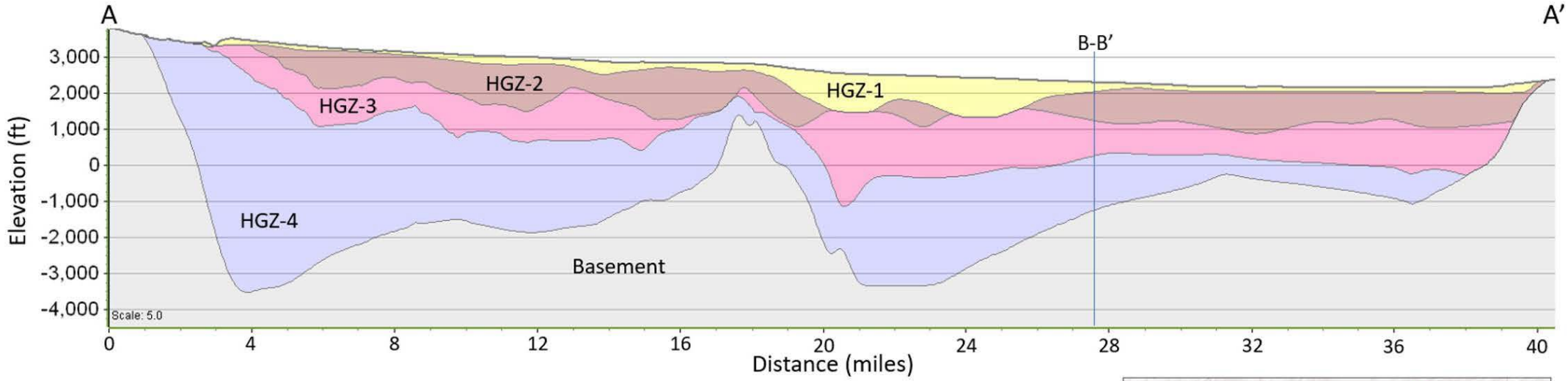
- Ramboll updated the 2019 Hydrogeologic Conceptual Framework with *reprocessed geothermal* and *newly available oil and gas 2D* seismic reflection data
- Estimated areas, volumes and percentage net sand, mixed, and net clay for each HGZ
- Tabulated a range of Specific Yield (Sy) values for clay, mixed sand and clay, and sand (fine sand, medium sand, and sand and gravel)
- Estimated the total volume of groundwater in storage in each HGZ on the basis of the minimum and maximum values for the Sy ranges
- Used water quality data to estimate the volume of groundwater in each HGZ that would be considered fresh (,1,000 mg/L total dissolved solids [TDS]), brackish (1,00-3,000 mg/L TDS) and saline (>3,000 mg/L TDS)

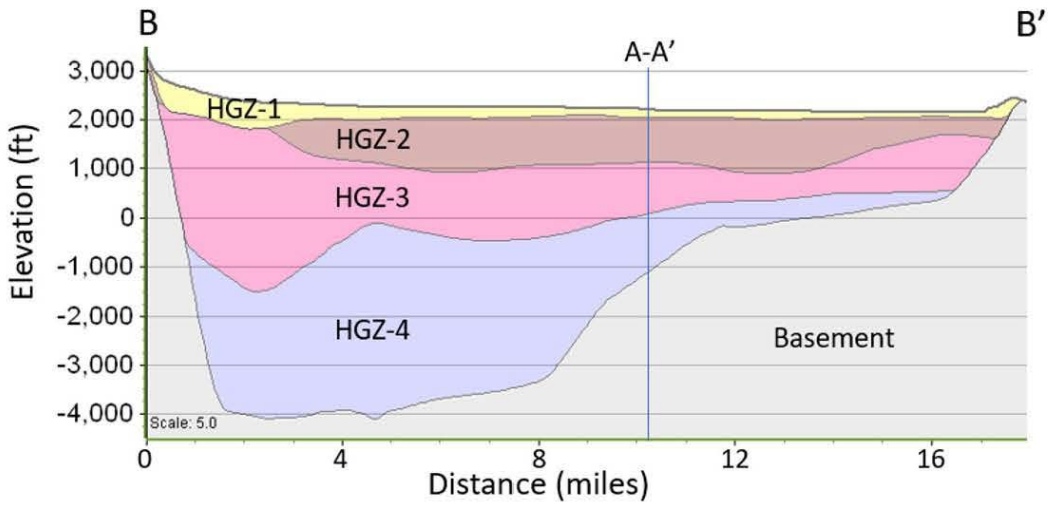
TWG New Groundwater in Storage Estimate 3

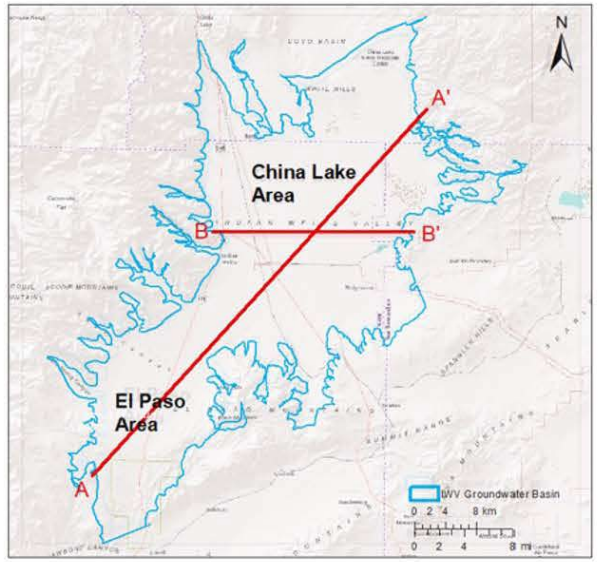




Ramboll Hydrogeologic Conceptual Model

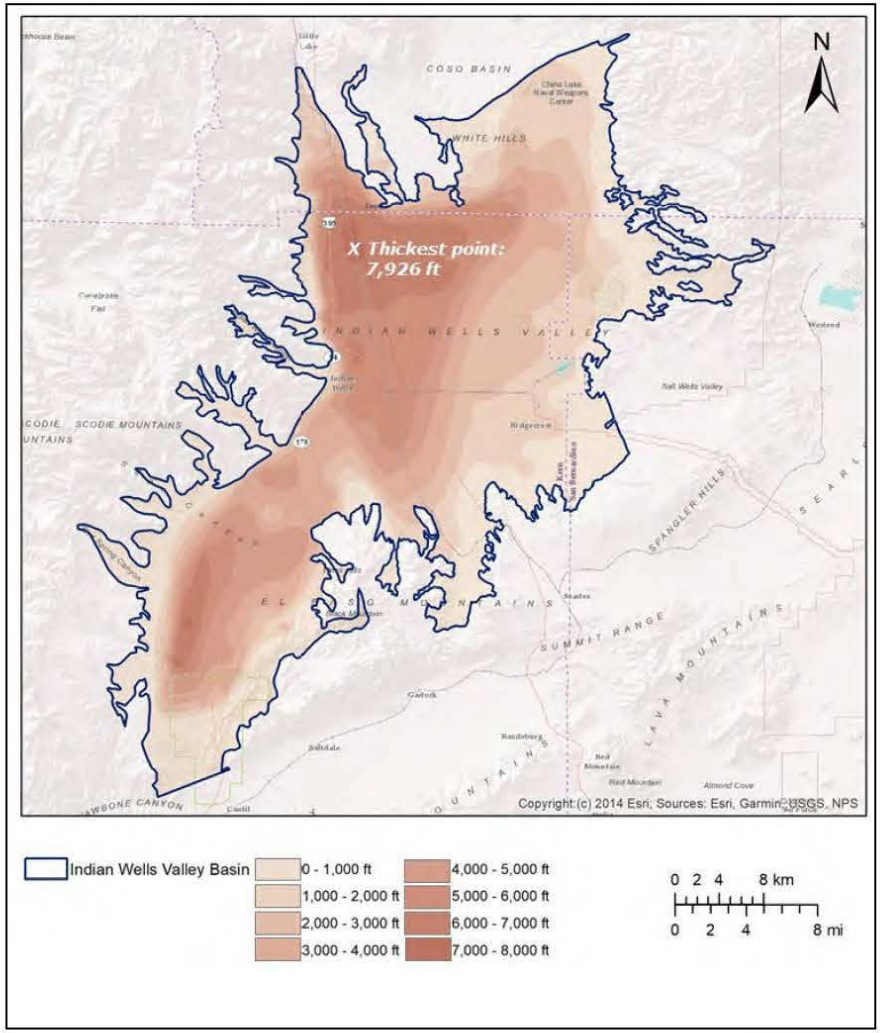




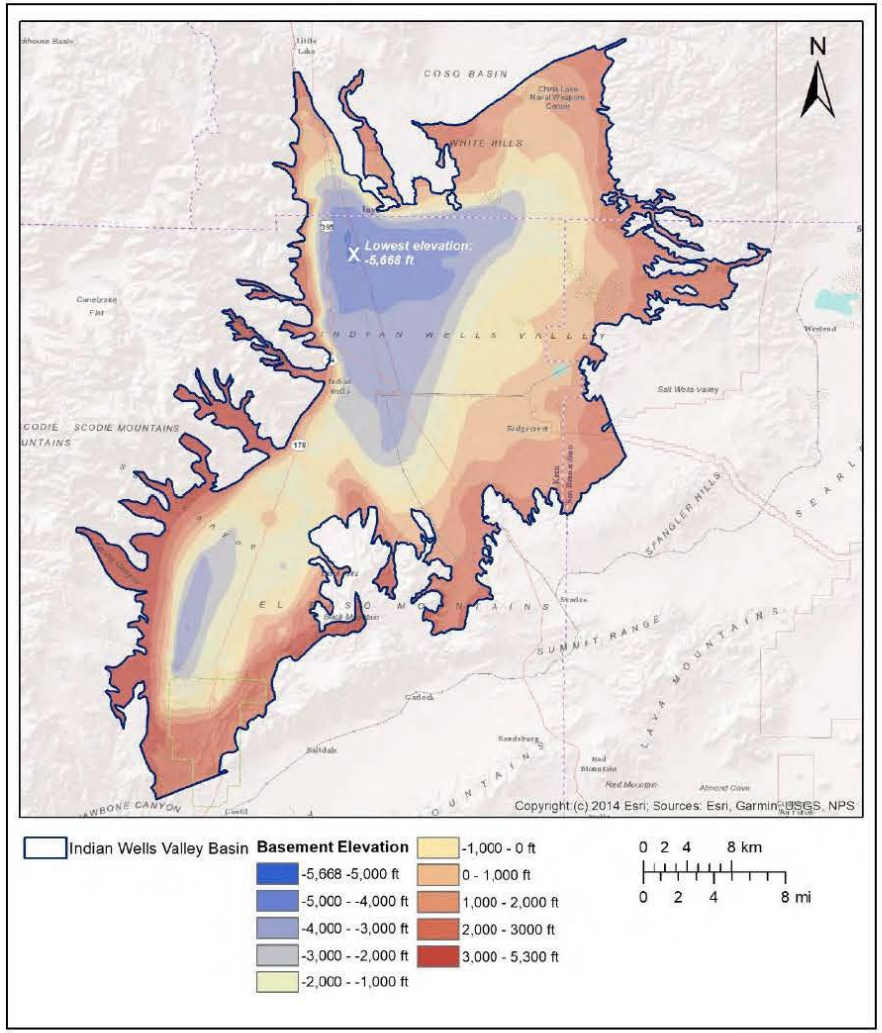


Reference: Storage Estimate, Indian Wells Valley, Ramboll, 2019, Revised 2024.

TWG New Groundwater in Storage Estimate 3



	Indian Wells Valley Technical Working Group Indian Wells Valley **Total Thickness of the Sediments in the IWV Basin**		
	Date: 9/18/2023		Figure 37

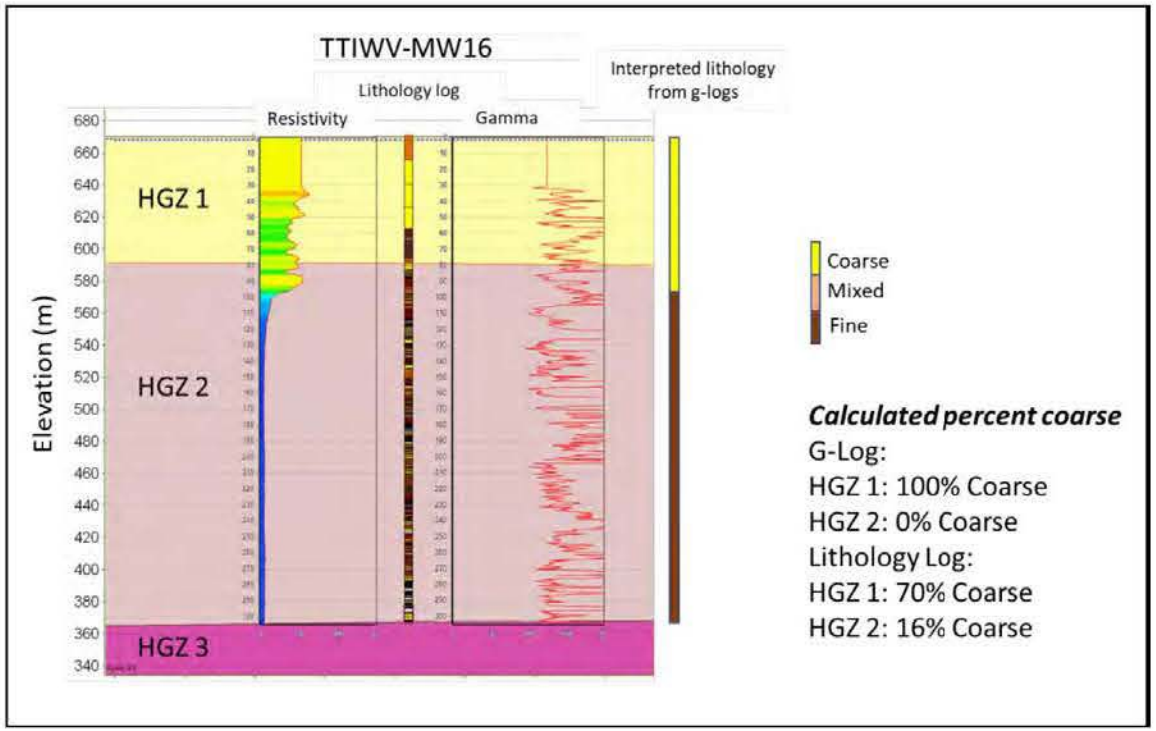


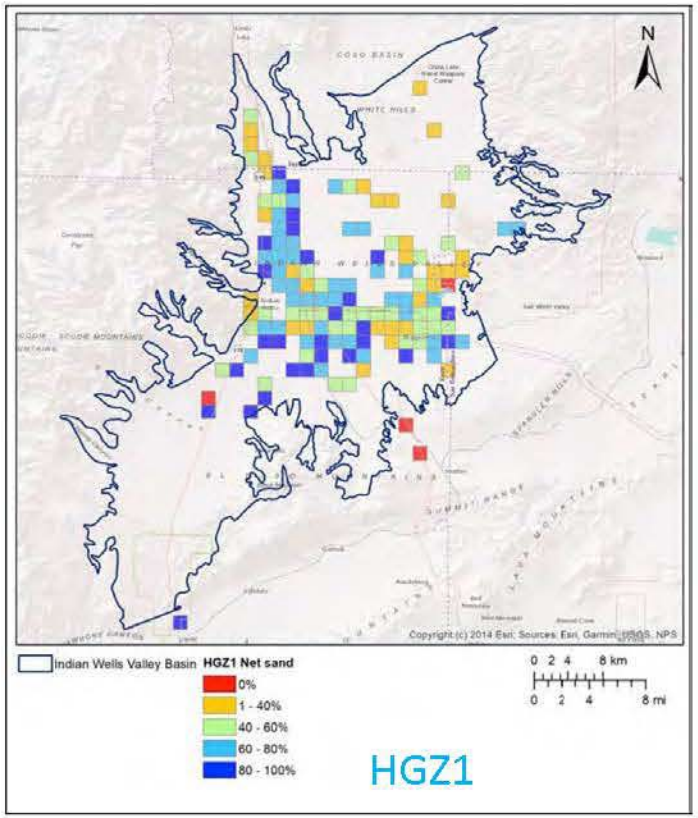
	Indian Wells Valley Technical Working Group Indian Wells Valley **Elevation of the Basement in the IWV Basin**		
	Date: 9/18/2023		Figure 34

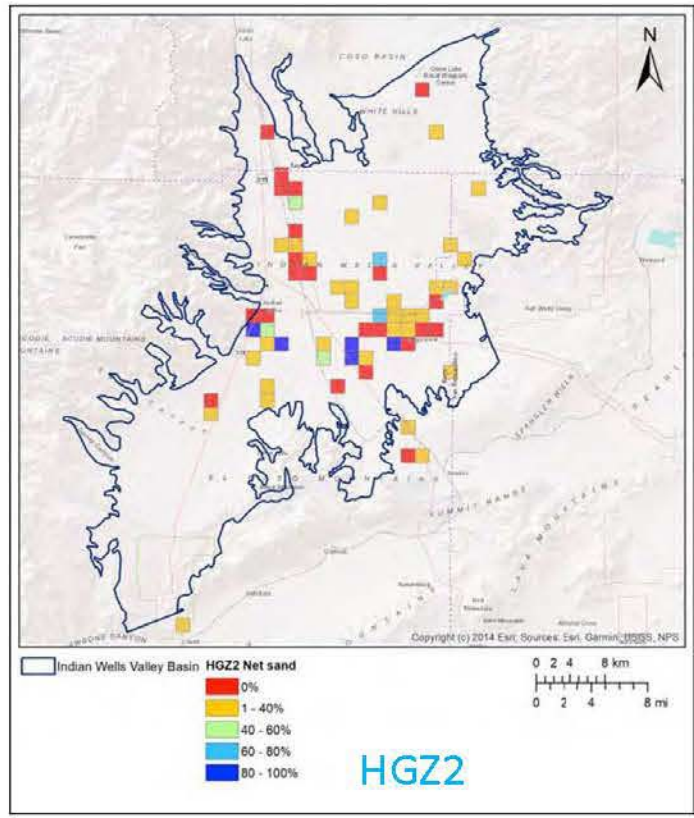
TWG New Groundwater in Storage Estimate 3
Total HGZ Layer Volumes

HGZ	Area (acres)	Total Volume (AF)*
HGZ1 total	279,000	89,200,000
HGZ1 saturated	213,000	38,600,000
HGZ2	293,000	172,500,000
HGZ3	282,000	326,200,000
HGZ4	268,000	460,800,000
Total Basin Volume		**1,054,800,000**
Total Saturated Basin Volume		**1,004,200,000**

TWG New Groundwater in Storage Estimate 3
HGZ1&2 Net Sand and Net Clay

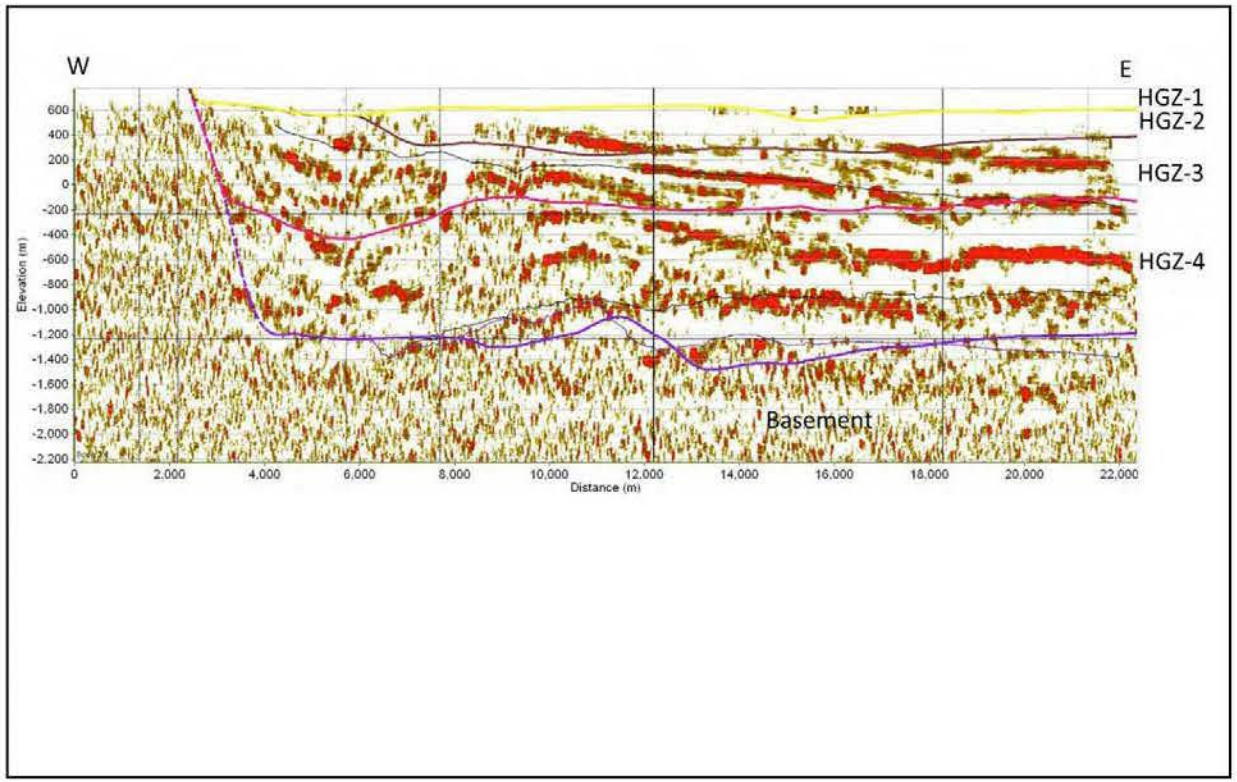




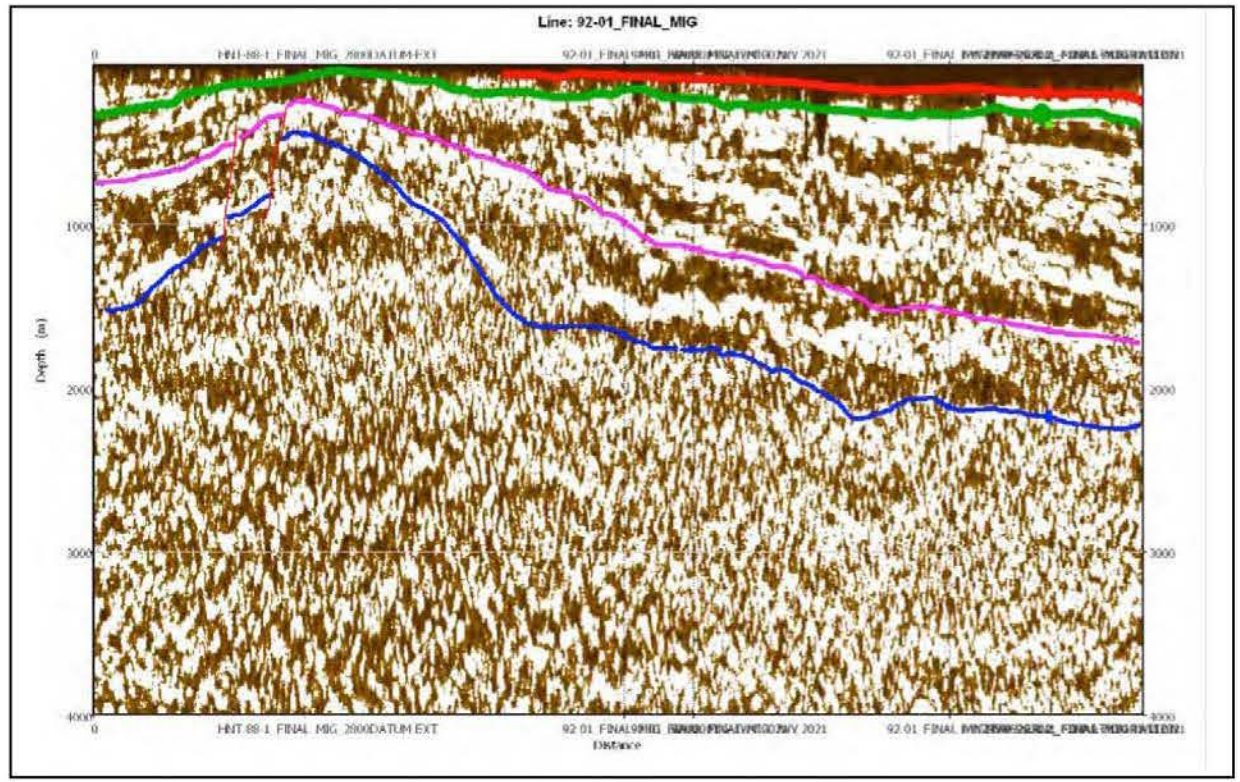


TWG New Groundwater in Storage Estimate 3Net HGZ3&4 Sand and Net Clay

Net Sand (92-02)



Net Clay (92-01)



TWG New Groundwater in Storage Estimate 3 Range of Specific Yield (SY) Applied

HGZ	Saturated Volume (AF)	SY Range	Minimum (AF)	Maximum (AF)
HGZ1	38,600,000	0.12 – 0.17	4,600,000	6,600,000
HGZ2	172,500,000	0.08 – 0.10	13,800,000	17,200,000
HGZ3	326,200,000	0.12 – 0.14	39,100,000	45,700,000
Subtotal HGZ1-3	**537,300,000**	**0.11 – 0.13**	**57,500,000**	**69,500,000**
HGZ4	460,800,000	0.06 – 0.10	27,600,000	46,100,000
Total	**998,100,000**	**0.09 – 0.12**	**85,100,000**	**115,600,000**

TWG New Groundwater in Storage Estimate 3 Water Quality Distribution (Total Dissolved Solids [TDS])

HGZ	Minimum Groundwater in Storage Considering Water Quality (AF)			Maximum Groundwater in Storage Considering Water Quality (AF)		
	Under 1,000 mg/L	1,000-3,000 mg/L	Over 3,000 mg/L	Under 1,000 mg/L	1,000-3,000 mg/L	Over 3,000 mg/L
HGZ1	3,500,000	400,000	700,000	5,000,000	600,000	1,000,000
HGZ2	6,700,000	300,000	6,800,000	8,400,000	300,000	8,500,000
HGZ3	19,700,000	800,000	18,600,000	22,900,000	900,000	21,900,000
Subtotal HGZ1-3	**29,900,000**	1,500,000	26,100,000	**36,300,000**	1,800,000	31,400,000
HGZ4	15,200,000	900,000	11,500,000	25,500,000	1,300,000	19,300,000
Total	**45,100,000**	2,400,000	37,600,000	**61,800,000**	3,100,000	50,700,000

Summary Approaches – New TWG Estimates 1, 2 & 3

Key Difference	Estimate 1	Estimate 2	Estimate 3
Methodology	DRI Model Boundary KCWA 2015 Water Levels DRI Vertical Cross-Sections DRI TDS Concentrations DRI Sy Distributions	DWR Basin Boundary Ramboll HGZ CASGEM 2017 Water Levels Literature Sy	Revised HGZs (Added HGZ4) Net Sand / Mixed / Clay Lithology&Literature Sy DRI TDS Concentrations
Areas Considered	China Lake & Part of El Paso	China Lake	China Lake & El Paso
Number of HGZ	3	3	4
Volumes Considered	Total, Fresh, Brackish	Total	Total, Fresh, Transitional, Brackish

HGZ	Type	Estimate 1		Estimate 3				Average of Methods	
		Fresh [AF]	Brackish [AF]	Fresh [AF]		Brackish [AF]		Fresh [AF]	Brackish [AF}
HGZ1	Range	---	---	3,500,000	5,000,000	1,100,000	1,600,000	---	---
	Average	10,970,000	5,810,000	**4,250,000**		1,350,000		7,610,00	3,580,000
HGZ2	Range	---	---	6,700,000	8,400,000	7,100,000	8,800,000	---	---
	Average	6,330,000	10,170,000	**7,550,000**		7,950,000		6,940,000	9,060,000
HGZ3	Range	---	---	19,700,000	22,900,000	19,400,000	22,800,000	---	---
	Average	24,670,000	35,480,000	**21,300,000**		21,100,000		22,990,000	28,290,000
Sub-Total	Range	---	---	29,900,000	36,300,000	27,600,000	33,200,000	---	---
	Average	41,970,000	51,460,000	**33,100,000**		30,400,000		37,530,000	40,930,000
HGZ4	Range	---	---	15,200,000	25,500,000	12,400,000	20,600,000	---	---
	Average	---	---	20,350,000		16,500,000		---	---
Total	Range	---	---	45,100,000	61,800,000	40,000,000	53,800,000	---	---

Difference in IWV GSP and IWV TWG Approaches

IWV GSP

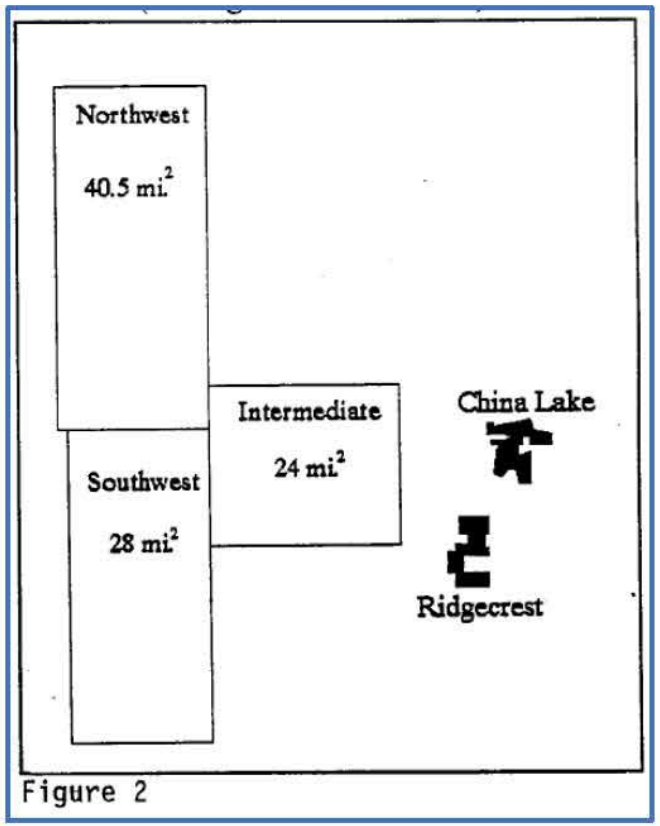
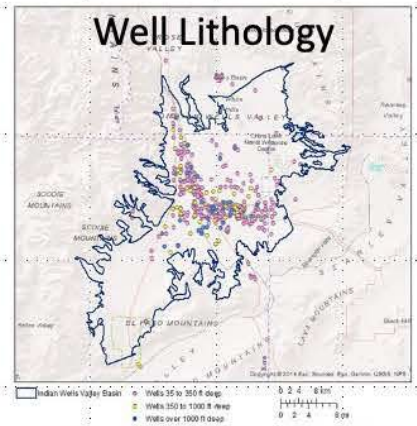
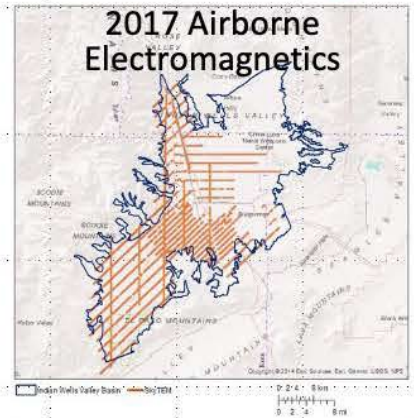


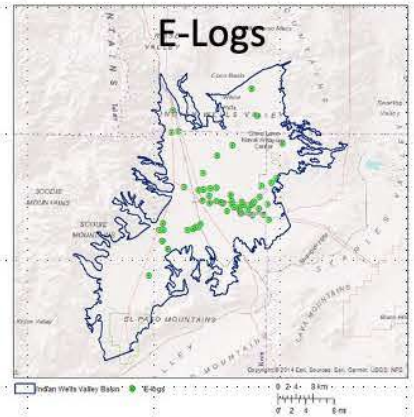
Figure 2

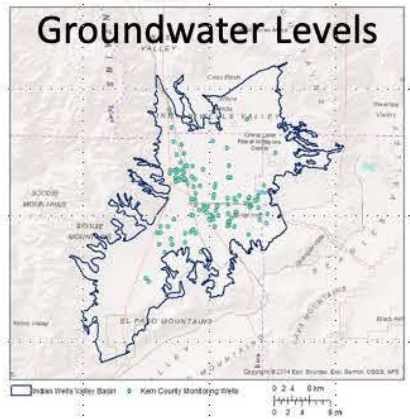
Unspecified geographic area
15% of basin size
200 feet of groundwater column
Specific yield of 0.20

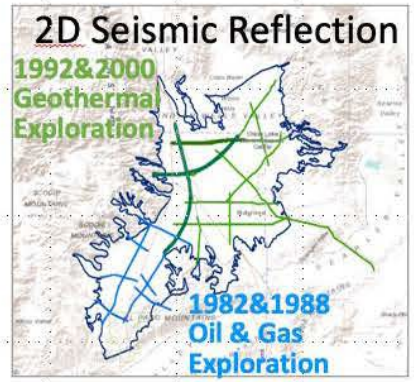
Datasets Used - IWVWD Storage Estimate for Basin

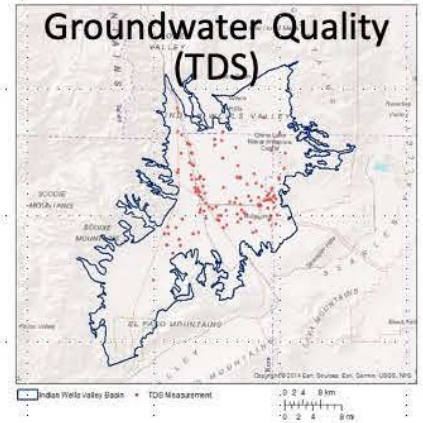












100% of basin size and complete coverage of basin geography
Complete analysis to basin bottom based on geology
Variable specific yield based on lithology and e-logs and seismic data

IWVWD Groundwater Storage Volume Conclusions

- GSP uses 1993 information, underestimates groundwater in storage
- Estimate 1 using the DRI model framework overestimates the storage volume due to the unrepresentative, high Sy value
- Estimate 3 is considered the most rigorous approach using a 3D model basin geometry and detailed lithologic analysis to estimate Sy
- Estimate 3 groundwater in storage in HGZ1 & 2
  - 12 MAF fresh - 24 MAF total
- Estimate 3 groundwater in storage in HGZ3
  - 21 MAF fresh - 42 MAF total
- Not running out of water, not proposing to pump basin down unreasonably

QUESTIONS?

References

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- Indian Wells Valley Groundwater Authority (IWVGA), 2020. Groundwater Sustainability Plan for the Indian Wells Valley Groundwater Basin – Bulletin 118 Basin No. 6-054. Prepared by Stetson Engineers, Inc., dated January 2020.
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- Heath, 1983, modified by McKinney & Savistsky 2014
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- Johnson, A.I., 1967. Specific Yield: Compilation of Specific Yields for Various Materials. USGS Water Supply Paper: 1662-D.
- Kansas Geological Survey, Buddenmeier and Schloss, 2000
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- Kunkel, F. and Chase, G. H. 1969. Geology and Groundwater in Indian Wells Valley, CA: U.S. Geological Survey Open-File Report, 84p.
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- United States Bureau of Reclamation (USBR). 1993. Indian Wells Valley Groundwater Project: USBR Technical Report Volumes I and II.

Workshop Items

C. Workshop Issues, Goals and Priorities (Cont.)

4. Discussion of SB-606 and AB-1668

Agenda for Presentation

1. Status of the Regulation and Timelines for Implementation
2. Regulatory Compliance Categories
3. Regulatory Compliance for Personal Use
4. Regulatory Compliance for Outdoor Use
    1. Calculation of INI and other Values for Outdoor Use (i.e. Water View Data)
5. Regulatory Compliance for Commercial Use
6. WD Posture for Personal and Outdoor Combined Use
7. WD compliance for Commercial Use
8. Potential Impacts of Consolidations on Compliance

Implementation Timelines

- Overall Goal is to Reduce Consumption by almost 30% by 2040 State Wide
- All Public Comment Periods are complete as of 1 July 2024
- Rule, adopted (??) on 3 July 2024 will go into effect on 1 Jan 2025
  - 1 Jan 2025, Agency should have the Data for Implementation
  - 1 Jan 2027, Agency begins reporting Urban Water Use Objective (WUO)
  - 1 Jan 2030, Allowable use is reduced
  - 1 Jan 2035, Additional reductions are implemented
  - 1 Jan 2040, Final reductions are implemented

Compliance Categories

- WUO is calculated as follows.
  - WUO = Rindoor + Routdoor + CIIdim + L + V + Pr + Bpr
  - Where:
    - WUO = Water Use Objective
    - Rindoor = Indoor residential use
    - Routdoor = Outdoor residential use
    - CIIdim = Commercial outdoor use using a dedicated irrigation meter
    - L = Water Loss
    - V = Variances (Note: there is an approved variance for Evaporative Coolers)
    - Pr = Temporary Provisions (Not likely applicable to IWVWD)
    - Bpr = Bonus incentive for potable reuse (Includes Indirect Potable Reuse)
      - Includes “Groundwater Replenishment Reuse Projects”

Per Capita Per Day Water Use

- Annual Per Capita Water Use (Rindoor)
  - Calculate the Populations served by one of the following methods
    - US or most recent special census data for the Service Area (31,024)
    - Service Connections x 3.3 (Approximately 39,600)
    - Number of dwelling units x 2.8 (Unknown)
  - CCR 10609.4 Residential Water Use
    - 55 gallons per capita per day until Jan 1 2025
    - 47 gallons per capita per day until Jan 1 2030
    - 42 gallons per capita per day after Jan 1 2035
  - 1900 AFY @ 55gpd, 1622 AFY @ 47gpd, 1450 AFY @ 42gpd for pop of 31024
  - 2420 AFY @ 55gpd, 2070 AFY @ 47gpd, 1850 AFY @ 42 gpd for pop of 39,600
  - Additional water may be applied for in a Variance for Evaporative Coolers

Outdoor Residential Water Use

- Annual Outdoor Water Use (Routdoor)
  - Routdoor = Soutdoor X RLA x Net Eto x 0.62
  - Water Code 968 Residential Outdoor Water Use Standard (Soutdoor)
    - Through June 30 2035 use 0.80 as the landscape efficiency factor
    - July 1 2035 standard becomes 0.63
    - July 1 2040 standard becomes 0.55
  - Net ETo Net evapotranspiration for the area in question
    - Approximately 66.5 inches/year per less 2.5” average rainfall per year or 64”
  - RLA is the Irrigable Irrigated area in sq/ft provided by WaterView
    - Value from our latest report is 23,419,644 sq/ft
  - 2040 calculated value is 1569 AFY.

Other Misc Uses in Calculations

- Dedicated Irrigation Meters = 40,733,836 gal/yr
  - Can increase as additional meters are installed, increases allowable use
- Water Loss, from our annual report, 66,984,000 gal
- Variances, currently 0, but we can apply for a evaporative cooler variance
- Temporary Provisions, Pool, ponds etc… 1,149,000 gal/yr
- Bonus Provisions for Water Reuse. Applicable if we have injected recycled water

Our Annual Water Use Objective WUO

- WUO for various compliance years
  - Current year 2024, WUO = 5107 AFY (0.80 LEF and 55 gal/day, pop 39,600)
  - 2030, WUO = 4860 AFY (0.80 LEF, and 47 gal/day, pop 41,500)
  - 2035, WUO = 4224 AFY (0.63 LEF, and 42 gal/day, pop 43,000)
  - 2040, WUO = 4072 AFY (0.55 LEF, and 42 gal.day, pop 44,500)

- What is the WUO compared to? The sum of:
  - Total Residential Use (Single and Multi Family Use)
  - Water used by CII DIM (Commercial Dedicated Irrigation Metered Water)
  - Water Losses
- For 2023 this value is 4782 AFY. (Total use is approximately 5350 AFY)

Current and Future Status

- We are currently in compliance, and likely will be until 2035
- By 2035 we will need to do additional work including
  - Apply for the Evaporative Cooler Variance
  - Ensure we are using the appropriate value for number of customers
  - Increase the number of Commercial Dedicated Irrigation Meters
    - This adds to our WUO value, will likely result in future regulations
  - Look at other variance options
  - Have recycled water injected/percolated into the aquifer
    - This could add significant growth potential to the IWV
    - Benefits both SGMA and California Conservation Goals

SGMA and SB-606 and AB 1668 Interrelated Impacts

- By 2040 WD will need to reduce residential use significantly compared to today. (15% reduction)
  - Even with significant population growth of additional 4900 people
- If by 2040 Farming is gone and SVM no longer gets its water from the IWV (Including Trona as well) Then WD use will likely be below 5300 AFY including commercial.
- A quick and conservative estimate of actual water use
- WD (5300) + Navy (2000) + Inyokern/Mutuals and De-minimus (1800) only totals 9200 AFY.
- This needs to be considered in the GSP.

Other Notable Issues

- Consolidations.
  - Consolidations will impact population served, number of connections, II etc…
  - Specific provisions in the regulation allow time for consolidations to meet standards if they were not previously covered
  - Consolidations will also increase SGMA compliance through reduced aquifer impacts

Workshop Items

C. Workshop Issues, Goals and Priorities (Cont.)

5. WaterView Update

6. Report on Water Losses, Consumption, and Production

Water Losses, Consumption, Production

- SB555 (2015) required urban water retail suppliers to submit water loss audits by October 1st each year. Currently the requirement is January 1st each year beginning in 2021.

- "Urban Retail Water Suppliers" are those that either serve more than 3,000 connections or produce more than 3,000 AF per year.

- Each audit is required to be validated by a certified (AWWA) Water Loss Validator

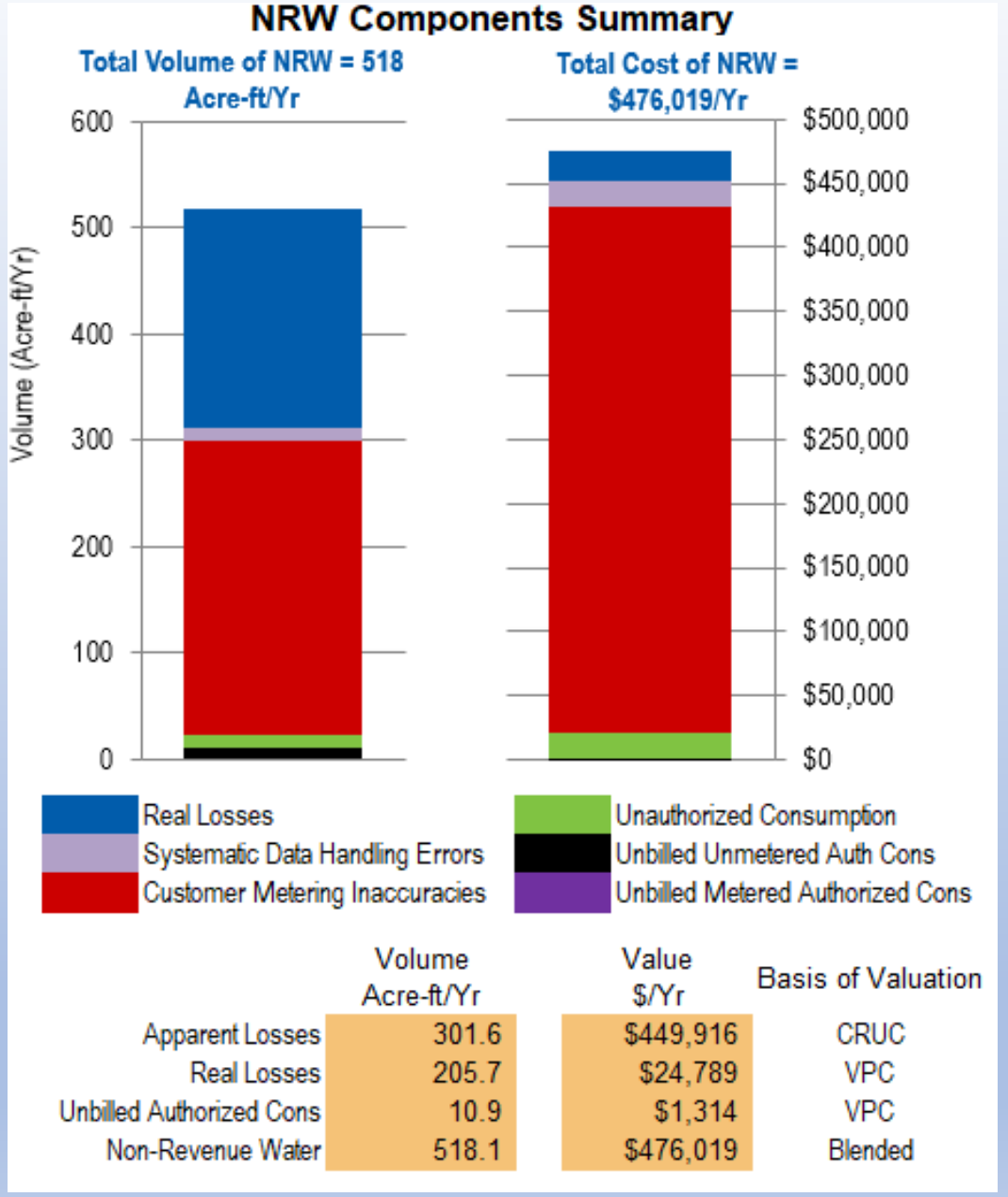
Water Losses, Consumption, Production

- Water Supplied
  - Water from own sources corrected using meter testing accuracy
- Authorized Consumption
  - Billed metered, billed unmetered, unbilled metered, unbilled unmetered
- Water Losses (Apparent + Real Losses)
  - Apparent Losses
    - Systematic handling errors, customer metering inaccuracies, unauthorized consumption
  - Real Losses
    - Physical water losses from the system (leaks)

										Water Supplied Error Adjustments				
	WATER SUPPLIED									choose entry option:				
VOS	Volume from Own Sources:	n	g	7	5,717.327	Acre-ft/Yr	n	g	8	volume	33.610	acre-ft/yr	under-registration	VOS
WI	Water Imported:	n	g	n/a	0.000	Acre-ft/Yr								WIEA
WE	Water Exported:	n	g	n/a	0.000	Acre-ft/Yr								WEE
	WATER SUPPLIED:				5,750.937	Acre-ft/Yr								
	AUTHORIZED CONSUMPTION													
BMAC	Billed Metered:	n	g	8	5,232.800	Acre-ft/Yr								
BUAC	Billed Unmetered:	n	g	n/a	0.000	Acre-ft/Yr								
UMAC	Unbilled Metered:	n	g	n/a	0.000	Acre-ft/Yr				choose entry option:				
UUAC	Unbilled Unmetered:	n	g	5	10.900	Acre-ft/Yr				custom	10.900	acre-ft/yr		
	AUTHORIZED CONSUMPTION:				5,243.700	Acre-ft/Yr								
	WATER LOSSES				507.237	Acre-ft/Yr								
	Apparent Losses													
	Default option selected for Systematic Data Handling Errors, with automatic data grading of 3									choose entry option:				
SDHE	Systematic Data Handling Errors:	n	g	3	13.082	Acre-ft/Yr				0.25%	default			
CMI	Customer Metering Inaccuracies:	n	g	2	275.411	Acre-ft/Yr				5.00%	percent		under-registration	
UC	Unauthorized Consumption:	n	g	3	13.082	Acre-ft/Yr				0.25%	default			
	Default option selected for Unauthorized Consumption, with automatic data grading of 3													
	Apparent Losses:				301.575	Acre-ft/Yr								
	Real Losses													
	Real Losses:				205.662	Acre-ft/Yr								
	WATER LOSSES:				507.237	Acre-ft/Yr								
	NON-REVENUE WATER													
	NON-REVENUE WATER:				518.137	Acre-ft/Yr								

Data Validity Tier: Tier III (51-70)

Volume from Own Sources (VOS) (corrected for known errors) 5,750.937	System Input Volume 5,750.937	Water Exported (WE) (corrected for known errors) 0.000	Billed Water Exported			Revenue Water (Exported) 0.000
		Water Supplied 5,750.937	Authorized Consumption 5,243.700	Billed Authorized Consumption 5,232.800	Billed Metered Consumption (BMAC) (water exported is removed) 5,232.800	Revenue Water 5,232.800
					Billed Unmetered Consumption (BUAC) 0.000	
				Unbilled Authorized Consumption 10.900	Unbilled Metered Consumption (UMAC) 0.000	Non-Revenue Water (NRW) 518.137
					Unbilled Unmetered Consumption (UUAC) 10.900	
			Water Losses 507.237	Apparent Losses 301.575	Systematic Data Handling Errors (SDHE) 13.082	
					Customer Metering Inaccuracies (CMI) 275.411	
					Unauthorized Consumption (UC) 13.082	
Water Imported (WI) (corrected for known errors) 0.000				Real Losses 205.662	Leakage on Transmission and/or Distribution Mains Not broken down	
					Leakage and Overflows at Utility's Storage Tanks Not broken down	
					Leakage on Service Connections Not broken down	



	Volume Acre-ft/Yr	Value $/Yr	Basis of Valuation
Apparent Losses	301.6	$449,916	CRUC
Real Losses	205.7	$24,789	VPC
Unbilled Authorized Cons	10.9	$1,314	VPC
Non-Revenue Water	518.1	$476,019	Blended

Serving Our Community for over 60 Years

Audit Year:	2022	Jul 01 2022 - Jun 30 2023
Data Validity Tier:	Tier III (51-70)	

Water Loss Control Planning Guide

	Water Audit Data Validity Tier (Score Range)				
Functional Focus Area	**Tier I (1-25)**	**Tier II (26-50)**	**Tier III (51-70)**	**Tier IV (71-90)**	**Tier V (91-100)**
Audit Data Collection	Launch auditing and loss control team; address supply metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations; Identify data gaps; improve supply metering	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs; Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or AMR/AMI system	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon with PIs for performance comparisons for real losses	Performance Benchmarking with PIs is meaningful in comparing real loss standing	Identify Best Practices/ Best in class; PIs are very reliable as real loss performance indicators for best in class service

Workshop Items

D. **General Manager Goals and Priorities**

Description: Update and discussion on General Manager goals and priorities.

i. Goals and Projects Tracking

Workshop Items

E. **Board of Director Goals and Priorities**
Description: Discussion on any Board of Director goals.

F. **Prioritize Projects and Goals/Develop Action Plans**
Description: Recap of priorities and plan of action.

G. **Review any Outstanding Issues**
Description: Review and discussion on outstanding issues.

- **Adjournment**