RECEIVED
May 17, 2024
DEPARTMENT OF
WATER RESOURCES

Thomas J. Budge (ISB# 7465)
Elisheva M. Patterson (ISB#11746)
RACINE OLSON, PLLP
201 E. Center St. / P.O. Box 1391
Pocatello, Idaho 83204
(208) 232-6101 – phone
(208) 232-6109 – fax
tj@racineolson.com
elisheva@racineolson.com

Attorneys for Idaho Ground Water Appropriators, Inc. (IGWA)

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

IN THE MATTER OF DISTRIBUTION OF WATER TO VARIOUS WATER RIGHTS HELD BY OR FOR THE BENEFIT OF A&B IRRIGATION DISTRICT, AMERICAN FALLS RESERVOIR DISTRICT #2, BURLEY IRRIGATION DISTRICT, MILNER IRRIGATION DISTRICT, MINIDOKA IRRIGATION DISTRICT, NORTH SIDE CANAL COMPANY, AND TWIN FALLS CANAL COMPANY	Docket No. CM-MP-2016-001
IN THE MATTER OF IGWA'S SETTLEMENT AGREEMENT MITIGATION PLAN	**IGWA'S PETITION FOR RECONSIDERATION AND REQUEST FOR HEARING**

Idaho Ground Water Appropriators, Inc. ("IGWA"), by and through counsel, submits this petition for reconsideration and request for hearing of the Director's *Final Order Specifying Additional Actions* ("Adaptive Order") issued May 3, 2024.

Absent from the Adaptive Order is an explanation regarding how the Director determined that a five percent increase to the annual groundwater reduction of 240,000 ac-ft was derived, nor what information was considered. IGWA requests reconsideration to determine whether alternative adaptive measures are more appropriate based on, among other things, the following.

First, when IGWA and members of the Surface Water Coalition ("SWC") negotiated the *Settlement Agreement Entered Into June 30, 2015, Between Participating Members of the*

Surface Water Coalition and Participating Members of Idaho Ground Water Appropriators, Inc. ("2015 Agreement"), the sentinel well benchmarks and goal were based on groundwater modeling of the conservation activities prescribed in Section 3.a of the 2015 Agreement and the Idaho Water Resource Board's recharge activities using Eastern Snake Plain Aquifer Model ("ESPAM") version 2.1. An updated ESPAM version 2.2 was issued in 2021 and is considered the best available science. When Section 3.a conservation activities and State Board recharge are modeled using ESPAM 2.2, the results show that the timeline for achieving the 2015 Agreement benchmark levels is impossible to meet, as explained in the testimony of Sophia Sigstedt at the March 14-15, 2024, administrative hearing in IDWR Docket No. CM-MP-2016-001, excerpts of which are attached hereto as Exhibit A and Exhibit B.

A second reason to reconsider the adaptive measures is the impacts of factors that affect sentinel well levels which IGWA's members do not control, such as long-term climate trend and incidental recharge. Adaptive measures must take into consideration the public interest in maximizing beneficial use of Idaho's resources, and whether alternatives to curtailment in groundwater use are available to meet the water needs of the SWC with existing water supplies.

In light of the foregoing, IGWA respectfully requests reconsideration and a hearing on the Adaptive Order. IGWA reserves the right to amend and expand issues to be considered at the hearing and will identify the same in its Statement of Issues.

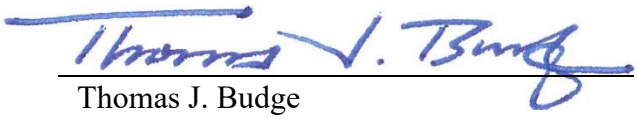
RESPECTFULLY SUBMITTED this 17th day of May, 2024.

RACINE OLSON, PLLP

By: _____
Thomas J. Budge
Attorneys for IGWA

CERTIFICATE OF SERVICE

I hereby certify that on this 17th day of May, 2024, I served the foregoing document on the persons below via email or as otherwise indicated:



Thomas J. Budge

Director Mat Weaver Garrick Baxter Kayleen Richter Sarah Tschohl IDAHO DEPARTMENT OF WATER RESOURCES 322 E Front St. Boise, ID 83720-0098	mat.weaver@idwr.idaho.gov garrick.baxter@idwr.idaho.gov kayleen.richter@idwr.idaho.gov sarah.tschohl@idwr.idaho.gov file@idwr.idaho.gov
Dylan Anderson DYLAN ANDERSON LAW PO Box 35 Rexburg, Idaho 83440	dylan@dylanandersonlaw.com
Skyler C. Johns Nathan M. Olsen Steven L. Taggart OLSEN TAGGART PLLC 1449 E 17th St, Ste A PO Box 3005 Idaho Falls, ID 83403	sjohns@olsentaggart.com nolsen@olsentaggart.com staggart@olsentaggart.com
John K. Simpson Travis L. Thompson Abigail R. Bitzenburg MARTEN LAW P. O. Box 63 Twin Falls, ID 83303-0063	jsimpson@martenlaw.com tthompson@martenlaw.com abitzenburg@martenlaw.com jnielsen@martenlaw.com
W. Kent Fletcher FLETCHER LAW OFFICE P.O. Box 248 Burley, ID 83318	wkf@pmt.org

Kathleen Marion Carr U.S. DEPT. INTERIOR 960 Broadway Ste 400 Boise, ID 83706	kathleenmarion.carr@sol.doi.gov
David W. Gehlert Natural Resources Section Environment and Natural Resources Division U.S. DEPARTMENT OF JUSTICE 999 18th St., South Terrace, Suite 370 Denver, CO 80202	david.gehlert@usdoj.gov
Matt Howard U.S. BUREAU OF RECLAMATION 1150 N Curtis Road Boise, ID 83706-1234	mhoward@usbr.gov
Sarah A Klahn Maximilian C. Bricker SOMACH SIMMONS & DUNN 2033 11th Street, Ste 5 Boulder, Co 80302	sklahn@somachlaw.com mbricker@somachlaw.com vfrancisco@somachlaw.com
Rich Diehl City of POCATELLO P.O. Box 4169 Pocatello, ID 83205	rdiehl@pocatello.us
Candice McHugh Chris Bromley MCHUGH BROMLEY, PLLC 380 South 4th Street, Suite 103 Boise, ID 83702	cbromley@mchughbromley.com cmchugh@mchughbromley.com
Robert E. Williams WILLIAMS, MESERVY, & LOTHSPEICH, LLP P.O. Box 168 Jerome, ID 83338	rewilliams@wmlattys.com
Robert L. Harris HOLDEN, KIDWELL, HAHN & CRAPO, PLLC P.O. Box 50130 Idaho Falls, ID 83405	rharris@holdenlegal.com

Michael A. Kirkham City Attorney CITY OF IDAHO FALLS P.O. Box 50220 Idaho Falls, ID 83405	mkirkham@idahofallsidaho.gov

Courtesy Copies to:

Corey Skinner IDWR-Southern Region 1341 Fillmore St., Ste. 200 Twin Falls, ID 83301-3033	corey.skinner@idwr.idaho.gov
Craig Chandler IDWR-Eastern Region 900 N. Skyline Drive, Ste. A Idaho Falls, ID 83402	craig.chandler@idwr.idaho.gov
William A. Parsons PARSONS SMITH & STONE P.O. Box 910 Burley, ID 83318	wparsons@pmt.org
Jerry Rigby RIGBY, ANDRUS & RIGBY LAW, PLLC P.O. Box 250 Rexburg, ID 83440	jrigby@rex-law.com
Andrew J. Waldera SAWTOOTH LAW OFFICES, PLLC 1101 W. River Street, Suite 110 Boise, ID 83702	andy@sawtoothlaw.com

in the SWC report that deficit pumping in 2022 results in a deficit near Blackfoot to Minidoka reach gains and a lower sentinel well target when you model those activities. And -- and in that report, they look at how -- how all of -- how that 2022 deficit propagates into the future, looking at those same outputs every year over a 50-year horizon.

And so mainly what I'm pointing out here in this section is that I agree with that, but the same is true for the benefits from the surplus conservation activities over the target allocations. Those near Blackfoot to Minidoka reach gains and the increase in water levels to the sentinel wells also propagate into the future over those same years.

And when you do the specific modeling, spatially and temporally, what you see is that they do cancel out the deficits on a IGWA-wide basis from the 2022 breach, both when you look at the near Blackfoot to Minidoka reach gains, there's more reach gains in the river than if IGWA had every single year done its 240,000 acre-foot allocation. And when you look at the sentinel wells similarly, there's a net gain in what the water level across those wells would have been.

Q. When Mr. Colvin testified this morning about the sentinel well index not meeting the 2026 target and

the other benchmarks that are prescribed by the agreement, is that due to the 2022 breach entirely, or are there other factors in there?

A. No. And I think even in Dave -- or Mr. Colvin's report, what you see is he -- he modeled -- and it sounded like from his direct testimony -- the 2.9 acre-foot -- or the 2.9 foot difference in the sentinel well from the deficit was calculated in 2023.

And so I similarly looked at what the effect of the surplus in what conservation activities would have been on the sentinel well in 2023. And what I see is that there -- with those activities, there would have been a net increase.

And, in fact, I think, based on my experience doing the modeling for the original settlement agreement in 2015 and knowing how ESPAM 2.1 and ESPAM 2.2 compare, that, in fact, one of the major reasons that we're far below what the 2023 target value is, is just that the model projection is significantly different with the improved model and that when we look at what -- and that when you look at what the activities were, even if they had been implemented at 240,000 acre-feet every single year and with the board's recharge, we wouldn't -- we still would be very far below what that 2023 target would be.

So it's really -- the reason we're really far below that target isn't because of the deficit pumping in 2022, but it's much more a function of the model we used to set that target. The version is very different compared to the more recent and adopted ESPAM 2.2 version.

And then I think I can similarly show you, if we look at some of these figures in the report, that extreme dry years also impacted where we were, where we are in the sentinel well index as much as, you know, a deficit in the pump.

Q. Okay. So along that line, let's go to -- some of what you just discussed here -- is that addressed on page 3 and 4 of your report -- or rebuttal report Section 2.1?

A. Yeah. So can we look at Figure 1, and I can -- I can kind of go through what that's showing?

Q. All right. Let's look at page 5 of Exhibit 143, Figure 1.

A. So Figure 1 shows the historical sentinel well index in the black line with the black points marking the historical sentinel well values. And that goes from 1981 through 2016.

And then leading up to developing that settlement agreement, before the settlement agreement

was signed, one thing that we did was we modeled using the current version of ESPAM at that time, ESPAM Version 2.1. We modeled what the effect of the districts or -- more like an aquifer-wide reduction at the time the Department was giving us a percentage of the total irrigated acres that resulted in 240,000 acre-feet of reduction.

So this modeling assumed across all of ESPAM ground water irrigated lands, a uniform reduction that resulted in 240,000 acre-feet of conservation in ground water activities and then 250,000 acre-feet of board recharge, either in the upper basin and the lower basin, distributed based on the typical water rights window when that recharge opens up. And what we see from the modeling using ESPAM 2.1 is shown in the blue dashed line with the blue points.

And across this -- horizontally across this figure, I've got three gray lines which represent the different settlement agreement targets. So the first gray line is equivalent to that 20 -- I think it was 2015 value of where the historical sentinel well is, and then that 2023 target is shown in the slightly more bold gray line at sort of that negative four number. And then the ultimate agreement target for 2026 is shown in the green line.

And so you can see that when we originally did that modeling, the projection was that we would hit the targets ahead of time, based on -- in 2023 and 2026. I redid that modeling, not changing anything except for the version of the model, and that's what's shown in the orange dashed line with the orange points.

And what we see there is that the change in model version, as was discussed in TJ's cross with Mr. Colvin, is that the water level rises is predicted to rise much more slowly, and it takes much longer to reach the targets, and that it would not reach the 2023 target in 2023, and that it takes almost to 2020 -- '48 for it to reach the ultimate target goal shown in that green line.

And if you just directly compare the two model versions, ESPAM 2.1 and ESPAM 2.2, over the original 10-year period of the model, what you see is that it's more than 50 percent. It predicts that the water level rise will be 50 percent less than what it would have been under the ESPAM 2.1 version of the model using ESPAM 2.2. So it's really that the targets were set unrealistically using basically an outdated, incorrect version of the model based on what we know now.

And the other thing that I'm plotting here is, following 2016, I've got a series of pink X's, and these

are the sentinel -- these are the observed sentinel well water levels post-settlement agreement. And so what you see is that they rise much more in line with the new ESPAM 2.2 prediction until we [unintelligible] extremely dry years, which I can discuss in the next figure, in 2021 and 2022, where we see an additional drop off from that modeling. Which, the modeling -- a basic assumption in it is that it's average hydraulic conditions. So it's not wet or dry based on the model period or the model projection.

Q. Thank you. And you said Figure 2-point -- or Figure 2 on page 6 discusses the impact of the -- the weather?

A. Well, this -- I've got -- I guess it's my Figure 2 and 3 kind of get into that. And so in Figure 2, what I'm showing is this is modeling by IDWR that was presented to the Eastern Snake Plain Hydrologic Modeling Committee in August 2021, and I think it was also presented at the following Steering Committee meeting.

But what IDWR did is they modeled the implementation of the settlement agreement terms very similar to what I showed you with my modeling in this analysis. They did it point by point location based on the summary performance reports and then the recharge

locations, and then they also included the impacts of the board's -- IWRB's recharge. And so what you see here is historical sentinel well index in blue. It's the same as what I showed you in the Figure 1 above.

And then following that, they show three lines. One is what the actual observed sentinel well index did. That's the upper blue line. So that -- that's just observed values. And then they did a middle -- the middle blue line shows you what the sentinel well would have done without the board's recharge, and then what the sentinel well would have done without the board's recharge and without IGWA's conservation activities.

And so what I want to point out from this figure is, one, that the board's recharge and IGWA's conservation activities -- and this was in the Department's conclusions -- have significantly improved what the sentinel well water levels would have been.

But what I also want to show you is that when you just look at the green line, without any of the aquifer management activities, what you see is that it would have gone up because of the wet year that we had in 2017 with or without those activities, but not as much. So -- so a wet year can significantly increase the sentinel well with or without the activities.

And, similarly, a dry year, like occurs in 2021, can dip down the sentinel well with or without the activities taking place. And in some cases, the increase or the drop can be even more than what the modeled activities on their own would have been.

Q. Okay. Let's go to the next page, page 7 of Exhibit 143 and discuss here, please.

A. So this gets at a similar point where, again, in the black line with black dots, I'm plotting the historical sentinel well values before the settlement agreement, and then the pink X's are the observed sentinel well values following the settlement agreement activities.

And in the background, what I'm showing is what's called the Palmer Drought Severity Index. And so this is an index developed for monitoring drought conditions. It's used really prominently throughout the -- the US, and this is showing what the conditions specific to the Eastern Snake Plain are.

And so the way the Palmer Drought Severity Index works is that positive values on this are representative of wet years, and negative values are representative of dry years. And in their definition of the Palmer Drought Index, above a three, a positive three, is an extremely wet year, and below a negative

three is an extremely dry year.

And so what you can see here is that even before, you know, the settlement agreement came into place, the sentinel wells fluctuate very strongly away from the average condition of 0 following either severely wet years, like you see in the 1980s or the 1990s, and then it drops severely down from average, that 0 value, following severely dry conditions, like the 2000s or the 2010s.

And then -- so what I'm showing here is that this drop that we see in 2021, 2022, and 2023 is really more a function of the extreme drought conditions that we had, and you can see that defined by the Palmer Drought Index.

And so, you know, a point that I want to make here is that when we look at the modeling projections using the ESPAM model, we're modeling those under average hydrologic conditions, and, over time, we expect that these climactic conditions, in terms of wet or dry years, are going to average out in the long term and that the activities that we're taking from the conservation activities are going to produce significant benefits to the well index over time. But in the short term, any significantly severely dry or severely wet year is going to cause a deviation up or down from sort

of those average -- average conditions that the model projection predicts.

Q. Okay. I'm gonna take you to the next page, Table 1 here. Can you describe what this is?

A. So this uses the same modeling that I described in my expert report, but I'm just sort of laying it out in the same way that Dave Colvin laid out his reach gain results in the Surface Water Coalition expert report. So we're looking at -- for each district, either based on the 205,000 allocation or the 200 and -- I've got two tables.

So Table 1 is looking at the 205,000 allocation by district, and it's summing up what the net reach gain benefit or deficit would have been resulting from all of IGWA's actual activities versus what if they had just done the bare minimum 205 every -- every year. And it's showing it in the same framework that Dave looks at. So we've got just the cumulative over 2016 to 2021, and then we look at 2022, the individual years through 2026, and then the cumulative of some of these later years going out all the way to 50 years to just show that the surplus activities by IGWA that were undertaken in those early years continue to have benefits that come into the reach and that benefit the sentinel well, you know, going out 50 years -- the same

Review of

SWC/IGWA Settlement Agreement Mitigation Plan-2022 Breach Expert Report

By

LRE

David Colvin, Jacob Bauer, Allan Foster, Gus Womeldorph and Scott Stokes

On behalf of

Idaho Ground Water Appropriators, Inc.

February 29, 2024

Submitted To:

Idaho Ground Water Appropriators, Inc. (IGWA)
Attention: T.J. Budge, General Counsel

Submitted By:

Lynker
Sophia C. Sigstedt, Senior Hydrologist, PH-GW
Jim McCord, Lead Hydrogeologic Engineer, PhD, PE
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

Table of Contents

Figures

Tables

1 Introduction

This report presents rebuttal of certain statements and claims presented in the February 2024 expert report by Colvin et al., at LRE submitted on behalf of the Surface Water Coalition ("SWC"), referred to herein as the "SWC Report". The format of this rebuttal addresses specific sections of the SWC Report, quoting specific statements and claims in the SWC Report (in italics), followed by rebuttal.

2 SWC Report Section 2 "IGWA's 2022 Performance"

"*Excess pumping by the GWDs has long term effects that outlast any one irrigation season and further contributes to the declines in aquifer levels and reach gains that the 2016 Mitigation Plan is intended to address.*" (SWC Report, Sec 2.2 pg 3)

Just as groundwater pumping has long-term effects, surplus groundwater conservation by the IGWA groundwater districts (GWDs) from 2016-2020 has long term effects that extend beyond a single irrigation season and offsets the impacts to Near Blackfoot to Minidoka reach gains and Sentinel Well levels alleged in the SWC Report, as will be shown in Sections 2.1 and 2.2.

"*Excessive 2022 pumping by IGWA members contributed to the Sentinel Well Index declines which are far below the 2016 Mitigation Plan targets.*" (SWC Report, Sec 2.2 pg 3)

The GWDs utilized averaging in their conservation programs in part due to the long-term impacts of groundwater conservation. The use of averaging enabled individual farmers to comply with the conservation program developed by their GWD programs even though the farmer pumped more water in 2022 than prior years.

Surplus conservation by the GWDs from 2016-2020 resulted in higher Sentinel Well levels than would have occurred if the GDWs had implemented the precise conservation targets allocated by IGWA (205,000 acre-feet) and IDWR (240,000 acre-feet), as will be shown in Section 2.1.

Sentinel Well levels are below 2016 Mitigation Plan targets because those targets were established partly on modeling using ESPAM version 2.1 which predicted that groundwater conservation implemented under the 2016 Mitigation Plan would produce much higher groundwater levels than were realized in practice. IDWR has since improved ESPAM and issued version 2.2 which shows very different groundwater level projections in the Sentinel Wells, as will be shown in Section 2.1.

Lastly, very dry hydrologic conditions in 2021 and 2022 impacted the GWDs' ability to meet projected targets, as will be shown in Section 2.1.

2.1 SWC Report Section 2.3.1 "Sentinel Well Impacts"

"*ESPAM results show that the 2022 underperformance by the Bingham, Bonneville-Jefferson, and Jefferson-Clark Ground Water Districts will cause a total of a 0.29 foot decline in the Sentinel Well Index.*" (SWC Report, Sec 2.3.1, pg 4)

The SWC Report is not clear as to the corresponding time period for the model result showing a 0.29 foot decline in the Sentinel Well Index. Modeling as described in Lynker's Expert Report dated February

15, 2024, of surplus conservation by the GWDs from 2016-2020 results in a net increase to the Sentinel Well Index of 0.34 feet or 0.13 feet in April 2023 depending on whether the surplus is based on conservation targets allocated by IGWA (205,000 acre-feet) or IDWR (240,000 acre-feet), respectively.

"*A comparison to Eastern Snake Plain Aquifer (ESPA) groundwater storage numbers helps to put this Sentinel Well Index change number into perspective. In a recent Eastern Snake Hydrologic Modeling Committee (ESHMC) meeting, IDWR staff member Mike McVay presented historical ESPA groundwater storage changes (McVay, 2023). Mr. McVay presented the storage change from spring of 2015 to spring of 2016 as a loss of 300,000 acre-feet of water. During this same time frame, the Sentinel Well Index decreased by 0.27 feet. This is comparable to the decrease caused by IGWA's 2022 underperformance and gives context to the scale of this type of impact*." (SWC Report, Sec 2.3.1, pg 4)

This is not a fair comparison. First, McVay did not model the effect of the of a 300,000 acre-ft decrease in aquifer storage. Second, the SWC Report's modeling showing a 0.29 feet decline was created by running ESPAM in superposition mode which does not account for other influences including incidental recharge and lagged depletions/accretions from groundwater pumping and aquifer recharge in prior years, whereas the observed 0.27 feet decline is a function of those factors.

"*The Sentinel Well Index decline due to IGWA's 2022 underperformance is significant, especially since the 2016 Mitigation Plan goals are not being met. These impacts propagate into the future and warrant mitigation. These impacts will result in decreased Snake River reach gains, thereby reducing the volume of water available to SWC members and for storage fill as long as the impacts persist*." (SWC Report, Sec 2.3.1, pg 4)

I agree that the effects of groundwater pumping propagate into the future. However, the effects of groundwater conservation also propagate into the future. Surplus groundwater conservation by the GWDs from 2016-2020 have resulted in a net increase to Near Blackfoot to Minidoka reach gains and net increase in groundwater levels as measured by the Sentinel Well Index. The fact that the 2016 Mitigation Plan Sentinel Well targets have not been met within the timeframe originally anticipated is primarily a function of model error which caused ESPAM to predict excessive aquifer recovery levels, along with the influence of two severely dry years in 2021 and 2022.

Figure 1 shows a comparison of ESPAM2.1 and ESPAM2.2 pre-settlement agreement modeling[1] of the Sentinel Well response to 240,000 acre-feet groundwater pumping reduction and 250,000 acre-feet IWRB recharge along with the historical (1981-2016) and observed post settlement agreement (2017-2023) Sentinel Well values. The *black dotted line* shows the historical Sentinel Well index (1981-2016). The *blue dotted line* shows the ESPAM2.1 projection of Sentinel Well values post-settlement agreement (2017-2023). The *orange dotted line* shows the ESPAM2.2 projection of Sentinel Well values post-settlement agreement (2017-2023). The *pink X's* are the observed Sentinel Well values post-settlement agreement (2017-2023). Under ESPAM2.1 projections, the 2016 Mitigation Plan Sentinel Well goal would be achieved within the timeframe prescribed by the 2016 Mitigation Plan. Under ESPAM2.2 projections, the 2016 Mitigation Plan Sentinel Well goal would not be achieved until 20248. ESPAM2.2

[1] 240,000 af GWD reduction was applied using a uniform percentage reduction across all GW irrigated lands as defined by ESPAM source water GIS layer and using consumptive use rates from ESPAM GW GIS CIR layer and 250,000 af IWRB recharge was modeled with about 43,000 af at MP31 and 207,000 af at Hilton Spill.

projects Sentinel Well Index values from 2017-2027 that are 51.55% lower than ESPAM 2.1 projections. ESPAM2.2 is currently accepted as the best science available.

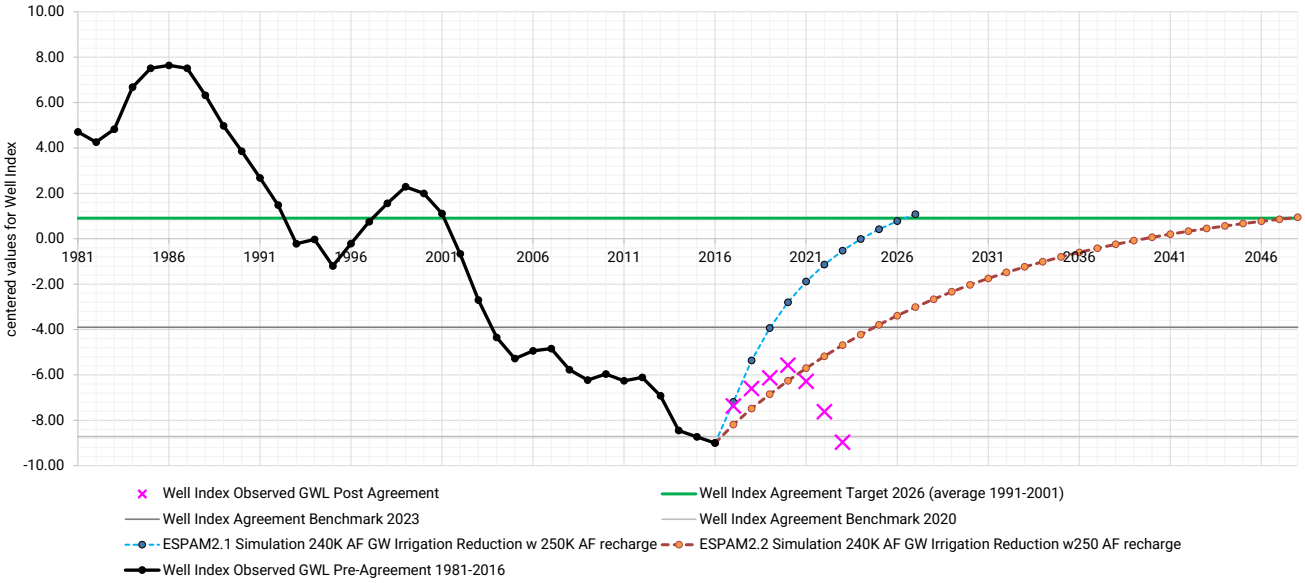


Figure 1: Comparison of ESPAM2.1 and ESPAM2.2 pre-settlement agreement modeling of Sentinel Well response to 240,000 acre-feet GW reduction and 250,000 acre-feet IWRB recharge and historical (1981-2016) and observed post settlement agreement (2017-2023) Sentinel Well values.

The ESPAM projections of Sentinel Well values shown in Figure 1 assume average hydrologic conditions. Hydrologic conditions that are above or below average will cause a deviation from the modeled projection. In fact, hydrologic conditions can have a much greater impact on groundwater levels than does groundwater conservation, such that extreme hydrologic conditions may dwarf the impacts of the GWDs' conservation activities in the short-term. Over time as climatic influences average out, however, the GWDs conservation efforts make a significant difference in groundwater levels.

Figure 2 shows IDWR modeling, presented to ESHMC August 2021, showing what the Sentinel Well Index (*dark blue dotted line)* would look like absent IWRB recharge "Recharge" (*light blue dotted line)* and absent IWRB recharge and IGWA conservation "Mitigation" (*green dotted line)*. IDWR's presentation to ESHMC with Figure 2 included findings that "changes in aquifer management have significantly improved aquifer conditions", "recharge and total conservation have added significant amounts of additional water into the ESPA" and "a combination of wet years and changes in aquifer management have resulted in an increased sentinel index". IDWR also determined that reservoir capacity in the Snake River system was increased by an additional 84,750 acre-feet above Minidoka in 2021 due to a combination of IWRB recharge and IGWA Conservation.

IDWR's presentation to ESHMC concluded that, 1) it took decades for water levels to decline to their current levels, likewise it will take decades to resolve the issue, 2) changes in aquifer management are already starting to improve aquifer conditions 3) there will be droughts, where options for aquifer management will be limited and 4) during wet periods, it is important to capture as much water into the aquifer for later use. These last two points made by IDWR are a strong argument for allowing averaging in the GWDs conservation plans because it incentivizes conserving and recharging maximum amounts,

like GWDs did 2016-2020, to offset extreme drought conditions like 2021 and 2022. There are long-term benefits in lagged accretions to the river and SWC supplies and reservoir capacity in the Snake River system is increased to meet demands in subsequent dry years.

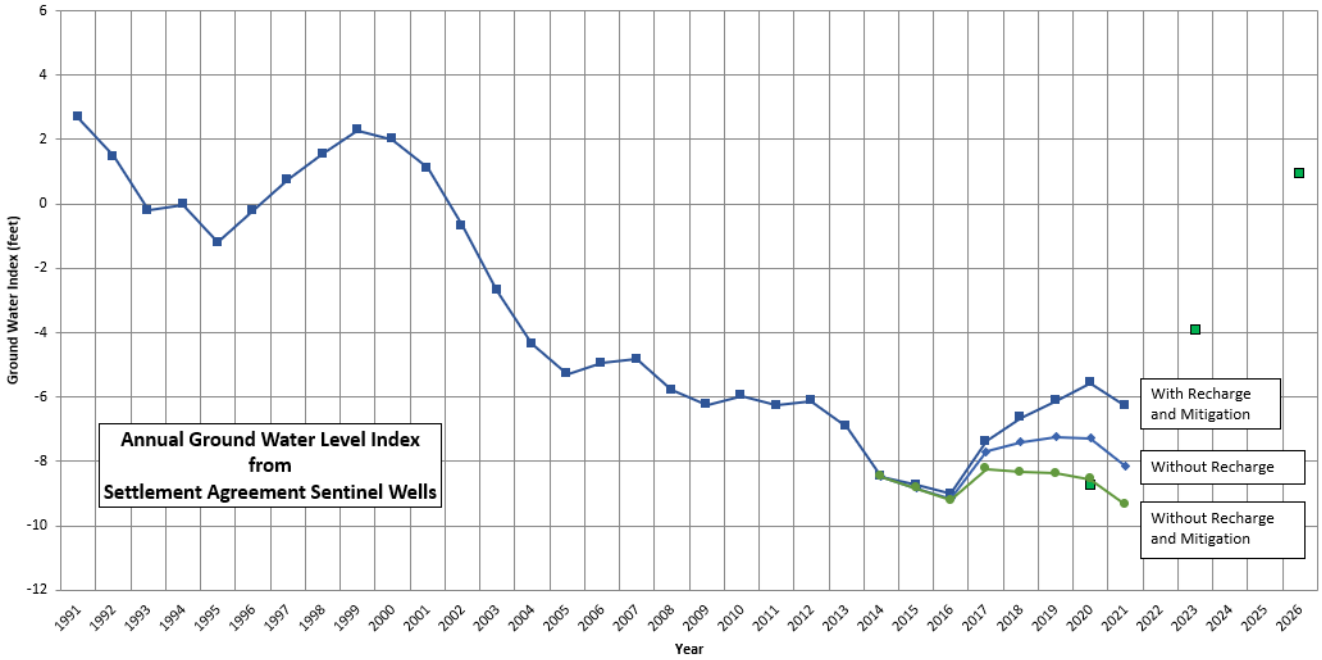


Figure 2: IDWR modeling, presented to ESHMC August 2021, showing what the Sentinel Well Index would look like absent IGWA conservation "Mitigation" and IWRB recharge "Recharge"

Figure 3 shows the Palmer Drought Severity Index (PDSI) for divisions 7 and 9 which represent climatic conditions on the Eastern Snake Plain. The PDSI is a standardized index generally spanning -10 to 10, where negative values represent dry conditions and positive values represent wet conditions. The PDSI is used to monitor and quantify drought conditions and is the most prominent index of meteorological drought used in the United States for drought monitoring and research. Values below -3 represent extreme drought conditions (NCAR, 2023). The PDSI shows extremely dry (below -4) hydrologic conditions for 2021 and 2022.

In keeping with the extreme drought conditions for 2021 and 2022, the observed Sentinel Well Index shows a significant drop from 2021-2023. Wet cycles will have the opposite effect. This is illustrated in Figure 3 where relatively wet conditions (1997-2001) and dry conditions (2002-2006) show significant deviations from average (or zero) in the historical Sentinel Well Index values.

It also bears mentioning that the Sentinel Well Index targets in the 2016 Mitigation Plan are benchmarks, and failing to meet the targets does not put the GWDs out of compliance with the 2016 Mitigation Plan; it simply triggers possible adaptive measures.

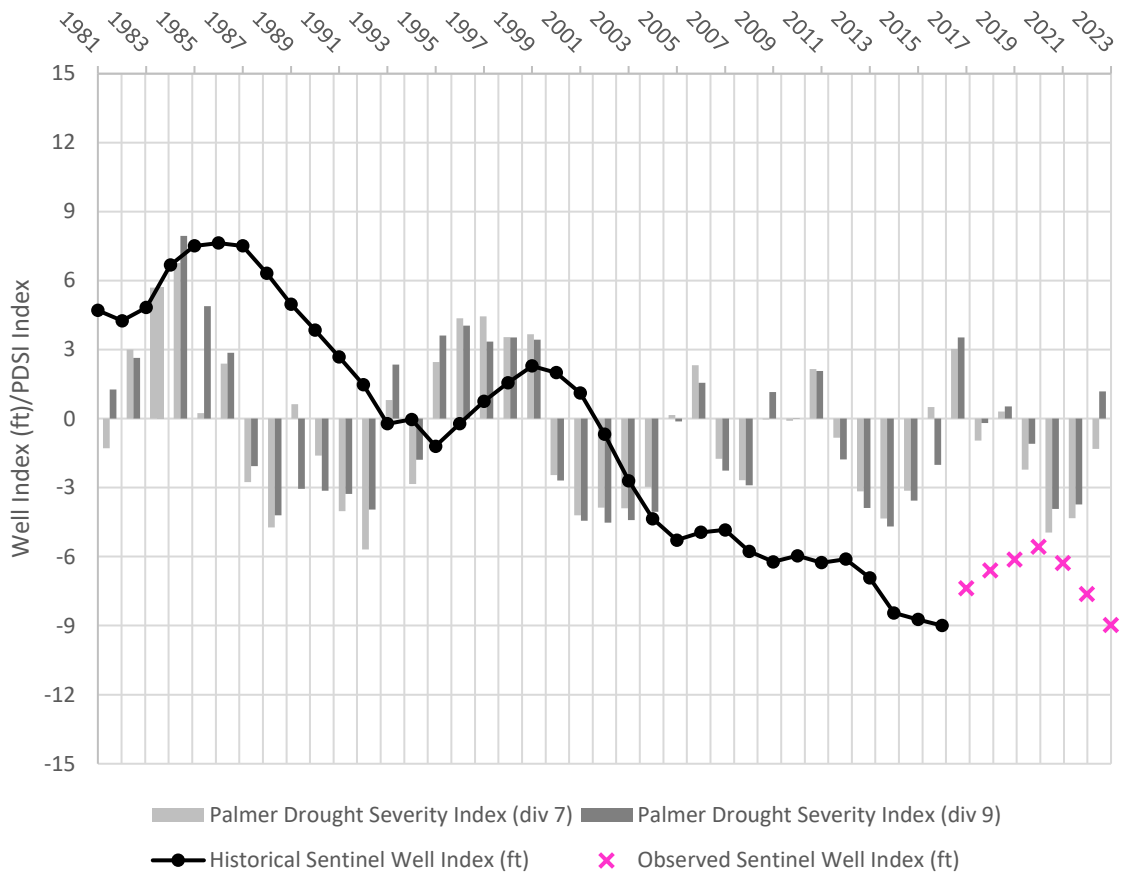


Figure 3: Historical (1981-2016) Sentinel Well Index (black dotted line) with the Observed Sentinel Index (2017-2023) Post-settlement Agreement (pink Xs), as well as, PDSI for Div 7 and 9 (grey bars).

2.2 SWC Report Section 2.3.2 "Reach Gain Impacts"

"*Table 2 shows the ESPAM calculated reductions in reach gains over a 50-year period. A significant amount of impact has yet to happen.*" (SWC Report, Sec 2.3.2, pg 4)

Table 2 - GWD 2022 Underperformance Impacts on Snake River Reach Gains

	Reductions of Near Blackfoot to Minidoka Snake River Reach Gains (Acre-Feet)			
Calendar Year	Bingham	Bonneville	Jefferson-Clark	Total
2022 (Sept-Dec)	**4,178**	**63**	**5**	**4,245**
2023	**6,165**	**536**	**150**	**6,850**
2024	**2,857**	**477**	**256**	**3,590**
2025	**1,703**	**340**	**294**	**2,337**
2026	**1,109**	**237**	**302**	**1,648**
2027-2036	**2,834**	**610**	**1,995**	**5,439**
2037-2046	**480**	**91**	**676**	**1,247**
2047-2072	**293**	**50**	**443**	**787**
Totals	**19,618**	**2,404**	**4,120**	**26,143**

As mentioned above, surplus conservation by the GWDs from 2016-2020 also propagates into the future, thereby increasing the volume of water to SWC members. Results from Lynker modeling as described in Lynker's Expert Report dated February 15, 2024, shows that surplus conservation by the GWDs from 2016-2020 results in a net increase in gains to the Near Blackfoot to Minidoka reach compared to minimum conservation targets allocated by IGWA (205,000 acre-feet) and IDWR (240,000 acre-feet) as shown in Table 1and Table 2, respectively. When surplus mitigation is taken into account, there is a net gain to the Near Blackfoot to Minidoka reach of about 275,000 acre-feet or 190,000 acre-feet, respectively.

2016-2022 IGWA Conservation Model Analysis-Near Blackfoot to Minidoka Reach Gains from Surplus over 205K									
all values are in acre-feet (Af)									
	Bingham	AFA	BJ	Carey	HFMAD	JC	MV	NS	IGWA Total
IGWA Target	205k af	205k af	205k af	205k af	205k af	205k af	205k af	205k af	205k af
2016-2021	54,102	67,022	21,043	22	1,109	10,896	1,729	1,097	157,019
2022	-2,668	20,105	11,067	21	610	2,600	4,473	848	37,056
2023	-3,608	2,075	85	38	807	1,600	1,326	846	3,170
2024	-913	1,734	-59	53	882	1,459	1,369	930	5,455
2025	-261	1,385	1	71	901	1,286	1,344	971	5,697
2026	-29	1,104	50	88	878	1,125	1,287	973	5,475
2027-2036	1,042	4,846	837	1,599	5,424	5,793	8,941	7,313	35,795
2037-2046	541	1,611	396	2,022	1,703	1,723	4,232	3,557	15,785
2047-2072	381	1,154	268	3,597	919	973	3,431	2,828	13,552
Totals	**48,588**	**101,037**	**33,687**	**7,511**	**13,232**	**27,456**	**28,131**	**19,364**	**279,004**

Table 1: 2016-2022 IGWA Conservation Model Analysis of SWC Near Blackfoot to Minidoka Reach Gain Benefits of Surplus Conservation Compared to IGWA Target Allocation of 205,000 af.

2016-2022 IGWA Conservation Model Analysis-Near Blackfoot to Minidoka Reach Gains from Surplus over 240K									
all values are in acre-feet (Af)									
	Bingham	AFA	BJ	Carey	HFMAD	JC	MV	NS	IGWA Total
IDWR Target	240k af	240k af	240k af	240k af	240k af	240k af	240k af	240k af	240k af
2016-2021	40,236	54,358	17,660	21	1,074	8,425	231	741	122,746
2022	-5,001	18,712*	10,362	21	594	1,875	3,904	673	31,140*
2023	-5,551	860	-789	37	787	736	609	624	-2,688
2024	-1,917	974	-714	52	861	664	605	683	1,207
2025	-902	854	-463	68	879	545	585	710	2,278
2026	-473	705	-282	85	856	445	557	710	2,603
2027-2036	-397	3,197	-187	1,545	5,285	2,000	3,855	5,314	20,610
2037-2046	181	1,079	182	1,952	1,658	598	1,820	2,581	10,050
2047-2072	141	774	141	3,471	895	378	1,473	2,052	9,323
Totals	**26,316**	**81,513**	**25,909**	**7,251**	**12,889**	**15,665**	**13,640**	**14,089**	**197,305**

Table 2: 2016-2022 IGWA Conservation Model Analysis of SWC Near Blackfoot to Minidoka Reach Gain Benefits of Surplus Conservation Compared to IDWR Target Allocation of 240,000 af.

Note that in the February 15, 2024 Lynker Expert Report a transpose error in Table 3 resulted in the 2022 AFA volume from the 205k results being reported in the 240K row, the correct values are shown in Table 2 above.

3 SWC Report Section 3 "Proposed Remedy

"*An appropriate remedy should mitigate all impacts of IGWA's excessive junior groundwater pumping, including long-term impacts that happen over many years.*" (Sec 3, pg 5)

Impacts to the Sentinel Well Index and to Near Blackfoot to Minidoka reach gains in 2022 were effectively remedied in advance by surplus conservation by the GWDs from 2016-2020.

3.1 SWC Report Section 3.2 "2022 Breach Remedy"

"*An effective remedy to the 2022 Breach could include reducing 2024 pumping at the locations where the excessive pumping occurred.*" (Sec 3.2, pg 5)

This remedy was already done in advance by surplus conservation from 2016-2020.

"*Table 3 presents the recommended 2024 additional pumping reductions, which are equal to the Director's quantification of 2022 excessive pumping amounts.*" (Sec 3.2, pg 6)

Table 3 - Recommended Remedy: 2024 Additional Pumping Reductions

Ground Water District	Additional Pumping Reductions (acre-feet)
Bingham	32,476
Bonneville-Jefferson	5,204
Jefferson-Clark	18,605
Total	**56,285**

Surplus conservation by the GWDs from 2016-2020 exceeded conservation targets under the 2016 Mitigation Plan. The surplus resulted in net gains over the period 2016-2072 to the Near Blackfoot to Minidoka reach by a total of about 275,000 acre-feet or 190,000 acre-feet, depending on whether the IGWA conservation target (205,000 acre-feet) or the IDWR conservation target (240,000 acre-feet) is used to measure the surplus. Thus, the GWDs have implemented in advance the remedy proposed by the SWC.

4 References

Steward-Maddox, N., 2021.The ESPA and the Role of Aquifer Management, presentation to the Eastern Snake Hydrologic Modeling Committee on August 24, 2021.

LRE, 2024. SWC/IGWA Settlement Agreement Mitigation Plan-2022 Breach Expert Report Docket No. CM-MP-2016-001, prepared for Idaho Surface Water Coalition February, 2024.

Dai, Aiguo & National Center for Atmospheric Research Staff (Eds). Last modified 2023-08-19 "The Climate Data Guide: Palmer Drought Severity Index (PDSI).” Retrieved from https://climatedataguide.ucar.edu/climate-data/palmer-drought-severity-index-pdsi on 2024-02-26