Sarah A. Klahn, ISB #7928
Maximilian C. Bricker, ISB #12283
SOMACH SIMMONS & DUNN
1155 Canyon Blvd. Suite 110
Boulder, CO 80302
Telephone: (303) 449-2834
sklahn@somachlaw.com;
mbricker@somachlaw.com
Attorneys for City of Pocatello

IN THE DISTRICT COURT OF THE FOURTH JUDICIAL DISTRICT

OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF ADA

CITY OF POCATELLO, CITY OF BLISS, CITY OF BURLEY, CITY OF CAREY, CITY OF DECLO, CITY OF DIETRICH, CITY OF GOODING, CITY OF HAZELTON, CITY OF HEYBURN, CITY OF JEROME, CITY OF PAUL, CITY OF RICHFIELD, CITY OF RUPERT, CITY OF SHOSHONE, CITY OF WENDELL, BINGHAM GROUND WATER DISTRICT, BONNEVILLE-JEFFERSON GROUND WATER DISTRICT, AND MCCAIN FOODS USA, INC.,

Petitioners,

vs.

IDAHO DEPARTMENT OF WATER RESOURCES, AND GARY SPACKMAN, in his capacity as Director of the Idaho Department of Water Resources,

Respondents.

Case No. CV01-23-08258

IDWR Docket No. CM-DC-2010-001

DECLARATION OF MAXIMILIAN C. BRICKER IN SUPPORT OF COMPLAINT FOR DECLARATORY RELIEF, PETITION FOR WRIT OF PROHIBITION, AND PETITION FOR WRIT OF MANDAMUS

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

I, Max Bricker, declare and state as follows:

1. I am over the age of 18 and competent to testify. I have personal knowledge of the facts set forth herein and, if called upon as a witness, I could and would competently testify thereto. I am an attorney admitted to the bar of Idaho and am an attorney at Somach Simmons & Dunn, P.C.

2. I am an attorney of record for Petitioner City of Pocatello ("Pocatello") in the above-captioned action, as well as an attorney for Pocatello in proceedings before the Director ("Director") of the Idaho Department Water Resources ("IDWR" or "Department") in Docket No. CM-DC-2010-001.

3. Attached as Exhibit A is a true and correct copy of IDWR's *Summary of Recommended Technical Revisions to the 4th Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover for the Surface Water Coalition* by Kara Ferguson and Matt Anders, dated December 23, 2022.

4. Attached as Exhibit B is a true and correct copy of a Memorandum from Heidi Netter and Greg Sullivan of Spronk Water Engineers, Inc., to Kara Ferguson and Matt Anders of IDWR, dated January 16, 2023, regarding Comments on behalf of the Coalition of Cities and the City of Pocatello on the Idaho Department of Resources (sic) Summary of

Recommended Technical Revisions to the 4th Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover for the Surface Water Coalition.

5. Attached as Exhibit C is a true and correct copy of a Memorandum from Dave Shaw (ERO Resources) and Dave Colvin (LRE Water) to Matt Anders, IDWR, dated January 16, 2022 [sic], regarding SWC Response to IDWR Recommended SWC Methodology Updates.

6. Attached as Exhibit D is a true and correct copy of a Memorandum from Sophia C. Sigstedt (Lynker) to Matt Anders and Kara Ferguson (IDWR) dated January 16, 2023 re Comments on 2022 IDWR Staff Recommendations.

7. Attached as Exhibit E is a true and correct copy of Water District 01's Water Report-May 16, 2023.

I declare under penalty of perjury under the laws of the State of Idaho that the foregoing is true and correct.

DATED this 19th day of May, 2023.

SOMACH SIMMONS & DUNN, P.C.

Maximilian C. Bricker, ISB #12283

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 19th day of May, 2023, I caused to be filed a true and correct copy of the foregoing document via iCourt E-File and Serve, and upon such filing, the following parties were served via electronic mail:

Idaho Dept. of Water Resources
file@idwr.idaho.gov
gbaxter@idwr.idaho.gov
gary.spackman@idwr.idaho.gov
sarah.tschohl@idwr.idaho.gov

Kathleen Marion Carr
US Dept. Interior
960 Broadway Ste 400
Boise, ID 83706 kathleenmarion.carr@sol.doi.gov

John K. Simpson
MARTEN LAW LLP
P.O. Box 2139 Boise, ID 83701-2139
jsimpson@martenlaw.com

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

Travis L. Thompson
MARTEN LAW LLP P.O. Box 63
Twin Falls, ID 83303-0063
tthompson@martenlaw.com
jnielsen@martenlaw.com

Matt Howard
US Bureau of Reclamation
1150 N Curtis Road
Boise, ID 83706-1234
mhoward@usbr.gov

W. Kent Fletcher
FLETCHER LAW OFFICE
P.O. Box 248
Burley, ID 83318
wkf@pmt.org

Thomas J. Budge
Elisheva M. Patterson
RACINE OLSON
P.O. Box 1391
Pocatello, ID 83204-1391
tj@racineolson.com elisheva@racineolson.com

Candice McHugh
Chris Bromley
MCHUGH BROMLEY, PLLC
380 South 4th Street, Suite 103
Boise, ID 83702
cbromley@mchughbromley.com
cmchugh@mchughbromley.com

Robert L. Harris
HOLDEN, KIDWELL, HAHN & CRAPO, PLLC
P.O. Box 50130
Idaho Falls, ID 83405 rharris@holdenlegal.com

Robert E. Williams
WILLIAMS, MESERVY, & LOTHSPEICH, LLP
P.O. Box 168
Jerome, ID 83338
rewilliams@wmlattys.com

Skyler C. Johns
Nathan M. Olsen
Steven L. Taggart
OLSEN TAGGART PLLC
P.O. Box 3005
Idaho Falls, ID 83403
sjohns@olsentaggart.com
nolsen@olsentaggart.com
staggart@olsentaggart.com

Randall D. Fife
City Attorney
City of Idaho Falls
P.O. Box 50220
Idaho Falls, ID 83405
rfife@idahofallsidaho.gov

William A. Parsons
PARSONS SMITH & STONE
P.O. Box 910
Burley, ID 83318
wparsons@pmt.org

Dylan Anderson
Dylan Anderson Law
P. O. Box 35
Rexburg, ID 83440
208-684-7701
dylan@dylanandersonlaw.com

Corey Skinner
IDWR—Southern Region
1341 Fillmore St., Ste. 200
Twin Falls, ID 83301-3033
corey.skinner@idwr.idaho.gov

Tony Olenichak IDWR—Eastern Region
900 N. Skyline Drive, Ste. A
Idaho Falls, ID 83402
Tony.Olenichak@idwr.idaho.gov

Maximilian C. Bricker, #12283

IDAHO DEPARTMENT OF
WATER RESOURCES

322 E Front Street, Suite 648, Boise ID 83702 • PO Box 83720, Boise ID 83720-0098
Phone: 208-287-4800 • Fax: 208-287-6700 • Email: idwrinfo@idwr.idaho.gov • Website: idwr.idaho.gov

Governor Brad Little **Director Gary Spackman**

EXHIBIT A

Summary of Recommended Technical Revisions to the 4th Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover for the Surface Water Coalition

12/23/2022

By: Kara Ferguson, Staff Hydrologist & Matt Anders, Hydrology Section Supervisor

In a status conference on August 5, 2022, the Director of the Idaho Department of Water Resources (IDWR) issued a directive to IDWR staff to convene a committee of experts to review and provide comments on potential technical changes to the "Fourth Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover" (Methodology) issued on April 19, 2016. IDWR staff created a technical working group composed of IDWR staff, experts representing the parties to the ongoing Surface Water Coalition (SWC) delivery call, and other interested parties. IDWR identified potential technical changes to the Methodology and presented them to the technical working group for discussion.

IDWR hosted six technical working group meetings between November 16 and December 14, 2022. Before each meeting, IDWR staff circulated PowerPoint presentations and agendas to the working group. The meetings were attended by interested members of the public and consultants and attorneys for parties to the SWC delivery call. Department staff and attorneys also participated. The meetings included presentations by IDWR staff and working group members, as well as open discussion on the topics presented. During the final meeting on December 14, 2022, IDWR staff stated that IDWR would provide a document summarizing staff's preliminary recommendations on potential technical changes to the Methodology.

Based on the information presented at the meetings and distributed to the technical working group, IDWR staff have the following preliminary technical recommendations:

- Update the Baseline Year (BLY) irrigation demand used to determine reasonable in-season demand from the current average of diversion demands for the 2006, 2008, and 2012 irrigation seasons to the diversion demand for the 2018 irrigation season.
- Update the BLY irrigation demand used to determine reasonable carryover for each SWC member from the current average of the diversion demands for the 2006, 2008, and 2012 irrigation seasons to the diversion demand for the 2018 irrigation season.
- Update the project efficiency value used to calculate monthly reasonable in-season demand from a rolling average of the previous eight years to a rolling average of the previous fifteen years.

At this time, staff do not have recommendations on utilizing near real time METRIC for determining crop water need, updating April and July regressions to improve their predictive power for natural flow supply, or using transient model simulation for determining curtailment priority dates. IDWR will continue to evaluate the integration of these and other techniques into the methodology.

IDWR requests written comments from the technical working group on the above recommendations or any other topic covered during the meetings. Please submit any comments no later than January 16, 2023, to matthew.anders@idwr.idaho.gov.

EXHIBIT B

Spronk Water Engineers, Inc.
1000 Logan St. | Denver, CO 80203-3011 | (303) 861-9700 | spronkwaterengineers.com

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TO: Kara Ferguson, Staff Hydrologist & Matt Anders, Hydrology Section Supervisor, Idaho Department of Water Resources

CC: Candice McHugh and Chris Bromley, McHugh Bromley, PLLC; Rob Harris, Holden, Kidwell, Hahn & Crapo, PLLC; and Sarah Klahn, Somach Simmons & Dunn, PC

FROM: Heidi Netter and Greg Sullivan, Spronk Water Engineers, Inc.

DATE: January 16, 2023

RE: Comments on behalf of the Coalition of Cities and the City of Pocatello on the Idaho Department of Resources Summary of Recommended Technical Revisions to the 4th Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover for the Surface Water Coalition, by Kara Ferguson and Matt Anders on December 23, 2022.

Under direction of the Director of the Idaho Department of Water Resources ("IDWR"), IDWR staff organized a technical working group ("TWG") to provide comments on potential technical changes to the Fourth Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover ("SWC Methodology"). The SWC Methodology was first ordered on April 7, 2010 and last amended on April 19, 2016. IDWR held numerous TWG meetings between November 16 – December 14, 2022 and Greg Sullivan and Heidi Netter of Spronk Water Engineers, Inc. ("SWE") participated in all of them, along with representatives of the Coalition of Cities and the City of Pocatello ("Cities").

On December 12 and 21, 2022, during the period of the TWG meetings, SWE submitted comments to the TWG via emails with attachments (*see* **Attachments 1** and **2**). These comments are made on behalf of the Cities to elaborate on the comments and materials previously provided.

IDWR Recommendations:

Following the conclusion of the TWG meetings, IDWR staff submitted a summary of three proposed changes to the SWC Methodology on December 23, 2022 that it recommends be implemented ("IDWR Recommendations"). The proposed changes consist of the following:

1. Update the Baseline Year ("BLY") irrigation demand used to determine reasonable in-season demand from the current average of diversion demands for the 2006, 2008, and 2012 irrigation seasons to the diversion demand for the 2018 irrigation season.

2. Update the BLY irrigation demand used to determine reasonable carryover for each SWC member from the current average of the diversion demands for the 2006, 2008, and 2012 irrigation seasons to the diversion demand for the 2018 irrigation season.

3. Update the project efficiency value used to calculate monthly reasonable in-season demand from a rolling average of the previous eight years to a rolling average of the previous fifteen years.

Comments on IDWR Recommendations:

Updated Baseline Year

IWDR staff recommends that the BLY be changed to 2018 because the previous BLY that is based on an average of conditions during 2006, 2008, and 2012 ("06/08/12") no longer reflects conditions during year(s) with above average diversions. During the meeting on November 16, 2022, IDWR presented information showing that combined SWC member diversions during 06/08/12 that averaged a combined 3,194,722 acre-feet and were 99.8% of the 2001 – 2021 average. This information showed that the SWC member diversions were no longer above average, but instead were very slightly below average. The combined SWC diversions during the proposed new BLY of 2018 are 186,000 acre-feet greater than the combined average diversions the 06/08/12 BLY. The increased diversions for the proposed new BLY will translate into greater projected shortages to the SWC members under the SWC Methodology.

A review of the data suggests that the 06/08/12 average diversions are no longer above average because the diversions by several of the SWC members have increased since the SWC Methodology was last updated in 2016. IWDR did not provide any information or analysis to explain why the SWC diversions have increased.

The information previously submitted by SWE on December 12 and 21, 2002 indicates that the computed Project Efficiency ("PE") for most of the SWC members has decreased or remained flat since the methodology was last updated in 2016. This is surprising given the continued sprinkler conversions and general advances in irrigation practices and technology that have occurred in the irrigation industry over the past 20 years. Only Minidoka shows a trend of significantly increasing efficiency. In addition, the low PE values for most SWC members during September and October are concerning.

The 2010 Fourth Amended Methodology Order states that "[d]uring periods of drought when groundwater users are subject to curtailment, members of the SWC should exercise reasonable efficiencies to promote the optimum utilization of the State's water resources." (paragraph 15). Application of the current SWC Methodology results in an unreasonable positive feedback loop for determination of the BLY: the more the SWC members divert, the greater the BLY diversions must be in order to stay above average. IDWR (or the TWG) should conduct additional analysis to determine whether the additional diversions are needed to meet crop demands, an analysis that could take the form of a basin-wide crop survey or other type of analysis. In the meantime, it is unreasonable to change the BLY in the manner that will increase shortages to the SWC members and result in greater curtailment of juniors.

Updated Project Efficiencies

IDWR proposes to change computation of the monthly average PE values from the average for the most recent 8 years to the average of the most recent 15 years. IDWR did not explain why it is proposing this

change. Changing from an 8-year average to a 15-year average may lessen the effect of recent reductions in PE for certain SWC members. The 2010 Order entails a "reasonable test" be applied to SWC member efficiencies. Here no reasonableness test has been applied, and as discussed in detail in **Attachment 1**, flat or decreasing PE values for the SWC members are concerning given continued sprinkler conversions by the SWC members and the advances in irrigation practices that continue to occur in the industry.

Other Comments

1. Irrigated acres provided by SWC should be accompanied by shapefiles to show that the reported irrigated acres reasonably match the actual irrigated lands. This can be confirmed using aerial imagery, field verification, and/or remote sensing such as NDVI, METRIC ET, and CDL.
2. The SWC Methodology provides that the crop water needs of the SWC members may be adjusted for supplemental groundwater use on the irrigated lands. IDWR should require that information necessary for this adjustment be compiled and utilized to adjust the reasonable in-season demand of the SWC members.

Attachments

Attachment 1 - 12/12/2022 Email

From: Greg Sullivan <gsullivan@spronkwater.com>
Sent: Monday, December 12, 2022 9:48 AM
To: Anders, Matthew; Jaxon Higgs; ssigstedt@lynker.com; Dave Shaw; Heidi Netter; Ferguson, Kara; dave.colvin@lrewater.com; TJ Budge; wkf@pmt.org; Travis Thompson (tlt@idahowaters.com); sklahn@somachlaw.com; Chris Bromley; 'Candice McHugh'; MHoward@usbr.gov; rbsnowmobiles@gmail.com; Kresta Davis (KDavis2@idahopower.com); Dave Blew (DBlew@Idahopower.com); Ragan, Brian; Baxter, Garrick; John Simpson - Barker Rosholt & Simpson LLP (jks@idahowaters.com); Heidi Netter; Geisler, Ethan; Sukow, Jennifer
Subject: Weaver, Mathew <Mathew.Weaver@idwr.idaho.gov>; Cecchini-Beaver, Mark <Mark.Cecchini-Beaver@idwr.idaho.gov>; Vincent, Sean <Sean.Vincent@idwr.idaho.gov>; Spackman, Gary <Gary.Spackman@idwr.idaho.gov>
Attachments: 2022-12-12 SWC Diversions and CWN.xlsx

Attached is a spreadsheet containing the graphs and tables of historical adjusted diversions and crop water needs for the SWC members that I presented to the SWC TWG on Friday, December 9. The underlying IDWR data on which the graphs and tables are based are also included.

As discussed during the meeting, the graphs and tables in the spreadsheet suggest that use of crop water need and project efficiency as a predictor of demand in the SWC Methodology should be revisited.

Let me know if you have any questions.

Thanks,

Greg

Gregory K. Sullivan, P.E.
Principal Water Resources Engineer
Spronk Water Engineers, Inc.
1000 Logan Street
Denver, CO 80203
303.884.9976 cell
gsullivan@spronkwater.com

Attachment 2 - 12/21/2022 Email

From: Greg Sullivan <gsullivan@spronkwater.com>
Sent: Wednesday, December 21, 2022 1:23 PM
To: Anders, Matthew; Jaxon Higgs; ssigstedt@lynker.com; Dave Shaw; Heidi Netter; Ferguson, Kara; dave.colvin@lrewater.com; TJ Budge; wkf@pmt.org; Travis Thompson (tlt@idahowaters.com); sklahn@somachlaw.com; Chris Bromley; 'Candice McHugh'; MHoward@usbr.gov; rbsnowmobiles@gmail.com; Kresta Davis (KDavis2@idahopower.com); Dave Blew (DBlew@Idahopower.com); Ragan, Brian; Baxter, Garrick; John Simpson - Barker Rosholt & Simpson LLP (jks@idahowaters.com); Heidi Netter; Geisler, Ethan; Sukow, Jennifer
Subject: Updated Comparison of Adjusted Diversions and Crop Water Needs for SWC Members
Attachments: 2022-12-21 SWC Diversions and CWN.xlsx; 2022-12-21 SWC Diversions and CWN Charts.pdf

TWG Members:

Attached is updated version of the spreadsheet comparing the historical Adjusted Diversions and Crop Water Needs (CWN) for the SWC members during 2001 – 2021. The spreadsheet includes several additional charts described below. PDFs of the added charts are attached.

Annual Project Efficiency Time-Series (AnnChartsPE Tab)

Additional charts were added in columns S – AH showing the computed annual Project Efficiency (PE) for each SWC member during from 2001 – 2021. The input flags that can be used to exclude certain years from the analysis (set on the AB tab) also operate to limit the annual efficiency values that are plotted in the new graphs. The flag in the attached spreadsheet is currently set to exclude years with a Demand Shortfall (DS) [flag = 2]. The trendlines plotted on the graphs indicate generally flat or declining PE for 6 of the 7 SWC members. This is surprising given the continued sprinkler conversions and general advances in irrigation practices and technology that have occurred in the irrigation industry over the past 20 years. Only Minidoka shows a trend of significantly increasing efficiency. The following are the changes in PE from 2001 – 2021 indicated by the trendlines for each SWC member:

Change in Project Efficiency (2001-2021)
(percentage point change)

A&B	-4.6%
AFRD2	-3.6%
BID	-1.0%
Milner	-12.6%
Minidoka	+12.2%
NSCC	-3.0%
TFCC	+1.8%

Because the PE values used in the SWC Methodology are currently based on averages for the most recent 8 years, any declines in the computed PE values will translate into increased demands and increased shortages.

Annual Project Efficiency vs Annual Adjusted Diversions AND Annual Crop Water Need (AnnAll Tab)

Additional scatter diagrams were added in columns AG – BM to plot the Annual Project Efficiency (PE) vs the Annual Adjusted Diversions AND Annual Crop Water Need for the 2001 – 2021 period. Again, the flag in the attached spreadsheet is set to exclude years with computed Demand Shortfalls (DS). Also plotted on the Annual Adjusted Diversions scatter charts are the average PE (solid black line) and the average PE + 1 standard deviation (dotted black line).

Monthly vs. Annual Project Efficiencies (AnnAll Tab)

Charts were added in columns BO – CD that compare the monthly average PE, average annual PE, and average annual PE + 1 standard deviation for each SWC member. These charts illustrate the low PE values in some months that cause monthly demands computed based on CWN / PE to be very sensitive to changes in CWN.

Discussion

The current SWC Methodology uses Monthly CWN / Avg Monthly PE to compute the monthly Diversion Demand. The Avg Monthly PE values for many of the SWC members vary widely throughout the irrigation season, and are unreasonably low in some months, particularly in September and October. The low monthly PE values may be due in part because they do not reflect the portion of the diversions that may be stored in soil moisture for subsequent use. For example, consider a month with 100 AF diverted, 30 AF of CWN, and 20 AF accruing to soil moisture. Under the SWC methodology, the computed PE would be 30%, but the actual PE considering the water stored in soil moisture would be 50%.

Because of the wide variability in the computed monthly PE values, consideration should be given to using seasonal PE values rather than monthly PE values in computing the monthly Diversion Demands. This would help level out the wide swings in the monthly diversion demands that sometimes occur in application of the SWC Methodology when relatively low monthly PE values are divided into relatively high monthly CWN values. If seasonal PE values are utilized, the data for September and October should be reviewed and potentially excluded from calculation of the seasonal PE values since the efficiencies in those months are unreasonably low.

In addition, the current use of average PE values during the most recent 8 years in the Diversion Demand calculations should be reviewed. The 2010 Fourth Amended Methodology Order states that "[d]uring periods of drought when junior groundwater users are subject to curtailment, members of the SWC should exercise reasonable efficiencies to promote the optimum utilization of the State's water resources." (paragraph 15). The annual PE values shown in the above referenced graphs show significant year-to-year variations for each SWC member. Since the data in the charts have been filtered to exclude years with computed demand shortages, variations in the computed annual PE values indicate that each of the SWC members have operated at a range of efficiencies to meet crop water demands over the past 20 years. Given the level or declining trend in average efficiencies for most SWC members, the current methodology that uses average efficiencies for the most recent 8 years may discourage reasonable and efficient use by the SWC to the detriment of groundwater users and contrary to optimum utilization of the State's water resources.

The following table compares the average annual PE values for 2014-2021 (most recent 8-year period) against alternate PE values computed from annual data and April – August data for 2001-2021. The alternate PE values are tabulated as averages and as averages plus 1 standard deviation. All values exclude years in which demand shortages were computed.

PE Summaries	A&B	AFRD2	BID	Milner	Minidoka	NSCC	TFCC
2014-2021 Avg	58%	32%	41%	49%	52%	34%	38%
2001-2021 Avg	60%	34%	41%	56%	47%	34%	38%
2001-2021 Avg + 1 Std Dev	65%	36%	45%	65%	53%	37%	41%
2001-2021 (Apr-Aug) Avg	63%	36%	44%	58%	50%	37%	43%
2001-2021 (Apr-Aug) Avg + 1 Std Dev	68%	39%	48%	68%	55%	40%	46%

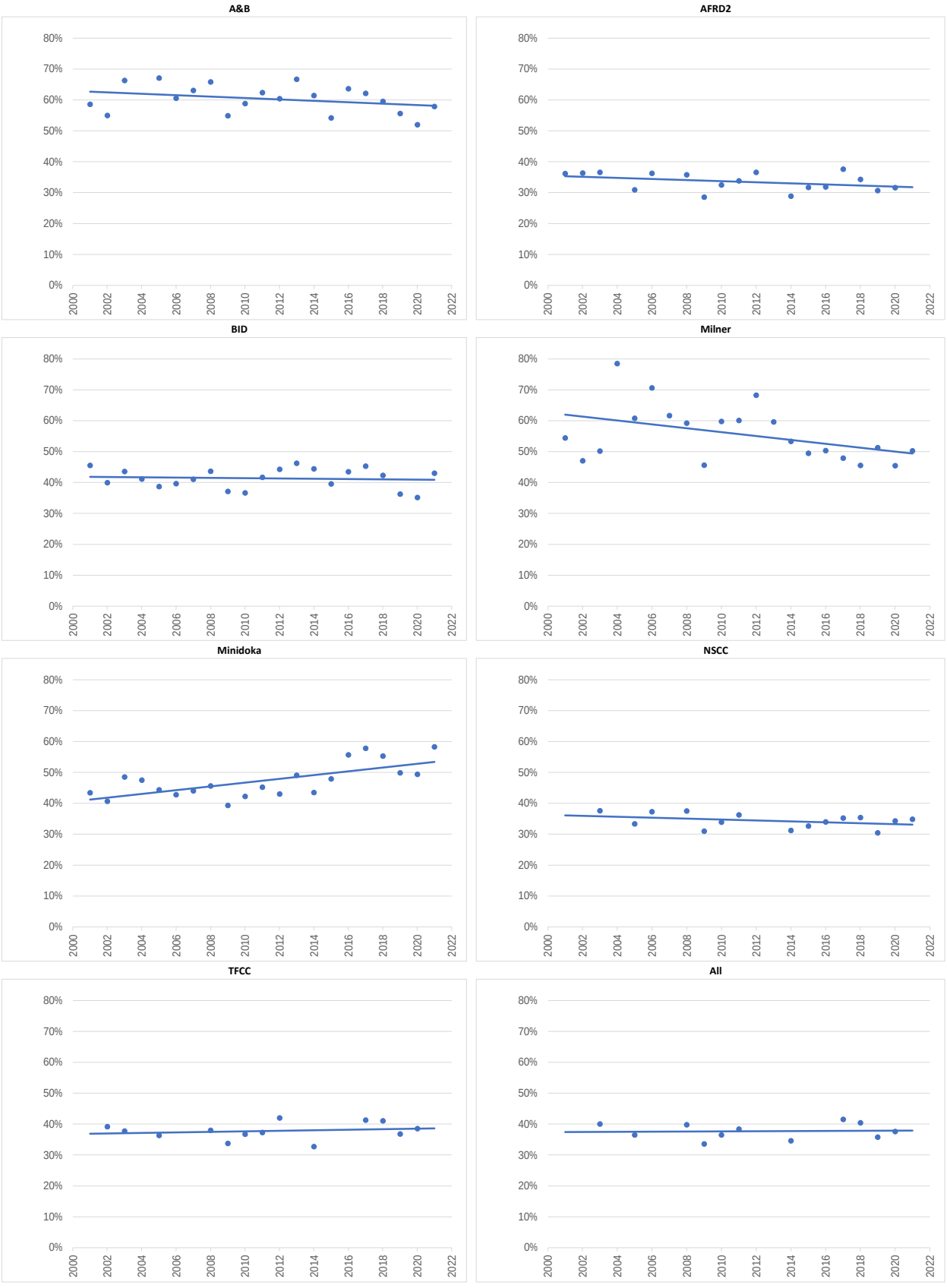
The above values are computed in columns CF – CU in the AnnAll tab in the attached spreadsheet. These values illustrate some different ways that annual and seasonal PE values can be computed from the historical data. If IDWR is going to continue computing Reasonable In Season Demand (RISD) based on CWN / PE, consideration should be given to using PE values that better reflect reasonable and efficient operations of the SWC members than do the historical averages that are currently used in the SWC Methodology. This would help ensure that curtailment and/or mitigation of impacts from junior groundwater use occurs when SWC supplies are short under reasonable and efficient operations.

Thanks,

Greg

Gregory K. Sullivan, P.E.
Principal Water Resources Engineer
Spronk Water Engineers, Inc.
1000 Logan Street
Denver, CO 80203
303.861.9700
303.884.9976 cell
gsullivan@spronkwater.com

Annual Project Efficiency
Surface Water Coalition Members
2001 - 2021 (AF)
Exclude Years with Demand Shortfall (DS)

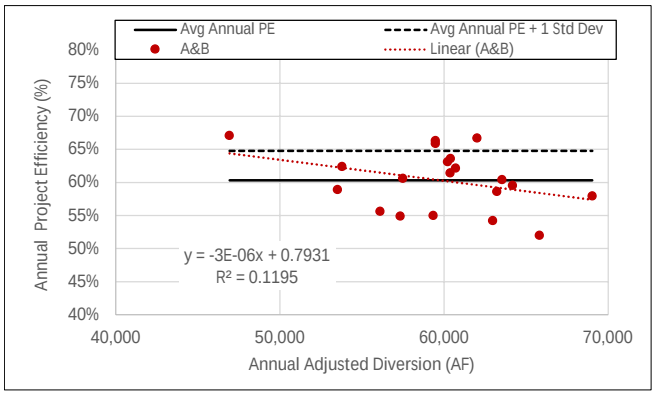


Annual Project Efficiency v. Annual Adjusted Diversions

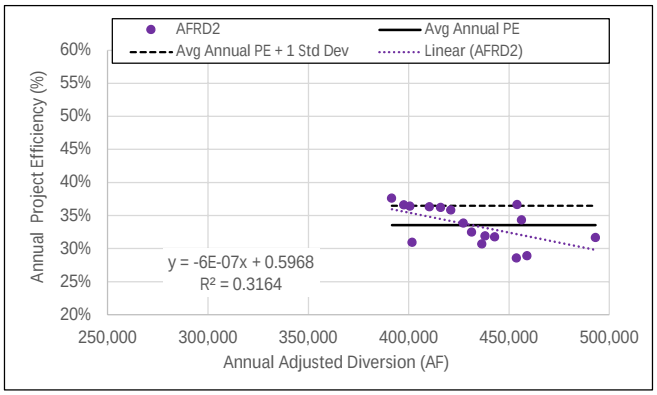
Surface Water Coalition Members

Exclude Years with Demand Shortfall (DS)

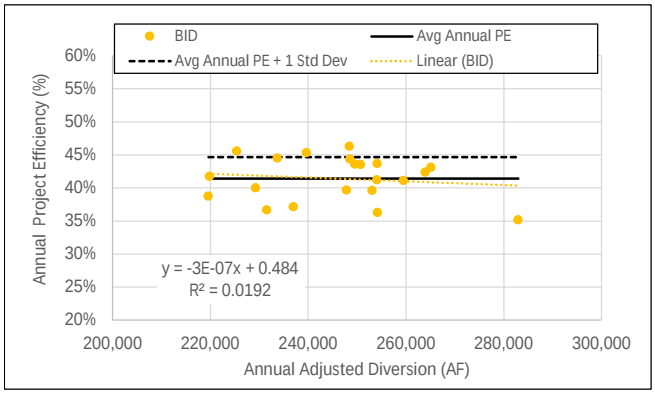
A&B



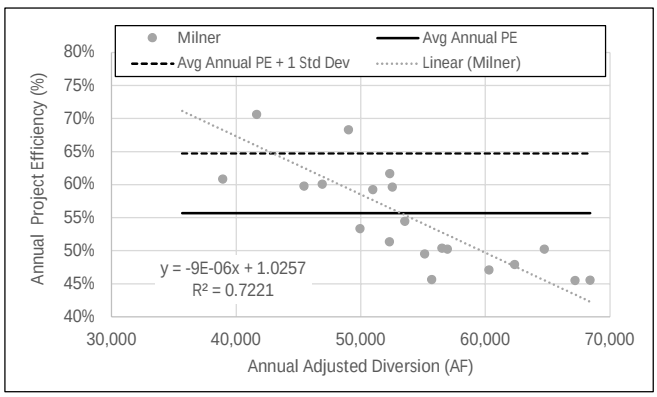
AFRD2



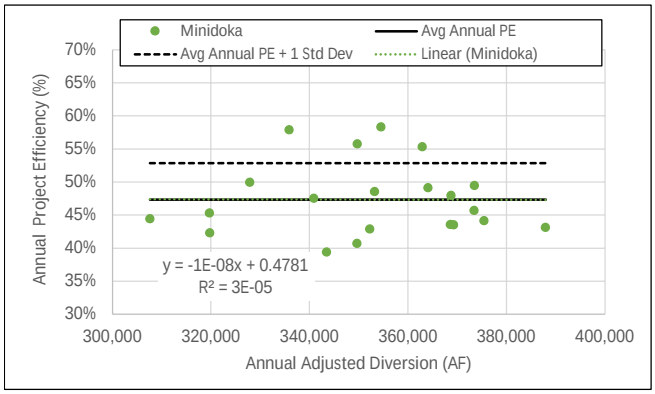
BID



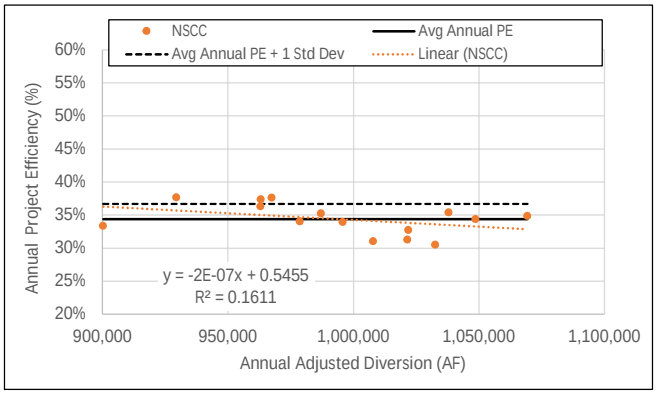
Milner



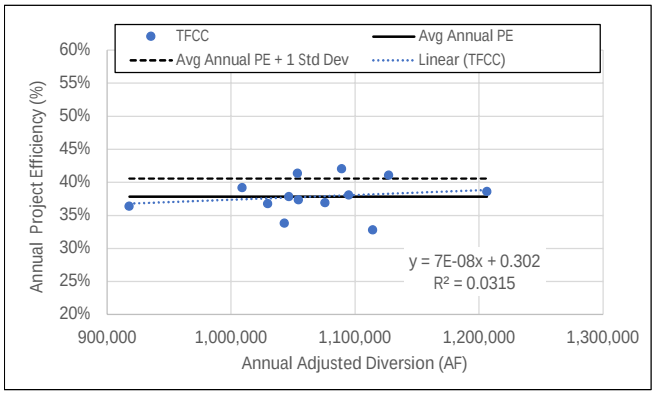
Minidoka



NSCC



TFCC



Notes:

Note different scales.

(1) Annual Project Efficiency (PE) computed as Annual Crop Water Need (BCWN) divided by Annual Adjusted Diversion.

(2) Annual Adjusted Diversions are historical reported diversions adjusted for to remove wheeled water, recharge, and mitigation (IDWR spreadsheet: DS RISD Calculator_2022_August 15.xlsx).

(3) Annual Crop Water Need (BCWN) computed as crop weighted average crop irrigation requirement ("CIR") multiplied by District reported irrigated area.

(4) Average Annual PE is the average of the 2001-2021 annual PE values.

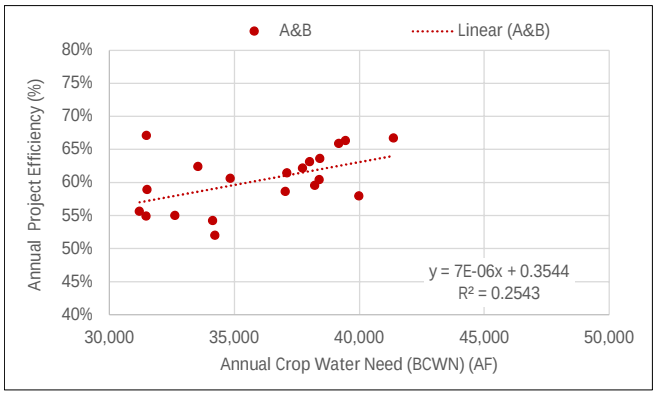
(5) Average Annual PE + 1 Std Dev is the average of the 2001-2021 annual PE Values plus 1 standard deviation.

Annual Project Efficiency v. Annual Crop Water Need (CWN)

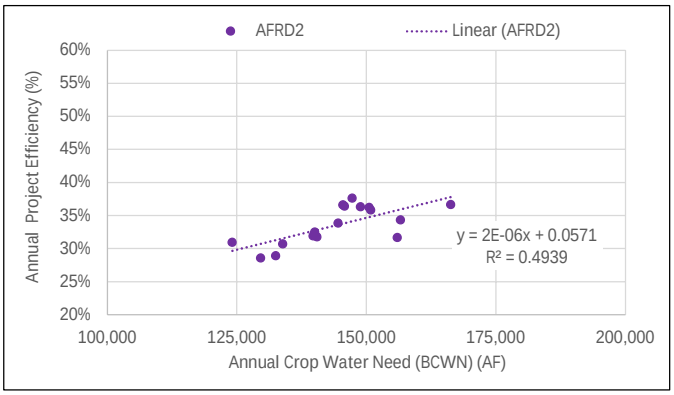
Surface Water Coalition Members

Exclude Years with Demand Shortfall (DS)

A&B



AFRD2



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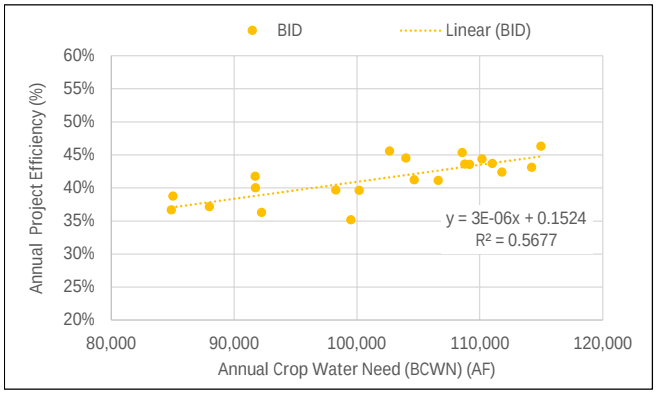
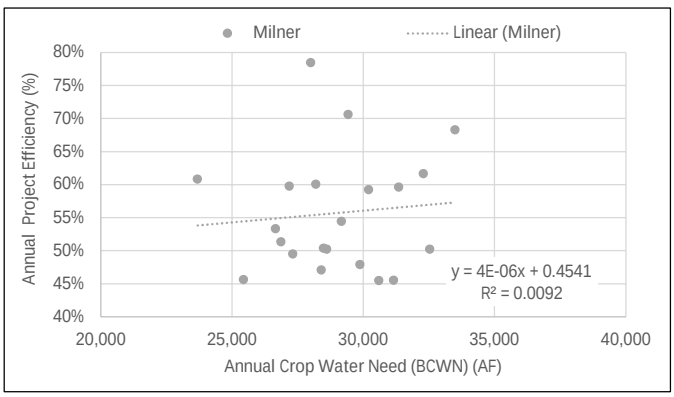
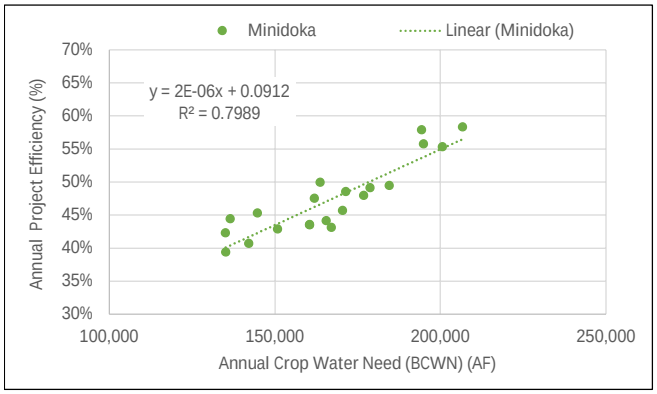


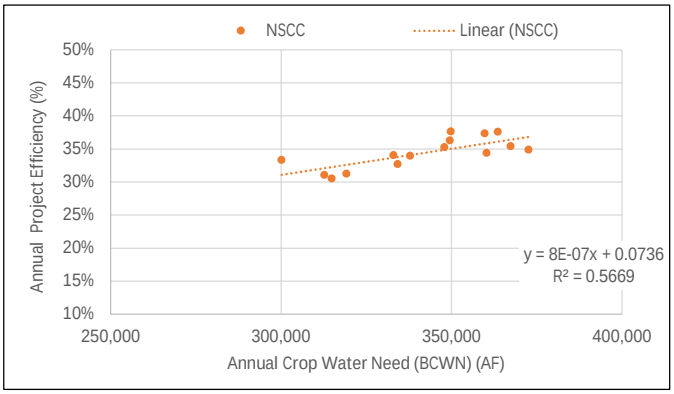
Milner



Minidoka



NSCC



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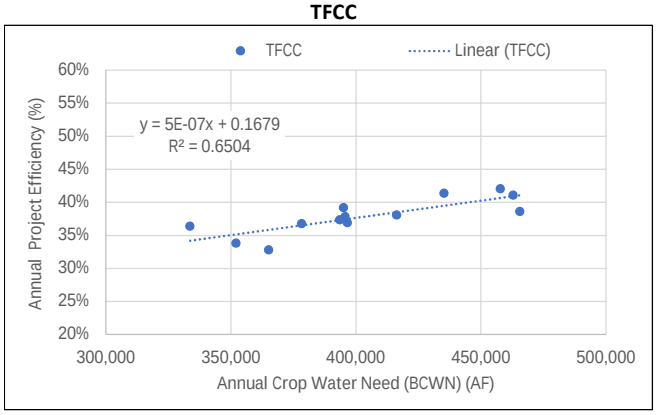


Notes:

Note different scales.

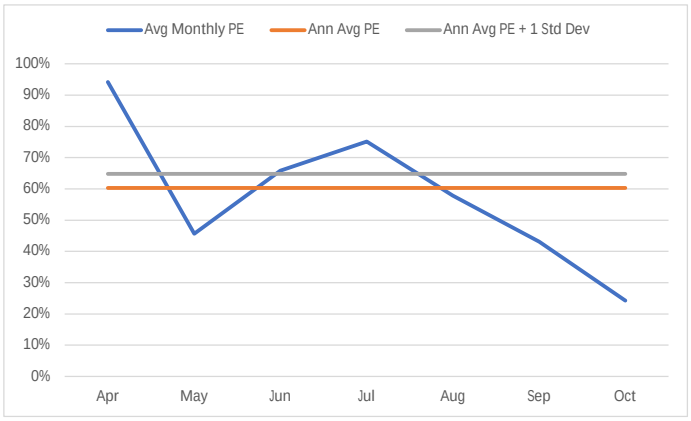
(1) Annual Project Efficiency (PE) computed as Annual Crop Water Need (BCWN) divided by Annual Adjusted Diversion.

(2) Annual Adjusted Diversions are historical reported diversions adjusted for to remove wheeled water, recharge, and mitigation (IDWR spreadsheet: DS RISD Calculator_2022_August 15.xlsx).

(3) Annual Crop Water Need (BCWN) computed as crop weighted average crop irrigation requirement ("CIR") multiplied by District reported irrigated area.

Annual Project Efficiency v. Monthly Project Efficiencies
Surface Water Coalition Members
Exclude Years with Demand Shortfall (DS)

A&B



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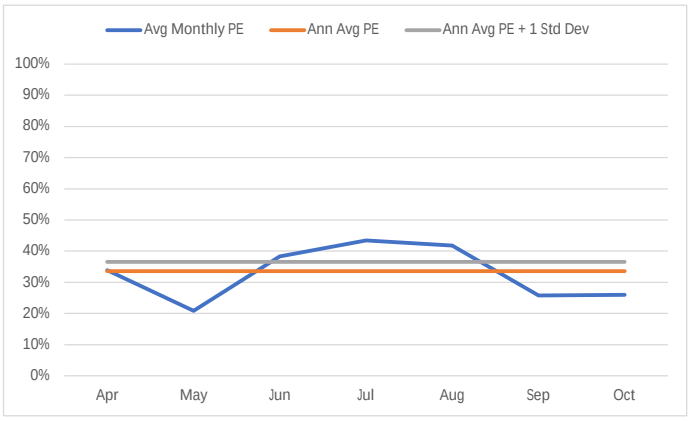

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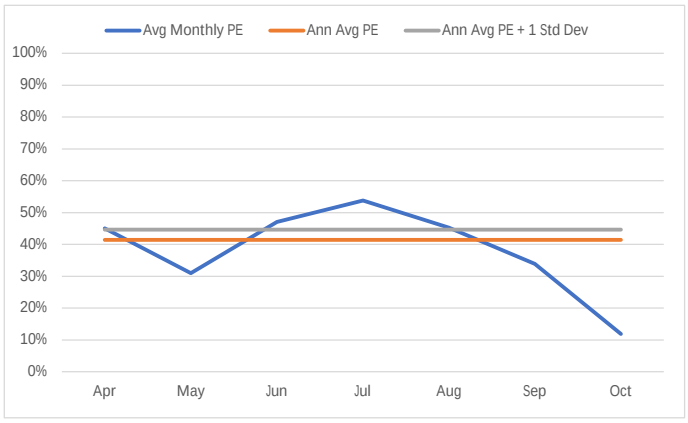

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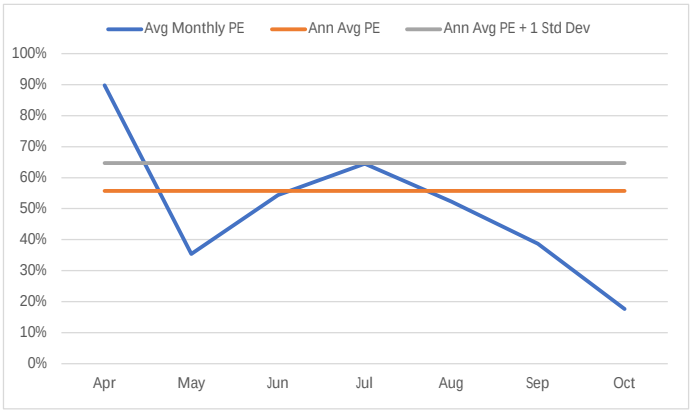

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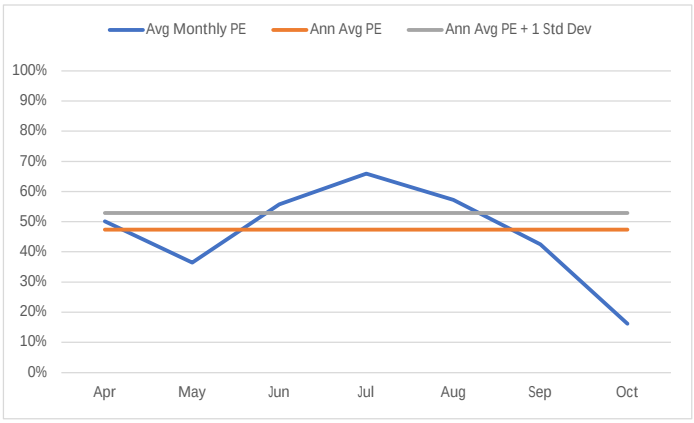

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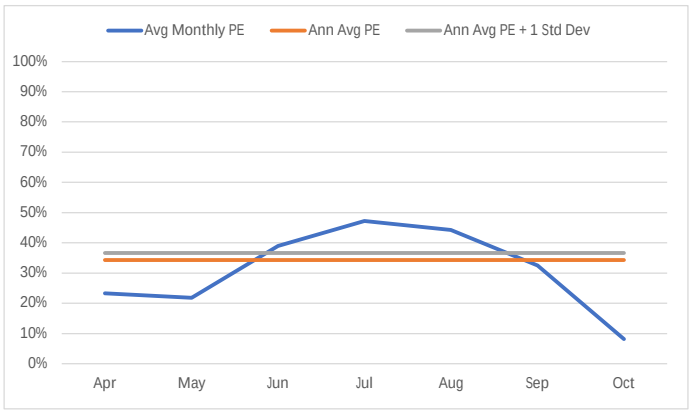

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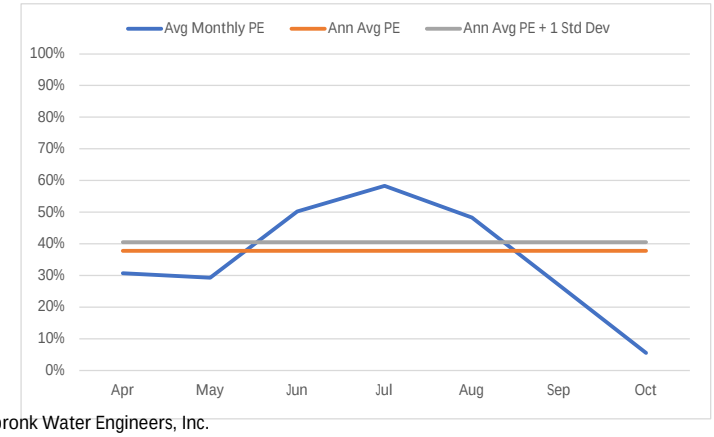

EXHIBIT C

Memorandum

To: Matt Anders (Idaho Department of Water Resources)

From: Dave Shaw (ERO Resources), Dave Colvin (LRE Water)

Date: January 16, 2022

Subject: **SWC Response to IDWR Recommended SWC Methodology Updates**

Introduction

On December 23, 2022, Idaho Department of Water Resources (IDWR) staff issued a document summarizing their recommendations for updating the Surface Water Coalition (SWC) Methodology. IDWR presented considerations and potential updates in Technical Working Group (TWG) meetings convened during November and December 2022. The current Methodology was established in the April 19, 2016 IDWR Fourth Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover (Fourth Amended Final Order)[1].

The Methodology is intended to protect the maximum reasonable diversion of SWC senior water rights from the in-season impacts caused by junior groundwater pumping. Decades of groundwater pumping effects have reduced the Snake River flows and reduced the water supply for senior water rights creating continuing but variable impacts. This variability creates inherent limitations for the Methodology and has particular significance on the potential updates IDWR presented during TWG meetings.

In addition, the Methodology strives to use predictions and observations to predict reasonable in-season demands (RISD) for SWC entities. Many steps of the Methodology transition from predictive tools early in the season to measured field data later in the season when hydrologic observation data are available. Many of the data, methods, and analyses are insufficient to account for changes in farming practices forced upon SWC entities as a result of economic conditions and water supplies being unreliable throughout the season and year to year.

Despite these fundamental limitations, many aspects of the SWC Methodology represent the best available science for estimating forecasted supply (FS), RISD, and Demand Shortfall (DS). Additional comments on specific IDWR update recommendations are provided below.

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[1] Fourth Amended Final Order https://idwr.idaho.gov/wp-content/uploads/sites/2/legal/CM-DC-2010-001/CM-DC-2010-001-20160419-Fourth-Amended-Final-Order-Regarding-Methodology-for-Determining-Material-Injury-to-Reasonable-In-Season-Demand-and-Reasonable-Carryover.pdf

1. IDWR Recommended Methodology Updates

a. Baseline Year Update for In-Season Demand and Carryover

IDWR is recommending that the Baseline Year (BLY) be updated to 2018. The process for selecting the BLY is described in the Fourth Amended Final Order and identifies both 2018 and 2020 as candidate baseline years. Based on the additional years of data considered since the Methodology was developed, both 2018 and 2020 are superior to the current baseline years (2006, 2008, 2012) which are no longer acceptable candidates. IDWR's rationale for only selecting 2018 is that 2020 had relatively high late-season diversions for the Twin Falls Canal Company (TFCC). Estimates of late-season project efficiency are higher in 2020 than in 2018, indicating that the late-season TFCC diversions, although higher, are reasonable. Changes in late season demands are being driven by economic conditions and the dairy industry's need for feed that has resulted in double cropping and changes in harvest methods. Double cropping is sometimes triticale followed by field corn resulting in later season water demands to finish the corn. Other examples are alfalfa harvested as green chop instead of baled hay so the crop water requirement is continual instead of allowing time for the crop to dry in the field so it can be baled. In the past hay crops were often 3 cuttings per year but now are 5 or more cuttings that create additional crop water needs, particularly late irrigation season demands. Additionally, late season irrigation is sometimes required for cover crops or late season ground working in preparation of fall seeding that is likely not reflected by AgriMet Et data.

A review of CWN data for the period 2000 – 2022 shows an increase over time that has, in part, resulted in the need to select a new BLY for determining an adequate water supply for the SWC. If the current methodology is continued, a regular review of the BLY is recommended as provided in Step 9 of the Methodology Order. Along with changes in CWN, a review of NASS crop data layers (CDL) should be completed to verify the crop mix present on the land served by the SWC if the use of METRIC is not implemented.

The selection of a new BLY is expected to increase the total reasonable carryover quantities for most of the SWC members. Step 8 in the Methodology Order needs to be reviewed to be certain the new reasonable carryover quantities can actually be replaced by the junior ground water users if the SWC members' reasonable carryover is used to finish the season at the Time of Need.

b. Update Project Efficiency Values

Central to proper determination of project efficiency is an accurate determination of CWN. As climate conditions and cropping patterns change, the determination of CWN needs to

be kept current with conditions in the field. AgriMet is a significant resource so long as the results are adapted to current cropping patterns and field conditions.

Using a 15 year rolling average for current year reasonable project efficiency instead of the present 8 year rolling average does not appear to change the current year efficiencies significantly. As the available record of Project Efficiencies continues to grow, using the longer 15 year rolling average may have advantages, but may need to be reviewed again in the future.

2. IDWR TWG Topics Not Being Recommended for Methodology Updates

In their December 23, 2022 letter, IDWR staff identified issues that were discussed during the TWG meetings that are not being recommended as updates to the SWC Methodology.

a. Real-time METRIC data for determining crop water need

IDWR staff presented information about the potential benefits of utilizing real-time METRIC and PRISM data for determining crop water need (CWN). These data sources are spatially variable estimates of evapotranspiration (ET) and precipitation, respectively. They would likely better represent the variability of ET and precipitation across SWC entities compared to the current methods which are based on ET and precipitation data observed at two AgriMet stations.

It is our opinion that IDWR should continue to evaluate the benefits of incorporating real-time METRIC and PRISM data into estimating actual CWN. Other available data, including OpenET, should be considered as well.

b. April and July Natural Flow Regressions

During the TWG meetings, IDWR presented information about the performance of variables originally selected to support April and July FS predictions. Additional data from 2016-2021 were added to evaluate the performance of the predictor variables as measured by the correlation coefficient comparing predictions to actual natural flow. In summary, no significant degradations in predictive capability were identified, so there is no recommendation to change this aspect of the Methodology. Other candidate predictor variables should continue to be assessed and considered for incorporation should their performance prove better than the current inputs.

c. Transient ESPAM Modeling

During the November 28, 2022 TWG meeting, IDWR staff presented an analysis comparing steady state and transient uses of the Eastern Snake Plain Aquifer Model Version 2.2 (ESPAM) for determining curtailment dates under the Methodology. No TWG meeting attendees stated that they remembered the original rationale for steady-state modeling, including IDWR staff.

Steady-state modeling of groundwater curtailment predicts the maximum impacts that would occur over infinite time. There is no time variable result that relates to the irrigation season. In reality, the impacts of curtailment take time to propagate through the aquifer and occur over months, years, or decades depending on variables such as the distance of a well from the river, and the aquifer transmissivity between the two.

Transient and steady-state versions of ESPAM were created to support various administration and planning efforts by IDWR and Eastern Snake Plain Aquifer (ESPA) stakeholders interested in evaluating the interaction between surface water and groundwater. Steady-state versions of the model are used when results showing ultimate impacts without regard to time are desired. Transient ESPAM versions are used when results require time variable inputs (e.g. pumping limited to the irrigation season) or outputs (e.g. reach gain impacts during a single irrigation season).

Because the Methodology is intended to address in-season injury, transient modeling analysis is the only appropriate way to determine curtailment dates that would protect SWC water rights and supplies. IDWR presented the steady state versus transient differences between ESPAM predicted in-season impacts of curtailment as increases in near Blackfoot to Minidoka reach gains during the 2021 and 2022 seasons. IDWR showed that the transient ESPAM model predicts an October 11, 1900 curtailment date would result in 97,700 acre-foot (AF) impact in the April to September period. Steady-state modeling of the same curtailment date predicts approximately 1,100,000 AF of impact accruing instantaneously as reach gain increases. The steady-state result is clearly erroneous and overpredicts the in-season benefits of curtailment by more than an order of magnitude.

IDWR staff also presented the impact of curtailment in future years beyond the in-season benefits. Future years with relatively low natural flow would provide SWC benefits from the increased reach gains. Years with higher natural flows, when storage fills, would not directly benefit SWC as reach gain increases. IDWR speculated that these wet years would possibly result in increased flow past Milner or provide additional water for managed aquifer recharge. Utilizing the current recharge sites would not significantly

increase near Blackfoot to Minidoka reach gains and therefore would provide limited benefit to SWC water supplies.

IDWR's modeling analysis conclusions stated that "*Short-term curtailments in response to in-season predictions of DS [Demand Shortfall] are inadequate to provide water during the time of need for several of the shortfall volumes predicted in 2021-2022*." This conclusion highlights the multi-year challenges that the Methodology is currently incapable of addressing.

Curtailment required by the Methodology is only applicable to junior groundwater users not covered in a settlement agreement or mitigation plan. The current agreements between SWC and ESPA groundwater users acknowledge the multi-year aspects of injury. IDWR's modeling results and the existing settlement agreements recognize the need for more effective protection of SWC's water supplies. Other Methodology steps are adjusted to create conservative results that protect senior surface water supplies, and the same approach should be taken with the modeling of curtailment dates.

Currently, the only aspect of the Methodology that has an impact year to year is the calculation of Reasonable Carryover. Although it is unlikely to be sufficient to protect SWC water supplies in all years, the Reasonable Carryover calculation could be increased to consider the inadequacies of curtailment for meeting in-season shortfalls. Ultimately, a comprehensive administration approach will need to fully address the multi-year nature of junior groundwater pumping on senior surface water supplies.

EXHIBIT D

MEMORANDUM

To: Matt Anders and Kara Ferguson, IDWR

From: Sophia C. Sigstedt, Lynker

Subject: Comments on 2022 IDWR Staff Recommendations

Date: January 16, 2023

This memorandum addresses my comments on the analyses presented to the 2022 Technical Working Group (TWG) related to revisions to the Methodology Order for determining injury to water rights held by members of the Surface Water Coalition. It serves as an addendum to Idaho Department of Water Resources (IDWR or Department) staff recommendations for the 2022 Methodology Update. IDWR staff and other members of the TWG presented analyses and recommendations regarding the following topics:

1. Baseline Year (BLY)
2. Forecasting Natural Flow Supply
3. Near-Real-Time METRIC for ET
4. Project Efficiency (PE)
5. ESPAM2.2 Steady State v. Transient

IDWR staff proposed changes related to BLY and PE, but only presented the results of internal analysis without recommending changes to the other topics investigated. TWG members were asked to consider whether the proposed recommendations provide a better technical basis than the current technique, or if there was an alternative with a better technical basis.

Sections 1-5 summarize my comments based on the proceedings for each TWG topic as listed above, respectively.

The topics identified above are not the only items in the Amended Methodology Order that should be considered regarding technical improvements. The comments in this memo are primarily in response to recommended changes made by IDWR staff in their memorandum dated December 23rd, 2022[1] and should not be considered a comprehensive summary of my opinions on all the technical aspects presented to the TWG or any other outstanding issues in the proceeding.

Section 1: Baseline Year Update

The IDWR staff recommended:

- Update the BLY irrigation demand used to determine Reasonable In-Season Demand (RISD) from the current average of diversion demands for the 2006, 2008, and 2012 (06/08/12) irrigation seasons to the diversion demand for the 2018 irrigation season.
- Update the BLY irrigation demand used to determine Reasonable Carryover for each SWC member from the current average of diversion demands for the 06/08/12 irrigation seasons to the diversion demand for the 2018 irrigation season.

[1] Summary of Recommended Technical Revisions to the 4th Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover for the Surface Water Coalition (IDWR, December 23rd 2022)

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

In my opinion the recommendation to replace average diversions for the 06/08/12 irrigation seasons with single-year diversions in 2018 as the BLY does not have an adequate technical basis, and alternatives should be considered due to the following:

1. IDWR should consider rank within the period-of-record (POR) and select an average of years closer to the rank of the 06/08/12 BLY selected in 2015. IDWR staff presented analysis to the TWG for individual years 2018 and 2020 for consideration as the updated BLY. Either of these individual years are inadequate to represent reasonably dry baseline conditions for SWC diversions.

   When the average of diversion demands for the 06/08/12 irrigation seasons was selected as the BLY in 2015, the 06/08/12 average ranked between 7th and 8th highest for diversions, or about the 55th percentile (based on a normal distribution), for the POR 2000-2015 (**Figure 1**). IDWR staff presented analysis of Demand Shortfall calculations using 2018 and 2020 as an alternative BLY as they were both found to individually meet all the BLY criteria as shown in **Table 1**. For the POR 2000-2021 the diversion demand for 2018 and 2020 rank 3rd and 2nd, respectively, highest for diversions out of the 22 years, or about the 90th and 95th percentile (based on a normal distribution) for the POR (**Figure 2**).

   In a hindcast analysis by IDWR staff, the higher rank in BLY SWC diversions appears to cause a huge shift in the type of water year (i.e. wet, average, dry, very dry) where Demand Shortfalls are calculated. The hindcast showed a Demand Shortfall much more frequently in average and even wet years in addition to every dry or very dry year. When you compare the distribution of SWC total diversion demands for the POR 2000-2015 compared to 2000-2021 in **Figures 1** and **2**, however, it is apparent that they are very similar with mean diversions of 3.16 maf and 3.2 maf, respectively. The standard deviation is also very similar for the POR 2000-2015 compared to 2000-2021 at 178,089 af and 178,587 af, respectively. The selection of the BLY is meant to be conservative as defined by the BLY criteria. The shift to SWC diversions of a much higher rank (compared to the previous BLY) like 2018 or 2020 translates to a much higher level of conservatism and is not technically justified given the similarity between mean diversions and the standard deviation for the 2000-2021 POR versus the 2000-2015 POR.

   The Methodology Order states that the BLY can be a year or an average of years that meet the BLY criteria (**Table 1**). IDWR staff considered rank within the POR when they recommend keeping the 2002 and 2004 average Heise natural flows as the Supply in the Reasonable Carryover calculation from the 4th Amended Methodology Order for the 2022 update[2]. The average of diversion demands for the 2006 and 2018 (06/18) irrigation seasons meet all the BLY criteria as shown in **Table 1** and is closer to the 55th percentile based on a normal distribution for diversions 2000-2021 similar to the rank of the BLY 06/08/12 (**Figures 1** and **2**) as applied in the 4th Amended Methodology Order. The BLY of 06/18 has a better technical basis than the proposed update to 2018 as the BLY.

Table 1. Baseline Year and Baseline Year Criteria

BLY Criteria	BLY Avg 06/18	BLY 2018	BLY 2020	Avg 2000-2021
Abv Avg SWC Diversions	3.22 maf	3.38 maf	3.53 maf	3.20 maf
Abv Avg GDD	2575 units	2550 units	2600 units	2495 units
Abv ET	1265 mm/d	1275 mm/d	1280 mm/d	1245 mm/d
Blw Avg Precipitation	3.9 in	2.6 in	2.7 in	4.5 in
Abv Avg SWC Supply	8.52 maf	9.00 maf	8.10 maf	7.70 maf

[2] Proposed Modification of the Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover: Reasonable Carryover (IDWR, presentation slide no. 4, December 9th, 2022)

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

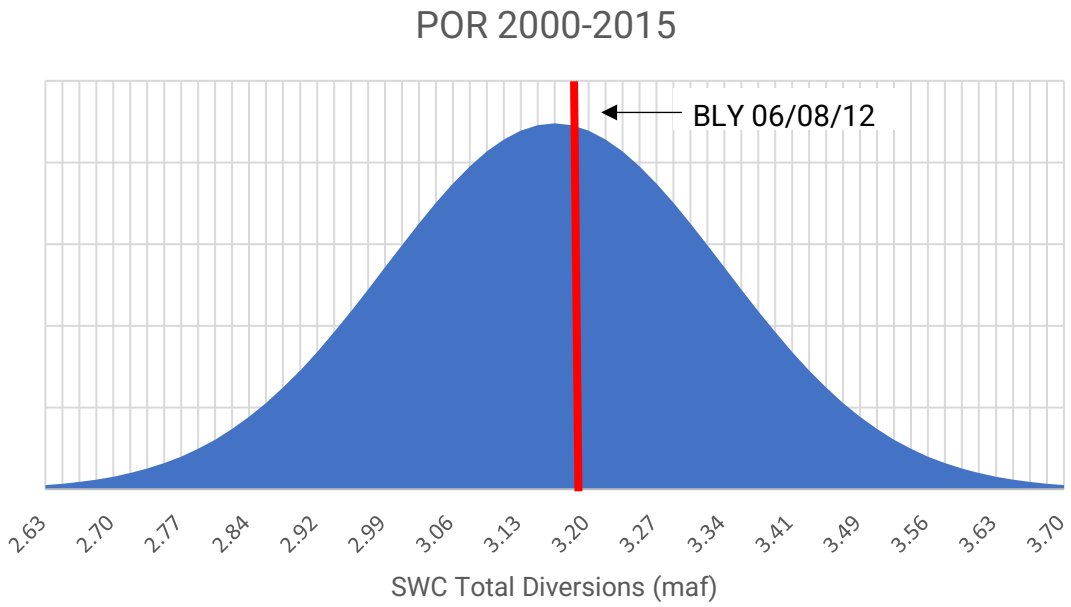


Figure 2. Normal distribution of SWC Total Diversion over the POR 2000-2015, the *red line* shows where the selected BLY 06/08/12 for the 4th Methodology Order falls within the normal distribution.

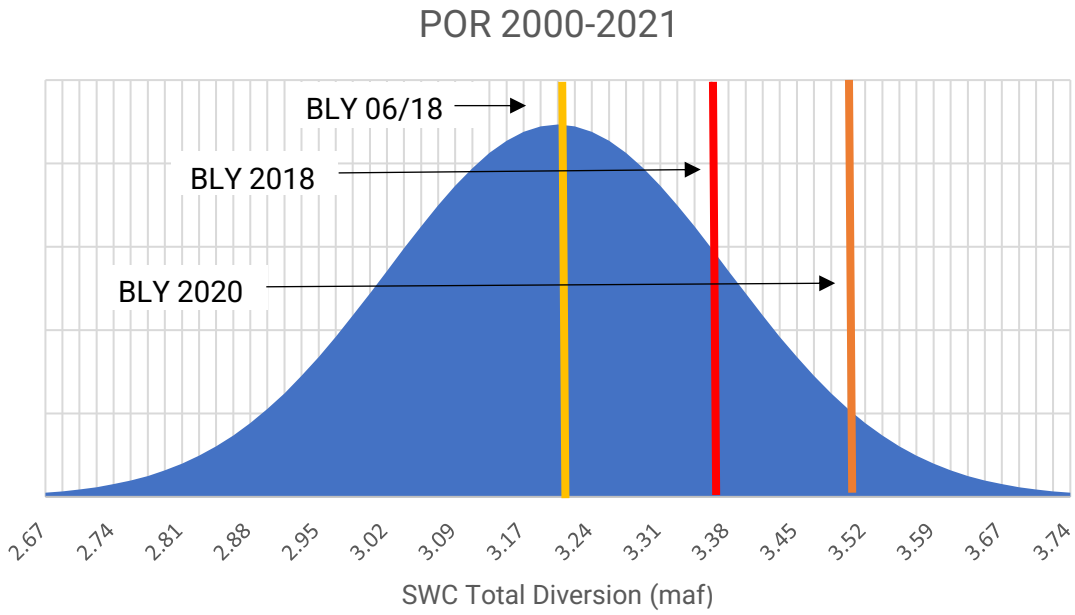


Figure 2. Normal distribution of SWC Total Diversion over the POR 2000-2021, the *yellow line*, *red line*, and *orange line* show where the proposed BLY 06/18, 2018 and 2020 falls within the normal distribution, respectively.

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

2. Another reason a better alternative would be to use diversion demands for the 06/18 irrigation seasons for the BLY is that there were unique hydrologic circumstances in 2018 that I don't believe represent the typical dry year. The 2017/2018 snowpack was very high and water year forecasts and early season streamflow led to positive water supply forecasts which resulted in a record amount of aquifer recharge in 2018. IDWR staff acknowledged the technical difficulties in sorting out surface water adjustments like recharge in applying the Methodology Order. The combination of large volumes of widely distributed canal recharge, often in relatively rarely used or new systems, may have exacerbated uncertainty in the adjustment. The positive water supply outlook may have also resulted in less stringent surface water administration and ultimately higher diversions than the crop water need alone would predict. Consequently, using gross diversions in 2018 as the BLY effectively overstates surface water irrigation demand. IDWR staff presentations and a review of Twin Falls Agrimet station data also showed the 2018 irrigation season is the only year in the 1992-2021 POR with a zero-precipitation total for July-September. The fact that almost any individual water year will have some unique circumstance is a good reason for continuing to define the BLY based on an average of years as the Methodology Order does currently.
3. An additional reason for using a specific percentile (or rank) within the POR when establishing a BLY, and for using an average of years, is that the process for selection of the BLY otherwise appears arbitrary and subjective. If IDWR staff are presented with multiple years within the POR that fit the criteria for a BLY, and there is no guidance or standard method for selecting a single BLY, the ultimate selection becomes purely subjective. Using an average of years that targets a prescribed rank is a more objective and technically defensible process.

Section 2: Forecasting Natural Flow Supply

IDWR staff did not make a recommendation on updating April and July regression models to improve their predictive power for natural flow supply. The staff did make presentations to the TWG on natural flow forecasting models that showed the Twin Fall Canal Company (TFCC) model is degrading in the R^2 value. This degradation is significant in that the R^2 values is an expression of the explanatory power of the forecast model. The TFCC natural flow forecast models also started with the lowest R^2 values based on the previously revised forecast. The technical information presented to the TWG indicated that a revised natural flow method for TFCC should be evaluated and a recommendation for an improved method should be made. However, given the extremely compressed timeframe for staff and TWG members to conduct a thorough evaluation I understand why a recommendation was not made at this point.

Lynker's technical memorandum included as addendum to IDWR staff recommendations in 2015[3] laid out an alternative forecast model approach that I continue to think should be further investigated. The approach is creating a regression relationship or alternative model that forecasts the physical natural flow supply with subsequent allocation of that physical supply among the rights of the SWC. The technical basis for this suggestion is that water rights administration creates a non-continuous and non-normally distributed dependent variable in the regression analysis. This is likely the reason it is difficult to find a high performing regression model for TFCC.

The process for natural flow forecast model revision should also be standardized in-terms of defining how frequently a thorough re-evaluation of the predictors and models is done (i.e. 3-yrs, 5-yrs, if R^2 value drops below a threshold). This should include re-evaluating previously tested predictors over the new POR, as well as, casting a new net of total predictors for consideration by the TWG. While the TFCC model stands out in needing a refinement all of the models could be improved if sufficient time for the analysis were allowed. Several of the models utilize a depth to groundwater measurement as a predictor from a specific Sentinel Well flagged by a separate TWG (IGWA-SWC)[4], as likely impacted by American Falls Reservoir level.

[3] Recommended Revisions to the Surface Water Coalition Methodology (DWR, March 16th, 2015)
[4] IGWA/SWC Steering Committee TM: 2021 Sentinel Well Recommendations (IGWA/SWC TWG, August 20th, 2021)

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

Section 3: Near-Real-Time METRIC for ET

The IDWR staff did not make a recommendation on utilizing near-real-time METRIC for determining Crop Water Need (CWN) in the RISD calculation. The application of METRIC in the determination of crop demands deals with a complex dataset that requires complex processing. Given the magnitude of the task to incorporate METRIC data I understand the staff not making a recommendation at this time. The IDWR staff should keep track of the calculation utilizing the METRIC data in parallel to the current CWN calculation method as way to continue to evaluate its use. The Department's Eastern Snake Plain Aquifer (ESPA) model already utilizes METRIC data for consumptive use calculations used for model input data. Given the complexity of the METRIC data I also recommend further investigation into the method behind the calibration and processing of the dataset to determine how and to what extent the METRIC data can be validated at the field-scale or if there are common misrepresentations that should be considered in the process of data quality assurance checks. This should be done in coordination with validation efforts by the Department on their ESPAM Metric calibration and processing.

The IDWR staff presentation regarding near-real-time METRIC application identified a significant shortcoming in the current method for calculating CWN as the fact that the most up-to-date crop data is from the previous year and that SWC irrigated acre datasets sometimes represent service areas, not the actual irrigated land[5]. Non-irrigated acres should not be considered in determining the irrigation supply necessary for SWC members[6]. The METRIC data could first be used to create a standard review process for the Methodology Order Step 1 submittal of irrigated acres by the SWC entities. IDWR staff should use a precise determination of irrigated acreage irrespective of whether it uses METRIC in the calculation of CWN. With IDWR staff only checking against the total acres for the decreed place of use, there is little to no incentive to keep the spatial data for the irrigated acres up to date. The METRIC data would be available for the current irrigation season and can be used to assess actual irrigated land. Some of the preliminary analysis by IDWR staff using METRIC data illustrated that through processing they were able to identify about 15,000 acres within the TFCC irrigated acres dataset that should not qualify as irrigated. The mischaracterized acres were all minor areal corrections but over a large service area such as TFCC added up to a significant amount of erroneous total acres. This just highlights the importance of spending the time to get an accurate picture of irrigated acres for an accurate RISD calculation. As previously noted in Lynker's 2015 comment letter the 5% change standard for SWC submittals should be reconsidered in light of large districts like TFCC where a 5% error in the irrigated acres can result in calculation of tens of thousands of acre-feet of erroneous mitigation obligation. Liz Cresto an IDWR staff member on the TWG in 2015 also made a similar recommendation in her comment letter attached to the staff memorandum.

Neither the 2015 nor the 2022 TWG has provided an opportunity to address concerns regarding supplemental groundwater use. This is a critical aspect of the RISD calculation and was one of the specific technical items cited for revision by the District Court. Analysis of supplemental groundwater use is likely critical to accurately applying METRIC in the RISD calculation.

Section 4: Project Efficiency

The IDWR staff recommended:

- Update the project efficiency value used to calculate monthly reasonable in-season demand from a rolling average of the previous eight years to a rolling average of the previous fifteen years.

[5] Proposed Modification to Method for Determining Reasonable In-Season Demand for the Surface Water Coalition: Use of the Near Real Time Metric (IDWR, presentation slide no. 8, November 17th 2022)
[6] Second Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover-pg 4

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

The technical basis for the IDWR staff recommendation was based on there being an extended POR available. TWG discussions and subsequent presentations identified other issues that should be considered in Methodology applications of project efficiency (PE) to RISD calculation.

1. There is higher uncertainty in the April and October project efficiency values. April and October represent months during the irrigation season when the method of calculating RISD strictly as a function CWN and PE is less reliable because CWN is often not the driving factor in diversions[7].
2. Project efficiency among SWC entities are almost all flat or declining (6 out of 7 entities), which is contrary to what would be expected with technology advancements and constrained water supplies[8].

Change in Project Efficiency (2001-2021) (percentage point change)	
A&B	-4.6%
AFRD2	-3.6%
BID	-1.0%
Milner	-12.6%
Minidoka	+12.2%
NSCC	-3.0%
TFCC	+1.8%

3. Scatter plots by SWC entity comparing Annual Crop Water Need to Annual Diversions show Crop Water Need is limited as a predictor given the low explanatory power indicated by the low R^2 values in the analysis[9].

Regarding the mid-season calculation of RISD, the sensitivity and appropriate use of CWN as a predictor for in-season demands for SWC entities should be evaluated. Technical analysis to the TWG showed that this is not a strong relationship[10]. This disconnect should be evaluated by the TWG so a recommendation can be made. The trends in declining PE are concerning in that they are contrary to our expectations given the direction technology advancements and constrained water supply. The declines in PE are significant in that any decline in PE will result in increased demands and subsequently increased calculated Demand Shortfalls. The IDWR staff presentation on PE illustrated how the very minor change in PE resulting from extending the POR for the average translated to tens of thousands of acre-feet differences in the Short Fall determination[11]. Sullivan (e-mail to TWG 12/21/2022) found that when analyzing monthly PE the low PE in some months cause monthly demands calculated based on CWN/PE to be very sensitive to changes in CWN. I agree with Sullivan's recommendation that given the outside influences and uncertainty in some of the monthly PE values IDWR staff should consider using a seasonal PE value in computing monthly diversion demands. I also agree with Sullivan's recommendation that consideration should be given to PE values that better reflect reasonable and efficient operations of SWC members. Given the observed declining trends in PE and the historically wide range in operational PE by entity it is hard to know when SWC supplies are short under reasonable and efficient operations. This is consistent with Lynker's 2015 recommendation for an investigation into trends among entities related to PE factors.

[7] Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover-pg 18
[8] Greg Sullivan e-mail, Updated Comparison of Adjusted Diversion and Crop Water Needs for SWC Members, to TWG December 21, 2022
[9] Analysis in Greg Sullivan datasheet "2022-12-21 SWC Diversions and CWN.xls"
[10] Analysis in Greg Sullivan datasheet "2022-12-21 SWC Diversions and CWN.xls"
[11] Proposed Modification of the Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover: Project Efficiency (IDWR, presentation slide no. 15, November 28th, 2022)

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

Given the compressed timeframe around the 2022 TWG meeting there was not sufficient time for the TWG members to analyze or address these outstanding issues. Additional time should be set aside for the TWG to conduct an analysis and make a recommendation.

Section 5: Steady State v. Transient

The Department staff did not make a recommendation on using transient model simulation for determining curtailment priority dates in the Methodology. The IDWR staff presented to the TWG the following:

1. Technically the steady state application is not consistent with the variable curtailment dates and mitigation volumes under the Methodology.
2. Transient analysis shows that in-season shortfalls can generally not be met at Time of Need by in-season curtailment.
3. There is a huge difference in resulting determination of the curtailment priority date if a steady state v. transient model is applied.
4. Under a transient model application any Demand Shortfall above ~100K af would result in aquifer wide curtailment

It is not clear what additional analysis the Department staff need to conduct to make a recommendation on steady state v. transient model application. What is clear is that this represents a huge uncertainty to the water users and how they make planning and management decisions moving forward.

Lynker
5445 Conestoga Court, Suite 100
Boulder, Colorado 80301

EXHIBIT E

WATER REPORT – May 16, 2023

Total system natural flow continues to be sufficient to fill irrigation rights currently diverting water that are senior to the American Falls Reservoir 1921 priority storage right while continuing to accrue new storage into the 1917-priority Henrys Lake and 1913-priority Jackson Lake storage rights. It appears the American Falls storage right will reach 100% accrual near the end of this week, at which time the 1935-priority Island Park, 1936-priority Grassy Lake, 1939-priority Palisades, and perhaps the 1969-priority Ririe Reservoir space will begin accruing additional storage under their priorities.

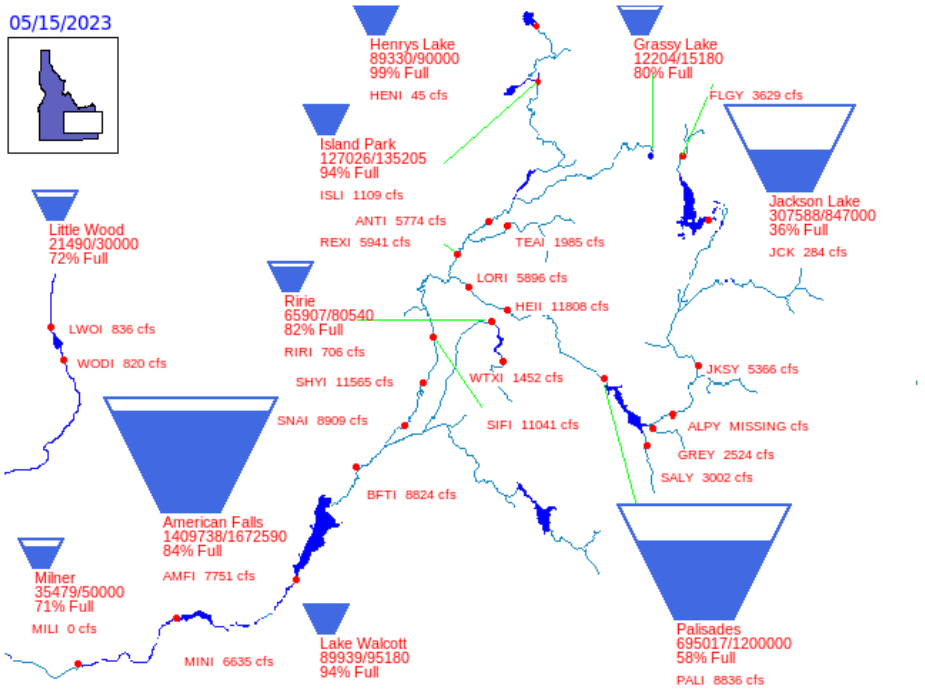
All system natural flow is expected to be delivered to senior canal rights or stored to reservoir storage rights without spilling past Milner for at least the next few weeks. Whether the natural flow will be sufficient to fill the entire reservoir system and spill excess water past Milner probably won't be known for certain until mid-June.

CALENDAR

May 17th – Henrys Fork Watershed Council Meeting beginning at 9 AM at Fremont County Annex Building in St. Anthony or via Zoom link https://us02web.zoom.us/j/88172196681.

May 18th – Jackson Lake Operations Public Information Meeting beginning 3pm at Teton County Library in Jackson, Wyoming.

Bureau of Reclamation, Pacific Northwest Region
Major Storage Reservoirs in the Upper Snake River Basin



PROVISIONAL DATA - Subject to change

Average daily streamflows indicated in cubic feet per second.
Reservoir levels current as of midnight on date indicated.
Click on gaging stations (red dots) for streamflow hydrographs.

Upper Snake River system is at 67 % of capacity.

(Jackson Lake,Palisades, Grassy Lake,Island Park,Ririe,American Falls,LakeWalcott)

Total space available:	1338037 AF
Total storage capacity:	4045695 AF