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RECEIVED

Dec 19, 2023

**DEPARTMENT OF
WATER RESOURCES**

Attorneys for Bonneville-Jefferson Ground Water District

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

IN THE MATTER OF BONNEVILLE-
JEFFERSON GROUND WATER DISTRICT'S
CONSERVATION MITIGATION PLAN FOR
THE SURFACE WATER COALITION

Docket No. CM-MP-2023-002

~~Docket No. CM-DC-2010-001~~

IN THE MATTER OF THE DISTRIBUTION
OF WATER TO VARIOUS WATER RIGHTS
HELD BY AND 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

**PETITION FOR APPROVAL OF
BONNEVILLE-JEFFERSON
GROUND WATER DISTRICT'S
CONSERVATION MITIGATION
PLAN FOR THE SURFACE WATER
COALITION**

COMES NOW the Bonneville-Jefferson Ground Water District (hereafter the "BJGWD")
through counsel and on behalf of its members and hereby submits its *2023 Mitigation Plan for the
Surface Water Coalition Delivery Call* (hereafter "Mitigation Plan") pursuant to the Rules for
Conjunctive Management of Surface and Ground Water, IDAPA 37.03.11.043.

I.
PRELIMINARY STATEMENT

This Mitigation Plan is intended to secure advance approval of the mitigation methods and practices that junior groundwater users within BJGWD can rely upon and implement to avoid curtailment during irrigation seasons. The BJGWD intends for this Mitigation Plan to mitigate material injury Twin Falls Canal Company, North Side Canal Company, A&B Irrigation District, American Falls Reservoir District #2, Burley Irrigation District, Milner Irrigation District, and Minidoka Irrigation District, which are commonly known and hereafter referred to collectively as the Surface Water Coalition (hereafter “SWC”) may experience during irrigation seasons, while providing flexibility for the BJGWD to implement long-term conservation practices that are responsive to conditions arising from Idaho’s wet and dry weather cycles that significantly impact the Eastern Snake Plain Aquifer (hereafter (“ESPA”).

This Mitigation Plan is being provided while ongoing litigation is being addressed between the SWC and the Idaho Ground Water Appropriators, Inc. (hereafter “IGWA”), over the interpretation of material terms of *IGWA’s Stipulated Mitigation Plan* in Dkt. No CM-MP-2016-001 (hereafter “2015 Settlement Agreement”).¹ Dkt. No. CM-MP-2016-001 provides a detailed account of this dispute, but relevantly, the SWC filed a *Notice of Steering Committee Impasse/Request for Status Conference with the Director* on July 26, 2022. In that document, SWC challenged IGWA’s use of a 5-year rolling average used by IGWA members to measure compliance with 2015 Settlement Agreement and IGWA’s historic practice of accounting for diversions by A&B Irrigation District and Southwest Irrigation District in calculating each district’s proportionate share of the 240,000 acre-feet reduction obligation. The interpretation and

¹ BJGWD is an individual signatory to this agreement.

application of these terms drastically impacts the BJGWD's irrigation and mitigation activities each year.

Former Director of IDWR, Gary Spackman, interpreted the IGWA's obligations in the 2015 Settlement Agreement differently than how the BJGWD and other IGWA members understood these obligations. The Director's interpretation of the 2015 Settlement Agreement in the *Compliance Order* created significant issues with how IGWA members determine their individual mitigation obligations. IGWA addressed these issues in its *2022 Performance Report*, filed on April 1, 2023. This report identifies these issues as follows:

The Director's final decision will in any case require a new method of measuring compliance. If the decision requires the IGWA districts alone to conserve 240,000 acre-feet, then each district's proportionate share of 240,000 acre-feet will need to be redetermined. The districts will not simply scale up their current obligations. Reallocation will require consideration of modeled impacts and other factors. When the Agreement was first entered into it took the districts more than a year to agree upon an equitable apportionment of the 240,000 acre-feet obligation. Reapportionment will likewise be a considerable undertaking.

See 2022 Performance Report.

In addition to creating uncertainty as to what BJGWD's individual mitigation obligation is, the pending litigation involving the interpretation of the 2015 Settlement Agreement has raised questions as to whether the BJGWD was in breach during the 2021 or 2022 irrigation seasons. For example, if a five-year rolling average is used to measure compliance with a 205,000 af reduction obligation, BJGWD was not in breach during the 2021 and, perhaps, the 2022 irrigation season.

The BJGWD is also actively participating in the formation of a Ground Water Management Plan with IDWR, SWC, and other water users for the Eastern Snake Plain Aquifer Ground Water Management Area (hereafter "GWMP"). It is anticipated that the GWMP will require additional conservation activities from the BJGWD and other water users on the ESPA, but what those activities will need to be remains uncertain. Until the GWMP is developed and implemented, water

users on the ESPA, including BJGWD, are uncertain what management activities will be required of them.

The foregoing issues notwithstanding, BJGWD intends to mitigate for potential shortfalls SWC may experience in 2024 under this Interim Plan. Therefore, this Mitigation Plan is submitted in good faith for the purpose of mitigating material injury SWC may experience in 2024, creating certainty as to BJGWD's mitigation obligations, and protecting BJGWD from devastating curtailment of irrigated acres during the 2024 irrigation season and beyond.

II. PRELIMINARY INFORMATION

A. The name and mailing address of the party filing this proposed Mitigation Plan.

Bonneville-Jefferson Ground Water District
P.O. BOX 51121
Idaho Falls, ID 83405

Counsel of Record:
OLSEN TAGGART PLLC
Skyler C. Johns
P.O. BOX 3005
Idaho Falls, ID 83404

B. Water Rights Benefitted. This Mitigation Plan is designed to benefit the surface water rights held by or on behalf of SWC. BJGWD's proposed mitigation activities are designed to benefit any senior surface water rights diverting from the Snake River or its tributaries and administered by the Watermaster of Water District 01 that the Director has found or may find to be materially injured by the use junior groundwater rights.

C. Summary of Activities. This Mitigation Plan is designed to provide replacement water at the time and place required by injured SWC members and to offset depletive effects of ground water withdrawal on surface and ground water on the ESPA by allowing BJGWD to utilize

surface water sources in Water District 01 for direct delivery of storage water and/or managed aquifer recharge and reduce its consumptive use of ground water supplies through pumping reductions and/or reduction in irrigated acres.

III. MITIGATION ACTIVITIES

A. Purpose. The primary purposes of this Mitigation Plan are to protect the interests of the SWC and to minimize the local economic impact within BJGWD’s boundaries from reduction or curtailment of water rights. A secondary purpose is to provide accruals to the aquifer as a whole. A third purpose for the Mitigation Plan during Ground Water Management Plan Development (5-year Plan) is to establish a framework for BJGWD members to voluntarily exchange mitigation efforts within the BJGWD, as approved by BJGWD.

B. Time Frame of Mitigation Plan. The 5-year Plan will operate from 2024 through 2028 or until the adoption by IDWR of a GWMP, whichever is first.

C. Elements of Mitigation Plan

1. Conceptual Basis

- a. The remedy defined by the *Sixth Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover* (hereafter “Methodology Order”) is incapable of providing adequate relief to the SWC. This is because hindcast calculations by IDWR presented in their “Summary of Hindcast SWC Delivery Call Demand Shortfall Calculations 2000-2022” table (IDWR, 2022) indicate that in some years the need to SWC may be as high as 250,000 acre feet, yet analysis presented by IDWR in the 2022 SWC Methodology Technical Working Group shows that a full curtailment of all groundwater rights junior to 1900 would yield, at most,

approximately 97,700 acre feet (Sukow, 2022), leaving SWC approximately 150,000 acre feet deficient. This is because the hydrologic connection is remote, the resource is large, and no direct immediate relief would be achieved if the junior water use were discontinued.

- b.** The burden imposed on communities dependent on groundwater irrigation by the remedy defined by the Methodology Order is fiscally incongruent with provisions of Idaho law that “[T]he policy of securing the maximum use and benefit... of Idaho’s water resources, has long been the policy in Idaho.” *Clear Springs Foods, Inc. v. Spackman*, 150 Idaho 790, 808, 252 P.3d 71,89 (2011).
- c.** Both deficiencies identified in subsection a and b above arise primarily from a temporal mismatch between a short-term calculation of need, largely driven by precipitation and surface-water processes independent of the Eastern Snake River Plain Aquifer, and a longer-term physical process of propagation of hydraulic effects of curtailment or reduction of groundwater pumping through the aquifer.
- d.** This temporal mismatch is not required by Idaho law; rather, Rule 20-04 of the Conjunctive Management Rules, Idaho Administrative Code Chapter 37.02.11, states that, “etc ...these rules may require mitigation or staged phased curtailment of a junior priority use.”
- e.** Both deficiencies identified in subsection a and b above can be addressed by a mitigation plan that provides an adaptively managed, uniform, year-by-year combination of reductions and enhancements. This is a mechanism that honors

both the Idaho law cited above and the physical realities of both the aquifer system and the surface-water supply to the SWC.

- f.** It is to the advantage of the SWC to have temporally smoothed reductions within the BJGWD rather than highly variable reduction volumes from year-to-year dependent on whether curtailment is indicated by the Methodology. Preliminary Eastern Snake Plain Aquifer Model (hereafter “ESPAM”) modeling by Rocky Mountain Environmental Associates (hereafter “RMEA”) of the 23-year IDWR hindcast indicates that on average, temporally smoothed reductions would have produced greater accrual to SWC in years of need than strict priority curtailment within the BJGWD would have provided. This is primarily because the bulk of accruals from curtailment within the BJGWD arrive in future years when the need is unknown; by the time need is known, it is too late to obtain relief through curtailment.
- g.** Effects of reductions and aquifer enhancement within the BJGWD that accrue to the SWC are describe here as Primary Benefits.
- h.** The aquifer as a whole, and other spring and river reaches hydraulically connected to it, receive the accrual of any effects of curtailment that do not propagate to SWC. These accruals are described here as Secondary Benefits.
- i.** Due solely to the physical configuration of the aquifer and the geographic location of the BJGWD, any efforts with the BJGWD and this Mitigation Plan in specific provide more accrual to the aquifer as a whole than to the SWC, or in other words, the Mitigation Plan provides more Secondary Benefits than Primary Benefits.

2. Quantification of Obligation

- a.** The part of the SWC shortfall attributable to conditions in the aquifer can be directly related to the aquifer water budget.
- b.** The ESPAM2.2 water budget indicates that aquifer-wide, outflows exceed inflows by an average of approximately 300,000-acre feet per year.
- c.** For purposes of this Mitigation Plan, the total Obligation for all pumpers of groundwater tributary to the ESPA is 300,000-acre feet per year.
- d.** The BJGWD Obligation is the part of the Total Obligation to be assigned to the BJGWD. Additional detail is provided later in the Mitigation Plan.

3. Deriving the BJGWD Obligation from the Total Obligation

- a.** The Total Obligation is derived from hydrologic effects that propagate to the Reach from the Eastern Snake Plain Aquifer and all areas tributary to it.
 - i.** SWC is entitled to relief from all pumping that affects its senior interests.
 - ii.** It would be unjust to assign that relief to only some of the pumpers who affect the Reach.
 - iii.** Partition or assignment of the Total Obligation should consider all pumping whose effects originate in or propagate to the ESPA.
- b.** WMIS data cannot be used to partition the Total Obligation because these data are not available for all areas that affect the Reach.
- c.** Water-right data can be used to partition the Total Obligation proportionally.

of groundwater fractions from analog areas within the model boundary. This is because the mixed-source lands outside the model boundary represent only a fraction of total effect to the aquifer.

- e. With these considerations, the BJGWD Fraction is calculated as follows:
 - i. For all areas within or tributary to the Eastern Snake Plain Aquifer, calculate [(Groundwater Irrigated Acres) x (Standard Acre Ft/Acre) x (Percentage of Supply from Groundwater)]. This becomes the “Base Number.”
 - ii. Perform the same calculation for areas within the BJGWD. This becomes the “BJGWD Number.”
 - iii. The BJGWD Fraction is (BJGWD Number) / (Base Number).
- f. The BJGWD Obligation is (Total Obligation) x (BJGWD Fraction).

4. Quantification of Required Accrual to SWC

- a. Under a paradigm that SWC is entitled to long-term protection of its senior water rights, and that steady efforts over time provide greater benefit to SWC than on-and-off efforts which cannot target an unknown future year of need, the Required Accrual to SWC resulting from the BJGWD Obligation will be assessed by applying the BJGWD Obligation to a steady-state rendition of the ESPAM2.2 aquifer model, spatially-distributed proportionally to the water-right places of use for groundwater irrigation rights within the BJGWD. For purposes of this spatial distribution, acreage for groundwater-only lands will be weighted by a factor of 1.0 and acreage for lands with supplemental rights will be weighted by a factor of 0.5.

b. The result of the modeling described above will be the quantity of accrual that the SWC would receive every year, had the BJGWD Obligation been provided annually for enough years in the past that the transient time series of accruals had equilibrated. This is the “Required Accrual” to SWC and will be used to judge adequacy of effects as discussed later under accounting.

5. **BJGWD Activities to Meet the BJGWD Obligation.** Four BJGWD activities can provide accruals to the relevant Reach. These are ranked as follows:

a. **Recharge.** Recharge under this plan refers to intentional processes that measure and convey surface water to underground storage in the ESPA. Because recharge can be targeted to specifically accrue to the SWC, and because it does not reduce economic contribution of the BJGWD to the region, Recharge is the preferred activity. Under the Mitigation Plan, the BJGWD may assign its Recharge to any location within the ESPA, in order to balance accruals to the SWC and accruals to the aquifer in general, and to balance current-year accruals with future accruals.

b. **Pumping Reductions.** Pumping Reductions refer to any reduction in ground water pumping from the BJGWD’s established Baseline Value. **The method by which the Baseline Value will be calculated is attached as Exhibit A to this Petition.** Pumping Reductions contribute future accrual to the SWC, and it also contributes to Secondary Benefits. Therefore, Pumping Reductions are preferred to of Wet Water Deliver. *See below.* Pumping Reduction are less preferred than Recharge because Pumping Reductions reduce the economic contribution of the BJGWD to the region.

- c. **Fallowing Acres.** Fallowing Acres refers to the intentional withholding of ground water from a defined section of land that is otherwise authorized to divert ground water under a valid water right. As with Recharge, Fallowing Acres contributes accrual to the SWC, and it also contributes to Secondary Benefits. Therefore, Fallowing Acres is preferred to Wet Water Delivery. However, Fallowing Acres does more to reduce the economic contribution of the BJGWD to the region than Pumping Reductions. Thus, Pumping Reductions are preferred to Fallowing Acres.
- d. **Delivery of Storage Water (i.e., “Wet Water Delivery”).** Wet Water Delivery refers to the direct delivery of storage water to the SWC that is acquired from surface water sources. Wet Water Delivery is the least-preferred alternative because it provides no residual benefit, because it provides no Secondary Benefits, and because it is least likely to be available when it most is needed.
- e. These priorities are guiding principles for BJGWD consideration but are not binding. Allocation of efforts will be the sole decision of BJGWD.

6. Quantification of Efforts

- a. Quantification of effort is separate from the partition of effects to primary and secondary effects, which is addressed later.
- b. **Recharge.** In each year of the Mitigation Plan, contribution to the aquifer of the BJGWD Recharge will be calculated using the same methods that Idaho Water Resource Board uses in that year to calculate volumes of Recharge conducted under its program.

- c. **Reductions.** Pumping Reduction will be quantified as the difference between a Baseline Value and the WMIS pumping data for the year of Reduction. Until the working group for the Ground Water Management Plan devises an alternate Baseline calculation, the Baseline for calculating Reductions under the Plan will 2.3-acre feet per acre per year, as explained in an attached technical memorandum.
- d. **Fallowing Acres.** In each year of the Mitigation Plan, contribution to the aquifer from Fallowing Acres will be calculated using the Baseline Value multiplied by the number of Fallowing Acres.
- e. **Wet Water Delivery.** Wet Water Delivery will be quantified by Water District 01 delivery records.

7. Partition of Effects

- a. The general principal is that efforts will be partitioned into three general fractions:
 - i. Effects that accrue to SWC in the year of effort;
 - ii. Effects that accrue to SWC in future years;
 - iii. Effects that accrue to non-SWC reaches.
- b. The transient version of ESPAM that is current at the time of the effort will be used to perform the partition for the following efforts:
 - i. Recharge;
 - ii. Pumping Reductions;
 - iii. Fallowing.
- c. Effects of Wet-Water Delivery will be accounted 100% to SWC in the year of

effort; no effects of Wet Water Delivery will be credited for future years or to non-SWC reaches.

- d. For consistency with the assumption of continuous past performance implicit in the calculation of Required Accrual to SWC, BJGWD efforts from 2016 through 2023 will be partitioned per the above methods, for each year using the ESPAM version that was current in the year of efforts. (See section 4(b)). These results will *not* be used in place of ongoing processes to determine whether prior efforts were adequate and what remedies are required; these simply are to recognize any future benefits that yet will accrue to SWC, in a logical parallel to the fact that the calculated Required Accrual to SWC assumes that relief had been continuous over past years.

8. Accounting

- a. Primary Accounting will be performed using a spreadsheet that is conceptually illustrated in Table 1. The columns of Table 1 are defined as follows:
 - i. **Year.** Calendar year. Because summertime accruals directly benefit diversion and wintertime accruals directly affect reservoir storage, annual accounting is adequate.
 - ii. **Required Accrual to SWC.** This is the accrual that SWC would have received if the BJGWD Obligation had been met every year far enough into the past that equilibrium was achieved and would receive if provision of the BJGWD Obligation continued into each future year of the accounting.

- iii. Accruals from Efforts.** In each year, Accruals from Efforts is the sum of:
1. Current-year accruals from current-year Recharge, Pumping Reduction or Fallowing Acres;
 2. All accruals from past Recharge, Pumping Reduction or Fallowing Acres that are modeled to accrue in the current year;
 3. All Wet-Water delivery in the current year.
- iv. Yearly Balance of Accrual.** Yearly Balance of Accrual is (Required Accrual to SWC) minus (Accruals from Efforts). A negative number means that efforts have been insufficient, and a positive number means that efforts have exceeded requirements.
- v. Yearly Contribution to Secondary Effects.** This is the part of the current-year efforts indicated by ESPAM modeling to accrue to non-SWC reaches. It is not temporally partitioned in the Primary Accounting Spreadsheet.

Table 1. Conceptual Illustration of Accounting of Primary Benefits

1. Year	2. Required Accrual to SWC	3. Accruals from Efforts	4. Yearly Balance of Accrual	5. Yearly Contribution to Secondary Effects
2024	(calculated number of acre feet, constant year to year)	(2024 accruals from 2016 effort) plus (2024 accruals from 2017 effort) etc plus (2024 accruals from 2024 effort)	(Column 2) minus (Column 4); calculated only after current-year values are known	(2024 effort) minus (Current and future accruals from 2024 effort to SWC)
2025	"	(2025 accruals	"	(2025 effort)

1. Year	2. Required Accrual to SWC	3. Accruals from Efforts	4. Yearly Balance of Accrual	5. Yearly Contribution to Secondary Effects
		from 2016 effort) plus (2025 accruals from 2017 effort) etc plus (2025 accruals from 2025 effort)		minus (Current and future accruals from 2025 effort to SWC)
2026	"	(2026 accruals from 2016 effort) plus (2026 accruals from 2017 effort) etc plus (2026 accruals from 2026 effort)	"	(2026 effort) minus (Current and future accruals from 2026 effort to SWC)
2027	"	(2027 accruals from 2016 effort) plus (2027 accruals from 2017 effort) etc plus (2027 accruals from 2027 effort)	"	(2027 effort) minus (Current and future accruals from 2027 effort to SWC)
2028	"	(2028 accruals from 2016 effort) plus (2028 accruals from 2017 effort) etc plus (2028 accruals from 2028 effort)	"	(2028 effort) minus (Current and future accruals from 2028 effort to SWC)

b. Secondary Accounting. Column 5 in Table 1 records the secondary benefits that are created, but it does not provide enough information to apply secondary benefits to needs or obligations that may arise in non-SWC reaches. Secondary

accounting will include annual tabulation of the volume, timing and location of all BJGWD efforts. This will allow future quantification of accruals to any other need, purpose or obligation that may be contemplated outside of this Mitigation Plan.

i. Conceptual Basis.

1. Nothing that affects the aquifer is permanent; all cones of depression from pumping eventually equilibrate by reducing flows to springs and gaining reaches and by inducing additional seepage from losing reaches. All mounds from incidental or managed Recharge eventually equilibrate by increasing flows to springs and gaining reaches and by reducing seepage from losing reaches. All Reductions in pumping (including from fallowing) reduce the magnitude of cones of depression and reduce the propagation of their effects to springs and hydraulically connected river reaches.
2. For purposes of this Mitigation Plan, Secondary Benefits are of two classes:
 - a. Effects that eventually will accrue to other springs and reaches, but are latent in the ESPA;
 - b. Effects that have or currently are causing increased spring discharges, increased river gains, and/or reduced river losses outside the Reach.
3. For the purposes of this Mitigation Plan, quantification and ranking of the two classes is not necessary. Likewise, it is not necessary to

determine timing and location of secondary accruals. The specified Secondary Accounting will allow further partition and discretization, should the need arise.

- ii. Obligation.** There is no obligation under this plan to provide Secondary Benefits. The purpose of quantification and accounting is to document the contribution that it does make.

9. Reporting

- a.** Each year, by May 1, BJGWD will provide to IDWR the following:
 - i.** The current year Required Accrual to SWC;
 - ii.** Certification of commitments by BJGWD Patrons for Reductions or Fallowing;
 - iii.** Certification of commitments for water supply, conveyance and use of facilities for Recharge;
 - iv.** Certification of commitments for Wet Water for delivery.
 - v.** Preliminary calculation of Yearly Balance of Accrual.
- b.** Each year, by December 21, BJGWD will provide to IDWR the following:
 - i.** The current year Required Accrual to SWC;
 - ii.** Record of actual Reductions or Fallowing;
 - iii.** Record of actual Recharge;
 - iv.** Record of actual Wet Water Delivery;
 - v.** Updated accounting, including updates to future accruals from current-year efforts, along with the current-year ESPAM modeling performed to quantify accruals and partition of effects.

10. Safe Harbor

- a. As long as the springtime preliminary calculation of Yearly Balance of Accrual (9)(a)(v) is a positive number, BJGWD members in good standing will not be subject to curtailment to satisfy the SWC call.
- b. If the condition of (10)(a) is not met, the Mitigation Plan does not provide the BJGWD members with safe harbor from curtailment under the SWC call.
- c. If the Mitigation Plan does not provide BJGWD members with safe harbor, the Mitigation Plan does not specify the curtailment that IDWR may consider or implement.
- d. The Mitigation Plan does not provide for any other remedy than (10)(c) above.
- e. If the curtailment remedy must be exercised, this will be considered part of the operation of the plan and will not constitute breach.
- f. The BJGWD may report to IDWR the names and WMIS numbers of members not in good standing; that is, not complying with BJGWD allocation of efforts and/or costs.
- g. The Mitigation Plan does not provide safe harbor for non-compliant members, but neither does it specify curtailment of non-compliant members; this determination is left to IDWR.

11. Remedy for Failure to Perform. If the December calculation of Yearly Balance of Accrual III(C)(9)(b)(v) is a negative number, a one-time increase in the following year's Required Accrual to SWC of 150% of the shortfall will be calculated, as a penalty for non-performance.

12. Adaptive Management. This plan may be extended indefinitely upon agreement

between IDWR and BJGWD, with the adaptive provision that the calculation of Required Accrual to SWC be adjusted per the then-current ESPAM water budget shortfall. This calculation will be performed at the time of extension, and the timing of future adaptive-management updates will be specified at the time of each extension.

13. Internal BJGWD Allocation and Exchange. This Mitigation Plan authorizes but does not require BJGWD to allow its members to voluntarily exchange locations of Recharge or Fallowing, to participate in providing facilities, water or funding for Recharge, or to participate in providing funding or water for Wet-Water delivery, in exchange for adjustments to members' individual obligations to participate in BJGWD Reductions and/or assessments. The details of any such exchanges, allowances or adjustments are internal to BJGWD and the plan specifies neither methods, metrics, nor reporting requirements for such arrangements. Nevertheless, all Recharge, Reduction, Fallowing and Delivery of Wet Water will be accounted and accrued based on the actual volumes, times and locations of occurrence, as provided in this Mitigation Plan.

IV. ADDITIONAL INFORMATION

This Mitigation Plan incorporates by reference any relevant factual positions asserted by IGWA in Dkt. Nos. CM-DC-2010-001, CM-MP-2016-001, CM-MP-2009-007, to the extent these factual positions have not materially changed.

V. RELIEF REQUESTED

Based on the foregoing, BJGWD and its users hereby request that:

1. IDWR advertise this Mitigation Plan as required under the CM Rules;

2. IDWR hold any hearing as may be required;
3. The Director enter an order approving this Mitigation Plan upon such terms and conditions as may be reasonable and necessary to comply with CM Rule 43
4. For such other and further relief as the Director may determine is reasonable and necessary to enable the Ground Water Users to mitigate for any material injury to senior surface water rights in Water District 01 to avoid or reduce curtailment.

Submitted this 19th day of December 2023.

DATED: December 19, 2023

OLSEN TAGGART PLLC

/s/ Skyler C. Johns

SKYLER C. JOHNS

CERTIFICATE OF SERVICE

I hereby certify that on this 18th day of December 2023, I served the foregoing document on the persons below via email as indicated:

/s/ Michelle J. Castro
Michelle J. Castro

Director Gary Spackman Garrick Baxter Sarah Tschohl Idaho Department of Water Resources 322 E Front St. Boise, ID 83720-0098	mathew.weaver@idwr.idaho.gov garrick.baxter@idwr.idaho.gov sarah.tschohl@idwr.idaho.gov file@idwr.idaho.gov
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COURTESY COPY TO:
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MEMORANDUM

To: Bonneville Jefferson Ground Water District
From: Thane Kindred
Reviewed by: Bryce Contor
RMEA Project: 22-0216
Date: December 14, 2023

Re: Calculation and defense of Baseline allocation for Bonneville Jefferson Ground Water District

This memorandum comes in response to your request regarding calculation of a Baseline allocation (Baseline) as part of Bonneville Jefferson Groundwater District's (BJGWD's) mitigation plan. Rocky Mountain Environmental Associates, Inc. (RMEA) recommends a Baseline of **2.30 acre-feet per acre**. This Baseline was calculated using a three (3)-step process:

1. Calculate the median crop mix in BJGWD from 2010-2014;
2. Calculate the district Crop Irrigation Requirement (CIR) for BJGWD given its median crop mix and the per-crop CIR;
3. Calculate a final baseline using CIR (from step 2) and irrigation efficiency;

The remainder of this memorandum provides a more detailed explanation of the methods used to calculate the Baseline, a discussion of the limitations of this analysis, and brief comparison between RMEA's recommended Baseline and a Baseline calculated using the Water Measurement Information System (WMIS) data.

1. The crop mix for each of the years between 2010 and 2014 was calculated using the 2015 Irrigated Lands dataset, made available by Idaho Department of Water Resources (IDWR), and the United States Department of Agriculture (USDA) CropScape data for 2010 to 2014. Descriptions of these datasets are as follows:
 - The 2015 Irrigated Lands dataset contains a number of GIS "polygons," each representing an irrigated filed. For this analysis, no distinction was made between groundwater irrigated and surface water irrigated lands; the assumption being that crop mix would be consistent across BJGWD regardless of the source of irrigation.

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- The CropScape data consists of a series of maps, one for each year, that identify plant type across the contiguous United States. The maps are generated by training computer software to recognize crops from areal imagery.

Once the two (2) datasets were obtained, RMEA determined the dominate crop type and calculated the acreage of each irrigated field. The acres of fields with similar crop types where then summed to determine the acres per crop for each year. Because the acres per crop changed from year to year, RMEA calculated the median number of acres for each crop across the five (5)-year period (2010-2014). Because the median number of acres was not the same year for each crop type, the sum of median acres did not add up to the total number of irrigated acres. This resulted in a value of zero (0) acres for several crop types that were only grown in one (1) or two (2) of the five (5) years. This does not distort the results because these data are used only to calculate a representative depth of consumptive use; the acres from this step are not used to calculate a baseline volume. The yearly acres and the five (5)-year median of each crop type are shown in Table 1 attached to this memorandum.

Of the 179,432 acres identified by IDWR as irrigated within BJGWD in 2015, 2,513 were classified by CropScape as non-irrigated. Because of the discrepancy between the two (2) datasets, these acres were not included the representative crop mix. Crop types with a median acreage greater than zero (0) were classified into one of eight (8) categories based on data available from the Kettle Butte AgriMet weather station (see step 2 below) and plotted in Figure 1.

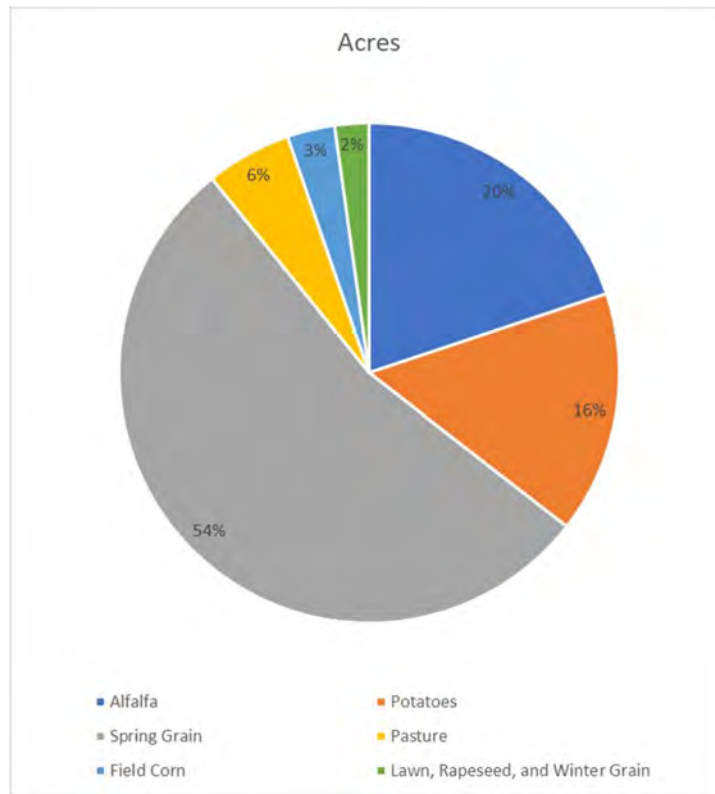


Figure 1: BJGWD crop mix groups representative of the years 2010-2014.

- RMEA calculated CIR for each individual crop type by subtracting precipitation during the growing season from yearly evapotranspiration (ET) by crop type, both available from the Kettle Butte AgriMet Weather Station located in the center of BJGWD, for each year that data was available between 1988 and 2015. The differences were then averaged to obtain a reasonable estimate of CIR. The crop's total CIR within BJGWD was then calculated using the following equation:

$$\text{Equation 1: } \text{Crop Total CIR in BJGWD} = \text{Crop Acres} \times \text{Crop CIR}$$

A representative-district-wide CIR was then calculated by taking the total BJGWD CIR (i.e., sum of all crop type CIRs) and dividing it by the sum of median acres per crop type. The results of this analysis are shown in Table 2 below:

Table 2: Acres, CIR, and total CIR volume per crop type.

Crop	Acres	Crop CIR (af/acre)	Total CIR Volume (af)
Alfalfa	34,762	2.82	98,116
Pasture	9,675	2.22	21,503
Lawn	6	2.76	17
Winter Grain	2,479	1.85	4,578
Spring Grain	93,868	1.83	172,013
Potatoes	27,360	2.00	54,766
Field Corn	5,385	1.62	8,715
Rapeseed	1,385	1.43	1,984
Total	174,920	2.07	361,690

The final step in obtaining a weighted-average, district-wide CIR depth was to divide the total CIR volume by the total acres used in analysis; (361,690 acre feet / 174,920 acres) = 2.07 feet.

- To convert the representative-district-wide CIR to a pumping rate, RMEA divided BJGWD's CIR depth by estimated irrigation efficiency. Table 3 presents the pumping rate and pumping volume for 100, 95, 90, 85, and 80 percent efficiency. Due to the high depth to water in many of their wells, BJGWD has developed a highly efficient system, however no system is perfectly (i.e. 100 percent) efficient. Thus, RMEA deems an efficiency of 90 percent to reasonably represent BJGWD's system for the purposes of these calculations.

Table 3: Pumping rate and volume based on assumed efficiency of BJGWD

Efficiency	100%	95%	90%	85%	80%
Pumping Rate (af/acre)	2.07	2.18	2.30	2.44	2.59

This analysis relies heavily on IDWR's Irrigated Lands dataset, CropScape plant cover maps, and the Kettle Butte AgriMet Weather Station. These data sources are considered to be among the best available science and are thus useful in developing a mitigation plan. However, these data sources are not without limitations, and those limitations will have been propagated into this analysis. This analysis is also subject to any imprecision that may have resulted from the assumption in Step 1 that crop mix would be independent of water source.

The Baseline recommended by RMEA in this memorandum differs from the one used by BJGWD in the years since 2015, which was calculated using WMIS data from 2010-2014. The WIMS data suggested a baseline of 1.64 acre-feet per acre. At the same assumed 90 percent efficiency, this implies CIR of 1.48 acre-feet per acre, which is inconsistent with the requirements derived from the Kettle Butte AgriMet Station data. Looking at the implications of the WMIS-suggested Baseline a different way, for BJGWD to have sustained the crop mix indicated by the data, BJGWD would need to have had an efficiency of 113 percent. As an efficiency over 100 percent is not possible, RMEA concludes that a Baseline of 2.30 acre-feet per acre better represents real-world pumping by BJGWD from 2010-2015.

RMEA appreciates the opportunity to perform this work. Feel free to contact us if there are any questions or if you would like to discuss the results further. We look forward to working more with you in the future.

Sincerely,



Thane R. Kindred
Staff Geologist

Reviewed by



Bryce A. Contor
Principal Hydrologist

Attachments:

Table 1:

Table 1: Yearly and Median Crop Mix for BJGWD between 2010 and 2014.

Plant Cover Type	Corn	Sorghum	Barley	Durum Wheat	Spring Wheat	Winter Wheat
Category	Field Corn	Median of Zero	Spring Grain	Median of Zero	Spring Grain	Winter Grain
2010 Acres	5,390	0	51,486	307	47,878	1,369
2011 Acres	3,235	287	53,468	0	52,107	2,728
2012 Acres	4,715	0	76,662	0	20,211	2,479
2013 Acres	5,385	0	72,378	0	21,435	4,929
2014 Acres	5,805	0	75,706	0	16,708	2,231
Median	5,385	0	72,378	0	21,435	2,479

Plant Cover Type	Oats	Canola	Safflower	Alfalfa	Other Hay/Non Alfalfa	Sugarbeets
Category	Spring Grain	Rapeseed	Median of Zero	Alfalfa	Pasture	Median of Zero
2010 Acres	25	2,120	13	34,762	189	0
2011 Acres	131	1,385	2	24,205	2,197	1
2012 Acres	1	1,045	0	29,417	2,004	0
2013 Acres	55	2,749	0	35,768	3,155	0
2014 Acres	120	2	0	39,992	2,746	0
Median	55	1,385	0	34,762	2,197	0

Plant Cover Type	Potatoes	Peas	Sod/Grass Seed	Grass/Pasture	Missclassified as Non-Irrigated	
Category	Potatoes	Median of Zero	Lawn	Pasture	None	Total
2010 Acres	26,079	126	1	7,478	2,210	179,432
2011 Acres	27,152	0	20	9,793	2,722	179,432
2012 Acres	32,169	0	0	8,216	2,513	179,432
2013 Acres	27,360	0	91	1,304	4,823	179,432
2014 Acres	31,658	7	6	1,954	2,496	179,432
Median	27,360	0	6	7,478	2,513	177,432