BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

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	***THIRD AMENDED* FINAL ORDER REGARDING METHODOLOGY FOR DETERMINING MATERIAL INJURY TO REASONABLE IN-SEASON DEMAND AND REASONABLE CARRYOVER**

BACKGROUND

On June 23, 2010, the Director ("Director") of the Idaho Department of Water Resources ("Department") issued his *Second Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand and Reasonable Carryover* ("Methodology Order"). The Methodology Order explained how the Director would determine material injury to storage and natural flow water rights of members of the Surface Water Coalition ("SWC").[1] The SWC, the Idaho Ground Water Appropriators, Inc. ("IGWA"), and the City of Pocatello filed petitions seeking judicial review of the Methodology Order and its subsequent application. The petitions were consolidated with Gooding County Case No. CV-2010-382.[2]

On September 26, 2014, District Court Judge Eric Wildman issued his *Memorandum Decision and Order on Petitions for Judicial Review* ("Methodology Remand Order") in Gooding County Consolidated Case No. CV-2010-382. The Court "affirmed in part and set aside in part" the Methodology Order. *Methodology Remand Order* at 48. The Court remanded the Methodology Order to the Director for further proceedings as necessary. *Id.* The Court identified six general topics on remand. Each of the six topics are margin headings in the following text and are discussed below.

[1] The SWC is comprised of A&B District, American Falls Reservoir District #2, Burley Irrigation District, Milner Irrigation District, Minidoka Irrigation District, North Side Canal Company, and Twin Falls Canal Company. Each entity holds separate senior surface natural flow water rights and have separate storage contracts for storage water space in the reservoirs.

[2] The following cases were consolidated with Gooding County Case No. CV-2010-382: Gooding County Cases CV-2010-383, CV-2010-384, CV-2010-387, CV-2010-388, Twin Falls County Cases CV-2010-3403, CV-2010-5520, CV-2010-5946, CV-2012-2096, CV-2013-2305, CV-2013-4417, and Lincoln County Case CV-2013-155.

Remedy for Material Injury to SWC Irrigation Season Natural Flow and Storage Water Rights

The Court held the Methodology Order failed to "provide a proper remedy for material injury to reasonable in-season demand when taking into account changing conditions." *Methodology Remand Order* at 10. If material injury to the SWC's irrigation season water rights is greater than originally determined by the Director in April, the injury must be remedied through either curtailment or mitigation at the time of the additional determination of injury. *Id.*

The Court went on to say that when taking into account changing conditions the Director must "apply his established procedure as written or further define and/or refine the procedure so that [SWC] members relying on the procedure know when to anticipate its application and are able to plan accordingly." *Id.* at 40.

The Court held the Director may require use of reasonable carryover pursuant to a properly enacted mitigation plan that contains appropriate contingency provisions to protect senior rights." *Id.* at 16. In conjunction with a mitigation plan, the Director can require the SWC "rely on its reasonable carryover provided that: 1) existing carryover storage allocations meet or exceed the additional shortfall to the revised reasonable in-season demand; and 2) junior users secure a commitment at that time for a volume of water equal to the shortfall to the revised reasonable in-season demand to be provided the following season if necessary." *Id.*

Supplemental Ground Water Adjustment

The Court affirmed that supplemental ground water is a factor the Director has the authority to consider in the context of a delivery call. *Id.* at 18. However, administration "to less than the full amount of acres set forth on the face of the [SWC's] Partial Decrees. . . must be supported by clear and convincing evidence." *Id.* at 19. The Director's "assignment of an entity wide split for each member of the [SWC] of the ground water fraction to the surface water fraction is not supported by substantial evidence in the record." *Id.*

Predictors for Twin Falls Canal Company

The Court held the Joint Forecast prediction does not accurately predict water supply for the Twin Falls Canal Company ("TFCC"), and remanded the issue back to the Department for further proceedings as necessary. *Id.* at 20.

Crop Distribution Data

The Court affirmed the Director's use of the U.S. Department of Agriculture's 1990-2008 National Agricultural Statistics Service ("NASS") data for determining crop distributions but also encouraged the Director to "take into account available data reflecting current cropping patterns." *Id.* at 21.

ESPA Model Boundary

The Court concluded "the *Methodology Order* wrongly uses the ESPA Model boundary, instead of the boundary of the area of common water supply, to determine a curtailment priority date." *Id.* at 24.

Mitigation for Reasonable Carryover Shortfall

Step 10 of the Methodology Order offered an alternative to providing the full volume of reasonable carryover shortfall established in Step 9. Under Step 10, junior ground water users could request that the Department model the transient impacts of the proposed curtailment. Junior water right holders could alternatively mitigate modeled transient depletions over a period of years. The Court remanded Step 10 to the Department, concluding that when the Director determines a shortfall to reasonable carryover and a corresponding mitigation obligation, the alternative of mitigating for transient future simulated reach gains resulting from modeled curtailment needs to be further justified. *Id.* at 28. The Court questioned the "viability of phased curtailment as a justification" for Step 10. *Id.*

SUMMARY

The purpose of this Third Amended Final Order is to establish the Director's methodology for determining material injury to storage and natural flow water rights either held by or committed to members of the SWC consistent with the Court's holding in the Methodology Remand Order.

FINDINGS OF FACT

I. Overview of the Methodology for Determining Material Injury to Water Rights by Determining Reasonable In-Season Demand and Reasonable Carryover

1. The methodology for determining material injury to water rights by determining reasonable in-season demand ("RISD") and reasonable carryover should be based on updated data, the best available science, analytical methods, and the Director's professional judgment as manager of the state's water resources. In the future, climate may vary and conditions may change; therefore, the methodology may need to be adjusted to consider a different baseline year or baseline years.

2. In-season demand shortfall will be computed by subtracting RISD from the forecast supply ("FS"). In-season demand shortfall is computed using the following equation:

- In-Season Demand Shortfall = FS – RISD

3. If the FS is greater than the RISD, there is no demand shortfall. If the FS is less that the RISD, the negative difference is the demand shortfall. Initially, RISD will be equal to the historic demands associated with a baseline year or years ("BLY") as selected by the

Director, but will be corrected during the season to account for variations in climate and water supply between the BLY and actual conditions.

4. Reasonable carryover shortfall will be computed by subtracting reasonable carryover from actual carryover, where reasonable carryover is defined as the difference between a baseline year demand and projected typical dry year supply. Reasonable carryover shortfall will be computed using the following equation:

- Reasonable Carryover Shortfall = Actual Carryover – Reasonable Carryover

5. If actual carryover exceeds the reasonable carryover, there is no reasonable carryover shortfall. In contrast, if reasonable carryover exceeds the actual carryover, the negative difference is the reasonable carryover shortfall.

6. The concepts underlying the selection of the BLY, determination of in-season demand shortfall, and reasonable carryover shortfall will be discussed in detail below.

II. In-Season Demand Shortfall

A. Considerations for the Selection of a Baseline Year

7. A BLY is a year or average of years when irrigation demand represents conditions that can be used to predict need in the current year of irrigation at the start of the irrigation season. The purpose in predicting need is to project an upper limit of material injury at the start of the season.

8. A BLY is selected by analyzing three factors: (1) climate; (2) available water supply; and (3) irrigation practices. R. Vol. 37 at 7098.[3] To capture current irrigation practices, identification of a BLY is limited to years subsequent to 1999. *Id.* at 7096.

9. The historic diversion volumes from the BLY, along with the predicted supply forecast at the start of the irrigation season, are used to predict the initial in-season demand shortfall, where demand shortfall is the difference between the BLY demand ("BD") and the FS. Demand shortfall increases in magnitude as the difference between BD and FS increases. Demand shortfall increases with increases in BD, decreases in FS, or both. Assuming constant irrigation practices, crop distributions, and total irrigated acres, demand for irrigation water typically increases in years of higher temperature, higher evapotranspiration ("ET"), and lower precipitation. If water demand data is averaged for several years and these averages are the basis to predict demand shortfall at the start of the season, in a high water demand year, these averages may often under-predict the demand shortfall. In a high water demand year, under-prediction of demand shortfall might be acceptable if the junior priority ground water right holders and the senior priority surface water right holders shared equally in the risk of water shortages. Equality

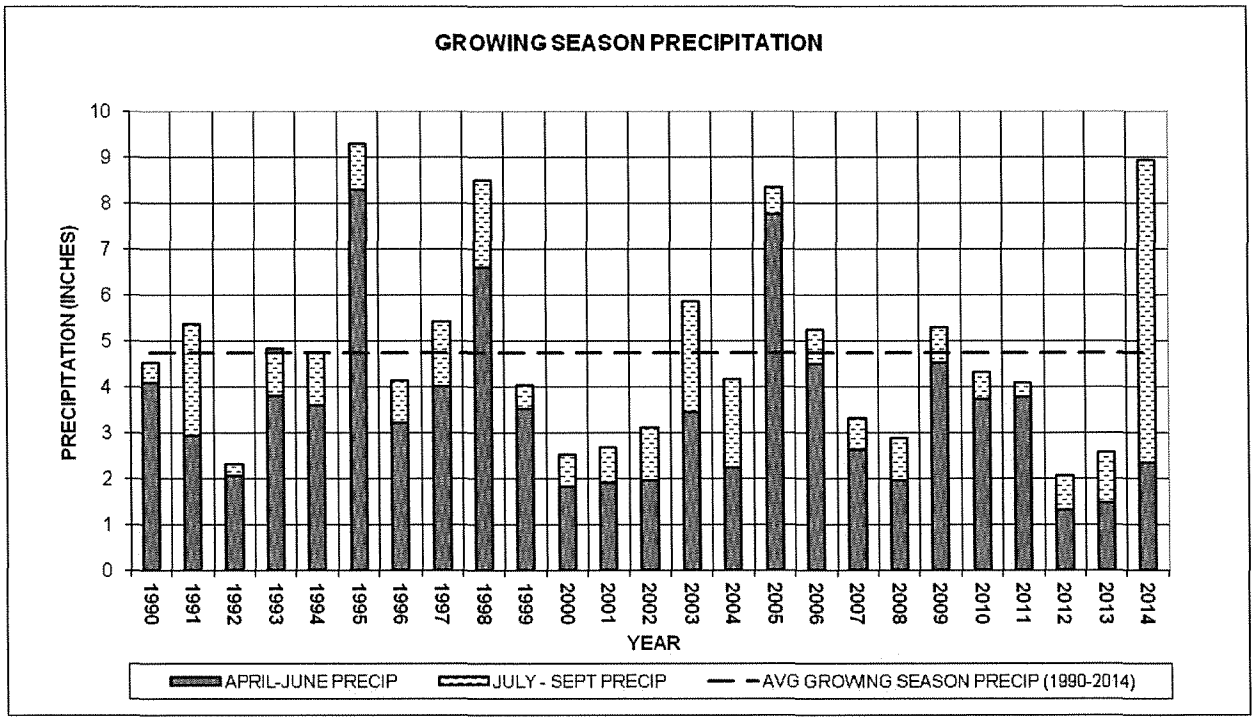
[3] All citations in this Order are to material that was admitted during the original hearing and is part of the final agency record on appeal in Gooding County Case No. CV-2008-551, which was lodged with the Fifth Judicial District Court on February 6, 2009.

in sharing the risk will not adequately protect the senior priority surface water right holder from injury. Actual demand shortfalls to a senior surface water right holder resulting from predictions at the start of the irrigation season based on average data unreasonably shifts the risk of shortage to the senior surface water right holder. Therefore, a BLY should represent a year(s) of above average diversions, and should avoid years of below average diversions. An above average diversion year(s) selected as the BLY should also represent a year(s) of above average temperatures and ET, and below average precipitation to ensure that increased diversions were a function of crop water need and not other factors. In addition, actual supply (Heise natural flow and storage) should be analyzed to assure that the BLY is not a year of limited supply.

i. Climate

10. For the methods outlined herein, climate is represented by precipitation, ET, and growing degree days.

11. Precipitation. Water, in all phases, introduced to Idaho from the atmosphere is termed precipitation. During the growing season, precipitation has a substantial influence on crop water need, both as a source of water to growing crops and as an influencing factor on ET. Ex. 3024 at 19. The figure below shows the precipitation recorded during the growing season at the National Weather Service's Twin Falls weather station.



Growing Season Precipitation at National Weather Service's Twin Falls Weather Station 1990–

2014.[4]

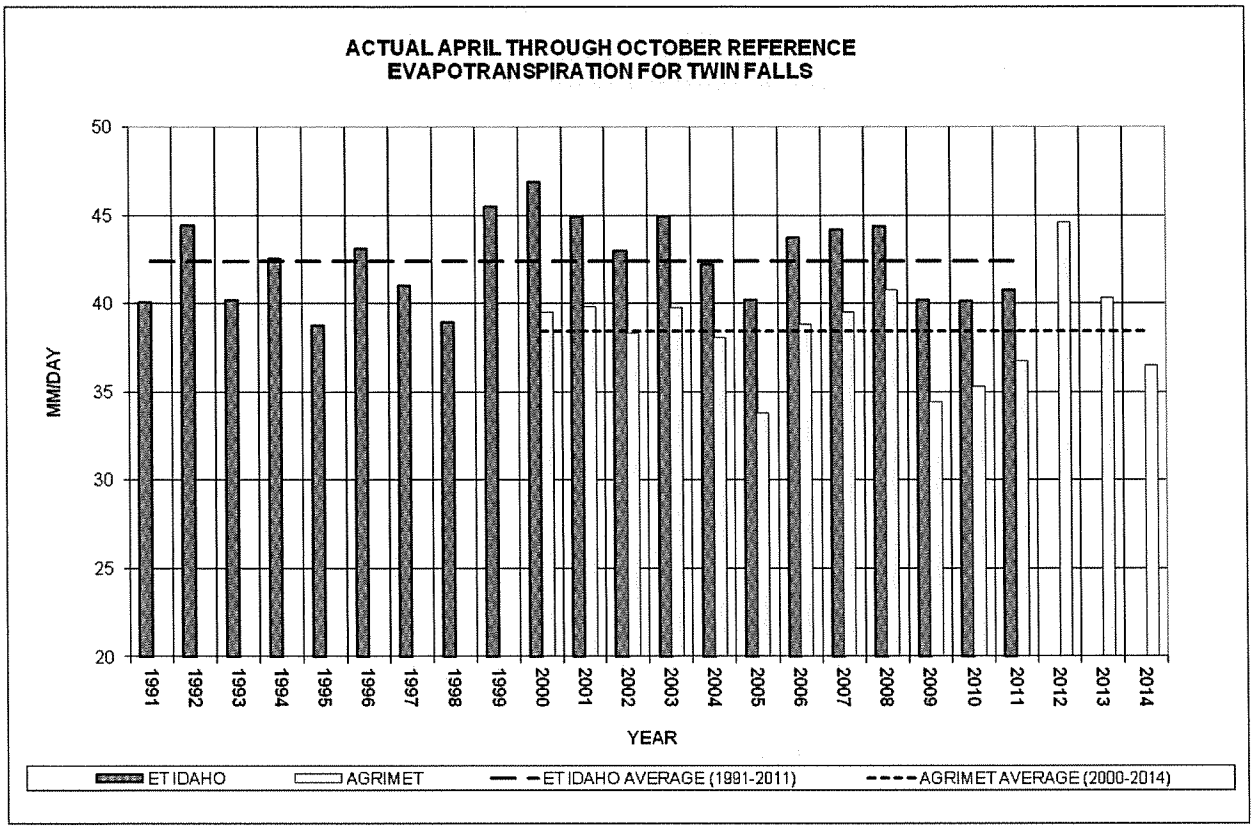
12. Evapotranspiration. ET is a combined variable representing the amount of water that transpires from vegetation and evaporates from the underlying soil. ET is an important factor for properly estimating RISD. In its water budget calculations, the SWC proposed the use of ET values from the USBR as part of their Pacific Northwest Cooperative Agricultural Network, i.e. AgriMet. Ex. 8000, Vol. II, Chap. 9; Ex. 8000, Vol. IV, Appdx. AU. The ground water users proposed the use of ET values from Richard G. Allen and Clarence W. Robison 2007, Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho, i.e. ETIdaho. Ex. 3007A at 21; Ex. 3024 at 1-58.

13. Reference ET is a standardized index that approximates the climatic demand for water vapor (i.e. ET) and is used here to identify potential BLY. Because there is not a single Reference ET data set that spans the entire period of analysis (1990-2014), two separate Reference ET data sets are considered. ETIdaho Reference ET data are currently available from 1990 through 2011. AgriMet Reference ET data are available from 2000 to 2014. Ideal candidate BLY are years in which Reference ET exceeds average Reference ET values. The individual year is compared using both AgriMet and ETIdaho Reference ET data for those years in which both data are available and only AgriMet data in those years where there is no ETIdaho data.

14. Years of above average values of Reference ET are appropriate BLY candidates.[5] Total April through October Reference ET for the period of record from the Twin Falls (Kimberly) AgriMet site is shown below.

[4] Chart created from raw NOAA National Weather Service total precipitation data obtained from the NCDC's Climatological Data Annual Summary Idaho report series for the Twin Falls 6 E and Twin Falls Sun Valley Regional Airport weather stations.

[5] Values for Reference ET between ETIdaho and AgriMet do not match because they are derived differently. The relevant information for identifying a potential BLY is the relationship between the year under consideration and the average for the data sets.



Actual Reference ET for Twin Falls (Kimberly) with both AgriMet and ETIdaho data. 1991-2014.

15. Growing Degree Days. Growing degree days define the length and type of growing season. Growing degree days are an arithmetic accumulation of daily mean temperature above a certain base temperature. Ex. 3024 at 10; 117-21. These growth units are a simple method of relating plant growth and development to air temperatures. Different plant species have different base temperatures below which they do not grow. At temperatures above this base, the amount of plant growth is approximately proportional to the amount of heat or temperature accumulated. A higher annual growing degree day value correlates to a higher potential rate of plant growth. The table below shows growing degree days accumulated for April through September for the Twin Falls (Kimberly) AgriMet site.

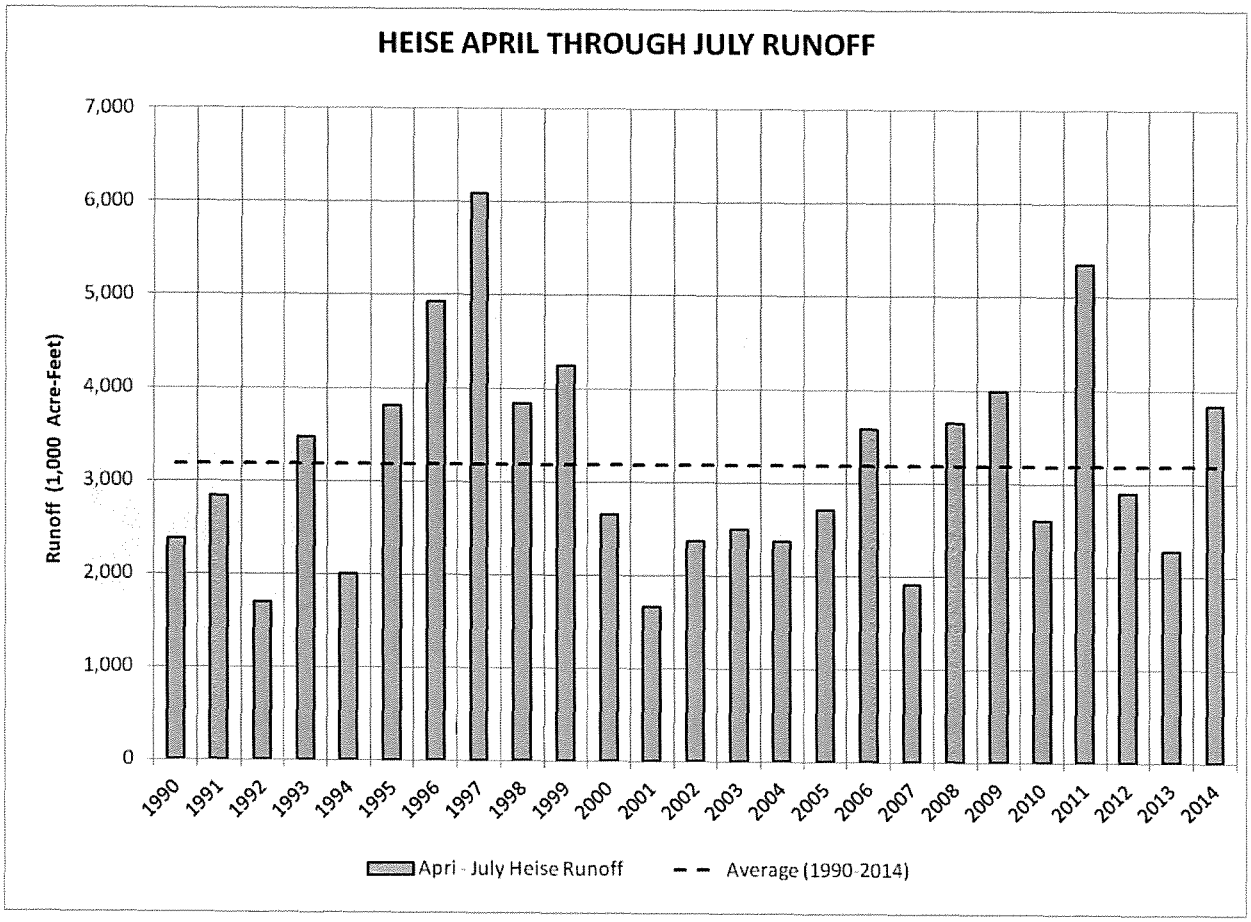
Year	GDD: April-Sept	% of Average	Year	GDD: April-Sept	% of Average
1991	2,095.4	86%	2003	2,585.4	106%
1992	2,610.7	107%	2004	2,428.9	99%
1993	2,004.7	82%	2005	2,320.1	95%
1994	2,516.8	103%	2006	2,601.9	106%
1995	2,257.8	92%	2007	2,657.7	109%
1996	2,418.6	99%	2008	2,382.9	97%
1997	2,478.4	101%	2009	2,469.7	101%
1998	2,422.2	99%	2010	2,215.0	91%
1999	2,294.9	94%	2011	2,314.6	95%
2000	2,591.3	106%	2012	2,735.3	112%
2001	2,600.8	106%	2013	2,672.8	109%
2002	2,465.6	101%	2014	2,553.0	104%

Average GDD (1991-2014): 2,445.6

Growing Degree Days ("GDD") for Twin Falls (Kimberly) AgriMet Site 1991-2014.

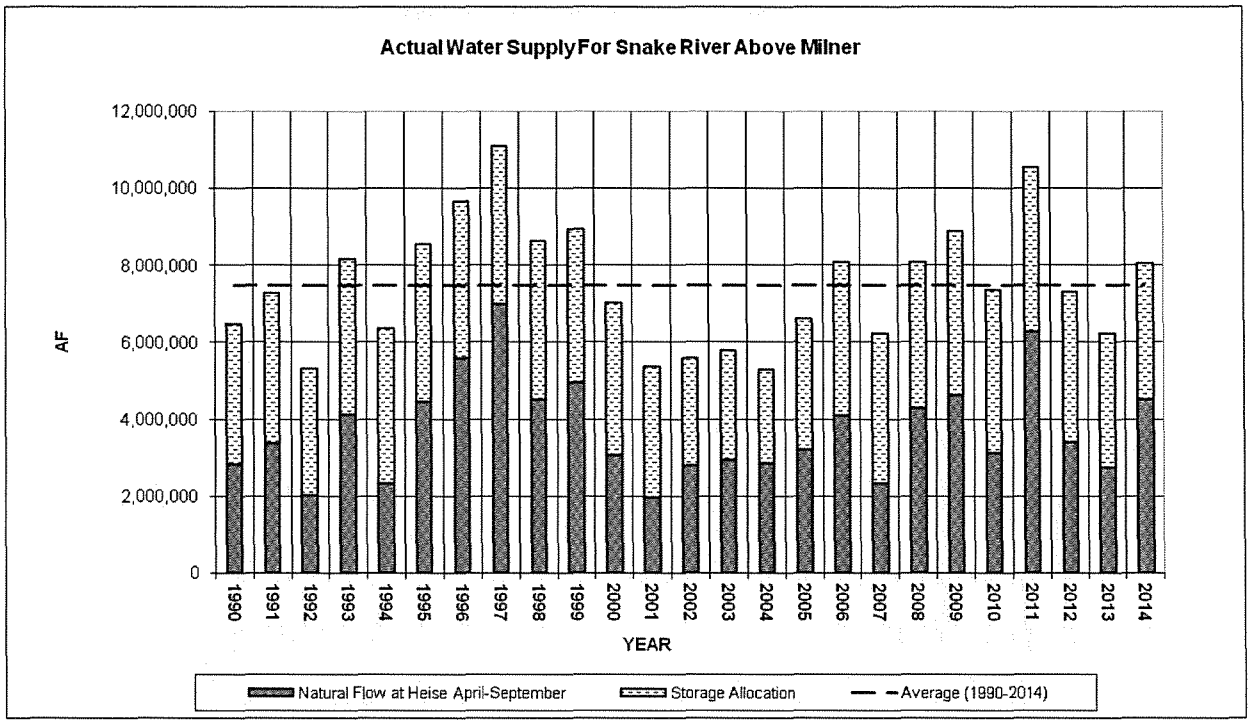
ii. Available Water Supply

16. The April through July Heise runoff volume represents the volume of water available for diversion into storage reservoirs and also serves as an indicator of natural flow supplies. The graph below shows actual unregulated flow volumes at Heise for 1990 through 2014. The 1990 to 2014 average (3,186,000 acre-feet) is indicated by the dashed line.



April through July Unregulated Flow Volume at Heise, 1990-2014.

17. The total actual supply of the Snake River is represented in the graph below as the sum of the Heise natural flow and reservoir storage allocations for years 1990-2014.



Actual water supply for the Snake River above Milner 1990-2014.

iii. Irrigation Practices

18. A BLY must be recent enough to represent current irrigation practices. R. Vol. 37 at 7099-7100. Conditions that should be consistent are: (a) the net area of the irrigated crops, (b) farm application methods (flood/furrow or sprinkler irrigation), and (c) the conveyance system from the river to the farm. The type of sprinkler systems should be similar between the BLY and the current year.

19. Sprinkler systems are currently the predominant application system. *Id.* at 7101-02. To ensure that current irrigation practices are captured, selection of a BLY for the SWC should be limited to years subsequent to 1999. *Id.* at 7096; 7099-7100.

20. Estimates of irrigated acres from the hearing show a trend of decreasing irrigated acreage. R. Vol. 28, 5205-15; R. Vol. 37 at 7100. According to the Hearing Officer, beneficial use cannot occur on acres that have been hardened or are otherwise not irrigated. R. Vol. 37 at 7100.

21. There are lands within the service areas of SWC entities that are irrigated with supplemental groundwater. Exhibit 3007. Supplemental groundwater is a factor the Director can consider in the context of a delivery call. *Methodology Remand Order* at 18-19.

B. Selection of the Initial Baseline Year

22. The selection of a single BLY for all entities is challenging, with individual years meeting some of the BLY requirements but not all. By selecting a BLY that is comprised of the average of multiple years, a BLY can be selected that better represents the required conditions for each and all entities. The years 2000-2014 were considered for the BLY selection.

23. When selecting the BLY the Director must evaluate the most recent data to determine whether the standards of selection of a BLY are satisfied.

24. In the Methodology Order the Director used an average of 2006 and 2008 (06/08) for the BLY. The 06/08 BLY no longer meets the BLY selection criteria. In particular, when compared to the average of the annual diversions from 2000-2014, the 06/08 diversions are no longer above average.

25. The Director reviewed the years since the issuance of the Methodology Order and finds that 2012 meets the selection criteria for a BLY. However, 2012 had the lowest growing season precipitation, highest ET, and most growing degree days during the BLY selection period (1991-2014). Because 2012 represents the maximum values for these criteria during the period of analysis, 2012 is not an appropriate single-year BLY candidate.

26. Individually no one year during the period of analysis met all the BLY requirements; 2006 had below average diversions, 2008 had below average growing degree days, and 2012 had record high ET, record high growing degree days, and record low precipitation. The Director finds that using the values from 2006, 2008, and 2012 (06/08/12) for an average BLY fits the selection criteria for the SWC. When compared to the period 1991-2014, the 06/08/12 average has below average growing season precipitation, above average ET, above average growing degree days, and represents years in which diversions were not limited by availability of water supply. The 06/08/12 average diversions are greater than the average of the combined annual diversions from 2000-2014.

	2000-2014 Avg. Diversions	06/08/12 Avg. Total Diversions	06/08/12 % of Avg.
A&B	57,906	59,993	104%
AFRD2	420,863	427,672	102%
BID	242,646	251,531	104%
Milner	50,430	47,135	94%
Minidoka	354,277	369,492	104%
NSCC	982,567	978,888	100%
TFCC	1,045,120	1,060,011	101%
			Average 101%

Average SWC Diversions for 2000-2014 and 2006/2008/2012 BLY.

27. The average total actual supply of the Snake River for the 06/08/12 BLY is 7,823,757 AF. The 1990-2014 average total actual supply of the Snake River is 7,478,899 AF as

depicted in Finding of Fact 17. Because the 06/08/12 BLY total actual supply exceeds the 1990-2014 total actual supply average, the BLY is not a year in which diversions were limited by water supply.

C. Calculation of Reasonable In-Season Demand

28. RISD is the projected annual diversion volume for each SWC entity during the year of evaluation that is attributable to the beneficial use of growing crops within the service area of the entity. Given that climate and system operations for the year being evaluated will likely be different from the BLY, the BLY must be adjusted for those differences. As stated by the Hearing Officer, "The concept of a baseline is that it is adjustable as weather conditions or practices change, and that those adjustments will occur in an orderly, understood protocol." R. Vol. 37 at 7098.

i. Project Efficiency

29. Project efficiency ("E_p") is the ratio of total volumetric crop water need within a project's boundary and the total volume of water diverted by that project to satisfy crop needs. It is the same concept as system efficiency, which was presented at hearing. Ex. 3007 at 28-29. Implicit in this relationship are the components of seepage loss (conveyance loss), on-farm application losses (deep percolation, field runoff), and system operational losses (return flows). By utilizing project efficiency and its input parameters of crop water need and total diversions, the influence of the unknown components can be captured and described without quantifying each of the components.

30. Project efficiency is calculated as set forth below:

$$E_p = \frac{CWN}{Q_D}$$

Where:

E_p = project efficiency,
CWN = crop water need, and
Q_D = irrigation entity diversion of water specifically put to beneficial use for the growing of crops within the irrigation entity.

31. Monthly irrigation entity diversions ("Q_D") will be obtained from Water District 01's diversion records. Ex. 8000, Vol. II, at 8-4, 8-5. Raw monthly diversion values will then be adjusted to remove any water diversions that can be identified to not directly support the beneficial use of crop development within the irrigation entity. Examples of adjustments include the removal of diversions associated with in-season recharge and diversion of irrigation water on the behalf of another irrigation entity. Adjustments, as they become known to the Department, will be applied during the mid-season updates and in the reasonable carryover shortfall calculation. Examples of adjustments that can only be accounted for later in the season include SWC water placed in the rental pool and SWC private leases. Adjustments are unique to each irrigation season and will be evaluated each year. Any natural flow or storage water deliveries to

entities other than the SWC for purposes unrelated to the original right will be adjusted so that the water is not included as a part of the SWC water supply or carryover volume. Water that is purchased or leased by a SWC member may become part of IGWA's shortfall obligation; to the extent that member has been found to have been materially injured. *See e.g.* R. Vol. 38 at 7201, fn. 11 (Eighth Supplemental Order). Conversely, adjustments will be made to assure that water supplied to private leases or to the rental pool will not increase the shortfall obligation.

32. Monthly project efficiencies will be computed for the entire irrigation season. Project efficiency varies from month-to-month during the season, and will typically be lower during the beginning and ending of the season. Monthly project efficiencies will be divided into actual monthly crop water need ("CWN") values to determine RISD during the year of evaluation. The tables below present average project efficiencies for each SWC member (2007-2014), with project efficiencies during that time span greater or less than two standard deviations excluded from the calculation. By including only those values within two standard deviations, extreme values from the data set are removed.

Month	A&B	AFRD2	BID	Milner	Minidoka	NSCC	TFCC	Monthly Avg.
4	1.67	0.39	0.43	0.77	0.47	0.16	0.30	0.60
5	0.61	0.29	0.28	0.41	0.37	0.29	0.31	0.37
6	0.73	0.43	0.44	0.63	0.54	0.47	0.51	0.54
7	0.68	0.45	0.56	0.74	0.61	0.50	0.58	0.59
8	0.50	0.39	0.60	0.66	0.53	0.32	0.44	0.49
9	0.41	0.26	0.48	0.56	0.44	0.21	0.26	0.38
10	0.14	0.26	0.14	0.15	0.14	0.05	0.04	0.13
Season Avg.	0.68	0.35	0.42	0.56	0.44	0.29	0.35	0.44

SWC Member Average Monthly Project Efficiencies from 2007-2014.

ii. Crop Water Need

33. CWN is the project wide volume of irrigation water required for crop growth, such that crop development is not limited by water availability, for all crops supplied with surface water by the surface water provider. Crop water need is the difference between the fully realizable consumptive use associated with crop development, or ET, and effective precipitation (W_e) and is synonymous with the terms irrigation water requirement and precipitation deficit. Ex. 3024. For the purposes of the methodology, CWN is calculated as set forth below:

$$CWN = \sum_{i=1}^{n} (ET_i - W_e) A_i$$

Where,

CWN = crop water need
ET_i = consumptive use of specific crop type,
W_e = effective precipitation,

A_i = total irrigated area of specific crop type,
i = index variable representing the different specific crop types grown within the irrigation entity, and
n = upper bound of summation equal to the total number of different specific crop types grown within the irrigation entity.

iii. Evapotranspiration

34. Evapotranspiration ("ET") can be calculated with theoretically based equations that calculate ET for an individual crop, necessitating crop distribution maps for each year. Ex. 3007A at 21, Figure 3, Tables 6-12; Ex. 3024 at 1-58; Ex. 8000, Vol. II at Chapter 9; Ex. 8000, Vol. IV, Appdx. AU.

35. At hearing, values of ET were estimated by the SWC from AgriMet, Ex. 8000, Vol. IV, Appdx. AU-1, and by the ground water users from ETIdaho, Ex. 3007A at 21; Ex. 3024 at 1-58. At this time, the Director finds that the use of AgriMet is more appropriate for determining ET than ETIdaho. At this time, AgriMet, is available to all parties in real-time without the need for advanced programming. Accordingly, the methodology will rely on AgriMet derived ET values in the calculations of project efficiency, crop water need, and RISD. In the future, with the development of additional enhancements, ETIdaho may become a more appropriate analytical tool for determining ET.

36. CWN is derived by multiplying crop specific ET values, adjusted for estimated effective precipitation, by the total irrigated area of individual crop types, and summing for all crop types. The areas for individual crop types will be derived from published crop distributions from the United States Department of Agriculture's National Agricultural Statistics Service ("NASS"). Ex. 1005 at 1. NASS creates a crop-specific land cover digital dataset from satellite imagery and field checks. The dataset is called the Cropland Data Layer (CDL). Each year this dataset will be used to calculate a crop distribution acreage for each SWC entity. In the future, the NASS data may not be the most accurate source of data. The Department prefers to rely on data from the current season if and when it becomes usable.

37. AgriMet crop water use (i.e. ET) and weather data are gathered at the Rupert and Twin Falls (Kimberly) stations. Both stations are located in the vicinity of the SWC entities. A&B Irrigation District ("A&B"), Burley Irrigation District ("BID"), and Minidoka Irrigation District ("Minidoka") are nearest to the Rupert AgriMet station. ET data gathered at the Rupert station reasonably represents the climate conditions for A&B, BID, and Minidoka. ET data gathered at the Twin Falls (Kimberly) station reasonably represents the climate conditions for American Falls Reservoir District No. 2 ("AFRD2"), Milner Irrigation District ("Milner"), North Side Canal Company ("NSCC"), and TFCC. Ex. 8000, Vol. IV at AU-2, AU-8.

iv. Effective Precipitation

38. Effective precipitation ("W_e") is the amount of total precipitation held in the soil horizon available for crop root uptake. Effective precipitation will be estimated from total precipitation (W) employing the methodology presented in the USDA Technical Bulletin 1275.

Ex. 8000, Vol. IV, Appdx. AU3, AU8. Total precipitation (W) data is published by the USBR as part of its Pacific Northwest Cooperative Agricultural Network, i.e. AgriMet. Ex. 8000, Vol. IV, Appdx. AU3. W_e values derived from AgriMet based precipitation values are independent of crop type.

39. AgriMet precipitation (W) values are easy to understand and regularly used by the farming, water supply, and water management communities. Accordingly, the methodology will rely on AgriMet derived W values in the calculations of crop water need and RISD.

40. As with ET data, AgriMet precipitation data are available from the Rupert and Twin Falls (Kimberly) stations. AgriMet data from the Rupert station reasonably represents of the climate conditions for A&B, BID, and Minidoka. AgriMet data from Twin Falls (Kimberly) reasonably represents climate conditions for AFRD2, Milner, NSCC, and TFCC. Ex. 8000, Vol. IV at AU-2, AU-8.

v. Summary of Reasonable In-Season Demand Calculation

41. At the start of the irrigation season, RISD is equal to the baseline demand, or total season adjusted diversions for the baseline year(s). When calculated in-season, RISD is calculated below.

$$RISD_{milestonex\_x} = \sum_{j=1}^{m}\left(\frac{CWN_j}{E_{p,j}}\right) + \sum_{j=m+1}^{7} BD_j$$

Where:

$RISD_{milestone\_x}$ = reasonable in season demand at specified evaluation milestones during the irrigation season,
CWN = crop water need for month j,
E_p = baseline project efficiency for month j,
BD = baseline demand for month j,
j = index variable, and
m = upper bound of summation, equal to the month calculation occurs, where April = 1, May =2, … October = 7.

42. Water is sometimes diverted into canals and onto crops fields in support of crop development for reasons other than strictly meeting the consumptive requirement of the crop; such as canal wetting, salt leaching, soil wetting, and soil temperature control. April and October represent months during the irrigation season when the method of calculating RISD strictly as a function of CWN and E_p is less reliable, because CWN is often not the driving factor in diversions during these bookend months. To account for uncertainty of RISD calculations during those time periods, April and October RISD adjustments have been developed.

43. April RISD Adjustment: In April, calculated RISD, as a function of CWN and E_p, can grossly under estimate actual diversion needs. Therefore, for each individual surface water provider, if the calculation of CWN/E_p for the month of April is less than the April average diversion volume over a record of representative years in the recent past, then RISD will be equal to the April average diversion volume. If the calculation of CWN/E_p is greater than the

April average, then RISD will equal the calculated CWN/E_p volume.

44. October RISD Adjustment: In October, calculated RISD, as a function of CWN and E_p, can either grossly under or over estimate actual diversion needs. For each individual surface water provider, if the calculation of CWN/E_p for the month of October is greater than the October maximum diversion volume, or less than the October minimum diversion volume,[6] over a record of representative years in the recent past, then RISD will be equal to the October average diversion volume, over the same period of representative years. If the calculation of CWN/E_p is less than the October maximum diversion volume, or greater than the October minimum diversion volume, then RISD will equal the calculated CWN/E_p volume.

D. Adjustment of Forecast Supply

45. As stated by the Hearing Officer, "There must be adjustments as conditions develop if any baseline supply concept is to be used." R. Vol. 37 at 7093.

i. April Forecast Supply

46. The forecast supply is comprised of natural flow and stored water.

47. Typically within the first week of April, the USBR and the USACE issue their Joint Forecast that predicts an unregulated inflow volume at the Heise Gage from April 1 to July 31 for the forthcoming year. The joint forecast ("Joint Forecast") issued by the United States Bureau of Reclamation ("USBR") and the United States Army Corp of Engineers ("USACE") for the period April 1 through July 31 "is generally as accurate a forecast as is possible using current data gathering and forecasting techniques." R. Vol. 8 at 1379, ¶ 98. Given current forecasting techniques, the earliest the Director can predict material injury "with reasonable certainty" is soon after the Joint Forecast is issued. R. Vol. 2 at 226. With data from 1990 through the irrigation year previous to the current year, a regression equation will be developed for each SWC member. The regression equations for A&B and Milner were developed by comparing the actual Heise natural flow to the natural flow diverted. *See e.g.* R. Vol. 8 at 1416-22. For AFRD2, BID, Minidoka, NSCC, and TFCC, multi-linear regression equations were developed by comparing the actual Snake River near Heise natural flow and the flows at Box Canyon to the natural flow diverted. The regression equations will be used to predict the natural flow diverted for the upcoming irrigation season. *Id.* at 1380. The actual natural flow volume that will be used in the Director's April Forecast Supply for each SWC entity will be one standard error below the regression line, which underestimates the available supply. *Id.*; Tr. p. 65, lns. 6-25; p. 66, lns. 1-2. The purpose of the shift to one standard error below the regression line is to ensure senior water right holders do not bear the risk of under-prediction of supply. The forecasting techniques will be revised based on updated data and the forecasting techniques may be revised when improvements to the forecasting tools occur.

[6] Minimum October diversion values will not be considered for years in which a SWC entity had zero carryover storage, as the Department will consider this an indication that October diversions were potentially limited by available water supply.

48. The storage allocation for each member of the SWC will be estimated by the Department following the Joint Forecast. The Department will forecast reservoir fill and storage allocation consistent with the methods established in the *Fifth Supplemental Order Amending Replacement Water Requirements Final 2006 & Estimated 2007.* R. Vol. 23 at 4294-97 as explained below. The Department will evaluate the current reservoir conditions and the current water supply outlook to determine historical analogous year or years to predict reservoir fill. The Department may identify and use a combination of different analogous years to predict individual reservoir fill. Input variables for determining the individual storage water allocation for each SWC member are: (a) the analogous year's or years' total reservoir fill volume; (b) an estimated evaporation volume; and (c) the previous year's carryover volume. The FS (the combination of the forecast of natural flow supply and the storage allocation) for each SWC member will be determined by the Director shortly after the date of the Joint Forecast.

49. If, at any time prior to the Director's final determination of the April FS, the Director can determine with certainty that any member of the SWC has diverted more natural flow than predicted, or has accrued more storage than predicted, the Director will revise his initial, projected shortfall determination.

ii. July Forecast Supply

50. Approximately halfway through the irrigation season, the FS will be adjusted. FS is comprised of natural flow and stored water.

51. When adjusting the natural flow component of the FS, the Department's water rights accounting model will be used to compute the natural flow diverted by each member of the SWC. The natural flow diversion for the remainder of the irrigation season will be estimated based on the regression analyses.

52. Linear regression equations for AFRD2, A&B, and Milner, were developed by comparing the July 1 snow water equivalent (inches) at the Two Oceans Plateau SNOTEL site to the natural flow diversions. The regression equations for AFRD2, A&B, and Milner would be used only in those years when the snow water equivalent at the Two Oceans Plateau SNOTEL site is greater than zero (0). Years when the snow water equivalent equals zero, the total natural flow prediction for the period July 1 to October 31 will be zero (0) AF.

53. Multiple linear regression equations for BID, Minidoka, and NSCC were developed to predict natural flow diversions employing the following predictor variables: (1) Snake River near Heise natural flow (April – June), (2) March depth to water at well 05S2E27ABA1 and (3) the snow water equivalent at the Two Oceans Plateau SNOTEL site on June 15.

54. The multiple linear regression model for TFCC will be based on the following

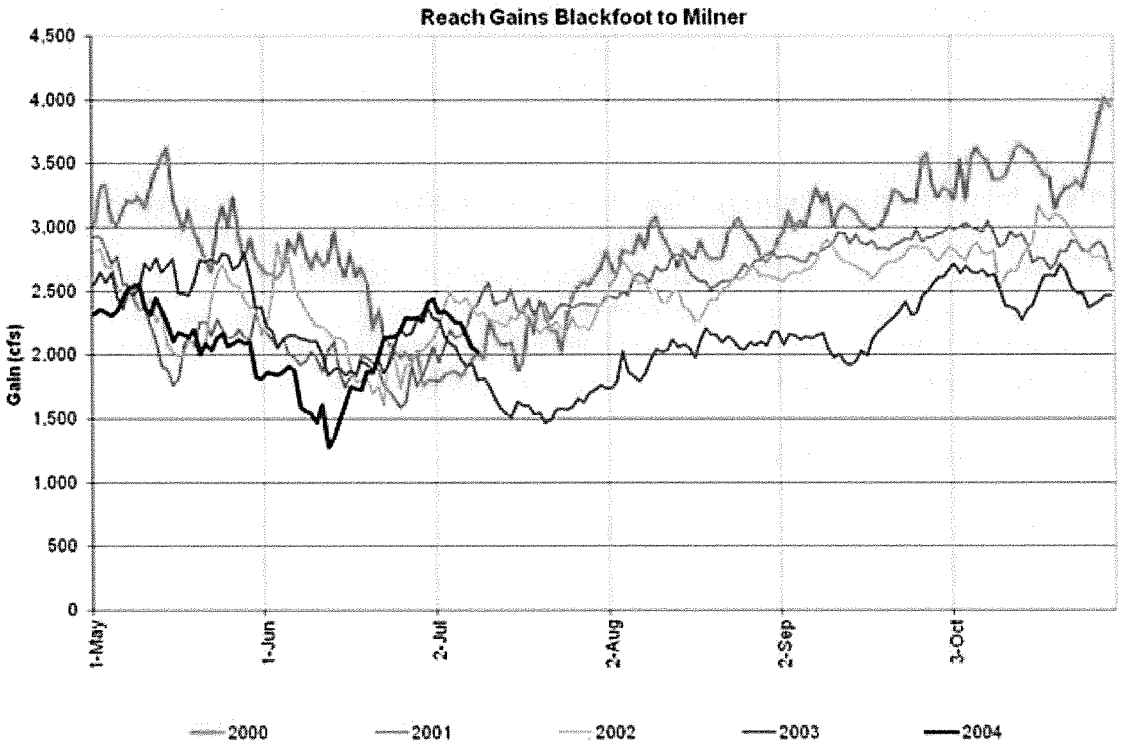
predictor variables: (1) Snake River near Heise natural flow (April – June), (2) Spring Creek total discharge (January – May) and (3) the snow water equivalent at the Two Oceans Plateau SNOTEL site on June 15.

55. When adjusting the storage component of the FS, the Department must consider whether stored water has been allocated in determining the storage component of the FS. In normal to dry years, the reservoirs will typically have filled to their peak capacity for the season and the storage water will have been allocated. If the BOR and Water District 01 have allocated stored water to spaceholders, the Department will use the actual preliminary storage allocations to the SWC. If the BOR and Water District 01 have not yet allocated stored water to spaceholders, the Department will predict the storage allocations based on the storage allocations from an analogous year.

iii. Time of Need

56. The FS will again be adjusted shortly before the Time of Need. The Time of Need is established by predicting the day in which the remaining storage allocation will be equal to reasonable carryover. The Time of Need will not be earlier than the Day of Allocation. FS is comprised of natural flow and stored water.

57. When adjusting the natural flow component of the FS the Department's water rights accounting model will compute the natural flow diverted by each member of the SWC as of the new forecast date. The natural flow diversion for the remainder of the irrigation season will be estimated based on a historical year with similar reach gains in the Blackfoot to Milner reach. The following is an example of estimating reach gains from an analysis of historical years. Reach gains for the years 2000 – 2003 and a portion of year 2004 are graphed below. Considering 2004 as an example of a current year, and comparing 2004 to the hydrographs for 2000 – 2003, year 2003 has similar reach gains and is appropriately conservative. Therefore, the natural flow diverted in 2003 would be used to predict the natural flow diversions for the remainder of the 2004 season.



Example Reach Gain Analysis for 2004.

58. When adjusting the storage component of the FS, the Department will use the actual preliminary storage allocations to the SWC.

59. The adjusted FS is the sum of the actual natural flow diversions, the predicted natural flow diversions, and the storage allocation.

E. Calculation of Demand Shortfall

60. The equation below is used to determine the amount of predicted demand shortfall during the irrigation season.

$$DS = FS - RISD$$

Where:

DS = demand shortfall for specified evaluation points throughout the season,
FS = forecasted supply for remainder of season after specified evaluation point during the season, and
RISD = Reasonable in-season demand from above.

61. The amount calculated represents the volume that junior ground water users will be required to have available for delivery to members of the SWC found to be materially injured by the Director. The amounts will be calculated in April, at the middle of the season, and at the time of need.

III. Methodology for Determining Material Injury to Reasonable Carryover

62. CM Rule 42.01.g states the following guidance for determining reasonable carryover: "In determining a reasonable amount of carry-over storage water, the Director shall consider average annual rate of fill of storage reservoirs and the average annual carry-over for prior comparable water conditions and the projected water supply for the system."

A. Projected Water Supply

63. CM Rule 42.01.g states that the Director "shall consider . . . the projected water supply for the system." Carryover shortfall will be determined following the completion of the irrigation season. Because it is not possible to adequately forecast the irrigation demand for the following irrigation season at the end of the current irrigation season, the Director must make a projection of need. R. Vol. 37 at 7109 ("Anticipating the next season of need is closer to faith than science."). The average of 2006/2008/2012 BLY will be the projected demand.

64. Similar to projecting demand, the Director must also project supply. The Heise natural flow, for the years 2002 and 2004, were well below the long term average (1991-2014) but were not the lowest years on record. The average of the 2002 and 2004 supply will be the projected supply, representing a typical dry year. The 2002 and 2004 supply is computed as follows:

- 2002 supply = natural flow diverted + new fill
- 2004 supply = natural flow diverted + new fill
- Projected supply = average of 2002 supply and 2004 supply

Carryover from previous years is not included in the 2002 and 2004 supply calculation because it was not new water supplied during the 2002 or 2004 irrigation year.

65. Reasonable carryover is defined as the difference between a baseline year demand and projected typical dry year supply. Reasonable carryover is computed using the following equation:

Reasonable carryover = 2006/2008/2012 average – 2002/2004 average

B. Average Annual Rate of Fill

66. CM Rule 42.01.g states that the Director "shall consider the average annual rate of fill of storage reservoirs . . . ." The average annual reservoir fill serves as a means to evaluate reasonable carryover, calculated as the difference between the projected demand and the projected supply. For purposes of the table below, any water contributed to the rental pool from the previous year was added to the next year's fill volume so that it does not artificially lower the percent fill. R. Vol. 37 at 7108. Water that is supplied to the rental pool lowers carryover and could impact the following year's fill. The percent fill does not include water deducted for reservoir evaporation. The annual percent fill of storage volume by SWC entity is shown below:

	A&B	AFRD2	BID	Milner	Minidoka	NSCC	TFCC
1995	100%	100%	100%	100%	100%	100%	100%
1996	100%	100%	100%	100%	100%	100%	100%
1997	100%	100%	100%	100%	100%	100%	100%
1998	100%	100%	100%	100%	100%	100%	100%
1999	100%	100%	100%	96%	100%	98%	99%
2000	100%	99%	99%	98%	100%	97%	97%
2001	100%	100%	100%	100%	100%	91%	87%
2002	41%	100%	100%	90%	92%	84%	88%
2003	43%	100%	99%	66%	92%	94%	99%
2004	34%	82%	98%	48%	95%	82%	63%
2005	58%	100%	100%	77%	98%	100%	100%
2006	98%	100%	99%	98%	100%	99%	99%
2007	89%	100%	83%	92%	77%	95%	97%
2008	100%	100%	85%	100%	80%	99%	100%
2009	100%	100%	100%	100%	100%	100%	100%
2010	100%	100%	100%	100%	100%	100%	100%
2011	100%	100%	100%	100%	100%	100%	100%
2012	88%	100%	97%	91%	94%	94%	96%
2013	80%	100%	97%	90%	86%	97%	100%
2014	93%	100%	100%	100%	93%	100%	100%
Average	87%	99%	99%	92%	96%	96%	96%
Std Dev	22%	4%	2%	14%	4%	6%	8%

Annual Percent Fill of Storage Volume by Entity (1995-2014).[7]

C. Average Annual Carryover

[7] *See e.g.* Ex. 4125. Exhibit 4125 accounts for water deducted for evaporation, but does not take into account water supplied to the rental pool.

67. CM Rule 42.01.g states that the Director "shall consider the . . . average annual carry-over for prior comparable water conditions . . . ." This factor will be taken into consideration when determining reasonable carryover. Actual carryover volumes were adjusted from values reported in the storage reports so that they did not include water received for mitigation purposes or water rental by the canal company for use within the irrigation district. R. Vol. 37 at 7108. Actual carryover from 1995 through 2014 was sorted into categories ranging from very dry to wet. The categories are based on the Heise natural flow volumes from April through September.

Heise April - Sept. Natural Flow (KAF)	Year	Heise Natural Flow April - Sept	A&B	AFRD2	BID	Milner	Minidoka	NSCC	TFCC
Very Dry	2001	1,968	9,902	4,217	37,430	26,854	55,132	42,421	26,917
	1994	2,319	82,885	26,894	54,136	45,902	102,823	128,356	18,687
<3000	2007	2,320	62,739	7,962	34,639	36,520	61,744	68,947	-21,811
	2013	2,721	55,245	10,647	50,107	34,342	68,405	132,899	23,949
	2002	2,775	30,192	8,570	72,835	14,531	99,488	128,572	32,635
	2004	2,833	-3,771	18,537	47,845	8,735	97,905	19,145	21,551
	2003	2,931	9,401	3,649	51,686	6,906	81,673	166,217	-18,169
	Average	**2,552**	**35,228**	**11,496**	**49,811**	**24,827**	**81,024**	**98,080**	**11,966**
	2000	3,059	66,915	20,787	107,425	43,173	160,183	205,510	52,536
Dry	2010	3,108	95,604	103,272	113,262	58,754	174,009	313,341	30,989
3000 - 4000	2005	3,195	36,665	99,097	90,190	37,593	150,623	365,001	64,452
	2012	3,385	68,356	38,682	86,178	45,124	139,426	194,255	76,578
	Average	**3,187**	**66,885**	**65,460**	**99,264**	**46,161**	**156,060**	**269,527**	**56,139**
	2006	4,079	89,311	107,682	102,873	58,755	182,612	365,672	51,187
	1993	4,116	102,493	123,508	154,461	50,332	264,713	300,942	104,424
Average	2008	4,288	92,193	102,753	130,762	63,342	182,531	413,408	65,648
4000 - 4500	1995	4,447	82,567	167,451	134,340	75,451	237,300	441,729	58,675
	1998	4,498	87,250	144,057	109,014	67,777	193,810	494,664	156,433
	Average	**4,286**	**90,763**	**129,090**	**126,290**	**63,131**	**212,193**	**403,283**	**87,274**
	2014	4,510	78,065	92,232	144,930	56,202	208,714	441,951	133,411
	2009	4,613	104,174	145,530	125,688	66,935	204,581	426,779	95,533
>4500 KAF	1999	4,949	78,312	121,793	168,545	67,147	205,716	454,338	191,501
	1996	5,583	85,209	145,019	127,123	70,250	228,786	472,790	111,459
	2011	6,347	116,495	231,938	170,150	65,072	294,967	563,360	151,678
	1997	7,007	89,811	114,324	87,073	65,307	202,475	464,715	136,926
	Average	**5,502**	**92,011**	**141,806**	**137,251**	**65,152**	**224,206**	**470,655**	**136,751**

Actual Carryover Volumes by Entity, Sorted by Heise Natural Flow (1995-2014).

68. In considering the principles articulated in CM Rule 42.01.g, the Director will project reasonable carryover shortfalls for members of the SWC. The following table represents the 2006/2008/2012 BLY diversion volumes and total reservoir storage space by entity. By dividing the total reservoir space by the 2006/2008/2012 diversion volume, a metric is established that describes the total number of seasons the entity's reservoir space can supply water.

	A&B	AFRD2	BID	Milner	Minidoka	NSCC	TFCC
06/08/12 BLY	59,993	427,672	251,531	47,135	369,492	978,888	1,060,011
Total Reservoir Space	137,626	393,550	226,487	90,591	366,554	859,898	245,930
Number of Seasons of Reservoir Space	2.3	0.9	0.9	1.9	1.0	0.9	0.2

Total Reservoir Space[8] in Comparison to Demand.

D. Reasonable Carryover

i. A&B

69. A&B's reservoir space has the lowest average annual rate of fill with the highest variability in fill. *See* Finding of Fact 66. In very dry years, the potential exists that A&B's actual carryover will be less than the reasonable carryover. *See* Finding of Fact 67. A&B has an approximate two-year water supply provided by its total available storage space. *See* Finding of Fact 68. Because of its lower rate of fill, it is likely A&B will experience carryover shortfalls in consecutive dry years. Because of these factors, the calculated reasonable carryover of 18,500 AF is used for A&B. *See* Finding of Fact 75.

ii. AFRD2

70. AFRD2 has the highest and most consistent reservoir rate of fill of any member of the SWC. *See* Finding of Fact 66. Therefore, any unfilled space in the fall will most likely fill. AFRD2 has an approximate one-year supply available in storage. *See* Finding of Fact 68. In a very dry year, AFRD2's historical carryover volume is often less than the calculated reasonable carryover volume using the reasonable carryover equation (BLY 06/08/12 – 2002/2004 supply) *See* Finding of Fact 67. Given the high likelihood of filling during a multi-year drought and after a very dry year, the reasonable carryover can be adjusted downward from the calculated value without shifting the risk of shortage to the senior right holder. Because of these factors, the historical average carryover in very dry years of 11,500 AF is used as the reasonable carryover for AFRD2. *See* Finding of Fact 75.

iii. BID & Minidoka

[8] *See* R. Vol. 8 at 1373-74.

71. In an average demand year, BID and Minidoka will have enough water to meet demands given a low water supply. *See* Finding of Fact 67. *See also* R. Vol. 37 at 7105. Historically, even in very dry years, BID's and Minidoka's carryover have been well above the calculated reasonable carryover and it is unlikely that they will have reasonable carryover shortfalls in the future. *See* Finding of Fact 67. *See also* R. Vol. 37 at 7105. Because of these factors, the calculated reasonable carryover of 0 AF is used for BID and Minidoka. *See* Finding of Fact 75. *See also* R. Vol. 37 at 7105.

iv. Milner

72. Similar to A&B, Milner's reservoir space has the second lowest average annual rate of fill of all entities with a high degree of variability in fill. *See* Finding of Fact 66. In very dry years, the potential exists that Milner's actual carryover will be less than the reasonable carryover. *See* Finding of Fact 67. Milner has an approximate two-year water supply available in storage. *See* Finding of Fact 68. Because of its rate of fill, it is likely Milner will experience carryover shortfalls in consecutive dry years. Because of these factors, the calculated reasonable carryover of 4,800 AF is used for Milner. *See* Finding of Fact 75.

v. NSCC

73. NSCC has a near average annual rate of fill in comparison to all entities and an approximate one-year water supply available in storage. *See* Findings of Fact 66 and 68. In dry years, the potential exists that its reasonable carryover will be less than its actual carryover. *See* Finding of Fact 67. Because of these factors, the calculated reasonable carryover of 65,500 AF is used for NSCC. *See* Finding of Fact 75.

vi. TFCC

74. TFCC has a near average annual rate of fill in comparison to all entities, but only a one-quarter of a year's water supply available in storage. *See* Findings of Fact 66 and 68. In dry years, the potential exists that its reasonable carryover will be less than its actual carryover. *See* Finding of Fact 67. Because of these factors, the calculated reasonable carryover of 25,200 AF is used for TFCC. *See* Finding of Fact 75.

75. Reasonable carryover values for the SWC members are as follows:

	Reasonable Carryover (Acre-Feet)
A&B	18,500
AFRD2	11,500
BID	0
Milner	4,800
Minidoka	0
NSCC	65,500
TFCC	25,200

E. Reasonable Carryover Shortfall

76. Reasonable carryover shortfall is the numerical difference between reasonable carryover and actual carryover, calculated at the conclusion of the irrigation season. Actual carryover is defined as the storage allocation minus the total storage use plus or minus any adjustments. Examples of adjustments include SWC water placed in the rental pool and SWC private leases. Adjustments are unique to each irrigation season and will be evaluated each year. Any storage water deliveries to entities other than the SWC for purposes unrelated to the original right will be adjusted so that the water is not included as a part of the SWC carryover volume. Water that is purchased or leased by an SWC member may become part of IGWA's carryover shortfall obligation. *See e.g.* R. Vol. 38 at 7201, fn. 11 (Eighth Supplemental Order). Conversely, adjustments will be made to assure that water supplied by a SWC member to private leases or to the rental pool will not increase the reasonable carryover shortfall obligation to the same SWC member.

77. Reasonable carryover shortfall is calculated as follows:

Reasonable Carryover Shortfall = Actual Carryover – Reasonable Carryover

CONCLUSIONS OF LAW

1. This order contains the methodology by which the Director will determine material injury to RISD and reasonable carryover to members of the SWC.

2. "The agency's experience, technical competence, and specialized knowledge may be utilized in the evaluation of the evidence." Idaho Code § 67-5251(5); IDAPA 37.01.01.600.

3. Idaho Code § 42-602 states that, "The director of the department of water resources shall have discretion and control of the distribution of water from all natural sources . . . . The director of the department of water resources shall distribute water . . . in accordance with

the prior appropriation doctrine." According to the Hearing Officer, "It is clear that the Legislature did not intend to grant the Director broad powers to do whatever the Director might think right. However, it is clear also that the Legislature [in Idaho Code § 42-602] did not intend to sum up water law in a single sentence of the Director's authority." R. Vol. 37 at 7085. The Idaho Supreme Court has recently stated, "Given the nature of the decisions which must be made in determining how to respond to a delivery call, there must be some exercise of discretion by the Director." *American Falls Res. Dist. No. 2 v. Idaho Dept. Water Resources*, 143 Idaho 862, 875, 154 P.3d 433, 446 (2007).

4. "The prior appropriation doctrine is comprised of two bedrock principles—that the first appropriator in time is the first in right and that water must be placed to a beneficial use." *In Matter of Distribution of Water to Various Water Rights Held by or for the Benefit of A & B Irrigation Dist.*, 155 Idaho 640, 650, 315 P.3d 828, 838 (2012). "The concept that beneficial use acts as a measure and limit upon the extent of a water right is a consistent theme in Idaho water law." *Id.*; *see also American Falls*, 143 Idaho at 879, 154 P.3d at 450 (stating that while an appropriation for a beneficial use is "a valuable right entitled to protection . . . . Nevertheless, that property right is still subject to other requirements of the prior appropriation doctrine.").

5. "Concurrent with the right to use water in Idaho 'first in time,' is the obligation to put that water to beneficial use." *American Falls*, 143 Idaho at 880, 154 P.3d at 451; *see In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 652, 315 P.3d at 840 (referring to "'the constitutional requirement that priority over water be extended only to those using the water'") (quoting *American Falls*, 143 Idaho at 876, 154 P.3d at 447). "'It is the settled law of this state that no person can, by virtue of a prior appropriation, claim or hold more water than is necessary for the purpose of the appropriation, and the amount of water necessary for the purpose of irrigation of the lands in question and the condition of the land to be irrigated should be taken into account.'" *Id.* at 14 (quoting *Washington State Sugar v. Goodrich*, 27 Idaho 26, 44, 147 P. 1073, 1079 (1915)).

6. "'The policy of the law of this State is to secure the maximum use and benefit, and least wasteful use, of its water resources.'" *Clear Springs Foods, Inc. v. Spackman*, 150 Idaho 790, 808, 252 P.3d 71, 89 (2011) (quoting *Poole v. Olaveson*, 82 Idaho 496, 502, 356 P.2d 61, 65 (1960)). The Idaho Constitution enunciates a policy of promoting optimum development of water resources in the public interest. *Baker v. Ore-Ida Foods, Inc.*, 95 Idaho 575, 584, 513 P.2d 627, 636 (1973); Idaho Const. Art. XV, § 7. "There is no difference between securing the maximum use and benefit and least wasteful use of this State's water resources and the optimum development of water resources in the public interest. Likewise, there is no material difference between 'full economic development' and the 'optimum development of water resources in the public interest.' They are two sides of the same coin. Full economic development is the result of the optimum development of water resources in the public interest." *Clear Springs*, 150 Idaho at 809, 252 P.3d at 90. "The policy of securing the maximum use and benefit, and least wasteful use, of the State's water resources applies to both surface and ground waters, and it requires that they be managed conjunctively." *Clear Springs*, 150 Idaho at 809, 252 P.3d at 90.

7. "Conjunctive administration 'requires knowledge by the IDWR of the relative priorities of the ground and surface water rights, how the various ground and surface water

sources are interconnected, and how, when, where and to what extent the diversion and use of water from one source impacts the water flows in that source and other sources.' . . . . That is precisely the reason for the CM Rules and the need for analysis and administration by the Director." *American Falls,* 143 Idaho at 877, 154 P.3d at 448.

8. The CM Rules incorporate all principles of the prior appropriation doctrine as established by Idaho law. *American Falls*, 143 Idaho at 873, 154 P.3d at 444; CM Rule 20.02, 10.12.

9. While the presumption under Idaho law is that an appropriator is entitled to his decreed water right and the CM Rules may not be applied so as require a senior appropriator to demonstrate an entitlement to the water in the first place, there may be post-adjudication factors relevant to the determination of how much water is actually needed in responding to a delivery call. *American Falls* at 877-878, 154 P.3d at 448-449. Under the CM Rules and Idaho law, the Director has the "authority and responsibility to investigate claims when delivery calls are made," and the "authority to evaluate the issue of beneficial use in the administration context." *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 652, 315 P.3d at 840. "Given the nature of the decisions which must be made in determining how to respond to a delivery call, there must be some exercise of discretion by the Director." *American Falls*, 143 Idaho at 875, 154 P.3d at 446. "'If this Court were to rule the Director lacks the power in a delivery call to evaluate whether the senior is putting the water to beneficial use, we would be ignoring the constitutional requirement that priority over water be extended only to those using the water.'" *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 652, 315 P.3d at 840 (quoting *American Falls*, 143 Idaho at 876, 154 P.3d at 447).

10. In responding to a delivery call under the CM Rules, the Director "may employ a baseline methodology as a starting point for considering material injury," provided the baseline methodology otherwise comports with the prior appropriation doctrine as established by Idaho law. *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 653, 315 P.3d at 841; *see also Methodology Remand Order* at 17.

11. Once the Director determines that material injury is occurring or will occur, junior appropriators subject to the delivery call bear the burden of proving that the call would be futile or to challenge, in some other constitutionally permissible way, the senior's call. *American Falls* at 877-878, 154 P.3d at 448-449; *see also Methodology Remand Order* at 31. Junior appropriators have the burden of proving by clear and convincing evidence that the delivery call is futile or otherwise unfounded. *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 653, 315 P.3d at 841.

12. "This case illustrates the tension between the first in time and beneficial use aspects of the prior appropriation doctrine." *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 650, 315 P.3d at 838. The Idaho Supreme Court has in this case "recognized the critical role of the Director in managing the water resources to accommodate both first in time and beneficial use aspects: 'Somewhere between the absolute right to use a decreed water right and an obligation not to waste it and to protect the public's interest in this valuable commodity, lies an area for the exercise of discretion by the

Director.'" 155 Idaho at 651, 315 P.3d at 839 (quoting *American Falls*, 143 Idaho at 880, 154 P.3d at 451). Thus, in this case the Director may use "a baseline methodology, both as a starting point for consideration of the Coalition's call and in determining the issue of material injury." *Id.* at 155 Idaho 650-651, 315 P.3d at 838-39. However, "[i]f changing conditions establish that material injury is greater than originally determined pursuant to the baseline analysis, then adjustments to the mitigation obligation of the juniors must be made when the Director undertakes his mid-season calculations." *Methodology Remand Order* at 18.

13. In the context of conjunctive administration, the Director's methodology for projecting material injury does not impose an obligation upon members of the SWC to reprove their water rights. To the extent water is available, members of the SWC are authorized to divert and store water in accordance with the terms of their licenses or decrees. Nothing established herein reduces that authorization. The question that the CM Rules require the Director to answer in this proceeding is, when water is not available to fill the water rights of the SWC, how much water is reasonably necessary for the SWC to accomplish the beneficial purpose of raising crops; because what is needed to irrigate crops may be less than the decreed or licensed quantities. *American Falls*, 143 Idaho at 880, 154 P.3d at 451; *see In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 650, 315 P.3d at 838 ("'[i]t is the settled law of this state that no person can, by virtue of a prior appropriation, claim or hold more water than is necessary for the purpose of the appropriation") (quoting *Washington State Sugar v. Goodrich*, 27 Idaho 26, 44, 147 P. 1073, 1079 (1915)). "The concept that beneficial use acts as a measure and limit upon the extent of a water right is a consistent theme in Idaho water law." *Id.*

14. Holders of senior-priority water rights may receive less than their licensed or decreed quantities and not suffer material injury within the meaning of the CM Rules. As a result, in-season demand should be viewed in light of reasonableness and optimum development of water resources in the public interest. CM Rules 20 and 42; *American Falls*, 143 Idaho at 876-80, 154 P.3d at 447-51; *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 650-652, 315 P.3d at 838-40.

15. Here, the Director has established a methodology for determining material injury to members of the SWC. The methodology predicts material injury to RISD by taking the difference between RISD and the forecasted supply. The years 2000 through 2014 were analyzed to select the initial BLY because the period of years captured current irrigation practices in a dry climate. Based upon evaluation of the record, members of the SWC were exercising more reasonable efficiencies during this time period than during the 1990s when supplies were more plentiful. During periods of drought when junior ground water users are subject to curtailment, members of the SWC should exercise reasonable efficiencies to promote the optimum utilization of the State's water resources. CM Rules 20 and 42; *American Falls,* 143 Idaho at 876-80, 154 P.3d at 447-51; *Clear Springs*, 150 Idaho at 807-10; 252 P.3d at 88-91; *In re Distribution of Water to Various Water Rights Held by or for the Ben. of A&B Irr. Dist.*, 155 Idaho at 650-652, 315 P.3d at 838-40.

16. At this time, with the recognition that the methodology is subject to adjustment and refinement, RISD will be equal to the historic demands associated with the BLY

(2006/2008/2012), and will be corrected during the season to account for variations in climate and water supply between the BLY and actual conditions.

17. Recognizing that climate and surface water supplies (natural flow and storage) are inherently variable, the Director's predictions of material injury to RISD and reasonable carryover are based upon the best available information and the best available science, in conjunction with the Director's professional judgment as the manager of the State's water resources. Recognizing his ongoing duty to administer the State's water resources, the Director should use available data, and consider new analytical methods or modeling concepts, to evaluate the methodology. As more data is gathered and analyzed, the Director will review and refine the process of predicting and evaluating material injury. The methodology will be adjusted, if the data supports a change.

18. If the Director predicts that the SWC will be materially injured because of a demand shortfall prediction, either in the preseason or in the midseason, the demand shortfall represents a mitigation obligation that must be borne by junior ground water users. If mitigation water in the amount of the projected RISD shortfall cannot be secured or optioned by junior ground water users to the satisfaction of the Director (*see Order on Petition for Judicial Review* at 19), the Director will curtail junior ground water users to make up any deficit.

19. By requiring that junior ground water users secure mitigation water or have options to acquire water in place during the season of need, the Director ensures that the SWC does not carry the risk of shortage to their supply. By not requiring junior ground water users to deliver or assign mitigation water until the time of need, the Director ensures that junior ground water users supply only the amount of mitigation water necessary to satisfy the reasonable in-season demand. All approved methods of mitigation shall be considered in the Director's review of projected RISD shortfall.

20. Unless there is reasonable certainty that junior ground water users can secure the predicted volume of water and provide that water at the time of need, the protection afforded to the senior water right holders is compromised. The risk of shortage is then impermissibly shouldered by the SWC. Members of the SWC should have certainty entering the irrigation season and at midseason that mitigation water will be delivered or assigned at the time of need, or curtailment of junior ground water rights will be ordered.

21. Because climate and the supply that the SWC appropriated (natural flow and storage) are inherently variable, the Director cannot and should not insulate the SWC against all shortages. The Director can, however, protect the SWC against reasonably predicted shortages to RISD.

22. Currently, the USBR and USACE's Joint Forecast is an indispensible predictive tool at the Director's disposal for predicting material injury to RISD. Given current forecasting techniques, the earliest the Director can predict material injury to RISD with reasonable certainty is soon after the Joint Forecast is issued in early April. The pre-irrigation season supply forecast for A&B and Milner can be predicted solely from the Joint Forecast. To improve the accuracy of prediction, the pre-irrigation season supply forecast for AFRD2, BID, Minidoka, NSCC, and

TFCC will currently be predicted from both the Joint Forecast and from flow data at Box Canyon.[9]

23. By shifting the April Forecast Supply prediction curve down one standard error of estimate, the Director purposely underestimates the water supply that is predicted. The Director further guards against RISD shortage by using the 06/08/12 BLY, which has above average diversions, above average ET, below average in-season precipitation, and above average growing degree days. The 06/08/12 average represents years in which water supply did not limit diversions. The Director's prediction of material injury to RISD is purposely conservative. While it may ultimately be determined after final accounting that less mitigation water was owed than was provided, this is an appropriate burden for junior appropriators to carry. Idaho Cost. Art. XV, § 3; Idaho Code § 42-106. Shifting the prediction curve down one standard error of estimate and adoption of a baseline year that uses above average diversions, above average temperatures and evapotranspiration and below average precipitation is necessary to protect senior rights if the Director administers to an amount less than the full decreed quantity of the SWC's rights. *Methodology Remand Order* at 33, 35.

24. The Director will review, at the end of the season, the volume and efficiencies of application of surface water, the amount of mitigation water provided by junior ground water users, and may, in the exercise of his professional judgment, readjust the reasonable carryover shortfalls to reflect these considerations.

25. "Storage water is water held in a reservoir and is intended to assist the holder of the water right in meeting their decreed needs." *American Falls*, 143 Idaho at 878, 154 P.3d at 449. "Carryover is the unused water in a reservoir at the end of the irrigation year which is retained or stored for future use in years of drought or low-water." *Id.* Under Idaho Code, "[o]ne may acquire storage water rights and receive a vested priority date and quantity, just as with any other water right," but "[t]here is no statutory provision for obtaining a decreed right to 'carryover' water." *Id.* Rather, carryover is a "component of the storage right." *Order on Petition for Judicial Review* (Jul. 24, 2009) at 20. Storage carryover is "permissible . . . absent abuse." *American Falls*, 143 Idaho at 880, 154 P.3d at 451.

26. The storage reservoirs implicated in this proceeding were intended to provide supplemental supplies of water "to create a buffer against the uncertainty of the weather." *Opinion Constituting Findings of Fact, Conclusions of Law and Recommendation* (April 29, 2008) at 6. "The history of the development of the reservoir system, most recently Palisades, makes it clear that storage of water was a primary purpose to prevent disaster during periods of shortage as have been experienced in the recent past." *Id.* at 60. The purpose of carryover also is "insurance against the risk of future shortage." *Order on Petition for Judicial Review* (Jul. 24, 2009) at 20.

27. CM Rule 42.01 sets forth factors the Director is "may consider in determining whether the holders of water rights are suffering material injury and using water efficiently and without waste." CM Rule 42.01 does not limit the Director's determination of reasonable carryover to consideration of the factors enumerated in CM Rule 42.01g, but only requires that

[9] The method for predicting the natural flow supply may be subject change based upon improved predictive models.

the Director consider those enumerated factors. One such factor is "[t]he extent to which the requirements of the holder of a senior priority water right could be met with the user's existing facilities and water supplies." CM Rule 42.01g. This factor is qualified, however, by the provision that "the holder of a surface water storage right shall be entitled to maintain a reasonable amount of carry-over storage to assure water supplies for future dry years." CM Rule 42.01g. Thus, CM Rule 42.01g does not require water right holders to exhaust their storage water supplies prior to making a delivery call under the conjunctive management rules. This is consistent with the purposes of the storage reservoirs and the carryover components of the storage water rights.

28. In considering CM Rule 42.01g in *American Falls*, the Idaho Supreme Court framed the SWC's challenge to the "reasonable carryover" provision as presenting the question of whether the holders of storage water rights are "entitled to insist on all available water to carryover for future years in order to assure that their full storage water is met (regardless of need)," *American Falls,* 143 Idaho at 879, 154 P.3d at 450, and answered this question in the negative:

> At oral argument, one of the irrigation district attorneys candidly admitted that their position was that they should be permitted to fill their entire storage water right, regardless of whether there was any indication that it was necessary to fulfill current or future needs and even though the irrigation districts routinely sell or lease the water for uses unrelated to the original rights. This is simply not the law of Idaho. While the prior appropriation doctrine certainly gives pre-eminent rights to those who put water to beneficial use first in time, this is not an absolute rule without exception. As previously discussed, the Idaho Constitution and statutes do not permit waste and require water to be put to beneficial use or be lost. Supra, paragraph 11.

American Falls, 143 Idaho at 880, 154 P.3d at 451.

29. As discussed in the Findings of Fact, reasonable carryover is determined by projecting the water supply for the system. This is accomplished by projecting the 2002/2004 supply and the 2006/2008/2012 demand. Next, the Director examines the average annual rate of fill of the storage rights held by members of the SWC to determine each entities' relative probability of fill. Finally, the Director examines the average annual carryover for prior comparable water conditions by reviewing Heise natural flow.

30. On or before November 30, the Department will issue estimates of actual carryover and reasonable carryover shortfall volumes for all members of SWC. These estimates will establish the obligation of junior ground water users in providing water to the SWC for reasonable carryover shortfall. Fourteen (14) days following the issuance by the Department of reasonable carryover short fall obligations, junior ground water users will be required to establish, to the satisfaction of the Director, their ability to supply a volume of storage water or to conduct other approved mitigation activities that will provide water to the injured members of the SWC equal to the reasonable carryover shortfall for all injured members of the SWC. If junior ground water users cannot provide this information, the Director will issue an order curtailing junior ground water rights.

31. Recognizing that reservoir space held by members of the SWC may fill, and to prevent the waste of water, junior ground water users are not required to deliver or assign the volume of reasonable carryover until after the Day of Allocation (defined in footnote 16, *infra*). Junior ground water users are obligated to hold the secured or optioned mitigation water until reservoir space held by the SWC fills. If the reservoir space does not fill, junior ground water right holders must deliver or assign the secured or optioned mitigation water to the senior water right holders up to the amount of storage space that did not fill.

32. The Director recognizes that his analysis of the obligation for reasonable carryover differs from his analysis for RISD obligations. In predicting RISD shortages, the Director is able to premise his determination on the Joint Forecast. The Director requires junior ground water users to provide the entire RISD shortage because the Joint Forecast allows determination of material injury with reasonable certainty.

33. In the fall of the subsequent irrigation season, the Director cannot, with reasonable certainty, predict material injury to reasonable carryover. As found by the Hearing Officer, "Anticipating the next season of need is closer to faith than science." R. Vol. 37 at 7109.

ORDER

Based upon and consistent with the Findings of Fact and Conclusions of Law, the Director hereby orders that, for purposes of determining material injury to reasonable in-season demand and reasonable carryover, the following steps will be taken:

1. Step 1: By April 1, members of the SWC will submit electronic shape files to the Department delineating the total anticipated irrigated acres for the upcoming year within their water delivery boundary or confirm in writing that the existing electronic shape file submitted by SWC has not varied by more than 5%. Department staff will review submitted shapefiles and modify them as necessary to ensure that: (1) the total acreage count does not exceed the decreed number of acres; (2) all of the irrigated land is located within the decreed place of use; and (3) acres are not counted more than once due to overlapping polygons within a shape file or between shape files submitted by different SWC members. Because the SWC members can best determine the irrigated acres within their service area, the SWC should be responsible for submitting the information to the Department. If this information is not timely submitted, the Department will determine the total irrigated acres based upon past cropping patterns and current satellite and/or aerial imagery. If a SWC member fails or refuses to identify the number of irrigated acres within its service area by April 1, the Department will be cautious about recognizing acres as being irrigated if there is uncertainty about whether the acres are or will be irrigated during the upcoming irrigation season. The Department will electronically post electronic shape files for each member of the SWC for the current water year for review by the parties. In determining the total irrigated acreage, the Department may account for supplemental ground water use. The Department currently does not have sufficient information to accurately determine the contribution of supplemental ground water to irrigate lands irrigated with surface water delivered by the SWC. If and when reliable data is available to the Department, the methodology will be amended to account for the supplemental ground water use.

2. If the acreage count is under reported by more than five percent of the irrigated acreage limit of the water right, then the Department will assess the impact of this reduction in use of the water right on any mitigation requirement.

3. Step 2: Typically within the first two weeks of April, the USBR and USACE issue their Joint Forecast that predicts an unregulated inflow volume at the Heise Gage for the period April 1 through July 31. Within fourteen (14) days after issuance of the Joint Forecast, the Director will predict and issue an April Forecast Supply for the water year for each SWC entity. The Director will compare the April Forecast Supply for each SWC entity to the baseline demand ("BD") for each SWC entity to determine if a demand shortfall ("DS") is anticipated for the upcoming irrigation season. The April Forecast Supply for each SWC entity is the sum of the forecasted natural flow supply and the forecasted storage allocation for each SWC entity. The forecasted natural flow supply will be determined using regression analysis. The forecasted storage allocation will be determined using an analogous year(s).

4. Step 3: The April DS is the volume of mitigation water junior water right holders must actually physically secure for delivery or deliver by other activities, as confirmed by ESPAM 2.1 model simulations, unless adjusted as explained below. If junior ground water users previously secured mitigation water for a reasonable carryover shortfall to an individual SWC member in the previous year, the current-year mitigation obligation to the individual SWC member will be reduced by the quantity of water secured for the reasonable carryover shortfall.

5. By May 1, or within fourteen (14) days from issuance of the values set forth in Step 2, whichever is later in time, junior ground water users will be required to establish, to the satisfaction of the Director, their ability to secure a volume of storage water or to conduct other approved mitigation activities that will deliver water to the injured members of the SWC at the time of need.

6. Step 4: If junior ground water users fail or refuse to submit this information by May 1, or within fourteen (14) days from issuance of the values set forth in Step 2, whichever is later in time, the Director will issue an order curtailing junior ground water users.[10] The ESPA Model will be run to determine the priority date to produce the necessary volume within the area of common ground water supply as described by CM Rule 50.01.

7. If, at any time prior to the Director's final determination of the April Forecast Supply, the Director can determine with certainty that any member of the SWC has diverted more natural flow than predicted, or has accrued more storage than predicted, the Director will revise his initial, projected demand shortfall determination.

8. Step 5: If the storage allocations held by members of the SWC fill, there is no reasonable carryover shortfall. If the storage allocations held by members of the SWC do not fill, within fourteen (14) days following the publication of Water District 01's initial storage

[10] This presumes that any reasonable carryover obligation has been met, and that junior ground water users are not already under prior curtailment from deficiencies in meeting the previous year's obligation.

report, which typically occurs soon after the Day of Allocation,[11] the volume of water secured by junior ground water users to fulfill the reasonable carryover shortfall shall be made available to injured members of the SWC. The amount of reasonable carryover to be provided shall not exceed the empty storage space on the Day of Allocation for that entity. If water is owed in addition to the reasonable carryover shortfall volume, this water shall be delivered or assigned to members of the SWC at the Time of Need, described below. The Time of Need will be no earlier than the Day of Allocation.

9. Step 6: Approximately halfway through the irrigation season, but following the events described in Step 5, the Director will, for each member of the SWC: (1) recalculate RISD; (2) issue a revised Forecast Supply and (3) estimate the Time of Need date.[12]

10. RISD will be calculated utilizing the project efficiency, baseline demand, and the cumulative actual crop water need determined up to that point in the irrigation season. The cumulative CWN volume will be calculated for all land irrigated with surface water within the boundaries of each member of the SWC. Volumetric values of CWN will be calculated using ET and precipitation values from the USBR's AgriMet program, irrigated areas provided by each entity, and crop distributions based on NASS data

11. The Forecast Supply for each SWC is the sum of the year-to-date actual natural flow diversions, the forecasted natural flow supply for the remainder of the season, and the storage allocation for each member of the SWC. The forecasted natural flow supply for the remainder of the season will be based on regression analysis. The storage allocation will be based on the actual preliminary storage allocations issued by the BOR and Water District 01. If the BOR and Water District 01 have not yet allocated stored water to spaceholders, the Department will predict the storage allocations based on an analogous year(s).

12. The calendar day determined to be the Time of Need is established by predicting the day in which the remaining storage allocation will be equal to reasonable carryover, or the difference between the 06/08/12 average demand and the 02/04 supply. The Time of Need will not be earlier than the Day of Allocation.

13. This information will be used to recalculate RISD and adjust the projected DS for each member of the SWC. The Director will then issue revised RISD and DS values. Any increase to the projected DS for each SWC entity is an additional mitigation obligation of the junior ground water users.

14. Upon a determination of an additional mitigation obligation, junior ground water users will be required to establish, to the satisfaction of the Director, their ability to secure a volume of storage water or to conduct other approved mitigation activities that will deliver the

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[11] The Day of Allocation is the time in the irrigation season when the Water District 01 watermaster is able to issue allocations to storage space holders after the reservoir system has achieved its maximum physical fill, maximum water right accrual, and any excess spill past Milner Dam has ceased. Tr. p. 902, lns. 7-25; p. 903, lns. 1-10.

[12] At the earliest established Time of Need for any member of the SWC, junior ground water users are required to provide remaining mitigation to all materially injured members of the SWC.

additional mitigation obligation water to the injured members of the SWC at the time of need. If junior ground water users fail or refuse to submit this information within fourteen (14) days from issuance of a Step 6 order, the Director will issue an order curtailing junior ground water users.[13] The ESPA Model will be run to determine the priority date to produce the necessary additional mitigation obligation volume within the area of common ground water supply, as described by CM Rule 50.01.

15. Step 7: Shortly before the estimated Time of Need, but following the events described in Steps 5 and 6, the Director will, for each member of the SWC: (1) recalculate RISD; (2) issue a revised Forecast Supply; and (3) establish the Time of Need. The revised Forecast Supply for each SWC entity is the sum of the year-to-date actual natural flow diversions, the forecasted natural flow supply for the remainder of the season, and the storage allocation for each member of the SWC. The forecasted natural flow supply for the remainder of the season will be based on analogous years with similar Blackfoot to Milner reach gains. The storage allocation will be based on the actual preliminary storage allocations issued by the BOR and Water District 01.

16. This information will be used to recalculate RISD and adjust the projected DS for each member of the SWC. RISD will be calculated utilizing the project efficiency, baseline demand, and the cumulative actual crop water need determined up to that point in the irrigation season. The Director will then issue revised RISD and DS values.

17. Step 8: At the Time of Need, junior ground water users are required to deliver to each injured member of the SWC the Step 7 revised DS calculated at the Time of Need. Alternatively, any additional mitigation obligation calculated in Step 6 and Step 7 can be satisfied from the each SWC member's reasonable carryover if (a) the reasonable carryover exceeds the additional mitigation obligation, and (b) the junior ground water users secure sufficient water to replace the reasonable carryover.

18. The Director will review, at the end of the season, the volume and efficiencies of application of surface water, the amount of mitigation water delivered by junior ground water users, and may, in the exercise of his professional judgment, readjust the reasonable carryover shortfalls to reflect these considerations.

19. Step 9: Following the end of the irrigation season (on or before November 30), the Department will determine the total actual volumetric demand and total actual crop water need for the entire irrigation season. This information will be used for the analysis of reasonable carryover shortfall, selection of future baseline years, and for the refinement and continuing improvement of the method for future use.

20. On or before November 30, the Department will issue estimates of actual carryover and reasonable carryover shortfall volumes for all members of SWC. These estimates will be based on, but not limited to, the consideration of the best available water diversion and

[13] This presumes that any reasonable carryover obligation has been met, and that junior ground water users are not already under prior curtailment from deficiencies in meeting the previous year's obligation.

storage data from Water District 01, return flow monitoring, comparative years, and RISD. These estimates will establish the obligation of junior ground water users in providing water to the SWC for reasonable carryover shortfall. Fourteen (14) days following the issuance by the Department of reasonable carryover short fall obligations, junior ground water users will be required to establish, to the satisfaction of the Director, their ability to supply a volume of storage water or to conduct other approved mitigation activities that will provide water to the injured members of the SWC equal to the reasonable carryover shortfall for all injured members of the SWC. If junior ground water users cannot provide this information, the Director will issue an order curtailing junior ground water rights.

IT IS FURTHER ORDERED that the amended Final Order supersedes the Final Order issued April 7, 2010 and the Amended Final Order issued June 16, 2010.

IT IS FURTHER ORDERED that pursuant to sections 67-5270 and 67-5272, Idaho Code, any party aggrieved by the final order or orders previously issued by the Director in this matter may appeal the final order and all previously issued orders in the matter to district court by filing a petition in the district court of the county in which a hearing was held, the final agency action was taken, the party seeking review of the order resides, or the real property or personal property that was the subject of the agency action is located. The appeal must be filed within twenty-eight (28) days: (a) of the service date of the final order; (b) of an order denying petition for reconsideration; or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration, whichever is later. *See* Idaho Code § 67-5273. The filing of an appeal to district court does not in itself stay the effectiveness or enforcement of the order under appeal.

Dated this 16th day of April, 2015.

GARY SPACKMAN
Director

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 17TH day of April, 2015, the above and foregoing, was served by the method indicated below, and addressed to the following:

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Deborah Gibson
Administrative Assistant to the Director

EXPLANATORY INFORMATION TO ACCOMPANY A FINAL ORDER

(To be used in connection with actions when a hearing was **not** held)

(Required by Rule of Procedure 740.02)

The accompanying order is a "**Final Order**" issued by the department pursuant to section 67-5246, Idaho Code.

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a final order within fourteen (14) days of the service date of this order as shown on the certificate of service. **Note: The petition must be received by the Department within this fourteen (14) day period.** The department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See section 67-5246(4), Idaho Code.

REQUEST FOR HEARING

Unless the right to a hearing before the director or the water resource board is otherwise provided by statute, any person who is aggrieved by the action of the director, and who has not previously been afforded an opportunity for a hearing on the matter shall be entitled to a hearing before the director to contest the action. The person shall file with the director, within fifteen (15) days after receipt of written notice of the action issued by the director, or receipt of actual notice, a written petition stating the grounds for contesting the action by the director and requesting a hearing. See section 42-1701A(3), Idaho Code. **Note: The request must be received by the Department within this fifteen (15) day period.**

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, any party aggrieved by a final order or orders previously issued in a matter before the department may appeal the final order and all previously issued orders in the matter to district court by filing a petition in the district court of the county in which:

i. A hearing was held,
ii. The final agency action was taken,
iii. The party seeking review of the order resides, or
iv. The real property or personal property that was the subject of the agency action is located.

The appeal must be filed within twenty-eight (28) days of: a) the service date of the final order, b) the service date of an order denying petition for reconsideration, or c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration, whichever is later. See section 67-5273, Idaho Code. The filing of an appeal to district court does not in itself stay the effectiveness or enforcement of the order under appeal.