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**MEMORANDUM**

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**Subject: Bear River Basin Plan  
STORAGE SUMMARY**

**Date:** July 20, 2000

**Introduction:** This memorandum is intended to summarize Wyoming storage issues on the Bear River. Existing storage is documented and Bear River Compact limitations discussed. More detailed information relative to reservoirs deemed to be significant for the purposes of this study is provided in separate technical memorandums for those specific storage facilities.

**Bear River Compact Limitations:** Article VI of the Amended Bear River Compact addresses the allocation of Bear River storage in Wyoming as follows (bold highlights added):

**“ARTICLE VI**

*A.. Existing storage rights in reservoirs constructed above Stewart Dam prior to February 4, 1955 are as follows:*

<i>Idaho</i>	<i>324 acre-feet</i>
<i>Utah</i>	<i>11,850 acre-feet</i>
<b><i>Wyoming</i></b>	<b><i>2,150 acre-feet</i></b>

*Additional rights are hereby granted to store in any water year above Stewart Dam, 35,500 acre-feet of Bear River water and no more under this paragraph for use in Utah and Wyoming; and to store in any water year in Idaho or Wyoming on Thomas Fork 1,000 acre-feet of water for use in Idaho. Such additional storage rights shall be subordinate to, and shall not be exercised when the effect thereof will be to impair or interfere with:*

- (1) existing direct flow rights for consumptive use in any river division and*
- (2) existing storage rights above Stewart Dam, but shall not be subordinate to any right to store water in Bear Lake or elsewhere below Stewart Dam.*

*One-half of the 35,500 acre-feet of additional storage right above Stewart Dam so granted to Utah and Wyoming is hereby allocated to Utah, and the remaining one-half thereof is allocated to Wyoming.*

*B. In addition to the rights defined in paragraph A. of this article, further storage entitlements above Stewart Dam are hereby granted. Wyoming and Utah are granted an additional right to store in any year 70,000 acre-feet of Bear River water for use in Utah and Wyoming to be divided equally; and Idaho is granted an additional right to store 4,500 acre-feet of Bear River water in Wyoming or Idaho for use in Idaho. Water rights granted under this paragraph and water appropriated, including ground water tributary to Bear River, which is applied to*

**beneficial use on or after January 1, 1976, shall not result in an annual increase in depletion of the flow of the Bear River and its tributaries above Stewart Dam of more than 28,000 acre-feet in excess of the depletion as of January 1, 1976. Thirteen thousand (13,000) acre-feet of the additional depletion above Stewart Dam is allocated to each of Utah and Wyoming, and two thousand (2,000) acre-feet is allocated to Idaho.**

The additional storage rights provided for in this paragraph shall be subordinate to, and shall not be exercised when the effect thereof will be to impair or interfere with:

- (1) existing direct flow rights for consumptive use in any river division and
- (2) existing storage rights above Stewart Dam, but shall not be subordinate to any right to store water in Bear Lake or elsewhere below Stewart Dam; provided, however, there shall be no diversion of water to storage above Stewart Dam under this paragraph B. when the water surface elevation of Bear Lake is below 5,911.00 feet, Utah Power & Light Company datum (the equivalent of elevation 5,913.75 feet based on the sea level datum of 1929 through the Pacific Northwest Supplementary Adjustment of 1947). Water depletions permitted under this paragraph B. shall be calculated and administered by a commission-approved procedure.

**C. In addition to the rights defined in article VI, paragraphs A. and B., Idaho, Utah and Wyoming are granted the right to store and use water above Stewart Dam that otherwise would be bypassed or released from Bear Lake at times when all other direct flow and storage rights are satisfied. The availability of such water and the operation of reservoir space to store water above Bear Lake under this paragraph shall be determined by a commission-approved procedure. The storage provided for in this paragraph shall be subordinate to all other storage and direct flow rights in the Bear River. Storage rights under this paragraph shall be exercised with equal priority on the following basis: six (6) percent thereof to Idaho; forty-seven (47) percent thereof to Utah; and forty-seven (47) percent thereof to Wyoming.**

**D. The waters of Bear Lake below elevation 5,912.91 feet, Utah Power & Light Company Bear Lake datum (the equivalent of elevation 5915.66 feet based on the sea level datum of 1929 through the Pacific Northwest Supplementary Adjustment of 1947) shall constitute a reserve for irrigation. The water of such reserve shall not be released solely for the generation of power, except in emergency, but after release for irrigation it may be used in generating power if not inconsistent with its use for irrigation. Any water in Bear Lake in excess of that constituting the irrigation reserve may be used for the generation of power or for other beneficial uses. As new reservoir capacity above the Stewart Dam is constructed to provide additional storage pursuant to paragraph A. of this article, the commission shall make a finding in writing as to the quantity of additional storage and shall thereupon make an order increasing the irrigation reserve in accordance with the following table:**

<u>Additional storage acre-feet</u>	<u>Lake surface elevation Utah Power &amp; Light Company Bear Lake datum</u>
5,000	5,913.24
10,000	5,913.56
15,000	5,913.87
20,000	5,914.15
25,000	5,914.41
30,000	5,914.61
35,500	5,914.69
36,500	5,914.70

*E. Subject to existing rights, each state shall have the use of water, including ground water, for ordinary domestic, and stock watering purposes, as determined by state law and shall have the right to impound water for such purposes in reservoirs having storage capacities not in excess, in any case, of 20 acre-feet, without deduction from the allocation made by paragraphs A., B. and C. of this article.*

*F. The storage rights in Bear Lake are hereby recognized and confirmed subject only to the restrictions herein before recited.”*

**Pre-1955 (pre-compact) Wyoming Storage in Bear River Drainage:** Below is a listing of all Pre-1955 compact reservoirs that were permitted in the Bear River Basin in Wyoming. Article VI of the Bear River Compact recognizes 2150 acre-feet of storage rights associated with reservoirs constructed in Wyoming prior to 1955. However, the total storage actually constructed prior to 1955 equals 3,284.43 acre-feet. This storage is summarized below.

<b>PRE-COMPACT DEVELOPED STORAGE</b>				
<b>Reservoir</b>	<b>Permit Number</b>	<b>Priority</b>	<b>Source</b>	<b>Volume (acre-feet)</b>
Pacific Fruit Express	2048R	01-19-1911	Bear River	118
Noblitt No. 1	1669R	09-21-1907	Erwin Creek	31.2
Noblitt No. 4	1672R	09-21-1907	Erwin Creek	10.5
Noblitt No. 2	1670R	09-21-1907	Potatoe Creek	18
Noblitt No. 3	1671R	09-25-1907	Potatoe Creek	24.5
Reed Upper	6095R	12-17-1953	Garrett Sprgs, Birch Creek	8.55
Reed Lower	6096R	12-17-1953	Garrett Sprgs, Birch Creek	21.3
Quealy Sheep – Q.P.	2753R	10-12-1914	Birch Cr. Springs	97.1
Noblitt – Poison Cr. Res.	1590R	8-2-1909	Poison Creek	21.5
Hawkins Cr. Res.	1841R	6-29-1910	Hawkins Creek	14.1
Frederick No. 1	2213R	6-3-1910	Underwood Creek	1.32
Stoffers Reservoir	2214R	8-16-1910	Wyman Creek	3.74
Holland Reservoir	2379R	10-21-1911	Leeds Creek	65.32
Ellen Reservoir	2673R	6-1-1914	Antelope Creek	12.8
Richey Reservoir	3309R	7-11-1916	Twin Creek	135.95
The Thoman Reservoir	5513R	9-16-1943	Gosseberry Draw	98.08
Rock Reservoir	2748R	10-3-1914	Hartley Creek	72.5
Anna Reservoir	1589R	8-4-1909	Lindon Creek	12
Gus Reservoir	1588R	8-4-1909	Dipper Creek	20
C.H. Smith Reservoir	3370R	10-26-1916	South Fork Twin Creek	84.55
E.W. Smith Reservoir	3398R	10-20-1914	Spring Creek	20.7
Rasmussen Reservoir	3405R	1-4-1917	Springs (Yellow Creek Trib.)	8.25
Crompton Reservoir	4057R	1-20-1928	Pleasant Valley	90.83
Enl. Crompton Reservoir	4616R	11-13-1934	Pleasant Valley	79.46

Enl. Crompton Reservoir	5270R	4-25-1940	Pleasant Valley	208.68
Painter Reservoir	5515R	12-7-1943	Pleasant Valley	167.61
3 <sup>rd</sup> Enl. Crompton Res.	6117R	2-5-1954	Pleasant Valley	406.25
Heber Reservoir	896R	8-21-1906	Willow Creek	388.5
Blake Reservoir	5698R	12-15-1049	Willow Creek	152.71
Myers Reservoir	5064R	3-28-1939	Mill Creek	556.5
<b>Valid Water Permits NOT adjudicated and NOT in Tab Book</b>				
Chesney	3553R	2-3-1919	Thomas Canyon	128.35
Bartek	3221R	11-12-1915	Rock Creek	36.12
Angelo	5703R	9-4-1957	Buyer Creek	29.64
Martin	5544R	11-8-1944	North Sublette Creek	1.25
Larson	5499R	5-28-1943	Pine Creek	3.81
East (A.V. Quinn)	1159R	9-20-1907	Sulphur Creek	125
Maninfior	5559R	10-31-1945	Spring Creek	9.76
<b>TOTAL</b>				<b>3284.43</b>

**Wyoming Storage in the Bear River Basin (1955-1976):** The original 1958 Bear River Compact allocated 17,750 ac-ft of additional storage to Wyoming. From a review of the existing records in the State Engineer's Office (SEO), it appears that the following water users were granted allocations:

<b>ORIGINAL COMPACT ALLOCATED STORAGE</b>		
Reservoir	Permit Number	Allocated Volume (acre-feet)
Sulphur Creek Reservoir	5695R	4103.13
Sulphur Creek Reservoir	6481R	510.41
Sulphur Creek Reservoir	6562R	1100
Woodruff Narrows Res.	6556R	3000
Woodruff Narrows Res.	8060R	250
Whitney Reservoir	Utah Permit	4200
Martin Res. (Bazoo Hollow)	6434r	87.9
Massae Reservoir	6884r	107.5
Enl. Massae Reservoir	6885r	50.69
Wyman Reservoir	6484r	21.88
Needle Rock Reservoir	9603r	100.05
Smiths Fork	TF 18 3/105	4100
Thomas Fork	No App. Filed	55
Keith Putnam (Rabbit Cr.)	UT A-52663	63
<b>TOTAL</b>		<b>17,749.56</b>

**Available Wyoming Bear River Compact Storage:** When the Bear Lake elevation drops below 5911 feet, compact restrictions on storage go into effect as indicated above. These restrictions, however, do not impact storage rights granted under the original 1958 compact. Wyoming’s original compact storage rights include 2150 acre-feet of pre-existing storage and 17,750 acre-feet of additional storage. New storage constructed since the original compact is summarized below:

<b>STORAGE CONSTRUCTED AFTER 1958</b>	
<b>Reservoir</b>	<b>Volume (acre-feet)</b>
Sulphur Creek Reservoir	5714
Original Woodruff Narrows Allocation	3000
Whitney Reservoir	4200
Martin Reservoir	88
Massae Reservoir	108
Enl Massae Reservoir	51
Wyman Reservoir	22
Additional Woodruff Narrows Allocation	250
Ben Reservoir	*
<b>TOTAL</b>	<b>13,433</b>

*\* The Ben Reservoir was originally permitted in 1995 for storage of Green River Basin water. In 1997, an enlargement was filed (permit # 10657E) to also allow water from the East Branch of LaChapelle Creek in the Bear River Basin as an additional supply. Permit #10657E defines the Bear River allocation of Ben Reservoir as being “Under Amended Bear River compact, Article VI, B for irrigation - 300.29 ac-ft of annual storage, and 150.15 ac-ft of annual depletion...” This storage right, therefore, is subordinate to direct flow rights and Bear Lake elevation requirements as defined in the amended Bear River Compact.*

It should be noted that the Needle Rock Reservoir on Yellow Creek has been approved, but was not constructed. In addition, Keith Putnam elected not to construct a reservoir on Rabbit Creek and has been granted the right to transfer his compact depletion to other lands. As no storage is now going to be constructed by Putnam, the 63 acre-feet allocation under the 1958 Compact is available for re-allocation. It should also be noted that an application is still pending for the Ferney Glade Reservoir on the Smiths Fork which was filed on 8-1-1960 for 5201 acre-feet of storage. The 4,100 acre-feet allocated to Smiths Fork was primarily intended for this project. In addition, no development has occurred on the Thomas Fork in Wyoming. Hence, Wyoming’s remaining 1958 Compact allocation can be calculated as follows:

Smiths Fork	4,100 acre-feet
Thomas Fork	55
Putnam Allocation	63
Needle Rock Allocation	<u>100.05</u>
	<b>4318.05 acre-feet</b>

As listed above, the pre-compact (pre-1955) storage developed in Wyoming totals 3284.43 acre-feet (although only 2150 acre-feet is recognized by the Bear River Compact). This, combined with the 13,433 acre-feet of storage developed under the 1958 compact, totals 16,717.43 acre-feet of storage that can be filled in Wyoming when the Bear Lake level drops below 5911 feet in elevation. In addition, Wyoming has allowed Woodruff Narrows, Broadbent Reservoir, and Sulphur Creek Reservoir to temporarily store a portion of the above 4318.05 acre-feet when Bear Lake levels dropped below elevation 5911 in the early 1990's.

**Sulphur Creek Reservoir and Woodruff Narrows Reservoir:** The largest Wyoming reservoirs in the Bear River Basin (and hence most significant from a regulatory standpoint) are Sulphur Creek and Woodruff Narrows.

Because of the storage limitations imposed by the original 1958 and amended 1980 Bear River Compacts, there is some flexibility beyond a strict priority basis for the storage of these facilities and the other facilities receiving Compact storage waters. As other facilities are built, this analysis will have to be redone to determine their impact on Sulphur Creek and Woodruff Narrows. The following table reflects the order of filling the two reservoirs under existing Wyoming permits based on water rights priority dates:

<b>RESERVOIR FILLING ORDER (by priority dates)</b>		
<b>Reservoir Filing</b>	<b>Priority</b>	<b>Volume (acre-feet)</b>
Original Sulphur Creek	2-14-1950	4103.13
1 <sup>st</sup> Enlargement Sulphur Creek	08-21-1958	510.41
2 <sup>nd</sup> Enlargement Sulphur Creek	10-1-1958	1528.85
Original Woodruff Narrows	8-3-1959	28,100
1 <sup>st</sup> Enlargement Woodruff Narrows (8060R)	7-25-1975	24,667
1 <sup>st</sup> Enlargement Woodruff Narrows (8061R)	8-6-1979	4523
3 <sup>rd</sup> Enlargement Sulphur Creek	9-8-1982	4261
3 <sup>rd</sup> Enlargement Sulphur Creek Pipeline	10-31-1986	9370

*Note: Sulphur Creek pipeline has a priority of 9/8/1982 if taken from Sulphur Creek and 10/31/1986 if taken from the Bear River through the pipeline.*

Since the enlargement of Woodruff Narrows is senior to the third enlargement of Sulphur Creek, no Amended Compact storage would occur in Sulphur Creek until Woodruff Narrows had taken its total annual maximum amount. It is clearly a desirable operational strategy to hold as much water high in the basin as possible, Compact storage to Woodruff Narrows and Sulphur Creek reservoirs is typically filled on a proportional basis by type of Compact allocation for that reason. The following represents the maximum annual amounts that can be stored in any one year under the reservoir permits.

<b>RESERVOIR FILLING (by proportion)</b>		
Reservoir Filing	Priority	Volume (acre-feet)
<b><u>1958 Compact Allocation</u></b>		
Original Sulphur Creek	2-14-1950	4103.13
1 <sup>st</sup> Enlargement Sulphur Creek	08-21-1958	510.41
2 <sup>nd</sup> Enlargement Sulphur Creek	10-1-1958	1100
Subtotal		5714 (23.6%)
Woodruff Narrows	8-3-1959	18,240
1 <sup>st</sup> Enlargement Woodruff Narrows	7-25-1975	250
Subtotal		18,490 (76.4%)
<b><u>Amended Compact Allocation</u></b>		
1 <sup>st</sup> Enlargement Woodruff Narrows	7-25-1975	20,960 (67%)
3 <sup>rd</sup> Enlargement Sulphur Creek	9-8-1982	10,315 (33%)

The Bear River Compact allows for “carryover” storage to occur when there was sufficient water and when facilities are not drawn down such that the annual maximum storage is not sufficient to fill the reservoir. The following carryover amounts are specified under the various permits:

<b>CARRYOVER STORAGE SUMMARY</b>		
<b>Reservoir Filing Permit No.</b>	<b>Volume (acre-feet)</b>	<b>Comments</b>
<b><u>Sulphur Creek</u></b>		
6562R	428.85	<i>Carryover (or surplus under 9222R)</i>
9222R	2830.33	<i>Carryover or surplus</i>
<b><u>Woodruff Narrows</u></b>		
6556R	700	<i>Carryover - Wyoming</i>
6556R	3560	<i>Carryover - Utah</i>
8060R	985.09	<i>Carryover - Wyoming</i>
8060R	2481.91	<i>Carryover - Utah</i>
8061R	768.91	<i>Carryover - Wyoming</i>
8061R	3754.09	<i>Carryover - Utah</i>

**Detailed Reservoir Data:** Detailed data for the Sulphur Creek, Woodruff Narrows, Whitney, Ben, and Broadbent Reservoirs can be found in the respective technical memorandums for those facilities. These facilities were chosen based on their size and relative significance in the basin. The Ben and Broadbent Reservoirs are interesting in that they are permitted to utilize Green River Basin water for filling.

***References:***

1. *Bear River Compact as Amended, Amended Compact Unanimously Approved December 22, 1978 by Duly Appointed Commissioners from those states of Idaho, Utah, and Wyoming, Ratified by the Legislatures of all 3 states in 1979, Congressional Consent Public Law 96-189 February 8, 1980.*
2. *Sue Lowry, Summary of 1958 Bear River Compact Allocations, October 1990*