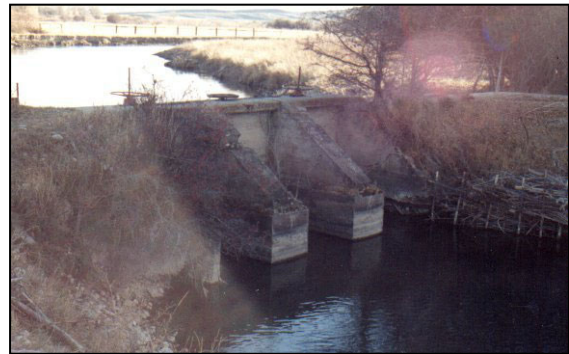


MEMORANDUM

**Subject: Bear River Basin Plan
Key Structures and Diversions
CHAPMAN CANAL DIVERSION**

Date: August 7, 2000

Diversion Description: The headgate structure consists of an older concrete headwall with three 5-foot slide gates. Water is diverted using a driven pile dam structure cemented into the river bottom.



Chapman Canal Diversion

Diversion Location: Diversion is on the Upper Bear in Wyoming as shown in the location map hereafter. Irrigated lands include Utah (not shown).

Latitude N 41° 19' 68.7"
Longitude W 111° 00' 56.6"

Conveyance Description: Open channel canal, approximately 31,680 feet in length.¹

Direct Flow Water Rights:²

Priority Date	Permit Number	Permitted Use	Permitted Acres	Flow (CFS)	Cumulative (CFS)	Comments
10-01-1871	TERR	Irrigation	35	0.50	0.50	(Bartlett)
10-01-1871	TERR	Irrigation	66	0.94	1.44	(Bartlett)
10-01-1880	TERR	Irrigation	30	0.42	1.86	(Morris Irr – Upper)
10-01-1880	TERR	Irrigation	64	0.91	2.77	(Morris Irr – Upper)
10-01-1880	TERR	Irrigation	98	1.40	4.17	(Morris Irr – Upper)
10-01-1880	TERR	Irrigation	15	0.21	4.38	(Morris Irr – Upper)
10-01-1880	TERR	Irrigation	15	0.21	4.59	(Morris Irr – Upper)
10-01-1880	TERR	Irrigation	56	0.80	5.39	(Morris Irr – Upper)
10-01-1880	TERR	Irrigation	40	0.57	5.96	(Morris Irr – Upper)
08-13-1886	TERR	Irrigation, Storage	1155	16.46	22.42	
08-13-1886	TERR	Irrigation, Storage	6892	98.46	120.88	134 CFS state line cap

08-28-1905	(Utah)	Irrigation RS, O	6900 A/F	134	254.88	(Neponset Reservoir) 134 CFS state line cap
04-12-1912	2622E	Irrigation	40	0.57	255.45	
05-03-1912	2577E	Irrigation	285	4.07	259.52	134 CFS state line cap
05-21-1912	2593E	Irrigation	712	10.17	269.69	134 CFS state line cap
02-06-1913	2758E	Irrigation	55	0.79	270.48	
02-25-1959	6001E	RS?		19.1 A/F		(Dry Lake Reservoir) 134 CFS state line cap

Bear River Compact: The Amended Bear River Compact specifically references water rights in the Chapman Canal. Article X of the Compact states:

ARTICLE X

A. The following rights to the use of Bear River water carried in interstate canals are recognized and confirmed.

<i>Name of Canal</i>	<i>Date of Priority</i>	<i>Primary Right (Second-feet)</i>	<i>Lands Irrigated (Acres)</i>	<i>State</i>
<i>Hilliard East Fork</i>	<i>1914</i>	<i>28.00</i>	<i>2644</i>	<i>Wyoming</i>
<i>Chapman</i>	<i>8-13-86</i>	<i>16.46</i>	<i>1155</i>	<i>Wyoming</i>
	<i>8-13-86</i>	<i>98.46</i>	<i>6892</i>	<i>Wyoming</i>
	<i>4-12-12</i>	<i>0.57</i>	<i>40</i>	<i>Wyoming</i>
	<i>5-3-12</i>	<i>4.07</i>	<i>285</i>	<i>Utah</i>
	<i>5-12-12</i>	<i>10.17</i>	<i>712</i>	<i>Utah</i>
	<i>2-6-13</i>	<i>0.79</i>	<i>55</i>	<i>Wyoming</i>
	<i>8-28-05</i>	<i>134.00*</i>		
<i>Francis Lee</i>	<i>1879</i>	<i>2.20</i>	<i>154</i>	<i>Wyoming</i>
	<i>1879</i>	<i>7.41</i>	<i>519</i>	<i>Utah</i>

- *Under the right as herein confirmed not to exceed 134 second-feet may be carried across the Wyoming-Utah state line in the Chapman Canal at any time for filling the Neponset Reservoir, for irrigation of land in Utah and for other purposes. The storage right in Neponset Reservoir is for 6,900 acre-feet which is a component part of the irrigation right for the Utah lands listed above.*

Associated Storage Rights:

Reservoir	Shareholder	Volume (Acre-ft)	Est. % of Shares Used this Diversion ³	Comments
Sulphur Creek	Earl Cook	17.5	100%	
Sulphur Creek	Russell Cook	17.5	100%	

Irrigation Practices: Flood Irrigated in Wyoming. ³

Estimated Diversion Efficiency:

Calculated Diversion Efficiency = Conveyance Efficiency X Application Efficiency:

Conveyance Efficiency:	50%
Application Efficiency:	<u>55%</u>
Overall Diversion Efficiency:	27% (Wyoming Portion)

Conveyance efficiency is estimated based on total length of main canal. Application efficiency for flood irrigation and sprinkler irrigation is estimated at 55% and 85% respectively..

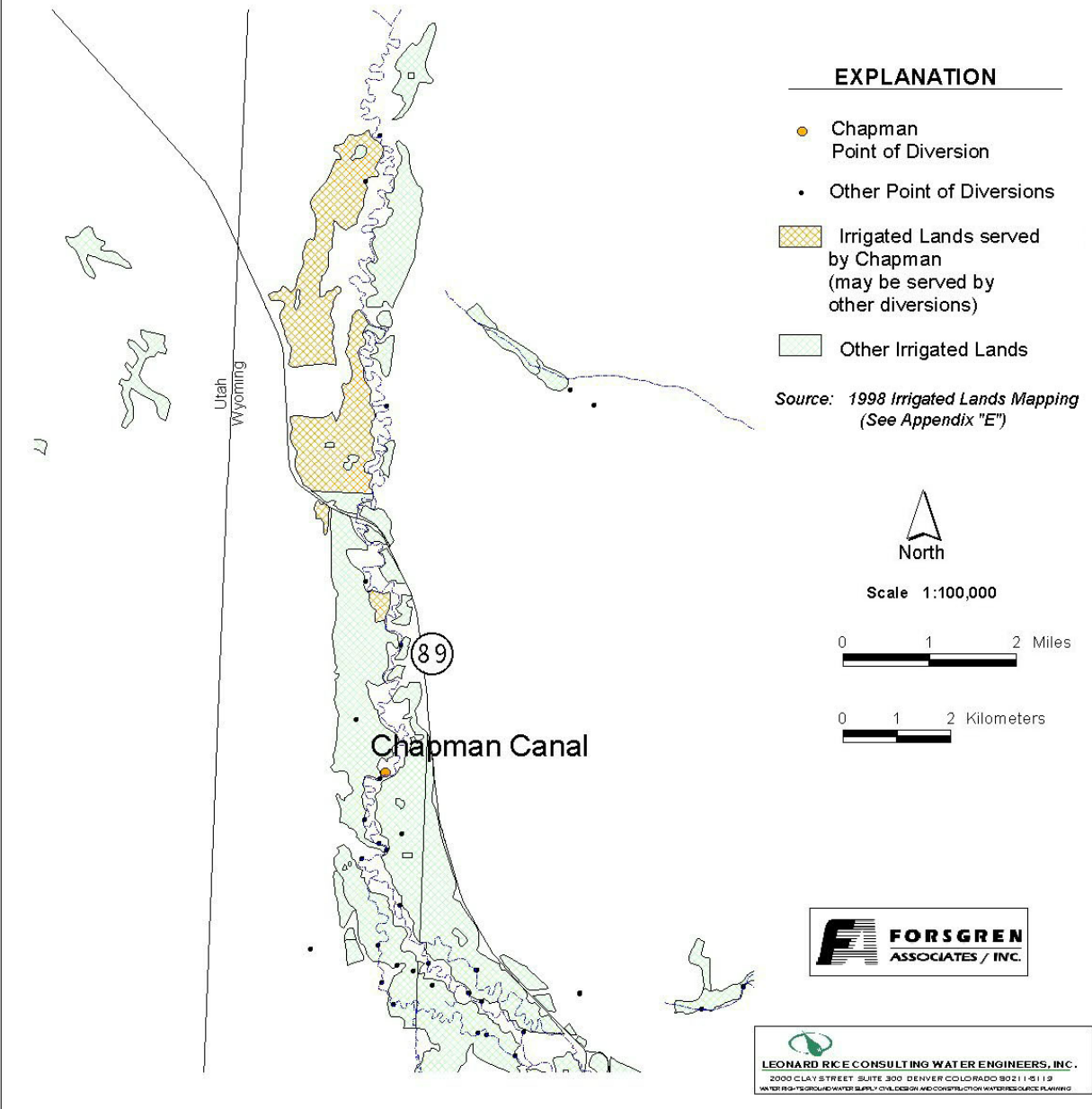
Crop Types / Consumptive Use: Irrigated acreage is primarily meadow grasses with minimal (less than 10%) alfalfa. ³

Return Flows: Return flow is ultimately captured by the Woodruff Narrows. Lower Morris Brothers Ditch also captures significant return flow. Flooding problems are reported in the North Uinta County (Town of Bear River) area (approximately 10 miles north of Evanston) when the Chapman Canal is running full.

The following return flow pattern was adopted for modeling in this study are as follows:

<u>Month</u> <u>(after initial Diversion)</u>	<u>Percent of Return</u>
0	70%
1	20%
2	<u>10%</u>
	100%

Chapman Point of Diversion Location Map



Other Operational Information: The Chapman Canal is a pre-compact inter-state canal. Utah lands are irrigated using Wyoming water rights. The Bear River Compact limits to flow into Utah to 134 CFS. There is a gaging station at the state line that is typically checked bi-weekly from mid-April to October 1st. The Chapman Canal also delivers water to the Neponset Reservoir.³

References:

- 1) *USDA -Soil Conservation Service Economic Research Service-Forest Service in Cooperation with the States of Idaho, Utah, Wyoming, Irrigation Conveyance Systems, Working Paper for the Bear River Basin Type IV Study, Idaho-Utah-Wyoming, April 1976*
- 2) *Water rights summary obtained from State Engineer Interstate Reglist – revised April 14, 1999*
- 3) *Irrigation practices based on field investigation and interview with Mr. Don Shoemaker, Water Hydrographer-Commissioner – November 12,1999.*
- 4) *State of Utah Natural Resources, Water Budget Studies – Utah, Bear River Study Area, September 1994*

**BEAR RIVER WYOMING DIVERSIONS
MONTHLY DIVERSION RECORDS**

CHAPMAN CANAL (Chapman & Bartlett)

YEAR	MAY			JUNE			JULY			AUGUST			SEPTEMBER		
	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft
*1970															
1971	1895	61.1	3758.7	3825	127.5	7586.8	2191	70.7	4345.8	705	22.7	1398.3	1585	52.8	3143.8
1972	1839	59.3	3647.6	2990	99.7	5930.6	1470	47.4	2915.7	795	25.6	1576.9	1075	35.8	2132.2
1973	2447	78.9	4853.6	4462	148.7	8850.2	2835	91.5	5623.1	1767	57.0	3504.8	528	17.6	1047.3
1974	2790	90.0	5533.9	4332	144.4	8592.4	2290	73.9	4542.1	915	29.5	1814.9	518	17.3	1027.4
1975	926	29.9	1836.7	4384	146.1	8695.5	4013	129.5	7959.7	420	13.5	833.1	834	27.8	1654.2
1976	1781	57.5	3532.6	2864	95.5	5680.7	1721	55.5	3413.6	561	18.1	1112.7	486	16.2	964.0
1977	1033	33.3	2048.9	2476	82.5	4911.1	155	5.0	307.4	122	3.9	242.0	185	6.2	366.9
1978	1638	52.8	3248.9	4922	164.1	9762.6	1927	62.2	3822.1	656	21.2	1301.2	731	24.4	1449.9
1979	2713	87.5	5381.2	3160	105.3	6267.8	1012	32.6	2007.3	764	24.6	1515.4	184	6.1	365.0
1980	2074	66.9	4113.7	3512	117.1	6966.0	1821	58.7	3611.9	779	25.1	1545.1	794	26.5	1574.9
1981	2689	86.7	5333.6	3390	113.0	6724.0	1184	38.2	2348.4	290	9.4	575.2	638	21.3	1265.5
1982	2417	78.0	4794.0	4309	143.6	8546.8	2349	75.8	4659.2	138	4.5	273.7	329	11.0	652.6
1983	668	21.5	1325.0	815	27.2	1616.5	2088	67.4	4141.5	124	4.0	246.0	98	3.3	194.4
1984	1600	51.6	3173.6	1294	43.1	2566.6	216	7.0	428.4	216	7.0	428.4	120	4.0	238.0
1985	1726	55.7	3423.5	2576	85.9	5109.4	1124	36.3	2229.4	410	13.2	813.2	294	9.8	583.1
1986	2217	71.5	4397.4	2802	93.4	5557.7	1525	49.2	3024.8	631	20.4	1251.6	412	13.7	817.2
1987	2748	88.6	5450.6	2832	94.4	5617.2	980	31.6	1943.8	967	31.2	1918.0	997	33.2	1977.5
1988	3873	124.9	7682.0	2860	95.3	5672.7	1144	36.9	2269.1	527	17.0	1045.3	258	8.6	511.7
1989	3663	118.2	7265.5	3555	118.5	7051.2	2823	91.1	5599.3	1122	36.2	2225.5	514	17.1	1019.5
1990	2556	82.5	5069.8	3858	128.6	7652.2	1524	49.2	3022.8	90	2.9	178.5	58	1.9	115.0
1991	2981	96.2	5912.7	3785	126.2	7507.4	1262	40.7	2503.1	1319	42.5	2616.2	1170	39.0	2320.7
1992	3009	97.1	5968.3	2515	83.8	4988.4	1318	42.5	2614.2	213	6.9	422.5	385	12.8	763.6
1993	2883	93.0	5718.3	5384	179.5	10679.0	2815	90.8	5583.5	964	31.1	1912.1	233	7.8	462.1
1994	4437	143.1	8800.7	2791	93.0	5535.9	706	22.8	1400.3	136	4.4	269.8	89	3.0	176.5
1995	4709	151.9	9340.2	6540	218.0	12971.9	3577	115.4	7094.9	670	21.6	1328.9	514	17.1	1019.5
1996	3412	110.1	6767.6	5197	173.2	10308.1	2194	70.8	4351.7	893	28.8	1771.2	910	30.3	1805.0
1997	4276	137.9	8481.3	4489	149.6	8903.8	2102	67.8	4169.3	1453	46.9	2882.0	660	22.0	1309.1
1998	3005	96.9	5960.3	3671	122.4	7281.3	1428	46.1	2832.4	456.3	14.7	905.1	622	20.7	1233.7

AVERAGES **83.0** **5100.7** **118.6** **7054.8** **57.4** **3527.3** **20.9** **1282.4** **18.1** **1078.2**

Notes: *1. No published records are available for this diversion for 1970
 2. This "pre-compact" canal irrigates lands in Utah (with Wyoming water rights). Only 134 CFS maximum is allowed to flow into Utah (monitored at state line). Historically, this has not been an issue and has not required regulation. Canal ultimately feeds into Neponset Reservoir in Utah.