
MEMORANDUM

**Subject: Bear River Basin Plan
Key Structures and Diversions
CROWN & PINE GROVE DIVERSIONS**

Date: August 7, 2000

Diversion Description: The “Crown Ditch” and “Pine Grove Canal” are separate conveyances with separate headgates. The two canals merge approximately 50 yards downstream of the Crown diversion. There is a divider box located approximately ½ mile further downstream. As a matter of practicality, these two diversions are typically regulated together.



Crown Headgate

The Crown gate structure consists of a 60-inch diameter squash pipe with a slide gate. The Pine Grove gate structure is virtually identical to the Crown.

Diversion Location: Diversions are on the Upper Bear in Wyoming. Irrigated lands are located in Wyoming as shown in the respective location maps hereafter.

Crown:

Latitude N 41° 00' 53.2"
Longitude W 110° 52' 23.9"

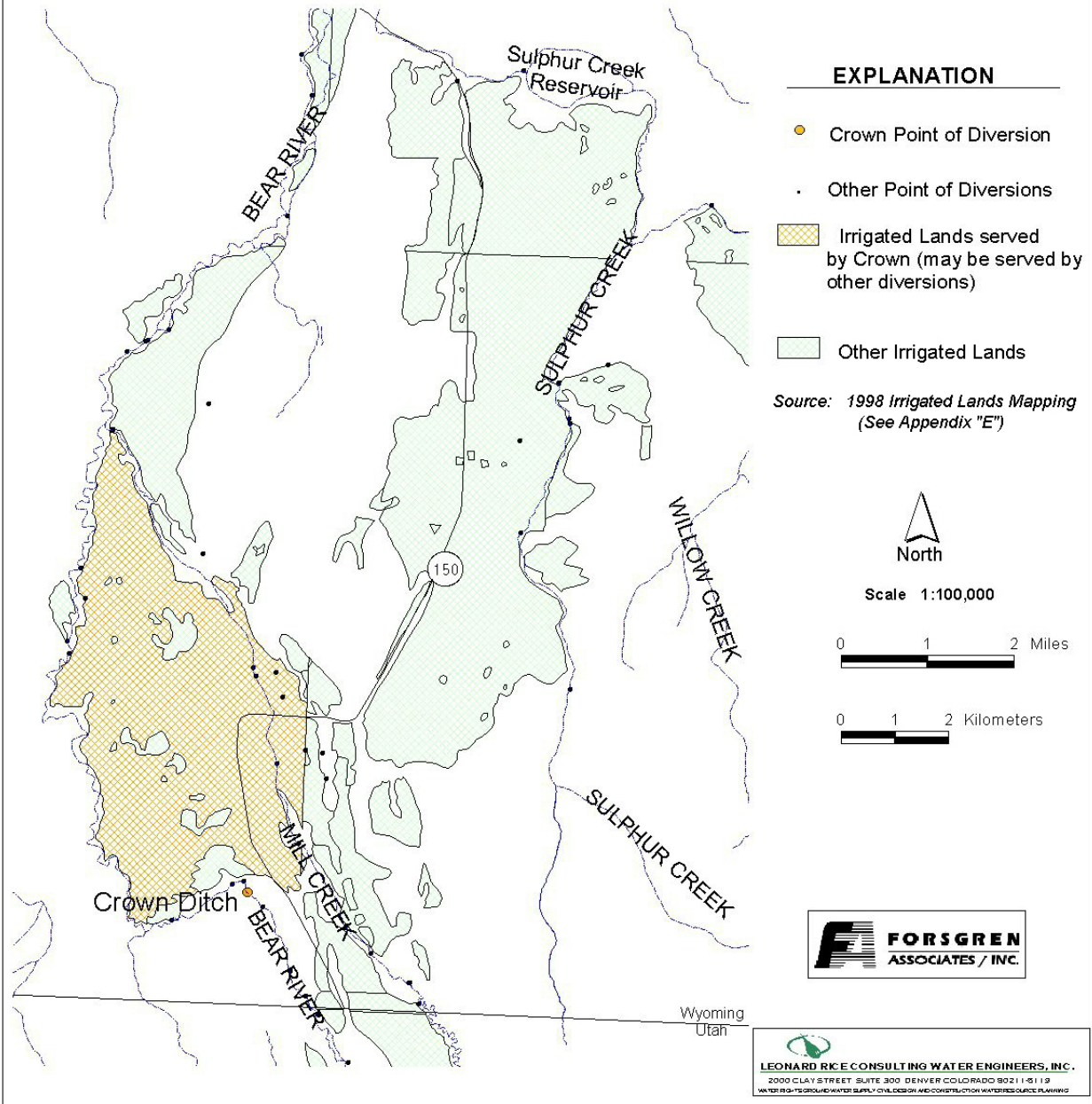
Pine Grove:

Latitude N 41° 00' 57.7"
Longitude W 110° 53' 07.0"

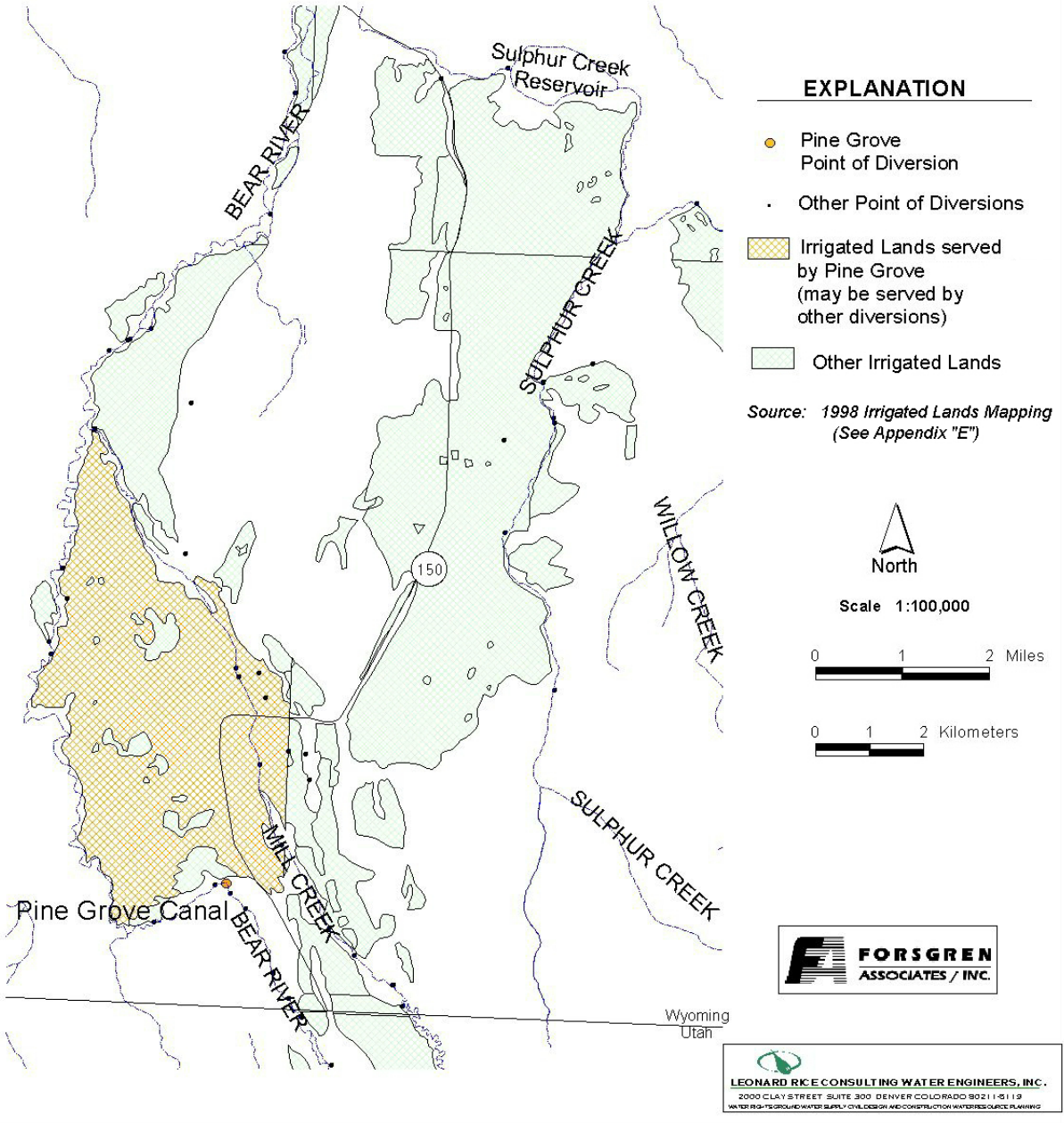
Conveyance Description: Both the Crown and the Pine Grove are open channel canals .

Crown Ditch - Approximately 26,400 feet in length.¹
Pine Grove Canal - Approximately 36,960 feet in length.¹

Crown Point of Diversion Bear River Basin, Wyoming



Pine Grove Point of Diversion Bear River Basin, Wyoming



Direct Flow Water Rights:²

Priority Date	Permit Number	Permitted Use	Permitted Acres	Flow (CFS)	Cumulative (CFS)	Comments
10-05-1890	TERR	Irrigation	20	0.28	0.28	
10-05-1890	TERR	Irrigation	160	2.28	2.56	
10-05-1890	TERR	Irrigation	135	1.92	4.48	
10-05-1890	TERR	Irrigation	365	5.21	9.69	
10-13-1890	TERR	Irrigation	140	2.00	11.69	<i>Pine Grove (lateral)</i>
10-13-1890	TERR	Irrigation	110	1.57	13.26	<i>Pine Grove (lateral)</i>
10-13-1890	TERR	Irrigation	773	11.04	24.30	<i>Pine Grove (lateral)</i>
06-30-1892	25E	Irrigation	15	0.21	24.51	<i>Enl Pine Grove (lateral)</i>
04-13-1903	1021E	Irrigation	155	2.21	26.72	<i>Enl Pine Grove (lateral)</i>
01-06-1908	1864E	Irrigation, Storage	401	5.73	32.45	

Associated Storage Rights:

Reservoir	Shareholder	Volume (Acre-ft)	Est. % of Shares Used this Diversion ³	Comments
Whitney	Ted James	64	100%	
Whitney	Moe Jackson	123.75	25%	
Whitney	Darrell Goodfellow	168.75	50%	
Whitney	Milton Johnson	223.88	100%	
Whitney	J.C. Stauffer	135	100%	
Whitney	Robert Reese	61.75	100%	

Irrigation Practices: Land is all flood irrigated..³

Estimated Diversion Efficiency: Canal losses are relatively high due to porous nature of soils in the higher reaches of the Upper Bear.

Calculated Diversion Efficiency = Conveyance Efficiency X Application Efficiency:

Conveyance Efficiency:	50%
Application Efficiency:	<u>55%</u>
Overall Diversion Efficiency:	27%

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

Crop Types / Consumptive Use: Water is used entirely to irrigate meadow grasses, primarily Timothy, Meadow Foxtail, etc.³

Return Flows: Return flow is split between the Lewis Ditch (approx. 25%), Mill Creek (approx. 25%), and the Meyers No. 2 Ditch (approx. 50%).

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

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

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 6,1999.*
- 4) *State of Utah Natural Resources, Water Budget Studies – Utah, Bear River Study Area, September 1994*

**BEAR RIVER WYOMING DIVERSIONS
MONTHLY DIVERSION RECORDS**

CROWN and PINE GROVE

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	142	4.6	281.7	1212	40.4	2404.0	951	30.7	1886.3	361	11.6	716.0	285	9.5	565.3
1972	318	10.3	630.7	1384	46.1	2745.1	732	23.6	1451.9	311	10.0	616.9	343	11.4	680.3
1973	13	0.4	25.8	869	29.0	1723.6	892	28.8	1769.3	437	14.1	866.8	216	7.2	428.4
1974	147	4.7	291.6	1004	33.5	1991.4	695	22.4	1378.5	504	16.3	999.7	218	7.3	432.4
1975	61	2.0	121.0	942	31.4	1868.4	1048	33.8	2078.7	333	10.7	660.5	275	9.2	545.5
1976	252	8.1	499.8	948	31.6	1880.3	782	25.2	1551.1	385	12.4	763.6	347	11.6	688.3
1977	348	11.2	690.2	584	19.5	1158.3	112	3.6	222.1	60	1.9	119.0	81	2.7	160.7
1978	61	2.0	121.0	886	29.5	1757.4	153	4.9	303.5	383	12.4	759.7	95	3.2	188.4
1979	365	11.8	724.0	921	30.7	1826.8	704	22.7	1396.4	192	6.2	380.8	112	3.7	222.1
1980	0	0.0	0.0	1068	35.6	2118.3	928	29.9	1840.7	414	13.4	821.2	386	12.9	765.6
1981	29	0.9	57.5	989	33.0	1961.7	483	15.6	958.0	264	8.5	523.6	191	6.4	378.8
1982	33	1.1	65.5	1158	38.6	2296.9	917	29.6	1818.8	337	10.9	668.4	365	12.2	724.0
1983	305	9.8	605.0	701	23.4	1390.4	773	24.9	1533.2	320	10.3	634.7	144	4.8	285.6
1984	191	6.2	378.8	709	23.6	1406.3	769	24.8	1525.3	223	7.2	442.3	22	0.7	43.6
1985	683	22.0	1354.7	643	21.4	1275.4	652	21.0	1293.2	192	6.2	380.8	232	7.7	460.2
1986	205	6.6	406.6	1124	37.5	2229.4	763	24.6	1513.4	475	15.3	942.1	131	4.4	259.8
1987	427	13.8	846.9	717	23.9	1422.1	741	23.9	1469.8	276	8.9	547.4	165	5.5	327.3
1988	309	10.0	612.9	778	25.9	1543.1	106	3.4	210.2	67	2.2	132.9	42	1.4	83.3
1989	862	27.8	1709.8	403	13.4	799.3	528	17.0	1047.3	140	4.5	277.7	83	2.8	164.6
1990	236	7.6	468.1	712	23.7	1412.2	637	20.5	1263.5	154	5.0	305.5	172	5.7	341.2
1991	179	5.8	355.0	632	21.1	1253.6	782	25.2	1551.1	270	8.7	535.5	185	6.2	366.9
1992	576	18.6	1142.5	610	20.3	1209.9	344	11.1	682.3	111	3.6	220.2	84	2.8	166.6
1993	170	5.5	337.2	537	17.9	1065.1	506	16.3	1003.6	390	12.6	773.6	142	4.7	281.7
1994	495	16.0	981.8	869	29.0	1723.6	289	9.3	573.2	43	1.4	85.3	57	1.9	113.1
1995	81	2.6	160.7	401	13.4	795.4	628	20.3	1245.6	202	6.5	400.7	274	9.1	543.5
1996	340	11.0	674.4	267	8.9	529.6	394	12.7	781.5	264	8.5	523.6	227	7.6	450.2
1997	341.7	11.0	677.8	609.2	20.3	1208.3	699	22.5	1386.4	151.3	4.9	300.1	268.3	8.9	532.2
1998	52.1	1.7	103.3	383.2	12.8	760.1	656	21.2	1301.2	182.2	5.9	361.4	66.4	2.2	131.7
1999	170	5.5	337.2	658	21.9	1305.1	746	24.1	1479.7	276	8.9	547.4	111	3.7	220.2

AVERAGES

8.2 505.6

26.1 1553.8

20.5 1259.2

8.6 527.8

6.1 363.8

Notes: *1. No published records are available for this diversion for 1970

2. Crown and Pine are two separate diversions with channels merging about 50 yards downstream of Crown. They split about 1/2 mile further downstream. The two canals are typically regulated jointly near the head.