*MEMORANDUM*

**Subject:** **Bear River Basin Plan**
**Key Structures and Diversions**
**SOUTH BRANCH IRRIGATING DIVERSION**

**Date:** August 7, 2000

**Diversion Description:** The South Branch Irrigating headgate consists of a 48-inch culvert with a canal gate. There is no headwall. The bank at the diversion is experiencing significant erosion.

***South Branh Irrigating headgate structure***

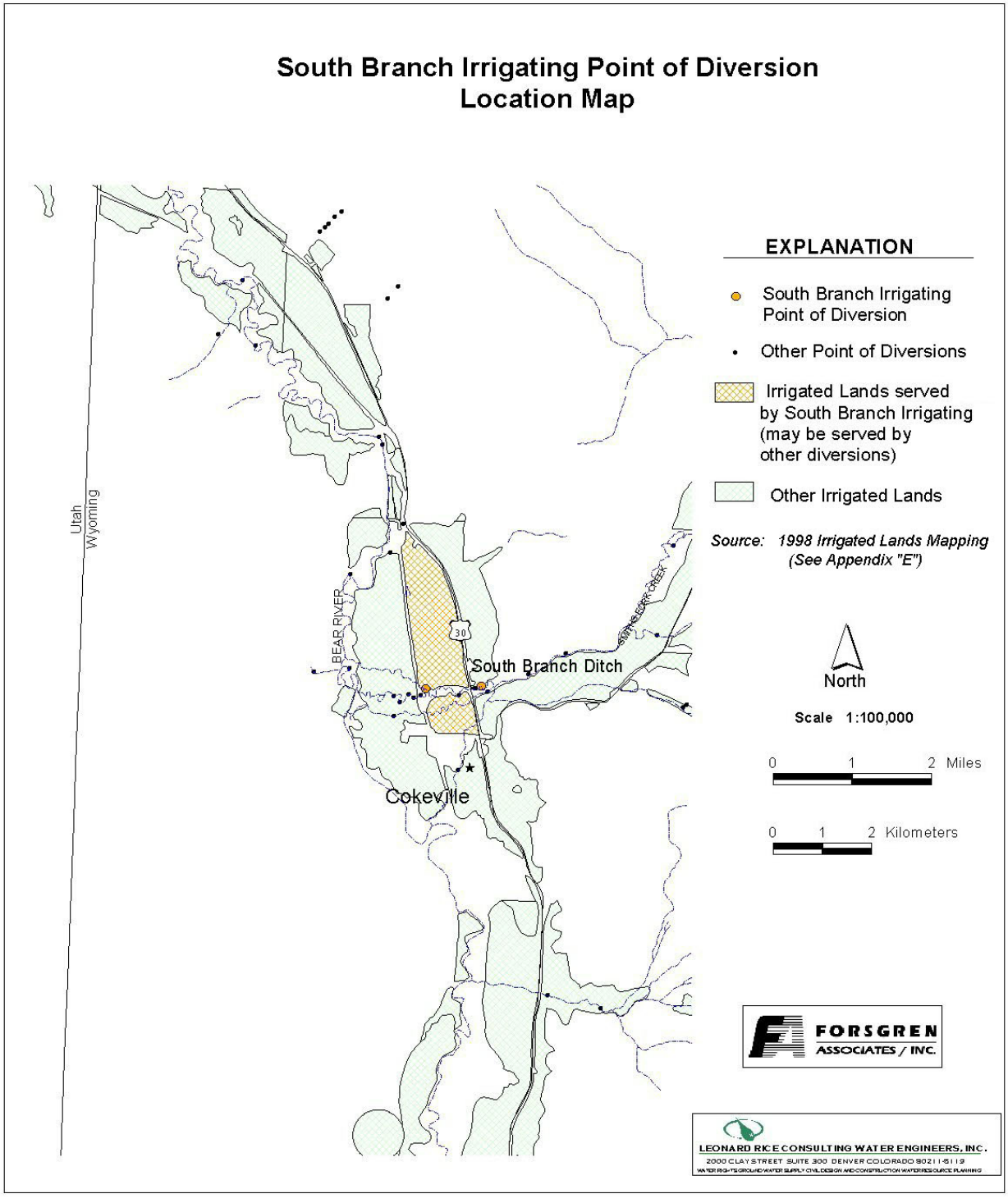
**Diversion Location:** The South Branch Irrigating diversion is actually located on the North Branch of the Smiths Fork, tributary to the Bear River. The Diversion is regulated as part of the Central Division of the Bear River Compact. See location map hereafter.

| | |
|---|---|
| Latitude | N 42° 05' 38.7" |
| Longitude | W 110° 57' 43.9" |

**Conveyance Description:** Open channel canal, approximately 10,560 feet in length.[1]

**Direct Flow Water Rights:**[2]

| Priority Date | Permit Number | Permitted Use | Permitted Acres | Flow (CFS) | Cumulative (CFS) | Comments |
|---|---|---|---|---|---|---|
| 06-16-1887 | TERR | Irrigation, Domestic, Storage | 435 | 6.21 | 6.21 | |
| 05-30-1903 | 1065E | Irrigation, Domestic, Storage | 115 | 1.64 | 7.85 | |
| 08-26-1937 | 5081E | Irrigation | 82 | 1.17 | 9.02 | |


South Branch Irrigating Point of Diversion
Location Map
EXPLANATION
South Branch Irrigating Point of Diversion
Other Point of Diversions
Irrigated Lands served by South Branch Irrigating (may be served by other diversions)
Other Irrigated Lands
Source: 1998 Irrigated Lands Mapping (See Appendix "E")
North
Scale 1:100,000
0 1 2 Miles
0 1 2 Kilometers
Utah
Wyoming
BEAR RIVER
30
South Branch Ditch
Cokeville
FORSGREN ASSOCIATES / INC.
LEONARD RICE CONSULTING WATER ENGINEERS, INC.
2000 CLAY STREET SUITE 300 DENVER COLORADO 80211-5119

**Irrigation Practices:** Approximately 60% of the land is irrigated using hand line or wheel roll sprinklers. The remaining 40% is flood irrigated.[3]

**Estimated Diversion Efficiency:**

Calculated Diversion Efficiency = Conveyance Efficiency X Application Efficiency:

| | |
|---|---|
| Conveyance Efficiency: | 60% |
| Application Efficiency: | 70% |
| **Overall Diversion Efficiency:** | **42%** |

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 alfalfa and grain (mostly oats). Crops are rotated.[3]

**Return Flows:** Return flow is received directly into the Bear River.

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

| Month (after initial Diversion) | Percent of Return |
|---|---|
| 0 | 50% |
| 1 | 25% |
| 2 | 15% |
| 3 | 10% |
| | 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. Kevin Wilde, Water Hydrographer-Commissioner – November 30, 1999.*

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

**BEAR RIVER WYOMING DIVERSIONS**
**MONTHLY DIVERSION RECORDS**

## *SOUTH BRANCH IRRIGATING*

***(On the North Channel of Smiths Fork)***

| | MAY | | | JUNE | | | JULY | | | AUGUST | | | SEPTEMBER | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YEAR | 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 | 0 | 0.0 | 0.0 | 988 | 32.9 | 1959.7 | 221 | 7.1 | 438.3 | 191 | 6.2 | 378.8 | 4 | 0.1 | 7.9 |
| 1971 | 0 | 0.0 | 0.0 | 260 | 8.7 | 515.7 | 405 | 13.1 | 803.3 | 471 | 15.2 | 934.2 | 0 | 0.0 | 0.0 |
| 1972 | 0 | 0.0 | 0.0 | 60 | 2.0 | 119.0 | 36 | 1.2 | 71.4 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 1973 | 0 | 0.0 | 0.0 | 313 | 10.4 | 620.8 | 475 | 15.3 | 942.1 | 357 | 11.5 | 708.1 | 335 | 11.2 | 664.5 |
| 1974 | 316 | 10.2 | 626.8 | 624 | 20.8 | 1237.7 | 440 | 14.2 | 872.7 | 338 | 10.9 | 670.4 | 0 | 0.0 | 0.0 |
| 1975 | 749 | 24.2 | 1485.6 | 923 | 30.8 | 1830.7 | 56 | 1.8 | 111.1 | 804 | 25.9 | 1594.7 | 0 | 0.0 | 0.0 |
| 1976 | 227 | 7.3 | 450.2 | 554 | 18.5 | 1098.8 | 42 | 1.4 | 83.3 | 662 | 21.4 | 1313.1 | 30 | 1.0 | 59.5 |
| 1977 | 156 | 5.0 | 309.4 | 170 | 5.7 | 337.2 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 |
| 1978 | 1498 | 48.3 | 2971.2 | 1289 | 43.0 | 2556.7 | 0 | 0.0 | 0.0 | 0 | 0.0 | 0.0 | 181 | 6.0 | 359.0 |
| 1979 | 641 | 20.7 | 1271.4 | 781 | 26.0 | 1549.1 | 491 | 15.8 | 973.9 | 18 | 0.6 | 35.7 | 0 | 0.0 | 0.0 |
| 1980 | 89 | 2.9 | 176.5 | 406 | 13.5 | 805.3 | 435 | 14.0 | 862.8 | 409 | 13.2 | 811.2 | 0 | 0.0 | 0.0 |
| 1981 | 507 | 16.4 | 1005.6 | 639 | 21.3 | 1267.4 | 295 | 9.5 | 585.1 | 126 | 4.1 | 249.9 | 12 | 0.4 | 23.8 |
| 1982 | 821 | 26.5 | 1628.4 | 913 | 30.4 | 1810.9 | 611 | 19.7 | 1211.9 | 319 | 10.3 | 632.7 | 97 | 3.2 | 192.4 |
| 1983 | 911 | 29.4 | 1806.9 | 1930 | 64.3 | 3828.1 | 841 | 27.1 | 1668.1 | 292 | 9.4 | 579.2 | 0 | 0.0 | 0.0 |
| 1984 | 508 | 16.4 | 1007.6 | 1663 | 55.4 | 3298.5 | 694 | 22.4 | 1376.5 | 196 | 6.3 | 388.8 | 30 | 1.0 | 59.5 |
| 1985 | 194 | 6.3 | 384.8 | 744 | 24.8 | 1475.7 | 422 | 13.6 | 837.0 | 0 | 0.0 | 0.0 | 5 | 0.2 | 9.9 |
| 1986 | 1320 | 42.6 | 2618.2 | 2139 | 71.3 | 4242.6 | 1396 | 45.0 | 2768.9 | 371 | 12.0 | 735.9 | 132 | 4.4 | 261.8 |
| 1987 | 365 | 11.8 | 724.0 | 426 | 14.2 | 845.0 | 202 | 6.5 | 400.7 | 76 | 2.5 | 150.7 | 346 | 11.5 | 686.3 |
| 1988 | 502 | 16.2 | 995.7 | 563 | 18.8 | 1116.7 | 260 | 8.4 | 515.7 | 62 | 2.0 | 123.0 | 60 | 2.0 | 119.0 |
| 1989 | 429 | 13.8 | 850.9 | 672 | 22.4 | 1332.9 | 367 | 11.8 | 727.9 | 230 | 7.4 | 456.2 | 180 | 6.0 | 357.0 |
| 1990 | 1314 | 42.4 | 2606.3 | 894 | 29.8 | 1773.2 | 308 | 9.9 | 610.9 | 146 | 4.7 | 289.6 | 0 | 0.0 | 0.0 |
| 1991 | 501 | 16.2 | 993.7 | 403 | 13.4 | 799.3 | 364 | 11.7 | 722.0 | 218 | 7.0 | 432.4 | 153 | 5.1 | 303.5 |
| 1992 | 202 | 6.5 | 400.7 | 180 | 6.0 | 357.0 | 186 | 6.0 | 368.9 | 54 | 1.7 | 107.1 | 0 | 0.0 | 0.0 |
| 1993 | 294 | 9.5 | 583.1 | 775 | 25.8 | 1537.2 | 593 | 19.1 | 1176.2 | 236 | 7.6 | 468.1 | 95 | 3.2 | 188.4 |
| 1994 | 261 | 8.4 | 517.7 | 257 | 8.6 | 509.8 | 136 | 4.4 | 269.8 | 7 | 0.2 | 13.9 | 54 | 1.8 | 107.1 |
| 1995 | 629 | 20.3 | 1247.6 | 636 | 21.2 | 1261.5 | 512 | 16.5 | 1015.5 | 286 | 9.2 | 567.3 | 216 | 7.2 | 428.4 |
| 1996 | 435 | 14.0 | 862.8 | 855 | 28.5 | 1695.9 | 295 | 9.5 | 585.1 | 303 | 9.8 | 601.0 | 155 | 5.2 | 307.4 |
| 1997 | 473.7 | 15.3 | 939.6 | 514.5 | 17.2 | 1020.5 | 286.8 | 9.3 | 568.9 | 381.8 | 12.3 | 757.3 | 246.4 | 8.2 | 488.7 |
| 1998 | 656.2 | 21.2 | 1301.6 | 608.6 | 20.3 | 1207.1 | 338.9 | 10.9 | 672.2 | 454.6 | 14.7 | 901.7 | 262.1 | 8.7 | 519.9 |
| **AVERAGES** | | **15.6** | **957.5** | | **24.3** | **1448.6** | | **11.9** | **732.4** | | **7.8** | **479.3** | | **3.0** | **177.4** |