WOLF CREEK

GARRARD DITCH DIVESION
GRINNELL DITCH DIVERSION ON WOLF CREEK

WOLF CREEK DRAINAGE
INTRODUCTION

BIG PICTURE

Wolf Creek flows out of the east slope of the Bighorn Mountains, between the tributaries of the Big Goose and the Tongue before joining the Tongue in Ranchester. The Tongue flows east out of Ranchester until it turns northeast near Acme, Wyoming, to cross the Montana state line approximately seven miles. Once in Montana, the Tongue runs into the Tongue River Reservoir. Wolf Creek has no storage of any significance to draw upon.

CHARACTERISTICS

Wolf Creek works its way through a predominance of cobble and gravel bars from old river channels, driving up its instream losses.

USAGE

Wolf Creek's diversions are devoted almost entirely to agricultural irrigation.

Regulation

Water commissioners estimate that regulation is imposed on Clear Creek drainage diversions with the following timing:

Wet Yr.	*Avg. Yr.*	*Dry Yr.*
None or last of August	2nd week of July	1st week of July

Agriculture

Growers in the Wolf Creek drainage tend to devote approximately 45 percent of their lands to alfalfa, 35 percent to grass hay, 5 percent grain, and 15 percent corn. Typically, they rotate the alfalfa/grass crop with wheat or oats for a single year to replenish their soils. They tend to use 50 percent ditch-flood irrigation and 50 percent sprinkler irrigation.

The typical irrigation season runs from April 15-May 1 (depending on whether the spring runoff is delayed by colder weather) to mid/early October (depending on when the first snows fall and the ground freezes). All of the irrigators using Wolf Creek practice post-season irrigation, using their full rights to do so.

Double Appropriation

Irrigation water rights with priority dates of March 1, 1945 or earlier are entitled to an additional 1cfs per 70 acres under Wyoming's surplus water statutes. Whenever the supply in a stream exceeds the amount required to satisfy all existing appropriations established prior to March 1, 1985, the stream is said to be in an excess flow condition and water right holders with priorities between March 2, 1945 and March 1, 1985 may use an additional 1 cfs for each 70 acres irrigated.

In Wolf Creek, this practice is limited primarily by the condition of ditches. No diversions on Wolf Creek can divert more than their appropriation.

Permitted Uses

Permits granted for water appropriation are granted for specific uses. The following pages contain tables of permits and their associated uses. The following table provides a key to those uses:

Code	Use
Chem	Chemical
Com	Commercial
Cul	Culinary
D	Domestic
Drl	Drilling
Eng	Steam Engines
Fire	Fire Protection
Fish	Fish Propogation
F.C.	Flood Control
I	Irrigation
Ind	Industrial
I.F.	Instream Flow
Mech	Mechanical
Mfg	Manufacturing
Mil	Milling

Code	Use
Min	Mining
Misc	Miscellaneous
Mun	Municipal
Oil	Oil Refining or Production
P.C.	Pollution Control
Power	Power Development
R.R.	Railroad
Rec	Recreational
Ref	Refining
Res. Supply	Supply Facility for a Reservoir
S	Stock
T	Transportation

WATER RIGHTS

Two water rights summary tables are provided for each diversion serving irrigation referenced here. The first, included in the body of the diversion synopsis, refers to the rights on record with the State Engineer's Office and is derived from that office's *Tabulation of Adjudicated Surface Water Rights of the State of Wyoming, Water Division Number Two* (Oct. 1999).

Because this rights summary is pulled directly from the SEO *Tab,* the rights cited follow the SEO's priority order:

Hierarchy	Format of right	Example
1	Day, Month, Year	05-15-1884
2	Month and Year	05-00-1884
3	Specified Season and Year	Spring 1884
4	Year Only	1884
5	Before Year	Before 1884

Board orders or court orders may also establish a specific priority.

Irrigated Lands Water Rights Database

The second table, which follows the diversion synopsis, is taken from the irrigated lands water rights database developed for the basin plan. It can be used as a reference with the following caveats: It only lists water rights associated with the irrigated lands polygons mapped by HKM. The table does not include nonirrigation rights devoted to reservoir supply, municipal, fish propagation, etc. The rights on this table are associated only with those irrigated lands identified through the course of this study, both actively irrigated and currently idle.

Column Heading Key

PerNo	Permit Number	"Terr" denotes a territorial right.
PerSfx	Permit Suffix	D = direct flow E = enlargement R = reservoir
Facility Name		Parentheses denote the former means of conveyance for the water right.

Unit	Flow or volume	CFS = cubic feet per second AF = acre-feet GPM = gallons per minute
SupTyp	Supply Type	OS = original supply SS = supplement supply, for lands having an original supply from another source Sec = secondary supply, for water stored in a reservoir
Status	Status of adjudication	Adj = adjudicated Una = unadjudicated
Source	Source water	Parentheses denote the permit number of the related storage right.

KEY DIVERSIONS

Diversion: **GARRARD DITCH DIVERSION**

Date: 12 Sep. 2000

Note: The Garrard has a right for more than 10 cfs; it diverts approximately half of that.

Garrard Ditch headgate

Diversion Description: Headgate consists of a single, 5.7 x 2-foot rectangular wooden gate in steel slider operated by a Waterman-type screw mounted in a concrete headwall.

Diversion Location: The Garrard Ditch diversion is located on the main stem of Wolf Creek downstream from the community of Wolf.

Headgate:

Lat.	Long.
N 44° 47' 22.9"	W 107° 13' 6.2"

Conveyance Description: Open channel canal, approximately 2.3 mi. long with two siphons under creek crossings.

Direct Flow Water Rights: A summary of the direct-flow rights on Wolf Creek follows:

Permit	Priority Date	Permitted Use	Acres	Flow (cfs)	Cumulative (cfs)
Terr.	04-00-1883	I	750	10.71	10.71
7204E	11-05-1997	S		0.05	10.76

Associated Storage Rights: None

Agricultural Practices: See introduction to Wolf Creek drainage

Irrigation Practices: See introduction to Wolf Creek drainage

Return Flows: Estimated percentage of total diversion developing into return flows:

Destination	Wet yr.	Mid yr.	Dry yr.
Wolf Creek	10	7	5

Losses: Typical (10 percent) by the end of the ditch

References: Pat Boyd, water commissioner, State Engineer's Office, interview, 12 Sept. 2000

Irrigated Lands Water Rights Database

PerNo	PerSfx	Facility Name	Priority	Acres	Amount	Unit	SupTyp	Status	Source
Terr	D	Gerrard	April 30, 1883	750	10.71	CFS	OS	Adj	Wolf Creek

Name	Garrard Ditch Diversion
Source	Wolf Creek
District	5
Data	Total monthly flow in AF

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1970													
1971													
1972													
1973													
1974							0.00	0.00	0.00	153.92	374.56	0.00	528.48
1975													
1976													
1977													
1978													
1979													
1980													
1981							0.00	543.06	1034.82	1037.38	489.23	257.19	3361.68
1982							0.00	377.30	1006.81	817.81	484.09	269.32	2955.33
1983							0.00	0.00	0.00	476.96	448.89	238.13	1163.98
1984							0.00	323.52	572.01	596.23	515.90	117.44	2125.10
1985							0.00	314.94	578.65	524.42	399.40	59.45	1876.86
1986							0.00	387.28	611.49	508.38	266.52	209.26	1982.93
1987							0.00	320.53	580.96	0.00	0.00	0.00	901.49
1988							0.00	389.87	809.82	380.12	96.10	0.00	1675.91
1989													
1990							0.00	238.65	285.98	553.69	302.05	186.74	1567.11
1991							0.00	0.00	0.00	0.00	192.84	60.13	252.97
1992							0.00	469.61	342.78	190.18	375.89	453.55	1832.01
1993							99.91	896.68	559.69	528.46	238.78	177.42	2500.94
1994							0.00	517.81	414.99	358.38	121.51	100.55	1513.24
1995							0.00	52.37	199.64	277.44	185.58	2.98	718.01
1996							0.00	0.00	184.31	148.63	33.71	25.54	392.19
1997							0.00	376.19	579.44	255.10	149.27	77.82	1437.82
1998							0.00	584.56	365.23	224.07	137.28	60.19	1371.33
1999							0.00	0.00	326.48	224.50	78.08	29.65	658.71
Mean							5.26	304.86	444.90	381.88	257.35	122.39	1516.64
Max							99.91	896.68	1034.82	1037.38	515.90	453.55	3361.68
Min							0.00	0.00	0.00	0.00	0.00	0.00	252.97

Notes: 1. Monthly data is derived from spot measurements in the Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980
2. Zero flow is assumed prior to the first and after the last measurement

Name	Garrard Ditch Diversion		
Source	Wolf Creek		
District	5		
Data	First & Last Dates, Max. Days		
Water Year	First Date of Measurement	Last Date of Measurement	Maximum Days Missing
1970			
1971			
1972			
1973			
1974	24-Jul	31-Aug	0
1975			
1976			
1977			
1978			
1979			
1980			
1981	9-May	21-Sep	24
1982	18-May	22-Sep	20
1983	7-Jul	23-Sep	13
1984	15-May	11-Sep	18
1985	15-May	10-Sep	17
1986	14-May	13-Sep	17
1987	16-May	29-Jun	13
1988	18-May	19-Aug	36
1989			
1990	16-May	13-Sep	20
1991	12-Aug	12-Sep	8
1992	7-May	29-Sep	50
1993	22-Apr	29-Sep	21
1994	2-May	30-Sep	27
1995	24-May	1-Sep	29
1996	13-Jun	30-Sep	27
1997	8-May	26-Sep	8
1998	4-May	23-Sep	14
1999	4-Jun	10-Sep	12
Avg.	26-May	12-Sep	20
Earliest	22-Apr	29-Jun	0
Latest	12-Aug	30-Sep	50

Notes: 1. Data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980.

KEY DIVERSIONS

Diversion: **GRINNELL DITCH DIVERSION ON WOLF CREEK**
AKA: Grinnell Livestock Co (on Wolf Creek), Grinnell & Stewart

Date: 12 Sep. 2000


Grinnell Ditch headgate

Note: The Grinnell's direct-flow rights were transferred from Big Goose to the Wolf on 9/13/2000 to allow the owners to tap their supplementary rights in Big Goose Creek. Because of the fractured limestone and gravel in its path and the length and low slope of its channel, this ditch tends to have large instream losses. Water commissioners report that the condition of the headgate and rights have reduced the diversion to approximately 3 cfs.

Diversion Description: Headgate consists of a single, 4.5 x 3.5-foot rectangular steel gate in steel slider raised/lowered by a Waterman-type screw mounted in concrete headwall.

Diversion Location: The Grinnell Ditch diversion is located on the main stem of Wolf Creek just downstream from the community of Wolf.

Headgate:

Lat.	Long.
N 44° 46' 24.4"	W 107° 13' 55.5"

Conveyance Description: Open channel canal, approximately 4.8 mi. long

Direct Flow Water Rights: A summary of the direct-flow rights on Wolf Creek follows:

Permit	Priority Date	Permitted Use	Acres	Flow (cfs)	Cumulative (cfs)
Terr.	09-11-1884	I	1666	23.8	23.8
7182E	09-04-1996	I,Res Supply	427	6.1	29.9

See Note above on actual amount diverted.

Associated Storage Rights: None

Agricultural Practices: See introduction to Wolf Creek drainage

Irrigation Practices: See introduction to Wolf Creek drainage

Return Flows: Estimated percentage of total diversion developing into return flows:

Destination	Wet yr.	Mid yr.	Dry yr.
Wolf Creek	20	15	10

Losses: Approximately 50 percent by the end of the ditch

References: Pat Boyd, water commissioner, State Engineer's Office, interview, 12 Sept. 2000

Irrigated Lands Water Rights Database

PerNo	PerSfx	Facility Name	Priority	Acres	Amount	Unit	SupTyp	Status	Source
Terr	D	Grinnell Live Stock Co's	Sep. 11, 1884	3000	42.86	CFS	OS	Adj	Wolf Creek
Terr	D	Grinnell Live Stock Co.	Sep. 11, 1884	3000	42.86	CFS	OS	Adj	Wolf Creek
Terr	D	Stewart (Grinnell Live Stock Co.)	Dec. 10, 1884	915	13.07	CFS	OS	Adj	Wolf Creek
Terr	D	Stewart (Grinnell Live Stock Co.)	Dec. 10, 1884	915	13.07	CFS	OS	Adj	Wolf Creek
275	E	Enl. Stewart (Grinnell Live Stock Co.)	May 28, 1897	104	1.48	CFS	OS	Adj	Wolf Creek
7182	E	Enl. Grinnell Livestock Company	Sep. 4, 1996	427	6.1	CFS	OS	Adj	Wolf Creek

Name	Grinnell Ditch Diversion on Wolf Creek
Source	Wolf Creek
District	5
Data	Total monthly flow in AF

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1970													
1971													
1972													
1973													
1974								0.00	0.00	151.72	78.21	0.00	229.93
1975													
1976													
1977													
1978													
1979													
1980													
1981								151.62	738.75	502.29	142.70	10.34	1545.70
1982								87.07	331.44	375.13	164.96	114.76	1073.36
1983								0.00	0.00	311.48	97.91	0.00	409.39
1984								0.00	120.20	267.61	100.49	42.00	530.30
1985								148.41	365.01	104.73	0.00	0.00	618.15
1986								292.59	420.59	265.93	12.56	0.00	991.67
1987								181.98	403.90	0.00	0.00	0.00	585.88
1988								316.26	609.17	99.65	0.00	0.00	1025.08
1989													
1990								0.00	0.00	147.75	310.80	0.00	458.55
1991													
1992								0.00	49.59	307.31	320.29	165.79	842.98
1993								635.21	780.44	679.00	682.02	46.61	2823.28
1994								319.88	1055.26	700.11	208.57	0.00	2283.82
1995								0.00	795.57	355.46	59.66	108.99	1319.68
1996								0.00	30.35	140.05	170.44	118.29	459.13
1997								369.40	676.71	214.25	0.00	0.00	1260.36
1998								541.88	920.65	872.22	845.16	170.49	3350.40
1999								0.00	728.33	371.66	233.30	32.13	1365.42
Mean								169.13	445.89	325.91	190.39	44.97	1176.28
Max								635.21	1055.26	872.22	845.16	170.49	3350.40
Min								0.00	0.00	0.00	0.00	0.00	229.93

Notes: 1. Monthly data is derived from spot measurements in the Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980
2. Zero flow is assumed prior to the first and after the last measurement

Name	Grinnell Ditch Diversion on Wolf Creek		
Source	Wolf Creek		
District	5		
Data	First & Last Dates, Max. Days		
Water Year	First Date of Measurement	Last Date of Measurement	Maximum Days Missing
1970			
1971			
1972			
1973			
1974	3-Jul	31-Aug	0
1975			
1976			
1977			
1978			
1979			
1980			
1981	25-May	2-Sep	24
1982	27-May	22-Sep	43
1983	7-Jul	17-Aug	13
1984	19-Jun	11-Sep	24
1985	22-May	15-Jul	12
1986	14-May	2-Aug	17
1987	16-May	29-Jun	13
1988	17-May	9-Jul	37
1989			
1990	27-Jul	15-Aug	7
1991			
1992	26-Jun	29-Sep	34
1993	10-May	8-Sep	24
1994	24-May	18-Aug	19
1995	1-Jun	29-Sep	38
1996	13-Jun	30-Sep	27
1997	15-May	14-Jul	7
1998	4-May	23-Sep	16
1999	4-Jun	10-Sep	10
Avg.	3-Jun	24-Aug	20
Earliest	4-May	29-Jun	0
Latest	27-Jul	30-Sep	43

Notes: 1. Data is from Hydrographers' Annual Reports for years 1980 and later, and from WRDS for years prior to 1980.