

STATE OF COLORADO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RESOURCES NO.6

1982 ANNUAL REPORT
Preliminary



DIVISION OF WATER RESOURCES
WATER DIVISION VI

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MEMORANDUM

DATE: January 13, 1983

TO: Jeris A. Danielson, State Engineer

FROM: Wesley E. Signs, Division Engineer, Water Division No. 6

We find in Division 6 that many fee well permits are going as long as one year with no decisions one way or the other. Many of these are in areas which are not over appropriated and it would seem that the problem should not be that difficult. In several instances the people have applied for a decree and occasionally have drilled without a permit. It is somewhat embarrassing on our part from the standpoint that it is hard to prosecute when the well permit will eventually be issued.

Also, some people have investments that hinge on the issue of these permits. One instance was two people were planning a plant nursery and needed the well for this purpose. It took almost one year to receive their permit. In the case of borrowed money and options to meet, this can be economically devastating. It would seem that a letter or a call between our office and the State office could facilitate this type of permit, particularly in under appropriated areas.

We would like to check on the number of water cases that are on microfilm. I know that some of them are and if we could obtain these it would facilitate a storage problem that we have storing the cases.

WES:ar

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INTRODUCTION

Division 6 is located in the northwestern corner of the state and includes the Yampa, White, and North Platte River drainages. Elevations range from 5,000 feet within the canyons along the western boundary of the state to more than 12,000 feet along the Continental Divide. Climatic conditions vary widely across the region due mainly to the variations in elevation. Precipitation ranges from less than nine inches in the desert areas to more than 50 inches along the Continental Divide.

The most productive crop bearing areas lie between the 6,000 feet and 8,000 feet range in elevation. The higher elevations and the western desert areas are primarily used for summer and winter grazing and for recreational purposes. The bulk of these lands are owned by the U.S. Government and are managed by the Bureau of Land Management and the Forest Service.

The growing season in Division 6 varies from less than 30 days in the North Platte drainage to around 90 days in the lower White and Yampa drainage. This short growing season is most suitable for the production of irrigated native hay, alfalfa hay, and irrigated pasture which total about 250,000 acres within the Division. Irrigated acreage broken down by drainage basin is as follows: Yampa River - 100,000 acres, North Platte River - 120,000 acres, and the White River - 30,000 acres. Dry land farming is practiced in the mid-areas of the Yampa River and the White River drainages, with small grains being the basic crops. Dry crop lands amount to around 131,000 acres in the Yampa River

drainage with approximately 17,000 acres in the White River drainage. This ground is normally summer fallowed, which means that only a little over 50 percent is in crop in any given year.

Irrigated cropland occupies less than two percent of the land area in Division 6, but this cropland constitutes the economic heart of the farms and ranches in the area. Almost all the irrigated cropland is used for pasture or winter feed production for livestock. Although agriculture remains the dominant water user in the region, a shift in use is taking place as the energy industry expands and requires more water. The nation's greatest known potential oil resources, estimated at 600 billion barrels of equivalent oil in high-grade deposits, are in the oil shales of the Green River Formation which extends over much of northwestern Colorado. The oil shale deposits in the Piceance Creek Basin cover a small geographical area, but they include the richest deposits in the world. The amount of water that will be needed by the oil shale and coal industries in the future is difficult to predict without being able to predict realistic production rates, but it is known that large quantities of water will be required. Coal fired electrical generation plants, coal gasification plants, and slurry pipelines are also expected to require a great deal of water in the near future and will provide more competition with agriculture for a limited supply of water.

WATER SUPPLY

Almost all the snow courses in Division 6 were above their normals going into the 1982 irrigation season which was a welcome change after the extremely low snow pack experienced during the previous year. As of May 1, 1982, the average water content of all the snow courses in Division 6 was 31 percent above the normal and 540 percent of last year's total. The above average snowpack enabled most of the reservoirs in Division 6 to fill and this coupled with near average precipitation throughout most of the growing season produced excellent growth in hay and grains throughout the region. Problems were encountered later in the year, however, when almost daily rains in August and September slowed and in some cases completely halted harvesting operations. The rains left the winter wheat crops too wet to harvest and the fields too wet to accommodate the heavy harvesting equipment. Some hay had been cut and left to dry in the fields prior to the rains and became wet and slightly rotted. Hay that could not be cut on schedule went to seed which reduces nutritional and thus economic value of the hay.

SNOW PACK DATA
As of May 1, 1982

<u>STATION</u>	<u>CURRENT YEAR</u>		<u>PREVIOUS YEAR</u>		<u>NORMAL YEAR (63-77 Avg.)</u>
	Total Snow Depth	Total Water Content	Total Snow Depth	Total Water Content	
<u>NORTH PLATTE BASIN</u>					
Cameron Pass	70 in.	31.5 in.	24 in.	10.0 in.	32.1 in.
Columbine Lodge	54	26.3	3	1.9	20.7
Northgate	8	2.6	0	0.0	4.1
Park View	24	8.5	1	0.3	6.8
Willow Creek Pass	32	11.5	4	1.5	10.8
<u>YAMPA BASIN</u>					
Elk River	42	16.9	0	0.0	16.1
Hahns Peak	30	11.6	0	0.0	9.1
Bear River	30	12.1	0	0.0	7.5
Columbine	54	26.3	3	1.9	20.7
Croshe	46	17.6	0	0.0	11.8
Dry Lake	49	22.1	17	7.0	17.8
Lynx Pass	34	12.0	0	0.0	8.7
Rabbit Ears	81	37.9	36	11.2	27.1
Tower	154	74.0	70	28.6	53.5
Yampa View	36	16.3	0	0.0	9.8
<u>WHITE RIVER</u>					
Burro Mountain	38	16.7	13	4.0	14.9
Rio Blanco	32	13.9	0	0.0	10.4

PRECIPITATION DATA

TOTAL PRECIPITATION FOR YEAR

<u>STATION</u>	<u>PREVIOUS YEAR</u>	<u>THIS YEAR</u>	<u>NORMAL YEAR</u>
Meeker	16.79		not available
Steamboat Springs	26.73	24.32	23.87
Walden	11.29	11.18	9.61

TRANSMOUNTAIN DIVERSIONS

NAME	P R E V I O U S Y E A R						T H I S Y E A R					
	SOURCE			RECIPIENT			SOURCE			RECIPIENT		
	STREAM	W.D.	STREAM	W.D.	AMT. (A.F.)	STREAM	W.D.	STREAM	W.D.	AMT. (A.F.)		
Stillwater Ditch	Yampa R.	58	Egeria Cr.	53	1592.0	Yampa R.	58	Egeria Cr.	53	3961.0		
Dome Creek Ditch	Done Cr.	58	Egeria Cr.	53	60.0	Dome Cr.	58	Egeria Cr.	53	668.0		
Rich Ditch	Trout Cr.	57	Oak Cr.	58	2774.0	Trout Cr.	57	Oak Cr.	58	462.0		
Sarvis Ditch	Sarvis Cr.	58	Muddy Cr.	50	no info available	Sarvis Cr.	58	Muddy Cr.	50	no info available		
Morgan Creek Feeder #1	Cotton-wood Cr.	44	Morgan Cr.	57	no info available	Cotton-wood Cr.	44	Morgan Cr.	57	no info available		
Michigan Ditch	Michigan R	47	Joe Wright Cr.	48	1100.0	Michigan R.	47	Joe Wright Cr.	48	1160.0		
Cameron Pass Ditch	Michigan R.	47	Joe Wright Cr.	48	123.0	Michigan R.	47	Wright Cr.	48	123.0		

SURFACE WATER

Total 1982 surface diversions were greater than last year due chiefly to above normal runoff. Agriculture remained the dominant water user in the Division with total diversions of

A.F. for the irrigation of _____ acres.

District 47 had the greatest irrigated acreage totalling 114,027 acres more than the rest of the divisions combined. Recreation and miscellaneous uses accounted for the second greatest diversions followed by industrial. Total diversions by district are show below.

<u>DISTRICT</u>	<u>DIVERSIONS (A.F.)</u>
43	
44	
47	
54	
55	
56	
57	
58	

TRANSMOUNTAIN DIVERSIONS

Transmountain and transbasin diversions in the Yampa and North Platte River Basins both increased over last year. Total exports from District 58 into the Colorado River Basin were 4629 A.F. Total exports from the North Platte Basin into the South Platte Basin increased to 1283 A.F. Actual diversions by ditches are shown in the surface water diversion statistics.

RESERVOIR OPERATIONS

Water District 47 - Most reservoirs started IY 1982 with very little water in storage but exceptionally heavy runoff allowed most reservoirs to fill. For the first time, we approached the 17,000 A.F. limitation placed on irrigation water stored by the U.S. Supreme Court. There was very little water released to irrigation resulting in excellent carryover storage into the 1983 season.

Meadow Creek Reservoir filled for the first time. Walden Reservoir is presently full while Pole Mountain Reservoir was drained for repairs.

Water District 58 - There was excellent runoff this season and all but a few reservoirs filled. Yamcolo Reservoir filled for the first time and there is excellent carryover storage for irrigation purposes as releases were small.

At the request of the Division of Parks, 6,653 A.F. belonging to Division of Wildlife was released out of Steamboat and Pearl Lakes in an attempt to control shoreline vegetation. These releases were made in September and October and refilling should occur next May.

Water Districts 43, 44, 54, 55, 56 and 57 - There is not much storage capacity for irrigation in these districts but most irrigation reservoirs were low at the beginning of the season and there is now good carryover storage. All reservoirs controlled by Division of Wildlife were full all year.

GROUND WATER

The number of new well permits issued in Division 6 during 1982 fell to 180, down substantially from the 304 permits issued last year and far below the 470 permits issued in 1979. The continued slow down was due to the negative impact of high interest rates on new house construction. Due to an unfilled well inspector's position, field inspections of new wells were reduced to 65.

PLANS OF AUGMENTATION

Plans of augmentation allow a water right owner to divert water out of priority by providing stored replacement water or senior direct flow water to augment the river system. Two new augmentation plans were decreed in Division 6 during the 1982 water year bringing the total to ten. Four more augmentation plans are pending before the courts. Due to ample water supplies, none of the augmentation plans had to be administered.

RESERVIOR STORAGE

1982

DISTRICT 43

FILLED CAPACITY IN ACRE FEET

RESERVOIR NAME	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Totals (all reservoirs)	7731	7731	7731	7731	7731	8300	9000	9700	9000	8300	8300	8300

RESERVOIR STORAGE

DISTRICT 44

1982

FILLED CAPACITY IN ACRE FEET

RESERVOIR NAME	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Elkhead	13574	13574	13574	13574	13574	14023	14023	13800	13574	13574	13574	13574
Ralph White	605	605	605	605	650	605	605	605	605	605	605	605
DD & E	282	282	282	282	282	282	1408	1408	704	704	704	704
Miscellaneous	1100	1100	1100	1100	1100	1799	3415	2984	1992	1799	1799	1708
Totals	15561	15561	15561	15561	15561	16260	19496	19020	17101	16682	16682	16591

RESERVOIR STORAGE
DISTRICT 47

1982

FILLED CAPACITY IN ACRE FEET

RESERVOIR NAME	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Lake John	5860	6246	6246	6246	6246	6246	6246	5970	5970	6470	6470	6470
Walden	750	750	750	750	750	2486	4164	5204	4659	4350	4350	4350
MacFarlane	0	450	450	450	450	450	1650	2546	2267	2267	2401	2401
North Michigan	1249	1249	1249	1249	1249	1249	1249	1249	1249	1249	1249	1249
Cowdry	239	239	239	239	239	239	449	449	449	449	449	449
Laune	1401	1540	1540	1540	1540	1540	1540	2540	1540	1540	2100	2132
Delaney S & E	57	57	57	57	57	57	57	57	57	270	411	411
Big Creek	1434	1434	1434	1434	1434	1434	1434	1434	1434	1434	1434	1434
Pole Mountain	0	0	0	0	0	0	0	1351	0	0	0	0
Buffalo	486	486	486	486	486	486	486	486	486	486	486	486
Clayton	11	84	84	84	84	213	213	213	213	213	213	213
Hecla	0	255	255	255	255	255	255	255	255	255	255	255
Aqua Fria	0	0	0	550	550	550	550	550	550	550	550	550
Seymore	525	525	525	525	525	525	525	525	525	487	314	300
West Arapahoe	0	0	0	0	0	0	497	497	497	475	200	200
Meadow Creek	333	893	893	893	893	902	3050	4666	4833	4418	4418	4418
Miscellaneous	457	457	457	457	457	457	457	1040	902	804	902	918
Totals	12802	14919	15119	15269	15269	17089	23265	28032	25984	25813	26200	26736

RESERVOIR STORAGE

DISTRICT 56

1982

FILLED CAPACITY IN ACRE FEET

RESERVOIR NAME	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Totals (all reservoirs)	56	56	56	56	100	146	250	294	190	160	150	150

RESERVOIR STORAGE

1982

DISTRICT 57

FILLED CAPACITY IN ACRE FEET

RESERVOIR NAME	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Temple	0	0	0	0	0	553	553	400	341	341	341	341
Sheriff	300	300	300	300	300	300	502	986	986	986	986	986
Sage Creek	290	290	290	290	290	364	364	609	450	450	450	450
Miscellaneous	39	39	39	39	39	66	84	84	72	60	53	53
Totals	990	990	990	990	990	2018	2519	3148	2675	2484	2377	2377

RESERVOIR STORAGE

DISTRICT 58

1982

FILLED CAPACITY IN ACRE FEET

RESERVOIR NAME	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Steamboat Lake	23385	23385	23385	23385	23385	23068	21935	22651	23919	23865	23385	17727
Pearl Lake	5791	5791	5791	5791	5791	5791	5882	5882	5882	5806	5806	4097
Stillwater	840	840	840	840	840	840	1440	3603	5864	4803	4668	4469
Yamcolo	4589	4791	6094	6187	6579	6983	8020	7845	9094	8485	7197	7147
Allen Basin	61	61	61	61	61	61	592	1258	1505	1046	1304	944
Crosho	188	188	188	188	188	188	655	1017	876	812	781	760
Fish Creek	1500	1404	1304	1207	1114	996	1207	1842	1842	1842	1691	1600
Gardner Park	0	0	0	0	0	0	0	855	1155	1155	1155	1155
Catamount	7800	7800	7800	7800	7800	7800	7800	7800	7800	7800	7800	7800
Miscellaneous	1600	1600	1600	1600	1600	1890	2813	3200	2813	2496	1900	1900
Totals	45754	45860	47063	47059	47358	47617	50344	55871	60855	58110	55687	47599

INTERSTATE COMPACTS

Interstate compacts, decrees, and agreements governing Division 6 and actual deliveries are discussed in detail below.

A. Upper Colorado River Compact - Article XIII(a) of the Upper Colorado River Compact specifies that the state of Colorado will not cause the flow of the Yampa River at the Maybell gage to be depleted below an aggregate of 5,000,000 acre feet for any period of ten consecutive years beginning with the first day of October succeeding ratification of the Compact. Total flow past the Maybell gage during the 1982 water year was A.F. making the aggregate for the last ten consecutive years A.F. The 1982 flow was percent of normal based on a 63 year period of record.

Article XI of the Upper Colorado River Compact oppor- tions the consumptive use of water of the Little Snake River and its tributaries between the states of Colorado and Wyoming. Article XI was not administered during the 1982 water year due to sufficient water supplies. Total flow past the Little Snake River gage near Lily Park was A.F.

B. Decree Exerpted from Nebraska vs. Wyoming (325 vs. 589 (1945)) - The Nebraska vs. Wyoming Decree enjoins the state of Colorado from:

1. Divering or permitting the diversion of water from the North Platte River and its tributaries for the irrigation of more than a total of 145,000 acres of land in Jackson County, Colorado during any one irrigation year;

2. Storing or permitting the storage of more than a total amount of 17,000 A.F. of water for irrigation purposes from the North Platte River and its tributaries in Jackson County, Colorado between October 1 of any year and September 30 of the following year;

3. Exporting out of the basin of the North Platte River and its tributaries in Jackson County, Colorado to any other stream basin or basins more than 60,000 A.F. of water in any period of ten consecutive years reckoned in continuing progressive series beginning with October 1, 1945.

All requirements set forth in the decree were satisfied during the 1982 water year. Total irrigated acreage in Jackson County was 114,027 acres up 3,025 acres from the 1981 total of 111,002 acres. Total storage for irrigation purposes in the North Platte Basin in Jackson County was 14,700 acre feet and exports from the North Platte Basin totaled 1283 acre feet.

C. Pot Creek Agreement - Pot Creek, a tributary of the Green River, originates in the Uintah Mountains northeast of Vernal, Utah and flows into Colorado approximately 30 miles north of Dinosaur, Colorado. Water in the Pot Creek drainage basin is apportioned between Utah and Colorado based on an interstate priority system agreement. Under terms of the agreement, Utah is allowed to store the first 95.88 acre feet of available water from January 1 to December 31 of every year. The next 104.45 acre feet is passed for storage in Colorado. During February, March, and April,

Colorado received 677 acre feet at the state line satisfying requirements for stored water. Beginning May 1, Utah is allotted the first 4cfs at the upper gage near Vernal and the next 6.5cfs is to be passed to Colorado. During May and June, Colorado should have received 426.8 acre feet at the state line. Actual delivery was 148.0 acre feet.

DAM SAFETY

The following dam inspections were performed by the Dam Safety Branch in Division 6 during fiscal year 1981-82.

ANNUAL SAFETY INSPECTIONS BY HAZARD RATING

High - 12

Moderate - 9

Low - 2

CONSTRUCTION INSPECTIONS BY HAZARD RATING

High - 2

Moderate - 1

Low - 6

An additional 31 dam inspections were performed by Division 6 water commissioners. Reports were completed for these inspections and submitted to the Dam Safety Branch.

PERSONNEL

<u>NAME</u>	<u>POSITION</u>	<u>DISTRICT</u>	<u>F.T.E. MONTHS</u>	<u>MILEAGE, 1982 FISCAL YR.</u>	
				<u>STATE VEHICLE</u>	<u>PERSONAL</u>
Wesley E. Signs	Division Engineer		full-time	2656	618
Robert McCabe	Asst. Div. Engineer		full-time		2188
W. Kent Holt	Hydrographer		full-time	411	4079
Walt Bohrer	1042 Commissioner*		full-time		
Alice Wilson	Secretary		full-time		
Joe Brown	Water Commissioner C	43	full-time	18,999	
William Dunham	Water Commissioner B	43	5.04		6597
Don Rice	Water Commissioner B	44	full-time	8694	2032
Don Gilroy	Water Commissioner B	54	1.48		2463
Jack Leonard	Water Commissioner B	55-56	2.54		4318
Truman Manes	Water Commissioner B	57-58	full-time		9403
Charles Gregory	Water Commissioner B	58	full-time	533	5155
Bill Millner	Water Commissioner B	58	6.11		3514
Eric Wagner	Sr. Water Commissioner	47	full-time		5791

*Position vacant

SUMMARY OF WATER COURT ACTIVITIES
(1982 Water Year)

Division 6 (except District 43)

<u>Applications</u>	<u>Water Referee Consultations</u>	<u>Decrees</u>
330	221	202
District 43		
122	98	93

OTHER WATER RELATED ACTIVITIES

Division 6 was able to obtain funding from the Upper Yampa Conservancy District for equipment to install three evaporation stations. Two of the stations were installed and began providing evaporation data in the spring of 1982. One of the stations was installed in Walden and is operated by the District 47 water commissioner. The other station was installed near Lake Catamount and is operated by the lake's caretaker. Negotiations are in progress with the National Park Service to install the third station at Dinosaur National Monument in the spring of 1983. The data provided by the stations has been a big help in estimating total depletions in the Division and is shown in Exhibit A.

During the 1982 water year, the Upper Yampa Conservancy District completed a feasibility report for Stagecoach Reservoir to be located in the Yampa River about 17 miles south of Steamboat Springs. The proposed reservoir will have a storage

capacity of 33,720 acre feet for municipal, industrial, irrigation, and recreation purposes. The project is expected to cost about \$11,500,000 or \$348 per acre foot. The annual price per acre foot of industrial and municipal water has not been set but should not exceed \$40 per acre foot. The Conservancy District is attempting to obtain funding from the Colorado Water Conservation Board and the Colorado Water Resources and Power Development Authority.

Feasibility studies were also begun on a \$2 to \$3 billion coal pipeline project to move coal from northwestern Colorado to southern California. The project is proposed by W. R. Grace and Company and calls for the packaging of pulverized coal from its mine near Craig into plastic containers and floating the bags via pipeline to the west coast. The pipeline will use fresh water diverted from the Yampa to carry the coal into the Glenwood Springs area where the fresh Yampa water will be exchanged for salt water from natural sources. This process should help to reduce salinity in the Colorado River. Studies of the project are supposed to be completed by 1985 and construction by 1987 if all goes according to schedule.

Due to economic problems, the Colorado-Ute Electric Association announced on February 16 that it was withdrawing funding from the proposed Juniper-Cross Mountain Project which was to have been built in Moffat County. The project was to have included two integrated dams and reservoirs on the Yampa River storing 1.3 million acre feet of water. Hydroelectric facilities were to have a combined generating capacity of 148,000 kilowatts. Colorado-Ute and the Colorado River Water Conservation District entered into an agreement in 1979 under which Colorado-Ute

would advance funds for the licensing process and then would have an option to purchase the hydroelectric power. Proceeds from the power sales were to be used to finance construction costs.

EXHIBIT A
DIVISION 6
1982 EVAPORATION STUDY
PRELIMINARY INTERPRETTED DATA

	<u>Walden</u>		<u>Lake Catamount</u>
	All Figures in Inches of Water		
April	1.19	Gross Evaporation	1.88
	.39	Effective Precipitation	1.54
	.80	Net Depletion	.34
May	3.58		3.96
	1.71		1.82
	1.87		2.14
June	4.27		4.30
	.58		1.05
	3.69		3.25
July	5.43		5.27
	1.77		2.16
	3.66		3.11
August	4.54		5.05
	.86		1.89
	3.68		3.16
Sept.	2.30		3.51
	1.45		2.67
	.85		.84
Oct.	1.34		2.13
	.59		1.93
	.29		.20
	22.65	Yearly Gross Evaporation	26.10
	7.35	Effective Precipitation	13.06
	15.30	Yearly Net Depletion	13.04