

1983

DIVISION 6 ANNUAL REPORT

PRELIMINARY

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I. WATER ADMINISTRATION

A. CURRENT WATER YEAR

1. What Were Your Accomplishments For The Year?

A. 1983 marked the second year in which Division 6 operated its pan evaporation program. Funds to purchase equipment for the evaporation stations were obtained through a grant from the Upper Yampa Conservancy District. Two of the stations were installed and began providing information in the spring of 1982. One of the stations is located in Walden and is operated by the District 47 water commissioner. The other station is located at Catamount Lake and is operated by the Lake's caretaker. A third station was installed on Trout Creek in 1983 and is operated by the District 57 water commissioner. Data collected from these three stations is used to compute net depletions in Division 6 and is also used to analyze water right changes where consumptive use estimates are required. Results of this years program are shown in the appendix.

B. Division 6 also began operating two lysimeter stations on Trout Creek in District 57 during the spring of 1983. The lysimeters were originally installed by Leonard Rice Water Engineers under a contract from Energy Fuels Corporation. The stations were operated by Leonard Rice for a three year period but had become run down and in need of repair. A grant from the Upper Yampa Conservancy District allowed the Division 6 staff to repair the stations and bring them back into operation. The stations are now supplying us with data on consumptive use from high mountain hay meadows. Using data collected from the stations we have been able to compute more accurate crop coefficients for use in the Blaney Criddle formulas for estimating consumptive use. Some minor problems were encountered during the 1983 lysimeter program, but with the experience gained, future years should yield more reliable information. Results of this years operation are shown in the appendix.

C. Dam Inspections.

The dam safety branch was preparing reports pursuant to the provisions of H.B. 1416 and was therefore only able to make 23 annual dam inspections in Division 6 during 1983. The Division 6 staff and water commissioners inspected the remaining high hazard dams and most of the low and moderate hazard dams. A total of 107 dams were inspected and inspection reports were completed for most. Copies of the inspection reports including recommendations were sent to the Denver dam safety branch. Five inspections were made for dams located on USFS lands and copies of the reports were mailed to the USFS. The USFS requires that dams located within a national forest be inspected every 3 years.

Western Engineers was contracted by the Stillwater Reservoir Company during 1983 in order to determine the causes for excessive seepage thru the Stillwater Reservoir and to prepare plans for remedial action. Leakage into the upstream face of the embankment was discovered during a dam inspection by the dam safety branch

in 1982 and was reported to the dam owners in July, 1983. Two slumped areas approximately 3.5' deep were located on the upstream face of the embankment about 50 feet apart. When the water level of the reservoir was maintained at the level of the depressed areas water could be heard flowing into the embankment. Western Engineers conducted dye tests at the site on July 14, 1983 but could not determine where the water was exiting the sinkholes. Backhoe excavations of the sinkholes revealed that the bulk of the seepage is flowing thru isolated channels from which much of the fines have been removed. Western has recommended that the seepage holes be excavated to a depth of at least 20 feet and the seepage paths then be sealed off with a bentonite slurry. The Stillwater Reservoir Company has accepted these recommendations but has been unable to locate a contractor to make the needed repairs until June, 1984. Until repairs are completed storage restrictions will remain in effect to keep the water level below the seepage paths.

D. Wells

During the 1983 water year well permits were issued for 229 new wells in Division 6; up 79 from the 150 permits issued last year. 159 new wells were drilled during the 1983 water year. A vacant well inspectors position was filled in December, 1982 and well inspections increased considerably over last year. A total of 420 field inspections were made on new wells and late registrations. Work was also started on a groundwater inventory map for the division. All drilled wells are being marked on a map and keyed to an index with all available data for each well.

E. Assignment Of Priority Numbers To Water Rights

The Division 6 staff began a project in 1983 to assign a priority number to each water right in the division. Each water right will have a unique priority number assigned to it derived from its Julian Calendar priority date and adjudication date. The priority numbers will be assigned by the Denver Computer Services Division for existing water rights using the existing computer tabulation and will facilitate the administration and cataloging of new water rights in the division.

Once all existing water rights are assigned a priority number by the Computer Services Branch, new water rights will be numbered by our office as they are recieved and cataloged into our files.

F. Miscellaneous

In addition to the previously mentioned activities, the Division 6 staff also fulfilled the following responsibilities:

1. Collect and maintain diversion records for water rights in the division. Enter diversion records into computer storage.
2. Regulate surface and groundwater diversions within the division to insure that water is apportioned in accordance with state laws.
3. Insure that Division 6 is in compliance with interstate compacts and agreements and the decree excerpt from Wyoming VS Nebraska.
4. Consult with referee concerning all new water right applications. Issue written report to referee expressing recommendation.

5. Submit expert testimony before the water court in water right cases.
6. Hold informal hearings between litigents to resolve disputes without court hearing.
7. Enforce all judicial decisions and regulations in water matters.
8. Assist public in applications for well permits and water rights.
9. Give water presentations to water user organizations and concerned groups to keep them informed of new developments.
10. Maintain personnel records and make budget allocations for Division 6 staff.
11. Collect and maintain streamflow and pan evaporation data. Monitor and record spring flow data for Tract Cb augmentation plan. Prepare rating curves for surface diversion structures.
12. Calculate irrigated acres under each water right and compute consumptive use. Prepare annual water budget.
13. Annually prepare and update a tabulation of all water rights.
14. Mediate water disputes between users.
15. Meet with water officials from other states in regard to interstate compacts and water projects of mutual interest.

2. What Has Been The Divisions Involvement In The Water User Community For The Year?

- A. Inspect privately owned reservoirs and advise owners of problem situations. Make recommendations for corrections in dam problems.
- B. Make presentations before cattlemen's organizations, realtors organizations, League of Women Voters, etc., concerning new developments in water law and water projects that could have an impact on water users.
- C. Collect and provide hydrologic data to individuals and organizations planning new water development projects. Assist in completing necessary water applications and well permits necessary to implement projects.
- D. Advise water user organizations and individuals on methods to increase efficiency of existing water projects and provide pertinent hydrological data.
- E. Consult with officials of the C.W.C.B. concerning minimum streamflow appropriations and proposed new water projects.

3. What Particular Issues Impacted Or May Impact Existing Policies, Statutes, Administrative Practices, etc? What Was The Nature And Degree Of Impact?

A. H.B. 1416 will have a significant impact on dam safety by allowing the construction of many new reservoirs without plans and specifications approved by the State Engineer and by removing some existing reservoirs from jurisdiction.

B. The Colorado River Water Conservation District has been negotiating with Colorado-Ute to obtain an agreement on the future operation of the proposed Juniper-Cross Mountain Project. The water rights to the project, which is to be located on the lower Yampa River, are owned by the River District which has a contract with Colorado-Ute to construct the project. The contract was to have contained a clause subordinating the project to 65,000 acre feet of consumptive use annually to junior upstream water rights, but this clause was inadvertently omitted. Colorado-Ute is now opposed to the inclusion of such a clause in the contract. If the project is built without subordinating to upstream junior water rights, the effect would be devastating to water users in the Yampa Basin. Many large expensive reservoirs such as Yamcola Reservoir, Lake Catamount, Steamboat Lake, and Pearl Lake would not be able to store additional water. In addition, many surface diversions decreed after 1962 would probably be out of priority all year long.

C. Another major concern of water users in the Yampa Basin is the claim of the U.S. to minimum stream flows thru Dinosaur National Monument. In water cases 79SA99 and 79SA100, the Supreme Court of Colorado allowed the U.S. 6 months after the final decree was entered in these cases to quantify its claims for minimum flows in the Yampa River. The Master-Referee concluded that the U.S. is entitled, pursuant to the reserved rights doctrine, to water rights for an unquantified minimum stream flow in the Yampa River within Dinosaur National Monument. The U.S. will have to file applications with the Division 6 Court and the courts will decide at that time whether the specific uses claimed are within the purposes of the reservation. Recreational boating has already been excluded as a legitimate use by the court. It is unknown at this time what amount of water will be awarded, but if the U.S. is awarded a reserved right for the unimpaired natural flow of the Yampa River with a 1938 priority date, all water rights vested after that date would effectively be taken and Colorado would lose the beneficial use of most of the Yampa River water allocated to it under the Upper Basin Compact. Absolute decrees in the Yampa drainage above Dinosaur National Monument junior to the 1938 reservation date total about 1,200 c.f.s. and 12, 514 a.f. and conditional rights total about 9,000 c.f.s. and 1,900,000 a.f.

D. The impact of minimum streamflow filings by the Colorado Water Conservation Board are beginning to be felt in Division 6, mainly, by applicants filing for new well permits. The minimum streamflow filings in conjunction with existing water rights have caused many streams to become over-appropriated and, therefore, applicants in these basins are no longer eligible for exempt well permits.

4. What Problems, Concerns, Issues, Tasks, etc., Could Not Be Addressed During The Year? Why?

A. In order to comply with the provisions of H.B. 1416, the dam safety branch was unable to conduct adequate dam inspections in Division 6 this year. This placed a greater workload on our staff to make sure that all dams were inspected.

B. Funding was not available to furnish the division offices with a computer terminal this year. A computer terminal or small computer is badly needed in order to process new water rights and to administer existing water rights. The

number of new water rights are increasing rapidly and a computer would greatly facilitate the cataloging and processing of these water rights. Processing each new right requires a tremendous amount of repetitive paper work which could easily and rapidly be handled by a computer.

C. Division 6 had an unfilled secretarial position for approximately 4 months which impaired office efficiency.

5. What Has Been The Effect Of Workload Changes Upon The Staff.

A. The year has not yet ended, but it appears that the total number of new water right cases will increase again this year. The number of structures filed on will certainly increase as many of the cases are applications for multiple filings on springs. The water court changed its pricing policies on new water right applications and these changes have in effect encouraged multiple filings under one application. At the same time the judicial system has cut the water referee's mileage in half so that it will be impossible for him to field inspect these new cases. Filing fees on new cases should be increased to cover the cost of field checking and processing the case through the court.

6. What Has Been The Impact Of Budget On Division Operations?

A. We have encountered numerous problems in purchasing auto equipment with authorized state contractors refusing to sell equipment at the contract price. In other cases we have been forced to order equipment and wait for months for its delivery. Water commissioners have been told to drive to other cities to purchase equipment that was readily available in their home town at comparable prices. It seems that it would be more effective for the state to set a reasonable price ceiling on auto equipment and then allow employees to purchase needed supplies at the best price available in their area.

B. Problems have also resulted from the state policy of running state vehicles under operating funds and private vehicles under travel funds. In some years one of these two funds is reduced substantially while the other is not. This results in curtailing the activities of one group of water commissioners more severely than the other. Funds in these accounts should be more freely interchangeable or all vehicles should be operated under the travel account.

C. The U.S.G.S. cut back or eliminated funding for several gages in Division 6 this year. Funding was completely cut for the Pot Creek Gage at the Colorado-Utah gage. This gage is necessary for the administration of the Pot Creek Agreement between Colorado and Utah and we have assumed responsibility for operating the gaging station.

B. COMING WATER YEAR

1. What Particular Problems And Concerns Will Impact Division Operations?

A. The major concern of the division is to obtain a favorable resolution regarding the U.S. government reserve rights claims in Dinosaur National Monument. As previously mentioned, and award to the U.S. of the unimpaired natural flow of the Yampa River with a 1938 priority date will be devastating to water users in the Yampa Basin. The Attorney General's office should use all its available resources to make certain that the U.S. is not awarded an unreasonable amount of water.

B. Construction of the Juniper-Cross Mountain Project without the subordination of its water rights to upstream junior water rights is also a concern of this division as described previously.

C. Minimum streamflow appropriations to the C.W.C.B. will also impact water users in the division by causing previously non over-appropriated streams to become over-appropriated thus limiting exempt well permits in the basin.

2. Are There Particular Problems And Concerns That Will Not Be Addressed?

None

3. What Projected Work Items Are Planned For The Division Staff?

A. Update and correct the water rights tabulation.

B. Prepare a groundwater inventory map for the division. All drilled wells will be marked on a map and keyed to an index with all available data for each well. This map will be available to the public to assist in determining groundwater characteristics for a given area.

C. Assign a unique priority number to each water right derived from its Julian Calendar priority date and adjudication date. These priority numbers will be used in the administration of all water rights and facilitate the cataloging of new water rights.

D. Continue to operate lysimeter station on Trout Creek and accumulate data on consumptive use. Prepare annual report showing results.

E. Continue to operate 3 evaporation pans in the division. Prepare an annual report depicting the results.

F. Inspect all major dams in the division and prepare a written report for each inspection.

G. Operate Pot Creek gaging station and prepare an annual report.

H. Continue to operate 4 reservoirs belonging to the Division of Wildlife in Division 6, primarily, to maintain outflows for minimum streamflow requirements and for moderation of spring flooding.

I. In addition to the items specified above, we will continue to perform those other duties directed by statute and briefly summarized in Item I A-1 of this report.

4. What Are Your Priorities In Terms Of Goals And Objectives?

A. Having all information properly submitted for an accurate and complete 1984 water rights tabulation.

B. Continually updating and obtaining more accurate land measurements for the ever-important consumptive use program for the water budget.

C. Having all records accurately and timely completed for all diversion records.

D. Receiving the public in an attitude that we are their servants and filling their requests as near possible under the state statutes.

E. Strive to make all records available to the public in as accurate and complete format as possible.

F. Attempt to consolidate the storage of records in as small a space as possible, particularly using microfilm as the budget will allow.

G. Strive to make working conditions as safe as possible for all division personnel.

H. Work with all media to attempt to present the Division as furnishing accurate and reliable information concerning all aspects of water.

II RECOMMENDATIONS

A. POLICIES

1. Water Administration

A. As noted under section A-4, a computer terminal or small computer is needed in this office to process all the paper work associated with the cataloging and processing of new decrees.

B. All log information submitted by well drillers should be entered into the microfilm records and sent to the division offices. This would save alot of time and phone calls from our office to Denver. This log information is needed for our groundwater inventory maps and to provide data to the public.

C. Provisions should be made to allow the Division Offices to store their water court records on microfilm. Our office is running out of storage space for these records.

D. The water data bank should be expanded to allow entry of river call information. The computer coding sheets should also include a space to enter this data.

2. Personnel

A. The wage scale for water commissioners should be increased to a more realistic level. Water commissioners are not being fairly compensated now for their time and efforts, and promotions are extremely difficult to secure.

3. Budget

A. Mileage rates should be increased so that water commissioners do not have to subsidize the State when they use their own vehicles. A 4-wheel drive vehicle cannot be operated for \$.24 per mile.

B. Operating and travel budgets have been reduced over the past several years to the point that we will have insufficient funds available in a drought year.

4. Litigation Activities

A. The Attorney General's office should use all its available resources to obtain a favorable resolution of the federal claims for minimum stream-flows thru Dinosaur National Monument.

SUMMARY OF WATER COURT ACTIVITIES

	<u>Division 6</u>	<u>District 43</u>
Number of Water Cases Filed	246	47
Number of Consultations with Referee	321	64
Number and Type of Decrees Issued by Water Court		
Surface	192	27
Ground Water	32	12
Reservoir	83	10
Transfer	4	
Alternate Point	21	1
Change of Use	21	1
Plan for Augmentation	2	
In Stream Flow	4	
Other	1	
Number and Type of Structures in Decrees		
Ditches	386	31
Reservoirs	488	10
Wells	51	14

* District 43 Water Applications are Handled by Division 5 Water Court

APPENDIX

COLORADO DIVISION OF WATER RESOURCES DIVISION 6

CONSUMPTIVE USE DATA COLLECTION PROGRAM 1983

Description Of Program

Two evaporation stations were established in 1982. One, in Walden, is operated by the district 47 water commissioner, Eric Wagner. The other, next to Lake Catamount, is operated by Catamount management personnel. The evaporation station in Walden is read daily in conjunction with a NWS Station. The station at Lake Catamount is read less frequently. All equipment was paid for by the Upper Yampa Water Conservancy District, Jackson County Water Conservancy District, and Colorado-Ute Electric.

During the spring of 1983 Division 6 personnel obtained permission from Colorado Yampa Coal Co., (formerly, Energy Fuels Corp.), to take over the lysimeter program described in Energy Fuels Corporation Lysimeter Program, March 1981, by Leonard Rice Consulting Water Engineers Inc.,.

Truman Manes, Water Commissioner for Water District 57 operated and maintained four lysimeters and one recording raingage owned by CYCC. Also installed and operated was an evaporation pan at site A and a non-recording raingage at site B. All equipment was operational from May 27 to October 5, 1983, at which time the lysimeters were deactivated. The evaporation pan and raingage at site A operated until November 7.

In addition to adding new equipment, the fences surrounding the sites were repaired. It was also discovered that there were a number of very small holes, apparently caused by electrolysis, in both the water storage tanks and the lysimeters themselves. The lysimeters were dug out and repaired along with the storage tanks. All equipment was then reinstalled with either new or reconditioned fittings, valves, and tubing. The composition of vegetation inside the lysimeters was found to be unrepresentative of the surrounding area and new sod was introduced into the lysimeter tanks. The Upper Yampa Water Conservancy District provided the evaporation pan, non-recording raingage and the materials used for all lysimeter repairs.

The west lysimeters on sites A and B were operated with automatic valves that kept the water at a constant level throughout the season. The baffles between the lysimeter tanks and the float chambers on both east installations at sites A and B were removed and the entire area resodded. These were irrigated manually in an effort to duplicate actual irrigation practices. Automatic water level recorders were not used. All water level changes in the storage tanks were recorded using staff gage readings. This was generally done once a week.

Generally, the lysimeters operated well and the data derived should be of good quality. The only major problem was deterioration of the vegetation at site B west. A gradual loss of all plants in the lysimeter occurred throughout the growing season until August 29 when no live grass was observed in the tank. It was later discovered that rodents apparently were responsible for the vegetation loss. Damage by rodents was not evident at any other site except B east, and then only late in the season after the grass was harvested and watering resumed. Very little late season growth was observed on this site and it is assumed that the mice and gophers were responsible. These losses of vegetation should have caused the measured evapotranspiration to be somewhat less from the lysimeters than from land irrigated under field conditions.

The east lysimeters at both sites were irrigated to the top of the sod and then allowed to dry out until the free water level dropped below the soil level in the tanks. Water would again be added to fill the tanks back to the top of the sod. The dates irrigated are as follows:

SITE A EAST	SITE B EAST
May 27	May 27
June 16	June 16
July 11	June 30
July 29	July 29
August 17	August 17
September 6	September 6
October 5	October 5

In order to simulate harvest conditions these lysimeters were allowed to dry out thoroughly during the period prior to August 17. On August 17 the grass on both sites was cut about two inches above the ground. The harvested grass was allowed to dry and was then weighed. Site A east produced 1.47 tons/acre. Site B east produced 2.07 tons/acre. This is only slightly less than would be expected of normal agricultural yields from irrigated lands in the area. On August 17 normal watering was resumed.

We had theorized that the manually operated tanks would show less water use than that of the float operated tanks. We were unable to confirm this due to the rodent problems at site B.

The difference in precipitation recorded at both sites was greater than expected considering the short distance between the two. Small intense thunderstorms are the probable cause of this variability. On June 20 site A received one inch of rain in less than 15 minutes.

Data Reduction And Projections

Table 1 contains the monthly data obtained from the raingages and all four lysimeters. The gross Et is the total water loss recorded plus the precipitation. The average gross Et is the mean of the four installations.

The monthly temperatures in table 2 were computed with the aid of a regression equation based on data collected by Energy Fuels in 1978 thru 1980. This equation uses the mean monthly temperatures for Steamboat Springs and Hayden to predict the temperatures at the lysimeter sites. This table also contains all the information to compute the Blaney-Criddle monthly crop coefficient. The irrigation requirement is the gross Et less the effective precipitation. This number would represent the total average consumptive use of irrigation water from the lysimeters.

Table 3 is a projection of the irrigation water required for grass at various locations in division 6. This table was generated using crop coefficients similar to those calculated for the lysimeter sites. The total water requirement as predicted would probably approximate consumptive use by lawn irrigation but in most instances is much higher than the consumptive use from irrigated fields.

The pan evaporation shown in table 4 is the measured loss from the evaporation pans plus the precipitation.

The gross lake evaporation shown in table 5 is the pan evaporation times .71. The net depletion is the gross lake evaporation less the effective precipitation. The effect of precipitation in this case is an estimate of the loss of precipitation to the soil-water system from a surface under native vegetative conditions.

Table 6 contains estimates of the net reservoir depletion from evaporation at various locations throughout division 6 for 1983. These were computed assuming the monthly gross evaporation changes .119 inches per F°. Local rainfall data was used to compute the effective precipitation for each location

RECORDED CONSUMPTIVE USE 1983

SITE A

SITE B

Month	Precipitation (Inches)	Lysimeter Water Use In Inches		Precipitation (Inches)	Lysimeter Water Use in Inches		Average Gross Et in inches
		East Tank	West Tank		East Tank	West Tank	
May (27-31)	.23	--	.24	.27	--	1.29	.63
June	3.59	.99	2.22	2.13	2.61	2.07	4.83
July	1.94	2.40	2.65	1.92	3.77	2.68	4.81
August	2.79	3.04	3.27	2.48	4.37	2.01	5.81
September	.70	2.38	3.56	.98	2.11	2.71	3.53
October (1-5)	.38	.21	--	.38	.21	.25	.55
TOTALS:	9.63	9.02	12.31	8.16	13.07	11.01	
Gross Et in inches							
May (27-31)	.23	.23	.47	.27	.27	1.56	.63
June	4.58	4.58	5.81	4.74	4.74	4.20	4.83
July	4.34	4.34	4.59	5.69	5.69	4.60	4.81
August	5.83	5.83	6.06	6.85	6.85	4.49	5.81
September	3.08	3.08	4.26	3.09	3.09	3.69	3.53
October (1-5)	.59	.59	.38	.59	.59	.63	.55
TOTALS:	18.65	18.65	21.57	21.23	21.23	19.17	20.16

PARAMETERS RELATED TO IRRIGATION REQUIREMENTS 1983

Month	Mean Temp (°F)	Precip (Inches) Ave. Both Sites	% Daylite Hours	% Month	Blaney-Criddle Crop Coefficient (Kp)	Average Gross Et (In) All Sites	Inches Effective/Precip	Irrigation Requirement (Inches)
May (27-31)	52	.25	10.10	16	.75	.63	.18	.45
June	57	2.86	10.15	100	.83	4.83	2.06	2.77
July	65	1.93	10.27	100	.72	4.81	1.44	3.37
August	68	2.64	9.58	100	.89	5.81	2.02	3.79
September	57	.84	8.39	100	.74	3.53	.61	2.92
October (1-5)	49	.38	8.00	16	.88	.55	.26	.29
TOTALS:		8.90				20.16	6.57	13.59

$$Kp = \frac{(Gross Et) (100000)}{(Temp \text{ } ^\circ F) (\% \text{ Daylite}) (\% \text{ Month})}$$

WATER REQUIRED (IN ADDITION TO RAINFALL) FOR OPTIMUM GRASS GROWTH
FOR SELECTED NWS STATIONS 1983

	APR	May	JUNE	JULY	AUG	SEPT	OCT	TOTAL
Walden		1.99	2.53	3.36	3.68	3.36		14.93
Spicer		1.87	2.68	2.13	4.13	3.22		14.02
Yampa		2.04	2.76	3.17	3.53	3.07		14.56
Steamboat		1.42	2.52	3.41	3.71	2.96		14.02
Hayden		2.34	3.28	3.21	4.77	3.29	1.62	18.50
Craig		2.45	2.45	3.61	4.01	3.46	1.94	17.90
Maybell		1.98	3.67	4.02	4.51	3.32	1.88	19.37
Browns Park	1.94	2.68	3.10	4.54	4.31	3.33	2.45	22.37
Marvine		.01	2.35	2.07	1.78	2.94		9.15
Little Hills		1.31	2.54	3.80	3.91	3.24		14.79
Rangely	1.92	2.13	4.28	5.02	4.96	4.02	3.07	25.40
CYCC (5/27-10/5)		.43	2.52	3.85	3.31	3.26	.26	13.62
Meeker		2.39	3.33	3.99	4.28	3.75	2.06	19.80

These figures represent the total predicted evapotranspiration less the effective precipitation. Other factors such as the growing season, initial soil moisture, water availability conditions, and specific agricultural practices must be accounted for in determining the actual "irrigation requirement" or "consumptive use of irrigation water".

This table is produced by using Blaney-Criddle methodology as described in SCS Technical Release 21 with the following adjustments for crop coefficients.

Ka=Average seasonal crop coefficient

Ka=.66 (.70 for Walden and Spicer)

Kp=Monthly crop coefficient

$Kp = Ka + .28 \cos [19 - (\text{month} - 9)] - .13$

1983 MONTHLY PAN EVAPORATION

	Walden (8120 ft)	Lake Catamount (7000 ft)	Colo Yampa Coal (6670 ft)
APRIL	.86	---	---
MAY	4.19	4.30*	4.00*
JUNE	5.65	5.78	5.71
JULY	7.10	6.57	5.73
AUGUST	5.65	5.82	5.66
SEPTEMBER	5.65	4.15*	3.91
OCTOBER	2.35	2.70*	2.62
	31.75	0.3	27.68

*Contains estimated data

1983 TEMPERATURE AND PRECIPITATION

	Walden		Lake Catamount		(Site A) Colo Yampa Coal	
	TEMP	PRECP	TEMP	PRECP	TEMP	PRECP
APRIL	29.6	1.76	35.*	3.50*	36*	3.23*
MAY	40.6	1.87	46.*	3.25*	47*	3.05*
JUNE	51.6	2.51	55.*	2.95	57*	3.59
JULY	59.9	2.42	63.*	3.48	65*	1.94
AUGUST	61.2	1.69	65.*	1.25	68*	2.79
SEPTEMBER	51.7	.39	55.*	.80*	57*	.70
OCTOBER	40.3	1.09	44.*	2.00*	45*	1.29

*Estimated from Steamboat Springs data

1983 LAKE EVAPORATION

		Gross Lake Evaporation (Inches)	Effective Precipitation (Inches)	Net Depletion (Inches)
APRIL	Walden	.61	.61	0
	Catamount	---	---	---
	CYCC	---	---	---
MAY	Walden	2.97	1.50	1.47
	Catamount	3.05	2.34	.71
	CYCC	2.84	2.30	.54
JUNE	Walden	4.01	2.12	1.89
	Catamount	4.10	2.48	1.62
	CYCC	4.05	2.94	1.11
JULY	Walden	5.04	2.19	2.85
	Catamount	4.66	3.04	1.62
	CYCC	4.07	1.83	2.24
AUGUST	Walden	4.01	1.59	2.42
	Catamount	4.13	1.21	2.92
	CYCC	4.02	2.59	1.43
SEPTEMBER	Walden	4.01	.38	3.63
	Catamount	2.95	.77	2.18
	CYCC	2.78	.68	2.10
OCTOBER	Walden	1.67	.98	.69
	Catamount	1.92	1.65	.27
	CYCC	1.86	1.16	.70
TOTALS:	Walden	22.32	9.37	12.95
	Catamount	20.81	11.49	9.32
	CYCC	19.62	11.50	8.12

1983 RESERVOIR EVAPORATION (NET DEPLETION IN INCHES)
Gross Evaporation Less Effective Precipitation

	ELEV	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	TOTAL
Walden	8115		1.47	1.89	2.85	2.42	3.63	.69	12.95
Spicer	8380		1.33	2.02	1.52	2.96	3.36	.37	11.56
Yamcolo Res.	9580			.94	.59	.88	1.13		3.54
Lake Catamount	7000		.71	1.62	1.62	2.92	2.18	.27	9.32
Steamboat Lake	8000			1.53	1.95	2.51	1.30	.37	7.66
Craig	6440		1.57	1.68	2.40	2.73	2.47	.85	11.70
Maybell	5908		1.05	3.12	2.89	3.35	2.24	.73	13.38
Buford	7020		.99	2.13	2.22	2.50	2.50	.52	10.86
Meeker	6347	.15	1.56	2.76	2.92	3.09	2.92	1.07	14.47
Rangely	5290	.30	1.40	4.09	4.32	4.10	3.52	2.53	20.26

COLORADO DIVISION OF WATER RESOURCES
DIVISION 6 WATER BUDGET PROGRAM
1983

WATER DISTRICT 47
RESERVOIR EVAPORATION AT 8300. FT.

MONTH	EVAPORATION (INCHES)	NET DEPLETION (AF.)
11	0.00	0.
12	0.00	0.
1	0.00	0.
2	0.00	0.
3	0.00	0.
4	0.00	0.
5	1.34	343.
6	1.72	496.
7	2.67	728.
8	2.25	603.
9	3.53	947.
10	0.57	153.
	12.08 TOTALS	3269.

IRRIGATION CONSUMPTIVE USE

ELEV. 8000. FT. CAMPBELL	11417. IRR. ACRES	IRR. SEASON	5/25/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
5	.45		
6	2.63		
7	2.82		
	5.89 YEARLY TOTAL		
NET DEPLETION =	5607. ACRE FT.		0.49 ACRE FT. PER ACRE

ELEV. 8600. FT. MICH TO KIMMONS	9491. IRR. ACRES	IRR. SEASON	5/25/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
5	.37		
6	2.51		
7	1.54		
	4.42 YEARLY TOTAL		
NET DEPLETION =	3496. ACRE FT.		0.37 ACRE FT. PER ACRE

ELEV. 8300. FT. MICH TO WALDEN	10167. IRR. ACRES	IRR. SEASON	5/25/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
5	.40		
6	2.38		
7	2.62		
	5.41 YEARLY TOTAL		
NET DEPLETION =	4580. ACRE FT.		0.45 ACRE FT. PER ACRE

ELEV. 8000. FT. 4944. IRR. ACRES IRR. SEASON 5/20/1983 - 7/25/1983
MIC BL WALDEN

MONTH	DEPLETION (INCHES)
5	.79
6	2.63
7	2.83
	6.25 YEARLY TOTAL

NET DEPLETION = 2574. ACRE FT. 0.52 ACRE FT. PER ACRE

ELEV. 8600. FT. 12356. IRR. ACRES IRR. SEASON 5/25/1983 - 7/25/1983
ILL TO MIDLAND

MONTH	DEPLETION (INCHES)
5	.37
6	2.51
7	1.54
	4.42 YEARLY TOTAL

NET DEPLETION = 4551. ACRE FT. 0.37 ACRE FT. PER ACRE

ELEV. 8000. FT. 9427. IRR. ACRES IRR. SEASON 5/20/1983 - 7/25/1983
LOWER ILLINOIS

MONTH	DEPLETION (INCHES)
5	.79
6	2.63
7	2.83
	6.25 YEARLY TOTAL

NET DEPLETION = 4910. ACRE FT. 0.52 ACRE FT. PER ACRE

ELEV. 8200. FT. 11648. IRR. ACRES IRR. SEASON 5/25/1983 - 7/25/1983
LIL GRIZZLY

MONTH	DEPLETION (INCHES)
5	.43
6	2.81
7	1.91
	5.15 YEARLY TOTAL

NET DEPLETION = 4997. ACRE FT. 0.43 ACRE FT. PER ACRE

ELEV. 8200. FT. 14930. IRR. ACRES IRR. SEASON 5/20/1983 - 7/25/1983
BIG GRIZZLY

MONTH	DEPLETION (INCHES)
5	.75
6	2.81
7	1.91
	5.47 YEARLY TOTAL

NET DEPLETION = 6809. ACRE FT. 0.46 ACRE FT. PER ACRE

ELEV. 8300. FT. ROARING FK	10738. IRR. ACRES	IRR. SEASON	6/01/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
6	2.74		
7	1.82		
	4.56 YEARLY TOTAL		
NET DEPLETION =	4084. ACRE FT.		0.38 ACRE FT. PER ACRE

ELEV. 8300. FT. NORTH FK	13428. IRR. ACRES	IRR. SEASON	5/25/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
5	.40		
6	2.38		
7	2.62		
	5.41 YEARLY TOTAL		
NET DEPLETION =	6054. ACRE FT.		0.45 ACRE FT. PER ACRE

ELEV. 8400. FT. NON TRIB IN CO	1030. IRR. ACRES	IRR. SEASON	6/01/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
6	2.30		
7	2.55		
	4.85 YEARLY TOTAL		
NET DEPLETION =	417. ACRE FT.		0.40 ACRE FT. PER ACRE

ELEV. 8000. FT. N WHITE	4748. IRR. ACRES	IRR. SEASON	5/20/1983 - 7/25/1983
MONTH	DEPLETION (INCHES)		
5	.79		
6	2.63		
7	2.83		
	6.25 YEARLY TOTAL		
NET DEPLETION =	2472. ACRE FT.		0.52 ACRE FT. PER ACRE

IRRIGATION TOTAL FOR WATER DISTRICT 47

50551. A.F. NET IRRIGATION DEPLETION 0.442 A.F./ACRE 114324. IRR. ACRES

WATER DISTRICT 43
RESERVOIR EVAPORATION AT 6800. FT.

MONTH	EVAPORATION (INCHES)	NET DEPLETION (AF.)
11	0.00	0.
12	0.00	0.
1	0.00	0.
2	0.00	0.
3	0.00	0.
4	0.5	17.
5	1.18	43.
6	2.34	96.
7	2.45	97.
8	2.70	98.
9	2.64	94.
10	.20	7.
	12.01 TOTALS	452.

IRRIGATION CONSUMPTIVE USE

ELEV. 7700. FT. ABOVE BUFORD	2175. IRR. ACRES	IRR. SEASON	6/20/1983 - 7/31/1983
	MONTH	DEPLETION (INCHES)	
	6	.92	
	7	2.21	
		3.13 YEARLY TOTALS	
NET DEPLETION =	567. ACRE FT.		0.26 ACRE FT. PER ACRE

ELEV. 6350. FT.	13596. IRR. ACRES	IRR. SEASON	6/05/1983 - 7/31/1983 8/20/1983 - 9/10/1983
WR AB YELLOW CK	MONTH	DEPLETION (INCHES)	
	6	2.99	
	7	4.17	
	8	1.67	
	9	1.26	
		10.09 YEARLY TOTAL	
NET DEPLETION =	11429. ACRE FT.		0.84 ACRE FT. PER ACRE

ELEV. 6500. FT. TRIBS AB MEEKER	5108. IRR. ACRES	IRR. SEASON	6/01/1983 - 7/15/1983
	MONTH	DEPLETION (INCHES)	
	6	3.23	
	7	1.90	
		5.13 YEARLY TOTAL	
NET DEPLETION =	2185. ACRE FT.		0.43 ACRE FT. PER ACRE

ELEV. 6800. FT. 5222. IRR. ACRES IRR. SEASON 6/10/1983 - 7/20/1983
UPPER TRIBS MONTH DEPLETION (INCHES)

6 1.50
7 2.16
3.66 YEARLY TOTAL

NET DEPLETION = 1594. ACRE FT. 0.31 ACRE FT. PER ACRE

IRRIGATION TOTAL FOR WATER DISTRICT 44

16955. A.F. NET IRRIGATION DEPLETION 0.66 A.F./ACRE 25638. IRR. ACRES

WATER DISTRICT 55
RESERVOIR EVAPORATION AT 5500. FT.

MONTH	EVAPORATION (INCHES)	NET DEPLETION (AF.)
11	0.25	0.
12	0.00	0.
1	0.00	0.
2	0.00	0.
3	0.00	0.
4	0.50	0.
5	1.39	0.
6	3.41	0.
7	3.26	0.
8	3.64	0.
9	2.50	0.
10	0.58	0.
	15.53 TOTALS	0.

IRRIGATION CONSUMPTIVE USE

ELEV. 5700. FT.	1350. IRR. ACRES	IRR. SEASON	5/20/1983 - 7/25/1983 8/20/1983 - 8/31/1983
LOCATION SNAKE	MONTH	DEPLETION (INCHES)	
	5	.84	
	6	3.89	
	7	3.50	
	8	1.86	
		10.09 YEARLY TOTAL	
NET DEPLETION =	1135. ACRE FT.		0.84 ACRE FT. PER ACRE

IRRIGATION TOTALS FOR WATER DISTRICT 55

1135. A.F. NET IRRIGATION DEPLETION .84 A.F./ACRE 1350. IRR. ACRES

WATER DISTRICT 58
RESERVOIR EVAPORATION AT 8000 FT.

MONTH	EVAPORATION (INCHES)	NET DEPLETION (AF.)
11	0.00	0.
12	0.00	0.
1	0.00	0.
2	0.00	0.
3	0.00	0.
4	0.00	0.
5	0.43	90.
6	1.53	336.
7	1.95	423.
8	2.51	535.
9	1.30	269.
10	0.00	0.
	7.72 TOTALS	1652.

IRRIGATION CONSUMPTIVE USE

ELEV. 6900. FT. ELK R	6783. IRR. ACRES	IRR. SEASON	6/10-1983 - 7/31/1983
	MONTH	DEPLETION (INCHES)	
	6	1.71	
	7	3.35	
		5.06 YEARLY TOTAL	
NET DEPLETION =	2862. ACRE FT.		0.42 ACRE FT. PER ACRE

ELEV. 7000. FT. TRIB TO ELK R	3474. IRR. ACRES	IRR. SEASON	6/20/1983 - 7/15/1983
	MONTH	DEPLETION (INCHES)	
	6	.89	
	7	1.59	
		2.47 YEARLY TOTAL	
NET DEPLETION =	716. ACRE FT.		0.21 ACRE FT. PER ACRE

ELEV. 8000. FT. BEAR RIVER	10972. IRR. ACRES	IRR. SEASON	6/01/1983 - 7/31/1983
	MONTH	DEPLETION (INCHES)	
	6	2.68	
	7	3.12	
		5.80 YEARLY TOTAL	
NET DEPLETION =	5302. ACRE FT.		0.48 ACRE FT. PER ACRE

ELEV. 800. FT.
 TRIBS BL SARVIS

MONTH	DEPLETION (INCHES)
6	1.36
7	1.66
	3.01 YEARLY TOTAL

NET DEPLETION = 1123. ACRE FT.

4473. IRR. ACRES IRR. SEASON 6/15/1983 - 7/15/1983
 0.25 ACRE FT. PER ACRE

ELEV. 6770. FT.
 YAMPA R TO ELK

MONTH	DEPLETION (INCHES)
6	1.37
7	3.41
8	1.82
	6.59 YEARLY TOTAL

NET DEPLETION = 3672. ACRE FT.

6683. IRR. ACRES IRR. SEASON 6/15/1983 - 8/15/1983
 0.55 ACRE FT. PER ACRE

ELEV. 7800. FT.
 TRIBS AB SARVIS

MONTH	DEPLETION (INCHES)
6	2.43
7	2.60
	5.04 YEARLY TOTAL

NET DEPLETION = 2074. ACRE FT.

4943. IRR. ACRES IRR. SEASON 6/10/1983 - 7/20/1983
 0.42 ACRE FT. PER ACRE

IRRIGATION TOTALS FOR WATER DISTRICT 58

15749. A.F. NET IRRIGATION DEPLETION 0.42 A.F./ACRE 37328. IRR. ACRES

SUMMARY FOR WATER DISTRICT 55 IN ACRE-FT

IRRIGATION DEPLETION	1135.
RESERVOIR EVAPORATION	0.
CHANGE IN RESERVOIR STORAGE	0.
OUT OF BASIN DIVERSIONS	0.
MUNICIPAL & INDUSTRIAL CONSUMPTION	0.
MISC. USE OR CORRECTIONS	150.
TOTAL DEPLETION	1285.

SUMMARY FOR WATER DISTRICT 56 ACRE-FT

IRRIGATION DEPLETION	3476.
RESERVOIR EVAPORATION	66.
CHANGE IN RESERVOIR STORAGE	10.
OUT OF BASIN DIVERSIONS	0.
MUNICIPAL & INDUSTRIAL CONSUMPTION	0.
MISC. USE OR CORRECTIONS	150.
TOTAL DEPLETION	3702.

SUMMARY FOR WATER DISTRICT 57 IN ACRE-FT

IRRIGATION DEPLETION	7189.
RESERVOIR EVAPORATION	112.
CHANGE IN RESERVOIR STORAGE	-221.
OUT OF BASIN DIVERSIONS	334.
MUNICIPAL & INDUSTRIAL CONSUMPTION	4500.
MISC. USE OR CORRECTIONS	100.
TOTAL DEPLETION	12014.

SUMMARY FOR WATER DISTRICT 58 IN ACRE-FT

IRRIGATION DEPLETION	15749.
RESERVOIR EVAPORATION	1652.
CHANGE IN RESERVOIR STORAGE	3842.
OUT OF BASIN DIVERSIONS	3993.
MUNICIPAL & INDUSTRIAL CONSUMPTION	700.
MISC. USE OR CORRECTIONS	300.
TOTAL DEPLETION	25936.

SUMMARY FOR WATER DISTRICT 47 IN ACRE-FT

IRRIGATION DEPLETION	50551.
RESERVOIR EVAPORATION	3269.
CHANGE IN RESERVOIR STORAGE	2360.
OUT OF BASIN DIVERSIONS	358.
MUNICIPAL & INDUSTRIAL CONSUMPTION	100.
MISC. USE OR CORRECTIONS	400.
TOTAL DEPLETION	57038.

SUMMARY FOR WATER DISTRICT 43 IN ACRE-FT

IRRIGATION DEPLETION	18629.
RESERVOIR EVAPORATION	452.
CHANGE IN RESERVOIR STORAGE	400.
OUT OF BASIN DIVERSIONS	0.
MUNICIPAL & INDUSTRIAL CONSUMPTION	4000.
MISC. USE OR CORRECTIONS	500.
TOTAL DEPLETION	23981.

SUMMARY FOR WATER DISTRICT 44 IN ACRE-FT

IRRIGATION DEPLETION	16955.
RESERVOIR EVAPORATION	752.
CHANGE IN RESERVOIR STORAGE	-21.
OUT OF BASIN DIVERSIONS	0.
MUNICIPAL & INDUSTRIAL CONSUMPTION	5400.
MISC. USE OR CORRECTIONS	500.
TOTAL DEPLETION	23586.

SUMMARY FOR WATER DISTRICT 54 IN ACRE-FT

IRRIGATION DEPLETION	4689.
RESERVOIR EVAPORATION	62.
CHANGE IN RESERVOIR STORAGE	0.
OUT OF BASIN DIVERSIONS	0.
MUNICIPAL & INDUSTRIAL CONSUMPTION	0.
MISC. USE OR CORRECTIONS	100.
TOTAL DEPLETION	4851.

DIVISION 6 BREAKDOWN BY RIVER BASIN

	YAMPA	LITTLE SNAKE	GREEN	WHITE	N PLATTE	COLORADO
IRRIG DPLTN	39893.	5824.	3476.	18629.	50551.	67822.
RES EVAP	2516.	62.	66.	452.	3269.	3096.
CHG STORAGE	3600.	0.	10.	400.	2360.	4010.
MUN-IND	10600.	0.	0.	4000.	100.	14600.
TRANS-MTN	3659.	0.	0.	0.	358.	3659.
MISC	900.	250.	150.	500.	400.	1800.
OUTFLOW	1584385.	671234.	30000.	818862.	721904.	3104481.
BASIN YIELD	164553.	677370.	33702.	842843.	778942.	3199468.
CONS USE	61168.	6136.	3702.	23981.	57038.	94987.
PCT CONS	.0372	.0091	.1098	.0285	.0732	.0297

IRRIGATED ACRES -	North Platte River	114324
AF/Acres - .44		
IRRIGATED ACRES -	Colorado River	112120.
AF/Acres - .60		

NOTES: Yampa River outflow is estimated flow at the confluence of Little Snake River.
 North Platte outflow includes Big Creek, Line Creek, Camp Creek, and Encampment River drainages within Colorado.
 Little Snake River does not include any uses in Wyoming.
 Green River does not include mainstem.