

1954

J. E. WHITTEN  
State Engineer

C. C. HEZMALHALCH  
Deputy



L. T. BURGESS  
Chief Hydrographer

HARRY L. SITTSER, Jr.  
Office Engineer

STATE OF COLORADO  
OFFICE OF STATE ENGINEER  
DIVISION OF WATER RESOURCES  
DENVER-2

Durango, Colo.  
February 8-1955



**SUBJECT:**

Mr. J. E. Whitten  
State Engineer  
Denver, Colo.

Dear Sir:

Herewith is submitted the final annual report for  
Irrigation Division 7 for 1954. This will supplant the  
preliminary report which was submitted in November.

Very truly yours,

*J. R. Williams*  
Division Engineer.

Preliminary Report of Division Seven for 1954

By J. R. Williams,  
Division Engineer.

As of April first the accumulated snow and water content on the Animas River as measured at the snow measuring stations was about sixty percent of the average for 18 years of record. The same percentage applied to the Dolores River. On the La Plata the amount of water at elevation 9700 feet was forty percent of the mean for a shorter period of record. Following a short water year in 1953 the outlook for 1954 was poor.

Precipitation.

The records of precipitation at several Weather Bureau Stations in the division was as follows:

Station:	Jan.:-	Mar. :	April -	June :	July-	Sept. :	Total	
	Amt.:	Dep	Amt. :	Dep. :	Amt. :	Dep. :	Amt. :	Dep.
Cascade:	6.07:	-3.31 :	4.08 :	-1.15:	12.26:	+3.93:	22.41 :	- 0.53 :
Cortez :	1.77:-	2.29 :	3.02 :	+.10:	5.28:	+ .67:	10.07 :	- 1.52 :
Durango:	3.56:	-1.37 :	2.88 :	-1.74:	8.82:	+2.78:	15.26 :	- 0.33 :
Fort Lewis :	3.12:-	1.63 :	2.15 :	- 1.15:	7.52:	+1.26:	12.79 :	- 1.52 :
Ignacio:	3.25:	- .43 :	2.55 :	- .84:	6.39:	+ .91:	12.19 :	- 1.36 :
Pagosa Springs:	4.40:-	1.48 :	2.71 :	- 1.31:	6.39:	- .29:	13.50 :	- 3.08 :
Rico :	4.67:-	3.37 :	2.95 :	-1.87:	11.12:	+2.92:	18.74 :	- 2.32 :
Silver-ton :	2.62:-	3.64 :	3.13 :	- 1.67:	9.97:	+2.65:	15.72 :	- 2.66 :
Vallecito Dam :	4.97:-	1.71 :	3.63 :	- .71:	10.68:	+3.80:	19.28 :	1.38 :
Wolf.Cr. Pass :	15.35:-	4.54 :	4.49 :	- 4.04:	13.79:	+3.62:	33.63 :	- 4.96 :
Average All Sta.	4.98	- 2.38	3.16	- 1.44	9.22	+2.22	17.36	- 1.69
Percent Dep.	- 32		- 31		+ 32		- 9	

The lack of adequate snow and rainfall during the first six months of the year and following 1953 was reflected in the amounts of stream flow for the April- June period and on some streams thru out the entire season.

Estimates of Stream Flow.

Stream and Location	Month and Flow in Acre Feet						Total
	April	May	June	July	August	Sept.	
Animas at Durango	43040	91900	71330	49110	22970	21620	299970
Mean 17 yrs 1937-1953	54070	147720	176380	72710	31300	23740	505920
% of Mean 1954	80	62	40	68	73	91	59
Pine at Val. Dam	24030	59120	33650	24490	13940	14390	169620
Mean 1937-1953	23040	71590	76770	33240	13430	11940	230010
% 1954	104	83	44	74	104	121	74
La Plata Hesperus	4000	6640	2670	2150	1030	1250	17740
Mean 26 yrs. 1928-1953	5510	11520	9000	2620	1460	1120	31230
% 1954	73	58	30	82	71	112	57
Dolores at Dolores	32650	56620	19820	11190	8500	8480	137500
Mean 1937-1953	51400	117120	91950	26350	12990	9100	308910
% 1954	64	48	22	42	65	93	44

Use of Water from Reservoirs.

Name of Reservoir	Amount of Water in Storage in Acre Feet					
	Capacity	Amount April 1	Maximum Amount	Date of Max.	Amount Nov. 1	Amount Used
Jackson Gulch	10000	3480	6460	May 26	3160	4470
Vallecito	126280	36340	89850	June 7	53440	45720
Ground Hog	21710	5000	9150	July 1	3830	6120
Narraguinepp	8750	2350	8750	Apr. 17	4100	8730
Red Mesa	1200	800	800	Apr. 1	0	800
Summit	4800	320	4580	May 25	220	4820
Totals	172740	48290	119590		66580	70660

The amount stored was 69 percent of total capacity and was 32000 a.f. less than was stored in 1953. The amount used from storage <sup>was</sup> 34600 a.f. less than in 1953. The amount remaining in storage at end of season is 21300 a.f. more than was remaining in 1953. Water was stored in reservoirs in July, August., September and October from runoff from heavy rains.

#### Administration.

More than usual amounts of troubles arose over distribution because of the short water supply and particularly so on the La Plata River. New Mexico had a new man from La Plata to represent that area for the compact administration. Compact requirements to New Mexico were met satisfactorily by rotations of flow from April thru June. It was impossible to deliver the required amounts thru the summer.

#### Crops.

Owing to the short stream supply in La Plata and Dolores rivers the crops were short in areas irrigated from those streams. Under storage the late crops were better than average.

A severe freeze on June 7 hurt first crops of hay and the fall planted wheat. Better than average rainfall during the July-September period caused good forage and hay crops over most of the area.

Annual Report of Division Engineer for Irrigation Division 7

1954

By J. R. Williams  
Division Engineer.

On April 1st. the accumulated snow and water content as measured at several snow courses on the Animas River was about sixty percent of average for 18 years of record. The same percentage was found on the the Dolores River. On the La Plata River at one station at elevation 9700 feet the amount of water in snow was forty percent for a shorter period of record.

Precipitation. The records of precipitation at several Weather Bureau Stations in the division were as follows:

Station	: Periods, Amount of Precipitation and Departure from Mean							
	Jan. to Mar.	April to June	July to Sept.	Total				
	Amt.	Dep.	Amt.	Dep.	Amt.	Dep.	Amt.	Dep.
Cascade	6.07	-3.31	4.08	- 1.15	15.26	3.93	22.41	-0.53
Cortez	1.77	-2.29	3.02	.10	5.26	.67	10.07	- 1.52
Durango	3.56	-1.37	2.88	- 1.74	8.82	2.78	15.26	-0.33
Fort Lewis	3.12	-1.63	2.15	-1.15	7.52	1.26	12.79	- 1.52
Ignacio	3.25	-0.43	2.55	- 0.84	6.39	0.91	12.19	-1.36
Pagosa Springs	4.40	-1.48	2.71	- 1.31	6.39	-0.29	13.50	- 3.08
Rico	4.67	-3.37	2.95	- 1.87	11.12	2.92	18.74	- 2.32
Silverton	2.62	-3.64	3.13	- 1.67	9.97	2.65	15.72	- 2.66
Vallecito Dam	4.97	-1.71	3.63	- 0.71	10.68	3.80	19.23	1.38
Wolf Cr. Pass	15.35	-4.54	4.49	- 4.04	13.79	3.62	33.63	- 4.96
Average	4.98	-2.38	3.16	-1.44	9.22	2.22	17.36	-1.69

Percent Departure      Minus 32                      Minus 31                      Plus 32                      Minus 9

The lack of adequate or normal snow cover during the winter and deficient rainfall during the spring months, following a deficient water year in 1953, was reflected in the amounts of stream flow and a consequent lack of sufficient irrigation supply for some areas during the early months and particularly the April- June period. While rainfall was above average for the July- September period and which was reflected to some extent in stream flow, the total stream flow for the irrigation season was still far below average.

Estimates of Stream Flow.

Stream & Location :	Monthly and Period Flow in Acre Feet							
	April :	May :	June :	Total :	July :	Aug. :	Sept. :	Total :
				3 Mos.:				6 Mos. :
<b>Animas</b>								
- Durango:	42120:	93950	: 70950	: 207020:	47980	: 22610	: 21740	: 299280 :
Mean 17 Yrs								
1937-1953:	54070	:147720	:176380	: 378170:	78710	: 31300	: 23740	: 505920 :
% of Mean								
1954 :	78	63	40	55	66	73	92	59
<b>Pine at *</b>								
Val. Res.:	24030	: 59120	: 33650	: 116800:	24490	: 18340	: 14390	: 169620 :
Mean								
1937-1953:	23040	: 71590	: 76770	: 171400:	33240	: 15430	: 11940	: 230010 :
% of Mean								
1954 :	104	83	44	68	74	104	121	74
<b>La Plata **</b>								
-Hesperus:	3970	: 9650	: 2630	: 13950:	2140	: 1100	: 1130	: 17620 :
Mean								
1928-1953:	5510	: 11520	: 9000	: 26030:	2620	: 1430	: 1120	: 31250 :
% of Mean								
1954 :	72	58	29	51	82	75	101	56
<b>Dolores</b>								
-Dolores :	32060	: 56520	: 19890	: 108170:	11460	: 3750	: 8330	: 136710 :
Mean								
1937-1953:	51400	:117120	: 91950	: 260470:	26350	: 12990	: 9100	: 308310 :
% of Mean								
1954 :	62	48	21	42	43	67	91	44

Note: \* Flow of Pine River at Vallecito Reservoir is computed by difference in stage of storage in reservoir.

\*\* La Plata at Hesperus is total of amount at Hesperus and diversions above the station for 1954 and the mean flow for 26 years.

Runoff per square mile & production from water content plus rainfall.

Stream :	Elev.:	No.Sq. :	Total :	Runoff :	Water :	Rain-:	Total:	No. :	Comp- :	% of
		Mi. in :	Flow in:	per Sq.:	in ft.:	fall :	Water :	Acres :	uted :	Runoff
		Drain- :	A.F. :	Mile :	Depth :	in ft.:	in ft.:	in :	Flow :	to
		age :	April- :	Ac.Ft.:	on :	April:	Drain- :	in Ac.:	in Ac.:	Comp-
		Area :	June :	April 1-:	June:	age Area:	Ft. :	uted Flo		
Animas :	6500	: 692	:207020	: 300	: 1.03	: 0.26:	1.29	: 442880	:571320	: 36
Pine :	7500	: 280	:116800	: 418	: 1.03	: 0.26:	1.29	: 179200	:251170	: 51
La Plata:	8110	: 37	: 13250	: 558	: 0.89	: 0.18:	1.07	: 23680	: 25340	: 52
Dolores :	6925	: 556	:108170	: 135	: 0.70	: 0.25:	0.95	: 355840	:338050	: 32

The runoff per square mile is naturally greater at higher elevations as is the percentage of flow in relation to water content of snow plus rainfall. The averages are as follows: Animas-546 a.f., Pine-612, La Plata-703, Dolores-463 for the April-June period.

Tabulated Statement of Water Commissioners Annual Ditch Reports.

Dist. No.	Amount: Approp-riated in S.F.:	Total Capacity of Canals in S.F.:	First Day Water Was Used From Nat. Stream	Last Day Water Was Used From Nat. Stream	No. of Days Water Was Used From Nat. Stream	Average Daily Am't. Used	No. Acre Feet Used	No. Acres Irrigated	Gross Head-Duty
29	589	* 639					*30000	*15000	2.0
30	590	769	April 1	Nov. 15	229	231	105830	25515	4.1
31	719	889	" 19	" 18	207	355	146830	49113	3.0
33	277	490	Mar. 1	" 30	189	42	15930	10280	1.6
34	864	1102	Mar. 31	" 30	245	259	126700	52245	2.4
69	116	66	Apr. 2	Aug. 25	145	15	4290	1179	3.6
Total	3155	3977	Mar. 1	Nov. 30	275	780	429630	153332	2.8

\* No report. Estimated by Division Engineer.

Tabulated Statement of Water Commissioners Annual Reservoir Reports.

Dist. No.	No. of Reservoirs	Area of High Water in Acres	Total Capacity in A.F. on May 1st	Quantity in Reservoirs in A.F. on May 1st	Quantity in Reservoirs in A.F. on Nov. 1	First Day Water Was Used	Last Day Water Was Used	No. of Days Water Was Used	Average Daily Am't. Used	No. Acre Feet Used	No. Acres Irrigated
29	5	*670	* 1500	* 1000						* 1000	* 150
30	5	955	25170	12740	20090	6/26	9/13	45	6.3	566	55
31	3	3093	128240	55900	52270	5/27	11/18	136	235	63790	3693
33	1	50	1200	810	220	5/3	11/14	96	5.2	1010	60
34	9	1214	26170	19140	3100	5/12	9/23	135	94	25370	4965
69	2	706	22640	5660	3330	7/7	9/12	38	2.6	200	9
Total	25	6688	204920	95250	84510	5/3	11/18	136	Max. 338	91936	8933

\* No Report. Estimated by Division Engineer. a. Includes 23980 ac. feet in Electra Lake which is used for power. b. Includes 6120 a.f. from Ground Hog Reservoir, in Dist. 69. c. Includes 21710 a.f. capacity of Ground Hog Reservoir.

The total amount of water used from natural streams, 429630 a.f., was more than used in 1953 when the total was 411520 a.f. although the total stream flow was less than in 1953. The total number of acres irrigated, 152332, was about a thousand less than in 1953. There was an increase of 953 acres in Dist. 31, a small increase in Dist. 69 but loss acres reported in all other districts with largest loss in Dist. 33 where the irrigated area fluctuates with the stream flow. The increase in amount of water diverted from streams over 1953 was due to the better than average rainfall experienced during the July- September period.

The maximum amount of water stored is not shown by reporting the amounts on May 1st. which this year totalled 95250 a.f. less 12220 a.f. in Cascade Reservoir which is used for power development. The total maximum amount in storage for irrigation was 122340 a.f. and the dates were from April 1st. to July 1st. when the greatest amounts were obtained. This compares with 148520 a.f. as maximum in 1953. The total used from storage, 91936 a.f. was 24700 a.f. less than in 1953. The amount remaining in storage on Nov. 19 was about 67000 a.f. which was 32000 more than in 1953. The greatest part of this was in Vallecito reservoir where there was 53440 as compared with 28280 a year ago. Some water was stored each month from July to October in Vallecito and Harraguinepp reservoirs and during July, September and October in Jackson Gulch.

The total number of acres irrigated from reservoirs was 89339 as compared with 91650 in 1953. The amount of water per acre was just a fraction over 1.0 acre foot. In Dist. 31 this made a total of 4.0 acre feet per acre which was an adequate water supply.

The La Plata area and some areas around Pagosa Springs suffered most from lack of water supply from streams and from lack of adequate storage reservoirs. The areas or districts which came thru best from the summer rains were Pine River, Florida Mesa, Mancos Valley and Montezuma Valley. As a result of a heavy rain the highest stream flow of the year occurred at Hesperus and on the Florida on July 23. All other streams had maximum flow on or about May 22d.

A severe frost on June 7th. did more damage to early hay and wheat than the lack of water. All districts came out with good second cuttings of hay except the La Plata and parts of the San Juan. There is plenty hay in the area for livestock and probably some for sale. The frost free period was from June 7th. to October 15 in nearly all of the irrigated areas.

Mr. Archie Toner was appointed Water Commissioner of Dist. 29. He was active in making the necessary regulations on the tributary streams and in getting more adequate headgates and measuring flumes installed. He did not obtain sufficient ditch records to make an efficient report.

From an administrative view point the year of 1954 was rough until the rains came in July when things eased up noticeably. We all came thru alive which may be better than we will do in 1955 unless the snow cover on the water sheds improves. On the Animas River drainage the water content of snow on Feb. 1st. was 9.5 ins. which is 92 percent of 1954 and 64 percent of the mean for the last five years.

There were no major irrigation developments made or started during the past year. The Bureau of Reclamation made a preliminary report on the Animas La Plata project and it is hoped that at some future date this will be an actual accomplishment. The Florida and Pine River Extension Projects depend on authorization by Congress of the Upper Colorado Development Plan.



J. E. WHITTEN  
State Engineer

C. C. HEZMALHALCH  
Deputy



L. T. BURGESS  
Chief Hydrographer

HARRY L. SITTSER, Jr.  
Office Engineer

STATE OF COLORADO  
OFFICE OF STATE ENGINEER  
DIVISION OF WATER RESOURCES

DENVER 2  
Durango, Colo.  
Dec. 4-1954

SUBJECT:

Mr. C. C. Hezmalhalch  
Deputy State Engineer  
Denver, Colo.

Dear Mr. Hezmalhalch:

In reply to your circular letter to all Division Engineers about crop yields and prices.

Owing to the drought which was prevalent for the first six months of 1954 and a severe freeze that occurred early in June, the first hay crops were about fifty percent of average. The small grain crops were about 65 percent.

Second crops of alfalfa, grass and forage from July thru October have been above average due to better than normal rainfall during that period.

The price of wheat is pegged by support at about \$3.30 per cwt. It is expected that demand will bring about better prices for stored grain early next year. Baled hay is being held about \$25 per ton with little moving because of the open weather. It is also expected that this price will improve early next year. Both hay and wheat will move south, if there is any left, next spring to the southern parts of the area, that is, to New Mexico, Arizona and Texas.

Very truly yours,

*J. R. Williams*  
Division Engineer.