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

Durango, Colo.
January 6-1958

SUBJECT:

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

Dear Sir:

Attached hereto is Annual Report of Irrigation Division
Engineer for Irrigation Division No. 7 for the year 1957.

Respectfully Submitted,

J. R. Williams
J. R. Williams
Division Engineer.



ANNUAL REPORT - IRRIGATION DIVISION 7

1957

By J. R. Williams
Division Engineer.

Water Supply

The water content of accumulated snow on the principal watersheds was as follows at beginning of irrigation season.

April 1st.

	Number	Snow	Water	Average	1957	No.	Remarks
Drainage	Courses	Depth	Content	Water	% of	Years	
	Inch.	Inch.	Content	Aver.	Record		
Upper San							
Juan	1	109	45.2	34.6	131	21	
						21	1 Course
Alamos	6	85	25.8	16.6	105	6	5 courses
Delores	2	46	13.2	10.8	122	21	

May 1st.

Upper							
San Juan	Number	Snow	Water	Average	1957	No.	Remarks
	Courses	Depth	Content	Water	% of	Years	
	Inch.	Inch.	Content	Aver.	Record		
San Juan	1	98	45.0	32.8	137	21	
Alamos	6	59	22.3	13.7	176	21 & 6	
Delores	3	36	16.2	8.0	200	21	

This was one of the few years of record that water content did not appreciably decrease during the month of April, due, of course, to excess precipitation during April which also continued thru May.

Precipitation
(Inches)

Month

Weather	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
Station	Inch.	Dep.	Inch.	Dep.	Inch.	Dep.	Inch.
Duarte	1.60	0.0	0.31	0.61	0.53	1.30	4.35
Alco	1.65	0.65	1.4	1.43	1.09	0.77	6.99
Vallacito							
Don	1.80	0.59	1.12	1.7	1.23	1.95	8.49
Hogosa							
Spring	1.47	0.24	0.46	0.73	0.90	1.14	5.90

The big storm of the winter occurred during the last week of January which accounts for the large amounts shown that month. The weather station on Wolf Creek Pass was lost in a snow slide at west side camp on or about January 27. There was no record there for January or later. At the snow course, however the increase in water content during January was from 10.2 ins. to 34.4 ins. A gain of 24.2 ins. which would indicate a total snow fall of about 24 feet for the month. Highway employees claimed 11 feet of snow fall during the one heavy storm.

Precipitation (Continued)

	Month										6 Mo.	12 Mo.		
	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Total				
Weather :														
Station :	Ins.	Dep.	Ins.	Dep.	Ins.	Dep.	Ins.	Dep.	Ins.	Dep.		Total		
Durango :	2.89	1.64	2.90	1.72	.51	-.40	4.17	2.34	3.65	1.30	.09	-1.79	14.21	25.43
	Est.										*	*		
Rico :	3.92	4.96	0.05	5.30	5.00	6.65	15.48	31.22						
Vallecito														
Dam :	3.65	3.40	1.09	6.02	5.08	1.09	19.31	33.88						
Pagosa														
Springs :	2.18	3.43	0.45	5.72	3.59	1.09	15.52	27.52						

* Precipitation at Rico not published for August. Estimated as about the same as at Vallecito Dam. Monthly averages and departure not as yet published. The annual average at Durango is about 19 ins. The departure was plus 6.43 or about 33 per cent. Heavy rains occurred during the night of July 25-26. Six inches was reported at Cascade.

Estimated Stream Flow
(Thousands of Ac. Ft.)

Stream	Amount	Month & Period								
		Forecast	Total							6 Mos.
		May	April	May	June	3 Mos.	July	Aug.	Sept.	Total
Animas	39 684									
Durango	151 630	55.7	96.0	305.9	432.6	134.2	77.2	59.2	732	
Mean										
1947-1956	476	51.1	140.6	164.7	356.4	67.2	30.0	22.5	476	
1957										
of Mean	154	60	64	136	121	274	253	170	154	
Dolores										
at Dolores	530	29.7	93.1	206.9	335.0	91.6	38.7	22.4	488	
Mean										
46 yrs.	289	48.2	111.1	82.0	241	24.2	12.9	10.6	289	
1957										
of Mean	168	62	62	250	139	379	300	211	168	
Los Rios										
at Dryfield	300	12.4	40.4	155.5	215	101.5	44.9	16.6	378	
Mean										
1947-1956	219	22.3	69.5	71.9	164	59.7	13.5	11.4	219	
1957										
of Mean	172	27	58	216	132	330	362	145	172	
La Plata	50									
at Fort	50.35	3.3	8.5	25.9	36.3	10.5	4.7	1.8	53.8	
Mean										
30 yrs.	50	3.4	11.2	8.7	25.3	3.6	1.4	1.1	50.4	
1957										
of Mean	177	31	76	267	145	404	336	164	177	
Florida										
Nr. Durango	80	4.9	11.5	44.4	60.7	25.3	11.1	4.0	101	
Mean										
30 yrs.	64	7.5	21.2	22.1	50.8	6.2	3.8	3.6	64	
1957										
of Mean	158	65	54	200	120	418	294	110	158	

W. indicates estimate by Williams. St. by Stockwell

Water Supply Cont'd.

Stream runoff was retarded during April and May because of the wet and cold weather. Heavy stream discharge commenced the last of May and continued thru June. Maximum stage occurred generally on June 6th, but there were several rather high stages of flow at about weekly intervals thru June.

Total stream discharge for June was either in excess of any previous record or exceeded on some streams only in years of 1949 and 1952 during the period of recent record.

Floods

Maximum flood discharge from snow melt did ^{not} reach the probable or expected amounts. The reason being that extreme warm, thawing weather did not last long enough at any period. It would warm up for about four or five days and then cool off for about a like period which was a good thing.

Heavy rain of July 25 and 26 caused floods on the Florida, Pine, and Vallecito Rivers considerably in excess of the June floods. It was just plain luck that such rains came late in July rather than in June or early July.

The flood peaks are estimated to have been as follows:

Stream	Date	Maximum Flow (C.F.S.)	Date	Max. Flow in S. F.
Florida River	June 6	3200	July 27	5100
Pine River	" 6	6300	" "	" "
Vallecito River	" 25	1400	July 26	2850
Vallecito Res. Inflow	" 6	5000	" 26	8000
Outflow from Vallecito Res.	" "	" "	July 27	14000

The cause of the big water down Pine River from Vallecito Reservoir was the opening of the spillway gates early in the morning of July 27. Inflow had caused the stage of storage to be about one foot above or over the top of the spillway gates. The amount of water in storage at 4:30 AM, July 27 was 123,250 acre feet, or about two thousand acre feet more than the capacity.

Flood Damage:

There was rather extensive flood damage on all streams. The Water Commissioners have included in their field books estimates of such damage, which were obtained by interviewing property owners who had suffered losses caused by floods.

Cost of Flood Protection and Estimated Flood Damage

Water Dist :	Place & Stream :	Flood Protection Cost :	Nature of Flood Damage :	Estimated Cost or Damage by Floods :
34	Dolores, Colo :	\$6069	No Damage to Town	
34	Mancos, Colo. :	6915	" " " "	
34	Dolores River :		Ditch Headings & Land Erosion	\$5850
			State Highway at Stoner	\$ 15000
34	Mancos River :		Ditches & Land Erosion	2850
31	Pine River :		Roads, bridges, houses, gardens, crops, ditches, land erosion	67651
30	Florida River :		Dams, headgates, fences, bridges, roads & land erosion	13600
30	Animas River :		"	11500
30	Junction Creek :		"	1200
30	Lightner " :		"	500
30	Salt " :		"	500
32	La Plata River :		"	10400
62	West Fork Dolores :		"	650
62	Disappointment Cr. :		"	12480
Totals Reported		\$ 12084		\$142,161

or to be included
 No report from Dist. 29 which includes San Juan and Piedra Rivers and tributaries. Damage on those streams was extensive also.

Crops

The overall effect of plentiful water supply and excessive rains during July, August and October was beneficial. Crop yields were above average although some percentage of the harvested crops was lost. Grass and forage was the best for a long time. Springs started running that had been dry for years.

The tabulation of Water Commissioners Reports conclude this report.

TABULATION OF WATER COMMISSIONERS DITCH REPORTS FOR 1957.

Dist. No.	Amount in S. F.	Capacity of Canals in S. F.	First Day Water Used From Stream	Last Day Water Used From Stream	Number of Days Water Was Used	Average Daily Amount Used	Number of Acre Feet Used	Number of Acres Irrigated
29	539	659					* 30000	* 15000
30	502	1077	Mar. 1	Nov. 15	260	216	112880	22659
31	725	959	May 1	Oct. 28	181	357	129380	47227
35	259	544	Apr. 10	Oct. 30	187	86	52130	14735
34	820	1342	Mar. 27	Oct. 31	219	373	163460	55915
69	65	52	Apr. 16	Sept. 30	168	16	5210	711
Totals	3951	4613	Mar. 1	Nov. 15	260	909	472560	156247

* No report for Dist. 29. Estimated by Division Engineer.

TABULATION OF WATER COMMISSIONERS ANNUAL RESERVOIR REPORTS

Dist. No.	Number of Reservoirs	Capacity in Acre Feet	Amount in Storage May 1	Amount in Storage Nov. 1	Change in Storage	First Day Water Used	Last Day Water Used	No. of Days Water Was Used	Average Daily Amount Used	No. of Acre Feet Used	Total No. of Acres Irrigated
29	5	1320	1500	1300						*1000	* 1500
30	5	918	25170	2240	12710	6/10	9/28	29	9	360	440
31	5	3223	12336	4338	7267	6/18	10/8	73	2.5	360	200
35	1	30	1200	1200	1200	7/12	10/15	18	6.6	254	195
34	9	1207	26470	12558	21550	6/1	11/1	153	73	22340	44740
69	2	700	22176	2343	15626						0
Totals	25	6839	214752	67327	135723	June 1	Nov. 1	153	79	24294	47075

* No Report by Water Commissioner of Dist. 29. Estimated by Division Engineer

(a) Includes 6600 acre feet from Ground Hog Reservoir in Dist. 69.

Tabulation of Water Commissioner's Annual Ditch Reports.

Dist. No.	Amount in S.F.	Capacity in S.F.	First Day	Last Day	Number of Days	Aver. Daily Am't. in S.F.	Number of Acres	Total No. Acres Irrigated
29	589	* 639					* 30000	* 15000
30	590	1070	Apr. 10	Nov. 15	220	205	90090	25236
31	713	922	Apr. 8	Nov. 15	212	322	136420	47133
33	271	392	Mar. 16	Oct. 31	189	44	16610	9260
34	837	1237	Mar. 29	Nov. 12	229	283	129560	51470
69	92	77	May 1	Oct. 31	184	11	4190	907
Totals	3092	4337	Apr. 8	Nov. 15	229	888	406870	149006

* No report by Water Commissioner. Estimated by Division Engineer.

Tabulation Of Water Commissioners Annual Reservoir Reports.

Dist. No.	Number of Reservoirs	Area in Acre-Feet	Capacity in Acre-Feet	Quantity in Reservoirs May 1st	Quantity in Reservoirs Nov. 1st	First Day	Last Day	No. Days	Number of Acres	Total Number of Acres Irrigated
29	5	* 670	* 1500	* 1000	* 100				* 1000	* 1500
30	5	935	25170	7410	16600	7/12	10/5	40	360	389
31	3	3093	128236	65310	43330	6/25	11/15	142	74110	36676
33	1	50	1200	740	0	6/1	10/29	63	770	600
34	9	1214	26166	18190	2580	4/14	11/24	90	24330	48785
69	2	706	22635	6640	4550			0	0	0
Total	25	6668	204907	99290	67160	4/14	11/24	142	100570	87941

* No report by Water Commissioner. Estimated by Division Engineer.

(a) Includes 23980 acre feet in Cascade Reservoir which is used for power.

(b) Includes Ground Hog Reservoir. 8680 a.f used in Dist. 34.

NOTE:

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