Alamosa, Colorado.
Nov. 24/1945

Mr. M. C. Hinderlider,
State Engineer,
State Capitol Building,
Denver, Colorado.

Dear Mr. Hinderlider:

Herewith is submitted the annual report of the Division Engineer for Division No. 3 for the year 1945. This report consists of summary statements of the reports of the Water Commissioners for the various ditches of diversions, acreage and reservoir storage.

The spring season was late with intermittent cold spells of several days' duration, which caused the water run off to be late, and because of this condition there were no excessive run offs or flood stages on any of the streams. This late run off turned out to be beneficial to the irrigated areas as it caused the water to run several weeks later than usual. In District No. 20 most of the requests for diversions were granted until the first week in July, when the river was put on a strict appropriation basis. The run off in all districts was less than in 1944.

Due to the slow run off in the spring the larger reservoirs were not able to store even sufficient water for the minimum demands. There is very little reservoir carry over storage this year as most of the reservoirs finished the season empty. Most of the small reservoirs were able to fill in the spring and during the season delivered the full amount of their storage. There were some rains in July and August which were a benefit to the crops, but not enough rainfall to increase the diversions to any appreciable extent. Artesian and pump wells were used to furnish the supplemental water necessary to mature the row crops where reservoir water was not available.

Only necessary repairs were made and no major improvements were built.

There were few administrative problems during the season and those that were presented were, seemingly, handled to the satisfaction of the parties concerned.

On the whole crops were good. The yield was good and prices good except for garden peas and cauliflower, and for these two items the price broke before the end of the season. The fall season held on well, which gave time for the potatoes to mature and for the farmers to finish digging.

Livestock came thru the season in good condition. The range in the mountains held up well and pasture in the valley was good. There was a fair hay crop, but Districts 25 and 26 again put up a short crop.

The labor situation was still acute but was relieved to some extent by German Prisoners of War supplied from the camp at Monte Vista. The sugar-beet acreage was further reduced this year because of the labor situation.

Climatology data is omitted from this report because that can be secured elsewhere.

In submitting this report I want to express my thanks and appreciation to all those who had a part in the administration of water decrees in this district during the past season.

Respectfully submitted,

Roy B. Heilman,
Irrigation Division Engineer,
Division No. 3.

WATER COMMISSIONERS' RESERVOIR REPORTS

1945

Name of Reservoir	District in which Located.	Capacity in Acre Feet.	Amount in Storage May 1, 1945. Acre Feet.	Amount in Storage Nov. 1, 1945. Acre Feet.	Amount of Water Delivered. Acre Feet.
Rio Grande	20	51113	29693	443	30650
Santa Maria	20	43565	16813	1969	14844
Continental	20	26716	17738	13144	4176
San Luis	20	4434	1400	0	1400
Archuletta	20	109	0	0	0
Spruce No. 1	20	52	52	0	39
Spruce No. 2	20	105	98	0	95
Fuchs	20	248	248	154	95
Troutvale No.1	20	510	510	4	98
Troutvale No.2	20	219	219	219	0
Squaw	20	140	140	101	39
Poage	20	157	157	0	
Shaw	20	361	229	0	66
Bristol Head No. 1	20	151	86	0	20
Bristol Head No. 2	20	804	300	0	254
Road Canon	20	395	424	145	358
Regan Lake	20	975	94	0	79
Lost Lakes	20	966	570	0	545
Goose Lake	20	232	183	0	183
Trout Lake	20	198	198	0	198
Spring Creek	20	145	145	0	98
Meadow Lake	20	114	114	114	0
S U Dude	20	120	81	0	76
Hermit No. 1)	20	360	123	56	141
Hermit No. 2)	20	360	74		
Metros	20	188	125	25	100
Terrace	21	17700	3765	550	7417
La Jara	21	14052	5827	3331	896
Cove Lake	22	7910	732	0	5078
Sanches	24	103155	12128	3780	35574
Eastdale No.1	24	3468	1593	0	1752
Salazar	24	142	60	50	1200
Mountain Home	35	19150	3177	1650	12194
Smith	35	5336	5336	2361	6892
Totals		303650	102532	38096	124551

COMPARISON FOR 10 YEAR PERIOD.

	No. of Acres Irrigated.	Acre Feet of Water Delivered to Ditches.
1936	663734	1157522
1937	646082	1110519
1938	702392	1371664
1939	715332	994770
1940	664267	769141
1941	717654	1635840
1942	733996	1398212
1943	769680	1123219
1944	749625	1557569
1945	746751	1318180

VEGETABLE SHIPMENTS

1945 Season

Potatoes	5162	Carloads
Cauliflower	1000	"
Garden Peas	1039	"
Cabbage	360	"
Mixed Vegetables	791	"
Lettuce	402	"
Spinach	109	"
Carrots	16	"
Broccoli	1	"
	8880	"

WATER COMMISSIONERS' DITCH REPORTS

1945

No. of Water District	No. of Ditches Reporting	First day Water was Carried	Last day Water was Carried	No. days Water was Carried	No. of Acre Feet Carried by all
20	188	3- 6	11- 1	238	608824
21	65	3-22	11-16	240	100132
22	112	3-21	11-20	245	371874
24	54	4- 1	10-31	214	69478
25	52	5- 1	10-31	183	39462
26	57	4- 1	10-31	214	48527
27	43	4- 2	10-31	200	9224
35	73	4- 1	10-31	214	70659
Totals					1318180

These figures include Reservoir water and Trans-Mountain Diversions.

1945 TRANS-MOUNTAIN DIVERSIONS

	Acre Feet.
Wemimuche — Robert Lohr 1614; Fuchs 526,	2140
Treasure Pass	258
Tabor-Spring Creek	243
Squaw Pass	183
Piedra	46
	2870

WATER COMMISSIONERS' DITCH REPORTS

1945

Number of Acres

Water District	No. Acres That Can Be Irrigated	Alfalfa	Natural Grass	Cereals	Pasture	Garden Peas
20	494417	66123	54037	49339	97455	4834
21	54404	5622	10620	7666	8406	5232
22	187845	14825	26518	19893	21236	2513
24	49569	3627	2665	9304	2615	637
25	121501	1203	26719	810	21654	
26	[illegible]	2731	31215	670	13628	
27	[illegible]	944	7801	202	4754	33
35	45835	2537	11276	3016	1959	130
Totals:	1026380	97612	170851	90900	241707	12985

Number of Acres

Water District	Potatoes	Sugar Beets	Beans	Field Peas	Cabbage	Sweet Clover
20	35109	628	8	9694	455	31591
21	2477		302	3707	171	2186
22	1851	277	327	4359	50	6187
24	1772		1547	10734	310	557
25	2			3		387
26	44					
27	22		4	231		10
35	379	[illegible]	57	1849	650	519
Totals:	41856	905	2245	30577	1636	41467

Number of Acres

Water District	Spinach	Lettuce	Cauli-flower	Summer Plow	Other Crops	Total Irrigated
20	303	1157	391	4345	899	356167
21		72	335	354	326	[illegible]
22		11	80	1209	564	99700
24		200	1458	265	878	36569
25				160	3	120941
26					10	48898
27		2		109	65	18177
35	53	75	618		369	23517
Totals:	355	1517	2882	6342	3114	746751

1945

Preliminary

November 10, 1945

Mr. M. C. Hinderlider
State Engineer
Denver, Colorado

Dear Mr. Hinderlider:

In reports such as we bring to you from year to year, in most part, only ab-normal happenings, it seems, should be presented, for relating normal conditions or procedures would be neither interesting or instructive.

It may be said briefly, that ~~we have had~~ 1945 was a very good year in water district 20, in spite of the fact that snow reports indicated not to good prospects for the irrigation season ahead.

The early snow about October 20, 1944 deposited a somewhat liberal supply of high snow which proved to be very valuable in furnishing rather late water.

It is interesting to note that with a River discharge far below normal, perhaps about 70%, no extreme shortage of water was felt, in fact comparative little pumping was found necessary or practiced.

A glance at River discharge reports will indicate that a very small amount of water passed the Alamosa station, which shows no flood stage was reached at any time but that ditches could use the entire daily run off. Total discharge for the River at Alamosa March 1st to November 1st was 15,500 acre feet, mostly return flow. And this was almost all used by ditches in dist. 20 below the Alamosa station.

Thus, making use of the entire river output, together with some timely rains both in the mountains and the valley, district 20 experienced rather a successful year.

A very late spring and an early frost this fall resulted in a short growing season and a correspondingly short potato crop; but the small vegetable and grain crops were very good with quite satisfactory prices prevailing.

Administration and equitable distribution to the ditches was made most difficult due to a very erratic river over a rather extended period, with 500 to 600 second feet diurnal changes not uncommon, for example, on June 16th, the River flow at the Del Norte Station was 3740 second feet and the next morning, June 17th, the discharge was 3097 second feet, a drop of 643 second feet in 24 hours; with such extreme changes, it is easy to understand the difficulty encountered in attempting to deliver proper quantities to ditches just above Alamosa and yet not waste water by the Alamosa station; an unpardonable sin - in the eyes of the water users.

The ever present problem of poor structures and equipment at the ditch and canal headings, generally is getting extremely serious, when we consider that little, or no repairs were made during the 11 year depression period, followed by 4 years of war when neither labor or materials were available, one can imagine something of the condition of the irrigation structures along the river and how this relates to distribution and administration; a sorry observation may well be added - the average water user looks to the up keep of his irrigation equipment last - which, as we know, should be first, being the most valuable property relative to his farm.

Mention must be made of the very great need for a complete study and survey of the small Reservoir situation - in the way of up-to-date capacity tables, and extensive repairs on the dams, spillways and discharge features.

Far to many dams have failed in recent months, causing much damage to government trails and valuable timber; so serious has the situation become that the Forest Service has become aggressive in their actions even to the extent of considering bringing a damage suit against the owners of the Shaw Reservoir, whose dam failed on July 24th last, causing extensive damage to Lake Fork Canon, situated on the South Fork of the Rio Grande.

My records show that this reservoir was not to be filled during the fall of '44 and the spring of '45, in order that extensive repairs could be made on the dam and particularly on the out-let pipe.

Water officials had believed that such was the procedure until on about July 18th, when this office was notified by Mr. Joel Goodman, Water Commissioner, that Mr. Ted Paulson, one of the co-owners of the Shaw Reservoir had notified him that he had just returned from the Shaw Reservoir and that the Gage height was 11.0 feet, showing storage of 298 acre feet, and that the owners desired certain deliveries for irrigation.

I advised Mr. Goodman that there must be some mistake that the Shaw Reservoir was supposed to be empty and not to make any deliveries until some investigation had been made.

Our next report from the Shaw Reservoir came in the form of a hurry-up phone call from Mr. Leon Raber, another co-owner, on July 24th that the dam was going out or had failed while he and Tunnis Hanna, the third co-owner, were attempting to remove deposits of mud and brush that beaver had deposited in front of and around the discharge pipe.

When some of this beaver dam had been dislodged, water suddenly rushed through the dam along the outside of the discharge pipe and in a very short time whole sections of the dam started to move and slide out of position; this was at about 4:30 in the afternoon.

The reservoir no doubt was emptied completely in a very short period of time, for Mr. Goodman and myself arrived about 8:30 p.m. at the point on State Highway #160 where Lake Fork empties into South Fork, distant about two miles from the reservoir site and found that the peak of the flood had passed sometime previous to that.

A careful study on July 25th, together with one of the owners (Mr. Raber), Mr. Loring, Forest Supervisor and Mr. Love, Forest Ranger, was made of the Reservoir site and the gutted canon below and it is the same old story of the untold power of water when out of control.

The cause of failure, I would say, was due to faulty installation of the discharge pipe at time of construction, carelessness on the part of the owners in improper maintenence, aided by beavers which perhaps were responsible for the reservoir being filled this past season.

The large number of these small reservoirs widely separated and their almost inacessable locations makes proper supervision extremely difficult; and it can be added that water is being called for from them at the peak of the irrigation season on the River.

The installation of the Stevens Remote Registering System, for the purpose of recording, in the Monte Vista office, water levels of the River for both the Del Norte and Monte Vista Stations, is still under consideration by the board of the Rio Grande Water Users, who have again requested me to discuss further with you the possibility of State aid in part financing the project; it is felt by all locally interested, that such an installation would greatly assist in the water administration.

Putting down irrigation wells has progressed this past season. I would say about as normal, with an estimate of 50 new wells in District 20 within the year and an estimated total of some 400 to 450 wells in the district.

Leveling has become so extensive in the San Luis Valley and expecially in the farms in District 20 that any report on irrigation would be incomplete without its mention. Reliable information from the Farm Security administration office, who furnish surveys for most of the work being done, report 16339 acres surveyed with about 85% of this amount actually leveled; this since 1939, and obviously does not include large acres previously leveled as well as that by farmers not included in the F. S. A. Program.

It is a long known fact that well leveled farms reduce appreciably the amount of water required to mature crops, especially where sub-irrigation is practiced, as is the method largely used in District 20.

Respectfully submitted,

D H Mathews

Special Deputy State Engineer

Copy

Regional Forester, Denver

July 27, 1945

J. MALCOIM LORING, Forest Supervisor

U
USES - Rio Grande
Shaw, John H. et al
Reservoir (Int.) 8/15/97

Reference is made to the above designated case.

The north dam went out about 4 p.m. on July 24 causing considerable damage to the channel of Lake Fork Creek and destroying about 1/2 mile of the Lake Fork trail. Probably 50 M.B.M. of engelmann spruce and corkbark fir timber was destroyed by the flood waters.

On July 25 I checked on conditions leading up to the incident and the damage in company with Leon Raber, one of the owners of the reservoir, Ranger Love and Dave Mathias, local representative of the State Engineer.

The owners informed Mr. Mathias last fall that they were planning to do extensive improvement work on the old dam this summer and consequently did not plan to store any water this spring. Last week he learned that Mr. Paulson, another of the owners, had been up to the reservoir and found it to be filled with water so the owners wanted to get credit for it in their ditch. It is claimed that the beaver plugged the outlet pipe and the lake filled from snow runoff. The lake ordinarily is filled by a diversion ditch from a branch of Hope Creek called Kitty Creek. It is not clear how the beaver could have filled Shaw Lake with 400 acre feet of water unless one of the owners opened the diversion ditch from Kitty Creek and left it open. I have requested Ranger Love to check further on this point. Note - I was later determined that the ditch was not used.

The beavers did have a small dam below the spillway which would raise the water in the spillway 10 inches. The average freeboard on the south dam is not more than 2 feet and in one place the water had gone over the top this year and the beavers had repaired the damage. This dam is only 5 or 6 feet high while the north dam which went out was about 12 feet above the old ground surface and 16½ feet above the bottom of the outlet pipe.

Mr. Raber called Mr. Mathias at 7:30 p.m. on July 24 and told him the dam went out. He stated that he and Tunis Hanna were trying to clear the trash placed by the beaver in the outlet pipe when the dam started to leak badly around the pipe. Soon the embankment started to slip out and they left the scene to notify the authorities. On July 25 Raber said that when they got there the water was at the top of the dam and the outlet was plugged by trash. While they were trying to pull out the trash with hooks, the water started over the top of the dam and the back slope caved in so they could not stop the water from destroying the dam. The break in the dam is now 40 feet wide and the damage in the canon below indicates that it went out very quickly. The guaging station on the South Fork about 12 miles down stream shows a raise of more than 600 second feet in fifteen minutes followed by a rapid drop in the crest of the flood. Mr. Mathias believes that the first statement is more logical because if the failure was chiefly at the bottom of the dam it would collapse more rapidly and the rise in the flood waters would be sharper than in the case of a dam wearing down from the top only.

There are two beaver lodges in the reservoir, one at each end of the lake. There were at least 3 beaver in the lodge at the north end of the lake on July 25. Mr. Raber said he had tried to get the State trappers to remove the beaver for several years but they had not been trapped out. The south dam went out in 1938 due to the beaver damming the spillway according to Raber. This caused a big gully to be washed out on a steep aspen covered slope and damage to Hope Creek. The beaver will have to be taken out of this reservoir before the spillway can be made effective.

Neither dam was very safely constructed according to specification for earth dams. The south dam did not have sufficient freeboard and was not riprapped or wide enough on the top. The one spillway was only 6 feet wide and would not have carried very much water in case of a heavy rain or rapid filling of the reservoir.

The north dam consisted of a dirt fill on the native sod of the meadow which was not keyed in by a core trench. It was 10 - 12 feet high and only 30 feet wide at the base. The face was nearly vertical and riprapped with logs as large boulders. There was no spillway on this dam and due to settling around the outlet pipe, the lowest and narrowest point was near the middle of the dam. It was this condition which prompted the owners to volunteer to not fill the reservoir this spring so they could reinforce the dam and raise the height of the dam. The outlet pipe was set in a trench and is about four feet below the level of the sod on which the fill was placed. This permitted a drawdown of more than 10 feet as specified in the original permit. It was stated in some of the papers "that inasmuch as the dam of said reservoir does not exceed in height, ten feet, it is unnecessary to have the plans thereof approved by the State Engineer of Colorado". This appears to be a weakness in the law where a dam of this height will impound several hundred acre feet of water and is such a potentail hazard to the land and property below. Any reconstruction of this dam should be strictly according to plans and specifications approved by the State Engineer and water should not be stored in it until it has been inspected and approved by the State Engineer's office.

The flood did not damage the bridge on the Lake Fork where U. S. Highway No. 160 crosses or any bridges across the South Fork. Outside of the erosion caused in Spring Creek and Lake Fork the main property damage is to the Lake Fork trail and value of the timber. According to our records the lower three miles of the Lake Fork trail was constructed in F. Y. 1934 at a cost of $967. Between ½ and 3/4 mile of this trail will have to be relocated on the slope where sliderock and rock outcrop will make construction costs much higher than the original trail. I estimate roughly that it will cost $1000 to rebuild this section and no labor is available to do the work.

The channel scoured out by the flood will average 1 chain wide for 2 miles or approximately 15 to 20 acres of creek bottom. In places there was a heavy stand of spruce timber either undermined or torn out by the roots. The canyon is very rough and this flood will increase the difficulty of ever constructing a road to make the timber in the upper Lake Fork accessible.

Claude 5 of the Special Privilege Agreement, Form 832, which was signed by the builders of this reservoir states that they agree "to pay the United States for any damage caused by the use or occupation of the forest reserve under the permit applied for herein". According to the easement record this reservoir was approved by the Department of Interior on October 26, 1907.

In a case like this, can the United States claim damages from the present owners of the reservoir? I note that Form 81 Stipulations used in more recent reservoir cases, clause 3 is more specific and refers to negligence on the part of the owner or his employees. In this particular case the reservoir had not been checked by Mr. Mathias this year prior to July 25. Ranger Love had been by the reservoir recently in connection with a sheep range inspection trip, but had not noticed anything unusual about the dam. It appears that the story put up by the owners about the beavers causing the level of the lake to get too high would be their main defense that it was not due to negligence on their part.

Several of these small irrigation reservoirs have gone out in the past two seasons causing severe erosion of the creek channels below the dams and more aggressive action is needed on the part of the State and Forest Service to insure that the dams are reasonably safe before storage is allowed. These dams are in the high country where they cannot be readily inspected and the amount of water stored in many of them has more of a nuisance value than anything else from the water inspector's viewpoint. Mr. Mathias has made a real effort to get into the back county and check these small structures but there are so many that it takes a good many days during the summer rush period to get to all of them.

The other dams which went out recently include the old Weiss Reservoir on Frisco Creek which was abondoned in 1917 but the dam was not torn down. This went out in 1944 following a heavy rain and scoured Middle Frisco Creek. Archuleta Lake Reservoir owned by Galbreath went out in 1944 in the spring scouring Archuleta Creek. Galbreath had a crew working on the dam in the fall of 1943 fixing the

outlet pipe and apparently the fill was not thoroughly tamped. Kreps Lake went out agin this spring but it held very little water and did not do much damage to the creek. Mr. Mathias reports that Spruce Lake No. 1 owned by Galbreath is unsafe and he had this drained within the past two weeks.

Decision as to whether dams are safe or not should be based on an engineer's inspection and judgment. I would appreciate your advice as to what action local Forest Officers should take in these reservoir easement cases to secure an increase in the safety factor on the old dams. During the war period it has been difficult to secure help to maintain these structures and, of course, when one goes out, it is claimed to be an Act of God or some other reason than storing too much water in the particular reservoir. In case Ranger Love is able to secure any more facts, about this case, I will keep you informed.