

APPENDIX L

Flood Control Operations Documents



DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1580
ALBUQUERQUE, NEW MEXICO 87103-1580
FAX (505) 766-2770

REPLY TO
ATTENTION OF:

April 16, 1993

Engineering and Planning Division
Planning Branch

Mr. Steve Witte
Division Engineer
Colorado Division of Water Resources
P.O. Box 5728
Pueblo, Colorado 81003-5728

Dear Mr. Witte:

In 1992 the U. S. Army Corps of Engineers completed a hydraulic analysis of the Purgatoire River below Trinidad, Colorado. This study shows the existing channel capacity below Trinidad Dam to be 3,000 cfs.

The current Water Control Plan for the flood control operation of Trinidad Lake calls for releases of 5,000 cfs, as measured at the Trinidad gage. Before the Water Control Plan can be revised, this office must conduct a public meeting on the subject to obtain comments on the proposed change in the operation of the dam. We hope to conduct the public meeting in Trinidad this summer.

Until the Water Control Plan can officially be revised, any releases from Trinidad Dam in excess of 3,000 cfs should not be made without consultation with this office. For additional information on the matter, please contact Mr. Dick Kreiner in the Reservoir Control Section at (505) 766-2639.

Sincerely,

Gary L. Garrel, P.E.

Chief, Engineering and Planning Division

Copies Furnished:

Mr. Chuck Lile, Director
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

County Commissioners
Court House
Trinidad, Colorado 81082

Ms. Thelma Lujan, Secretary
Purgatoire River Water Conservancy District
314 West Main Street
Trinidad, Colorado 81082

TRINIDAD

WTR-400

STATE OF COLORADO

WATER DIVISION 2 OFFICE OF THE STATE ENGINEER

310 East Abriendo, Suite B
Pueblo, CO 81004
Phone (719) 542-3368
FAX (719) 544-0800



Roy Romer
Governor

James S. Lochhead
Executive Director

Hal D. Simpson
State Engineer

Steven J. Witte, P.E.
Division Engineer

December 12, 1998

Mr. A. Jack Garner, Area Manager
United States Department of the Interior
Bureau of Reclamation
Eastern Colorado Area Office
11056 West County RD 18E
Loveland, CO 80537-9711

Dear Mr. Garner,

Please find enclosed the Division Engineer's present operating criteria for temporary storage and release of flood flows not stored in the flood pool pertaining to Trinidad Reservoir.

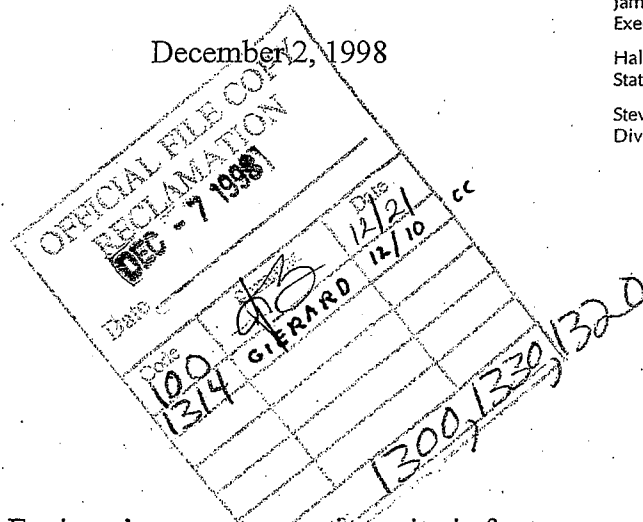
Sincerely,

Steven J. Witte
Division Engineer - Division 2
Colorado Division of Water Resources

Enclosure

cc: Mr. David Pope, Chief Engineer
Division of Water Resources
Kansas Department of Agriculture
901 S. Kansas Avenue
Topeka, KS 66612

Mr. Hal Simpson, State Engineer
Colorado Division of Water Resources
Room 818, Centennial Building
1313 Sherman Street
Denver, CO 80203



Mr. Garner, Dec. 2, 1998
page 2

Mr. Steve Miller
Colorado Water Conservation Board
721 State Centennial Building
1313 Sherman Street
Denver, CO 80203-2239

Mr. Dennis Montgomery
Hill & Robbins, P.C.
100 Blake Street Building
1441 Eighteenth Street
Denver, CO 80202-1256

Mr. Donald Pitts
Kansas Department of Agriculture
901 S. Kansas Avenue
Topeka, KS 66612

Mr. John Draper
Kansas Department of Agriculture
901 S. Kansas Avenue
Topeka, KS 66612

Mr. Eugene Aiello, President
Purgatoire River Water Conservancy District
314 West Main Street
Trinidad, CO 81082

Mr. Larry Trujillo
Colorado Department of Corrections
2862 South Circle Drive, Suite 400
Colorado Springs, CO 80906

Mr. Gary Moore
Field Solicitor's Office
Room 3005
P. O. Box 36900
Billings, MT 59107-6900

Ms. Julianne Woldridge
MacDougall Law Office
Western National Bank Building
102 N. Cascade Avenue, Suite 400
Colorado Springs, CO 80903-1418

Lt. Col. Lloyd Wagner
U.S. Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza, NE
Albuquerque, NM 87103-1580

Mr. Robert Trout
Trout & Raley, P.C.
1775 Sherman Street, Suite 1300
Denver, CO 80203

Ms. Julie Mckenna
Trout & Raley, P.C.
1775 Sherman Street, Suite 1300
Denver, CO 80203

Mr. Mark Rude
State Board of Agriculture
Division of Water Resources
214 Fulton Terrace
Garden City, KS 67846

Dr. Jeris Danielson
Danielson & Associates
6805 West Fourth Avenue
Lakewood, CO 80226

Ms. Wendy Weiss, Esq.
Assistant Attorney General
State Services Building
1525 Sherman Street, 5th Floor
Denver, CO 80203

Mr. Dale Book
Spronk Water Engineers, Inc.
1000 Logan Street
Denver, CO 80203-3011

Mr. Randy Hayzlett
Route 1
Lakin, KS 67860

Mr. Garner, Dec. 2, 1998
page 4

Mr. David Brenn
1710 Pheasant Ct.
Garden City, KS 67846

Mr. Thomas R. Pointon
34805 Road 17
Las Animas, CO 81054

Mr. James G. Rogers
32259 County Road 13 (Route 2)
Lamar, CO 81052

Mr. Danny Marques
#16390 County Road 75.1
Trinidad, CO 81082

Mr. William Howland
1640 West 6th
Las Animas, CO 81054

Enclosure to Mr. A. Jack Garner letter, dated December 2, 1998

CRITERIA FOR TEMPORARY DETENTION AND SUBSEQUENT RELEASE OF
FLOOD FLOWS STORED IN THE TRINIDAD RESERVOIR CONSERVATION POOL

Criteria for temporary detention of flood flows

The Division Engineer temporarily detains flood flows to limit releases from Trinidad Dam so as to cause the flow measured at the Trinidad gage to not exceed 3,000 cfs. This is in accord with a letter from Gary L. Gamel of the Corps of Engineers dated April 16, 1993, which states:

The Water Control Plan for the flood control operation of Trinidad Lake calls for releases of 5000 cfs, as measured at the Trinidad gage... Until the Water Control Plan can officially be revised, any releases from Trinidad Dam in excess of 3000 cfs should not be made without consultation with this office.

Because this lower rate is based upon hydraulic analysis performed below Trinidad, Colorado this is interpreted to mean that releases from Trinidad Dam should be limited so as to cause the flow measured at the Trinidad gage not to exceed 3000 cfs without consultation with appropriate personnel of the Albuquerque District, Corps of Engineers.

Criteria for subsequent release

The Division Engineer begins releasing water temporarily detained after 8:00 a.m. of the following day as soon as channel capacity is available. Channel capacity is available when such releases will not cause the flow at the Trinidad gage to exceed 3,000 cfs.

Water temporarily detained is released at the maximum rate, taking into account bypasses of reservoir inflow to satisfy current district demands and downstream senior rights, that will not cause the flow at the Trinidad gage to exceed 3,000 cfs.

The Division Engineer distributes the released waters ensuring that the project ditches are not exceeding their entitlements and that downstream rights are not diverting out of priority or beyond their entitlements.

TRINIDAD

WTR-400



Reply to
Attention of:

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA, NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3199

February 10, 1999

Operations Division
Reservoir Control Branch

Mr. Jack Garner
Area Manager
Eastern Colorado Area Office
Bureau of Reclamation
11056 West County Road 18E
Loveland, Colorado 80537-97111

Dear Mr. Garner,

Based upon our review of the "CRITERIA FOR TEMPORARY DETENTION AND SUBSEQUENT RELEASE OF FLOOD FLOWS STORED IN THE TRINIDAD RESERVOIR CONSERVATION POOL", as provided by Mr. Steve Witte, to you, in a letter dated December 2, 1998, the following comments are provided for clarification regarding the flood releases from Trinidad Dam.

In 1992, the U.S. Army Corps of Engineers (Corps) completed a hydraulic analysis of the Purgatoire River below Trinidad, Colorado. This study showed the existing channel capacity below Trinidad to be 3,000 cfs. As a result, the Corps advised Mr. Steve Witte of the significance of the findings in a letter dated April 16, 1993. The letter states in part "any releases from Trinidad Dam in excess of 3,000 cfs should not be made without consultation with this office." In other words, Corps personnel will make the call on releases above 3,000 cfs while river conditions are monitored. We did not feel that it was appropriate to place the responsibility on Colorado officials for calling for releases above 3,000 cfs when we had a study that indicated there could likely be flood problems.

The second to the last paragraph of Mr. Witte's letter states in part "that will not cause the flow at the Trinidad gage to exceed 3,000 cfs." For clarification, we suggest that this sentence be added: "However, the Corps of Engineers may direct releases greater than 3,000 cfs, but not to exceed 5,000 cfs at the Trinidad gage, if channel conditions permit."

If you have any questions on the information provided, please contact Mr. Dick Kreiner, at (505) 342-3383.

Sincerely,

C. Susan Hays

for D. E. Gronewold
Chief, Operations Division

OFFICIAL FILE COPY RECLAMATION		
FEB 16 1999		
Date		
Code	Signature	Date
1300	<i>A. J. Hays</i>	2/17
Copy 1300, 1330, 1344, 100		

STATE OF COLORADO



Bill Owens
Governor

Greg E. Walcher
Executive Director

Hal D. Simpson, P.E.
State Engineer

OFFICE OF THE STATE ENGINEER

Division of Water Resources
Department of Natural Resources

1313 Sherman Street, Room 818
Denver, Colorado 80203
Phone: (303) 866-3581
FAX: (303) 866-3589

December 3, 1999

<http://water.state.co.us/default.htm>

Mr. A. Jack Garner, Area Manager
Eastern Colorado Area Office, U.S. Bureau of Reclamation
11056 West County Road 18E
Loveland, CO 80537

Lt. Col Thomas Fallin, District Engineer
Albuquerque District, U.S. Army Corps of Engineers
4101 Jefferson Plaza NE
Albuquerque, NM 87103

Mr. Larry E. Trujillo, Chairman
Arkansas River Compact Administration
1525 Sherman Street, Suite 200
Denver, CO 80203

Mr. David Pope, Chief Engineer - Director
Kansas Division of Water Resources
109 SW 9th Street, Second Floor
Topeka, KS 66612

Mr. Eugene Aiello, President
Purgatoire River Water Conservancy District
314 West Main Street
Trinidad, CO 81082

OFFICIAL FILE COPY
RECLAMATION

Date DEC - 9 1999

Code	Surname	Date
180		

Copy to: 1300, 1318, 1330 (600)

Malcolm

Re: Temporary Detention and Release of Flood Flows at Trinidad Reservoir

Gentlemen:

I am aware that there have been discussions of the temporary detention of flood flows at Trinidad Reservoir during the current review of the Operating Principles for the Project, and also of concerns related to those operations expressed by downstream water users.

Article III of the Operating Principles Trinidad Dam and Reservoir Project pertains to flood control

and states that "Trinidad Reservoir shall be operated for flood control benefits in accordance with regulations prescribed by the Secretary of the Army and the following operating principles." In particular, Paragraph 3 of Article III states:

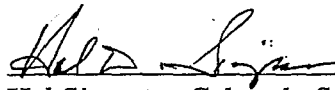
3. Any inflow, other than that stored for irrigation use, temporarily retained below the bottom of the flood control capacity for flood control purposes, shall be released by the operating agency at such rate, time, and quantity as may be ordered by the Colorado State Engineer, but within nondamaging flow in the channels below the reservoir.

I am directing this correspondence to you, as signatories to the Operating Principles, to document how the Colorado State Engineer makes the necessary determinations required by Paragraph 3. Accordingly, and until further notice, I will continue to utilize the attached:

CRITERIA FOR TEMPORARY DETENTION AND SUBSEQUENT RELEASE OF FLOOD FLOWS STORED IN THE TRINIDAD RESERVOIR BELOW FLOOD CONTROL CAPACITY AND FOR DISTRIBUTION OF RELEASED FLOOD FLOWS GENERALLY.

In addition, I hereby offer to provide suitable reports and accounting of any hydrologic events that require administration of the Purgatoire River pursuant to this criteria.

Sincerely,


Hal Simpson, Colorado State Engineer

cc Aurelio Sisneros
Wendy Weiss
Steve Witte
Peter Evans
James Rogers
Tom Pointon
Don Steerman
John Lefferdink

CRITERIA FOR TEMPORARY DETENTION AND SUBSEQUENT RELEASE OF FLOOD FLOWS STORED IN THE TRINIDAD RESERVOIR BELOW FLOOD CONTROL CAPACITY AND FOR DISTRIBUTION OF RELEASED FLOOD FLOWS GENERALLY

Criteria for temporary detention of flood flows

The Division Engineer temporarily detains flood flows to limit releases from Trinidad Dam so as to cause the flow measured at the Trinidad gage to not exceed 3,000 cfs. This is in accord with a letter from Gary L. Gamel of the Corps of Engineers dated April 16, 1993, which states:

The Water Control Plan for the flood control operation of Trinidad Lake calls for releases of 5000 cfs, as measured at the Trinidad gage ... Until the Water Control Plan can officially be revised, any releases from Trinidad Dam in excess of 3000 cfs should not be made without consultation with this office.

Because this lower rate is based upon hydraulic analysis performed below Trinidad, Colorado this is interpreted to mean that releases from Trinidad Dam should be limited so as to cause the flow measured at the Trinidad gage not to exceed 3000 cfs without consultation with appropriate personnel of the Albuquerque District, Corps of Engineers.

Criteria for subsequent release

The Division Engineer begins releasing water temporarily detained after 8:00 a.m. of the following day as soon as channel capacity is available. Channel capacity is available when such releases will not cause the flow at the Trinidad gage to exceed 3,000 cfs.

Water temporarily detained is released at the maximum rate, taking into account bypasses of reservoir inflow to satisfy current district demands and downstream senior rights, that will not cause the flow at the Trinidad gage to exceed 3,000 cfs. However, the Corps of Engineers may direct releases greater than 3,000 cfs, but not to exceed 5,000 cfs at the Trinidad gage, if channel conditions permit.

Criteria for distribution of released flood flows

The Division Engineer distributes the released waters ensuring that the project ditches are not diverting any flood flows temporarily stored in Trinidad Reservoir either below or in the Flood Control Capacity, unless John Martin Reservoir is spilling, or unless otherwise lawfully entitled to do so pursuant to a Colorado water right, an exchange or substitute supply plan administered by the Division Engineer, or a decreed plan for augmentation.



DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 Jefferson Plaza, NE
Albuquerque, New Mexico 87109-3435
Fax (505) 342-3199

RECEIVED

NOV 05 2004

DIVISION ENGINEER
PUEBLO, COLORADO

November 1, 2004

Operations Division
Reservoir Control Branch

Mr. Steve Witte
Division 2 Engineer
Colorado Division of Water Resources
310 East Abriendo, Suite B
Pueblo, Colorado 81004

Dear Mr. Witte:

This letter is in response to our conversations with your office regarding Trinidad Lake releases which occurred in early August, 2004. The following describes the reservoir operations during two rainfall events which occurred during this time:

First storm. On Thursday, August 5, heavy rains fell in the area above Trinidad Lake. The runoff reached the reservoir in the early hours of Friday, August 6, where water levels increased more than 5 feet, while accumulating over 3,700 acre-feet of storage. The release at this time was 74 cfs. As a result of the inflow, the Water Commissioner requested a release of 1,000 cfs during a daily coordination meeting. The current release was stepped up, and by Friday afternoon the total release was 963 cfs.

On Saturday, August 7, the Water Commissioner requested that the current release of 963 cfs be increased to 1,500 cfs. Typically, the gate change process occurs in two steps:

- 1) The gate opening for the requested release is calculated based on a conduit rating curve, and then the gates are adjusted.

- 2) One half-hour to one hour later, the downstream stage at the outlet works gaging station is checked to verify that the target flow has been reached.

However, in this particular case while in the process of accommodating the requested flow change, the gate attendant

on duty noticed that the downstream rating table for the outlet works gaging station had a maximum stage value of only 8 feet, which corresponds to a flow of 1,065 cfs. Without a downstream stage for a corresponding flow of the requested 1,500 cfs, the release cannot be directly verified from this gaging station as is normally done. The gate attendant attempted to contact The U.S. Army Corps of Engineers (Corps), Reservoir Control personnel at the District Office during the weekend to request further instructions, but was unsuccessful. As a result, flows remained at 963 cfs for the remainder of the weekend.

The Corps acknowledges that the Water Commissioner requested the release to be increased to 1,500 cfs on the morning of Saturday, August 6, and for reasons indicated above, the request was not accommodated. In an effort to ensure that future requests for flows above 1,065 cfs be verifiable from the outlet works gaging station, the USGS was notified of the limited rating table and requested that it be expanded to accommodate flows of up to 5,000 cfs.

Historically, Trinidad releases are usually well below 1,000 cfs and have only exceeded this value once, when on May 5, 2004, a release of 1,051 cfs was recorded. The USGS requested that they be notified of releases above this value to help in the development and expansion of the existing rating table for the outlet works gaging station.

Second storm. On Wednesday, August 11, heavy rains again fell in the area above Trinidad Lake. The runoff reached the reservoir the same day with lake elevations rising 2.5 feet, and accumulating over 1,800 acre-feet of storage. The reservoir release at this time was 163 cfs. During the daily coordination meeting on the morning of Thursday, August 12, the Water Commissioner requested a release of 1,300 cfs. The USGS was notified of the release, and they provided a downstream stage for the outlet works gaging station of 8.22 feet to correspond to the requested 1,300 cfs flow.

The release was increased to 1,300 cfs. However, after checking the downstream stage at the outlet works gaging station, it appeared that the release was actually decreasing even though the gates had been open to release 1,300 cfs. Fortunately, the USGS was on-site during the day and measured a flow of 1,260 cfs. It was during this release that the USGS determined that the turbulence at the outlet works flip bucket, where the gaging station is located, was causing a backwater effect and drawing down the water level in the outlet works gaging station well, thus

giving the effect of decreasing flows. Based on this information the USGS deemed the outlet works gaging station unreliable for flows in excess of 1,000 cfs.

The Corps and USGS are currently taking measures to ensure that reliable readings for flows exceeding 1,000 cfs be verifiable, including placing into production an existing secondary gaging station located approximately 100 yards downstream from the outlet works gaging station. The Corps hopes to have this secondary gaging station fully functional in the near future.

If you have any questions regarding the information provided, please contact me at (505)342-3602, or Mr. Dennis Garcia (505)342-3608.

Sincerely,

A handwritten signature in cursive script, appearing to read "C. Susan Shampine".

C. Susan Shampine
Chief, Operations Division

Enclosure

Copy Furnished (w/enclosure):

Mark Rude
Kansas Division of Water Resources
2508 Johns Street
Garden City, Kansas 67846

Keith Lucey
U.S. Geological Survey, Colorado District
P.O. Box 25046, Denver Fed. Center MS 415
Denver, Colorado 80225

Steve Miller
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

Mark Stark (CESPA-OD-JM)

Chuck Opet (CESPA-OD-TR)

Van Truan (CESPA-OD-SC)