

STATE OF COLORADO

Colorado Water Conservation Board Department of Natural Resources

1313 Sherman Street, Room 721
Denver, Colorado 80203
Phone: (303) 866-3441
Fax: (303) 866-4474
www.cwcb.state.co.us



Bill Ritter, Jr.
Governor

Harris D. Sherman
DNR Executive Director

Jennifer L. Gimbel
CWCB Director

Dan McAuliffe
CWCB Deputy Director

November 26, 2008

Mr. Eric Laux, Project Manager
Attn: CENWO-PM-AP
U.S. Army Corps of Engineers, Omaha District
1616 Capitol Ave.
Omaha, NE 68102-4901

Re: Chatfield Reallocation Study – Land Use Development Policy (LUDP) Guidance

Dear Mr. Laux:

This letter is in response to our November 25, 2008 conference call regarding the above referenced subject. The State of Colorado and other stakeholders participating in this effort seek your guidance and conditional approval for proposed exceptions to the Corps of Engineers (Corps) LUDP as it relates to recreational structures at Chatfield State Park. We fully understand that any such exceptions that may be granted by Corps will not be construed as precedent setting. Given the unique and challenging conditions associated with Chatfield Reservoir in preserving “in kind” facilities and recreational experiences, the non-federal sponsor is proposing placement of closed floodable wet flood-proofed structures within Zone 1 (between elevations 5,444 ft and 5,453.7 ft, MSL) that are capable of withstanding periodic flooding and that can easily be placed back into service following inundation. The elevations referenced herein are based on the assumption of a 20,600 acre-foot reallocation of existing storage space in the reservoir.

Three attachments are provided for your consideration in determining if the proposed structures meet FEMA regulations and simultaneously will be satisfactory to the Corps. Attachment A contains as-built drawings of existing recreation facilities around the reservoir that are in excellent shape today after 30 years of service, a period which included three significant flood events. Details regarding the 1980, 1983, and 1995 flood events are included in Attachment B, along with post-flood photographs of the swim beach facilities. Attachment C is a copy of the existing “Flood Operation Plan” from Colorado State Parks that is used as an SOP in preparing facilities for flooding and the actions taken to bring them back into service after water levels return to normal pool elevations. This “Flood Operation Plan” will be updated with new relevant elevations following approval of these proposed exceptions, and approval of the FR/EIS report. The Flood Plan will be updated to address new elevations and other necessary revisions.

The as-built drawings illustrate the durability and inherent flood damage resistance afforded by the structures. It is understood that any exception granted at this time would be conditional based upon approval of a final recreation modification plan and updated drawings & specifications that meet current building code requirements. Our intent is that the updated plans would incorporate the same structural elements as illustrated by the attached drawings and would meet FEMA requirements for all of the impacted structures. We propose that placement of structures in Zone 1 would include a self-imposed “freeboard” of approximately three feet above elevation 5444. In addition, all electrical facilities associated with the structures, and with any other infrastructure and facilities, would be properly flood-proofed for public safety and operational purposes.

Your consideration of these items and support in assisting in such a short time frame is greatly appreciated. Please let me know if you have any questions or need additional information.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tom Browning', with a stylized, flowing script.

Thomas W. Browning, Chief
Watershed Protection & Flood Mitigation Section

cc: Randy Behm, Chief
Flood Risk and Floodplain Management Section

Attachment A
As-Built drawings for existing recreation structures at Chatfield State Park

Files are located on the CWCB ftp site: <ftp://165.127.23.92/TempStore/>

Login: dnrgisdata

Password: TDavis_30

(Hard copies of the drawings will be sent via FedEx)

Attachment B

Previous Flood Events and Recreation Structure Photos

Chatfield High Pools of Record:

1. May 26, 1980: Pool Elevation 5,447.58'
2. June 30, 1983: Pool Elevation 5,447.12'
3. July 4, 1995: Pool Elevation 5,446.40'



Photo Top: Sign at top of structure indicates the level of high water at Chatfield Reservoir during the 1983 spring runoff.

Photo Bottom: Chatfield State Park recreation structures at the swim beach in full operation during the 2007 summer recreation season. Buildings are cleaned and inspected following each flood event, and then re-opened for use following protocol in the "Flood Operation Plan" (see Attachment C).

Attachment C

Chatfield “Flood Operation Plan”

TO: All Chatfield Personnel

REF: Operations Procedure No. 31

SUBJECT: Flood Operation Plan

DATE: March 2007

PURPOSE:

The following is the flood plan for Chatfield State Park. The goal for this procedure is to provide for the protection of facilities and equipment owned or leased by the State of Colorado, Division of Parks. This procedure assumes that flooding would probably be a gradual cumulative situation where there is sufficient time for effective action and not the result of a sudden up stream dam failure.

HISTORY:

In the past, floods have been the result of periods when both runoff and precipitation were high and gate closures were required for downstream sewer line and bridge repairs in the river bed. The lake inflows at the time were in the range of 2,500 to 3,200 cubic feet per second (CFS) while the outflows dropped to 500 CFS. The peak rate of elevation change was between .5 to 1 vertically foot per day. The highest peak was 5,447.08 feet elevation with 53,325 acre feet of storage.

RESPONSIBILITIES:

It is the responsibility of the Park management team and the Park Resource Tech. II to ensure that every safe and practical effort is made to protect or prevent damage to the facilities and equipment of Chatfield State Park. In his absence an alternate will be designated for this duty. Most of the tasks will be performed by Park Maintenance staff with assistance from other FTE and Seasonal personnel. All Primary electric power work, whether "hot" or not, should be performed by professional licensed personnel. It is the responsibility of all personnel to be particularly careful and to observe all safety rules while working under such adverse conditions. Take photos of flooding to document damage for Risk Management and historical record.

GENERAL INFORMATION:

Sand bagging has been attempted during previous floods and found to be totally ineffective. The necessary pumping of leakage from within the sand bag dike area cannot be maintained over the long term and is not cost effective. The affected buildings will suffer some damage to paint, doors, locks, partitions, and some surface materials. Structural damage has been and probably would be minimal.

Electric power systems are high priority simply because they are very expensive to repair in both labor and material and require some lead time for replacement components. Removal of all endangered items is the only cost effective protective measure.

The sewage lift stations, though submersible under normal conditions can be damaged by flood water entering and wicking into the motors through ends of the power cable. It is necessary to remove pumps and control panels. In low lying areas it is necessary to seal all manholes with

ramneck asphalt ribbon to keep manhole lids in place. Lids can be removed by hydraulic pressure and wave action.

Shelters, tables and grills should withstand flooding. The lowest of the sites have been under water without any significant damage. Flotsam may displace a few upright grills. Circuit Breakers at the Marina Point and Riverside Group Picnic Areas need to be removed. and the stainless steel tables should be removed.

1. The **Trigger point** for this plan is a lake elevation of 5,434.00 feet. At this level water is just touching the concrete apron at the swim beach and at the top of the concrete ramp at the South boat ramp.
2. Consider snow pack, runoff, raise rate, weather forecast and ground saturation to make the implementation decision.
3. The management team, using the facility elevation list as a guide and regular inspections will be able to develop action plans to manage the situation.
4. The Corps of Engineer's automatic lake elevation gauge is accessible by telephone. The current lake elevation determined by counting tone codes which represent the TENS, UNITS and two DECIMAL digits of the lake elevation above sea level. Fifty Four hundred feet is the assumed constant to which the last two whole digits and decimal digits are added. The number of short tones (dots) indicate the numbers separated by silent periods. Long tones (dashes) indicate zeros (example; ... _____ would indicate 5430.75 feet. The long tone being a zero).
5. Electric power on the Deer Creek meter is the first major concern to be addressed because it is one of the first areas to be affected and the hazards of working on electrical systems with high water.
6. All water faucets, hydrants, and valves should be kept closed or in their normal operating position to prevent contamination from entering the supply system.

ACTION TASKS:

The following Action Tasks should be accomplished in an organized manner without rushing so much as to damage things.

TASK # 1. Remove the contents of all threatened buildings down to the bare walls and floors. Include stored materials, furniture, appliances, bulletin boards poster and etc. Take care to protect these items during removal, transport and storage.

TASK # 2. Remove all dumpsters, trash cans, removable dumpster and toilet screen panels and etc. from the threatened areas. If time and personnel permit, remove and store railroad tie curbing or landscaping timbers and wood fencing which are likely to float away.

TASK # 3. Make the West side electric power system safe by shutting OFF the primary electric power to permit other protection work to proceed on the electric system. The transformers for Catfish Flats, Jamison, Swimbeach, and lift station #3 may be isolated from the primary feed. The West Entrance station can be re-connected through the Deer Creek Picnic Area transformer and power maintained until elevation 5,446.00.

- a. Qualified personnel (Sturgeon Electric Company or others) must open (de-energize) the main primary disconnect switch at Highway 121 and the Corps of Engineers entrance road.
- b. Qualified personnel must isolate the primary feed from the transformer at lift station #3 and re-connect to the Deer Creek Picnic Area transformer load with jumper blocks. Termination covers must be placed on the exposed transformer lugs to keep dirt out.
- c. Qualified personnel may re-energize the primary feed at the main disconnect switch (in (a.) above) to keep power to the West Entrance as long as possible while removal of other electrical components proceed.

TASK # 4. Remove all electrical components including circuit breaker panel boards with circuit breakers, water heaters, unit heaters and lift station control panels. and pumps. It is recommended that all wires be tagged with permanently marked tape or tags to make re-installation easier.

This can take from one to two hours or more for each unit.

See: Instruction sheet and Decision Point list.

DECISION POINTS:

This list of "ACTION TASKS" will aid planning a course of action that will suit the situation. Due to changes over the years, all areas of the lake shoreline, inlets and low lying picnic areas must be monitored. The elevations are the levels at which water is on the floor of the listed buildings or on the lowest point of the facility. The numbers were developed from actual elevations measured during the previous floods and as-built drawings where necessary. The decision points may not always reflect the access to the facility. If action is taken at each Decision Point, there should be sufficient time to complete the indicated tasks.

ELEVATION	EXPECTED CONDITIONS OR ACTION REQUIRED
5,434.00	- This is the trigger point for plan implementation
	- Water at the edge of the concrete apron , the beach where it meets the sand.
	- Water is at top of concrete on the South boat ramp
ACTION	- Notify Beach Concessionaire
ACTION	- Plum Creek Picnic Area
ACTION	- Seal manhole lids on Plum Creek force main and in Marina area
ACTION	<u>TASK # 2</u>
ACTION	- Swim Beach Complex
ACTION	<u>TASK #1, TASK #4</u>
ACTION	- Lift Station #3 (Swimbeach) and Transformer vault including DRY TYPE
transformer	
ACTION	<u>TASK #3, TASK # 4</u>
5,434.75	- Water is at the lowest point of the Plum Creek Picnic area road
5,435.33	- Water is at Swim Beach Complex aid station & bath house floor.
ACTION	- Transformer at Beach Complex

ACTION		<u>TASK #4</u>	
ACTION	-	Lift Station #2 (Jamison)	
ACTION		<u>TASK #4</u>	
5,436.00	-	Water is at Lift Station #3 (Swimbeach) (rim)	
5,437.00	-	Water is at beach concession floor and facility transformer	
5,437.50	-	Water is at Lift Station #2 (Jamison)	
5,438.25	-	Water is at C.S. #14 Plum Creek Picnic Area toilet floor and top of ramps north ramps	
5,438.50	-	Water at transformer at Lift Station #3 (Swimbeach)	
ACTION		Beach Complex to Fox Run	
ACTION		<u>TASK #2</u>	
ACTION	-	C.S. #21 Jamison Toilet	
ACTION		<u>TASK #1, TASK #4</u>	
ACTION	-	Lift Station #2 (Jamison) and Transformer	
5,440.00	-	Water at C.S. #21 Jamison toilet floor, west shore shelters Catfish Flats to Fox Run	
ACTION	-	C.S. #19 (Catfish Flats)	
ACTION		<u>TASK #1, TASK #4</u>	
5,441.00	-	Water at shelters at east end of North Ramps peninsula	
5,441.50	-	Water at C.S. #19 Catfish Flats	
5,443.00	-	Water at Riverside Picnic Area shelter at Marina lot	
ACTION	-	Lift Station #1 (Catfish Flats), Lift Station #5 (North Ramps), and C.S. #28, Riverside GPA	
ACTION		<u>TASK #1, TASK #4</u>	
5,444.00	-	Water is at Marina Point GPA	
5,444.50	-	Water is at Lift Station #1 (Catfish Flats)	
5,444.75	-	Water is at C.S. #28 (Riverside Picnic Area)	
5,445.00	-	Water is at Riverside Picnic Area east sites	
5,445.00	-	Water is at Marina Restroom floor	
5,445.00	-	Water at Platte River Bridge	
ACTION	-	C.S. #22 (Deer Creek Picnic Area)	
ACTION		<u>TASK #1 TASK #4</u>	
5,446.00	-	Water is at C.S. #22 and transformer at Deer Creek Picnic Area	
5,447.08	-	Highest water mark on June 30, 1983	
5,448.00	-	Water at Riverside GPA	
ACTION	-	C.S. #25 (North Ramps, and transformer and Lift	Station #5
(North Ramps)			
ACTION		<u>TASK #1 TASK #4</u>	
5,449.00	-	Water at C.S. #25 at North Ramp	
5,449.00	-	Water at road in front of C.S. #25 (North Ramps)	
5,454.50	-	Rim of Lift Station #6 (Roxborough Cove)	
* C.S.	=	Comfort Station	

ELECTRICAL EQUIPMENT

INSTRUCTION SHEET

Building and Utility Electrical System Component Removal.

Each of these procedures take about one to two hours per unit to complete and double that to reinstall.

First: Turn off all power to the building.

- A. Circuit Breaker Panel Board removal from restroom buildings, aid station, bath house and concession.
 - a. Remove panel cover by loosening (not removing) the retaining screws and releasing the latch mechanism.
 - b. Disconnect all wires from circuit breakers and tag them for reconnecting later.
 - c. Disconnect the three short jumper wires and the main conductors from the 70 or 90 Amp Main breaker.
 - d. Remove the four to six bolts or nuts and washers which secure the panel board to the cabinet.
 - e. Dismount the entire panel board assembly by pulling forward and out of the cabinet.
 - f. Coat all bare copper conductor ends with anti corrosion grease.
- B. The Main and Water Heater power panels in the bath house.
 - a. Disconnect all wires from the circuit breakers.
 - b. Dismount the entire panel board as in A. above.
- C. Water Heaters
 - a. Disconnect the wiring at the fused switch box for each water heater in the bath house and remove conduit and wire from box, leaving wire and conduit attached to the heaters.
 - b. Disconnect the wires and flex conduit at the junction box on the wall adjacent to the heater.
 - c. Close inlet and outlet water gate valves and drain the tank. Loosen and disconnect the supply and outlet unions at the top of the tank.
 - d. Handle the tank with care during removal to avoid damaging the glass lining.
- D. Furnaces or Unit Heaters, Riverside #28 and North Ramps #25.
 - a. Disconnect the wiring and flex conduit from the furnace.
 - b. Disconnect the thermostat wires from the furnace.
 - c. Unscrew the top plenum from the furnace hot air outlet, and raise the plenum about 1/2 to 3/4 inch and temporarily secure while the furnace is slid out and removed. A temporary support may need to be provided.
- E. Transformer Primary fuses. (not in vaults)
NOTE: This procedure must be performed by qualified personnel only.
 - a. Disconnect the Primary (15 kv) power at the Service Entrance Oil Switch, or the PSCo cutouts.
 - b. Open the transformer cabinet (both doors)
 - c. Using a HOT STICK, and 20 kv gloves pull the primary fuses and remove for storage.
 - d. Secure the transformer.
- F. Transformer Secondary Circuit Breaker Panels.

- a. Remove the four to six nuts and washers which secure the side shield panels in the right (secondary) side of the transformer cabinet and remove the panels.
 - b. Disconnect all of the wires from the circuit breakers and the panel board busses and tag the free ends for re-connection later.
 - c. Remove the panel board from the cabinet and secure the transformer.
- G. Ventilation Blowers.
 - a. It is not generally cost effective to remove in line blowers located in the back of the small plumber's chases. This is a low priority. The water rarely will get that high.
- H. Transformers in Concrete Block Vaults.

NOTE: BE ABSOLUTELY CERTAIN THAT PRIMARY POWER IS DISCONNECTED FROM THE TRANSFORMER.

 - a. Open the access door to the circuit breaker panel (the cabinet usually located on the inside wall of the vault).
 - b. Disconnect all wires from the circuit breakers and the panel board busses and tag the free ends for re-connection later.
 - c. Remove the panel board from the cabinet and secure the cabinet and transformer.
 - d. Disconnect and remove the DRY type transformer located in the Southwest inside corner of the transformer vault at Lift Station #3 (Swimbeach).
- I. Lift Station #1 and #2 (Catfish Flats and Jamison).
 - a. Open Control Cabinet and disconnect and tag all interconnecting wires for identification.
 - b. Remove the six nuts and washers from the inside panel mounting studs.
 - c. Dismount and remove the panel and secure the cabinet.
- J. Lift Station #3, the control panel must be removed in the same manner as the other lift stations.
- K. Lift Station #4, the control panel must be removed from its cabinet located in the underground vault in the same manner as other Lift Stations.
- L. Enhanced reservable Group Picnic Shelters (Riverside & Marina Point)
 - a. Remove cover plate and remove circuit breakers
 - b. Remove duplex outlets from wall mounted boxes.