



DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

John W. Hickenlooper
Governor

Mike King
Executive Director

Dick Wolfe, P.E.
Director/State Engineer

Bob W. Hurford, P.E.
Division Engineer

September 12, 2011

Mr. Philip Ceriani
Overland Ditch & Reservoir Company
28444 Redlands Mesa Rd.
Hotchkiss, CO 81419

Subject: OVERLAND DAM, WATER DIVISION 4, DAMID 400422

Dear Mr. Ceriani:

On August 2, 2011, our office inspected Overland Dam in accordance with Section 37-87-107 of the Colorado Revised Statutes, which assigns the State Engineer responsibility to determine the amount of water which is safe to impound in the reservoirs of all dams in the state of Colorado.

Conditions observed during the dam safety inspection resulted in a recommended safe storage level of Conditional Full Storage, indicating that the dam may be used to full storage provided certain conditions are met. Specifically, the maintenance, repair, and/or monitoring items listed on page 3 of the current inspection report are actions required by the owner to improve the safety of the dam.

Enclosed is a copy of the Engineer's Inspection Report along with two copies of the signature page. Please sign both signature pages, keeping one for your files and returning one to the Division 4 office. Please feel free to contact me if you have any questions or wish to discuss results of this inspection.

Sincerely,

Jason P. Ward, P.E.
Dam Safety Engineer

Enclosure: Copy of Engineer's Inspection Report dated August 2, 2011

Cc: Bob Hurford, Division Engineer
Steve Tuck, Water Commissioner
Denver Office, Safety of Dams Program
Linda Bledsoe, USDA Forest Service

Water Division 4 • Montrose

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ENGINEER'S INSPECTION REPORT

INSPECTOR: JPW

OFFICE OF THE STATE ENGINEER - DIVISION OF WATER RESOURCES - DAM SAFETY BRANCH

1313 SHERMAN STREET, ROOM 818, DENVER, CO 80203, (303) 866-3581

DAM NAME: OVERLAND #1	T: 110S R: 0920W S: 23	COUNTY: DELTA	DATE OF INSPECTION: 8/2/2011
DAM ID: 400422 YRComp: 1987	DAM HEIGHT(FT): 60.0	SPILLWAY WIDTH(FT): 75.0	PREVIOUS INSPECTION: 9/1/2009
CLASS: High hazard	DAM LENGTH(FT): 3200.0	SPILLWAY CAPACITY(CFS): 4367.0	NORMAL STORAGE (AF): 5828.0
DIV: 4 WD: 40	CRESTWIDTH(FT): 20.0	FREEBOARD (FT): 6.0	SURFACE AREA(AC): 252.0
EAP: 11/1/2004	CRESTELEV(FT): 9897.0	DRAINAGE AREA (AC.): 6200.0	OUTLET INSPECTED: 6/26/1990

CURRENT RESTRICTION: -- NONE --

OWNER: OVERLAND DITCH & RESERVOIR COMPANY	OWNER REP.: PHILIP CERIANI
ADDRESS: 28444 REDLANDS MESA RD.	CONTACT NAME: PHILIP CERIANI
HOTCHKISS CO 81419-0000	CONTACT PHONE: (970) 260-2057X

INSPECTION PARTY: Jason Ward	Steve Tuck	Philip Ceriani ; Bob Church
REPRESENTING: Dam Safety Branch	Water Commissioner	Owner

FIELD CONDITIONS OBSERVED	WATER LEVEL: BELOW DAM CREST 12.35 FT.	Below Spillway 6.35 FT.	GAGE ROD READING 35.65
	GROUND MOISTURE CONDITION: <input type="checkbox"/> DRY <input checked="" type="checkbox"/> WET <input type="checkbox"/> SNOWCOVER	OTHER rain during inspection	

DIRECTIONS: MARK AN X FOR CONDITIONS FOUND AND UNDERLINE WORDS THAT APPLY

UPSTREAM SLOPE

PROBLEMS NOTED ☐ (0) NONE ☒ (1) RIPRAP - MISSING, SPARSE, DISPLACED, WEATHERED ☒ (2) WAVE EROSION - WITH SCARPS

☐ (3) CRACKS WITH DISPLACEMENT ☐ (4) SINKHOLE ☐ (5) APPEARS TOO STEEP ☐ (6) DEPRESSIONS OR BULGES ☐ (7) SLIDES

☐ (8) CONCRETE FACING - HOLES, CRACKS, DISPLACED, UNDERMINED ☐ (9) OTHER

Main dam: Uniform slope and waterline with full riprap coverage. Boat ramp interrupts uniformity along main dam, but not a concern at this time. No problems observed.

Auxiliary dam: (2) Wave erosion with scarps along high waterline. Condition greatly improved with recent years maintenance. No evidence of recent or advancing activity. Generally uniform riprap coverage up to high waterline. (1) Some gap-graded (large boulders with voids) areas, but no problems observed at this time.

CONDITIONS OBSERVED: ☒ Good ☐ Acceptable ☐ Poor

CREST

PROBLEMS NOTED ☐ (10) NONE ☒ (11) RUTS OR PUDDLES ☐ (12) EROSION ☐ (13) CRACKS - WITH DISPLACEMENT ☐ (14) SINKHOLES

☐ (15) NOT WIDE ENOUGH ☐ (16) LOW AREA ☐ (17) MISALIGNMENT ☐ (18) IMPROPER SURFACE DRAINAGE ☐ (19) OTHER

Main dam: (11) Few small potholes developing. However, overall appearance is good. Uniform width and elevation with smooth alignment.

Auxiliary dam: (11) Ruts along full length from recent public access during wet conditions. Condition acceptable, but routine grading should be a part of maintenance plan if public access is continued.

CONDITIONS OBSERVED: ☒ Good ☒ Acceptable ☐ Poor

DOWNSTREAM SLOPE

PROBLEMS NOTED ☐ (20) NONE ☐ (21) LIVESTOCK DAMAGE ☒ (22) EROSION OR GULLIES ☐ (23) CRACKS - WITH DISPLACEMENT ☐ (24) SINKHOLE

☐ (25) APPEARS TOO STEEP ☒ (26) DEPRESSIONS OR BULGES ☐ (27) SLIDE ☐ (28) SOFT AREAS ☐ (29) OTHER

Main dam: (22) Concentrated erosion gullies periodically along right-most portion of embankment. See detailed description in 2008 and 2009 inspection reports. Area does not appear to have significantly changed, but should be monitored and repaired as necessary

Auxiliary dam: (26) Irregular surface with depressions and bulges creating varied slope as well. Historic condition with no apparent changes. Overall condition appears stable.

CONDITIONS OBSERVED: ☐ Good ☒ Acceptable ☐ Poor

SEEPAGE

- PROBLEMS NOTED** ☐ (30) NONE ☐ (31) SATURATED EMBANKMENT AREA ☐ (32) SEEPAGE EXITS ON EMBANKMENT
☐ (33) SEEPAGE EXITS AT POINT SOURCE ☒ (34) SEEPAGE AREA AT TOE ☐ (35) FLOW ADJACENT TO OUTLET ☐ (36) SEEPAGE INCREASED / MUDDY
DRAIN OUTFALLS SEEN ☐ No ☒ Yes Show location of drains on sketch and indicate amount and quality of discharge. ☐ (37) FLOW INCREASED / MUDDY ☐ (38) DRAIN DRY / OBSTRUCTED
☐ (39) OTHER

Main dam: All drain outfalls located and observed, except where noted.

- Left embankment toe drain outfall (10" PVC through outlet structure left wingwall): <10gpm
- Downstream conduit filter drain outfalls (2 each, 6" PVC, one through each wingwall on outlet structure, lower pipes): Both submerged at this tailwater elevation.
- Gate chamber drain outfall (6" PVC through outlet structure right wingwall, upper pipe): <5 gpm
- Outfall drains (2 each) from toe buttress drain: flowing, no estimate
- Drain A outfall: not located
- Spillway basin drain and underdrain outfalls: not located

(34) Historic boggy area between spillway and first bend in dam. No other uncontrolled toe seepage observed.

Auxiliary dam: Damp ground conditions observed just beyond toe with dense vegetation. Historic condition. None observed at toe or on embankment.

CONDITIONS OBSERVED: ☐ Good ☒ Acceptable ☐ Poor

OUTLET

- PROBLEMS NOTED** ☒ (40) NONE ☐ (41) NO OUTLET FOUND ☐ (42) POOR OPERATING ACCESS ☐ (43) INOPERABLE
☐ (44) UPSTREAM OR DOWNSTREAM STRUCTURE DETERIORATED (45) OUTLET OPERATED DURING INSPECTION ☐ YES ☒ NO
INTERIOR INSPECTED ☒ (120) NO ☐ (121) YES ☐ (46) CONDUIT DETERIORATED OR COLLAPSED ☐ (47) JOINTS DISPLACED ☐ (48) VALVE LEAKAGE
☐ (49) OTHER

Discharging during inspection. Outlet valve operated several times a year by owner. No reported problems.

(120) Still awaiting 2009 engineers internal inspection report.

CONDITIONS OBSERVED: ☒ Good ☐ Acceptable ☐ Poor

SPILLWAY

- PROBLEMS NOTED** ☐ (50) NONE ☐ (51) NO EMERGENCY SPILLWAY FOUND ☐ (52) EROSION WITH BACKCUTTING ☐ (53) CRACK - WITH DISPLACEMENT
☐ (54) APPEARS TO BE STRUCTURALLY INADEQUATE ☐ (55) APPEARS TOO SMALL ☐ (56) INADEQUATE FREEBOARD ☐ (57) FLOW OBSTRUCTED
☒ (58) CONCRETE DETERIORATED / UNDERMINED ☐ (59) OTHER

(58) Portion of top edge broken off 7th baffle block from right. Minor spalling on others.
Numerous cobbles and boulders in stilling basin.
One large piece of timber debris just downstream of stilling basin.
Reported leak and visual missing caulk in right-most expansion joint of control section wall.
Downstream channel clear and unobstructed. Dam access road crosses channel and creates irregularity, but no problems observed.
Unable to locate stilling basin underdrain outfall.

CONDITIONS OBSERVED: ☐ Good ☒ Acceptable ☐ Poor

MONITORING

- EXISTING INSTRUMENTATION FOUND** ☐ (110) NONE ☒ (111) GAGE ROD ☒ (112) PIEZOMETERS ☐ (113) SEEPAGE WEIRS / FLUMES
☒ (114) SURVEY MONUMENTS ☒ (115) OTHER drain outfalls
MONITORING OF INSTRUMENTATION ☐ (116) NO ☐ (117) YES PERIODIC INSPECTIONS BY: ☐ (118) OWNER ☐ (119) ENGINEER

Single data point (one-day) provided in 2010; 2009 data missing; Single point (one day) for 2011 provided at time of inspection.
Acceptable/Poor rating due to lack of monitoring frequency to establish performance pattern.

CONDITIONS OBSERVED: ☐ Good ☒ Acceptable ☒ Poor

MAINTENANCE AND REPAIRS

- PROBLEMS NOTED** ☐ (60) NONE ☐ (61) ACCESS ROAD NEEDS MAINTENANCE ☐ (62) CATTLE DAMAGE
☒ (63) BRUSH ON UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, TOE ☒ (64) TREES ON UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, TOE
☐ (65) RODENT ACTIVITY ON UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, TOE ☐ (66) DETERIORATED CONCRETE - FACING, OUTLET, SPILLWAY
☐ (67) GATE AND OPERATING MECHANISM NEED MAINTENANCE ☐ (68) OTHER

(63)/(64) Small brush and trees periodically on embankments and spillway channel. Otherwise clear visibility everywhere.

CONDITIONS OBSERVED: ☒ Good ☐ Acceptable ☐ Poor

Go to next page for Overall Conditions and Items Requiring Actions

OVERALL CONDITIONS

Conditions observed during the inspection do not currently threaten the safety of the dam. However, essential monitoring, inspection, and maintenance must be performed as a requirement for continued full storage in the reservoir.

Based on this Safety Inspection and recent file review, the overall condition is determined to be:

☐ (71) SATISFACTORY

☒ (72) CONDITIONALLY SATISFACTORY

☐ (73) UNSATISFACTORY

ITEMS REQUIRING ACTION BY OWNER TO IMPROVE THE SAFETY OF THE DAM

MAINTENANCE - MINOR REPAIR - MONITORING

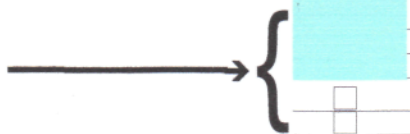
- ☐ (80) PROVIDE ADDITIONAL RIPRAP: _____
- ☐ (81) LUBRICATE AND OPERATE OUTLET GATES THROUGH FULL CYCLE: _____
- ☒ (82) CLEAR TREES AND/OR BRUSH FROM: **locally, as needed to maintain clear visibility.**
- ☐ (83) INITIATE RODENT CONTROL PROGRAM AND PROPERLY BACKFILL EXISTING HOLES: _____
- ☒ (84) GRADE CREST TO A UNIFORM ELEVATION WITH DRAINAGE TO THE UPSTREAM SLOPE: **on auxiliary dam.**
- ☒ (85) PROVIDE SURFACE DRAINAGE FOR: **spillway underdrain pipe (locate and clean, if necessary).**
- ☒ (86) MONITOR: **perform piezometer and seepage monitoring at least once per month during period of storage to establish performance pattern.**
- ☒ (87) DEVELOP AND SUBMIT AN EMERGENCY ACTION PLAN: **update information and format to current standards.**
- ☒ (88) OTHER: **Remove cobbles and boulders from spillway stilling basin.**
- ☒ (89) OTHER: **Consider permanent markings on piezometers.**

ENGINEERING - EMPLOY AN ENGINEER EXPERIENCED IN DESIGN AND CONSTRUCTION OF DAMS TO: (Plans and Specifications must be approved by State Engineer prior to construction.)

- ☐ (90) PREPARE PLANS AND SPECIFICATIONS FOR REHABILITATION OF THE DAM: _____
- ☐ (91) PREPARE AS-BUILT DRAWINGS OF: _____
- ☐ (92) PERFORM A GEOTECHNICAL INVESTIGATION TO EVALUATE THE STABILITY OF THE DAM: _____
- ☐ (93) PERFORM A HYDROLOGIC STUDY TO DETERMINE REQUIRED SPILLWAY SIZE: _____
- ☐ (94) PREPARE PLANS AND SPECIFICATIONS FOR AN ADEQUATE SPILLWAY: _____
- ☐ (95) SET UP A MONITORING SYSTEM INCLUDING WORK SHEETS, REDUCED DATA AND GRAPHED RESULTS: _____
- ☒ (96) PERFORM AN INTERNAL INSPECTION OF THE OUTLET: **Provide report from 2009 inspection.**
- ☐ (97) OTHER: _____
- ☐ (98) OTHER: _____
- ☐ (99) OTHER: _____

SAFE STORAGE LEVEL: RECOMMENDED AS A RESULT OF THIS INSPECTION

- ☐ (101) FULL STORAGE
- ☒ (102) CONDITIONAL FULL STORAGE
- ☐ (103) RECOMMENDED RESTRICTION
- ☐ (104) CONTINUE EXISTING RESTRICTION



FT. BELOW DAM CREST
FT. BELOW SPILLWAY CREST
FT. GAGE HEIGHT
NO STORAGE-MAINTAIN OUTLET FULLY OPEN

REASON FOR RESTRICTION

ACTIONS REQUIRED FOR CONDITIONAL FULL STORAGE OR CONTINUED STORAGE AT THE RESTRICTED LEVEL

Complete all minor repair, maintenance, and monitoring items listed above. Monitoring is a condition of full storage.

Engineer's
Signature

INSPECTED BY

Owner's
Signature

OWNER/OWNER'S REPRESENTATIVE

DATE: / /