COLORADO
Division of Water Resources
Department of Natural Resources

Dam Safety Branch

August 15, 2024

Mr. Scott Southworth
Falls Creek Ranch Association
6530 Falls Creek Main
Durango, CO 81301
via email: scottrobin410@gmail.com

When replying, please refer to:
**TURNER DAM, DAMID 300113**
**Water Division 7, Water District 30**

**SUBJECT:** 2024 Engineers Inspection Report

Dear Scott,

On July 26, 2024, I performed a dam safety inspection for the above referenced structure in accordance with Section 37-87-107, C.R.S. (1991 Repl. Vol.), which assigns the responsibility for the determination of the safe storage level for the reservoirs within Colorado to the State Engineer. The enclosed inspection report summarizes my findings during the inspection.

The condition of the Dam is rated as Satisfactory, and the recommended safe storage level is Full Storage. Please read the report and implement the recommendations on page 3.

If you have any questions, please contact me at 970-317-4147.

Sincerely,

Matthew J Gavin, P.E.
Colorado Dam Safety Branch

ec: Rob Genualdi, Division Engineer, Water Division 7
John Batka, Chief, Dam Safety Branch
Jeff Titus, Water Commissioner, WD30

# ENGINEER'S INSPECTION REPORT

INSPECTOR: MJG

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:** | TURNER | | | **T:** 360N | **R:** 0090W | **S:** 21 | **COUNTY:** LA PLATA | **DATE OF INSPECTION:** | 7/26/2024 |
| **DAM ID:** | 300113 | **YRCompl:** | 1969 | **DAM HEIGHT(FT):** | 35.0 | **SPILLWAY WIDTH(FT):** | 125.0 | **PREVIOUS INSPECTION:** | 9/28/2023 |
| **CLASS:** | High hazard | | | **DAM LENGTH(FT):** | 510.0 | **SPILLWAY CAPACITY(CFS):** | 5000.0 | **NORMAL STORAGE (AF):** | 472.0 |
| **DIV:** | 7 | **WD:** | 30 | **CRESTWIDTH(FT):** | 22.0 | **FREEBOARD (FT):** | 6.0 | **SURFACE AREA(AC):** | 42.0 |
| **EAP:** | 10/1/2022 | | | **CRESTELEV(FT):** | 7150.0 | **DRAINAGE AREA (AC.):** | 4057.0 | **OUTLET INSPECTED:** | 8/23/2013 |

**CURRENT RESTRICTION:** -- NONE --

| | | | |
|---|---|---|---|
| **OWNER:** | FALLS CREEK RANCH ASSOCIATION, INC. (SOUTHW | **OWNER REP.:** | SCOTT SOUTHWORTH |
| **ADDRESS:** | 6350 FALLS CREEK MAIN | **CONTACT NAME:** | SCOTT SOUTHWORTH |
| | DURANGO CO 81301-0000 | **CONTACT PHONE:** | (970) 247-9506X |

| | | | |
|---|---|---|---|
| INSPECTION PARTY | Scott Southworth | Bill Chambers | |
| REPRESENTING : | FCRA | FCRA | |

**FIELD CONDITIONS OBSERVED**

**WATER LEVEL: BELOW DAM CREST** ~6.3 **FT.** Below Spillway ~0.35 **FT.** **GAGE ROD READING** N/A

**GROUND MOISTURE CONDITION:** [x] **DRY** [ ] **WET** [ ] **SNOWCOVER** **OTHER**

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

## UPSTREAM SLOPE

**PROBLEMS NOTED** [x] (0)NONE [ ] (1)RIPRAP - MISSING, SPARSE, DISPLACED, WEATHERED [ ] (2) WAVE EROSION - WITH SCARPS

[ ] (3) CRACKS WITH DISPLACEMENT [ ] (4) SINKHOLE [ ] (5) APPEARS TOO STEEP [ ] (6) DEPRESSION OR BULGES [ ] (7) SLIDES

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

**No changes or concerns noted.**

CONDITIONS OBSERVED: [X] Good [X] Acceptable [ ] Poor

## CREST

**PROBLEMS NOTED** [x] (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

**No changes or concerns noted.**

CONDITIONS OBSERVED: [X] Good [X] Acceptable [ ] Poor

## DOWNSTREAM SLOPE

**PROBLEMS NOTED** [x] (20) NONE [ ] (21) LIVESTOCK DAMAGE [ ] (22) EROSION OR GULLIES [ ] (23) CRACKS - WITH DISPLACEMENT [ ] (24) SINKHOLE

[ ] (25) APPEARS TOO STEEP [ ] (26) DEPRESSION OR BULGES [ ] (27) SLIDE [ ] (28) SOFT AREAS [ ] (29) OTHER

**Vegetative cover appears slightly improved this year. No concerning erosion noted.**

CONDITIONS OBSERVED: [ ] Good [X] Acceptable [ ] Poor

## SEEPAGE

**PROBLEMS NOTED** [x] (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 [ ] (37) FLOW INCREASED / MUDD [ ] (38) DRAIN DRY / OBSTRUCTED

[ ] (39) OTHER

**Seepage control is very good. No signs of seepage; no hydrophytes in toe area.**

CONDITIONS OBSERVED: [X] 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** [x] (120) NO [ ] (121)YES [ ] (46) CONDUIT DETERIORATED OR COLLAPSED [ ] (47) JOINTS DISPLACED [x] (48) VALVE LEAKAGE

[ ] (49) OTHER

**Gate was exercised with no problems encountered. (48) Leakage is always an issue following gate operation; however, this does not present any immediate dam safety concerns.**

CONDITIONS OBSERVED: [ ] Good [X] Acceptable [ ] Poor

ENGINEER'S INSPECTION REPORT
DAM NAME: TURNER

DATE. 7/26/2024
DAM I.D.: 300113

## 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

**Spillway has good geometry and is maintained free of obstructions. The channel was recently mowed prior to the inspection and has the appearance of a city park.**

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

MONITORING OF INSTRUMENTATION ☐ (116) NO ☑ (117) YES PERIODIC INSPECTIONS BY: ☑ (118) OWNER ☐ (119) ENGINEER

**Dam has suitable monitoring for operational needs. (118) Residents recreate frequently on and around dam.**

CONDITIONS OBSERVED: ☐ Good ☒ Acceptable ☐ Poor

## MAINTENANCE AND REPAIRS

**PROBLEMS NOTED** ☑ (60 NONE ☐ (61) ACCESS ROAD NEEDS MAINTENANCE ☐ (62) LIVESTOCK 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

**Dam appears exceptionally well-maintained.**

CONDITIONS OBSERVED: ☒ Good ☐ Acceptable ☐ Poor

*Go to next page for Overall Conditions and Items Requiring Actions*

## OVERALL CONDITIONS

**Embankment exhibits excellent seepage control and is very well-maintained. There are no immediate safety concerns.**

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

**ENGINEERING - EMPLOY AN ENGINEER EXPERIENCED IN DESIGN AND CONSTRUCTION OF DAMS TO**

☐ PERFORM AN INTERNAL INSPECTION OF THE OUTLET

**7/26/2024** - **I will contact you later this year to perform inspection with the State's pipe crawler.**

The State Engineer, by providing this dam safety inspection report, does not assume responsibility for any unsafe condition of the subject dam. The sole responsibility for the safety of this dam rests with the reservoir owner or operator, who should take every step necessary to prevent damages caused by leakage or overflow of waters from the reservoir or floods resulting from a failure of the dam.

## 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:

Engineer's Signature _____ INSPECTED BY

Owner's Signature _____ OWNER/OWNER'S REPRESENTATIVE DATE: ___/___/___

## GUIDELINES FOR DETERMINING CONDITIONS

### CONDITIONS OBSERVED - APPLIES TO UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, OUTLET, SPILLWAY

GOOD
In general, this part of the structure has a near new appearance, and conditions observed in this area do not appear to threaten the safety of the dam.

ACCEPTABLE
Although general cross-section is maintained, surfaces may be irregular, eroded, rutted, spalled, or otherwise not in new condition. Conditions in this area do not currently appear to threaten the safety of the dam.

POOR
Conditions observed in this area appear to threaten the safety of the dam.

### CONDITIONS OBSERVED - APPLIES TO SEEPAGE

GOOD
No evidence of uncontrolled seepage. No unexplained increase in flows from designed drains. All seepage is clear. Seepage conditions do not appear to threaten the safety of the dam.

ACCEPTABLE
Some seepage exists at areas other than the drain outfalls, or other designed drains. No unexplained increase in seepage. All seepage is clear. Seepage conditions observed do not currently appear to threaten the safety of the dam.

POOR
Seepage conditions observed appear to threaten the safety of the dam. Examples:
1) Designed drain or seepage flows have increased without increase in reservoir level.
2) Drain or seepage flows contain sediment, i.e., muddy water or particles in jar samples.
3) Widespread seepage, concentrated seepage, or ponding appears to threaten the safety of the dam.

### CONDITIONS OBSERVED - APPLIES TO MONITORING

GOOD
Monitoring includes movement surveys and leakage measurements for all dams, and piezometer readings for High hazard dams. Instrumentation is in reliable, working condition. A plan for monitoring the instrumentation and analyzing results by the owner's engineer is in effect. Periodic inspections by owner's engineer.

ACCEPTABLE
Monitoring includes movement surveys and leakage measurements for High and Significant hazard dams; leakage measurements for Low hazard dams. Instrumentation is in serviceable condition. A plan for monitoring instrumentation is in effect by owner. Periodic inspections by owner or representative. OR, NO MONITORING REQUIRED.

POOR
All instrumentation and monitoring described under "ACCEPTABLE" here for each class of dam, are not provided, or required periodic readings are not being made, or unexplained changes in readings are not reacted to by the owner.

### CONDITIONS OBSERVED - APPLIES TO MAINTENANCE AND REPAIR

GOOD
Dam appears to receive effective on-going maintenance and repair, and only a few minor items may need to be addressed.

ACCEPTABLE
Dam appears to receive maintenance, but some maintenance items need to be addressed. No major repairs are requirecl

POOR
Dam does not appear to receive adequate maintenance. One or more items needing maintenance or repair has begun to threaten the safety of the dam.

### OVERALL CONDITIONS

SATISFACTORY
The safety inspection indicates no conditions that appear to threaten the safety of the dam, and the dam is expected to perform satisfactorily under all design loading conditions. Most of the required monitoring is being performed.

CONDITIONALLY SATISFACTORY
The safety inspection indicates symptoms of structural distress (seepage, evidence of minor displacements, etc.), which, if conditions worsen, could lead to the failure of the dam. Essential monitoring, inspection, and maintenance must be performed as a requirement for continued full storage in the reservoir.

UNSATISFACTORY
The safety inspection indicates definite signs of structural distress (excessive seepage, cracks, slides, sinkholes, severe deterioration, etc.), which could lead to the failure of the dam if the reservoir is used to full capacity. The dam is judged unsafe for full storage of water.

### SAFE STORAGE LEVEL

FULL STORAGE
Dam may be used to full capacity with no conditions attached.

CONDITIONAL FULL STORAGE
Dam may be used to full storage if certain monitoring, maintenance, or operational conditions are met.

RESTRICTION
Dam may not be used to full capacity, but must be operated at some reduced level in the interest of public safety.

### HAZARD CLASSIFICATION OF DAMS

High hazard
Loss of human life is expected in the event of failure of the dam, while the reservoir is at the high water line.

Significant hazard
Significant damage to improved property is expected in the event of failure of the dam while the reservoir is at the high water line, but no loss of human life is expected.

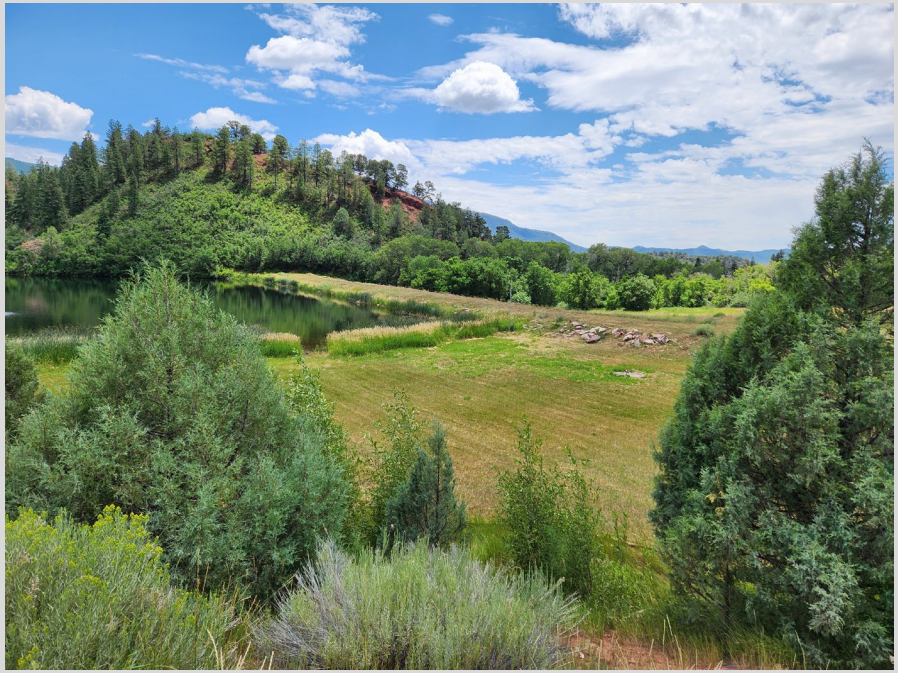
Low hazard
Loss of human life is not expected, and damage to improved property is expected to be small, in the event of failure of the dam while the reservoir is at high water fine.

NPH hazard - No loss of life or damage to improved property, or loss of downstream resource is expected in the event of failure of the dam while the reservoir is at the high water line.

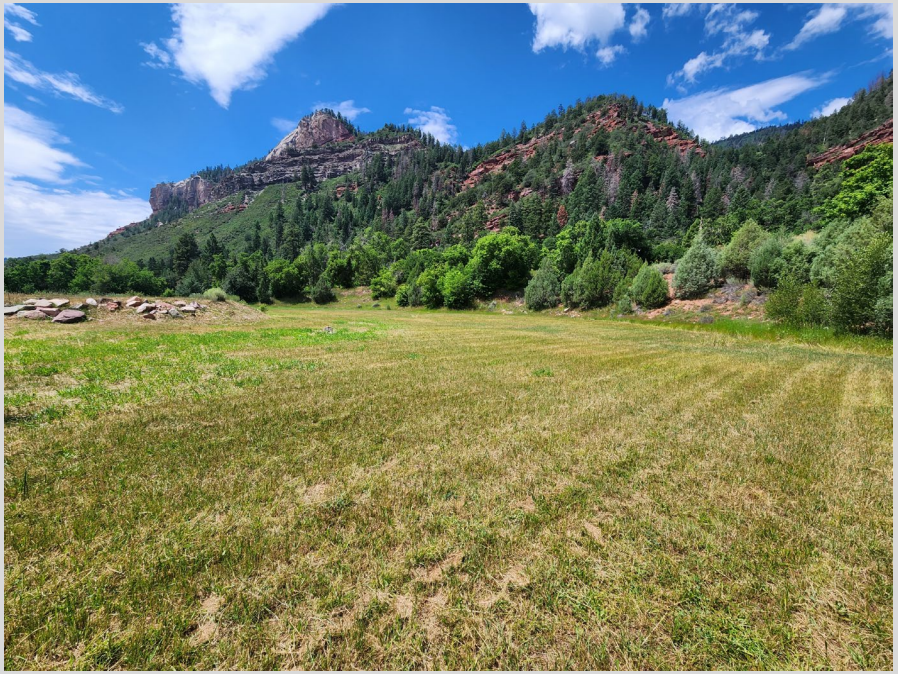
# Turner Dam

by Gavin, Matthew

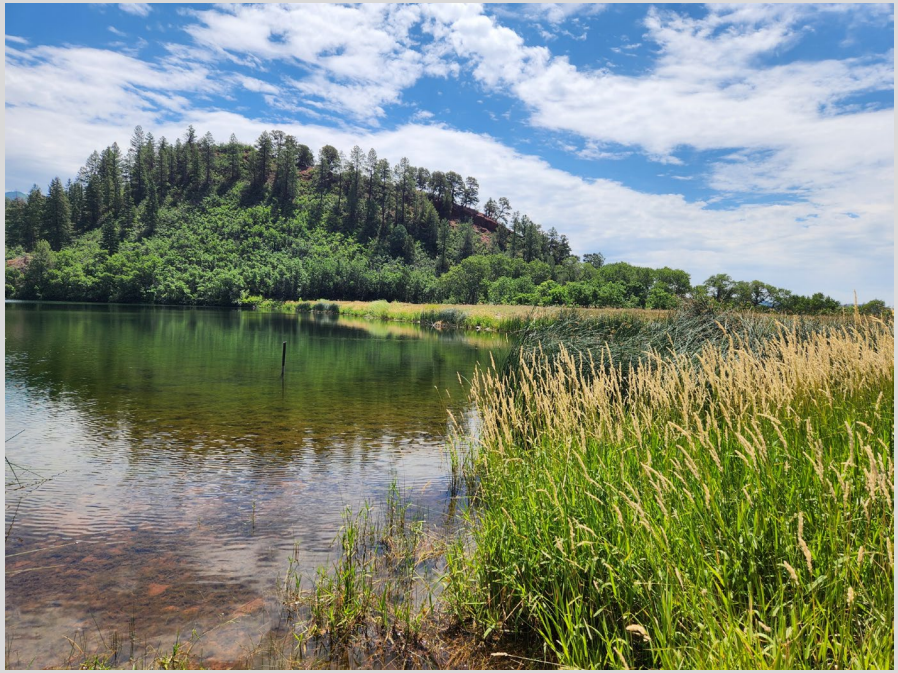
August 26, 2024



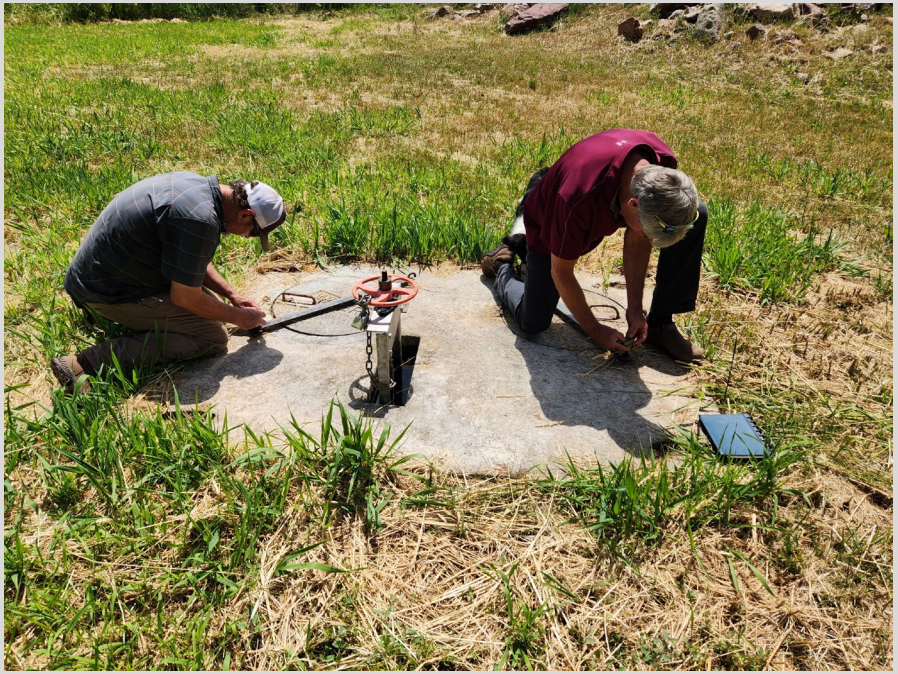
Spillway Channel – Upstream End



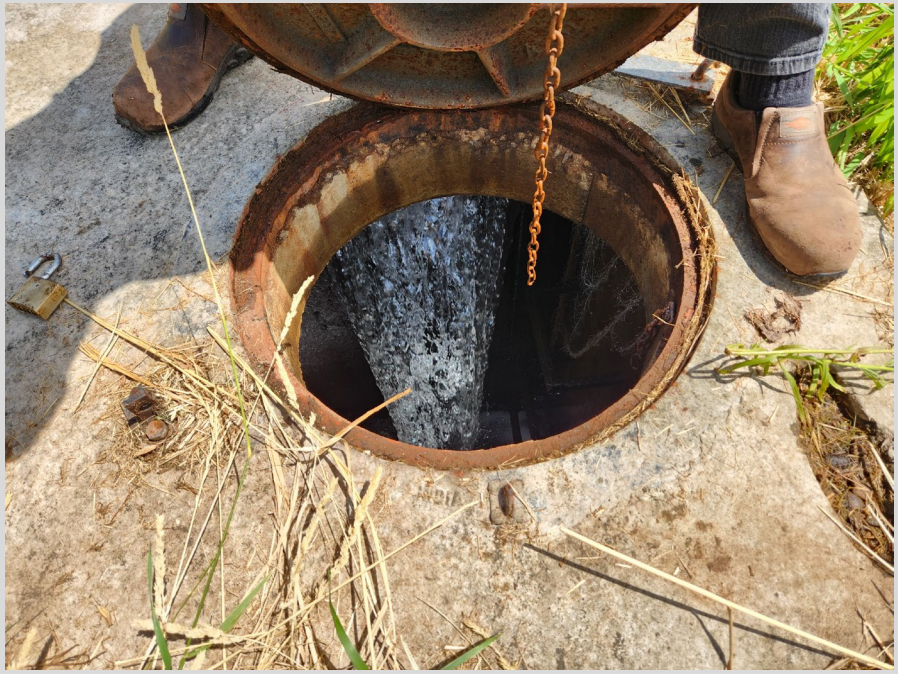
Spillway Channel – Looking Downstream



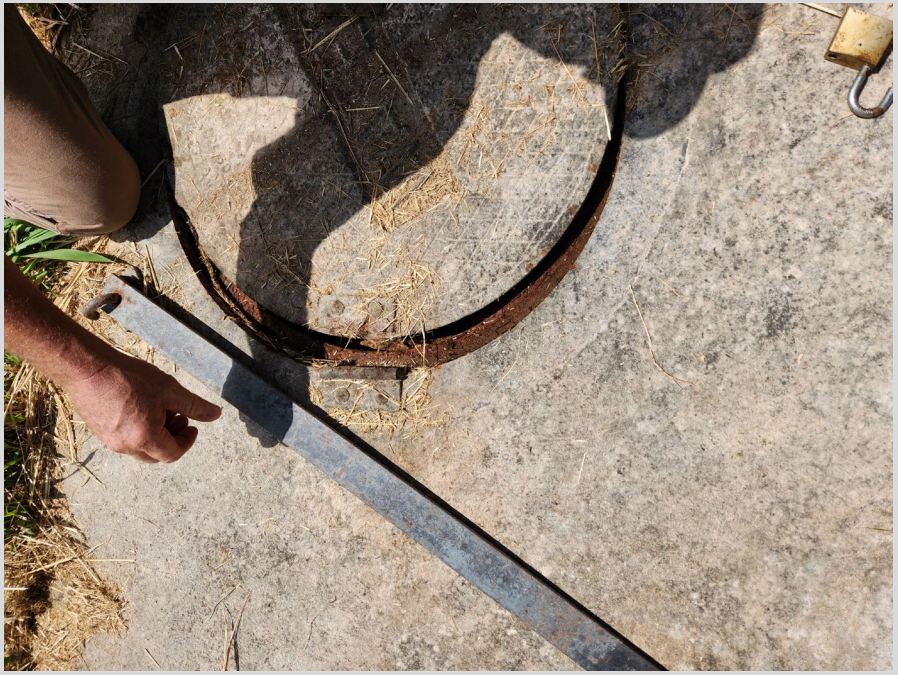
Looking at Upstream Slope from Spillway



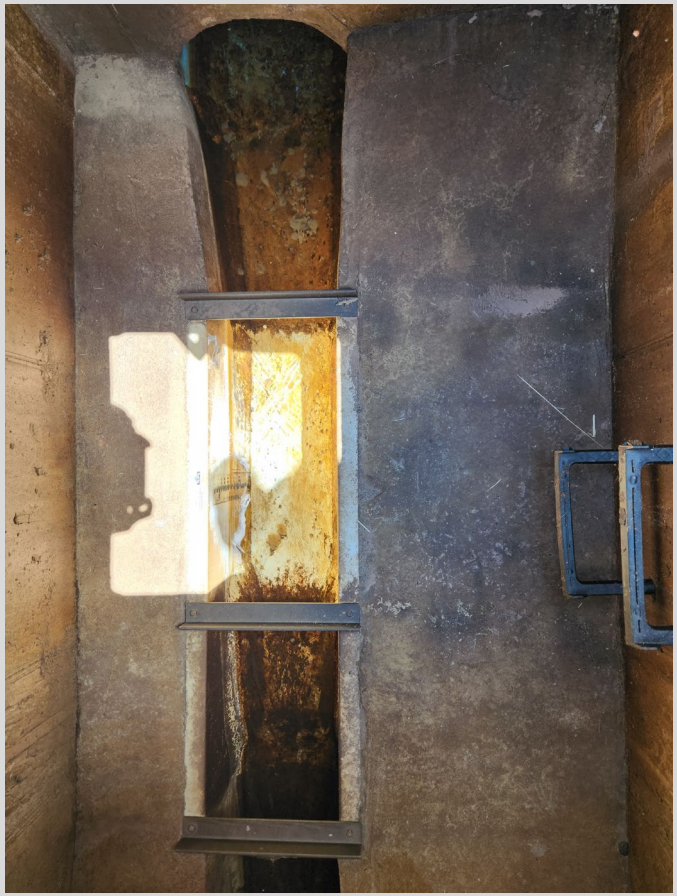
Vault in Spillway Channel



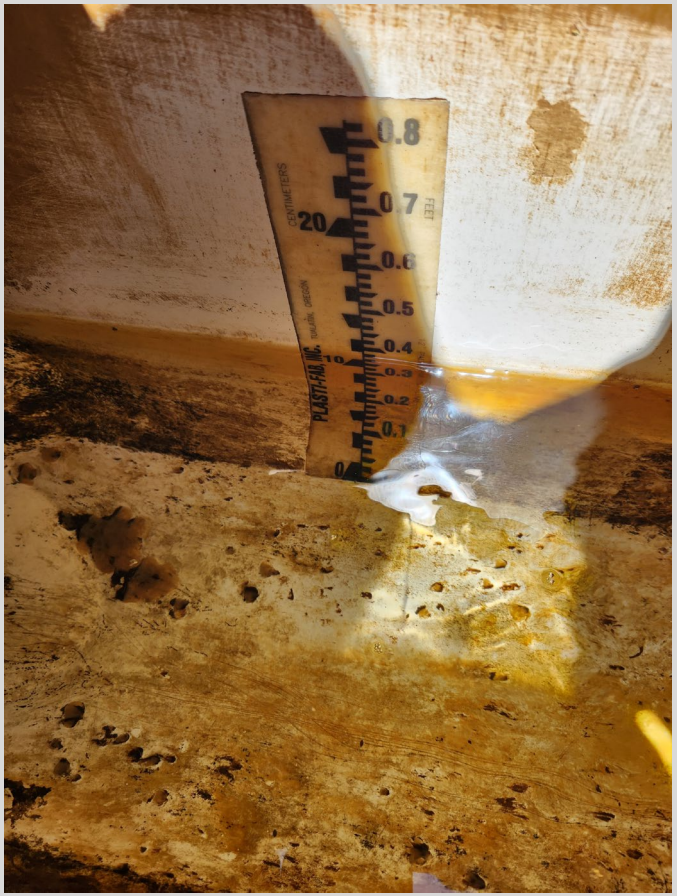
Flow Over Gate Inside Vault



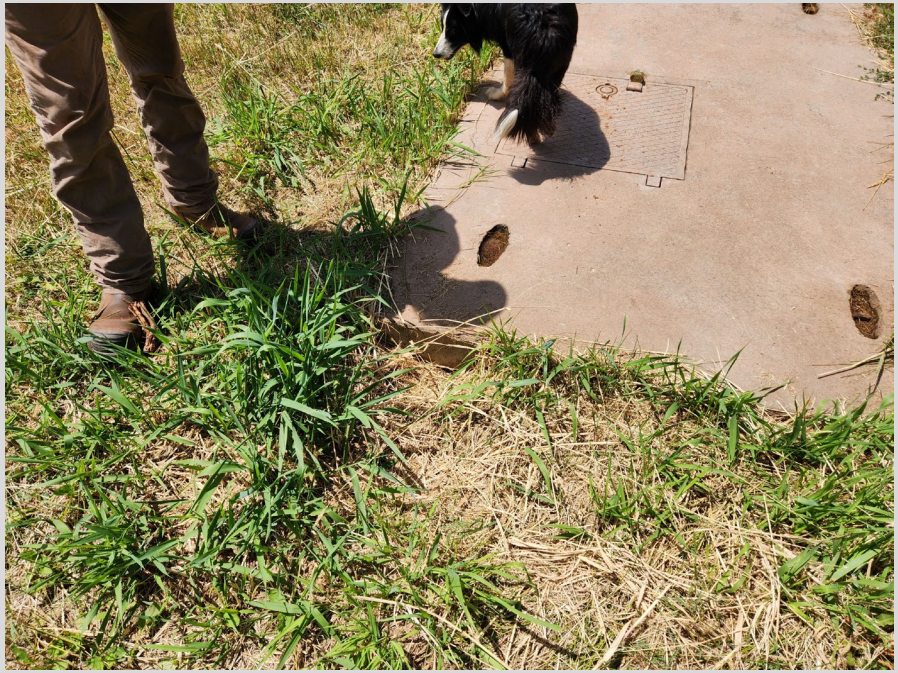
Flume Vault



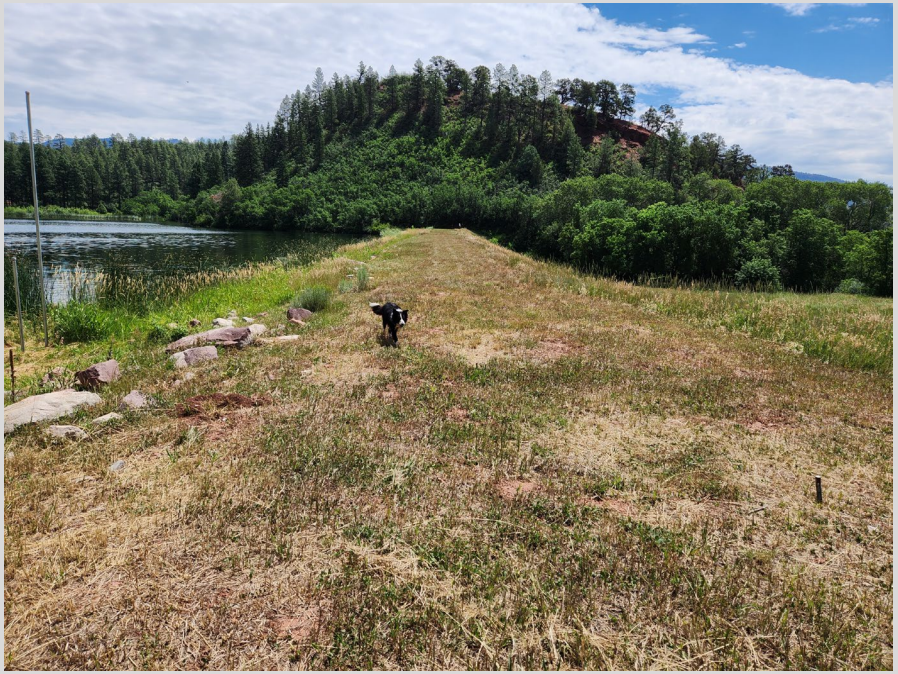
Flume Inside Vault




Staff Gage on Flume



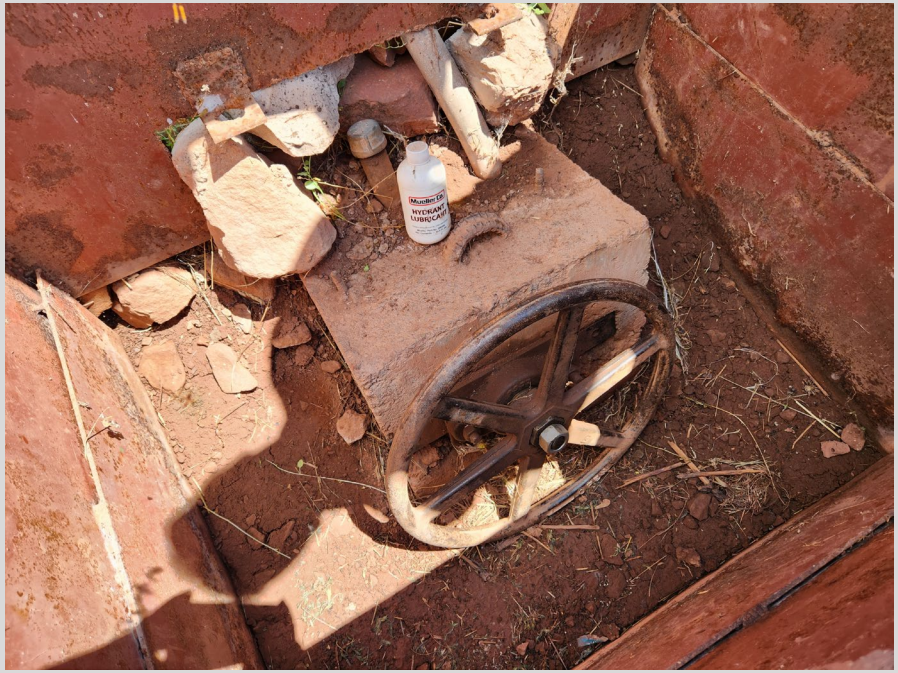
Lid of Vault



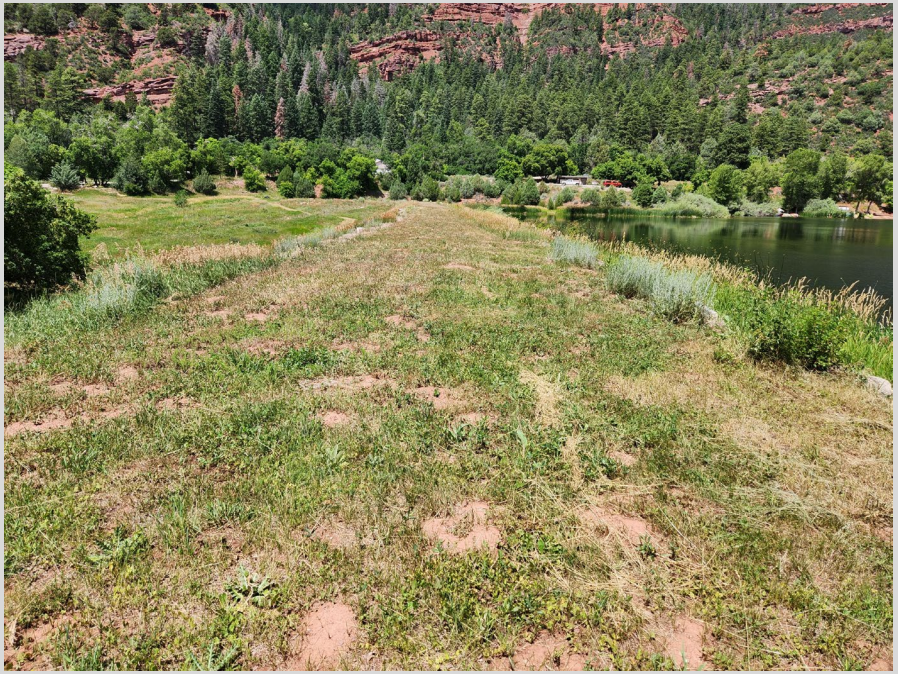
Crest from Right End

Upstream Slope and Crest

Outlet Operator Vault

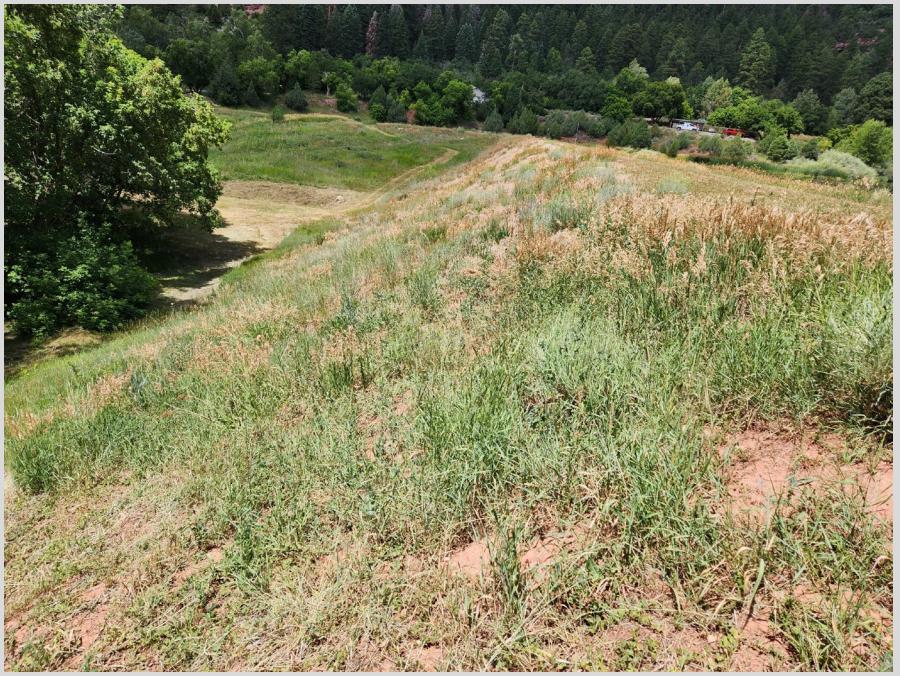



Outlet Operator

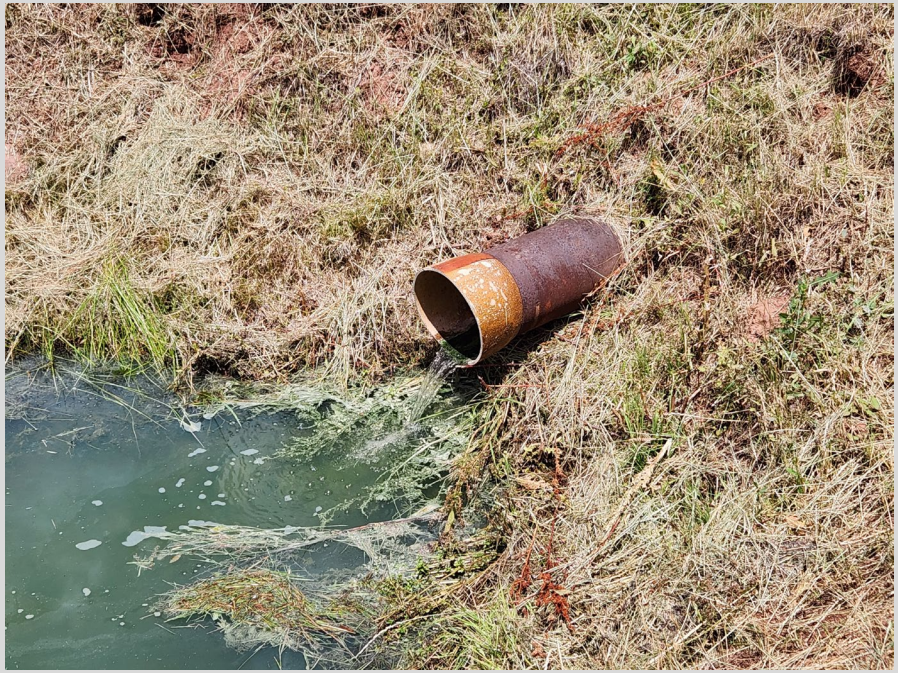


Crest from Left End

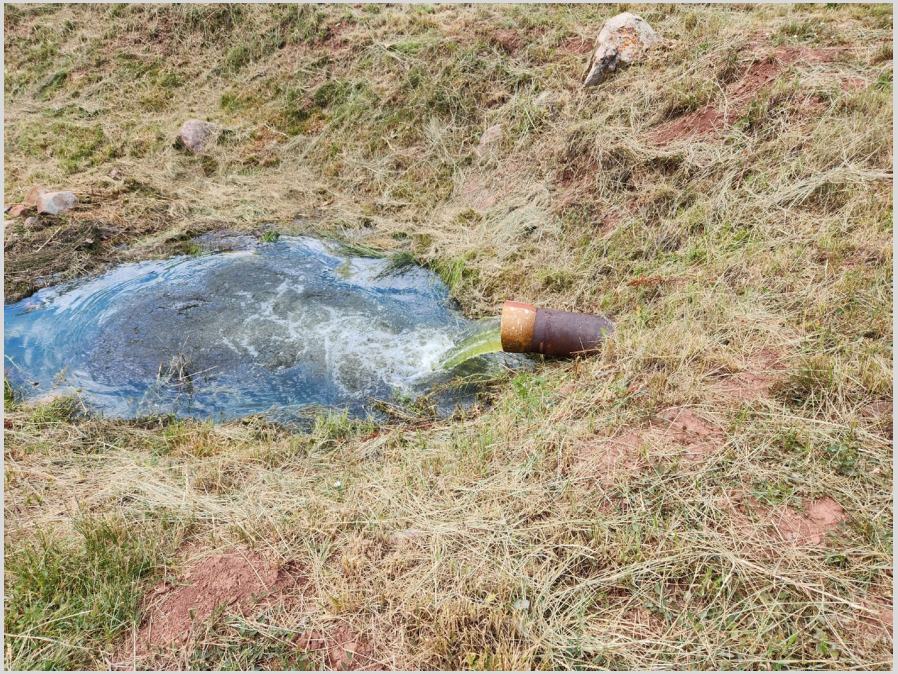
Upstream Slope from Left End



Left Groin and Downstream Slope



Outlet Outfall



Exercising Outlet