

State of California  
California Natural Resources Agency  
Department of Water Resources  
Division of Safety of Dams

Memorandum of Field Review  
Alteration to OJ  
Mill Pond Dam (No. 2381)  
Mendocino County

By Cory A. Miyamoto *CAM* 11/18/2022  
November 18, 2022 *RCB* 11/18/2022

## Reference

1. Kennedy Jenks, Technical Memorandum, re: "Scope of Work – Application for Approval of Plans for Dam Alteration, Former Georgia-Pacific Wood Products Facility", September 7, 2022.
2. Slate Geotechnical Consultants, 60% Design Drawings for Former Georgia-Pacific Wood Products Facility, Retrofit of Mill Pond Dam, March 29, 2022.
3. SAGE Engineers, [DRAFT] Basis of Design Report, Mill Pond Dam Seismic Remediation, August 4, 2017.
4. ESA, Memorandum, re: "Wave Study at Mill Site and Sizing of Primary Layer of Rock Slope Protection", August 11, 2017.

## Introduction

Mill Pond Dam is an earth embankment originally constructed in 1885 in Mendocino County. The dam did not come under DSOD jurisdiction until the late 1970's<sup>1</sup>. The dam site, now owned by Mendocino Railway, is at the edge of a bluff overlooking Soldier Bay on the Pacific Ocean in the City of Fort Bragg, California. The alignment of the embankment trends southwest to northeast. The dam includes a concrete spillway and crib wall near its southwestern end. Mill Pond Dam currently has a "low" hazard potential classification and "fair" condition assessment rating.

The dam has been under restriction by DSOD since 2010 due to structural stability issues, including potentially liquefiable embankment materials and foundation concerns. DSOD staff have also identified inadequate spillway capacity and the lack of a low-level outlet as additional deficiencies for this dam.

The previous owner (Georgia-Pacific) was actively engaged with DSOD to identify the necessary scope of work for alterations to the dam to remove it from State jurisdiction. Past discussions between DSOD and Georgia-Pacific indicated that, if the dam is altered to non-jurisdictional size, remediation requirements would be limited to requiring that the reservoir be retained in the event of an earthquake, in addition to restrictions on public access and future land development downstream of the dam. A DSOD letter to Georgia-Pacific, dated October 17, 2019, identified a deadline to fully complete work to address dam safety deficiencies of December 31, 2025.

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<sup>1</sup> The dam and reservoir are on the site of a former lumber mill, so the site is also subject to the jurisdiction of the California Department of Toxic Substances Control (DTSC). As such, the long-term disposition of the facility, including any future alterations, are also subject to DTSC requirements.

Memorandum of Field Review  
Mill Pond Dam (No. 2381), Mendocino County  
November 18, 2022  
Page 2 of 4

An alteration application was previously filed by Georgia-Pacific on August 31, 2017, accompanied by 60% design level plans and specifications. With the change in ownership, the original application was terminated and superseded by a new application filed by Mendocino Railway on April 7, 2022. Both alteration applications proposed to remove the dam from State jurisdiction by splitting the reservoir into two ponds of non-jurisdictional size.

On September 7, 2022, a revised 60% design level package was submitted by the owner's consultant, Kennedy Jenks (Reference 1). As outlined in the transmittal memorandum (Reference 1) and Basis of Design Report (Reference 3), three major modifications are proposed:

- Construction of a rock slope protection (RSP) buttress at downstream side of the crib wall at the south dam section.
- Ground improvement with cement deep soil mixing (CDSM) and construction of an earthfill buttress at the downstream side of the north dam section.
- Construction of a barrier wall near the center of the existing reservoir, dividing it into two smaller ponds.

This memorandum summarizes the Field Engineering Branch (FEB) review of the 60% design level submittal (References 1-4), which included preliminary plans and supporting technical documentation. FEB comments for the 60% design level package are summarized below:

#### **FEB Comments on 60% Design Package**

##### General

- Design Engineering Branch (DEB) needs to confirm that mitigation of the middle section of the embankment will not be necessary (ref: Geologic Review of Design Criteria, Basis of Design, and 60% Plans, October 16, 2017).
- Available project drawings and past inspection reports indicate the presence of numerous un-encased, small diameter conduits throughout the embankment. The long-term disposition of these conduits needs to be addressed as part of this alteration. The conduits need to be removed and replaced with compacted fill, or properly abandoned in place (with grout or other means).
- The need for seepage collection and control needs to be addressed. Past inspection reports have indicated seepage emanating from the timber crib wall at the south dam section, as well as the downstream toe are of the north dam section embankment.
- Previous stipulations regarding restriction of 1) public access and 2) downstream land development need to be confirmed in order for this to remain a facility with "low" hazard potential classification.
- The datum conversion between project plans and elevations shown on our Certificate of Approval needs to be clarified.
- The Division needs to confirm that the proposed cutoff wall is an acceptable interior barrier for the existing Mill Pond to be considered a compartmented reservoir.
- The Division needs to confirm and concur that the pond sediments are non-flowable, and that the proposed storage volumes of the West and East Pond will be less than jurisdictional size.

Memorandum of Field Review  
Mill Pond Dam (No. 2381), Mendocino County  
November 18, 2022  
Page 3 of 4

The following are FEB's comments on the submitted plans and specifications:

Specifications

- A full set of technical specifications needs to be provided for DSOD review.

Plans

1. Sheet 2 (Notes & Abbreviations):
  - a. Add Division of Safety of Dams (DSOD) to list of "Legend & Abbreviations"
  - b. Earthwork, Note 3: "Fill material shall be free of organic material, debris, and other unsuitable material, and consist of..."
  - c. Inspection and Observation, Note 1: Key stages of construction requiring DSOD inspection/observation include, but are not limited to:
    - i. Pilot Field Test Program for CDSM installation
    - ii. Beginning of CDSM production installation
    - iii. Foundation preparation for RSP and earthfill buttresses
    - iv. Placement of RSP and earthfill buttresses
    - v. Construction of cutoff wall, including reinforced concrete foundation preparation and placement.
  - d. Inspection and Observation (general): Add the following:
    - i. Continuous inspection by the Resident Engineer or his/her assistant is **required** when those portions of the work under DSOD jurisdiction are in progress.
    - ii. Work to be performed is subject to inspection by the State of California, Department of Water Resources, Division of Safety of Dams (DSOD). The Contractor shall be required to take all actions necessary to facilitate such inspection.
      1. Representatives from DSOD will periodically inspect the work in progress during construction, including the materials being incorporated into the works, as well as test results and documentation associated with the Project. The Contractor shall allow DSOD representatives access to all locations within Project boundaries.
      2. All communications with DSOD pertaining to the Project shall be coordinated through the Owner's Engineer or designated representative.
      3. A 72-hour notice from the Owner's representative is required to schedule a DSOD inspection. Therefore, the Contractor shall cooperate with the Owner's representative by giving at least 72-hour (business days) notice of any inspection requiring DSOD involvement to ensure the Owner has sufficient time to coordinate with DSOD.
      4. Submittals for changes to approved plans and specifications pertaining to jurisdictional work will also be submitted to DSOD for review and approval. It will be the Owner's Engineer's responsibility to provide such submittals to DSOD.
    - iii. All embankment and concrete foundations must be approved by DSOD prior to fill and/or concrete placement on the foundation.

Memorandum of Field Review  
Mill Pond Dam (No. 2381), Mendocino County  
November 18, 2022  
Page 4 of 4

2. Sheet 3 (Site Improvement Plan):
  - a. Provide area-capacity curves for the proposed West Pond and East Pond.
3. Sheets 7, 8 (North Dam Improvement Sections A, B, & C):
  - a. The tops of the new rock and earth fill buttress, as well as the engineered rock fill construction pad, need to be sloped to drain away from the embankment (downstream).
4. Sheet 9 (North Dam Improvement Section Detail):
  - a. CDSM columns need to be keyed at least 3-feet into bedrock (ref: Geologic Review of Design Criteria, Basis of Design, and 60% Plans, October 16, 2017).
5. Sheet 12 (Gravity Wall Section):
  - a. Provide concrete reinforcement details for the gravity wall section.
  - b. Clarify if the keyway is intended to be placed separately or monolithically with the proposed structural concrete infill. Will the structural concrete infill include any reinforcement?
6. Sheets 14 (South Dam Improvement Buttress Layout):
  - a. The existing utilities shown in the plan view (6-inch CIP, concrete vault, 20-inch CMP, and 8-inch CMP) need to be removed and replaced with compacted fill, or be properly abandoned in place (with grout or other means).
7. Sheets 14, 15 (South Dam Improvement Sections A, B, & C):
  - a. The top of the new RSP needs to be sloped to drain away from the embankment (downstream).
  - b. The RSP buttress foundation objective is described as "competent rock". Include a qualifier defining minimum acceptable degree of weathering or strength (ref: Geologic Review of Design Criteria, Basis of Design, and 60% Plans, October 16, 2017).
  - c. On Sheet 15, include the Notes listed on Sheet 14 (or fix note callouts to reference to Sheet 14).