



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Brown, Carlson, Mital, Helgeson and Schlossberg
FROM: Mark Zinniker, Generation Engineering Supervisor
DATE: December 27, 2018
SUBJECT: Update on Urgent Work at Carmen Diversion Reservoir
OBJECTIVE: Information Only

Issue

On July 25, 2018, the FERC issued a letter directing EWEB to take immediate action to work with our Independent Consultant (the “IC” for the 5-year Part 12 Dam Safety Review of the Carmen-Smith Hydroelectric Project, being performed by Schnabel Engineering) to develop a work plan to investigate and mitigate potential failure modes associated with sinkholes at Carmen Diversion Reservoir. To respond to that FERC direction, EWEB staff were compelled to request an emergency declaration for contracting with Schnabel Engineering for \$169,616 in engineering services so that investigation and mitigation work could proceed in a timely manner. The August 2018 correspondence to the Board related to the emergency declaration is included for reference as an attachment to this update.

On September 26, 2018, the FERC issued additional directives to EWEB including a requirement to drawdown the Carmen Diversion Reservoir to a free-flow condition by removing the fixed stoplogs from the dam’s sluiceway. The letter directed EWEB to complete the drawdown work by October 31, 2018. The FERC also required EWEB to confirm that the fixed stoplogs could be safely removed using a temporary bulkhead system by completing stability analyses of both temporary and permanent sluiceway/spillway configurations. EWEB negotiated Contract Amendment No. 1 with Schnabel Engineering to complete the required stability analyses for the amount of \$34,700.

On October 26, 2018, the FERC issued additional directives to EWEB that necessitated another contract amendment with Schnabel Engineering. The additional engineering services included:

- IC review and concurrence with the Carmen Diversion Reservoir stage-storage curve that EWEB uses to plan reservoir drawdown and wet weather reservoir management operations.
- IC review and concurrence with the hydraulic model of the diversion tunnel that EWEB uses to plan reservoir drawdown and set weather reservoir management operations.
- IC performance of rapid drawdown analyses and concurrence that the EWEB’s proposed rates of water level adjustment are safe for drawdown and wet weather reservoir management operations.
- IC review and concurrence that EWEB’s overall wet weather operating plan properly mitigates risks associated with the sinkholes.

These additional services, in combination with FERC insistence for the full-time presence of a Schnabel geotechnical engineer during the late October reservoir drawdown activities, resulted in EWEB staff negotiating Contract Amendment No. 2 with Schnabel Engineering for the amount of \$57,766.

Amendment No. 1 increased the emergency contract amount by 20-percent above the baseline contract value of \$169,616. Amendment No. 2, in combination with Amendment No. 1, increased the emergency contract amount by 55-percent above the baseline contract value, thus triggering Board notification. The current emergency contract value with Schnabel Engineering is \$262,082.

With Schnabel's support through this contract, EWEB received FERC approval on December 20 for our wet weather operating plan that will allow for nearly normal operation of the Carmen-Smith facilities until our next planned outage for major construction work at Carmen Powerhouse.

Requested Board Action

Information only. No Board action requested.



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Brown, Carlson, Mital, Simpson and Helgeson
FROM: Mark Zinniker, Generation Engineering Supervisor
DATE: August 23, 2018
SUBJECT: Urgent Investigations at Carmen Diversion Reservoir
OBJECTIVE: Information Only

Issue

As described in the attached emergency declaration, EWEB has needed to move ahead quickly on preparations for investigation work related to the presence of sinkholes on the bottom of Carmen Diversion Reservoir.

On July 16 and 17, 2018, a team consisting of EWEB staff, our Part 12D Independent Consultant (Schnabel Engineering), and our FERC dam safety compliance engineer inspected the Carmen-Smith Project. During that field inspection, the team viewed numerous known sinkholes in Carmen Diversion Reservoir, reviewed results from a previous bathymetric survey of the reservoir bottom, and discussed potential failure modes associated with the sinkhole situation.

In response to concerns raised from observations and discussions during the week of July 16th, the FERC issued a letter on July 25, 2018 requesting that EWEB take immediate action to work with the Independent Consultant to develop a work plan for assessing the site conditions, complete site investigations, and design of any needed repairs at the Carmen Diversion Reservoir within 45 days of receipt of their letter (see attached letter).

Since receipt of the FERC letter, EWEB staff have worked with Schnabel Engineering to negotiate a scope and fee to develop and perform the FERC mandated work plan. The fee exceeded the threshold for Board approval and waiting until the September 4th Board meeting would not permit EWEB to comply with the FERC-mandated response schedule. As a result, EWEB staff requested an emergency declaration so that this necessary work could proceed in a timely manner.

EWEB staff also observe that rapid progress on the FERC requested work plan is advantageous with respect to the approaching wet weather season which could complicate or preclude certain investigation and/or remediation opportunities.

Requested Board Action

Information only, no Board action requested.

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections – Portland Regional Office
805 SW Broadway, Suite 550
Portland, Oregon 97205
(503) 552-2700 Office - (503) 552-2799 Facsimile

7/25/2018

In reply refer to:
P-2242-OR

Mr. Mark Zinniker
Generation Engineering Supervisor
Eugene Water and Electric Board
P.O. Box 10148
Eugene, OR 97440

Subject: 2018 Dam Safety Inspection Follow-Up Items for the Carmen-Smith Project

Dear Mr. Zinniker:

On July 16 and 17, 2018, Ms. Kristie Hartfeil of this office inspected the Carmen-Smith Project, FERC No. 2242. All project structures were inspected. As discussed with you and your staff, numerous large sinkholes have been identified in Carmen Diversion reservoir in the past as well as during this inspection. Based on our observations, the sinkholes could pose a significant dam safety or reservoir blowout concern and require immediate attention. Based on our visual inspections, review of project files, and discussions during the Part 12D Potential Failure Mode Assessment (PFMA), we have significant dam safety concerns about the following:

- a. Thirteen sinkholes documented in the 2016 bathymetry survey of the Carmen Diversion reservoir, including a sinkhole 25 feet in diameter and 13 feet deep near the upstream dam toe;
- b. Two previously backfilled sinkholes immediately downstream of the dam near Station 24+00;
- c. Linear depressions or slumping observed on the dam downstream slope, near the toe between Stations 22+00 and 24+00; and
- d. Uncontrolled seepage exiting at the downstream dam toe between Station 22+00 and 23+00.

These observations are consistent with developing potential internal erosion failure modes of the foundation and/or embankment under normal loading conditions. Although the dam currently has a low downstream hazard classification, failure of the structure would result in loss of the ability to divert water into Smith Reservoir and

severely limit the functionality of the power project. In addition, there are dozens of people recreating in the Tamolitch Falls (Blue Pool) area downstream from the dam during the summer that could be endangered in the event of a reservoir blowout and/or dam failure. **Therefore, we are requesting that EWEB should take immediate action and work with your Part 12D Independent Consultant (IC) to develop a workplan for assessing the site conditions, complete site investigations, and design of any needed repairs to be submitted within 45 days of receipt of this letter.** Furthermore, you need to develop interim risk reduction measures, which could include restricting the reservoir level, increased monitoring and surveillance, and/or enhanced downstream warning systems.

Additional items observed during the inspection were discussed with you, Ms. Cheri Wilson, Mr. Dan Olmstead, and Ms. Laura Ohman. A complete list of the additional items requiring your attention are listed below:

General:

1. The 2016 Bathymetric and Topographic Survey of Trail Bridge Dam, Smith Dam, and Carmen Diversion Reservoirs for EWEB by David Evans and Associates was never formally submitted to D2SI-PRO. This report and all future bathymetric and topographical surveys should be filed with D2SI-PRO upon receipt by EWEB.

Carmen Diversion Development:

2. Seepage Weir CD-SW1 is affected by backwater from spillway discharges and does not adequately monitor seepage flows observed between Stations 22+00 and 23+00 at the downstream dam toe. Additional weirs should be constructed near the seepage exit points to adequately monitor flows.
3. An approximately 1250-foot-long seepage blanket was originally constructed over the native pervious talus slope along the western edge of the reservoir, as shown in the as-built Drawing 3048-A-22-004. Trees are currently growing along the eastern edge of the road and into the seepage blanket. All vegetation over the seepage blanket should be removed and the seepage blanket repaired to original condition.
4. Given the presence of recreationalists and campgrounds downstream, EWEB should confirm the low hazard classification of this development. This effort would include a dam break analysis under both flood and sunny day, inundation mapping, and Sudden Failure Assessment (SFA).
5. As mentioned above, Blue Pool is heavily recreated and is downstream of the Carmen Diversion development. If Blue Pool is determined to be within the inundation zone of a Carmen Diversion dam breach, EWEB should

revise their Emergency Action Plan and Public Safety Plan, including development of interim risk reduction measures, to provide adequate warning time for evacuation of recreationists.

6. As discussed during the inspection, the Carmen Diversion tunnel was last inspected in 1982, and required repairs at that time due to settlement and internal erosion of foundation material. It is our understanding that EWEB is intending to inspect the tunnel this fall and we concur with the importance of this activity.
7. The vegetation near the downstream toe impairs visual inspection for seepage and surficial changes due to dam operations. Your IC should provide a recommendation for the width of the vegetation buffer that EWEB should maintain.

Smith Dam Development:

8. The siren on the Smith Dam spillway operates only as the gate opens, providing an inadequate warning time for anyone downstream. EWEB should revise the Public Safety Plan and project operations to improve the warning time for spillway discharges.

Trail Bridge Development:

9. The actual embankment footprint of Trail Bridge Dam is much larger than what is currently covered by EWEB's vegetation management plan. The embankment footprint extends west across Highway 126 (West Embankment), to the upstream end of the impervious/cutoff blanket; and almost five hundred feet upstream along the right abutment. Vegetation (shrubs to trees) were observed within the embankment footprint at the following locations:
 - a. On both upstream and downstream slopes of the West Embankment;
 - b. On upstream impervious blanket from approximately Station 4+84 to Station 7+00; and
 - c. On several hundred feet of the upstream right abutment embankment shell and blanket.

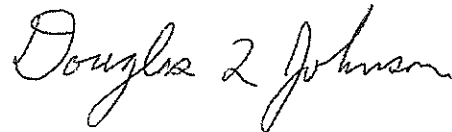
All vegetation over blanket and shell materials should be removed and embankment materials repaired to original condition.

Due to the potential urgency of the issues associated with the sinkholes at Carmen Diversion, in addition to providing a workplan as requested within 45 days from the date of this letter, we also request a face to face meeting with you and your

consultants to discuss the workplan and a path forward. For the remaining nine comments, please respond to or submit a plan and schedule for addressing comments Nos. 1 through 9 within 60 days of the date on this letter.

Thank you for your continued cooperation and interest in dam safety and emergency planning. If you have any questions, please contact Ms. Kristie Hartfeil of this office at (503) 552-2731.

Sincerely,

A handwritten signature in black ink that reads "Douglas L. Johnson". The signature is written in a cursive style with a large, prominent 'D' and 'J'.

Douglas L. Johnson, P.E.
Regional Engineer

Document Content(s)

P-2242 2018 DSI Follow-Up.PDF.....1-4

FINDINGS TO SUPPORT DECLARATION OF EMERGENCY

DATE: 8/17/2018REQUESTOR: Cheri Wilson, Generation EngineeringESTIMATED COST: \$169,616

In accordance with ORS 279A.065, ORS279A.025, 279B.080, 279B.145, 279C.335(5); 279C.380(4) and all applicable EWEB Rules:

The Purchasing Manager, with the concurrence of the General Manager and/or an affected Executive Manager, may approve award of a public contract for goods, services, or work as an emergency procurement.

“**Emergency**” means circumstances that:

- (A) Could not have been reasonably foreseen;
- (B) Create a substantial risk of loss, damage or interruption of services or a substantial threat to property, public health, welfare or safety; and
- (C) Require prompt execution of a contract to remedy the condition. (See ORS 279A.010((1)(f))

Such circumstances may also include, but are not limited to:

- (a) EWEB moving forward as quickly as possible to prevent interruption to vital services, restoration of vital services, or to
- (b) Prevention of loss to EWEB,
- (c) Protection of the quality of services, or
- (d) Other circumstances necessary to responsibly carry out EWEB's services to its customers

279B.145 Finality of determinations. The determinations under ORS 279B.055 (3) and (7), 279B.060 (3) and (10), 279B.075, 279B.080, 279B.085 and 279B.110 (1) are final and conclusive unless they are clearly erroneous, arbitrary, capricious or contrary to law.

NATURE OF THE EMERGENCY:

(Describe the nature of the emergency and what if any effort was made to complete a competitive process)

On July 16 and 17, 2018, a team consisting of EWEB staff, our Part 12D Independent Consultant (Schnabel Engineering), and our FERC dam safety compliance engineer inspected the Carmen-Smith Project. During that field inspection, the team viewed numerous known sinkholes in Carmen Diversion Reservoir, reviewed results from a previous bathymetric survey of the reservoir bottom, and discussed potential failure modes associated with the sinkhole situation. In response to concerns raised during those discussions, the FERC issued a letter on July 25, 2018 requesting that EWEB take immediate action to work with the Independent Consultant to develop a work plan for assessing the site conditions, complete site investigations, and design of any needed repairs at the Carmen Diversion Reservoir within 45 days of receipt of their letter (see attached letter). Since receipt of the FERC letter, EWEB staff have worked with Schnabel Engineering to negotiate a scope and fee to develop and perform the FERC mandated work plan. Since the fee exceeds the threshold for Board approval and waiting until the September 4th Board meeting will not permit EWEB to comply with the FERC-mandated response schedule, EWEB staff request an emergency declaration so that this necessary work can proceed in a timely manner. EWEB staff also observe that rapid progress on the FERC requested work plan is

advantageous with respect to the approaching wet weather season which could complicate or preclude certain investigation and/or remediation activities.

APPROVALS

Department Supervisor: _____ Date: _____

Purchasing Manager: _____ Date: _____

ET Manager: _____ Date: _____

General Manager: _____ Date: _____

PURCHASE CONTACT INFORMATION

Vendor/Contractor: Schnabel Engineering, Inc _____

Buyer Name: _____ P.O. Number: _____