



# 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

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## **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 16<sup>th</sup>, 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 4<sup>th</sup> 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.

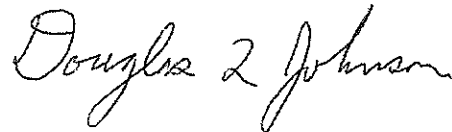
All vegetation over blanket and shell materials should be removed and embankment materials repaired to original condition.

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, flowing style.

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 4<sup>th</sup> 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: \_\_\_\_\_