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August 10, 2018

VIA electronic mail

Co-Hearing Officer Tam Doduc
Co-Hearing Officer Felicia Marcus
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Dear Hearing Officers

My proposed cross-examination questions for Mr. Tim Wehling, employee of the California Department of Water Resources, are attached to this letter.

Thank you,

A handwritten signature in black ink, appearing to read "D. Des Jardins", with a small mark above the final letter.

Deirdre Des Jardins
Principal, California Water Research

Cc: WaterFix Hearing Parties

Questions for Tim Wehling

1. Are you the Chief of the Chief of the Geotechnical and Engineering Services Branch of the Dams and Canals Section of the Department of Water Resources' Division of Engineering?
2. How long have you held that position?
3. What is the Geotechnical and Engineering Services Branch of the Dams and Canals Section?
4. How many professionals work for the Geotechnical and Engineering Services Branch?
5. Was the Dams and Canals Section of the Department of Water Resources' Division of Engineering asked to respond to a formal complaint of seepage from Clifton Court Forebay in 2017?
6. Is Exhibit DDJ-302 (except for the highlighting and handwritten notes) a copy of the memorandum, dated May 26, 2017, that was written in response to the complaint?
7. The "to" field on p. 1 of the memo (Exhibit DDJ-302) shows your name. Was a copy sent to you?
8. Who were the DWR employees who signed the memo (Exhibit DDJ-302) at the bottom of page 1.
9. Did either or both of them work for the Dams and Canals Section? If so, who?
10. Did either or both of them work for the Geotechnical and Engineering Services Branch of the Dams and Canals Section? If so, who?
11. Why does the memo (Exhibit DDJ-302) state that it comes from the Department of Water Resources, rather than from the professionals who prepared it? Is this a standard practice in the Dams and Canals Section?
12. The memo (Exhibit DDJ-302) states on p. 1:

As requested, we reviewed DWR documentation on CCF, other documents from Ms. Womack you emailed us this week, and previous complaints by Ms. Womack to DWR we found on the internet. On May

23, 2017, we performed a site visit from the Clifton Court Forebay embankment to observe the site. This memo provides a civil engineering perspective in helping to answer the questions above .

Is this your understanding of how the complaint was handled? Is this standard practice for the Dams and Canal's evaluation of a report of seepage from a dam?

13. The first response on page 2 states,

Responses

Based on our site visit and review of project documents, we prepared the following responses to the landowner questions.

Question 1

Based on DWR's recent geologic report (DWR, 2015b), the majority of the reservoir is constructed out of fine grained soils, the majority of which are clay. Clay generally has the lowest hydraulic conductivity of soil-like material (sand, clay, silt, etc.). The hydraulic head within the Forebay appears to be on the order of three to seven feet. This amount of hydraulic head is quite low, meaning there is very little driving pressure to cause seepage (DWR, 2016). Therefore, the seepage from the Forebay through the clay embankment should be very small and well within the capacity of Pump 6.

Did you review the response to Question 1 in the memo?

14. When you saw the sentence, "the majority of the reservoir is constructed out of fine grained soils, the majority of which are clay," what parts of the reservoir did you think the sentence was referring to?
15. Based on this sentence, and the fact that the hydraulic head within the Forebay is low, did you accept the conclusion that the seepage from the Forebay should be very small?
16. In addition to the recent geologic report, does the memo also reference DWR's Bulletin 200, Volume III Storage Facilities (on p. 4.)?

17. Exhibit DDJ- 302 is a copy of Bulletin 200, Volume III Storage Facilities.
Are you familiar with this document?

18. Page 202 of Exhibit DDJ- 302 has a description of the Clifton Court
Forebay foundation:

Foundation. The dam alignment rests almost entirely on deltaic sediments which consist of nonorganic flood-plain deposits covered by a blanket of organic and peaty soils. The organic blanket ranges in thickness from less than 1 foot to over 12 feet. In general, the organic soils have low shear strengths and low densities. They include soft organic clays, organic silts, and peat in various stages of decomposition. At first it was thought that the organic soil should be removed, but the existing Clifton Court levees, which had been constructed on this soil at steeper side slopes than planned for the Forebay, showed that the organic soil was usable as a foundation. Reinforcing the same existing levees to serve as forebay embankments was ruled out because the strengths of both levee and foundation were indeterminable. (underlining added.)

A.) Does this paragraph document that Clifton Court Forebay was constructed on unexcavated delta sediments?

B.) Does it document that there was 1 to 12 feet of organic and peaty soils?

C.) Over nonorganic flood-plain deposits?

19. Would 1 to 12 feet of organic and peaty soils be expected to have low hydraulic conductivity?

20. Would nonorganic flood-plain deposits be expected to have low hydraulic conductivity?

21. Bulletin 200, Volume III also describes the composition of the embankment:

Description. The dam, which has a maximum height of 30 feet, has two basic compacted zones and is ballasted with uncompacted material (Figure 174). Zone 1 material, which consists of fairly uniform inorganic silty and sandy clays, was placed on the reservoir side of the embankment. The balance of the embankment proper, designated Zone 2, consists of inorganic clays, sands, and silts. Waste materials, such as peats and soft organics, were placed as ballast on the outside of the embankment where needed for stability and were designated Zone 3. Slopes are protected from wave action with soil-cement consisting of nine pounds of cement per cubic foot of soil.

- A. Does this paragraph state that Zone 1 consists of fairly uniform inorganic silty and sandy clays, placed on the reservoir side of the embankment?
- B. Does this paragraph state that the balance of the embankment (Zone 2) consists of inorganic clays, sands, and silts?
- C. Does this state that waste materials, such as peats and soft organics, were placed on the outside of the embankment and designated Zone 3?
- D. Based on this description, was the statement in the memo that the reservoir consists of clay was referring to Zone 1 of the embankment?
- E. Would sands or silts in Zone 2 have low hydraulic conductivity?

22. The memo also states that the North embankment has leaked since the dam was built?

23. Bulletin 200, Volume 3 also documents the instrumentation that was installed when Clifton Court Forebay was built on p. 213-214:

Instrumentation

Instrumentation of Clifton Court Forebay was accomplished by using (1) settlement gauges, (2) slope indicators, (3) plastic tubes, and (4) structural monuments [...]

Permanent bench marks installed on the control structure have been monitored periodically since July 1969. During the period July 1969 to October 1969, when the structure became operational, settlement of 0.14 of a foot occurred.

- A. Does this paragraph indicate that only settlement gauges, slope indicators, plastic tubes, and structural monuments were installed?
- B. Do these instruments mostly monitor for movement of the embankments?
- C. Do any of these instruments monitor for seepage at CCF?
- D. Has any instrumentation monitoring for seepage been installed since Clifton Court Forebay was built?
- E. How does DWR monitor for seepage at CCF?

24. The Recommendations section of the memo (Exhibit DDJ- 302) states on p. 3:

Recommendations

If the answers above are insufficient for Operation and Maintenance or the landowner, we recommend an investigation to address the questions more conclusively.

- A. Did you consider the answers to be sufficient?
- B. Did the Operations and Maintenance division consider the answers to be sufficient?
- C. If not, what other investigation has been done:

25. The recommendations section of the memo (Exhibit DDJ- 302) also states on p. 4:

- Consider installing additional monitoring wells or piezometers to clarify the relationship between groundwater and the Forebay water.
- Inspect the Forebay embankment frequently, given that it is a relatively homogeneous clay embankment (DWR, 1970b). Between the desiccation cracking, animal burrows, and potential piping, it is entirely possible for a new seep to appear.

- A. Have any additional monitoring wells or piezometers been installed?
- B. How frequently are the Forebay embankments inspected?
- C. What steps does the Department of Water Resources take to control animal burrows in the embankment?
- D. What steps has the Department of Water Resources taken to evaluate the dessication cracking?

26. Bulletin 200, Volume III documents the peak ground acceleration assumed in building Clifton Court Forebay on p. 207:

Stability Analysis. The embankment was designed using the Swedish Slip Circle method of analysis employing a seismic force of 0.15g applied in the direction that would produce the lowest factor of safety for the condition being analyzed.

- A. Does this paragraph indicate that the design assumed a seismic force of 0.15 g?
- B. Haven't more recent seismic analyses, including the seismic hazard

evaluation for the Delta Risk management strategy, resulted in a much higher estimate of ground motions?

- C. Has DWR done a recent seismic hazard re-evaluation of Clifton Court Forebay? If so, what did it show?
- D. Does DWR have any plans to do seismic remediation of Clifton Court Forebay?

STATEMENT OF SERVICE

CALIFORNIA WATERFIX PETITION HEARING Department of Water Resources and U.S. Bureau of Reclamation (Petitioners)

I hereby certify that on August 10, 2018 I submitted to the State Water Resources Control Board and caused a true and correct copy of the following document(s):

Questions for Tim Wehling

to be served by Electronic Mail (email) upon the parties listed in the Current Service List for the California Water Fix Petition Hearing, dated August 7, 2018, posted by the State Water Resources Control Board at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/service_list.shtml

Note: In the event that any emails to any parties on the Current Service List are undeliverable, you must attempt to effectuate service using another method of service, if necessary, and submit another statement of service that describes any changes to the date and method of service for those parties.

I certify that the foregoing is true and correct and that this document was executed on August 10, 2018.

Signature:



Name: Deirdre Des Jardins

Title: Principal, California Water Research

Party/Affiliation:

Deirdre Des Jardins

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