

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Bon Tempe Dam No. 33-6 County Marin
 Type of Dam ERTH Type of Spillway Concrete weir and chute
 Water is 0.2 feet below the spillway crest and 6.2 feet below the dam crest.
 Weather Conditions Clear and mild
 Contacts Made Alex Anaya and Ronnie Chasteen during the inspection
 Reason for Inspection Periodic Evaluation

Important Observations, Recommendations or Actions Taken

As discussed in the April 25, 2013 inspection report, the upstream face is armored with large riprap that remains in generally satisfactory condition, but that is showing signs of local deterioration. I've asked Mr. Anaya to repair damaged areas of riprap as soon as is reasonably practical.

Vegetation control remains generally quite good, but limited areas of tall and dense vegetation within both downstream groins need to be cleared to improve the effectiveness of monitoring for seepage and other defects within these important locations.

Conclusions

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.

Observations and Comments

<u>Dam</u>	<p>The visible portions of the upstream face, crest, downstream face, and abutments are in satisfactory condition, with no indication of surficial distress or instability.</p> <p>The upstream face is armored with large riprap that remains in generally satisfactory condition, but that is showing signs of local deterioration due primarily to mechanical degradation. I've asked Mr. Anaya to repair damaged areas of riprap as soon as is reasonably practical.</p> <p>Vegetation control remains generally quite good, and the majority of both faces and the crest are covered with ankle to knee tall grass and other moderately tall ground cover that protect against erosion while permitting unimpeded access for inspection and monitoring for seepage and other defects. Limited areas of tall and dense vegetation within both downstream groins need to be cleared to improve the effectiveness of monitoring for seepage and other defects within these important locations.</p> <p>Similar to recent past inspections rodent control also remains satisfactory, and few to no indications of rodent activity were observed.</p>
<u>Spillway</u>	<p>The approach, control section, and exit channel were open and clear. The concrete walls and invert remain in satisfactory condition and are free of significant cracks or spalls indicative of excessive stress or deterioration.</p> <p>Total freeboard is 6 feet and the residual freeboard for the design storm is 1.7 feet. Freeboard is satisfactory.</p>

Inspected by J. Lowe
 Date of Inspection 7 April 2016
 Date of Report 8 April 2016

Photos taken? Yes No
 cc for Owner/Book

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Observations and Comments

<u>Outlet</u>	<p>Two 20-inch hydraulically operated butterfly valves provide upstream outlet control for the fully encased normally pressurized outlet. Downstream control is provided by three 12-inch mechanically operated butterfly valves. A fourth 8-inch gate valve controls flow to an irrigation supply line.</p> <p>Both upstream outlet control actuators were repaired following the March 5, 2015 inspection; the upstream controls were fully cycled multiple times and are in good order. Since the March 2015 inspection, the original three downstream control gate valves were also replaced with new butterfly valves (Kennedy, AWWA 250), which were partially cycled and are also in good working order.</p>
<u>Seepage</u>	<p>The downstream face and toe were dry and free of any indications of seepage.</p> <p>Clear seepage from the left abutment was approximately 0.5 to 1 gpm as measured at the outflow pipe below the downstream groin; the right groin seepage collection pipe was dry but abundant green vegetation within the groin is indicative of near surface moisture. Seepage at both locations is within historic values.</p>
<u>Instr.</u>	<p>Instrumentation consists of the following:</p> <ul style="list-style-type: none">• Twelve (12) survey monuments installed to monitor settlement and displacement of the embankment. Five (5) benchmarks or reference points are used to locate and monitor the survey monuments. Monuments are read at roughly five year intervals.• Two (2) seepage measurement locations installed to monitor seepage from the left and right abutments. Seepage from the left abutment is measured at an iron pipe below the left groin. Seepage from the right abutment is measured at a corrugated culvert pipe near the right-center toe of the embankment. <p>The latest instrumentation data was received from the owner on December 16, 2015.</p> <p>Seepage data covers the reporting period between January 2006 and July 2015. Seepage from both the right and left leaks has been on the decline since July of 2010, most likely because of the on-going drought. The reservoir water surface elevation followed the historic seasonal pattern throughout the same period. Reported seepage from the left leak varies from less than 1 gpm to a maximum of 60 gpm, with an average of around 15 gpm. Seepage from right leak has diminished to zero since 2009, probably the result of the installation of a gravel filled seepage interceptor trench near the center-right downstream toe in the year 2000. All seepage observed was clear and the volume of seepage measured at both groins is within historic values and is considered to be minor.</p> <p>Survey data covers the reporting period between January 1982 and July 2014. The maximum total recorded settlement is 0.483 feet, or 5.8 inches, at monument M-8. Settlement has remained stable within the data period and is considered to be minor.</p> <p>Alignment readings are also stable following the use of a new survey instrument introduced in December of 2005. The maximum displacement, recorded at monument M-3, is less than 1-inch, which is also considered to be minor.</p> <p>In their December 16, 2015 instrumentation data submittal letter the owner reports, <i>"The Bon Tempe Dam left leak is consistent with historic readings (up to 6 gpm); the right leak reading has dropped to zero within the last two years. Bon Tempe Dam is trending toward stabilization: settlement of -0.48 feet (maximum) and alignment of -0.48 feet (downstream direction; maximum)."</i></p>

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Observations and Comments

Based on the data submitted the dam appears to be performing satisfactorily, and no additional instrumentation is believed necessary at this time.



The spillway entrance, crest, and upstream face as viewed from the right abutment. As discussed in the April 25, 2013 inspection report, localized areas of the upstream face rock riprap is showing signs of local deterioration. I've asked Mr. Anaya to repair damaged areas of riprap as soon as is reasonably practical.

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The downstream face as viewed from the right abutment, above, and the left abutment, below. Vegetation control remains generally quite good.



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Limited areas of tall and dense vegetation within both downstream groins needs to be cleared to improve the effectiveness of monitoring for seepage and other defects within these important locations (above and below).



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Since the March 2015 inspection, the original three downstream control gate valves were replaced with new butterfly valves (Kennedy, AWWA 250), which were partially cycled and are in good working order.



The concrete spillway channel looking towards the plunge pool. The concrete spillway walls and invert remain in satisfactory condition and are free of significant cracks or spalls.