

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 Earth Type of Spillway Concrete weir and chute
 Water is 2 feet below the spillway crest and 8 feet below the dam crest.
 Weather Conditions Sunny and warm
 Contacts Made Lucy Croy, Kristin Arnold, and Jonathan Fouche (Marin Municipal Water District)
 Reason for Inspection Annual Inspection

Important Observations, Recommendations or Actions Taken

The wood log on the upstream face needs to be removed (photo 1).

As requested in the previous inspection report, woody vegetation was removed from the downstream face and groins (photo 2).

The rock in the drainage ditch at the right abutment was replaced with larger rock and is now performing satisfactorily (photo 2).

Vegetation growing in the concrete joints and behind the concrete walls of the spillway needs to be removed as part of annual maintenance (photo 4).

Per the California Water Code, outlet controls used in emergency drawdown need to be cycled annually by the owner.

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 and downstream faces, crest, and abutments are in satisfactory condition, with no indication of surficial distress or instability. Rip rap on the upstream face was in satisfactory condition. The wood log on the upstream face needs to be removed (photo 1).</p> <p>Vegetation control is satisfactory, and the embankment is covered in low lying grass and other low ground cover that provide protection against erosion without hindering access for inspection and monitoring for seepage and other defects. As requested in the previous inspection report, woody vegetation was removed from the downstream face and groins (photo 2). The rock in the drainage ditch at the right abutment was replaced with larger rock and is now performing satisfactorily (photo 2).</p> <p>Rodent control is satisfactory, and only minor indications of rodent activity were observed.</p>	
<u>Spillway</u>	<p>The spillway approach, control section, and exit channel were open and clear, and the log boom was in place. The concrete lined spillway channel remains in satisfactory condition, and the invert and walls are free of significant cracks or spalls indicative of excessive stress or deterioration. Vegetation growing in the concrete joints and behind the concrete walls needs to be removed as part of annual maintenance (photo 4).</p>	
<u>Outlet</u>	<p>None of the controls were cycled during this inspection. All upstream and downstream controls were fully cycled in the presence of DSOD during the March 13, 2019 inspection and found to be in good</p>	
Photos taken? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<u>MN</u> 4/29/2020	Inspected by <u>Michelle Lockhart</u>
cc for <u>Owner/Book</u>	<u>LS</u> 4/29/2020	Date of Inspection <u>April 15, 2020</u>
		Date of Report <u>April 29, 2020</u>

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Name of Dam Bon Tempe Dam No. 33-6
 Date of Inspection April 15, 2020

Observations and Comments

	operating condition. Per the owner's log, the outlets were not cycled when inspected on October 31, 2019. California Water Code mandates that critical outlet controls be cycled annually by the owner and in the presence of DSOD every three years.
<u>Seepage</u>	The downstream face and toe were dry and free of any indications of seepage. Clear seepage from the left abutment was approximately 2 gpm as measured at the outflow pipe below the downstream groin; the right groin seepage collection pipe was dry. Seepage at both locations appears to correlate more with rainfall than with reservoir elevation and remains within historical values.
<u>Instr.</u>	Instrumentation consists of the following: <ul style="list-style-type: none"> • Twelve (12) survey monuments installed to monitor settlement and horizontal 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 on July 31, 2019.</p> <p>Seepage data covers the reporting period between July 2009 and July 2019. Reported seepage from the left leak varies from less than 5 gpm to a maximum of 82 gpm (January-February 2016), with an average of around 20 gpm. Seepage trends with the reservoir water surface elevation. Seepage from right leak has diminished to near zero for the entire reporting period, 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 historical values.</p> <p>Survey data covers the reporting period between January 1982 and January 2020. The maximum recorded settlement is 0.491 feet, or 5.9 inches, at monument M-8 on May 31, 2018. The latest recordings show less total settlement than the 2018 readings and could be due to instrument error.</p> <p>Alignment readings are stable after 2005, when a new survey instrument was introduced, and appear to be trending in the upstream direction. The maximum recorded displacement, recorded at monument M-3, is 0.2 ft on August 28, 2014. The latest recordings show less displacement than the 2014 readings.</p> <p>The owner's conclusions from their July 2019 submittal were that, "The Bon Tempe Dam left seepage is consistent with historic readings and the survey data shows that Bon Tempe Dam is trending toward stabilization." Based on the data submitted, I agree with the owner's conclusions. The dam appears to be performing satisfactorily, and no additional instrumentation is believed necessary at this time.</p>

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Photo 1: View of the upstream face looking toward the right abutment and spillway. The circled debris needs to be removed.



Photo 2: View of the downstream face and seen from the right abutment, and the replaced rock in the drainage ditch.

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Photo 3: View of the spillway approach and concrete weir.



Photo 4: Vegetation growing in the spillway joints needs to be removed.