

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 Lagunitas Dam No. 33-2 County Marin
 Type of Dam ERTH Type of Spillway Concrete weir with steel and timber flume
 Water is 0.1 feet above the spillway crest and 7.4 feet below the dam crest.
 Weather Conditions Clear and mild
 Contacts Made Lucy Croy and Conner Pollard during the inspection
 Reason for Inspection Periodic Evaluation

Important Observations, Recommendations or Actions Taken

As discussed in the inspection reports dating back to April 2016, vegetation control along the upstream face needs improvement, and numerous small trees, bushes, and other woody vegetation that have accumulated along the waterline and upstream groins require removal.

A single gauge monitors pressure for the upstream outlet control hydraulic system. The gauge does not appear to provide any meaningful information, and I've asked Ms. Croy to replace the gauge with opening and closing pressure gauges for each of the two valves. The upstream hydraulic control will not move the valves if it is not pumped rapidly, and is therefore believed to be unreliable. I asked Ms. Croy to have the hydraulic system evaluated and, if necessary, repaired or replaced.

The seepage collection box has a significant accumulation of sediment. I asked Ms. Croy to ascertain the source of the sediment, and recommended running a sieve analysis to better identify the materials collected. The concern is that the sediment may be the result of internal erosion. I also asked that the box be well cleaned to facilitate monitoring for additional sediment accumulation.

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, downstream face, crest and abutments are in satisfactory condition with no indication of significant surficial distress or instability. The low concrete retaining wall along the upstream side of the crest is in satisfactory condition.</p> <p>As discussed in the inspection reports dating back to April 2016, vegetation control along the upstream face needs improvement, and numerous small trees, bushes, and other woody vegetation that have accumulated along the waterline and upstream groins require removal; vegetation control along the downstream face has improved and is now quite good. Access for inspection and monitoring for seepage and other defects is satisfactory.</p> <p>Rodent control remains satisfactory, and only minor indications of rodent activity were observed.</p>
<u>Spillway</u>	<p>The approach, control section, chute, and flume were clear and unobstructed.</p> <p>Pressure treated timbers supporting the flume appear to be in good condition, as does the stainless-steel flume sheathing, the under flume supports, and flume foundation connections.</p> <p>Approximately 0.1' of water was flowing through the spillway control section. The current design storm, prepared in 1983, is for a 2200-year return period producing 1328 cfs (~738 cfs / sq mi) from</p>

Photos taken? Yes No
 cc for Owner/Book

Inspected by J. Lowe
 Date of Inspection 14 February 2018
 Date of Report 16 February 2018

Feb 2/2018

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Observations and Comments

the 1.8 square mile drainage area. The spillway capacity is ~1812 cfs which is greater than the peak inflow. Total freeboard is 7.5 feet and the residual freeboard for the design storm is 1.8 feet. Freeboard is satisfactory.

Outlet

A 16-inch butterfly valve at elevation 759.0', and a 12-inch butterfly valve at elevation 747.0', provides upstream control for the fully encased normally unpressurized outlet. A 10-inch gate valve near the right downstream toe provides downstream control.

A single gauge monitors pressure for the upstream outlet control hydraulic system. The gauge does not appear to provide any meaningful information, and I've asked Ms. Croy to replace the gauge with opening and closing pressure gauges for each of the two valves.

Both upstream controls were partially cycled and the downstream control was fully cycled. The 16-inch upstream control and the 10-inch downstream control were fully cycled during 7 April 2016 inspection. The upstream hydraulic control will not move the valves if it is not pumped rapidly, and is therefore believed to be unreliable. I asked Ms. Croy to have the hydraulic system evaluated and, if necessary, repaired or replaced.

Seepage

The downstream face, groins, and abutments were dry and free of seepage.

Historical seepage from two sources along the left abutment, identified as the "Upper" and "Lower" leaks, is monitored from the lower left groin. Clear seepage through the Upper and Lower left abutment leaks were estimated at 6 gpm, and 3 gpm, respectively; seepage flows are within historical limits.

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Instr.

Instrumentation consists of two seepage measurement locations. Both seeps originate from the left abutment and are designated the "Upper" and "Lower" leaks.

The Upper leak originates within a pea gravel backfilled shallow adit in the upper left abutment. The source of the upper leak is believed to be within the vicinity of the upstream end of the spillway and adjacent fractured rock abutment. The Lower leak collects seepage believed to originate in fractured rock in the lower left abutment. Both leaks are collected and delivered within 3" PVC pipes to the recently repaired and improved seepage collection vault. Valves at the end of the delivery pipes allow the observer to isolate, and by doing so measure, seepage from one source or the other.

The latest instrumentation data was received from the owner on 21 June 2017.

Seepage data for the period between January 2007 and May 2017 was reviewed prior to the inspection. Within the period reviewed the average Upper leak seepage remains approximately 15 gpm or less. Seepage from the Upper leak had a maximum reported value of 22 gpm over the interval between February 2007 and July 2008. Average seepage from the Lower leak has decreased over time and is now on the order of 8 gpm or less, though there was a recent, short lived, spike to 18 gpm in January of 2017. The maximum reported seepage from the lower leak was 25 gpm in the fall of 2001. Seepage from both sources is clear, seepage rates are equal to or less than

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average, and reported rates remain within historical limits

The owner's conclusion from their June 2017 submittal was that, "The latest values are consistent with historic readings". Based on the data submitted I agree with the owner's conclusion. The dam appears to be performing satisfactorily, and no additional instrumentation is believed necessary at this time.



The upstream face looking in the direction of the spillway entrance (indicated by arrow). As discussed in the inspection reports dating back to April 2016, vegetation control along the upstream face needs improvement, and numerous small trees, bushes, and other woody vegetation that have accumulated along the waterline and upstream groins require removal.

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The downstream face looking towards the left abutment, above, and looking towards the right abutment, below. Vegetation control along the downstream face is quite good.



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Pressure treated timbers supporting the flume appear to be in good condition, as does the stainless-steel flume sheathing, the under flume supports, and flume foundation connections.



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