

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 Santiago Creek Dam No. 1029-6 County Orange
 Type of Dam Earth Type of Spillway Concrete-lined open channel and chute
 Water is 31 feet below spillway crest and 51 feet below dam crest.
 Weather Conditions Overcast
 Contacts Made Jacob Moeder, Nang Mwe, Steve Habiger, and Christian Wimenta with IRWD
 Reason for Inspection Periodic Maintenance Inspection

Important Observations, Recommendations or Actions Taken

Select if needed:		Descriptions, actions, and recommendations:
☒	Maintenance items required.	- The enlargement application filed on December 17, 2021, is progressing through the design phase, and construction is expected to begin in 2026. The application work consists of constructing a new inclined outlet intake structure, a new spillway, and constructing a downstream buttress. - Because several portions of this dam are expected to be replaced or improved in the next year, the following maintenance items, observed during this inspection, will not need to be addressed: - Repair the crack in the concrete liner on the upstream slope, located between Piezometers R1 and R6 (Photo 3). - Repair spalls with exposed concrete and damaged section of concrete in the spillway. - Remove sediment and vegetation from the left side of the spillway approach. - Repair erosion rills on the downstream slope. - However, if the enlargement project is significantly delayed, these maintenance items will need to be addressed during routine maintenance work. - Restore the upstream 24-inch slide gate at Elevation 730 feet to a fully operable condition during routine maintenance work. Arrangements need to be made to fully cycle this slide gate in our presence if the enlargement application work has not begun before the next inspection. - The alteration application filed on June 24, 2020, and approved on September 21, 2020, consists of geotechnical investigations to support the replacement of the outlet intake and spillway, and to support a crack study at the dam. The work was verified during this inspection and appeared to be completed satisfactorily. This inspection report will serve as the final construction inspection for the work (Photo 6).
☐	Outlet/spillway valves/gates need to be fully cycled during the next DSOD inspection.	
☐	Instrumentation submittal overdue.	
☒	Open construction, alteration, enlargement, repair, or removal application.	
☐	No Action Items/Recommendations.	
☒	Other.	

Photos taken? ☒ Yes ☐ No

Inspected by C.M. Lancaster *CM* 6/16/2025
 Date of Inspection 5/6/25
 Date of Report 6/16/25

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Conclusions

Hazard Classification: ☒ Extremely High ☐ High ☐ Significant ☐ Low

Condition Assessment: ☐ Satisfactory ☐ Fair ☒ Poor ☐ Unsatisfactory

Reservoir Restriction: ☒ Yes ☐ No

Restricted Reservoir 762.50 Datum: Original Distance Below Spillway 27.50 feet

Elevation: _____ Construction Crest: _____

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use at the restricted reservoir elevation of 762.50 feet.

Observations and Comments	
Dam	<i>Dam Description:</i> The dam consists of a zoned earthen embankment with a gravel-lined crest and a concrete-lined upstream slope. The reservoir is used for irrigation and storage.
	<i>Dam crest in satisfactory condition:</i> ☒ Yes ☐ No
	<i>Maintenance needed:</i> None.
	<i>Upstream/downstream slopes, abutments, and toe areas uniform, stable, and in satisfactory condition:</i> ☒ Yes ☐ No
	<i>Maintenance needed:</i> A crack in the concrete liner at the upstream hinge point, between Piezometers R1 and R6, appeared unchanged from the last inspection. The enlargement application includes work that would involve demolishing this area of the concrete lining. There are several erosion rills on the downstream slope which appeared to be unchanged since the last inspection. The enlargement application will include a downstream buttress that will address the erosion rills during construction.
	<i>Vegetation control satisfactory:</i> ☒ Yes ☐ No
	<i>Maintenance needed:</i> None.
Spillway	<i>Rodent control satisfactory:</i> ☒ Yes ☐ No
	<i>Maintenance needed:</i> Minor rodent activity was observed along the downstream hinge point that needs to be collapsed, backfilled, and compacted during routine maintenance work.
	<i>Dam comments:</i> Maintenance items that need to be addressed are listed above.
Spillway	<i>Spillway Description:</i> The spillway consists of a concrete-lined open channel that leads into a reinforced concrete-lined chute.
	<i>Log boom in place and intact:</i> ☒ N/A ☐ Yes ☐ No
	<i>Spillway approach area, control section, and downstream exit clear:</i> ☒ Yes ☐ No

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Name of Dam
Santiago Creek

Dam No.
1029-6

Date of Inspection
5/6/25

Observations and Comments	
	<i>Maintenance needed:</i> A minor amount of sediment had eroded down into the left side of the approach. This will be addressed during the enlargement application work. <i>Spillway condition satisfactory:</i> ☐ Yes ☒ No <i>Maintenance needed:</i> There are large spalls with exposed rebar and diagonal cracking along the walls of the spillway. <i>Spillway comments:</i> The enlargement application consists of the demolition of the existing spillway and construction of a new spillway. This work will address the maintenance items listed above.
Outlet	<i>Outlet Type/Description:</i> The low-level outlet consists of a 60-inch steel outlet pipe. The upstream end of the outlet is controlled by 8 slide gates located in the outlet tower. There are four 24-inch slide gates from Elevation 720 feet up to Elevation 750 feet. There are four 30-inch slide gates from Elevation 690 feet up to Elevation 710 feet. The four 30-inch gates are silted in and are inoperable. The downstream end of the pipe bifurcates into a 30-inch blowoff line and a 36-inch service line. The blowoff line is controlled by two 30-inch butterfly valves and the service line is controlled by a 36-inch butterfly valve. <i>Outlet Control:</i> ☒ Yes ☐ No <i>Last Cycled (DSOD Presence):</i> 5/6/25 <i>(Independently by Owner):</i> 5/6/25 <i>Comments:</i> All controls were fully cycled during the inspection, except for the 24-inch upstream slide gate at Elevation 730 feet. The hydraulic line had a leak, and the owner ran out of fluid to exercise the slide gate. Half of the upstream slide gates are hydraulically operated, and half are manually operated. The process takes about 2.5 hours. <i>Overall outlet condition satisfactory:</i> ☒ Yes ☐ No <i>Outlet visually unobstructed:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> Restore the slide gate at Elevation 730 feet to a fully operable condition during routine maintenance work. <i>Outlet comments:</i> Arrangements need to be made to fully cycle the slide gate at Elevation 730 feet in our presence if the enlargement application construction work has not begun before the next inspection. The enlargement application will include demolishing the existing outlet tower and constructing a new inclined outlet intake.

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Observations and Comments	
Seepage	Instrumented seepage monitoring at the dam: ☒ Yes ☐ No
	Description and measurements: There are 3 spillway underdrains that outfall at the downstream end of the spillway chute. The drains were dry during the inspection.
	Seepage observations and comments: There was no seepage observed on the downstream slope, groins, or toe of the dam.
	Seepage conditions are consistent with past inspection observations: ☒ Yes ☐ No
Maintenance needed: None.	
Instr.	Dam instrumented: ☒ Yes ☐ No Submittal required: ☒ Yes ☐ No
	Submittal frequency: Annually Overdue: ☐ Yes ☒ No
	Latest instrumentation submittal: <u>5/19/25</u> Reporting period: <u>CY 2024</u>
	Dam instrumentation: Instrumentation at the dam consists of 5 survey monuments, 7 open well multistage piezometers, and 5 single stage piezometers.
	Instrumentation at the dam is judged adequate at this time: ☒ Yes ☐ No
Instrumentation review: Survey Monuments: Three of the survey monuments are located along the crest of the dam, two are located on each abutment of the spillway. The latest survey was performed on June 6, 2024, and data is provided from 1989 to 2024. The survey data show a slight settling trend which is to be expected of an earthen embankment this size. Since 1989, the maximum cumulative settlement movement of 0.03 feet occurred at Monument BM-2, located near the center of the dam. Since 1989, the maximum cumulative horizontal movement of ~0.2 inches downstream occurred at BM-2. No concerning trends or condition were observed in the survey data. At the spillway, since the last survey on December 6, 2023, Monument BM-5, located on the left abutment of the spillway has horizontal movements of 0.077 feet west, and 0.109 feet south. These measurements reached yellow and red thresholds set by the owner. While they are not a dam safety concern at this time, they should be monitored for any progressing movement trends. Piezometers: The piezometers are located on the crest and downstream slope and have sensing intervals that measure pore pressures in the downstream shell, the "stream gravel" layer, and the foundation. Readings for Piezometers R-6 upper and No. 1 appear to have some correlation to changes in the reservoir elevation, while readings for Piezometer No. 4 appear to have some correlation to rainfall events. Readings for Piezometer R-5 appear to spike during rises in reservoir elevation, then slowly lower as the reservoir level drop over time. Reportedly, this piezometer has The remaining piezometers appear to have remained relatively steady over the last 10 years with only minimal fluctuations in the readings. No concerning trends or conditions were observed in the data.	

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Observations and Comments	
	<i>Instrumentation data indicate the dam is performing satisfactorily:</i> ☒ Yes ☐ No

In accordance with Division 3, Part 1, Chapter 2, section 6029 of the California Water Code, the owner or operator of a dam or reservoir is responsible for the safe operation, performance, and maintenance of their dam or reservoir, and obtaining all necessary permits and approvals from other permitting agencies, as required.



Photo 1. Upstream slope of the dam.

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Photo 2. Downstream slope of the dam.



Photo 3. Crack in the upstream concrete liner.

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Photo 4. Spillway approach.



Photo 5. Spillway downstream chute.

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Photo 6. Examples of corings in the spillway satisfactorily backfilled.

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Photo 7. Cycling the upstream slide gates.



Photo 8. Cycling one of the downstream 30-inch blowoff butterfly valves.