

McMICKEN DAM
FCD GAGE ID# 71707

STATION DESCRIPTION

LOCATION – The dam is located in the town of Surprise just to the west of Sun City Grand. The gage is located in the northeast corner of the dam near the alignment of Deer Valley Road and 171st Avenue. Latitude N 33° 40' 38", Longitude W 112° 25' 23". Located in the SW1/4 SW1/4 NW1/4 S24 T4N R2W in the McMicken Dam 7.5-minute quadrangle.

ESTABLISHMENT – The gage was established on March 24, 1983.

DRAINAGE AREA – The drainage area is 242.2 mi²

GAGE – The gage is a pressure transducer type instrument located inside the stilling well. Elevation of the diaphragm is 1.60 feet gage height, levels of May 11, 2006.

There are two painted staff gages located in the principal outlet, painted on the north wall of the outlet. The lower staff gage has a range from 0 – 7 feet gage height. The upper staff gage has a range from 7 – 14 feet. Both staff gages display about 0.3 feet high. In other words, when the displayed level is at 4 feet, it is actually 3.7 feet gage height. Elevations are levels of September 14, 2017.

There are three pool staff gages located about 200 feet south of the principal outlet. The staff gages all display in feet gage height. The lower staff gage has a range of 0 – 10 feet gage height. The middle staff gage has a range from 9 – 19 feet gage height. The upper staff gage has a range from 17 – 26 feet. All staff gages are within 0.05 feet of the displayed value, levels of September 14, 2017.

There are no crest gages at this location.

ZERO GAGE HEIGHT - Zero is defined as the low point at the concrete lip of the principal outlet. The zero elevation is 1,336.00 feet NAVD 1988, levels of February 24, 2015 and September 14, 2017.

HISTORY – Continuous gaging began March 24, 1983. Prior to this, peak events were possibly noted. Original gage (float?) was replaced with a pressure transducer on June 18, 1997. On May 11, 2006, pressure transducer was moved into intake pipe. It was formerly hanging in the stilling well at an elevation other than 0.00 as noted in previous station descriptions. The actual PT elevation was probably not known exactly during much of the time from June 1997 to May 2006. Zero gage height defined as the minimum point in the principal outlet in May 2006.

REFERENCES –

SM-87A is a settlement marker located about 30 feet south of the station house on top of the dam. Elevation 26.497 feet gage height and 1,362.481 feet NAVD 1988, levels of February 24, 2015.

SM-88 is a settlement marker located about 200 feet northeast of the station house on top of the dam. Elevation 26.269 feet gage height, or 1,362.253 feet NAVD 1988, levels of February 24, 2015.

SM-89 is a settlement marker located at station 480+00 on top of the dam. Elevation 26.270 feet gage height, or 1,362.254 feet NAVD 1988, levels of March 3, 2015.

SM-90 is a settlement marker located at station 485+00 on top of the dam. Elevation 27.073 feet gage height, or 1,363.057 feet NAVD 1988, levels of March 3, 2015.

SM-91 is a settlement marker located at station 490+00 on top of the dam. Elevation 26.897 feet gage height, or 1,362.881 feet NAVD 1988, levels of March 3, 2015.

SM-92 is a settlement marker located at station 495+00 on top of the dam. Elevation 26.748 feet gage height, or 1,362.732 feet NAVD 1988, levels of March 3, 2015.

SM-93 is a settlement marker located at station 500+00 on top of the dam. Elevation 26.960 feet gage height, or 1,362.944 feet NAVD 1988, levels of March 3, 2015.

RP1 is the concrete floor in front of gage house door. Elevation 27.278 feet gage height, levels of February 24, 2015.

RP-2 is a chiseled 'X' labeled 10101 and is located at the right upstream corner of the inlet to the principal outlet. Elevation 0.035 feet gage height, or 1,336.019 feet NAVD 1988, levels of February 24, 2015.

RP-3 is a chiseled 'X' labeled 10102 and is located at the left upstream corner of the inlet to the principal outlet. Elevation 0.032 feet gage height, or 1,336.016 feet NAVD 1988, levels of February 24, 2015.

RP-4 is a chiseled 'X' on the center headwall of the intake for the level sensor. It is at elevation 2.178 feet gage height and 1,338.178 feet NAVD88, levels of September 14, 2017.

RM1 is a US Coast and Geodetic Brass tablet #8366 (H366) located on the right downstream wingwall of the principal outlet structure. Elevation 5.66 feet gage height, or 1,341.64 feet NAVD 1988, levels of May 11, 2006.

CHANNEL AND CONTROL – The principal outlet for the dam is 20 foot wide concrete channel, that remains in channel control until about 10.1 feet gage height. At this water surface elevation the breastwall from 10.1 feet to the dam crest. The 10 foot high breastwall is 65 feet from the entrance. There are two gated outlets, both 24-inch diameter pipes. Both are considered abandoned and unused. An emergency spillway is located north of the principal outlet and functions a weir.

OUTLETS

The principal outlet is a 20 foot wide and 188.3 foot long culvert with an overhead breastwall 11 feet above the floor and 65 feet from entrance. Invert of inlet is 0.00 feet gage height or 1,336.00 feet NAVD 1988. Roughness is 0.012. Flow will begin through this culvert at elevation 0.00 feet gage height.

The two gated outlets are closed, due to concerns regarding integrity. They are to remain closed unless directed by FCDMC. The north gated outlet is a 24-inch CMP culvert of 200 foot length and a slope of 0.0006. The lip of the entrance is at elevation 0.10 feet gage height with the invert of the inlet at –2.84 feet gage height and the invert of the outlet at –2.87 feet gage height. The south gated outlet is a 24-inch CMP culvert of 211 foot length and slope of 0.0027. The lip of the entrance is at –1.30 feet gage height. The elevation of the invert of the inlet is –3.15 feet gage height, and the invert of the outlet is at –3.23 feet gage height. Gage height elevations are updated based on the 2006 datum adjustment. Last survey was done in 1992.

The emergency spillway is located at the north end of the dam. The spillway is about 2,000 feet in length and the crest elevation is 19.25 feet gage height or 1,355.25 feet NAVD 1988, levels of March 3, 2015.

Top of dam is at approximately 25.8 feet gage height, or 1,361.8 feet NAVD 1988, per survey dated 2009.

RATING – The current discharge rating is from the original design. Complex hydraulics is encountered in the principal outlet and was modeled from a scale model of the dam.

The current capacity rating is Rating #4 and is from the McMicken Dam Rehabilitation Project by URS Corporation dated November 2014.

DISCHARGE MEASUREMENTS – Any discharge measurements would be difficult. The McMicken Outlet Channel to the Agua Fria River would be the best spot for any

discharge measurements. Furthermore, a gage on the channel is located just downstream of the railroad bridge.

POINT OF ZERO FLOW – With both gated outlets closed, which is the usual condition, the PZF is at 0.00 feet gage height, located in the principal outlet. The south gated outlet, if open, has the lowest PZF of –0.16 feet gage height. The north gated outlet has a PZF of 0.10 feet gage height.

FLOODS / SIGNIFICANT IMPOUNDMENTS – The largest recorded impoundment was 2,595 acre-feet and 5.60 feet gage height, on September 8, 2014.

REGULATION – The dam is a regulation of natural flows in Trilby Wash and other drainages into the dam from the north and from the White Tank Mountains. About 45 percent of the drainage is from Trilby Wash.

DIVERSIONS – None

ACCURACY – Good

JUSTIFICATION – Monitor levels behind McMicken Dam for public safety.

UPDATE - October 25, 2023
 ES Thomas