TAT MOMOLIKOT DAM
FCD GAGE ID# 64207 (773)

STATION DESCRIPTION

LOCATION – Tat Momolikot Dam is located on Santa Rosa Wash in Pinal County south of Casa Grande. The gage is located in a stilling well at the damsite near the principal outlet. Latitude N 32° 39' 01"; Longitude W 111° 55' 49". Located in the NW1/4 NW1/4 S14 T9S R4E in the Vaiva Vo 7.5-minute quadrangle.

ESTABLISHMENT – The District began gaging the dam on January 21, 1998. The Corps of Engineers and the Bureau of Indian Affairs have gaged the site since construction was completed.

DRAINAGE AREA – 1,780 mi^2

GAGE – The gage is a pressure transducer type instrument. The PT diaphragm elevation is at approximately 2.60 feet gage height. This elevation was derived from amount of water being reported by the transducer gage and comparing it to the staff gage elevation from measurements and photographs taken on February 10, 2020.

There are 14 staff gages located along the northeast upstream face of the dam. All staff gages display in feet M.S.L. (aka NGVD29.) Most are in poor condition, but are still readable. Three have no numbers on them.

Staff Range	Value to subtract for gage height
1550 – 1555	No numbers
1545 – 1550	1485.16
1540 – 1545	No numbers
1535 – 1540	1485.19
1530 – 1535	1484.95
1525 – 1530	1485.24
1520 – 1525	1485.13
1515 – 1520	1485.1
1510 – 1515	1484.72
1505 – 1510	1485.27
1500 – 1505	1485.21
1495 – 1500	1485.20
1490 – 1495	No numbers
1485 – 1495 (staff plate on outlet tower)	1485.00

ZERO GAGE HEIGHT - Zero gage height is based bottom of the stilling well. Elevation is 1,485.00 feet NGVD29 and is equivalent to 1,486.967 feet NAVD88.

HISTORY – The Corps of Engineers established a float gage upon completion of the dam. The Flood Control District connected ALERT equipment to the float equipment as of January 21, 1998. On January 19, 2000, the float gage was removed by the District and replaced with a pressure transducer. The gage ID number was changed from 769 to 773, due to instrumentation change.

Sometime in 2019 the stilling well deteriorated and fell apart. The transducer gage was removed in June 2019 to avoid damage to it. Later in 2019 the stilling well was repaired. The transducer gage was replaced in December 2019 at an unknown elevation.

REFERENCE MARKS –

NOTE: All levels are referenced from the bottom of the stilling well defined as 1,485.00 feet M.S.L. (NGVD29) or 0.00 feet gage height. This is based on an adjustment to the surveyed data that was based on survey of a staff gage at 1,492 feet M.S.L. The elevation of the bottom of the stilling well was reduced by 0.25 feet, because it was assumed that the staff gage is not exactly 1,492, since other staff gages were off by 0.20 to 0.40 feet.

BM-1 is a cap located in a capped, 4-inch hand-hole pipe located on the hill slope at the right side of the dam. It is at elevation 82.632 feet gage height and 1,567.829 feet NGVD29 and 1,569.599 feet NAVD88, levels of January 30, 2020.

RM-1 is a stake located on top of the dam to the right of the centerline of the outlet. It is at elevation 72.783 feet gage height and 1,557.980 feet NGVD29 and 1,559.750 feet NAVD88, levels of January 30, 2020.

RM-2 is the top of a metal pin in the concrete base of the 1540-1545 foot staff gage. It is at elevation 54.557 feet gage height and 1,539.754 feet NGVD29 and 1,541.524 feet NAVD88, levels of January 30, 2020.

RM-3 is a chiseled ‘X’ on the concrete base of the 1520-1525 foot staff gage. It is at elevation 34.722 feet gage height and 1,519.919 feet NGVD29 and 1,521.689 feet NAVD88, levels of January 30, 2020.

RM-4 is the top of a metal pin in the concrete base of the 1500-1505 foot staff gage. It is at elevation 14.641 feet gage height and 1,499.838 feet NGVD29 and 1,501.608 feet NAVD88, levels of January 30, 2020.

RP-1 is a chiseled 'X' located on the headwall next to the stilling well. It was established on February 16, 2000. It is at elevation 4.570 feet gage height and 1,489.570 feet NGVD29 and 1,491.537 feet NAVD88, levels of January 30, 2020.

RP-2 is a rebar located near the top of the dam at the right downstream groin. It is at elevation 71.642 feet gage height and 1,556.839 feet NGVD29 and 1.558.609 feet NAVD88, levels of January 30, 2020.

RP-3 is a rebar located 5 feet streamward from the 1495-1500 foot staff gage. It is at elevation 9.272 feet gage height and 1,494.469 feet NGVD29 and 1,496.239 feet NAVD88, levels of January 30, 2020.

RP-4 is a chiseled 'X' on the northeast corner of a concrete pad above the outlet culvert at the outlet works. It is at elevation 6.249 feet gage height and 1,491.446 feet NGVD29 and 1,493.216 feet NAVD88, levels of January 30, 2020.

CHANNEL AND CONTROL – There is a single principal outlet from the dam with three intakes to the intake tower at the dam. There are two outlets that put water into Santa Rosa Wash channel, and the third outlet directs water to supplement irrigation for the Vaiva Vo Farms. There is an emergency spillway to the east of the main dam.

PRINCIPAL OUTLET / EMERGENCY SPILLWAY – The principal outlet is the inlet tower. There are three 42-inch square slide gates. The lower inlet is at elevation 0.0 feet gage height; the middle inlet is at 8.0 feet gage height, and the upper inlet on the west side of the tower is at 16.0 feet gage height, all levels are from the design memorandum. A conduit inside the tower and through the dam conducts water to the downstream side of the dam. The upstream elevation of the conduit is at 0.00 feet gage height and the downstream elevation is at -1.15 feet gage height, both from the design. There are several square, ungated intakes to the tower at about 24.0 feet gage height.

The emergency spillway is located about one-half mile east of the main dam. It is a broad crested weir with crest elevation 54.0 feet gage height, and 1,539.00 feet NGVD29 and weir length of 1,000 feet. Within the weir itself is a culvert 12-foot high by 13-foot wide and 79.12 feet in length, from the design report. The invert of the inlet of the culvert under the emergency spillway is 24.0 feet gage height and 1,509.00 feet NGVD29 from the design report.

Top of dam elevation is 1,559.5 feet NGVD29 in the middle and 1,557.5 feet at the ends.

RATING – The discharge rating is from the design, included in the publication Tat Momolikot Dam and Lake Saint Clair Water Control Manual. Similarly, the capacity rating is from the design. Both are rating #1.

DISCHARGE MEASUREMENTS – Direct measurements from the dam outlet channel would be difficult due to complexities at the outlet works.

POINT OF ZERO FLOW – Flow begins at 0.00 feet gage height through the lower gate, or 8.00 feet gage height through the middle gate, or 16.00 feet gage height through the upper gate, depending upon which is opened. Uncontrolled flow begins into the intake tower at 24.00 feet gage height. There is a box culvert under the emergency spillway which has an invert elevation of approximately 1,509.0 feet NGVD29 or 24.0 feet gage height. It is uncertain if water from the main pool at 24.0 feet gage height spills over toward the spillway. That could be verified during a high water event, though no event that great has occurred since gaging began in 2000.

FLOODS / SIGNIFICANT IMPOUNDMENTS – The peak stage recorded at the dam since the District began gaging is 21.05 feet gage height which occurred on October 4, 2018. The USGS gaged Santa Rosa Wash near Cockleburr prior to dam construction. The peak discharge was 53,100 cfs on September 27, 1962.

REGULATION – The dam is a regulation of natural flows in Santa Rosa Wash.

DIVERSIONS – None known upstream, however, the dam is capable of diverting water to the Vaiva Vo irrigation project.

ACCURACY – Good

JUSTIFICATION – Monitor Tat Momolikot dam for failure and possible inputs into the Gila River. It is unknown how well the dam is maintained by the operator and therefore it is important to monitor this dam.

UPDATE - February 20, 2020
D. E. Gardner