

## DREAMY DRAW DAM FCD GAGE# 4803

### STATION DESCRIPTION

**LOCATION** – The gage is located on the approximate 24th Street alignment, just east of the Northern Avenue – SR 51 interchange in Dreamy Draw Park. Latitude N 33° 33' 45", Longitude W 112° 01' 54"; Located in the NE1/4 SE1/4 S34 T3N R3E, in the Sunnyslope 7.5-minute USGS quadrangle.

**ESTABLISHMENT** – The gage was installed January 24, 1984.

**DRAINAGE AREA** – 1.35 mi<sup>2</sup>

**ELEVATION CONVERSION** – Elevations of staff gages on site are in MSL or NGVD29 datum. Though the staff gages are not exactly vertically aligned, in general add 1.8 feet to the staff reading to convert to NAVD88. Conversely, subtract 1.8 feet to convert from NAVD88 datum on web graphics to match staff gage elevations. Referenced NAVD88 elevations are from a 2010 survey by another entity.

**GAGE** – The gage is a pressure transducer type instrument. The PT is at gage height 0.12, elevation 1,371.58 feet NAVD88, levels of February 3, 2015.

There are nine staff gages located along the upstream face of the dam. The gages are in five foot intervals from 1,370 to 1,415 feet NGVD 1929. Staff gages read within 0.25 feet of stated NGVD elevations. Subtract 1,369.57 feet to get elevation in gage height. Add 1.85 feet to staff gage readings to convert elevations to NAVD 1988.

There are no crest gages at this location.

**ZERO GAGE HEIGHT** - Zero feet gage height is defined as the invert of the culvert pipe inside the intake structure. Zero gage height elevation is equivalent to 1,371.46 feet NAVD1988, levels of February 3, 2015.

**HISTORY** – Gaging established on January 24, 1984. Float gage replaced with a PT on June 23, 1993. April 19, 1995 the PT was raised to the outlet invert. January 1999 PT moved to 0.12 feet gage height when pad and well were reestablished due to significant sedimentation.

**REFERENCE MARKS** –

RM-1 – (DD103) – Brass tablet located in concrete at base of upper staff gage. Elevation 1,411.227 feet NAVD88 and 39.766 feet gage height, levels of February 3, 2015.

RM-5 is a chiseled 'X' on the concrete pad on the back side of the principal outlet trash rack outlet. Elevation is 1,376.470 feet NAVD88, or 5.009 feet gage height, levels of February 3, 2015.

SM-6 is a settlement marker at the top of the structure, at station 23+50. Elevation is 1,418.593 feet NAVD88, or 47.132 feet gage height, levels of February 3, 2015.

SM-7 is a settlement marker at the top of the structure, at station 24+10. Elevation is 1,418.597 feet NAVD 88, or 47.136 feet gage height, levels of February 3, 2015.

Previously surveyed references not surveyed on February 3, 2015:

RM2 - Brass cap located on concrete pad at gage well housing. Elevation 1,371.73 feet NAVD1988, or 0.15 feet gage height, levels of December 22, 1999.

RM7 – ADOT brass tablet at fence on east side of south bound highway. Stamped elevation = 1,363.087 feet NGVD1929.

RM8 – Hub with tack along fence on west side of south bound highway. Elevation = 1,349.54 feet NAVD1988.

RM9 – Pin in ground west of south bound highway and about 600 feet southwest of RM8, reference #50589 from ACDC ADMS, Elevation 1,340.06 feet NGVD1929, or 1,341.91 feet NAVD1988 equivalent.

**CHANNEL AND CONTROL** – The control for levels below approximately 35.4 feet gage height is the principal culvert outlet. Above approximately 35.4 feet gage height, flows begin through the emergency spillway. Top of dam is approximately 47 feet gage height.

### **PRINCIPAL OUTLET / EMERGENCY SPILLWAY**

The principal outlet is a 36-inch diameter concrete culvert pipe that is 275 feet in length. The culvert invert elevation at the intake structure is 1,371.461 feet NAVD1988, or 0.000 feet gage height, levels of February 3, 2015. The culvert invert elevation at the outlet is 1,364.847 feet NAVD1988, or -6.614 feet gage height, levels of February 3, 2015. There are several inlet points into the intake structure. The top of the intake structure is at elevation 11.00 feet gage height.

The minimum emergency spillway crest elevation is 1,406.96 feet NAVD1988, or about 35.5 feet gage height, based on levels of June 30, 2010 (survey by others) and February 3, 2015 (elevation comparison.) The bottom width of the spillway is 100 feet with 2:1 sideslopes.

The minimum top of dam elevation is approximately 1,418.50 feet NAVD1988, or about 47.04 feet gage height, based on levels of June 30, 2010, survey by others. The top paved service road on the dam was found to be at about 48.2 feet gage height, levels of February 3, 2015.

### **RATING** –

The current discharge rating is #3 and is a modification of rating #2 to compensate for change of PT location. Only the starting point of rating #2 was changed. No change to Rating #2 was made. Rating #2 is a combination culvert rating and weir rating. The culvert rating is for all flows through the culvert outlet. The rating was determined from an HY8 culvert analysis. The spillway acts as a weir for flows through the spillway. The weir was analyzed from the weir equation with weir coefficient of 2.90. Rating #1 is believed to have been taken from original design specifications.

The current capacity rating is #2 and is a DTM model from the ACDC ADMS, in April 1994. Rating #1 was taken from the design capacity curves.

**DISCHARGE MEASUREMENTS** – Measurements of the principal outlet could be made both directly and indirectly in the wash downstream from the dam.

**POINT OF ZERO FLOW** – The PZF is the invert of the outlet culvert, gage height 0.000 feet, elevation 1,371.461 feet NAVD1988, levels of February 3, 2015.

### **FLOODS / SIGNIFICANT IMPOUNDMENTS** -

Special Note: Back to back storms require special attention on this watershed due to its small contributing area, and significant slope and runoff potential. A first storm can saturate the soil profile, thus reducing infiltration and storage losses during a second storm that quickly follows the first. This can cause an increase in runoff to an extent greater than might be expected.

**REGULATION** – The dam has an ungated outlet that limits discharge to approximately 220 cfs before spilling and uncontrolled flow.

**DIVERSIONS** – None known

**ACCURACY** – Good

**JUSTIFICATION** – Monitor water levels in Dreamy Draw Dam for public safety.

**UPDATE**        February 4, 2015  
                         D E Gardner