CAVE CREEK WASH BASIN NEAR CACTUS ROAD FCD GAGE ID# 11807

STATION DESCRIPTION

LOCATION – The gage is located on at the Cave Creek Wash sediment basin just north of Cactus Road and 25th Avenue in Phoenix. The gage instrumentation is located on the right bank of the edge of the sediment basin outflow weir. Latitude N 33° 35' 56", Longitude W 112° 07' 01". Located in the SE1/4 SW1/4 S13 T3N R2E in the Sunnyslope 7.5-minute quadrangle.

ESTABLISHMENT – The gage was installed on June 27, 1991.

DRAINAGE AREA – 33.6 mi², below Cave Buttes Dam

<u>GAGE</u> – The gage is a pressure transducer type instrument. The PT diaphragm is at 0.35 feet gage height, levels of January 16, 2019. Gage height is relative to 0.00 feet gage height being the invert of the outlet structure.

There are two staff gages at this location.

A painted staff gage of range 0 – 11 feet is located on the outlet structure and readable from the east bank of the channel. It displays in gage height, levels of January 16, 2019.

A metal staff plate of range 0 – 11 feet is located on the outlet structure and is readable from the west bank of the channel. It displays in gage height, levels of January 16, 2019.

There are no crest stage gages at this location.

ZERO GAGE HEIGHT - Zero gage height is defined as the invert of the inlet of the outlet culvert in the outlet works. It is equivalent to 1,259.361 feet NAVD88, levels of January 16, 2019.

<u>HISTORY</u> – Gage installed on June 27, 1991. The PT instrumentation was originally installed in the outlet works gage house. However, it was found that the outlet works clogged frequently and did not give accurate stage readings. The transducer was moved on April 14, 1994 to its present location. PT re-worked and moved to elevation 0.80 feet gage height.

REFERENCE MARKS -

BM-4833 is an FCDMC brass cap located on the top of the right side of the basin near the station tube. It is at elevation 22.739 feet gage height and 1,282.100 feet NAVD88, levels of January 16, 2019.

RM-1 is a chiseled 'X' at the center of the downstream channel about 30 feet downstream of the weir. It is at elevation 9.693 feet gage height and 1,269.054 feet NAVD88, levels of January 16, 2019.

RM-2 is a chiseled 'X' at the toe of the right bank of the downstream channel, about 15 feet downstream of weir. It is at elevation 9.741 feet gage height and 1,269.102 feet NAVD88, levels of January 16, 2019.

RM-3 is a chiseled 'X' on the lip at the center of the channel on the weir. It is at elevation 9.979 feet gage height and 1,269.340 feet NAVD88, levels of January 16, 2019.

RM-4 is a chiseled 'X' on the top of the right side of the flat part of the outlet structure. It is at elevation 5.009 feet gage height and 1,264.370 feet NAVD88, levels of January 16, 2019.

RP-1 is a bolt on the right side of the transducer housing. It is at elevation 1.091 feet gage height, levels of January 16, 2019.

<u>CHANNEL AND CONTROL</u> – Cave Creek Wash transitions at this location from a channelized 'natural' channel into a sediment basin before entering a concrete lined channel. The gage is located on the outlet of a sediment basin. The actual channel joins the sediment basin approximately 800 feet upstream. The channel downstream of the basin is a concrete lined trapezoidal shape. Control for the outlet is the 48-inch culverts for gage heights below about 10 feet. Above 10 feet the weir becomes the control.

<u>RATING</u> – The current rating is Rating #2, developed from an HY-8 analysis by R. W. Cruff for flows in the culvert, and an HEC-RAS analysis based on December 2020 survey data. The previous rating used the weir equation for non-culvert discharges.

DISCHARGE MEASUREMENTS – Low flow discharge measurements could be made directly by wading at only very shallow depths. However, caution should be exercised because the channel is slippery when wet, and the velocities of the water could be high. High flow discharge measurements could be made from the downstream side of the Cactus Road bridge.

POINT OF ZERO FLOW – The PZF is the invert of the outlet culvert at 0.00 feet gage height.

FLOODS – The peak of record is 665 cfs and 13.16 feet gage height occurred on July 30, 2022. The previous peak recorded 3,247 cfs and 12.85 feet gage height occurred on August 3, 2005. A peak almost as large at 12.40 feet gage height and 2,461 cfs occurred on September 8, 2014.

<u>REGULATION</u> – Cave Buttes Dam's ungated principal outlet upstream limits flow to a maximum of about 600 cfs. Spillway flows occur under extreme circumstances. Additionally, the East Fork of Cave Creek had 5 detention basins which are to capture flows above the 2-year discharge and limit outflows to the 2-year storm drains. Finally, the City of Phoenix has a few dams along the base of the Phoenix Mountains that feed local drainage to Moon Valley Wash which outfalls to the Cave Creek sediment basin.

DIVERSIONS – None known

ACCURACY – Discharge readings are considered fair to good for weir flows above 9.95 feet gage height. Flows below the weir are poor to fair due to clogging on the outlet structure.

<u>JUSTIFICATION</u> – Monitor flows into the Arizona Canal Diversion Channel from Cave Creek Wash and Cave Buttes Dam for flood warning in the Paseo Park recreation area in Glendale.

<u>UPDATE</u> - January 29, 2024 E.S. Thomas