

MARCH 24-MARCH 28, 2003 FAMILIARIZATION TRIP AND WFO OUTREACH

Phoenix, Las Vegas, and Flagstaff Hydrologic Service Areas

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INTRODUCTION

As requested by Senior Service Hydrologist Tom Zickus, the primary purposes of this trip were to 1) accompany him to several remote gaging stations, and 2) provide assistance and training to the Hydrologic Focal Points for Las Vegas and Flagstaff. The gaging stations were visited to determine minor, moderate, and major flood flows as well as to document existing conditions. Also, flash flood, dam safety, and water supply issues were addressed. During the trip, the Mohave County Public Works, Flood Control District offices in Kingman AZ were visited to discuss their alert data and flood warning system and their plans for expanding the system. Photos were also taken at visited sites for inclusion on our WebPages.

LOGISTICS

Monday: Departed Salt Lake City for Phoenix at 8:40 am. Arrived Phoenix at 10:16 am. Tom Zickus picked me at the airport in a government owned 4x4 we would be using for the week. We drove to Salt River at 51st Avenue (proposed new forecast point), Hassayampa River near Morristown (HAMA3), and Santa Maria River near Bagdad, AZ (SMBA3). After changing the flat tire at SMBA3 (a very remote location), we drove to Laughlin, NV, arriving at 10:30 pm.

Tuesday: We were met by Barry Pierce, Hydrologic Focal Point, Las Vegas in the morning and decided to use the Las Vegas office 4x4 he drove while the tires were being evaluated on our vehicle. We took this opportunity to drive the Silver Creek flash flood prone area from Bullhead City, AZ to Oatman, AZ. We then picked up our 4x4, which now had a new tire, dropped off the other vehicle at the hotel parking, and proceeded to Big Sandy River near Wikieup (WKPA3). Returned to Laughlin, NV, arriving after dark.

Wednesday: We left Laughlin in two vehicles because Barry Pierce would be returning to Las Vegas later in the day. First stop was the recently installed Mohave County ALERT gages, Upper Sacramento Wash West and Upper Sacramento Wash East located at State Highway 68. Following Sacramento Wash, we visited the Mohave County Public Works, Flood Control District offices in Kingman AZ. Next we visited Truxton Wash near Valentine (TWVA3). After this site, Barry returned to Las Vegas and Tom and I continued on to Flagstaff's area. We drove the mostly unpaved road known as the "Simmons Highway" from near Seligman to near Prescott to observe the upper Verde River drainage including Big Chino Wash and Walnut Creek (YWCA3). We then visited Sullivan Lake and Hell Canyon, also within the Verde drainage, on our way to Williams, AZ, where we spent the night.

Thursday: We were met by Tom Clemmons, Hydrologic Focal Point, Flagstaff in the morning. Tom Clemmons left his car at hotel parking and we all rode together. First site visited was the water supply dam for Williams (dam safety issue). Next we visited the Chino Valley and Big Chino Wash above State Highway 89. We then drove to Verde River near Paulden (VDPA3). Last site visited was Verde River near Clarkdale (VDCA3). Although VDPA3 and VDCA3 are less than 40 river miles apart, the road distance is far greater with no direct route. From Clarkdale we drove back to Williams, where Tom Clemmons had left his car, and then to Flagstaff for the night.

Friday: We were once again met in the morning by Tom Clemmons. We visited water supply forecast point Lake Mary (WLMA3), Mormon Lake, and the Flagstaff office. Then Tom Zickus and I return to Phoenix, where he dropped me off at the airport. I departed Phoenix at 5:02 pm and arrived at Salt Lake City at 6:34 pm.

OBSERVATIONS

MARCH 24TH, SALT RIVER AT 51ST AVE: This is a proposed new forecast point where a gage has just recently been established by the USGS. The site is within an industrial use area including large warehouses and commercial storage tanks. We used a wire weight located on the bridge to measure the height of the bridge above the small non-flowing pond within the otherwise dry channel. Height of bridge above channel was 30.7 feet. We judged the major flood stage to be 27 feet (low-steel for bridge), the moderate flood stage to be 20 feet and the flood stage to be 16 feet, the same as bank full. When the USGS reports the drainage area for this gage and establishes a rating table, we will check these values with those for Salt River at Priest Drive (SLPA3).

MARCH 24TH, HAMA3: The Hassayampa River near Morristown was essentially dry at the time of our visit. Zero flow is 7.2 feet on the current rating table. Here we judged the major flood, moderate flood, flood, and bank full stages to be as determined for the CBRFC Critical Flows Study by Reed: major = 19 feet, moderate = 18 feet, flood = 17 feet, and bank full = 16 feet. These stages are consistent with wilderness values.

MARCH 24TH, SMBA3: The Santa Maria River near Bagdad was flowing at the time of our visit. Flow was estimated at 75 to 150 cfs. USGS reports that depth was 1.45 feet and flow was 31 cfs (note: unless otherwise stated, all USGS values in this report are from their Arizona Water Resources website). Zero flow is 1.17 feet on the current rating table. Average depth of water was over the top of my hiking boots, at least 6 inches (on the current rating table a depth of 6 inches or 1.67 feet = 74 cfs). The sandy bottom at this gage causes frequent shifts in the rating curve especially after large flows. The USGS reports that at this site the depth was 3.65 feet and the flow was 2,280 cfs just seven days before on 3/17/2003. To reach the site, I had to wade the river, sinking in the loose sand up to 2 feet. Here we determined the major flood stage to be 13 feet, the moderate flood stage to be 12 feet, the flood stage to be 11 feet, and bank full to be 10 feet. These numbers are in excellent agreement with those prepared by Reed (differences being 1 foot or less) and therefore, these stages are consistent with wilderness values.

MARCH 25TH, SILVER CREEK WASH FLASH FLOOD AREA: This 8 square miles, ungaged drainage for the Colorado River has a relatively steep elevation drop of 4000 feet in 12 miles (values estimated from an atlas). Although the watershed is largely undeveloped, the wash passes through Bullhead City and therefore, is of local concern. A short duration, high intensity rainfall over the top of this basin--in the vicinity of Oatman--could result in flash flooding in Bullhead City threatening lives and property.

MARCH 25TH, WKPA3: The Big Sandy River near Wikieup was flowing at the time of our visit. Depth was 3.19 feet on the staff gage attached to the stilling well (zero flow is 2.58 feet on the current rating table). We also noted a high water mark of approximately 6.0 feet. Flow was estimated at 20 to 40 cfs. USGS reports that depth was 3.2 feet and flow was 16 cfs. The site had recently been visited by the USGS as evidenced by the "digging" in the vicinity of the stilling well. The sandy bottom at this gage appeared more stable compared to conditions at SMBA3. The USGS reports that at this site the depth was 5.12 feet and the flow was 1,520 cfs just 8 days before on 3/17/2003. To reach the site, Barry and I had to cross the stream downstream where it is braided and relatively shallow. At WKPA3 we determined the major flood stage to be 18 feet, moderate flood stage to be 17 feet, flood stage to be 16 feet, and bank full to be 12 feet. These numbers are in good agreement with those prepared by Reed (differences being 2 feet or less) and therefore, these stages are consistent with wilderness values.

MARCH 26TH, SACRAMENTO WASH: The Sacramento Wash was dry at the time of our visit. Mohave County ALERT gages, Upper Sacramento Wash West and Upper Sacramento Wash East were recently installed at State Highway 68, 41.7 miles upstream of this Colorado River tributary's mouth. Since the low-flow channel bifurcates upstream, there are two gages, one for each low-flow channel. The primary channel is approximately 2000 feet wide. Here we determined the major flood stage to be 14 feet, the moderate flood stage to be 11 feet, the flood stage to be 8 feet, the same as bank full. When the drainage area for this gage and rating table are established/provided, we will check the above stages against those for similar drainages. Residences are increasingly encroaching upon the local undefined floodplain.

MARCH 26TH, MOHAVE COUNTY PUBLIC WORKS: At the Mohave County Public Works Flood Control District offices in Kingman, AZ, we met with Fred Weyermiller and Philip Wisely (Philip.Wisely@co.mohave.az.us) to discuss their ALERT network. Their system currently includes 12 stream gages. However, the gages currently do not have Handbook 5 Identifiers. A listing (including latitude, longitude, and elevation) was provided at the meeting and information can be viewed at:

http://weather.co.mohave.az.us/mod_perl/DWRReports.pl under sensor list.

ID	Name	Type	Last Data and Date
1513	Upper Sacramento (W	Stream_Gage_PT	0.43 04/16/03 08:18
1523	Upper Sacramento (E	Stream_Gage_PT	0.12 04/16/03 04:49
1553	Lower Sacramento Wa	Stream_Gage_PT	0.16 04/16/03 07:08
1583	Lake Havasu	Stream_Gage_PT	0.08 04/16/03 01:41
1593	Boundary Cone	Stream_Gage_PT	0.43 04/16/03 05:39
1603	Mohave Wash-Airway	Stream_Gage_PT	0.16 04/16/03 06:56
1613	Silver Creek Wash	Stream_Gage_PT	0.16 04/16/03 03:33
1623	Montana Wash	Stream_Gage_PT	0.24 04/16/03 03:46
1633	Detrital Wash	Stream_Gage_PT	2.00 04/15/03 03:29
1643	El Rodeo Channel	Stream_Gage_PT	0.27 04/16/03 04:14
1653	Holy Moses Wash	Stream_Gage_PT	0.20 04/16/03 03:29
1663	Times Gulch	Stream_Gage_PT	0.00 04/10/03 13:02

Their network additionally includes several rain gages.

MARCH 26TH, TWVA3: The Truxton Wash near Valentine was dry at the time of our visit. Zero flow is 1.99 feet on the current rating table. Here we judged the major flood, moderate flood, flood, and bank full stages to be: major = 30 feet, moderate = 22 feet, flood = 20 feet, and bank full = 13 feet. These numbers are in fair agreement with those prepared by Reed (differences being 3 feet or less) and therefore, these stages are consistent with wilderness values.

MARCH 26TH, CHINO VALLEY: The upper Verde River watershed is a high elevation valley that lies between the Juniper Mountains and Santa Maria Mountains to the west, and Big Black Mesa to the east. Water flowing into this valley infiltrates at its edges and is then drained by the Verde River below Sullivan Lake. (Also, see YWCA3 and Sullivan Lake below).

MARCH 26TH, YWCA3: This is a recently (within the last year or so) installed Yavapai County ALERT gage on Walnut Creek. The creek was flowing at the time of our visit, and the flow was estimated at 5 cfs. The gage was reporting 1.12 feet, from WHFS and RFC database, at the time of our visit; however, no rating table is available. Here we determined the major flood stage to be 19 feet, the moderate flood stage to be 17 feet, the flood stage to be 15 feet, the same as bank full. When the drainage area for this gage and rating table are established/provided, we will check the above stages against those for similar drainages.

MARCH 26TH, SULLIVAN LAKE DAM: Below Sullivan Lake Dam the channel quickly develops a small canyon. Water was flowing in this canyon at the time of our visit, but was flow not estimated. The Verde River is intermittent from Sullivan Lake Dam to the Granite Creek confluence, a distance of about 3 miles; perennial flow is maintained from this confluence to where it joins the Salt River. (Note: Granite Creek is a spring fed perennial creek.)

MARCH 26TH, HELL CANYON: Hell Canyon was viewed from State Highway 89. Water was flowing, but flow was not estimated. The confluence of Hell Canyon with the Verde River is 18 miles downstream of Sullivan Lake Dam. Hell Canyon drains the area east of Big Black Mesa.

MARCH 27TH, WILLIAMS CITY WATER SUPPLY DAM: The spillway for this dam is 70 feet wide and 2.5 feet high. Capacity is estimated at 1,050 cfs. However, the other end of the dam appears to be unstable, so full spillway capacity may not be reached prior to partial

dam failure. Even partial failure of the dam would threaten several blocks of homes (totaling 80 or more) downstream in the City of Williams. Therefore, this situation is a local dam safety issue that is raised every time the water level in the dam approaches the spillway elevation.

MARCH 27TH, VDPA3: Seven miles upstream of this gage, the Verde River near Paulden, the Verde River becomes perennial. The flow at the time of our visit was estimated at 50 to 100 cfs. The stream channel had recently been scoured, although the USGS record shows no recent high flows. The lack of a recent high flow in the record suggests that the gage is stuck or the rating curve has shifted due to scour (staff gage read 0.85 feet). USGS reports that depth was 0.83 feet and flow was 22 cfs. Here we determined the major flood stage to be 22 feet, the moderate flood stage to be 18 feet, the flood stage to be 14 feet, the same as bank full. These numbers are in fair agreement with those prepared by Reed (differences being 3 feet or less) and therefore, these stages are consistent with wilderness values.

MARCH 27TH, VDCA3: The Verde River near Clarkdale was estimated to be flowing at 150 to 200 cfs. USGS reports that depth was 0.35 feet and flow was 79 cfs. Here scour has likely also occurred. The USGS reports that at this site the depth was 5.56 feet and the flow was 3,120 cfs just 10 days before on 3/16/2003. Here we determined the major flood stage to be 24 feet, the moderate flood stage to be 18 feet, the flood stage to be 14 feet, the same as bank full. These numbers are in poor agreement with those prepared by Reed (differences being 14 feet or more) and therefore, these stages are not consistent with wilderness values. Indeed these values reflect the encroachment on the floodplain by the City of Clarkdale downstream.

MARCH 28TH, WLMA3: Lake Mary is a water supply forecast point. The lake elevation for lower and upper Lake Mary would be useful for water supply verification. The lower lake level at the time of our visit was 26 feet, 12.3 feet below the spillway crest elevation. Inflow has occurred this year but it would be nice to have a way to quantify the amount of inflow. Since the lake is two uncontrolled fill and spill reservoirs, knowing the lake elevations at the end of each month will provide a good estimate of inflows, if lake capacity curves are available.

MARCH 28TH, MORMON LAKE: This lake appears to be a closed basin above Lake Mary. The lake is intermittent and currently has water. Snow was essentially gone from this basin.

ACTION ITEMS

- 1) Determine what stations have been added to the RFC database since the critical stages study; determine major, moderate, minor, and bank full stages for these sites; and add the values to the database. (A program has been written by Senior Hydrologist Brenda Alcorn that will allow me to do the search of the database.)
- 2) Add the field determined critical stage values to the database. (I will begin this process in the near future.)
- 3) Establish Handbook 5 Identifiers for Mohave County ALERT gages. (This work has been performed by Barry Pierce.)
- 4) Enter the Handbook 5 IDs into the database. (This work has been accomplished by Brenda Alcorn.)