Rodeo/Chediski Fire: December 16, 2002 Hydrology Meeting

Prepared by Bill Reed, CBRFC: December 17, 2002.

Attendees:

Mike Hrzic, USACE-CAD; Bijan Nooran, USACE; Stephen Wiele, USGS; Blake Thomas USGS; Chris Smith, USGS; Tom Hieb, Navajo County; Tom Zickus, NWS-Phoenix; Bill Reed, NWS-Colorado Basin River Forecast Center; Brian Cosson, ADWR; Chuck McHugh, ADEM; Alex McCord, ADEM; Hugh Ward, FEMA; Wendy McCalla; ADEM, Beth Zimmerman, ADEM; and via telephone Greg Kuyumjian, USFS.

Presentations:

- Chuck McHugh, ADEM: "Rodeo/Chediski Fire Interagency Watershed Recovery Task Force Action Plan"
- Tom Hieb, Navajo County: "Overview of Recent Flooding"
- Bill Reed, CBRFC: "Activities of the CBRFC, Support of the Burn Area in Arizona"
- Mike Hrzic, USACE: "City of Heber, AZ, Hydrologic and Hydraulic Analysis, Impact of Rodeo-Chediski Fire"

Consensus:

There is an imminent threat to lives and structures within the pre-burn 50-year floodplains of Cibecue Creek and Carrizo Creek south of the rim; and within the pre-burn 100-year floodplains of several drainages north of the rim, especially Buckskin Wash and Black Canyon Wash. Due to post burn conditions, a reduction in soil infiltration rates, or what is sometimes refer to as initial extraction, has resulted in increased runoff. Preliminary analysis of observed post burn runoff, and the modeling of post burn conditions within NWSRFS, indicates that presently runoff is 5 times greater than during pre-burn conditions. Thus the post burn 5-year event can be greater than the pre-burn 100-year event. For small watersheds, less than 30 square miles, the 5-year 3-hour precipitation and the 5-year 6-hour precipitation will cause flooding. In larger watersheds the 5-year 6-hour precipitation seems to be required.

The similar vegetation of these watersheds, especially Ponderosa Pine, supports the use of similar rainfall amounts within the drainages on both sides of the rim. This was verified with meteorologists at both the Phoenix and Flagstaff National Weather Service offices. The following table provides the post burn runoff resulting from the 5-year 6-hour precipitation as well as the pre-burn 50-year flood and pre-burn 100-year flood.

Site	Drainage Area	5-year post burn	50-year pre-burn	100-year pre-burn
Carrizo nr Cibecue	114	14,000	14,100	19,900
Carrizo nr Show Low	439	29,100	28,300	37,100
Cibecue nr Overgaard	30	5,025	6,400	9,550
Buckskin Wash at Heber	29	5,025		3,734 (USACE)
Black Canyon at Heber	40	6,935		5,156 (USACE)
Black Canyon below Confluence w/ Buckskin	69	14,810		8,890 (USACE)

For the 5-year post burn event, the following equation can be used: $\mathbf{y} = 740\mathbf{x}^{0.65}$, where y is runoff in cfs, and x is drainage area in square miles. This equation is valid for the Water Year 2003. For high severity burn areas of slow recovery, especially untreated or steep sloped areas, the equation might still be applicable during Water Year 2004.