



## AUGUST 7 FLASH FLOOD NEAR ARCHES NATIONAL PARK, UTAH

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ON the 7th of August, 1987, at 6:00 p.m., a thunderstorm released a torrent of water which caused over \$60,000 damage to the Moab Highway, U.S. Highway 191, and to a culvert entering Arches National Park, approximately 5 miles north of Moab, Utah. The National Weather Service River Forecast Group estimates that approximately 0.75 inches fell from a solitary thundercloud in approximately one hour. The cloud was poised above the junction of the Dead Horse Point State Park/Canyonlands National Park road (Utah State Highway 313) and U.S. Highway 191. Several inches of water covered the highway junction area. During the same day, flood waters from a 0.7-inch-precipitation event reportedly overflowed a 6-foot culvert in a remote section of Castle Valley, approximately 30 miles to the southeast.

Two drainages received moisture from the thunderstorm. The largest, Courthouse Wash, carried most of the precipitation volume. The discharge from Courthouse Wash into the Colorado River was so great that the river was partially dammed and water in the river backed up to a depth of 3 feet at the confluence with Courthouse Wash. The wash was large enough to handle the precipitation flow without damage.



U. S. Highway 191 damage with the water gap to the right. Note the shallow channel which normally carries runoff without overflow (photo by Paul Guardy).

Bloody Mary Wash, with a total drainage area of only about six square miles, also received rainfall. The wash parallels U.S. Highway 191 from the junction with Highway 313 to the Colorado River, a few miles north of Moab. Bloody Mary Wash makes a severe bend as it enters Moab Canyon through a normally dry water gap in the cliffs near the Arches National Park visitor's center. A 1000-foot-long natural raceway eroded in a limestone member of the Pennsylvanian Hermosa Formation, constriction of flow, and a 15-20-foot drop at the water gap worked like a nozzle of a fire hose at the gap. Highway fill



Flood water from Bloody Mary Wash going towards the culvert. Arches entrance road is on left (photo by Paul Guardy).

and the north lane of U.S. Highway 191 were eroded away as the water ran through the gap, swirled in a plunge pool, and deposited a boulder-bar directly downstream. The water faced one more barrier as it ran toward the Colorado. A culvert constructed by the Civilian Conservation Corps lies beneath the Arches National Park entrance road. The arched opening is about 20 feet square but could not carry the flow. Water backed up into a large pool, which slowed the flow and may have prevented further damage downstream. The culvert was partially undermined and suffered several thousand dollars damage. Water came within 6 inches of flooding the Arches National Park entrance road. Peak flow in Bloody Mary Wash was estimated to be approximately 54,000 cubic feet/second.



Flash flood waters coming through the Bloody Mary Wash water gap (photo by Paul Guardy).