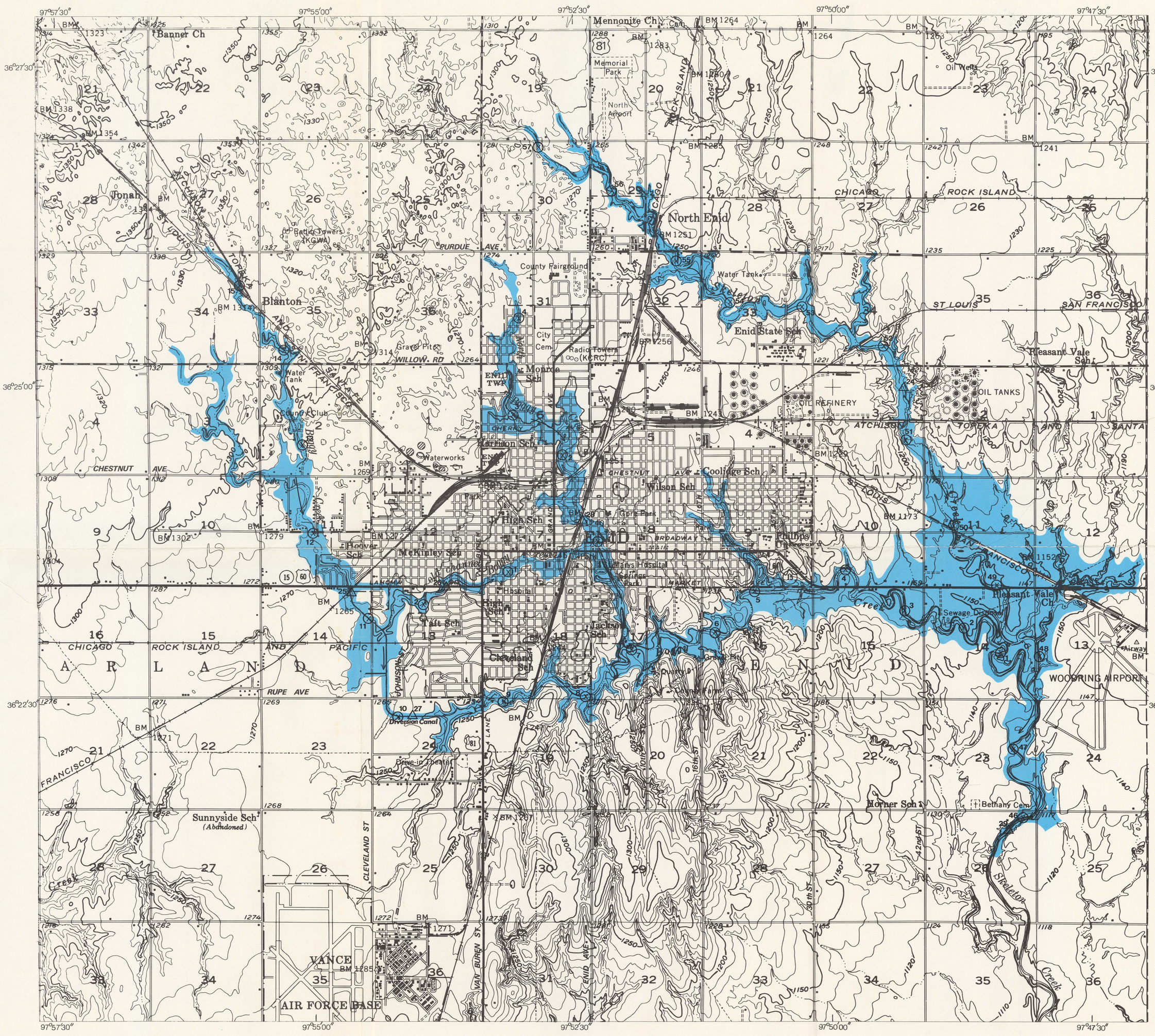


MAP OF ENID AREA SHOWING AREAS INUNDATED BY THE OCTOBER 1973 FLOOD.

EXTENT OF FLOODING IN ENID

The boundaries of inundation in the Enid area are delineated on the topographic map on sheet 2. The topographic map was published in 1956, thus urban development, relocation of some highways and streets, and other changes in the Enid area since 1956 are not shown on the map. However, the diversion canal that diverts the flow of Boggy Creek around the City of Enid was added to the map for this report. In addition, local names are used for the tributaries to Boggy Creek because official names for those tributaries have not been assigned.

The extent of the flooding shown on sheet 2 was mapped by using flood profiles based on elevation of high-water marks from field surveys. The high-water elevations at various points along the streams were located on the topographic map and flood boundaries were drawn by interpolating between contours (lines of equal ground elevation). Field inspection of flooded areas at many sites was used to verify the flood boundaries.

The flood profiles used to delineate the boundaries of flooding in Enid are shown in figures 6, 7, 8, and 9. Profiles of the streambeds are based on elevations taken from topographic maps. River miles shown on the profiles correspond with those marked along the streams on the flood map. The river miles were determined by the Geological Survey, and have not been checked for location accuracy by the Corps of Engineers. The abrupt changes of the profiles at some road and railroad crossings are differences in upstream and downstream water-surface elevations caused by bridge and culvert constrictions.

Aerial photographs taken by the Corps of Engineers show several areas inundated by the October 1973 flood. The area inundated by the flood along Skeleton Creek in the vicinity of Willow Road near Enid is shown in figure 10. The photograph also shows typical road damage and erosion caused by the flood. Figure 11 shows part of the area flooded by Boggy Creek at 30th Street in the southeast part of Enid. Most of the houses shown in the photograph were damaged considerably by the flood.

The time between rainfall and resulting runoff is important in forecasting floods and minimizing losses. The timing relationship between rainfall and runoff for the October 1973 flood is shown by the synthesized hydrograph in figure 12 for North Boggy Creek (site 28). The hydrograph was computed by using model-hydrograph methods described by Mitchell (1972). The hydrograph shows 9.4 inches (23.88 cm) of rainfall excess occurring within 4 hours. Rainfall excess is the amount of rainfall that contributes directly to stream runoff.

Drainage for North Boggy Creek through most of the urbanized area in Enid is confined to an underground culvert with a capacity less than 1,000 ft³/s (28.3 m³/s). Runoff from the October 1973 storm was more than 10 times greater than the culvert capacity, thus floodwaters flowed through the streets of Enid for slightly more than 8 hours (fig. 12). The 8-hour period indicates the approximate amount of time the discharge exceeded 1,000 ft³/s (28.3 m³/s).

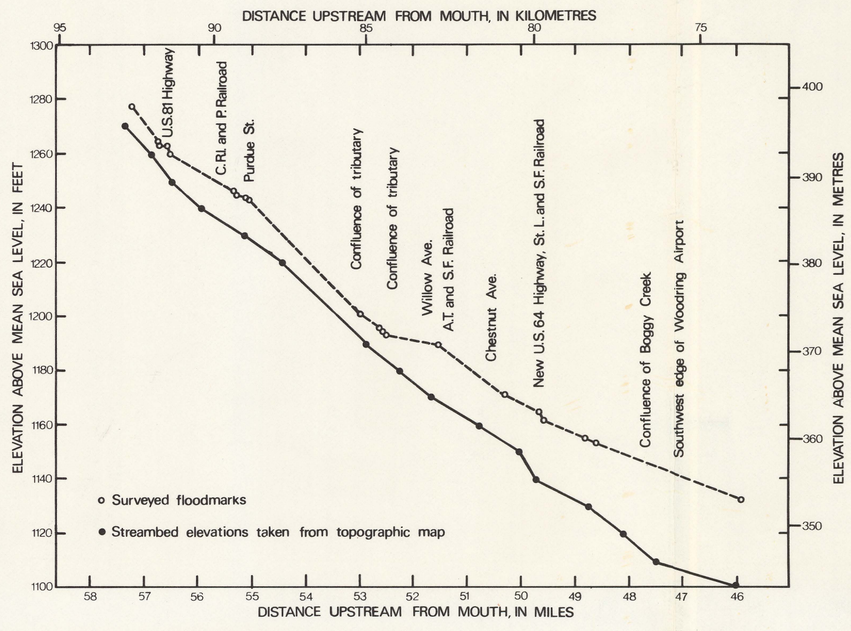


Figure 6.—Profile of October 1973 flood on Skeleton Creek near Enid.

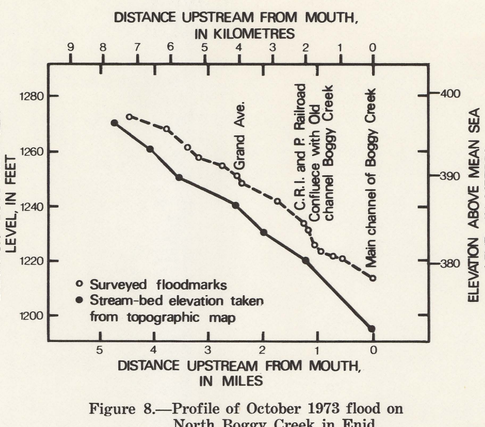


Figure 8.—Profile of October 1973 flood on North Boggy Creek in Enid.

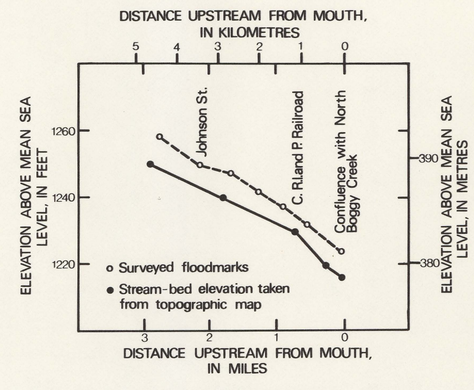
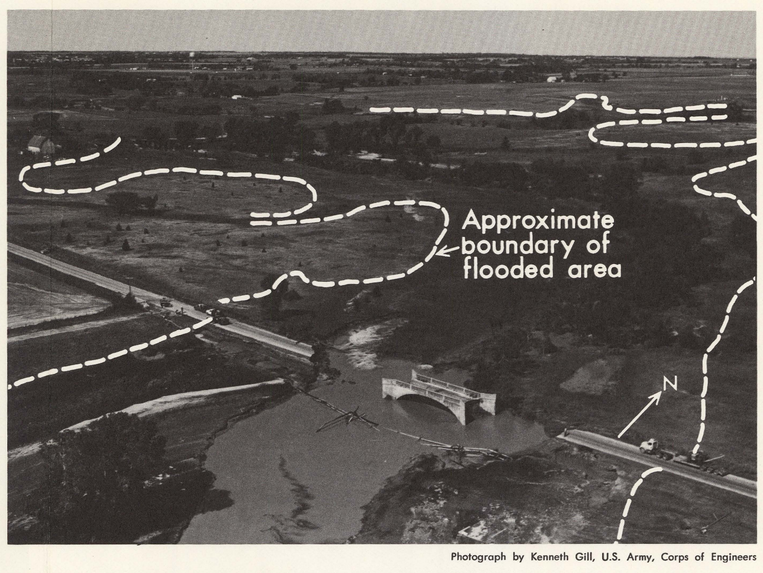
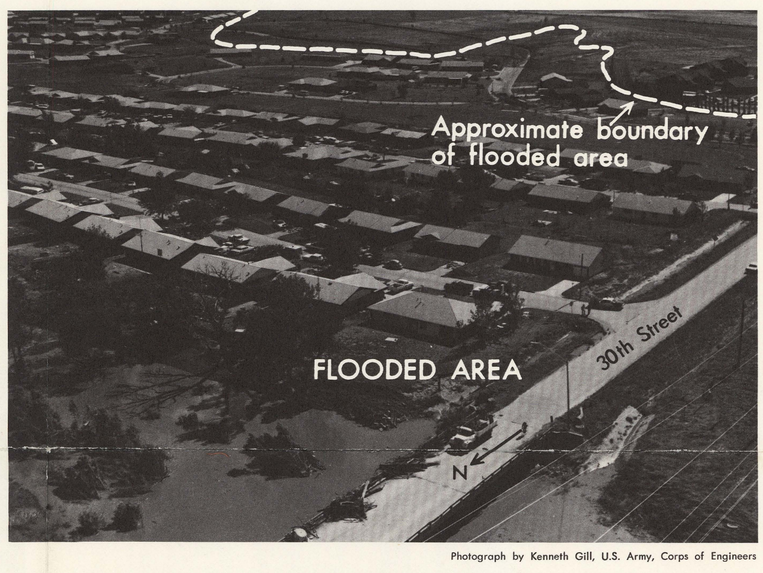


Figure 9.—Profile of October 1973 flood on old channel Boggy Creek in Enid.



Photograph by Kenneth Gill, U.S. Army, Corps of Engineers

Figure 10.—Flooded area and damage along Skeleton Creek in the vicinity of Willow Road near Enid.



Photograph by Kenneth Gill, U.S. Army, Corps of Engineers

Figure 11.—Area Flooded by Boggy Creek at 30th Street in Enid.

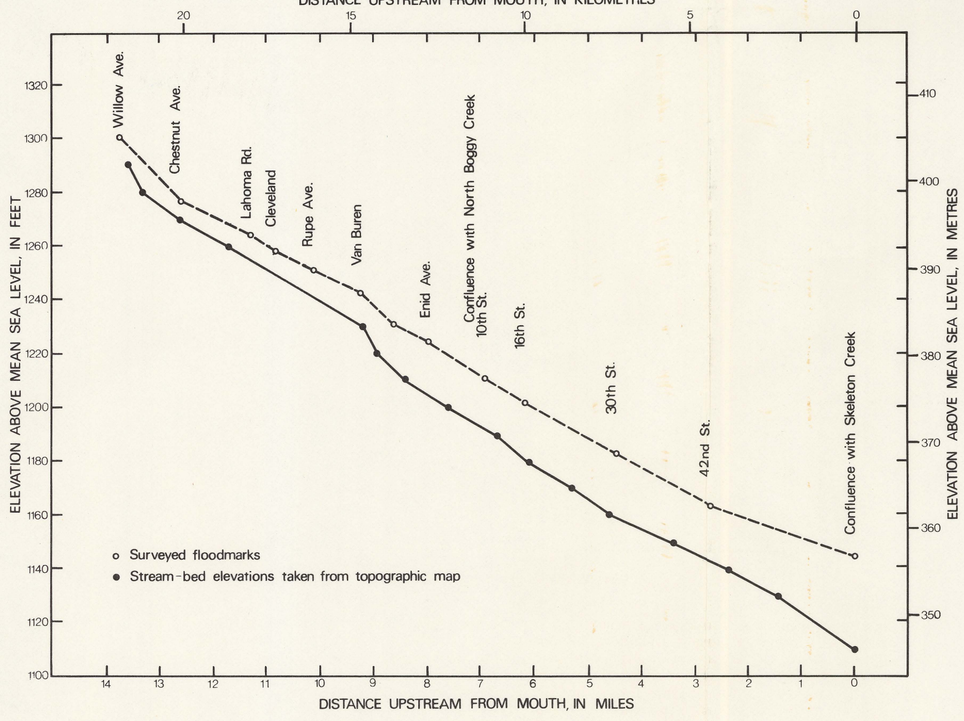


Figure 7.—Profile of October 1973 flood on Boggy Creek near Enid.

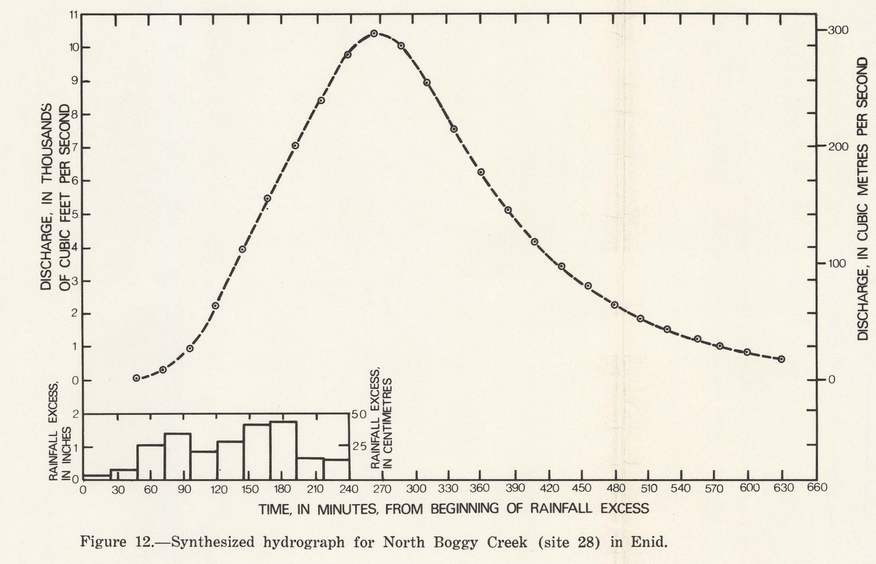


Figure 12.—Synthesized hydrograph for North Boggy Creek (site 28) in Enid.

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Acknowledgment is made to the U.S. Army Corps of Engineers, Tulsa District for surveying high-water elevations in part of Enid and for furnishing aerial photographs taken during and after the flood. Acknowledgment is made to the National Weather Service for furnishing rainfall data. Acknowledgment is also made to city officials of Enid for furnishing bench-mark data and other information pertaining to the flood and to local residents who supplied information on historical floods.

ADDITIONAL DATA

Additional information pertaining to floods on streams in the report area can be obtained from a report by Sauer (1974a), and from the District Office of the U.S. Geological Survey, 201 N.W. 3rd Street, Oklahoma City, Okla. ZC 73102.

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FLOOD OF OCTOBER 1973 IN ENID AND VICINITY, NORTH-CENTRAL OKLAHOMA

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October 1974
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