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Alternative Rehabilitation Methods for NRCS-Assisted Watershed Dams in Oklahoma

Over the past 60 years, Oklahoma NRCS has constructed over 2,100 flood control dams under the Watershed Protection and Flood Prevention Act (Public Law 83-566) and the Flood Control Act (Public Law 78-534). Many of these dams have either reached the end of their original 50-year design life or have had their hazard classification changed due to downstream development. As a result, some are being rehabilitated to satisfy current dam safety standards and extend their service life.

The Watershed Rehabilitation Amendments were enacted in 2000, authorizing NRCS to assist in the rehabilitation of these structures for the purpose of addressing public health and safety issues. To date, Oklahoma NRCS has completed the rehabilitation of 18 dams. Typically, this involves increasing the height of the embankment, widening the auxiliary spillway, adding or extending foundation drains, and replacing the principal spillway to increase the hydraulic capacity and meet current dam safety criteria.

Recently, the rehabilitation of three watershed dams in the Sallisaw Creek Watershed was completed with assistance from Oklahoma NRCS. All three dams are in Adair County, which is geographically located in the eastern-most part of the state. Dam number 15 was completed using more traditional means, but the rehabilitation of dam numbers 16 and 20 involved alternative design and construction techniques that were new to Oklahoma NRCS personnel. New principal spillway conduits were installed through both dams using a trenchless procedure known as boring and jacking. Roller compacted concrete (RCC) was employed to replace the as-built earthen auxiliary spillway on dam number 16.

This paper will give an overview of the rehabilitation of each of these sites, describe the complexities involved in the incorporation of the alternative methods into the design and construction processes, and share lessons learned along the way.