Ensuring Safety

In March of 2005, we changed our normal lake operations in an attempt to keep high lake levels (typically in the spring) from occurring. High lake levels can make seepage worse by increasing pressure on the dam. We have also increased the frequency and intensity of our dam monitoring efforts. The Nashville District has recently begun repairs on the Wolf Creek Dam. In January 2007, construction began on a modern "grout curtain". The dam is increasingly safer as the grout is placed. We are also designing a permanent concrete wall that will be longer and deeper than a previous wall installed in the 1970s. Construction will begin on the wall in 2008 and last up to six years. We believe the new wall will ensure the long-term safety of the dam.

Additional Lake Lowering

Although we believe the fix is a timely one, we recently began several risk-based studies to identify additional ways to lower risk while the fix is underway. In January 2007, the Corps made the decision, based on public health and safety concerns, to lower the lake to elevation 680. The lake level and increased protection from construction progress will be reevaluated in the fall of 2007.

What Can You Do?

If you live near the Cumberland River or a major tributary, check if your property is within a designated dam failure flooded area. The maps are available at your County Emergency Management office, the Corps' offices and at many public libraries as listed on our website. If you are in or near a designated flood area, you may:

- Purchase a weather band radio for early warning
- Have a plan for evacuation of your family to a designated gathering place
- Practice your evacuation plan
- Secure your property by locking doors and outbuildings upon departure
- Establish a contact person or persons outside the flooded area for check-in
- Consider purchasing flood insurance (strictly a personal choice)

Phone: 615-736-7161
Fax: 615-736-7065
Bill Peoples - Chief, Public Affairs
E-mail: William L. Peoples@usace.army.mil
Dave Hendrix - Project Manager
E-mail: John.D. Hendrix@usace.army.mil
Larry Craig - Power Project Manager (270) 343-0123
Sammy Alley - Power Plant Supt. (270) 343-0123
Craig Shoe - Resource Manager (606) 679-6337

You may access the Corps website for project updates and to monitor the construction progress at:
http://www.lrn.usace.army.mil/pao/issues/WOLcommo/

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Nashville District

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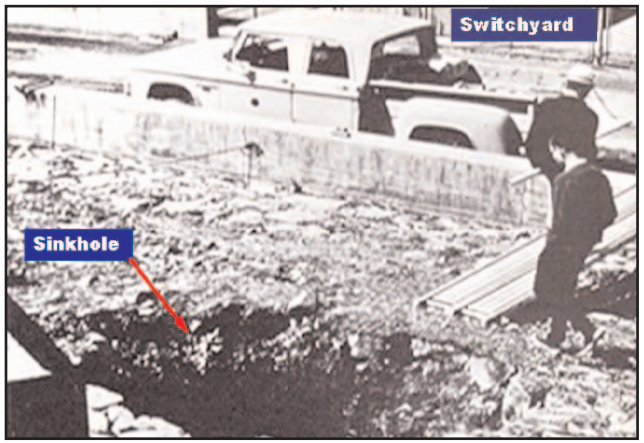
Wolf Creek Dam

Wolf Creek Dam is on the Cumberland River, near Jamestown, Kentucky. The dam was originally built in the 1940's for flood damage reduction and for hydropower production. It was completed in 1952. Lake Cumberland was created by the dam and is the largest manmade reservoir east of the Mississippi River. Wolf Creek Dam is over a mile long and provides a maximum flood storage capacity of over 6 Million acre-feet (1 acre-foot= 1 acre, 1 foot deep or 325,850 gallons). The lake's flood storage is over 40% of the total flood storage in the Cumberland River basin and the project produces 22% of the hydropower generated on the Cumberland River. Recreational opportunities abound at the lake, which receives more visitors (over 4 million) each year than Yellowstone Park.

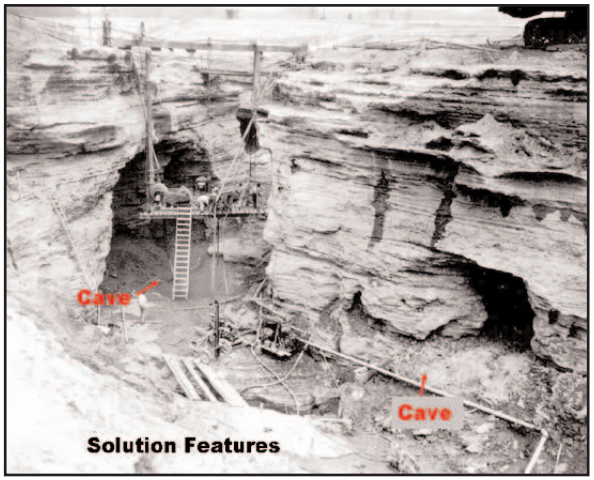
Wolf Creek Dam Seepage Problems and Solutions

In 1968, muddy flows below the dam and two sinkholes near the downstream end of the earthen dam signaled serious reservoir seepage problems. "Seepage" is the movement of water through and under the dam. Although some seepage is normal, an increase can lead to progressive erosion of the earthen dam. This erosion is called "piping". In 1968 investigations concluded active seepage and piping were due to the type of rock in the foundation of the dam. The rock is limestone with numerous connected fractures and joints. The soil



material in the cracks was slowly washed out, causing collapse of earthen materials and embankment into the voids.

The District immediately began an emergency investigation and grouting program between 1968 and 1970 to fill the voids. Grout is a mixture of sand, cement and water which can be pumped under pressure through small pipes deep into the dam to fill any voids. The grout filled the voids and stopped the progression of piping; however, grouting was not concluded to be a long-term fix. After studying numerous alternatives, the District chose to construct a concrete diaphragm wall to block the seepage. The way was built through two-thirds of the length of the earth embankment and into the rock foundation. This wall was constructed between 1975 and 1979. Since completion of the wall,



The foundation of Wolf Creek Dam has karst geology indicated here by caves.

District personnel have continued to closely monitor the project.

Over recent years, we have noted persistent and increasing wet areas downstream. Exploratory drilling has encountered soft, wet material in the embankment near the foundation. Also in several areas of the foundation, instruments have shown a slow increase in water pressure. These signs all indicate new solution features have opened. While the original wall interrupted the progression of erosion, seepage has since found new paths under and around the wall and perhaps through small openings in the wall as erosion of solution features continues.

In 2005, the District completed a Major Rehabilitation Report to evaluate ways to stop the progression of seepage and improve the long-term reliability of the dam. The recommendation is a new concrete diaphragm wall constructed using innovative technology that will reinforce the function of the original wall. This new wall will start near the concrete and earthen dam interface and run the full length of the

January 2007 grouting operation at the earthen embankment

earthen dam, 1,650 feet further than the existing wall. It will extend deeper than the deepest sections of the original wall and as much as 75 feet deeper than the majority of the original wall. The cost is estimated at $300 million and the schedule is to complete the wall by 2014. The Corps of Engineers has established Wolf Creek Dam rehabilitation as a top priority and is committed to continual funding.