# Dam Safety E-Newsletter

NJDEP BUREAU OF DAM SAFETY
Engineering and Construction

Spring 2018

## National Dam Safety Awareness Day: May 31, 2018

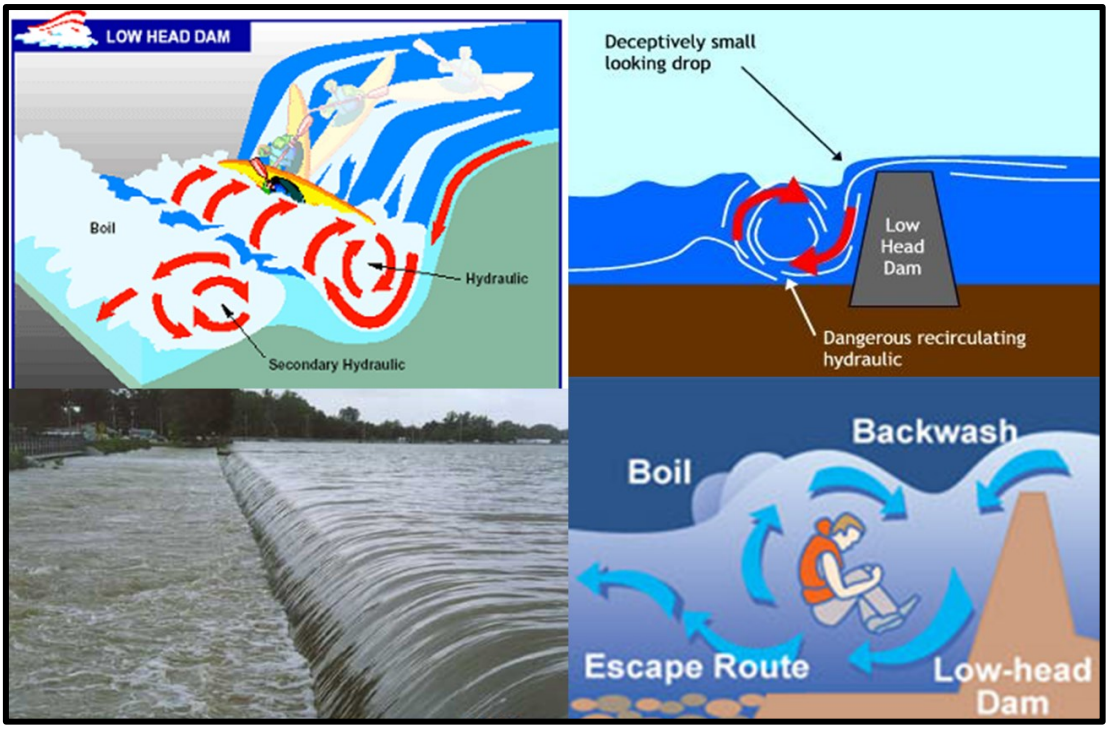
National Dam Safety Awareness Day was created to memorialize the South Fork Dam failure in Johnstown, Pennsylvania that occurred on May 31, 1889. This dam failure was the worst dam-related disaster in the history of the United States where over 2,200 lives were lost. We encourage all dam safety stakeholders to educate themselves on best practices for dam safety by promoting the lessons learned from dam failures. Community outreach is essential and can help either to prevent future catastrophic dam failures or lessen the impacts of a dam failure.

Low-head dams are also a notable topic for National Dam Safety Awareness Day. The Association of Dam Safety Officials outlines the dangers of these dams on their web page (click here) - "Each year, dozens of lives are lost at dams on U.S. streams and rivers, many at low-head dams, also known as run-of-river dams or 'drowning machines.' These structures, generally less than 15 feet high, can create backflow currents and turbulence capable of producing disorientation, hypothermia, exhaustion, and brutal battering. These forces combine to create a practically inescapable circular trap for even the strongest, life jacket-clad swimmer."

Watch *Over, Under, Gone: The Killer in Our Rivers*. Video

Please click here to visit US Bureau of Reclamation's website in recognition of National Dam Safety Awareness Day.

## Low Head Dams




Inside this issue:

## New Jersey Emergency Preparedness Conference: 20th Anniversary


The 20th Annual New Jersey Emergency Preparedness Conference took place at the Tropicana Casino Hotel in Atlantic City, New Jersey the week of April 30, 2018 and featured multi-disciplinary training seminars, break-out sessions, and networking with emergency response professionals from New Jersey. Engineers from the Bureau of Dam Safety (Bureau) presented during one of the break-out sessions during the conference. The seminar attendees learned about dam terminology, maintenance, operations, failure mechanisms, emergency action planning, recognition and response to dam emergencies, security concerns, and recent case studies about large storm events. The Bureau received excellent feedback from the seminar and plans to participate in the conference again next year to continue to promote dam safety and effective emergency action planning for dams in New Jersey.

20 YEARS
1999-2018
New Jersey Emergency Preparedness Conference

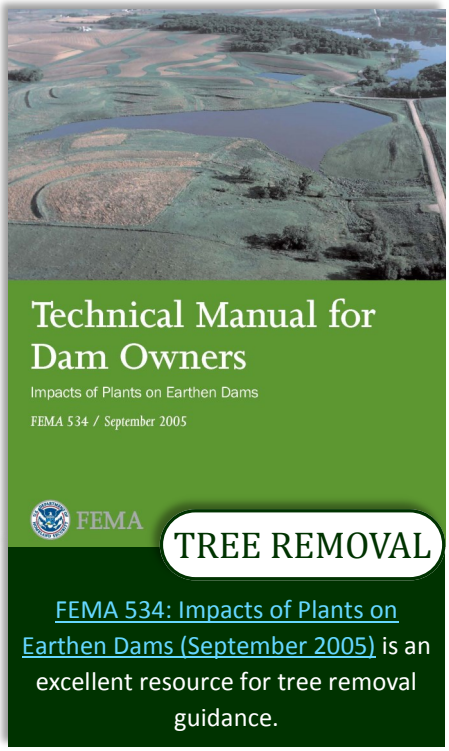

## ASDSO Northeast Regional Conference: June 4 - 6, 2018

The Association of State Dam Safety Officials (ASDSO) Northeast Regional Conference will be hosted at the Lancaster County Convention Center in Lancaster, PA from June 4 - 6, 2018. Please visit the ASDSO website at http://damsafety.org for more information regarding registration, exhibitors, and agenda topics.

## Technical Design Topic: Removing Trees & Root Systems from Dams

A critical element of dam embankment maintenance is vegetation control. Properly maintained grassy vegetation can help to prevent surface erosion of earthen embankment surfaces and aid in the control of burrowing animals. However, uncontrolled growth of vegetation can damage dam embankment slopes, earth-lined emergency spillway channels, and concrete structures as well as make regular visual inspections difficult or even impossible. When trees or brush become established on dam embankments, root systems can provide preferential seepage paths for water. If these seepage flows find an unfiltered exit with enough velocity, the seepage may transport soil particles and lead to internal erosion and piping failures. In addition, large trees are susceptible to blowing down or falling over, creating large holes from the upturned root balls, which will weaken the dam embankment and potentially lead to failure of the dam. For these reasons, trees and other woody vegetation are not permitted on dams in New Jersey and the removal of trees and root systems from dam embankments is required by the New Jersey Dam Safety regulations.

Please click here to view a quick reference guide regarding tree and brush control.
(*courtesy of the Ohio Department of Natural Resources*)

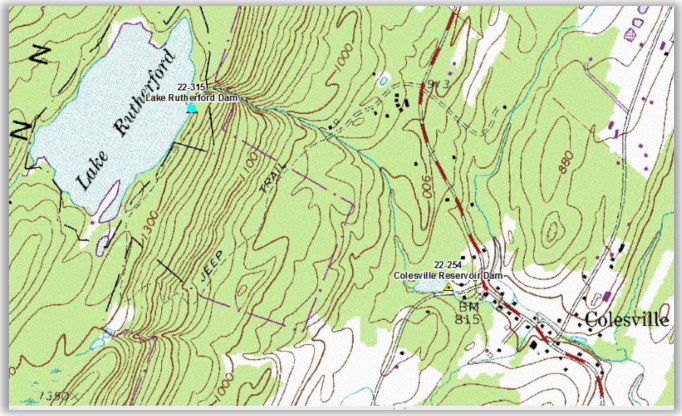

FEMA 534: Impacts of Plants on Earthen Dams (September 2005) is an excellent resource for tree removal guidance.

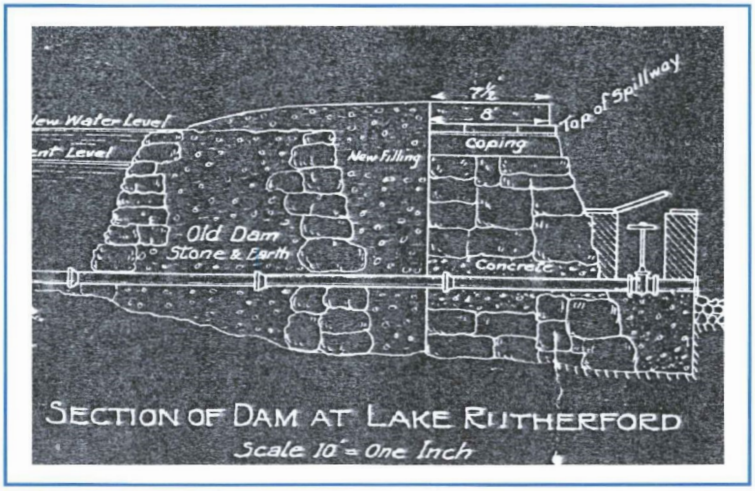
Sinkhole reveals overgrown root system

## Project Highlight: Hazard Creep and Rehabilitation of Lake Rutherford Dam

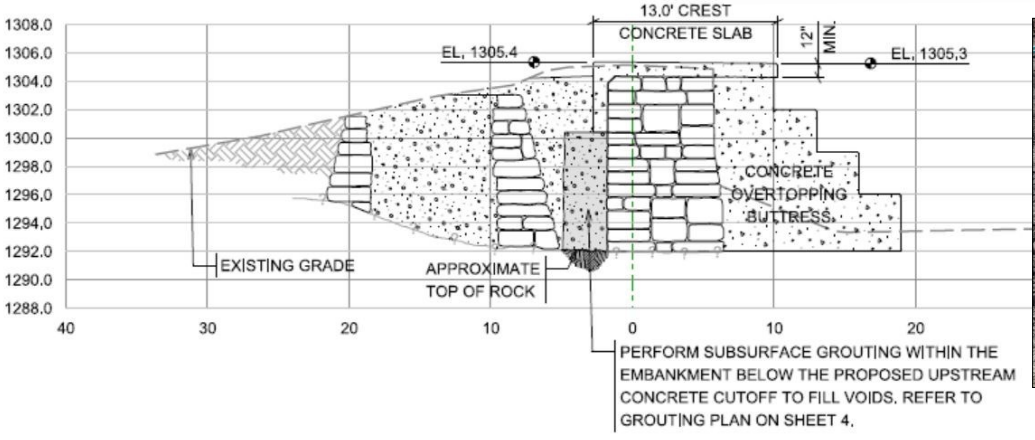
Perched in the mountains of northern New Jersey, above the small town of Colesville in Sussex County, the Lake Rutherford Dam was once listed by the Division as a Class III, Low Hazard Dam. A dam breach analysis study completed in 2008 revealed the potential for impacts to downstream residential structures from a hypothetical failure, even for sunny day conditions. The dam, owned by the Borough of Sussex, was then assigned a Class I, High Hazard rating and a spillway design storm equal to the full Probable Maximum Precipitation. A permit application for rehabilitation to address insufficient spillway capacity was issued by the Division in 2017, and construction activities at the site are now almost complete.

The 1910-era configuration of the existing structure was a composite of two dams - an early stone and earth dam located upstream of an ashlar stone dam (see inset - *"Section of Dam at Lake Rutherford"*). The current rehabilitation was designed by Civil Dynamics, a Division of GZA GeoEnvironmental and primarily features armoring of the crest and downstream face for overtopping protection with reinforced concrete crest slabs and mass concrete buttress sections. The project also includes regrading the dam crest, replacing the existing spillway with a pre-cast concrete box culvert, constructing a concrete cut-off as well as concrete parapet and training walls, extending the existing low-level outlet, performing selected grouting, and implementing other miscellaneous repairs.




[ NOT TO SCALE ]

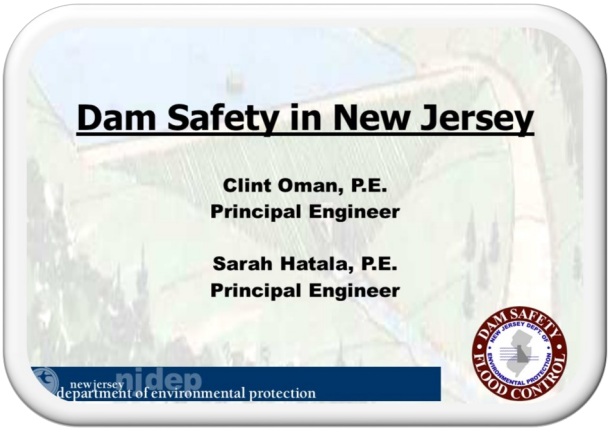



PROPOSED TYPICAL CROSS SECTION

SCALE: 1"=10'

## Community Outreach Program: Rowan University

On April 11, 2018, engineers from the Bureau of Dam Safety presented to about 50 students at Rowan University in Glassboro, NJ. The presentation covered a broad scope of dam safety topics such as dam terminology, spillway design storm definitions and determinations, hazard classifications, failure events, and emergency action plans.




## New Jersey Department of Environmental Protection

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### Helpful Dam Safety Links

Association of State Dam Safety Officials

Responsible Dam Ownership

Living With Dams

FEMA - National Dam Safety Program

Bureau of Reclamation - Dam Safety Program

U.S. Army Corps of Engineers

Visit our website at www.nj.gov/dep/damsafety/