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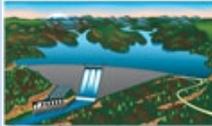
Some Dam – Hydro News™ And Other Stuff



Quote of Note: "I will not change just to court popularity." - Margaret Thatcher, prime minister

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"Good wine is a necessity of life." - Thomas Jefferson
Ron's wine pick of the week: 2014 Navarro Vineyards Pinot Noir "Anderson Valley"
"No nation was ever drunk when wine was cheap." - Thomas Jefferson



Dams:

(Major rehab.)

North Fork Reservoir dam to get major improvements

September 8, 2016, by Virginia Daffron, mountainx.com

Much of the responsibility for the safety of those who live and work below the Bee Tree and North Fork Reservoir dams rests on the shoulders of Swannanoa Fire Chief Anthony Penland. Ever watchful for the possibility of flooding, he and his staff keep one eye on long-range weather forecasts even as they train for and manage other emergencies. At a public meeting on the evening of Aug. 25, as the setting sun tinted the sky over the Swannanoa Valley in shades of rose and gold, the chief spoke of forecast of heavy rainstorms that could



FAILURE IS NOT AN OPTION: This rendering of the planned North Fork Dam improvements shows the new auxiliary spillway to the right of the center of the dam. Photo courtesy of Asheville Water Resources

affect the area in a week's time. While flooding in low-lying areas is a constant concern, the chief's nightmare scenario is a dam breach. "If a dam fails, get to high ground," Penland advised Swannanoa residents who attended the public meeting to discuss planned improvements to the North Fork Reservoir dam. "There will be a wall of water 28 feet high coming at [emergency responders]," he said. "We won't get there in time."

Avoiding that scenario is one of the goals of a \$30 million to \$35 million plan to update the North Fork Reservoir's dam to current state standards, Leslie Carreiro told residents who attended any of four information sessions held Aug. 22-25. Asheville's Water Resources Department manages the North Fork dam under a flood operations plan developed in collaboration with the North Carolina Department of Environmental Quality Dam Safety Division, but the time has come to department for the past 11 years. The Bee Tree dam, she says, was upgraded in the early 2000s. Designed by Greensboro-based Schnabel Engineering in partnership with Asheville's McGill Associates, the improvement project will add 4 feet to the height of the dam, update electronic instrumentation and monitoring systems, protect against earthquake damage, replace aging release gates at the main spillway and add a new auxiliary spillway designed to safely handle a 50,000-year rain event. A new bridge along the top of the dam will allow vehicle access from one side of the reservoir to the other, even if the road below the dam washes out due to flooding.

Latest in 1950s technology

When the North Fork Reservoir opened in 1955, it represented the latest in dam technology, Carreiro told citizens at the information sessions. But technology has changed over the last 60 years, and the state's goal is to bring every high-hazard dam — that is, every dam whose failure could cause the loss of human life or significant property damage — up to current standards. The North Fork dam, Schnabel engineer Mark Landis said, falls short in a number of categories and requires significant improvements to meet regulatory requirements. Today, the North Fork dam stands 130 feet tall and 1,200 feet long. Constructed from earthen fill excavated on the site, the dam creates a reservoir that provides 70 percent of the water in Asheville's system. The city owns 22,000 acres surrounding and comprising the reservoir, which is the catch basin for a 20-square-mile watershed extending up the slopes of the Black Mountains. A 36-inch pipe carries untreated water from an intake tower in the reservoir to a water treatment plant below the dam. From there, treated water is piped to Asheville water system customers. In addition to the main dam, a 55-foot-tall, 600-foot-long "saddle" dam fills in a low spot in the topography at the mouth of the valley. The saddle dam is also an earthen structure.

Judgment call

Under the current flood operation plan, the water level in the reservoir is managed by water department employees in coordination with weather services and state regulators. When forecasters predict rain, water managers release water to lower the reservoir's level and increase its capacity. But in the wake of the severe flooding that resulted from the one-two punch delivered by tropical storms Ivan and Frances in 2004, many local residents questioned whether dam releases had contributed to the flooding.

Those storms hit Biltmore Village particularly hard. Floodwaters reached depths of 4 feet in some areas. How much of that flooding should be attributed to water released into the Swannanoa River at the North Fork Dam still seems to be open to debate. At the Aug. 22 information session in Biltmore Village, Carreiro stressed that downstream flooding can result from water entering the system from the many tributaries that flow into the Swannanoa River below the dam. Additionally, in a post on the city's blog, Carreiro explains that "the dam was never designed for flood mitigation," since its purpose was to supply water to Asheville.

The Grand Bohemian Hotel in Biltmore Village has an extensive flood emergency plan, John Luckett, the hotel's general manager, told city water and emergency officials at the Aug. 22 meeting. Other Biltmore Village business folk said they were looking for more help from the city in keeping storm drains clear, especially when rainy weather is on the way. "We had \$50,000 in damage from a 3-inch rain in December," said Katie Avant of Surface Gallery. The business

owners aren't afraid to roll up their sleeves, said Danielle Vaeth of MTN Merch on Lodge Street. She has volunteered on several Asheville GreenWorks projects aimed at clearing storm drains in the area and improving the system's ability to handle stormwater. "We don't expect the city to do it all," she explained, "but we want guidance from them on how we can work together." "We'll commit to getting those answers from [the] stormwater [department]," pledged Jade Dundas, the city's Water Resources director. "They will follow up."

Passive system

The city's current water release practices, Landis said, are "not an exact science." But the new dam design will change that. The three massive, 18-foot-tall gates that water department employees now raise to release water from the dam into the primary spillway will be replaced with two concrete weirs. Water will flow freely into the spillway once the reservoir reaches a certain level. Only one operable gate will remain; its function will be to lower the water level for scheduled maintenance. Otherwise, the system will function without human control. It's a very different approach than the hands-on management strategy the water department now uses. Landis explained that a new auxiliary spillway will automatically release water in a controlled manner during extreme rain events. The new 600-foot-wide auxiliary spillway will sit between the main dam and the saddle dam. Its design uses fusegates, a technology developed and licensed by Hydroplus of Paris, France. In normal conditions, the fusegates look and function like concrete dams. Under extreme flood conditions, the gates are designed to tip forward and break free of the spillway, allowing a larger amount of water to be released, easing pressure on the dam.

Moving and shaking

Rock excavated during the construction of the auxiliary spillway will be used to buttress the downstream side of the main and saddle dams, increasing their ability to withstand an earthquake. The state adopted new seismic standards in 2014, partly in response to a 5.8 magnitude earthquake that hit Mineral, Va., in 2012. While no deaths and only minor injuries resulted from that quake, it damaged an estimated \$200 million to \$300 million in property, including the Washington Monument in Washington. While weather forecasting provides some advance warning for situations like the flooding of 2004, Landis pointed out, the effects of earthquakes on major infrastructure occur almost instantly. Carreiro and emergency personnel described the city's Emergency Action Plan, which she said was first created in the early 1990s and was updated in 2006 and again this spring. The EAP details the procedures for detecting a potential problem at the dam, formally initiating an emergency action (which allows resources to be mobilized), notifying various partners, responding to the emergency and, finally, determining when and how the emergency operation should end.

Water department staff inspect the dam on a daily basis, Carreiro explained. Workers are trained to detect a wide range of potentially hazardous conditions, including overtopping, embankment cracking, seepage, structural problems and sabotage or vandalism. Carreiro and emergency personnel encouraged citizens to sign up for emergency notification services offered by the city (at www.ashevillenc.gov) and Buncombe County (text "BCALERT" to 888777). They also asked residents to stay alert during severe weather events and to cooperate with emergency services if asked to evacuate.

Under construction

Residents of areas surrounding the North Fork reservoir who attended the information sessions expressed support for the dam improvements, as well as concerns. Liz Stillwell, the president of the homeowners' association at Laurel Ridge, a residential community that overlooks the North Fork reservoir, was one of several residents who asked how construction activities will affect roads leading to the reservoir. "It's one way in and one way out," Stillwell said of the road to her community. "We know there will be a lot of wear and tear on that road associated with this project."

The city has already begun pre-qualifying specialty building contractors, and it expects to send the project out for bids in the spring, Carreiro said. Construction should begin next June. The

city's target for completion is late 2019. Throughout the 26 months of construction, Carreiro and Landis told residents, most of the equipment used for the project will remain on-site, which will reduce construction traffic. Blasting for the auxiliary spillway will produce the rock needed for reinforcing the main and saddle dams. Depending on the selected building contractor's methodology, concrete may also be mixed at the site, further minimizing daily construction traffic. Additional information meetings for property owners and residents in the immediate area of the reservoir will be held closer to the beginning of the construction project, Carreiro said.

Water system operating revenues will finance the \$30 million to \$35 million project price tag, Carreiro explained. "The city Water Resources Department is an enterprise fund. So our budget comes from our revenues," she said. "One of the things on your utility bill is called a capital improvement project fee," she continued; that money has financed design and engineering fees up to this point. Closer to the start of construction, the water department will secure bond financing. Paying back those loans will "all be based on water revenue and not on city tax," she said. In response to a resident asking whether the North Fork Dam improvement project could be affected by the outcome of the state's bid to transfer the ownership of Asheville's water system to the Metropolitan Sewerage District, Carreiro said the project and the money to pay for it will stay with the water system. "If we stay with the city, if we merge with MSD, it's still our money for that function," she explained.

The North Fork Dam improvements, Carreiro concluded, are not discretionary. "The projects we have, we have because we need to do them," she said. "It's not just our preference." That's probably welcome news to Swannanoa Fire Chief Penland. Come the end of 2019, his department will still be watching the weather. "As soon as it starts raining, we check these low-lying areas about every hour," he told residents at the Aug. 25 information session. Even after the improvements, Penland's teams will still be honing swift-water rescue skills and urging residents to plan ahead. But the chances of a dam failure will be significantly reduced, which ought to help the chief and his colleagues — **not to mention the residents whose homes lie along the North Fork of the Swannanoa River — breathe a bit easier when the sky darkens and rain begins to fall.**

(Coming clean. Dam problems come in all sizes, large and small.)

Public gets details about Kyle Lake Dam project

By Eric Hrin, thecourierexpress.com, 9/9/16

FALLS CREEK, PA — People angling for information about the Kyle Lake Dam reconstruction project showed up for a public meeting this week. The Pennsylvania Fish and Boat Commission held the meeting at the Clarion Hotel, drawing a crowd that Timothy D. Schaeffer, director in the commission's policy and planning office, estimated at about 100 people. The main speaker, Michele Jacoby, director in the bureau of engineering for the commission, was positive about the project, which she said will allow the dam, a source of fishing and boating recreation, to operate safely for the next 50 years. The 165-acre lake is just west of DuBois in Jefferson County.



But she was also honest about the dam's current state, noting that the more than 100-year-old dam has a number of deficiencies, such as structural stability issues, insufficient storm capacity and age.

For instance, if a massive storm — called a "design storm" by engineers — caused an uncontrolled breach in the Kyle Lake Dam, the waters would reach DuBois and go past City Park, almost all the way to the DuBois Mall, she said. In the other direction, the waters would almost

flow to Reynoldsville. The commission is hoping to prevent such an occurrence with the \$5 million project to design and reconstruct the dam. "It's our job to make the repairs to minimize that possibility," Jacoby told the audience. "We don't want an uncontrolled breach." She noted that the design is finished. The dam's high-hazard, unsafe designation helped push it to the top of the list for funding, she noted. Recently, Gov. Tom Wolf announced that he was releasing \$25.7 million in capital budget funding for the repair of five high-hazard, unsafe dams, including Kyle Lake, and the design of two other dams, according to the commission. In a press release, the commission noted that high-hazard, unsafe dams have deficiencies of such a nature that if not corrected and the dams were to fail, substantial property damage and a probable loss of human life could occur. Jacoby said the dam, which can hold a maximum of 750 million gallons of water, will be reconstructed to withstand a design storm, which she defined as the largest predicted storm that experts could predict for this area, bringing about 30 inches of rain in a 24-hour period. "Our job is to design to the design storm," Jacoby commented. She said the commission has to design a dam that can handle the flows of a design storm.

In its current state, the dam can only carry 25 percent of such a huge storm. She said the water from a design storm would go over the top of the dam and the structure could be breached. As part of the dam reconstruction project, a new concrete spillway will be built that can handle the water from a "design storm" safely. Also, articulated concrete blocks will be placed on the top of the earthen dam and on the downstream side, also helping in this regard. The project has a "working estimate" cost of \$5 million, which includes such things as geotechnical analysis, surveying, environmental and historic assessments, dam break analysis and permitting, as well as construction inspection and the construction project itself. The construction project alone is estimated to cost between \$3.5 million to \$4 million. State Rep. Cris Dush, who attended the meeting, said the area has been blessed with a mix of public and private funding that came together at the right time for the project. It was noted at the meeting that some of the money being used to repair the high-hazard, unsafe dams is from the Act 89 Transportation bill that was passed under former Gov. Tom Corbett. The money was generated by a tax on motorboat fuel. A timeline for the dam reconstruction was shared with the audience. The reservoir is being drawn down this month by approximately a foot a day. It will be empty in the middle of October. A fish salvage will take place over two days in October. The fish will be taken to Cloe Lake, about 25 miles south, because of its similarities with Kyle Lake.

Permitting will take place in December and then the project will come before the state Department of General Services for approval and advertising in spring 2017, according to the timeline. Fish habitat construction will take place in fall 2017, the construction will occur from summer 2017 to summer 2018, and the reservoir will be re-filled from fall 2018 to spring 2019. Once the lake is re-filled, the fishery will be rebuilt. Jacoby said this will take 3 to 5 years, with small forage fish being put into the lake first, followed by larger fish, such as bass. She said the fishery would be in good shape within five years of its rebuilding. Jacoby shared some history about the dam, which she noted was built in 1909-1910 by the Buffalo, Rochester and Pittsburgh Railroad Company and later acquired by the fish and boat commission. She said the year 1910 can be seen stamped on the concrete on the outlet works of the dam.

(It doesn't pay to drink too much anywhere.)

Man drinking falls off Boulder County dam

By Raquel Villanueva, KUSA6, 9/10/16, 9news.com, Associated Press

BOULDER COUNTY - A 22-year-old man was injured falling off the Barker Dam early Saturday morning. At 2:25 a.m.,

crews responded to 27000 Boulder Canyon Drive after receiving a report that a man had been drinking and scaled the safety fence on the dam. He had fallen an estimated 15

to 20 feet onto the concrete spillway below. No water was passing through the spillway at the time. Members of the Boulder County Sheriff's Office, Nederland Fire Protection District,



American Medical Response, City of Boulder Water, and Rocky Mountain Rescue Group were able to pull him out. He was transported to a local hospital. **His condition was not released.**

(There, take that!)

Scoppe: Why we need a new dam law (it's not the reason you think)

By Cindi Ross Scoppe, Associate Editor, SEPTEMBER 12, 2016, thestate.com

Columbia, SC - GRANTED, I WAS out of the country when Hurricane Hermine unleashed her wrath on South Carolina, so I can't speak from firsthand experience of the destruction she wrought. **But I know what I read, and what friends tell me, and I know how completely recovered from the storm the Midlands and the rest of South Carolina seemed to be when I returned less than a week later.** So I was more than a little puzzled by The Associated Press headline last week: "Some SC lawmakers say Hermine showed dam rules not needed." **Some SC lawmakers say Hermine showed dam rules not needed** SC lawmakers remain skeptical about toughening dam-safety law.



Really? A weakened former hurricane waddles across our state, dams do not collapse under the weight of its six inches of rainfall — about a third as much as fell in the October deluge — and our lawmakers declare themselves done with post-flood, lessons-learned dam regulations? Just like that? **Because of course we're never going to see more than six inches of rain at a time again. Right? Perhaps I'm being too sarcastic, so let me grant a few more points:** Granted, there are some less-than-clear and rational minds in any profession, and we should not judge the entire profession by the ridiculous rantings of a few. Granted, when we're defending a position we know is difficult to defend, we sometimes grasp at straws, and say things that don't make a lot of sense. If I own a dam, shouldn't it be my responsibility to keep an eye on it to make sure it's not likely to breach and destroy homes downstream? Granted even that critics might be right when they say we would have done fine in the October deluge if we had been enforcing the dam rules we already have. That it might not have been our lack of adequate regulations but rather our lack of inspectors, and the timidity of those inspectors we did have, that made the circumstances ripe for 45 dams to break in the Columbia area alone. **But of course that misses a big part of the point. The idea behind a new law isn't just making it tougher.**

It's about making it clear to state regulators that they ought to actually enforce state law, rather than winking at violations, as they had done with many of the dams that failed. No, we shouldn't need to pass a law to do that, but sometimes we do, and refusing to make that a little clearer sends just the opposite message. **It's also about reallocating responsibility.** If we're going to actually inspect dams as often as we say we're going to inspect them, who should pay for those additional inspections? All of us, or the people who own and benefit from the dams? Consider: If I'm a builder, it's my responsibility to pay for the inspections that ensure the public my work is safe. If I'm a doctor or a barber, an architect or a therapist, it's my responsibility to pay for the licensing program that ensures the public I'm qualified to do my job. If I own a swimming pool, it's my responsibility to keep children from jumping into it and drowning. If I own a chemical business, it's my responsibility to make sure the chemicals are stored properly so they don't cause an explosion that destroys not just my business but the entire neighborhood.

If I own a dam, shouldn't it be my responsibility to keep an eye on it to make sure it's not likely to breach and destroy homes downstream? Or at least shouldn't I be partially responsible for that, rather than having everyone else pick up the cost of something that benefits me and endangers the rest of you? Making dam owners pay for some of the inspections is the most significant new

expense being proposed. They're already required to upgrade substandard dams; DHEC just hasn't been particularly aggressive about enforcing that law. How SC could improve dam safety rules after flood State's penny-pinching ways crippled dam safety program

If I own a dam, shouldn't I have to tell you, my downstream neighbors, when that dam breaches? Or when it's likely to breach, or when I'm making repairs? Shouldn't I have an emergency plan in place (who to call when there's a break, for instance), and shouldn't I have to test it occasionally to make sure I still have the right phone numbers and email addresses? Shouldn't my contact information be on file with state regulators, and shouldn't I have to let them know if I sell the dam? Shouldn't it be clear in state law that the dam is my responsibility? Yes, all of that would mean a little more paperwork, but it seems very little to ask for people whose property benefits them but poses a danger to the rest of us. Critics could be right when they suggest that we shouldn't treat someone who built an agricultural dam that became hazardous because neighbors sold their land for subdivisions the same as someone who built a dam in order to create a lake that would make the houses in his new subdivision more desirable. So maybe the law should acknowledge that. Writing that difference into law might be difficult, but that doesn't mean we should give up on reallocating responsibility, and sending a clear message to regulators. It means we need to figure out how to define the purpose of the dams and the benefit their owners derive from them and the risk the owners created when they built the dams, and then include those factors in our allocation of responsibility. And then we need to start enforcing our law.

(Learning the hard way.)

The Great Flood of 1986: What we have learned?

By Sarah Sell, WZZM, September 12, 2016, wzzm13.com

WEST MICHIGAN - Thirty years ago widespread flooding hit parts of West Michigan -- homes were damaged and crops were wiped out. Dams that failed, 14 in total, and several other dams were at risk of failing. It led to thousands of people being evacuated from their homes in several counties. It started Sept. 10, 1986 and last over a period of three days. A storm dumped up to 17 inches of rain over a 24-hour period of time. "In 1986, it was a massive flooding event," said Abby Watkins, the director of Newaygo County Emergency Services. "So, we always look at those catastrophic events and learn from them." The flood of 1986: What happened?



The storm caused flooding across a 60-mile area. In Kent County, the Childsdale Dam along the Rogue River in Rockford failed, causing flooding. Oceana County was likely the hardest hit. The Hart Dam, near Pentwater, failed as well. In Newaygo County, the Hardy Dam, was also at risk. In the end, it did not fail, but two smaller dams did. "The small dams that did fail, that is still very possible, that could happen again," Watkins said. Watkins says a failure of the two larger, hydroelectric dams, is unlikely. She says the county has also developed a better response and evacuation plan. "We have better warning systems to help educate and inform public about what's going on," Watkins said. "We have a better monitoring system along the river." Newaygo Fire Chief Jason Wolford says residents can help. "When we tell them it's time to go, they should listen because those plans have been tested and tested," he said. "We have their best well-being in mind." The Great Flood of 1986 serves as a lesson for years to come. Six people lost their lives and with better planning and technological advances, a similar flood might not be as catastrophic.

(Guess it's a dam?)

Removal Of Randolph Dam Opens 98 Miles Of White River And Tributaries

By STEVE ZIND • 9/13/16, digital.vpr.net

The removal of a dam on the White River in Randolph has opened up nearly 100 miles of habitat upstream. The dam is one of many so-called "deadbeat" dams that no longer serve a function and, conservationists say, impede rivers. A single backhoe removed the dam under the Main St. Bridge in Randolph village on Tuesday. The dam, built in the 1940s, was made of a series of interlocking steel plates stretched across the Third Branch of the White River. At just 5 feet high, it was far from imposing, but its removal is significant, according to Mary Russ, executive director of the White River Partnership. "Our native trout species can only jump over barriers of a foot. So it's a complete barrier to fish passage," Russ says. A video taken by Randolph angler Brendan Barden in 2013 shows brown trout trying unsuccessfully to clear the dam. The dam's removal opens up 98 miles of the White River's third branch and its tributaries. Russ says that's a long stretch of river compared to most projects like this. "You don't usually get 100 miles of stream. You might get 10, and that's a good number. So, it's a unique opportunity," she says.



Heather Furman, executive director of the Vermont Chapter of the Nature Conservancy, says there are benefits beyond opening up more of the river to spawning fish. "It opens up the main stem of the Third Branch to paddlers, so it has recreational benefits. It's also providing some flood resiliency for the businesses upstream. That's something communities can care about when they see dams like this come out," Furman said as she watched the dam removal. She says there are about 200 "deadbeat dams" that have been identified in the Connecticut River watershed. This particular one was high on the list for removal. "There's not an unlimited source of funds to do these projects. We want to do the ones that have the greatest conservation impact," she says. According to Furman, whether or not to remove an old dam involves calculating the benefits and the feasibility of removal, then raising funds to pay for the project. She says all of that is easier when there's local support. Taking down this dam was supported by the town, but not every community welcomes the group's efforts. In Swanton the Nature Conservancy and others have teamed up to oppose the village's plans to renovate a dam there.

(Looks like it would be better if it all failed.)

Portion of Dam Has Broken Away in Clearfield, Says Stott

September 14, 2016, by Gant Team in Local News, gantdaily.com

CLEARFIELD, PA – A portion of the Raftman's Memorial Dam, located along the West Branch of the Susquehanna River in Clearfield Borough, has broken away, Borough Operations Manager Leslie Stott confirmed in a phone interview with GANT News on Tuesday afternoon. More specifically, a portion of the dam has broken away and is on the concrete floor with the rest further out in the river. While it may have occurred due to "wear and tear" on the dam, they are not for sure what caused it to break away, and they may never know, she said.



They have lowered the river's water level "quite a bit" in order for the borough crew and engineer to take a look at the damage. The borough's engineer will be on-site to conduct further inspection on the extent of the damage Thursday,

according to Stott. “We’re asking the public to steer clear for safety reasons,” she said. Stott noted danger signs have been posted in the area of the Raftman’s Memorial Dam. “... Lowering the river, I think, gives a good sense of what will happen if it’s not repaired.” After the engineer’s inspection is completed, Stott said they will work on what can be done in an emergency and long-term so far as repairs to the dam.

(What a pain, expanding aggregate.)

Good Medicine for Fontana Dam

TVA engineers are doing some smart preventive maintenance on TVA’s majestic Fontana dam to keep it strong and stalwart for generations to come.

As one of TVA’s most popular recreation destinations, Fontana Dam remains as scenic and stalwart as ever. And over the next several weeks, TVA’s River Management and Dam Safety teams are working together to make sure it stays that way. The dam is experiencing a condition called alkali aggregate reaction (AAR), also known as concrete growth, which occurs when chemical reactions in the cement aggregate material cause swelling and stress. The condition is not causing any structural or stability problems at the dam. But AAR can eventually lead to difficulties in operating spillway gates and other dam mechanisms if left untreated over the long term.



To prevent that from happening, TVA is making highly tactical and engineered vertical slot cuts in the dam to proactively relieve the compression stress. Two slots will be cut starting mid-October, 5/8-inch wide and deep as 92 feet. The work is expected to be completed by November 22. Concrete growth in dams is not a rare occurrence. TVA previously cut slots in Fontana Dam in 2011. TVA continually monitors all of its dams to ensure they are performing as designed. Under a robust Dam Safety Program that includes inspections, instrumentation and independent reviews, TVA dams are managed and maintained with public and employee safety as top priority. TVA dams control flooding along the Tennessee River and each year prevent about \$240 million in flood damage in the TVA region and along the Ohio and Mississippi Rivers. To date, this system has prevented over \$6.3 billion in flood losses across the Tennessee Valley, including about \$5.7 billion in damage averted at Chattanooga—the Valley’s most flood-prone city.

(When all else fails, you need a good EAP.)

4 reasons why a dam owner should want an Emergency Action Plan

EAPs protect the facility and the community, and most importantly, a dam owner’s sanity

By Anthony Grubbs, Senior Associate, Water (Raleigh, NC), 09/13/16, stantec.com

Don’t get me wrong, I love listening to a thunderstorm. But on one particular Saturday evening, my family and I were finishing dinner during a severe storm when the phone rang. One of my clients, a dam owner, was concerned because his field tech had found a “spot” on a dam nearby. What did this “spot” mean? What do we do next? What about the people living downstream of the dam? Should we be worried? This is the call no dam owner wants to make. But the critical piece of responding to any potential crisis isn’t the crisis itself, but the preparation you’ve done in advance of such an occurrence. That’s what Emergency Action Plans



(EAP) for dams are all about—helping you minimize impacts, mitigate consequences, and facilitate a quick recovery should a dam breach occur. All states, except for Alabama, require some sort of dam safety program. But don't look at a requirement as another bureaucratic check box you need to check. EAPs are something a dam owner should want to create, even if it isn't required. Here's why:

Reason 1: EAPs can reduce liability

If a dam owner doesn't have a plan, that doesn't relieve him/her of culpability. Far from it. A dam owner should not only protect their asset, but more importantly, protect the people living downstream of the asset. An EAP allows the dam owner to exercise reasonable care, legally calculated from three factors: risk of an accident occurring, magnitude of harm should the risk happen, and availability of alternatives.

Reason 2: EAPs can keep you calm in a time of crisis

EAPs help you respond to an emergency situation in a calm, calculated manner. If you have a plan already written, you don't have to react emotionally. A plan greatly reduces the panic an organization feels when facing a potential crisis and the implications to the surrounding community. A plan also allows you to communicate with the public in a way that relieves their concerns and provides the necessary resources and contacts so everyone is communicating appropriately.

Reason 3: EAPs help protect your investment

How do you respond to an issue at a dam? You want to protect the integrity of the dam first and foremost, because remedial action often prevents a total dam failure. Therefore, a plan is integral to helping you protect your investment. An EAP provides step-by-step measures to address a deficiency.

EAPs also outline the key contacts you'll need to interface with during the crisis. So you can protect your investment while also protecting the community verses going into technical "engineer" mode—you can think in a more strategic and global manner.

Then there are the supplies. You don't want to locate pumps or lights at 2 a.m. on a dark and stormy night. EAPs allow you to predetermine how to get what you need, when you need it.

Reason 4: If you fail to plan, plan to fail

If you have no plan in place, you're in trouble. Many states offer templates you can use to get started. Once you have a template, the plan becomes less overwhelming, and reaching out to an experienced consultant can help you complete an EAP in a few weeks. I've worked with clients to produce EAPs within a week or two. We've been instrumental in guiding our clients through the EAP process and involving local agencies so that there is a seamless transition through all phases of the plan. Even more importantly, before we even start with the planning process, we do a breach inundation map. This tells us where, if the dam should fail, major flooding would occur. It also shows evacuation areas.

Part of your plan should also include a tabletop exercise (think of it as a crisis "run through") at least once every five years. Your plan is a living document and enacting a crisis scenario really tests your plan and allows you to find, and then fill, any potential gaps in coverage.

EAPs: How to get started

So where do you start? There are many resources out there to help, and first I'd recommend starting with your State Dam Safety Engineer. The Association of State Dam Safety Officials (ASDSO) also has some really great information. Finally, check out the National Dam Safety Program through FEMA. Oh, and don't forget to contact a knowledgeable technical consultant too (such as myself). So, back to that call I received that Saturday evening from a worried dam owner. How'd it end? Well, I walked him through the EAP we had previously prepared together and we determined the dam's condition and what level of emergency we were facing—all without leaving my house. We discussed next steps and how we intended to monitor the situation and

protect the community. And guess what? It worked. Crisis was averted, dam was intact, and residents were safe. And these are the very reasons why you need your own EAP.



Hydro:

(What more can you expect? Gotta pay for that expensive car. Untrue hogwash. No one is left out of the process.)

Federal energy bill would weaken environmental concerns in dam relicensing procedures

By Patrick Samuel, Special to The Bee, SEPTEMBER 8, 2016, .sacbee.com

Long before ecological considerations were fully understood or current environmental laws were on the books, rivers were dammed in the name of progress without much consideration of their impacts. This approach is a classic example of human ingenuity getting ahead of scientific understanding. Yes, dams provide a host of benefits to people; but they also degrade water quality, harm fisheries and hurt rural economies that rely on recreational tourism for income.

Over time, research and experience have helped us understand the costs and benefits of damming rivers for various purposes. In response to these realizations, state and federal statutes drafted in the 1970s gave states, Native American tribes and federal agencies authority to ensure that all river values are adequately considered and weighed during the Federal Energy Regulatory Commission hydropower dam permitting process. This permitting process is a crucial opportunity for measured consideration of current and future priorities for a river. The outcomes can have far-reaching consequences for people and wildlife, as they set the table for licenses that dictate dam operations for 30 to 50 years.



The Federal Energy Regulatory Commission process for dam relicensing allows partners to find compromises for the benefit of the public. This process has allowed flow adjustments on the Feather River, bringing healthier base flows while protecting vital water supplies for California's people and fish.

Unfortunately, hydropower provisions in the federal energy bill (S. 2012) currently before Congress threaten to undermine the essential provisions that work to bring our management of rivers back into balance. Disguised as a simplification of the hydropower licensing process, these provisions will significantly limit or altogether eliminate agency and tribal authorities' ability to protect imperiled fish under the Endangered Species Act, preserve water quality under the Clean Water Act, or seek mitigation measures where impacts cannot be avoided. While some improvements could be made around the licensing process for hydropower dams, stripping away the rights of states, tribes and federal agencies will not lead to better outcomes for Americans or their rivers.

The current FERC process allows partners to find compromises for the benefit of the public in dam licensing procedures. Agencies and tribes have built significant expertise over decades by employing environmental checks and balances to guide dam operations. Scientifically based flow

management regimes borne out of these hearings benefit whitewater enthusiasts, recreationalists and small-town economies reliant on tourism dollars.

For example, this process has allowed flow adjustments on the Pit and Feather rivers, bringing healthier base flows while protecting vital water supplies for California's people and fish. Today, these rivers are also kept cooler and more robust to support Chinook salmon and coastal rainbow trout during critical migration and spawning windows. Relicensing proceedings also allow for the exploration of fish passage alternatives at dams to help stem declines of our wild runs. This consideration is timely because several major dams in California that have prominent fish passage issues – such as Englebright Dam on the Yuba River – are currently undergoing relicensing. In short, the extensive relicensing process gives everyone an opportunity to learn from prior mistakes, gather the best available science, and explore current and future uses of our rivers that benefit communities while also protecting the wildlife that calls them home. Hydropower is a critical component of our domestic energy supply in California and will play a role in its future. However, Congress must resist attempts in the energy bill to weaken the rightful authorities of states, tribes and federal agencies to manage natural resources and protect public health and the environment during hydropower relicensing. Without input from these key players, California's mighty rivers and the communities that depend on them face an uncertain future. *Patrick Samuel is conservation program coordinator for California Trout, a nonprofit advocacy organization. He is also a member of the California Hydropower Reform Coalition.*

(Seems like yesterday.)

Hydroelectric plant built inside Upstate mountain celebrates 25 years

Bad Creek Hydro Station to increase capacity, Duke Energy says

Sep 08, 2016, wyff4.com

SALEM, S.C. —A hydroelectric plant built inside a mountain near Lake Jocassee, conjuring images from a James Bond movie, is celebrating 25 years of service. Duke Energy's Bad Creek Hydro Station in Salem is an engineering marvel that opened in 1991. Carey York, 70, was the project manager during all six years of construction.



"It's the best project I ever worked on," York said. "You don't realize it at the time until you get through it and say, 'Boy, we did a fabulous job for the company.'"

Located 500 feet below ground, the 32,000 square foot facility produces 1,065 megawatts, using water that flows through the mountain into Lake Jocassee. During an anniversary celebration, officials announced plans to increase capacity by another 200 megawatts. "That additional storage will not only help us reduce our carbon footprint, but it will enable us to meet the needs of our customers for peak electrical demands," Regis Repko, senior vice president of Fossil Hydro Operations said.

(Finally, after 6 long years.)

Six years in the making: Juneau Hydropower secures license needed to operate

By SAM DeGRAVE, JUNEAU EMPIRE, September 8, 2016 - juneauempire.com

In 2010, Juneau Hydropower started down a long regulatory road to obtain a license from the Federal Energy Regulatory Commission. Now, six years and several million dollars later, the company has that license in hand. On Thursday afternoon, the federal commission granted Juneau Hydropower a license for its Sweetheart Lake Hydroelectric Project, which "means a lot" if you ask Keith Comstock, the company's owner and CEO. "That's the big one," he told the Empire

in a phone interview Thursday. “That’s the hydropower license that allows us to own and operate a hydropower facility.” Beyond that, however, the FERC license allows Juneau Hydropower to move beyond the remaining regulatory safeguards standing between the company and construction. The company has essentially completed the roughly 25 preliminary environmental plans that it needs to file — such as a Bear Safety Plan for the U.S. Forest Service. Regulatory agencies wouldn’t sign off on any of these plans until the company had its FERC license.

“We’ve moved from a speculative or a hopeful project to a real licensed project; that’s a big difference,” Comstock said. “It’s like we graduated high school, and we’re off to college now.”

College, as far as Juneau Hydropower is concerned, is securing power purchase agreements, finalizing loans and equity investments, negotiating contracts; the list goes on. And that’s before the company can build its 19.8-megawatt facility comprising a 280-foot wide concrete dam and three 7.1-megawatt turbines (among other things) at Sweetheart Lake. There is much work yet to be done before the company can start generating power, but Comstock said he is happy to make it as far as he has. About eight out of 10 projects that begin the FERC licensing process never obtain the license they are seeking, Comstock said. That’s an anecdotal statistic was furnished by FERC officials, though, which Comstock said he wasn’t able to corroborate. “Just getting here was kind of a long shot,” he said, and it wasn’t inexpensive either.

Comstock said Juneau Hydropower has already invested millions in this project — though he wouldn’t be more specific than that. “It wasn’t cheap, but we think we got really good value because we used local people wherever we could,” Comstock said.



This picture from the city's Community Development Department shows Sweetheart Lake covered in ice. The lake, which is about 37 miles southeast of downtown, is the proposed site of a new hydroelectric power facility.

(To go or not go.)

Marshall seeks request for proposals on hydro dam

September 09, 2016, by Ken Delaney, wtvbam.com

MARSHALL, MI (WTVB) - The City of Marshall is seeking requests for proposals to determine if the 124 year old hydroelectric dam on the Kalamazoo River should be removed or restored.

The city owns and operates the dam and associated facilities under a permit issued by the Federal Energy Regulatory Commission. It was determined nearly four years ago that the dam was in need of significant construction upgrades. The dam generates less than one percent of Marshall's total energy requirements. If it is decided to rehabilitate the dam, that would require lowering the city's millpond by up to eight feet which would expose the bottom of the river to air.



City officials have consulted with local and state health officials for their guidance about potential environmental hazards in the project.

(A classic! And, wine too.)

Old Mill Days at Bale Grist Mill set for Oct. 1-2

FOR THE STAR, 9/14/16, napavalleyregister.com

Napa Valley's historic Bale Grist Mill will hold its Old Mill Days, an 1850s-1860s living history event for the whole family, on Oct. 1 and 2 at 3369 St. Helena Highway (Highway 29). The Bale Grist Mill is one of the last mills that still grinds grain on the old pair of stones brought here by ship from "the old country." During Old Mill Days people can visit the mill and experience the shared hard work and resulting sense of community that bound our forefathers together, with traditional farm chores such as corn husking and shelling, wheat threshing, butter making, apple pressing, hand sewing, bean seed shelling and rope making.



Tom Stockwell, Star - The original waterwheel of the Bale Grist Mill was only 15 feet in diameter. However, during the dry season it proved to be too small, and a 36-foot diameter wheel was built to replace it in the late 1840s.

Watch a blacksmith, see wagon wheel spokes being made using a draw blade at a shave horse bench, or chop some wood. Many artisans will be present who enjoy sharing their craft with others: lace making, wheat weaving, a gunsmith, surveyor and blacksmith. Mill docents will wear period-correct clothes to add to the experience. Children can wear simple authentic outfits and have their picture taken by the great waterwheel. Musicians will gather under the great oak trees and play old-time music all day. Stew, cornbread and fresh-pressed apple cider will be available for purchase. Admission is \$5 per person, and children under 6 free.



Water:

(Everybody wants free money.)

California water tunnels would need US funding, analyst says

Giant tunnels that Gov. Jerry Brown wants to build to haul water across California are economically feasible only if the federal government bears a third of the nearly \$16 billion cost because local water districts may not benefit as expected, according to an analysis that the state commissioned last year but never released.

By ELLEN KNICKMEYER, Associated Press, SEPTEMBER 14, 2016, modbee.com

SAN FRANCISCO - Giant tunnels that Gov. Jerry Brown wants to build to haul water across California are economically feasible only if the federal government bears a third of the nearly \$16 billion cost because local water districts may not benefit as expected, according to an analysis that the state commissioned last year but never released. The findings run counter to longstanding state pledges that the districts that would get water from the tunnels would pay the full cost. Restore



the Delta, a group opposing the project, obtained the fall 2015 cost analysis and subsequent state emails on revising the findings through open record laws and released them. The analysis and its new assumptions of shifting some costs to taxpayers are likely to heighten debate over Brown's proposal to build two 40-foot-high (12-meter-high) tunnels to carry water from Northern California's Sacramento River, just above its delta with the San Joaquin River, 35 miles (56 kilometers) south for use by politically influential agricultural and urban water districts, including in the state's top population center of Los Angeles.

Conservation groups and project supporters disagree over whether the tunnels would hurt or help dozens of threatened native fish and other species in the delta, which leads to the San Francisco Bay and is part of the largest estuary on the West Coast. The cost-benefit analysis by economist David Sunding of the University of California, Berkeley, for the first time raises the prospect that federal funding would be needed. U.S. officials have not publicly said they would share in the price tag. Further, no local water districts have agreed to pay their slated share for the tunnels because of uncertainty over regulatory approval and whether it would be worth the expense for them. Spending on the project has become the subject of an ongoing state audit and federal financial review. With districts balking, the state for the first time is dipping into public funds — fees paid by users of existing state water projects — to get the project through the planning phase, state spokeswoman Nancy Vogel told The Associated Press last month. Vogel on Wednesday called the state-commissioned analysis "outdated and incomplete." California has not concluded that the tunnels require federal funding to make the project feasible, she said.

The state's Natural Resources Agency commissioned the study from Sunding, who works as an economist with Brattle Group consultants. It looked at the share of costs that rural and urban water districts would pay and whether they would get enough water consistently to make the project's price worthwhile for them. However, even if the federal government or another party steps in to pay a third of the costs, the tunnels as proposed now would pay off only for the urban water districts involved, not for the rural districts, Sunding wrote. If the water districts have to pay all the costs, as the state has said it intends, "then the net benefits of the project are even more negative" for the rural districts that would help pay for it, Sunding wrote. Brown's administration is pushing for state and federal approval to build the tunnels, which would replace part of a half-century-old water system built by his father, Pat Brown, when the elder Brown was governor. The analysis builds in an assumption that the delta in coming years will see a magnitude-6.7 quake, which Sunding predicts would knock out the current water system for up to 30 months but leave the tunnels, if they were built, untouched. Geologists and engineers differ on the impact of such a quake on the state's water system. Barbara Barrigan-Parrilla of Restore the Delta said Brown administration officials "have to put inflated numbers in the economic analysis ... to try to create the economic justification" for the tunnels.



Other Stuff:

(Nonsense! Never heard of yolo.)

Here Are the Latest Additions to Oxford English Dictionary

'Yolo' made the cut

By Evann Gastaldo, Newser Staff, Sep 12, 2016, newser.com

(NEWSER) – The latest slang to be added to the Oxford English Dictionary: "yolo," which, as all the youngsters know, stands for "you only live once." The new crop of more than 1,000 words and terms added to the OED also includes "gender-fluid," "yogalates" (a combination of yoga and Pilates),



"fuhgeddaboudit," and "moobs" (man boobs), the Irish Times reports. In order to be added to the OED, a word must have been in use for "a reasonable amount of time" and there must be a few independent examples of it being used.



ⁱThis compilation of articles and other information is provided at no cost for those interested in hydropower, dams, and water resources issues and development, and should not be used for any commercial or other purpose. Any copyrighted material herein is distributed without profit or payment from those who have an interest in receiving this information for non-profit and educational purposes only.