

9/30/2016



Some Dam – Hydro News™ And Other Stuff



Quote of Note: "It's not whether you get knocked down, it's whether you get up." - Vince Lombardi

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"Good wine is a necessity of life." - Thomas Jefferson
Ron's wine pick of the week: 2013 Peachy Canyon Zinfandel "Incredible Red"
"No nation was ever drunk when wine was cheap." - Thomas Jefferson



Dams:

(They'll keep beating the drum because they think it's going their way.)

"Free the Snake Flotilla" Renews Calls for NW Dam Removal

September 16, 2016, publicnewsservice.org

LEWISTON, Idaho - A "Free the Snake Flotilla" is floating the Snake River on Saturday, calling for the removal of four dams on the lower Snake to help improve salmon and steelhead habitat. The second annual event includes members of the Nez Perce Tribe, sport fishermen, biologists, and others who believe dam removal is key to saving native, endangered salmon and steelhead. Kevin Lewis, executive director of Idaho Rivers United, said fish numbers in Idaho began to drop even before the Snake River dams, when four dams were built on the Columbia River. "When they built the four lower Snake dams, the numbers then dropped below



the point of self-sustaining," he explained. "So, you basically had crossed that tipping point of the fish being able to survive eight dams in each direction."

The groups want the Ice Harbor, Lower Monumental, Little Goose and Lower Granite dams to be removed. This summer the U.S. Army Corps of Engineers installed fish ladders on two Snake River dams to try and help the fish. Last year, of the 250,000 Snake River sockeye that made the run, only about 40 made it to central Idaho. Lewis said climate change is another factor in low fish numbers. Warmer temperatures have led to lower river flows, and dams create reservoirs where water tends to heat up. He said a federal judge recently ruled federal agencies need to reconsider dam removal as an option to save these fish. "This judge issued a scathing opinion that the federal government had repeatedly failed to do enough, including taking dam-breaching off the table as not being an alternative when clearly, it needs to be an alternative," he said. It would be the largest dam removal project in U.S. history. Lewis said the dams produce about three percent of the power on the Northwest grid, and that the region currently has a 15 percent energy surplus. But the Bonneville Power Administration said the dams play an important role at peak-demand times.

(Moving right along.)

1st Phase Of Lewisville Lake Dam Repairs Nearly Complete

September 15, 2016, cbslocal.com

LEWISVILLE (CBSDFW.COM), TX – One set of repairs at the Lewisville Lake Dam is nearing completion — but more work is needed. Stacy Gray, a project manager with the U.S. Army Corps of Engineers, says repairs on the 160-foot embankment slide that happened during massive floods in the spring of last year are expected to be complete by the end of the month. "We've been working on that for about nine months now," she said. "They are finishing final placement and should be completed by the end of this month. Then, the contractor will begin demobilization at that time."



Gray says next up is a study for modification to ensure that the more than 60 year old dam continues to perform its intended functions in the long-term. She said, "We built this dam 1948 to 1955, so it's part of our aging infrastructure system that the U.S. is working on recapitalizing." The second phase of modifications and repairs are expected to be completed by June of 2017. But in the meantime, Gray said, "This dam continues to perform exactly as it was designed to perform."

(Looks old and battered.)

Work begins to remove old dam in Mill Creek Canyon

Sept. 15, 2016, deseretnews.com

MILL CREEK CANYON, Utah — A watershed restoration project continues this fall with the removal of a dam and part of the existing boardwalk in Mill Creek Canyon. This phase of the project implements a 2015 U.S. Forest Service decision to remove the dam, reshape the stream channel and replace the boardwalk.



The dam, constructed about 1910, was once used to divert water into a pipeline that discharged through a hydroelectric plant at the mouth of

the canyon. The hydroelectric plant and pipeline have both been removed. The removal of the crumbling dam, and reshaping of the stream channel, will improve the long-term survival of the Bonneville cutthroat trout. The dam will be removed by piping water around the construction site, salvaging existing vegetation for revegetation, dredging silt from above the dam, removing the dam, reshaping the stream channel, replanting salvaged vegetation and restoring water to the new stream channel. The project is expected to take approximately two months. The road in the canyon will be open during construction, but the boardwalk, the parking areas adjacent to the construction site and the area around the dam will be closed to the public until the project is completed.

(Free money is always good.)

New grant program could provide up to \$10 million for Waterbury Dam repairs

vermontbiz.com, 09/16/2016 -- tim

Vermont Business Magazine The Senate passed an amendment Thursday introduced by Senator Bernie Sanders (I-Vermont) that would allow Vermont to apply for up to \$10 million for repairs to the Waterbury Dam, which was built in the 1930s. The amendment was included in the Water Resources Development Act of 2016, which now goes to the House of Representatives for consideration.



“The Waterbury Dam is an essential piece of Vermont’s infrastructure,” said Sanders, who serves on the Senate Environment and Public Works Committee. “Maintaining and repairing the dam has long been a priority for the state. This bi-partisan legislation is a first step in rebuilding aging dams in Vermont and throughout the United States.” Sanders’ amendment authorizes efforts to study, design and construct control gates, spillways and dam safety improvements for aging flood control reservoirs constructed by the Army Corps of Engineers before 1940. The Waterbury Dam is one of several dams in the United States that will be eligible to apply for the funds. The Waterbury Dam is located on the Little River three miles upstream from its junction with the Winooski River in Waterbury, Vermont. The dam was designed by the U.S. Army Corps of Engineers as part of a regional flood damage reduction plan for the Winooski River basin.

(Don’t think it’s a hydro dam.)

Our own low-head dam

9/17/16, journalreview.com

Yes! Montgomery County has one, right here in Crawfordsville, IN. It is about six feet high, almost 220 feet long and is always under water. It is about 75 years old. Can you guess where it is? If you said to yourself, “Just upstream from the U.S. 231 bridge, spanning Sugar Creek,” you are right! Officials at Crawfordsville Electric Light and Power believe the dam dates back to the mid to late 1930’s when the capacity of the plant dictated the need for a reliable source of water to cool the turbines. CEL&P, the first municipal power company in Indiana, owned the dam until a few years ago when the power plant along with its dam was sold to Sterling Energy Group Inc.



I have been unable to learn when, or if, Crawfordsville Energy, a subsidiary of Sterling, will make the plant a heat and power facility as originally planned. Press releases at the time of the sale stated Sterling would use clean coal technology in combination with natural gas to generate power and steam. I also couldn't find out if the dam figures in the company's future plans for the operation of the power plant. Although dams are built for various purposes that benefit society, including hydropower, irrigation, flood control and water storage, they often cause considerable harm to the rivers they span. Dams almost invariably have resulted in depleted fisheries and degraded riparian ecosystems. Obviously, they also alter a river's recreational opportunities. Over the past century, the United States has led the world in dam building. The U.S. Army Corps of Engineers has catalogued at least 80,000 dams greater than six-feet tall that are obstructing the flow of an estimated 17 percent of all the rivers and streams in our country. Former Governor of Arizona and Secretary of the Interior, Bruce Babbitt, noted that "we [the U.S.] have constructed one dam every day since the signing of the Declaration of Independence."

Indiana has fewer dams than the national average. Data compiled by the state on more than 1,100 Hoosier dams reveal that they range in height from about ten feet to more than ten stories and, on average, are about fifty years old. Seventy percent of them are privately owned. Because many dams no longer serve their intended purpose, a large number of them have been removed. As of last year, 1,300 dams have been removed in the U.S. Only two dams have been removed in Indiana: both of them were on the Eel River, a stream that rises near Fort Wayne and flows 110 miles through farmland and forests all the way to the Wabash River. After a five year long study by scientists and students at Manchester University supported by a major grant from the Natural Resources Conservation Service, dams at Liberty Mills and North Manchester were removed. The removal of the dams cost about \$120,000. Grants from the Ohio River Basin Fish Habitat Partnership and the U.S. Fish & Wildlife Service funded the project.

Since the low-head dams on the Eel River were removed in October 2012, pre- and post-removal monitoring clearly indicates that the Eel is now a healthier river. Fish in the Eel River can now move more freely, and the variety of aquatic habitats has increased. Data collected from the Eel indicates that species diversity also has increased since the dams have been removed. Aquatic biologists contend that a great diversity of species is a highly desirable characteristic of a stream. And there is no question that today the Eel River is much safer for recreational users. Here in Crawfordsville, we do know for sure that the dam restricts canoeing. A difficult portage around the dam is required to reach a safe and convenient take-out location. There is no doubt that removal of the dam would improve boating on the creek, though local anglers might miss a favorite fishing spot. Based on what we know about riparian ecology, it is most likely that removal of the dam would result in a healthier, more vital creek. At this time, the Friends of Sugar Creek believes our community would be well served by undertaking a study to determine the costs and benefits of removing our venerable, but perhaps undesirable, dam. *Aus Brooks is president of the board of the Friends of Sugar Creek.*

(Out with the old.)

Dam that caused fish kills on Pigeon River removed

By - Associated Press - September 16, 2016, washingtontimes.com

VANDERBILT, Mich. (AP) - A dam that caused numerous fish kills in a northern Michigan river has finally been removed. The Pigeon River was dammed several times since the late 1800s to help float logs, create a fishing pond and generate electric power for a yoga retreat. Operational and mechanical errors over the years allowed sediment releases that killed hundreds of thousands of trout. Scientists said the dams also caused variations in water levels and temperatures that harmed aquatic life in the blue-ribbon brook trout stream. State agencies sued the yoga retreat near Vanderbilt over the latest major fish kill in 2008. Ultimately, a



settlement was reached that called for dismantling the structure. An increase in Michigan sports license fees two years ago helped pay to remove the dam.

(The tree lost, but the old mill stays. Never plant a willow tree near your house. You can plant another kind of tree. You gotta save the dam.)

Appeals Fail, Willow Tree To Fall

By TAO WOOLFE, Sep 16, 2016, capenews.net

The willow tree that has graced the Town of Sandwich's historic district for more than 50 years will be cut down to allow a historic fish ladder and dam to be repaired at Shawme Pond, the Sandwich Board of Selectmen decreed at its meeting Thursday night, September 15. The unanimous vote came after a presentation by Kurt Staller, an engineer with Gibson-Thomas Engineering who is restoring the Lower Shawme Dam, spillway, fish ladder and stone walls behind Sandwich Town Hall. Mr. Staller said the footings of the new fish ladder will go right into the roots and severely damage the tree anyway. Mr. Staller also said the federal government and the state Office of Dam Safety recommends that no trees—or roots—be located near dams. He showed several photographs of the willow's roots coming through the existing dam walls and said the roots would eventually pop the stones out of the structure.



Although several residents turned out to protest the tree's removal at a recent hearing on cutting down the tree, only a few showed up at the selectmen's meeting. "Hopefully there will be some other alternatives. There should be some additional oversight to see if we can save the tree," said resident Daryl Crossman. "When it's gone it will change the whole complexion of how the downtown is going to look." Mr. Crossman, who is a member of the Sandwich Community Preservation Committee, said that board would not have pledged \$1.2 million to the dam restoration project if the members had known that an iconic tree would be cut down. The willow is about 50 to 70 years old, according to tree warden Justin O'Connor. Mr. O'Connor and Sandwich Department of Public Works director Paul Tilton told the selectmen the tree must be removed to allow the dam and fish pond renovations. The repair project encompasses the Lower Shawme Dam, spillway, fish ladder and stone walls behind town hall and the grist mill. The community preservation committee voted to support the \$1.2 million repair project last year and residents at Town Meeting in May also agreed to the work. The Sandwich Conservation Commission also approved the project earlier this year. Specific steps to mend the deteriorated complex include repairs of the spillway, fish ladder and inside stone wall, estimated at \$675,000; replacing the town hall stone wall, \$125,000; pressure grouting of the grist mill walls and floor, \$75,000; and the repointing of the dam stone walls, \$25,000.

(What? Build a new dam.)

Chimney Hollow dam expected to be tallest built in state in 50 years

By Pamela Johnson, Reporter-Herald Staff Writer, 09/17/2016, reporterherald.com

When Chimney Hollow Reservoir is built, the dam will be the largest constructed in Colorado in nearly half a century and the tallest ever in Larimer County. "Chimney Hollow dam will be the tallest one constructed in Colorado in the last 50 years," said Don Montgomery, the principal engineer who will design the reservoir project, drawing on experience from dams around the globe. "It will be in the order of 360 feet tall," he said, with a crest estimated at 1,400 feet long.

The tallest dam in Colorado, Morrow Point on the Gunnison River, stands 400 feet tall and was completed in 1968 — 48 years ago, according to information from Bill McCormick, chief of the dam safety branch of the Colorado Division of Water Resources.

Another dam project, expansion of the Gross Dam on South Boulder Creek, is in the permitting process, and, once complete, it will become the tallest in the state. Plans are to add another 130 feet to the 330-foot-tall structure that was built in 1955.

Locally, the two largest dams in Larimer County are at Horsetooth Reservoir and Carter Lake, which are each 220 to 240 feet tall, though each reservoir holds more water than Chimney Hollow's capacity when completed.

"It will be taller because of the formation that we're putting the storage into," said Brian Werner, spokesman for Northern Water, the district managing the project.



This aerial photo, courtesy of Northern Water, shows the area west of Loveland where Chimney Hollow will be built. Design of the project is underway and engineers say, at about 360 feet high, it will be the tallest dam built in Colorado in about 50 years. (Jeff Dahlstrom / Northern Water)

While Chimney Hollow will be the tallest dam in Larimer County, it will be about one-third the height of the tallest dam in the world, which the U.S. Bureau of Reclamation lists as the 984-foot tall Nurek Dam on the Vakhsh River in Tajikistan. The Hoover Dam, at 726.4 feet tall, was the tallest in the world when it was built in 1935 and still ranks in the top 20. Final design of Chimney Hollow will pare down the specific height and construction details for the dam, spillway, pipeline and inlets that will allow Northern Water to store as much as 90,000 acre-feet of Windy Gap Firming Project water. Northern Water, the agency coordinating the project, recently hired the Broomfield-based MWH Global with an \$11.9 million contract for engineering and design.

Montgomery, who was raised and went to college in Boulder and Larimer counties, is leading that process. He said he is excited to use the skills he has honed worldwide, working on projects on the Panama Canal and in Peru among other locations, in his home state to build a reservoir that will provide recreation that he, among many others, enjoys with his family. "To be able to bring that home is pretty amazing," said Montgomery. "To be able to help my community is pretty exciting. Once they're done, they become these great resources to the community." Chimney Hollow Reservoir is expected to be completed by 2021 to begin storing water for 13 participants including Loveland, Longmont and the Little Thompson Water District. And it will become a new recreation area managed by the Larimer County Department of Natural Resources.

The reservoir and surrounding park will be located west of Loveland near Carter Lake, Flatiron Reservoir and Pinewood Reservoir, which are all managed by Northern Water for water storage and by Larimer County for recreation. Specific recreation plans are still in the works, but Larimer County Department of Natural Resources officials are looking at a mix of camping, hiking and non-motorized boating, including paddle boats and sail boats. Campsites reachable only by boat also are in the initial plans. The design of Chimney Hollow should take about two years and will include determining the best type of structure to be built, whether it will have a clay core made from materials on site, a concrete face or an asphalt core, noted Montgomery. This will be determined by drilling, sampling and studying the area. The process will fine-tune the construction details and the costs as well as the exact height of the dam at Chimney Hollow. It will, however, be around 360 feet tall, which will make it the tallest in Larimer County. Construction of Chimney Hollow will be the biggest reservoir project in Larimer County in about six decades. Northern Water began applying for permits in 2003, and the federal government approved the project in

December 2014. Since then, the water district has been working on the rest of its needed permits. All that is left is a federal wetlands permit, which Werner expects to be approved this year. "This is the very last piece in the puzzle," said Werner. "At this point, there's nothing else. No other permits, no other agreements that we have to do. We've done it all."

(Looks like an accident waiting to happen.)

Call for in-depth inspection of Cullowhee dam

By Rex Hodge, September 20th 2016, wlos.com

WLOS — CULLOWHEE, N.C. -- An in-depth examination of the safety of the Cullowhee dam is in the works. The dam provides water for both Western Carolina University and the towns served by the Tuckasegee Water and Sewer Authority (TWSA). It was built in 1930. A preliminary study in 2005 found some erosion problems. "Some eroded areas on both ends of the dam where the dam ties into the soil structure," Dan Harbaugh, Director of the TWSA, said. Now, with a proposal for more recreation along the river, the university wants a thorough investigation done on the dam.



"The study is meant to show the potential options, the cost of the potential options, the outcome, the results of that potential option," Harbaugh said. Those options include removing the dam or modifying it with recreation and wildlife in mind. WCU Vice Chancellor for Administration and Finance, Mike Byers, said the university takes the responsibility for maintaining a safe and plentiful water supply seriously. "We continue to do routine maintenance on the Cullowhee dam as we move forward to study its long-term future, including the possibility of collaborating with other partners on a river park," Byers said. The university hopes the feasibility study can be done by the end of the year, so planning the next steps can begin in early 2017.

(Looks like a pile of rubble that probably leaked like a sieve.)

Hazardous dam removed from Grand River

By Jon Szerlag, Sep 21, 2016, fox47news.com

An 8-foot dam that was in the Grand River, MI and in deteriorating state has been removed, despite some challenges that crews encountered. The Lyons Dam, located in Ionia County was a high-hazard structure, a press release from the Department of Natural Resources states. The dam was completely removed this summer, restoring the natural river functions and allowing unimpeded fish movement. The dam was a concrete covered, rock-crib structure. The release says it was in a deteriorated state, which prompted dam safety inspections from the MDEQ to issue an emergency order to stabilize the structure earlier this summer. However, due to the cost of the repairs, it was determined removal was more feasible than repair.



The release states that the removal of the dam was complex because of several issues, including the presence of endangered snuffbox mussels. Design changes were made to reduce the project's footprint, and the snuffbox mussels were relocated before the project began. They will be monitored for a period of time after the completion of the project. Demolition was also slowed

when crews found a steel sheet pile wall that was not in the historical design documents. Even with the challenges the crew and departments faced, what is now in the dam's place is a "Newberry riffle," which looks and functions like natural rapids, the release says. The design includes a low-flow channel to allow for passage of canoes, kayaks and fish. During normal flow, small boats will be able to use the channel. "We're thrilled to finally have this structure removed from the Grand River. This river reach can now function more naturally and all species of fish can move freely through the system," said Scott Hanshue, DNR fisheries biologist and liaison on this project. "Additionally, it means great things for canoeists and kayakers who will now have a new experience to look forward to."



Hydro:

(The people who complain would be the first to sue without it.)

New fence not making good neighbors at Safe Harbor Dam

By AD CRABLE | Staff Writer, 9/19/16, lancasteronline.com

The proverb "good fences make good neighbors" does not seem to be working at the Safe Harbor Dam, PA. Anglers and

birdwatchers are complaining about a shiny 6-foot-high chain link fence that has been erected without explanation for several hundred yards at the top of the shoreline in front of the dam. The fence keeps the public from wandering from the parking area to the Susquehanna River's edge, anglers from fishing favorite spots near the dam, and birders from having unobstructed views of the river and islands. "I don't want to see that fence. No one does," Bob Sultzbach, 51, of Lancaster, complained last weekend as he fished from



river's edge near the confluence with the Conestoga River, an area that has not been fenced off. A stairway leads to that area. Steel posts forbid Sultzbach from wandering along water's edge or clambering over the steep riprap rocks on the bank and fishing closer to the dam as he has since he was a kid. The fence itself is the root of annoyance for birders such as Terry Webster, of Mountville. "The fence completely compromises the view that was available from the parking lot," said Webster, who last January saw more than 100 eagles from the spot. "True, if you jam your binoculars right against the fence it's almost like it's not there. Anyone sitting in their car will no longer be afforded any view." Birders like to have unfettered views for their powerful optics, such as binoculars and spotting scopes, and for taking pictures.

There is a widely shared belief that the fence was erected by Brookfield Renewable Energy Group, which has owned the dam since late 2014, as the result of an injury on the rocks and a subsequent lawsuit. Sultzbach said that was what he was told by a Safe Harbor employee when he asked about the new fence. But Brookfield spokesman Andy Davis told me he wasn't aware of any lawsuit, at least since the utility bought the dam. "The shoreline, which is actually the tailrace (discharge) of the powerhouse, has long been identified as a public safety risk by Brookfield," he said in an email. "Not only is the terrain very difficult to navigate and could easily cause injury, the conditions of the water are somewhat unpredictable at times. "Because Brookfield's Safe Harbor facility provides several types of generation, water levels can increase or decrease quickly with little notice. Combined with the rough terrain, these conditions could make egress very difficult or impossible.

"We continue to offer safe fishing access at the stairway on the east end of the new fence, and, of course, significant access on the stop log bridge on the downstream side of the powerhouse.

"Signage is currently being designed and placed on the fence directing individuals to these approved fishing areas." Most users remain convinced someone sued the dam sometime in the recent past and that's why the river's edge is no longer available to those who want to wander or fish or watch without a screen in front of their eyes. "It takes one person, one scenario, and it affects us all. That's the way the world works now," said Amelia Herr, of Millersville, who noticed the fence last weekend on a bike ride. Sultzbach shared similar sentiment. "If you're going to go on the rocks and hurt yourself and sue the place — that's ridiculous. That's your fault. It just takes one person to screw it up for everyone else."

(Keeping one of our PS's running. In case you wondered 107 billion gallons equals 328,371 acre-feet.)

TVA Making Dam Safety Checks at Raccoon Mountain

The reservoir at the top of the mountain contains approximately 107 billion gallons of water covering 528 acres of water surface, and the dam holding back that upper reservoir is 230 feet high and 8,500 feet long.

Sep 19, 2016, ohsonline.com

The Tennessee Valley Authority plans to begin making routine dam safety checks at its Raccoon Mountain reservoir beginning Sept. 19, causing some restricted access for visitors to the reservoir until the project is completed on Oct. 7. Dam safety checks are part of the utility's commitment to ensure all of its dams and earthen embankments continue to perform safely and reliably, according to TVA. The Raccoon



Mountain Pumped-Storage Plant is a hydroelectric facility, TVA's largest, with four generating units and a net capacity of 1,652 megawatts. Water is pumped from Nickajack Reservoir at the base of the mountain to the reservoir on top of the mountain, then released through a tunnel drilled through the center of the mountain to drive generators in the underground power plant in order to generate electricity when additional power is needed by the TVA system; the reservoir is in southeast Tennessee on a site overlooking the Tennessee River near Chattanooga.

According to TVA's online data, the reservoir at the top of the mountain contains approximately 107 billion gallons of water covering 528 acres of water surface, and the dam holding back that upper reservoir is 230 feet high and 8,500 feet long. It is the largest rockfill dam ever built by TVA.

(Up and running again.)

Historic Graue Mill in Oak Brook grinding again after repairs

By Frank Mathie, September 19, 2016, abc7chicago.com

OAK BROOK, Ill. (WLS) -- The old Graue Mill is once again grinding away again every day in west suburban Oak Brook. The mill was closed for repairs for almost a year, but now its old paddle wheel is spinning again. Let's let this paddle wheel take us back in time 164 years, spinning us away to another time when water - not electricity - was a big source of power. Power that could spin giant 2,000-pound grinding stones, turning corn into cornmeal. And it all began in 1852. "One



Copy obtained from the National Performance of Dams Program: <http://npdp.stanford.edu>

hundred and sixty four years ago they were opening these doors and the neighborhood had gained a factory for processing grain," said Rus Strahan, head miller.

Frederick Graue, a German immigrant, brought the grinding stones from France and he and his family kept them spinning for almost 70 years. The building fell into disrepair several times but now - thanks to over half a million dollars from the Forest Preserve District of DuPage County - the doors are open again and an ancient milling process is back on the job. "The corn goes in. It goes in between the stones and it's cut to a fine consistency. It comes out to the outer edge... It's spun out by the stone into the bucket," Strahan said. "Fresh corn mean it smells wonderful in here." It's not easy to make something very old seem like new but they have done it here. From the mid-1800 to the 21st century, it's been cornmeal just like great, great grandma. In 1852, Millard Fillmore was president, Abraham Lincoln was a lawyer in Springfield and it's the year that Uncle Tom's Cabin was published. And that's a part of this story, too. "The Graue family was anti-slave, so they made their mill available as a stop on the Underground Railroad," Strahan said. "So people would come in, escaping slaves at night. They would be hidden under these gears behind me during the day while at work." The spinning of the water wheel and the sound of the mill covered their arrivals and escapes - a sound that is still with us.

(It's the money that's holding it up.)

US hydropower: the potential for converting non-powered dams

20 September 2016, power-technology.com

Could the US be doing more to tap hydroelectric energy with its existing dam infrastructure? The US Department of Energy estimated in 2012 that fitting the country's non-powered dams (NPDs) with generation technology could produce 12GW of new clean energy. Rod James asks: is this potential being realised?

As many as 20,000 men made jobless by the Great Depression descended on southern Nevada to work on the project, which was pioneering both in terms of its sheer scale and the construction techniques it employed. The US today has around 2,500 hydropower plants, five of which have a higher total capacity than the Hoover Dam. Together these dams produce 51% of the country's total renewable energy output and as of 2012 made it the fourth largest hydropower player in the world, behind China, Brazil and Canada. While the 78GW of conventional- and 22GW of pumped-storage hydropower is a considerable contribution to the grid, some believe the country's hydropower potential has been far from fully realised.



When you think of hydropower in the US, the first image that's likely to come to mind is that of the Hoover Dam. As well as being the largest dam in the world at the time of completion in 1935, leading to the creation of Lake Mead, to this day America's largest reservoir, the project was perhaps the most vivid example of President Franklin D. Roosevelt's New Deal in action.

NPD represent great untapped potential

In 2012, a team at the Oak Ridge National Laboratory in Tennessee, which is owned by the US Department of Energy, published an exhaustive report titled 'An assessment of energy potential at non-powered dams in the United States'. The report, which caused quite a stir, examined the

electricity generating potential of 54,000 of the country's more than 80,000 non-powered dams which were built for tasks such as irrigation or ensuring stable navigation depths of waterways. It found that the 100 dams with the most potential could contribute around 12GW of clean energy to the mix, equivalent to a 15% increase in current hydropower output. The top ten, all found on the Ohio, Mississippi, Alabama and Arkansas rivers and their tributaries, could alone account for 3GW and the top 597 NPDs had the potential to generate more than one MW of power each. Eighty-one of the 100 largest are owned by branches of the US Army engineering corps, including each of the top ten. "The 100 dams with the most potential could contribute around 12GW of clean energy to the mix." "Many of the monetary costs and environmental impacts of dam construction have already been incurred at NPDs," says Boualem Hadjerioua, the study's principal investigator. "So adding power to the existing dam infrastructure can be achieved at lower cost, with less risk, and in a shorter timeframe than development requiring new dam construction. The abundance, cost and environmental favourability of NPDs combined with the reliability and predictability of hydropower, make these dams a highly attractive source for expanding the nation's renewable energy supply."

Generation figures are a good guide, but more research needed

Deciding whether an NPD has electricity generating potential is an uncertain science. The team immediately discounted dams under 5ft in height and those that might be considered auxiliary dams (sharing the same headwater as another, larger dam). The team then went about judging the individual potential of the remaining dams through the equation potential hydropower generation (in Mwh) equals average flow over an hour times gross head for hydropower generation times generating efficiency (an assumed 0.85). The Department of Energy acknowledge that these figures are really just a guide. Water flow measurements need to be carried out over a longer period so as to determine the characteristics of wet, dry and normal years and the report assumes that all water passing a facility can be converted into electrical energy and that hydraulic head is constant, which is often not the case. Hadjerioua also stresses that site-specific environmental factors, such as fish migratory routes and the economic rationale for retrofitting, are all factors to be considered by the dam's owners. "The assessment provides preliminary information for stakeholders, who can further evaluate the potential to increase hydropower production at NPD sites," he says. "Developers could use the information provided in the assessment to focus on more detailed analysis of sites that demonstrate a reasonable potential for being developed."

NPD transformation starting to speed up

In the years since the report was released, a number of developers have embarked on NPD retrofitting projects. The first major project in the wake of its publication broke ground in 2014, with electricity wholesaler Missouri River Energy Services looking to turn the Red Rock Dam near Des Moines, Iowa, from a flood control dam into a hydroelectric power station. Expected to be active in 2018, the plant will generate 36.44MW and could produce around 20MW more when water levels are high. "This is an expensive resource, but it's going to last 100 years," says Missouri River Energy Services CEO Tom Heller. "You can't build coal, you can't build nuclear. The only other solution is natural gas, and we are not strong believers that natural gas is a good investment for power supply."

According to the Energy Information Administration, 300MW of electricity generation capacity is expected to come online from retrofitted non-powered dams in 2016. This is compared to just 126MW between 2006 and 2015, suggesting that the projects started post-2012 are finally coming to fruition. In July, NPD conversion was given another boost by the Department of Energy when it announced it was making \$9.8mn of funding available for up to twelve projects that can produce "innovative technologies that will reduce capital costs and deployment times for pumped-storage and non-powered dam retrofits". "Adding power to these facilities can often be achieved at lower costs and in shorter timeframes than development requiring new dam construction," said the Office of Energy Efficiency and Renewable Energy in a press statement. "However, the majority of these non-powered dams have challenges such as low heads, low/varying inflows, and

environmental considerations that existing technologies are not able to overcome in a cost-effective way.”

Known as HydroNext, the grant scheme is looking for “innovative turbine/generator units that can operate at low heads and across a variety of flows can be incorporated with modular, standard designs to improve technical performance and reduce civil works costs and deployment times”.

The government is currently accepting project proposals and intends to start distributing funds this fiscal year. Although details on the bids have not been revealed, technologies such as the SLH turbine by California-based Natel give a good indication of what to expect. Unlike conventional low-head turbines, which are shaped like boat propellers or wheels, the SLH’s blades move more like the caterpillar tracks of a tank, a design that has proved more efficient in a series of low-head pilot projects. At the same time as HydroNext, the authors of the influential energy department report are working on the 'Hydropower vision report', a detailed roadmap for the development of hydropower in the US with contributions from more than 200 experts. While the 12GW that non-powered dams could contribute is a drop in the ocean of the country’s overall generation capacity, which in 2014 stood at 1,068GW, it could see hydropower become a bigger energy source than wind. It also serves as a reminder that sustainability is not necessarily about building anew, but thinking about what’s already there in a new way.

(After 103 years a little maintenance helps.)

Restoration work continues on historic Montana dam

By Chet Layman - MTN News, Sep 19, 2016, kpax.com

The century-old Hebgen Dam is getting a makeover. It's 85 feet high, 721 feet long and has survived more than a century's worth of challenges. Reporter Chet Layman recently paid a visit to the Hebgen Dam which is in the midst of a major renovation to make sure it will hold back the waters of the Madison River for another 100 years. The dam has seen much in its 103 year existence -- the 1959 earthquake that formed Quake Lake and a gate failure in 2008. NorthWestern Energy has been working for the last several years to make sure it holds tough for another 103 years. This year is the spillway reconstruction, and to meet current earthquake requirements takes reinforced concrete -- lots of reinforced concrete. "Just in the month of June alone, we placed over 1,300 cubic yards of very heavily reinforced concrete in the chute. Which exceeds the original volume of concrete in the entire original spillway from 1960," said NorthWestern Energy Senior Hydro Engineer B.J. Cope.



One major challenge to the work is the Blue Ribbon river trout fishery downstream. Maintaining that has been a primary function of this earth and concrete dam. "The Madison maintains its fishery and it's opportunities for the public again, largely because of the operation of this reservoir," said Montana Fish, Wildlife and Parks fish biologist Travis Horton.

The primary benefit of all this work is safety. Once damaged by the most powerful quake ever recorded in the Lower 48, Hebgen Dam will now take just about anything Mother nature throws its way. "This structure is designed to withstand a maximum credible earthquake for this site, which is a 7.3 magnitude earthquake with an epicenter just 100 meters from this structure," Cope said. Some repairs had to be made to the dam itself, "to know that those guys did that work in the dead of winter remotely up here with a steam shovel and mules and rail cars is just more and more impressive," Cope said. "And the original picture is kind of do a little bit of justice but the more you go out here with manpower and machinery and getting things done the more impressive it is," he added. The spillway work will be completed by end of October. The final restoration project at

Hebgen Dam is reconstruction of the outflow system. That pipe is currently 50 feet long and lined with Douglas fir logs. Work begins on that next spring.

(Important relicensing webinar.)

NHA Relicensing Summit Webinar

Wednesday, October 12, 2016, online, hydro.org

In July, NHA announced the launch of a Hydropower Relicensing Summit, which is a dual effort between NHA's Regulatory Affairs Committee and Small Hydro Council. We received a tremendous response to the industry survey, with over 50 practitioners providing insight and experience related to relicensing. We are now excited to enter phase two of the Summit process, a webinar scheduled for Wednesday, October 12, from 3:00-4:30 (Eastern).

The purpose of the webinar will be to share survey results, receive additional feedback from the industry, and provide an outline and set expectations for the in-person, industry-only Summit on November 15-16, in Washington, D.C.

Webinar Details & Information

- Date & Time: Wednesday, October 12, from 3:00-4:30 (Eastern)
- Registration: The webinar is free, but registration is required. You will be sent call-in details prior to the actual webinar. You can register here.
- Attendance: Throughout the entire Summit process we are encouraging broad and diverse participation. Therefore, the webinar is open to NHA members and non-members alike licensees/owners, consulting firms, law firms, manufacturers, and other practitioners in FERC relicensing.
- Other:
 - We encourage webinar participation regardless of whether you responded to the survey.
- Participation in the webinar is strongly encouraged but not required to attend the industry-only Summit in November.



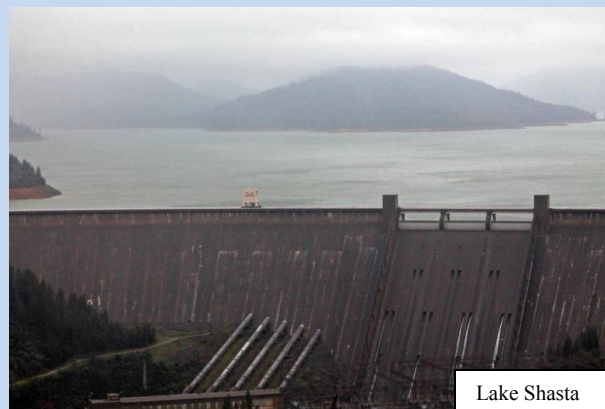
Environment:

(Doesn't think dams are the only answer.)

California must invest in watersheds, just like dams

By John Chiang, Special to The Bee, sacbee.com, SEPTEMBER 19, 2016

To support our prosperity and growth, California needs to expand its investments in our physical and natural infrastructure. This is particularly apparent as climate change puts stress on our ability to provide safe, clean water. One of the bills awaiting Gov. Jerry Brown's decision stands out as a common-sense measure that would help secure California's future water needs. Assembly Bill 2480, by Assemblyman Richard Bloom, D-Santa Monica, would require formal recognition of the five watersheds that feed Northern California's primary reservoirs as state infrastructure, just like the state's dams, canals and levees.



Lake Shasta

These watersheds provide the vast majority of the water for the State Water Project, supplying drinking water for more than 25 million people, irrigation for 8 million of acres of farmland and 85 percent of the water to San Francisco Bay.

California has policies and systems to maintain built water infrastructure. However, the state has no systems for protecting and maintaining our natural water infrastructure, which is essential to providing clean, plentiful water. The health of the land that surrounds California's rivers, lakes and streams is critical to a secure water supply, but is in decline due to development, drought and inconsistent land-management practices. AB 2480 seeks to make sure this land is protected and maintained. A key question is always the cost of such endeavors. The new law would apply modern infrastructure financing approaches to the repair and protection of watersheds. It also would respond to two of the state's top priority needs identified in the State Water Action Plan: providing for source watershed enhancement and for new financing approaches to enhance our water reliability, quality and supply. My report outlines the critical need to assess our infrastructure maintenance needs and develop financing approaches to address the backlog of investment. We also need to expand the financing options available to make those investments. We cannot afford to continue to rely on general obligation bond funding to meet our state's infrastructure needs. I can attest to the benefit of accessing cost-effective financing options such as revenue bonds and the federal government's newly established Water Infrastructure Financing and Innovation Act. AB 2480 does this, without raising costs for either the state or ratepayers. Those decisions can be made after deliberate discussion and in the context of future state budget planning.

Improving the condition of our watersheds – especially those that provide water for drinking and irrigation – is the least costly approach to enhancing water reliability while also improving the timing and quality of water flows. AB 2480 was crafted independently of last week's State Water Resources Control Board proposal to update water quality and flows in the southern Delta, but can still complement it. The bill is a critically important response to the challenges of our changing climate. Californians can agree that enhancing our water security is a good idea. I urge the governor to sign AB 2480. It will enhance our water security and help ensure more reliable, cleaner and likely more water as our weather patterns change.



Other Stuff:

(The biggest of everything at Three Gorges.)

World's largest shiplift starts operation at China's Three Gorges Dam

Source: Xinhua | September 18, 2016, Sunday | ONLINE EDITION, shanghaidaily.com

THE trial operation of a permanent shiplift on the Three Gorges Dam in central China's Hubei Province began Sunday. The shiplift, designed by a Chinese and German team, is the largest and most sophisticated in the world, according to the China Three Gorges Corp., a state-owned company responsible for the construction of the Three Gorges project. The beginning of its trial operation marks the completion of the Three Gorges project 22 years after construction on



the mammoth project began, said Zhang Shuguang, assistant general manager of the corporation. The vertical-hoisting elevator is designed to help small and medium-sized ships, with a maximum displacement of about 3,000 tonnes, to traverse the dam. The water level behind the dam is up to 113 meters higher than the downstream river.

The shiplift is equipped with a ship-chamber, which has a pool of water 120-meters long, 18-meters wide and 3.5-meters deep. The chamber, its mechanical systems and the water weigh 15,500 tonnes altogether. The shiplift has been installed to complement the five-tier ship lock next to it, which is also the world's largest and has allowed ships to pass through since 2003. The ship lock is running at full capacity, with its cargo throughput standing at 119.6 million tonnes in 2015, compared with 34.31 million tonnes in 2004. The increase has been attributed to the booming water transportation sector in the mountainous regions of the Three Gorges, including the southwestern municipality of Chongqing. It used to take ships about three to four hours to pass the dam via the ship lock. The shiplift will cut this time to about 40 minutes to one hour. Construction of the shiplift began in 1994. Due to technical difficulties, the project was put on hold in 1995. Construction resumed in 2008. The Three Gorges project is a multi-functional water control system. Its functions include flood control, transportation and power generation.

(Always said olive oil is good for everything.)

Olive Oil Saves Guy Stuck Trying to Retrieve Phone

He was caught head first between rocks as the tide was coming in

By Newser Editors and Wire Services, Sep 18, 2016, newser.com

NEWSER) – A man who got stuck head-first between two rocks on a Rhode Island jetty while trying to retrieve his cellphone has been rescued with the help of olive oil, reports AP. The strange incident happened Saturday afternoon near a fishing area in Point Judith, reports WJAR-TV. Authorities say the man dropped his phone and got stuck up to his chest when he bent down to retrieve it.

Narragansett firefighters and environmental police spent most of the afternoon trying to free him before the tide came in. After about 2½ hours, they were able to remove him with the help of olive oil. The man went to a hospital to be treated for hypothermia and a small injury to his foot. Fortunately for him, he has not been identified.



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