

5/8/2020



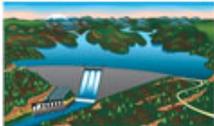
# Some Dam – Hydro News™ And Other Stuff



**Quote of Note:** *“The only difference between a tax man and a taxidermist is that the taxidermist leaves the skin.” - Mark Twain*

**Some Dam - Hydro News → Newsletter Archive for Current and Back Issues and Search:**  
(Hold down Ctrl key when clicking on this link) <http://npdp.stanford.edu/>. After clicking on link, scroll down under Partners/Newsletters on left, click one of the links (Current issue or View Back Issues).

**“Good wine is a necessity of life.” - -Thomas Jefferson**  
**Ron’s wine pick of the week: 2016 Alta Mora Italy (Other Regional Reds) "Etna Rosso"**  
**“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson**



## Dams:

What’s there to celebrate? Look at photo of so-called dam.)

### **Celebrating Earth Day with a dam removal**

Staff Report, April 19, 2020, reformer.com

LONDONDERRY, VT — To celebrate the 50th anniversary of Earth Day, Connecticut River Conservancy (CRC) will remove an old dam on Thompsonburg Brook this summer. The dam removal will open five miles of stream habitat for native brook trout and other aquatic species. The project is a joint effort between CRC, the Vermont Fish & Wildlife Department (VFWD), the U.S. Fish & Wildlife Service (USFWS), and Magic Mountain (dam owner). CRC recently received a \$9,500 grant from VFWD to help fund the removal. CRC officials say local economies and local rivers benefit from removing old dams that no longer serve a useful purpose - also known as deadbeat dams.



"We're thrilled that our river restoration work can help boost the local economy during these difficult times," Ron Rhodes, CRC's project manager for this dam removal, said in a statement. CRC hired Vermont engineering firm Dubois & King for project design plans, funded by VFWD and USFWS. Removing dams helps restore natural stream flows, allows sediment to move downstream, reduces water temperatures, improves clean water, and allows for aquatic organism passage, according to CRC. In this case, brook trout that live in the West River can seek refuge in Thompsonburg Brook during warm summer months and use the reopened habitat for spawning in the fall. The dam on Thompsonburg Brook is believed to have been built in the 1980s and is about 2.5 miles upstream from the confluence with the West River. The site of this river restoration project is owned by Magic Mountain, just off Route 11 in Londonderry.

"Magic Mountain is proud to partner with CRC, USFWS and state of Vermont to enhance the tributary system feeding into the West River which is a great natural resource here in southern Vermont," noted Geoff Hatheway, president of Ski Magic LLC. Rhodes praised the team effort in making this project happen: "This will be our 13th dam removal since Tropical Storm Irene and every single project requires a willing dam owner and a long list of dedicated partners and contractors to ensure a successful outcome. We are proud of the partnerships we have been able to forge over the past decade that have resulted in nearly 350 miles of stream being restored and opened to fish passage."

"The VFWD is excited to be part of the team supporting the CRC's efforts to remove this non-functioning dam on Thompsonburg Brook," said Will Eldridge, aquatic habitat biologist with VFWD. "This dam blocks upstream access to great habitat for cold-water fish like brook trout. Restoring access to this habitat will allow fish and other aquatic organisms to move freely throughout the brook." "Each time we remove an old dam, replace a bridge or culvert in the Connecticut River watershed, it has far-reaching benefits to the wildlife and people that depend on it. We are pleased to be a part of the team helping to remove this dam," said David Sagan, private lands biologist with USFWS. The Connecticut River Conservancy collaborates with partners across four states to protect and advocate for the rivers, to educate and engage communities.

(Lucky to be alive!)

### Officials with the East Fork Fire Protection District says three teens were rescued after jumping off the Power Dam on Friday.

Apr 24, 2020, ktvn.com (Florida)

They said the teens got trapped at the base. Officials said one was taken to the hospital with minor hypothermia symptoms. They want to remind residents that although the weather is getting nicer, you should still find safe places to swim.

(Pretty cool!)

### Sights and Sounds Drone Edition: Marion Dam

By Corey Adkins, April 24, 2020, (Michigan)

For this week's drone Sights and Sounds we're taking a low altitude flight over the spring run-off at the Marion Dam in Osceola County. Here's video:

<https://www.9and10news.com/2020/04/24/sights-and-sounds-drone-edition-marion-dam/>



(HUH! Fat chance of this happening. They want this since they didn't get the answer they wanted.)

### Dams: For collaborative path

By Letters editor, April 24, 2020, seattletimes.com

## Opinion: Re: “Electric utilities and conservation groups unite to seek solutions for Columbia River Basin dams” [April 17, Opinion]

As outlined in the Op-Ed, Northwest residents and business owners want to chart a new course for Lower Snake River dams to save endangered salmon. So do our regional governors. This is abundantly clear in their response to the wholly inadequate dam management options in the Columbia River System Operations Draft Environmental Impact Statement (DEIS).

Gov. Jay Inslee notes the plan falls short of Washington’s expectations to restore salmon and calls for an “active, collaborative, and visionary regional conversation.” Oregon Gov. Kate Brown is equally clear. The proposed plan “will not meet the expectations and needs of the citizens of Oregon and the region, nor provide adequate protection for salmon and steelhead ...” She adds: “This vision of the future can only be realized with leadership from and strong collaboration with the four states (Oregon, Washington, Montana and Idaho). Govs. Inslee and Brown are both right. If we want real solutions, we must go beyond the recommendations put forth in U.S. Army Corps of Engineers’ DEIS. We are heartened by Govs. Inslee and Brown’s leadership and support them in forging a collaborative path forward. Tom France, Seattle, regional executive director, National Wildlife Federation.

(Tailings dams are finally getting attention.)

### Montana's tailings-dam regulations are global model

BY MATT VINCENT, Apr 23, 2020, mtstandard.com

On August 4, 2014, the tailings dam at the Mount Polley mine in British Columbia breached and spilled millions of tons of mine waste into local waterways. Helicopters from the Cariboo Regional District and various media buzzed over the widespread damage, capturing the aftermath on video. The moment she saw the video, Tammy Johnson, executive director of the Montana Mining Association, knew something had to be done. Ever facing scrutiny and criticism from environmental groups and outdoor recreation advocates, the mining industry in Montana needed to do not just something, in Johnson’s opinion. It needed to do everything it could to prevent a disaster like Mount Polley from ever happening. The director immediately convened her membership and suggested what at the time seemed unfathomable.



“I think we ought to regulate ourselves,” Johnson recalled telling them. “Or else we’re going to have to let someone else do it for us, and we’re not going to like that.’ I thought I was going to get kicked out of the room.” Then she showed them the video. “Eventually, everyone realized it was the right thing to do. No one wanted to be responsible for what we saw on that video.” Over the next several months Montana’s mining leaders produced the most progressive and comprehensive draft of standards for tailings storage facilities its industry had seen to

date. The process was onerous and tedious, but worthwhile. “We pulled from everywhere, the best of everything we could find,” explained Mark Thompson, who was president of the MMA at the time and who’s now in charge of environmental affairs at Montana Resources. The Montana team reviewed tailings standards and regulations from all over the industry. They consulted experts and regulators from near and far. They looked at the technical report issued by a team of independent experts who were hired to review the Mount Polley failure. They had the independent experts look at their draft and suggest revisions, which were made.

Once they had a solid revision, they turned it into a draft bill and entered into the political arena of the Montana Legislature. Senator Chas Vincent from Libby sponsored the industry's bill, Senate Bill 409 (SB409), and lauded it as "a proactive Montana solution to protect the environment and mining jobs." The legislation laid out cradle-to-grave management priorities for tailings storage facilities in four bullets governing their design, operation, monitoring and closure:

- Meets state-of-practice engineering design standards;
- Uses applicable, appropriate and current technologies and techniques as are practicable given site-specific conditions and concerns;
- Provides protection of human health and the environment; and
- The regulation of tailings storage facilities is not prescriptive in detail but allows for the adaptive management using evolving best engineering practices based on the recommendations of qualified, experienced engineers.

These management priorities were ensured by requiring an experienced Engineer of Record for each operating mine with a tailings storage facility. Further, each one must develop a document known as a "TOMS," or Tailings Operations, Maintenance and Surveillance manual, which lays out responsibilities for all aspects of the tailings facility's management, including an emergency response plan. The engineer must certify the manual as well as inspect the tailings facility and review compliance with the manual annually.

For any new or expanding mines with tailings storage, there are even more stringent safeguards that apply. Those mines must create an independent review panel of three licensed engineers who are recognized experts in tailings-storage facilities. The panel is paid by the mine to oversee the work of its Engineer of Record, from design to closure. Further, any new or expanded tailings storage facility must include a design analysis of over 30 detailed items, site specific to each applicant. The design analysis assumes the most extreme consequences if the dam were to fail and includes but is not limited to the TSF's ability to withstand maximum credible earthquakes and maximum probable floods. Under Montana's regulations, "All (tailings facilities) are classified as extreme (in terms of) consequences of failure," explained Dr. Dirk Van Zyl, a world-renowned mining and tailings expert from the University of British Columbia. "It's very conservative and I think it's appropriate." Van Zyl served on the Mount Polley review board and is a current member on two IRPs in Montana. He's also a prominent voice in global tailings conversations. As a result of the Mining Association's work and the work of Sen. Vincent, the bill passed almost unanimously. Even more exceptionally, the new regulations were even praised by the industry's usual and most vocal opponents. A conservation director with Montana's Trout Unlimited described SB409 as "almost a perfect bill," while the Montana Environmental Information Center hailed the bill as "a victory," listing it among the good bills that passed during the 2015 legislative session. Governor Steve Bullock signed the bill in May of 2015. As fate would have it, Thompson was the first mine manager to shepherd the industry through how the new Montana law applied to a tailings storage expansion – for Montana Resources' Yankee Doodle Tailings Impoundment. Johnson described Thompson's going first as fortuitous. "I don't know if the revelation that he was going to be first was on his radar screen, but we couldn't have picked a better one. He knew (the law) from top to bottom."

Almost five years old now, Montana's law has worked even better than intended. Mines have not only complied with the regulations, but most operations have gone above and beyond. "Even though we're not required to have an IRP looking at our existing facilities, we do anyway," said Matt Wolfe, environmental manager at Sibanye-Stillwater's East Boulder platinum and palladium mine. "Even though we're not required to have a TOMS manual for our existing facilities, we do anyway. Because those are the best practices in the industry. We've adopted the best practices in the industry."



Another example of how the new law has improved operations, Wolfe explained, is the vast increase in automated monitoring employed as a result of the EOR and IRP's expertise. Instead of physically monitoring a dozen survey monuments on its TSF once a month, Sibanye-Stillwater now has automated GPS sensors, which survey each point every 30 minutes and reports data in real time via a computer control system. "If there was ever any movement, you'd see it almost Mount Polley failure immediately," Wolfe said, which would then trigger email and text alarms to personnel. Montana Resources also has seen similar improvements in both the technology and the number of monitoring points it employs at the YDTI. There were less than ten monitoring points in the embankment prior to 2012. Today, there are over 100 points established, all of them monitored remotely in real time.



For critics of the industry who may question the actual independence of the required IRP members, Van Zyl offered the following assurance. "Both of the IRPs that I am on, our attitude is that we're working for the people of Montana. We are not working for the regulators. We are not kowtowing to the companies or what the consultants say. Often we insist on adding quite a bit of work and so far, both Stillwater and MR have been very accepting." Unfortunately, many other places in the world did not act as Montana did in the face of the Mount Polley incident. While industry standards continue to improve, many regulatory jurisdictions, especially those in developing countries, leave adoption of these best practices up to the individual mining companies. As a result, two of the worst disasters in modern mining history have occurred after Mount Polley. Less than 80 miles apart from each other in the Minas Gerais district of Brazil, two tailings dams at iron mines collapsed in separate, devastating events that killed people and wreaked environmental ruin in both cases. The first dam collapsed in November of 2015, known as the Mariana disaster in which 19 people were killed. One of the mine's owners, Vale SA, proclaimed as part of a commitment to reform its safety standards, "Mariana, Never Again!" But in January of 2019 a 282-foot high tailings dam at Vale's Corrego de Feijão mine liquefied and collapsed. The cataclysmic event, which was also captured on video, unleashed millions of tons of mining sludge in an explosive wave on top of the unsuspecting residents of the small town of Brumadinho. More than 250 people died and people are still missing. As a result, the former CEO of Vale and 15 others are currently under criminal investigation.

The Global Tailings Review was begun shortly after the disaster at Brumadinho. GTR is a carefully crafted collaboration of the International Council on Mining and Metals, the United Nations Environment Programme and the Principles for Responsible Investment. It is a comprehensive effort by multiple stakeholders to create an international standard for the design and management of tailings storage facilities to prevent such catastrophic failures. Part of the Global Tailings Review's governance includes a seven-member expert review panel. Dr. Van Zyl is one of the GTR expert panel members and said he has referred to the Montana regulations often. Partially as a result, one of the tenets in the newly proposed standard is to classify all new facilities as extreme. This has received significant pushback from some members of the industry yet praise from a number of others in the NGO and public sector. Independent review boards are also a requirement of the global standard — another shadowing of the Montana law. "To me, the concepts of being a very high standard of design and the expectation of independent, expert review are two places where Montana led the way, definitely in the U.S. and also the world," said Van Zyl. "This is something that is not general knowledge to everybody but should be recognized."

The GTR released its initial draft of standards in September of 2019 and spent the rest of the year consulting with stakeholders across the globe in forums, both virtually and in person. Consultations were delivered in seven different languages. After considering input from these venues, the GTR initially expected to release a new international standard sometime in the second quarter of 2020. But the COVID-19 pandemic has compromised those plans. On its

website, GTR chairman Dr. Bruno Oberle stated “due to the challenges, both personal and operational, that we are all facing as COVID-19 spreads across the globe” that he and the co-conveners had taken the decision to delay the final standard’s publication. “At this state, we cannot predict when this will be, but we will ensure to keep our stakeholders up to date.” Whenever the standard is finally released, folks in Montana can be proud in knowing that the leadership of its own mining industry had something to do with it. Matt Vincent, former Butte-Silver Bow chief executive, is a private consultant. Montana Resources is one of his clients.

(Good advice.)

### **If the water’s brown, turn around**

BY JACK SPAULDING; SPAULDING OUTDOORS, Apr 29, 2020, batesvilleheraldtribune.com

As the spring days warm, kayakers and canoeists will be flocking to Indiana’s rivers and streams for some time on the water, paddle in hand and enjoying Mother Nature. Nothing is more pleasurable and relaxing than a cruise down a favorite stream or river, but danger waits for the inexperienced in regards to high water and spring runoff. High water can turn the most placid stream into a raging torrent with impassable rapids and dangerous “sweepers.” Running a river or stream during high water may sound exciting and challenging, but it is a fool’s outing.

Downed trees across the river or stream channel are called “sweepers.” The limbs sweep up canoes and kayaks, flip them over and pin the occupants under water ensnared in the branches. An encounter with a sweeper leaves little chance for escape even for the most experienced. Another grave danger on Indiana rivers are low head dams. They are structures built to back up water and have water flowing over them. On the downstream side of the dam are powerful rolling currents which grab boats and occupants in a continual push back toward the wall of the dam. Many years ago, I lost a good friend who was a conservation officer in charge of a river rescue practice operation for the Indiana Department of Natural Resources Law Enforcement Division. First Sgt. Karl Kelley died from injuries suffered during a training exercise on the East Fork of the White River at the Williams Dam in Lawrence County.

A boat containing two other conservation officers had overturned in turbulent waters; and when Kelley and another conservation officer attempted a rescue, their boat capsized as well. Years ago, there was a rescue/recovery operation on Big Flatrock River when a young man attempted to run the river when it was high and out of its banks. The boat he was in capsized, and his body wasn’t found for several days. In searching for the body, Indiana Conservation Officer Dean Shadley and a close friend of mine, Tim Kuhn, retrieved the body from a large growth of willow trees well over a mile from where the boat capsized. Running high water is no place for adventure. My advice is wear your personal flotation device and don’t attempt to navigate a swollen river or stream. If the water is high and brown, turn around – don’t drown.

(Doesn’t look like an overtopping failure. I’m putting my money on piping.)

### **Uzbek Dam Bursts, Forcing Evacuation Of Thousands Of Villagers**

**Uzbek officials say the breach has weakened the structure and they fear it could cause the entire dam to collapse.**

By RFE/RL’s, Uzbek Service, May 01, 2020, .rferl.org

A recently built dam in Uzbekistan has burst, sending water rushing toward villages on the floodplain downstream from the Sardoba Reservoir in the eastern region of Sidaryo. Authorities say 11,600 villagers were evacuated on May 1 after the dam on the Sidaryo River developed a breach at about 6 a.m. local time.

Video footage obtained by RFE/RL shows a gap in one section of the 29-meter-high (95ft.) concrete [don’t think this is right, it looks like an earthfill dam] structure and a torrent of water rushing toward the nearby villages.





Uzbek officials told RFE/RL the breach had weakened the structure and they feared it could cause the entire dam to collapse. Uzbek President Shavkat Mirziyoyev visited the site on May 1 after the evacuation of the flooded villages began. RFE/RL's Uzbek Service reports that construction of the Sardoba Reservoir dam by Uzbek state builders began in 2010 and was completed in 2017. Uzbekistan also has signed a \$23 million contract with China for the construction of a hydroelectric power station at the site of the dam. The Chinese hydroelectric project had been scheduled for completion in 2022.

(Dam Failures are not good anywhere.)

## Uzbekistan: 70,000 evacuated after dam wall collapses

Hundreds of houses flooded after dam wall partially collapsed due to heavy rain

By Bahtiyar Abdulkerimov | 02.05.2020, aa.com.tr

TASHKENT, Uzbekistan - Some 70,000 people have been evacuated from eastern Uzbekistan as hundreds of houses were submerged under waters from a collapsed dam, said government officials on Saturday. Agricultural lands and some residential areas in the region were flooded, hundreds of houses were damaged, and 56 people were injured in the Sirdaryo region after the Sardoba Dam partially collapsed due to heavy rain, according to Murod Sadikov, spokesperson of the Ministry of Emergency Situations. Rescue efforts in the region continue, and the water flow was redirected to local rivers. Speaking at the scene, President Shavkat Mirziyoyev said all necessary steps will be taken to address the situation. Completed in 2017, the Sardoba Dam, which has a water capacity of 922 million cubic meters, is used for irrigating agricultural lands in the provinces of Sirdaryo and Jizzakh.



(Don't usually use articles about foreign projects except when there's a dam failure.)

## Uzbekistan: Dam breach sends thousands running for safety

Security services have begun investigating possible violations during construction.

May 3, 2020, eurasianet.org

A burst dam in the Uzbekistan's Sirdaryo region late last week has flooded thousands of homes and sent water rushing into villages in neighboring Kazakhstan. No fatalities have been reported. The breach occurred on May 1, just before 6 a.m., when heavy rains and stormy winds caused the Sardoba dam wall to collapse partially. Officials warned that the dam was critically weakened and could crumble altogether, but that workers have been dispatched to shore it up. The General Prosecutor's Office said on May 3 that they have filed criminal proceedings over the incident for suspected violations of safety precautions during construction of the Sardoba reservoir, which was completed only three years ago. Investigations are being carried out by the State Security Service.

Emergency services personnel have so far evacuated 70,000 residents to safer ground. Media showed images of helicopters rescuing people trapped on their roofs by the rising water.

Evacuated citizens are being housed in schools and colleges, while some have been taken in by relatives. Although nobody is believed to have died in the flooding, at least 56 people are being treated for injuries at hospitals. President Shavkat Mirziyoyev flew by helicopter to the scene of the disaster within hours. State television news showed him meeting with residents affected by the flood and inspecting damage at the Sardoba reservoir. "Not one person will be left uncared for. We will organize places and suitable conditions for people to live, building will begin," he said in televised remarks. Officials have said leaks in the dam have been stemmed and more construction material is being dispatched to the scene to ensure the stability of the dam. Overflowing water has been redirected to a lake in the nearby Annasay district.

The incident has affected areas as far as Kazakhstan's Turkestan region, where 5,400 people have been evacuated from their homes, according to the Kazinform news agency. As part of measures intended to minimize the risk of a total collapse of the Sardoba reservoir, regional officials in Sirdaryo gave orders for water to be discharged, which led to that excess water causing overflows at in downstream reservoirs in the Maktaaral district of Turkestan region. Sardoba reservoir is 29 meters (95ft.) deep and designed to hold up to 922 million cubic meters of water. Construction began in 2010 during the rule of the late President Islam Karimov, but oversight for the project was entrusted to Mirziyoyev, who was then the prime minister. The project was completed in 2017. In May 2017, Uzbek state television broadcast reports of Mirziyoyev visiting the soon-to-be-completed reservoir and inspecting the works from a boat. The reservoir was intended to provide irrigation to farms in the Sirdaryo region, but there were also many other plans for the infrastructure. The government had intended to develop a fishing industry there.

And at the end of April, construction had started on a small hydroelectric power station being funded with \$23.6 million in loans from Russian lender Roseximbank. That plant was to be completed by 2022. Rains and winds had buffeted the Sirdaryo and Jizzakh regions for the best part of a week. On April 30, two children, a girl and a boy, born in 2006 and 2011, respectively, were killed when they were carried away by a mudflow as they were crossing a bridge on their way to the store. The flooding has occurred just as Uzbekistan's health and emergency response structures are under the strain of coping with the COVID-19 outbreak. That crisis, however, appears to be under relative control, going by official figures. The Health Ministry said on May 3 that they had detected nine new cases of the coronavirus, taking the total number of cases to date to 2,127. More than half of that number is said to have recovered.

Had lunch here a while ago, near Denver, CO. Great name!

<https://local.summitdaily.com/dillon-co/dillon-dam-brewery-970-262-7777>

(Dam failures everywhere!)

## Death After Dam Breaks Banks

By JOHN MBATI, 2 May 2020, kenyan.co.ke

**Over 400 families are breathing a sigh of relief, despite their homes being swept away by floods, as they managed to narrowly escape death after a dam (Marumanet) in Ndabibi, Naivasha burst and spilt over.**

In a report aired by KTN News on Saturday, May 2, that the incident occurred at midnight on Friday, May 1 and the water spillage destroyed property worth millions was destroyed. The roads in the area, 60 km (37.3 miles) from Naivasha Town were also destroyed as 10 people were reported missing.



"We heard running water and upon stepping outside, we found that trees and our crops were being carried away. We then alerted our neighbours downhill who also rescued themselves," one resident stated. "We found ourselves surrounded

with water and our cattle were immersed in water," another resident lamented as many others urged the government to offer aid. Area MCA Gathariki Kamanu affirmed that his office had initiated a headcount as they offered more safety directives. "We asked them to move to higher grounds," the MCA stated. Citizen TV on Saturday, May 2, added that a woman was forced to deliver by the roadside in Nanyuki County, after heavy rains made the roads impassable, hindering her from accessing services at the nearest health centre. On Friday, May 1, Nanyuki residents demonstrated after the incident occurred. They planted bananas stems on the road as police watched them protest, ready to dispel the crowd if the demonstrations turned rowdy. "The roads are impassable ever since the rains started. Some who were attending a burial service could not do so," one resident cried out as they pleaded with Nanyuki Governor Ndiritu Muriithi to develop roads in the region



**DILLON DAM BREWERY**

**30% Off All Take Out & To Go Beer!**  
**+\$4 Crowler 32oz Cans 3-6 pm!**

Burgers, Appetizers, Salads, Pub Favorites, Desserts, Kids  
6 Packs, Crowler Cans, Bombers, Growlers, Kegs

.....

**Call 970-262-7777 ~ 3-8 pm**  
**Fast Curbside Pickup**

.....

**More Specials on Instagram & Facebook**    
**Poker Card with Order ~ Win Future Prizes**

100 Little Dam Street, Dillon - (970) 262-7777 • dambrewery.com  
**LARGEST BREWPUB IN THE COLORADO ROCKIES**

4/30/20



## Hydro

(Hydro owners are the only people that smile when it rains.)

### **Wet Alabama winter and spring mean more hydro energy for customers**

By Stacy White, April 27, 2020, [alabamane.wsnewscenter.com](http://alabamane.wsnewscenter.com)

Strong storms in April have added to the above-average rainfall in Alabama this year. Those rains boosted the amount of low-cost, renewable hydro energy going to serve Alabama Power customers. "This period has been record-setting for rainfall in many areas of our state, particularly the rains we experienced in February," said Alan Peeples, Alabama Power Reservoir Management manager.

Since Jan. 1, Alabama statewide has received an average 33 inches of rainfall, compared to a normal of around 19 inches. More than 12 inches fell across the state in February alone.

Through mid-April, more than 31 trillion gallons of water have come through the company's 14 hydro facilities on the Coosa, Tallapoosa and Warrior rivers. Because of the abundant rainfall, hydro energy production this year is double what was originally estimated for the time period.



Hydro power generation is one of the most cost-effective sources of energy but is dependent on the amount of water available. The above-average rains mean more low-cost, renewable hydro energy to serve Alabama Power customers. It helps reduce the amount of more-costly energy sources needed to meet demand. "Through every heavy rain episode this year, our teams have

successfully managed our resources with safety as the top priority,” said Herbie Johnson, Hydro Services manager. “They plan and prepare to make sure our hydro assets run efficiently and, most importantly, safely.”



The winter and spring rainy seasons are busy times for the company’s Reservoir Management group. “Last year we had an extremely wet winter and spring, and this year has been wet as well,” Peeples said. “We are a small group of engineers managing the water for Alabama Power lakes, so the rainy seasons can be challenging.” “We’ve worked extra hard for many hours this year to manage the lakes during a record-setting wet winter – and this spring has been much of the

same,” said Christy Nix, lead principal engineer for Reservoir Operations. “It’s rewarding to see how these periods of heavy rains have been successfully managed for the benefit of customers, and how everyone on the team played a role in that success.”

(Now this is what a brewery should look like.)

Gull Dam Brewing as it looked before its opening in 2014 on Smiley Road in Nisswa at the former Werneke Water Wheel Center property. (Kelly Humphrey, Brainerd Dispatch)



(Water quality standards are hard to meet, when they want to kill a project.)

### Bell rings for next round in dam license fight

By Stephen Rappaport on Environment, News, April 30, 2020, ellsworthamerican.com

ELLSWORTH, Maine — In March, the Maine Department of Environmental Protection denied a request by Black Bear Hydro Partners for a water quality certification (WQC) under the Clean Waters Act.

The certification is critical to the company’s pending application for new licenses to maintain and operate the two Union River dams — one at the lower end of Graham Lake and the other forming Leonard Lake — known as the Ellsworth Hydroelectric Project. In its decision, the DEP



ruled that the project “will not result in all waters affected (the two lakes) being suitable for all designated uses and meeting all other applicable water quality standards.” On April 17, the company appealed the DEP’s action and asked the Maine Board of Environmental Protection to hold a public hearing on its application. Black Bear asked the board to “(w)ithdraw the WQC Denial and issue a WQC finding that (1) Leonard Lake meets the applicable ... water quality standards and (2) the Union River between Graham Lake and Leonard Lake meets applicable aquatic life and habitat criteria.”

According to the company’s Notice of Appeal, the DEP’s denial was “unsupported” by either Maine law or the department’s “course of conduct,” failed to consider all the data and information presented by Black Bear in its certification application and was “incorrect, arbitrary and capricious.” Without the required certification, it will be virtually impossible for the Federal Energy Regulatory Commission to approve new licenses for the dams. “This appeal from Brookfield does not come as a surprise,” Dwayne Shaw, executive director of the Downeast Salmon Federation, said in an email Monday morning. Black Bear, the company that operates the dams, is a part of

the Toronto-based Brookfield Renewable Energy Group. “The Maine DEP’s denial of Water Quality Certification was the right thing to do and is supported by Maine Water Quality law and the scientific data provided by Brookfield themselves,” Shaw said. “Some of the arguments in the appeal amount to asking for an increase in the speed limit after being pulled over and admitting to speeding.” Under the Clean Water Act, state waters are divided among several classes, based on measurements of several environmental factors, for the purpose of determining what activities may be allowed on a particular water body and how those activities must operate to maintain particular water quality standards.

Black Bear advanced two main arguments in support of its appeal. The first was that DEP misclassified Leonard Lake and applied the wrong standard for the required level of “dissolved oxygen” (DO) in its waters. Dissolved oxygen is a significant measure of the capacity of a body of water to sustain a healthy ecosystem for aquatic species including fish, plants and microorganisms that may be part of the food chain. DEP also ruled that, because of the project’s impact on the “benthic macroinvertebrate community,” tiny, bottom-dwelling aquatic animals and insect larvae in the water or burrowed into the bottom, Graham Lake and the section of the Union River that flows between the Graham Lake Dam and Leonard Lake “will not meet all applicable habitat and aquatic life standards.”

According to the National Institutes of Health, such benthic communities “are often used in biological monitoring programs to evaluate the ecological status of rivers” and serve as a way to measure the impacts of anthropogenic (human) activities. Black Bear argues that DEP failed to give “due consideration” to all the information and data the company presented as to how its hydroelectric project would operate in the future. Because of that failure, the company says the DEP decision was “incorrect” and should be overturned. In its application to FERC, the company has said it will reduce fluctuations in water levels at Graham Lake that often leave acres of mudflats exposed, and improve up- and downstream passage over the Leonard Lake dam for species such as alewives and eels which have suffered substantial injuries and deaths as the emigrate from the fresh water above the dam to the sea. “As Brookfield continues to delay the outcome of this relicensing we know that fish kills will continue,” Brett Ciccotelli, a fisheries biologist at Downeast Salmon Federation, said Monday. “Brookfield needs to change how it does business on the Union River.” As of Monday, the Board of Environmental Protection had yet to schedule a hearing on the Black Bear Hydro appeal.

### Countries That Use the Most Hydroelectric Power

%	Country	%	Country
100.0	Lesotho	92.5	Nepal
99.9	Paraguay	91.0	Tajikistan
99.6	Zambia	89.8	Mozambique
99.3	Bhutan	88.2	Ethiopia
99.3	Malawi	87.8	Republic of the Congo
98.6	D.R. Congo	78.9	Kyrgyzstan
98.3	Laos	78.3	Togo
98.2	Burundi	77.4	Equatorial Guinea
94.8	Albania	75.3	Montenegro
92.7	Norway	75.2	Myanmar



Water:

(Another water war!)

## Protest at Link River Dam

By Lyle Ahrens | April 27, 2020, fox26medford.com

Klamath Falls, Ore. – A protest is now underway at the Link River Dam in Klamath Falls. The protest comes in the wake of a ruling by a Marion County judge that water from Upper Klamath Lake should be controlled by the state, and not the federal government. The group had hoped the Bureau of Reclamation would stop the release of 'flushing flows' to benefit endangered salmon downstream.



"We'd like the Secretary of the Interior to enter into a contract." Explains Klamath Irrigation District board member Grant Knoll. "To buy stored water from the irrigators so they can continue to run water down the river lawfully." "As long as they're having a peaceful protest, and they're abiding by the laws, that's wonderful." Says Klamath Falls Police Chief Dave Henslee. "They have a right to assemble, and a right to protest, and a right to free speech." Klamath Project farmers will get less than half the amount of irrigation water they would in an average year.

(As they used to say in Boston, it's Spahn and Sain, and then pray for rain.)

## After snowpack hits near-historic low, Yukon Energy looks to diversify hydro-heavy grid

The territory says unpredictable weather is prompting efforts to not only increase efficiency but to also modernize the grid with wind, solar, biomass and potentially even geothermal energy sources

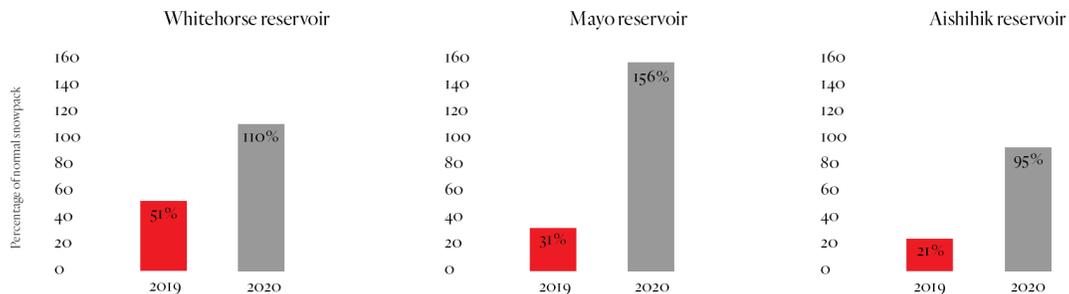
By Julien Gignac, Local Journalism Initiative reporter, Apr 28, 2020, thenarwhal.ca

Some discomforts of the Yukon winter don't last long — a car that just won't start, a parka that's frozen stiff. Others, however, carry over to following years. The 2018-19 winter in Yukon was dry and frigid. Snowpack hit a near-historic low as a result, leading to low water levels in the reservoirs that drive the territory's hydroelectricity plants. Because the territory's grid is heavily reliant on hydro, Yukon Energy has been forced to use more diesel fuel this year. Now, with climate change expected to make weather patterns even more volatile, the utility said it's making moves to diversify the grid.



**Yukon looks to up diversity and efficiency in energy**

## Snowpack levels at Yukon reservoirs in 2019 and 2020



According to a Yukon Energy fact sheet, the Whitehorse reservoir had just 51 per cent of its normal snowpack levels in 2019. The Mayo and Aishihik reservoirs fared much worse, with 31 per cent and 21 per cent of normal snowpack levels, respectively. “The last time we had numbers like that was in the late ’90s,” said Andrew Hall, president and CEO of Yukon Energy. **He added natural gas has been burning steadily since November to make up the difference.** And when an LNG generator broke down earlier this month, more diesel ended up being used to compensate for that lost capacity. Because of the lower water levels in the reservoirs, Yukon Energy estimates roughly 16.5 gigawatts of energy will need to be generated using fossil fuels in April and early May.

“That’s around the same amount of electricity 16,500 Yukon homes would use in a month,” the utility’s fact sheet states, “or about three per cent of the total amount of power we will likely need to generate this year.” **The sheet also notes 72 per cent of that power is being generated by natural gas, while diesel powers the rest.** Hall said climate change could actually mean more warm weather with higher levels of precipitation in the territory. **But the problem is rainfall is hyperlocal, meaning Whitehorse may get a lot, while Carmacks, a roughly two-hour drive north, gets a fraction of it.** “It’s a variable we don’t have a good handle on,” he said. **The trick is to diversify** the grid and look for efficiencies, according to Hall. And there’s a suite of things Yukon Energy is working on, in the near and long term, to do both.

### Residents to make money generating wind, solar power

**Hall said an easy win when it comes to efficiency would be to update the Whitehorse dam’s turbine, which dates back to the 1950s.** But beyond that, Yukon is working to expand a program that enables residents to make money by generating wind, solar and biomass electricity and feeding it into the grid. Hall said the Yukon government is in the process of doubling how much the cottage industry can produce by providing financial and technical support to First Nations and municipalities. **The territory will also introduce legislation to regulate geothermal development.** Yukon can also sync its grid with Atlin, B.C., where the Taku River Tlingit First Nation hopes to expand its hydroelectricity operations. The nation could provide the territory with upward of eight megawatts of power, Hall said. He added the project could be ready in roughly three years.

### Better research to anticipate the weather

**Since 2012, researchers at Yukon College, the Université du Québec and the University of Alberta have worked together with Yukon Energy to better predict water levels.** The hope is the research will help the utility better prepare for unanticipated weather patterns. Brian Horton, manager of climate change research at Yukon College’s research centre, said there are five automated weather stations equipped with sensors that measure the depth and volume of the water in the snowpack at the headwaters of Yukon rivers. The stations also use precipitation gauges to determine the levels of snow and rainfall. **The collected data, made available to Yukon**

Energy by satellite, can help determine seasonal forecasts and provide multi-decade projections, Horton said.

If Yukon Energy knows how much water is flowing, “they can make decisions on how they can operate the generating facilities within the envelope that they’re given,” he said. “This gives them more heads up, more planning capacity for knowing what’s available, what’s in the bank account, basically.” But all this work comes with a caveat. “You’re going to have, from time to time, these ... drought years,” Hall said. Developing a system that is 100 per cent renewable, even under drought conditions, is “just not realistic” for the territory, he added. “There could be years in the future where we have similar situations where you have to run diesel just to keep the lights on.” If anything is predictable, it’s that weather patterns will become less predictable with climate change. Hall agrees, calling efforts to predict the weather a “crapshoot.” Case in point? The snowpack levels from the 2020 winter season that left the Whitehorse reservoir at 110 per cent.

(Sometimes, too much rain can be a good thing.)

### **2020 excessive rainfall boosts hydroelectric power generation by TVA** **Although we’ve had serious flooding this year, there is an upside to all of this rain:** **increased generation of hydroelectric power like at the Chickamauga Dam.**

By Alison Pryor, April 29th 2020, wrcbtv.com

Chattanooga is over 13 inches above normal in rainfall to date for 2020 with more falling on Wednesday, and with the heavy rain, comes runoff and the need to control the water flow.

The above-normal rainfall extends beyond Chattanooga to the entire Tennessee River Valley, where over 30 inches of rain has fallen. This number is not typically reached until July.

Although we’ve had serious flooding this year, there is an upside to all of this rain: increased generation of hydroelectric power like at the Chickamauga Dam.



“It’s very flexible. The fuel is free. It’s from Mother Nature, and so we’re utilizing this extra flow to run water through as much hydroelectric turbines as we can at the dams,” James Everett, Manager of TVA’s River Forecast Center in Knoxville told Channel 3. About a half-million gallons per second were flowing through the generators and spillway gates at Chickamauga and Nickajack Dams on Wednesday. Watts Bar reported 400,000 gallons per second. “Looking back at the last 7 days, we’re about 300% of normal for hydro generation,” said Everett. That’s 3 times the typical amount, and the dams are about 35 percent above normal for 2020 so far. “That hydroelectric generation is very, very cost-effective and can offset some of those more expensive forms of generation, and then those savings can be transferred to the ratepayer,” Everett explained.

2020 is outpacing 2019, which set a record for rainfall and runoff. Runoff is the portion of rain that enters back into the reservoir system through streams and groundwater. It plays a big part in both power generation and flooding. “We’re already about 22 inches of runoff for the year, which is what we would normally see during an entire calendar year, and we’re just now 4 months through the year,” stated Everett. Managing the river is a balancing act of demands, needs, and Mother Nature, so operating plans are constantly being adjusted. “We’re using the system of dams in an integrated manor to store water, reduce flood levels downstream, and provide a tremendous amount of flood protection in areas like Chattanooga,” Everett said of the process. The River Forecast Center is monitoring conditions 24 hours a day to try to provide the best combination of flood control, power generation, navigational and recreational abilities, and water supply and quality along the Tennessee River.



## Environment:

(Now, that's one big ugly fish.)

### **Tags reveal some paddlefish survive wild ride at Table Rock Dam**

By Wes Johnson, Springfield News-Leader, April 23, 2020, news-leader.com

Researchers aren't sure if they went over the Table Rock Dam, MO spillway or through the big power-generating turbines. But at least two paddlefish took that wild ride and ended up being caught by snaggers at the upper end of Bull Shoals Lake, according to tags on the fish. "The best part is we do know they can leave Table Rock successfully and contribute to populations downstream," said Trish Yasger, a Missouri Department of Conservation fisheries biologist who specializes in paddlefish. Yasger said MDC doesn't stock paddlefish in Bull Shoals Lake, so any that are caught there somehow washed through or over the Table Rock Lake dam. MDC began stocking paddlefish in Table Rock in the mid-1970s, and the plankton feeders can grow huge there. The Missouri record paddlefish was snagged out of Table Rock Lake in 2015 and weighed 140 pounds.



"It's amazing how big they can get just by eating plankton," Yasger said. "Just like a whale that grows big eating plankton." MDC is in the process of analyzing paddlefish data from a five-year research project based on the jaw tags and small transmitter tubes inserted in some fish that are later reported by snaggers. The data shows that paddlefish are prolific swimmers, especially when water conditions are right.

- Seven paddlefish traveled upstream from Table Rock Lake in the White River arm and were harvested below the Beaver Lake dam in Arkansas;
- 71 paddlefish passed through the Truman Lake dam and were caught in Lake of the Ozarks;
- Three paddlefish passed through both dams for Truman Lake and Lake of the Ozarks, and were caught in the Osage River below Bagnell Dam;
- 11 paddlefish went upstream from the lake into the Osage River, entered the Marais des Cygnes River tributary, and were caught just below the Osawatomie City Dam in eastern Kansas.

Travels by paddlefish tagged in Lake of the Ozarks included:

- 13 paddlefish that passed through Bagnell Dam and were caught in the Osage River;
- Two paddlefish passed through Bagnell Dam, traveled down the Osage River to the Missouri River, swam upstream and were caught below Gavins Point Dam in South Dakota;
- One paddlefish traveled through the dam, down the Osage River and then upstream in the Missouri River, entered the Kansas River at Kansas City, then moved into the Wakarusa River and was caught below the Clinton Lake dam near Lawrence, Kan. "There's a lot of movement," said Yasger, MDC fisheries management biologist. "We have fish tagged in the lakes that have ended up in the open rivers like the Missouri and the Mississippi. It's good that adult fish are successfully going through the dams." The Missouri paddlefish snagging season opened March 15 and runs through April 30. Paddlefish are stocked annually in Truman Lake, Lake of the Ozarks, and Table Rock Lake. But many fish eventually move.

Biologists still have much to learn about paddlefish, Missouri's largest fish. But Yasger believes water flow motivates the fish to move to certain areas to spawn. Why they travel afar in other seasons is still a mystery. She said all of the paddlefish in Table Rock Lake are hatchery-raised. They don't spawn naturally in the lake or its tributary rivers, though they do in Truman Lake. For the research project, MDC biologists placed identification jaw tags and transmitter tubes in some adult paddlefish to track movements and angler harvests. Anglers are asked to continue reporting tags so biologists can add information to the database. Anglers can keep the silver jaw tag. They are asked to send a photo with the tag number.



Sub-legal fish with tags should be reported but released unharmed. While supplies last, MDC will send paddlefish t-shirts and caps to anglers reporting tags. To report tagged fish, contact Yasger by phone at 660-530-5500, or by email at [Trish.Yasger@mdc.mo.gov](mailto:Trish.Yasger@mdc.mo.gov). A weekly snagging report provided by Yasger provides information about paddlefish movement trends in the Osage River system and angler success. The report also provides information on changes to boat access due to high water, fishing regulations, guidelines for handling fish, and tips for success. For the report, visit <https://short.mdc.mo.gov/Ze9>.

(Better watch out for momma. Grizzlies get real mad when you're near their cubs.)

### FWP reports grizzly sightings by Lake Frances dam

khq.com, May 1, 2020

LAKE FRANCES, Mont. - The Montana Fish, Wildlife and Parks is reporting sights of two adolescent grizzly bears seen near the Lake Frances dam Friday morning. FWP wrote in a Facebook post Friday morning the bears are possibly still in the brush by the lake. FWP urges people to be careful if they are in the area



### Other Stuff:

(It's bound to happen with the caveat in the last paragraph of this article.)

### Saudi Aramco Design New Hybrid Engine to Cut Harmful Greenhouses Gasses

April 27th, 2020 - albawaba.com

Saudi Aramco has for years invested in research and development in engine technology and fuel efficiency as part of its sustainability strategy.

Scientists at Saudi Aramco and the King Abdullah University of Science and Technology have produced a design for a new hybrid electric-petrol engine that will cut harmful greenhouses gasses by more than 50 percent.



Developed in collaboration with scientists in China, it could bridge the gap between traditional internal combustion engines and the next generation of fully electric motor engines. It was

unveiled in a paper published in the prestigious journal Applied Energy. Advanced gasoline compression-ignition (GCI), in conjunction with varying battery sizes and cleaner types of petrol — like that refined from Saudi crude — could provide “an orderly transition toward a more sustainable transport future,” the paper said. Many countries have called for bans on traditional petrol engines over the next two decades, as concerns rise about the effects of environmental pollution and climate change. Aramco has for years invested in research and development in engine technology and fuel efficiency as part of its sustainability strategy, with centers studying the issue of pollutant emissions in Paris, Detroit and Shanghai.

#### HIGHLIGHTS

- The Aramco team warned that the move toward more efficient electric engines depends significantly on the sourcing and cost of raw materials used in battery production, and on how the electricity is produced to charge electric vehicles.
- Electrification trends worldwide are driving automakers toward larger batteries as a means to increase a vehicle’s all-electric range, but there is a risk attached: The geographical distributions of critical metals used in battery technologies are uneven.
- Two mining countries account for about 70 percent of worldwide supplies of lithium, cobalt, and graphite. China and Australia are the two biggest producers of ‘rare earth’ metals. But the Aramco team warned that the move toward more efficient electric engines depends significantly on the sourcing and cost of raw materials used in battery production, and on how the electricity is produced to charge electric vehicles.

“Climate change and mineral resourcing are inextricably linked,” said Amir Abdul-Manan, head of the Aramco team working in China with Shanghai Jiao Tong University. “A disorderly mobility transition worldwide could stress the supply of critical raw materials for battery production, possibly risking adverse ecological impacts particularly in mining countries, and potentially creating supply-chain vulnerability.” The paper said electrification trends worldwide are driving automakers toward larger batteries as a means to increase a vehicle’s all-electric range, but there is a risk attached: The geographical distributions of critical metals used in battery technologies are uneven. Two mining countries account for about 70 percent of worldwide supplies of lithium, cobalt, and graphite. China and Australia are the two biggest producers of “rare earth” metals.

“There is a real risk here that we are trending toward less efficient use of scarce minerals at a time when there is growing constraints on our global resources,” Abdul-Manan said. The paper confirmed earlier findings by researchers that the actual climate benefit of an electric vehicle would critically depend on how the electricity is produced. In regions with high penetration of low-carbon electricity, such as the use of nuclear in France or hydroelectric in China’s Sichuan province, electric vehicles have even greater emissions-reduction potential.



<sup>1</sup>This 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.