7/28/2017

Some Dam – Hydro News™

And Other Stuff

i

Quote of Note: *"When in doubt, just take the next small step." - Unknown*

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"Good wine is a necessity of life." - -Thomas Jefferson
Ron's wine pick of the week: **2013 Marchesi de Frescobaldi Italian (Tuscany) Red "Nipozzano Riserva"**
"No nation was ever drunk when wine was cheap." - - Thomas Jefferson

Dams:

(Let's hurry this job along!)

Why the state is in such a rush to fix Oroville Dam

Source: www.sacbee.com — July 12, 2017, 1wnc.com

The Dept. of Water Resources have asked federal regulators to let it demolish and replace an additional two hundred forty feet of the spillway's 3.000-foot concrete chute before the rains comes this fall, leaving less work for following year. CA executives are trying to speed up repairs on Oroville Dam's battered flood-control spillway. The Dept. of Water Resources have asked federal regulators to let it demolish and replace an additional two hundred forty feet of the spillway's 3.000-foot concrete chute before the rains comes this fall, leaving less work for following year. That two hundred forty-foot portion originally was going to be replaced following summer as piece of the for repairing the spillway, whose massive

structural problems in Feb sparked the downstream residents. Presently DWR executives believe that two hundred forty-foot section, in the upper piece of the spillway, should be replaced this year to create certain the all spillway can be rebuilt by the fall of two thousand eighteen. Erin Mellon, spokeswoman for DWR's parent agency the Natural Resources Agency, said executive wish to leave small to chance next year.

"Next year's construction season could be impacted if we've drought, or if we've excess rainfall," she said. Executive are "making sure that we can fit in as much as we can this year." DWR executive made the request to blast the extra 240 feet in a letter to the Federal Energy Regulatory Commission, which licenses Oroville Dam and should approve all aspects of the spillway reconstruction project. "After recent schedule evaluations and meetings with the contractor, we've determined it required to delete and reconstruct an extra 240 feet ... of the upper chute to ensure the project can be completed in two construction seasons," DWR project manager Ted Craddock wrote. The letter was sent Monday and posted on FERC's website Tuesday. Mellon said the request for extra demolition this summer reflects a fine-tuning of the construction schedule, not a dramatic overhaul. If OK'd by the federal agency, it'd expand the piece of the spillway demolished and replaced this season by about ten percent.
"It was always in flux," she said of the construction calendar. "This is getting closer to the final design plan." DWR's contractor, Kiewit Corp., is demolishing and rebuilding the lower two-thirds of the spillway this year, including the piece heavily damaged in February. The upper piece escaped significant damage but will be replaced besides next year. State executives declare this year's repairs will be sufficient to create the spillway operational when the rainy season resumes in November. Mellon said the latest wrinkle in the construction map won't change that. DWR's desire to speed up the timetable this year did create a hiccup with federal officials. A portion of the spillway in the vicinity of the 240-foot portion was demolished without FERC's approval, bringing a reproach from the federal agency and a temporary halt in all blasting. Demolition has since resumed, Mellon said.

(The BOC speaks.)

Board of Consultants tweaks former Oro Dam design recommendation

By Risa Johnson, chicoer.com, 07/13/17

Sacramento, CA >> In its eighth memorandum released Thursday, the independent board analyzing the redesign of the Oroville Dam spillways commends the construction contractor's work and makes slight tweaks to former recommendations. This is the second memorandum issued without any redactions which the state Department of Water Resources previously requested, citing national security concerns. The board suggested aerators may be necessary in its last memo, in order to prevent cavitation — a process where bubbles can damage a concrete surface. But after further investigation, including calculating the spillway's cavitation index for a variety of flows, the team changed its mind. The team also noted it could be difficult to complete construction by the deadline, if the contractor, Kiewit, had this added to its plate.

However, the board recommended the state Department of Water Resources research similar spillways without aeration features. It also suggested testing by use of a physical model, if possible, to confirm the board's analysis. "If a decision is made to add aerators in the FCO (flood control outlet) Spillway, they should be thoroughly evaluated and tested to make sure that they do not adversely impact the performance of the spillway," the memo reads. The board said it was pleased on a site visit June 21 with Kiewit's demonstration of placing roller-compacted concrete, planned to go into the largest holes of the spillway. All members were in attendance except for Faiz Makdisi who was out of the country, according to the document.

"The BOC observed the RCC (roller-compacted concrete) placement and found the RCC mix to be workable with no segregation, easily compacted, and can be placed within the temperature restrictions, despite high ambient temperatures exceeding 100 degrees Fahrenheit," the memo reads. As roller-compacted concrete is going into small, deep crevices, the board noted it may be difficult to fill with the material, so the team suggested using a cement mix called flowable fill or dental concrete for those hard-to-reach places. Cleaning and preparation of the rock foundation of the spillway has been done much better this time around, compared to when the dam was originally constructed, the board said. "The BOC is favorably impressed with the Contractor's general approach, use of the job site and the mobilized equipment," the memo reads.

(Relicensing does not affect dam safety.)

Oroville Chamber of Commerce asks for Oroville Dam relicensing delay

By Josh Copitch, Jul 13, 2017, krcrtv.com

OROVILLE, Calif. - The Oroville Chamber of Commerce initiated a letter from the Oroville Dam Coalition to the Federal Energy Regulatory Commission asking for a delay in the relicensing of the Oroville Dam. A delay in the relicensing of the Dam would allow for the Board of Consultants and the Forensic Team, tasked by FERC to investigate the spillway, to be completed. This way relicensing participants could assess the impacts of the spillway incident. "We are asking for a pause to allow the forensic report to come back and allow FERC to thoroughly vet their findings," said Sandy Linville, President and CEO of the Oroville Chamber of Commerce. "We want to make sure DWR is looking at dam safety as being paramount, and that the new license reflects that." Signers hope that the Commission will issue a new license only when there is clarity on the current spillway reconstruction project and how the damage from the spillway incident is going to be addressed by the licensee.

Current signers of the Oroville Dam Coalition letter to FERC are: Oroville Area Chamber of Commerce, City of Biggs, Town of Paradise, Feather River Recreation and Parks District, City of Wheatland, Sutter County Board of Supervisors, Live Oak Chamber of Commerce, Yuba-Sutter Chamber of Commerce, Yuba-Sutter Economic Development Corporation, Sutter-Yuba Realtors Association, American Whitewater, California Sportfishing Protection Alliance, and Citizens for Fair and Equitable Recreation.

Oroville Dam: Drone video shows progress on spillway repair

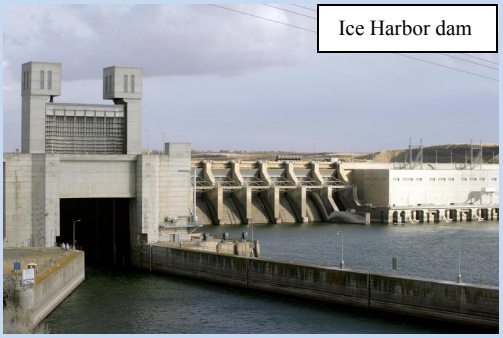
By Gieson Cacho | mercurynews.com, July 15, 2017

http://www.mercurynews.com/2017/07/15/drone-video-shows-progress-on-oroville-dam-repair/

(More on the Lower Snake River dams.)

What The Debate Over Four Snake River Dams Means For Salmon — And The Northwest

By FRANKIE BARNHILL • 7/12/17, boisestatepublicradio.org


Ice Harbor dam

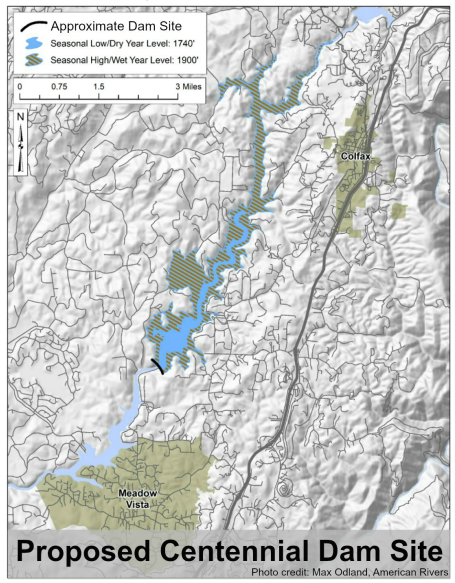
A debate about four Washington state dams has put the spotlight back on a longstanding story about salmon. The Idaho Statesman has begun a series about the endangered species, which asks whether destroying the dams will be enough to save the fish. Frankie Barnhill sat down with Statesman reporter Rocky Barker to learn more about what's at stake.

Barker has been following this issue for about 25 years. He says in that time, some things have changed in the debate (ex: climate change is now an issue, while the four dams in question have created sophisticated passages for the fish to swim through since the early 90s). Barker says one thing he's learned from reporting on the salmon is that the species is both fragile and resilient, and is tied to the identity of the Northwest. The Idaho Statesman's series runs through October. For more information, search #SavingSalmon on social media.

(It'll be a miracle if this gets built!)

Nevada Irrigation District hears cost estimate, timeline for Centennial Dam project

By Alan Riquelmy, theunion.com, July 12, 2017



Proposed Centennial Dam Site
Photo credit: Max Odland, American Rivers

Recent estimates for the price of the Centennial Dam call for $256 million in construction costs, an amount that doesn't include land purchases, engineering and a handful of other items. Nevada Irrigation District directors on Wednesday heard from Michael Forrest, project manager on Centennial, who said construction on the dam will take about two-and-a-half years. He estimated NID could meet that timeline with two shifts working six days a week, with no overly restrictive constraints on trucking materials to the site. Forrest, vice president of the company Aecom, said a low estimate for construction is $217 million, with the high climbing to $307 million. The midrange is $256 million.

Fielding audience questions, Forrest said the estimate is for construction costs only. Other costs include a new Dog Bar Road bridge, estimated at $54 million. NID already has spent over $4 million on land purchases. Another $8.9 million is earmarked for other costs, partly for a cultural resources assessment. Officials gave no grand total for the Centennial project during Wednesday's meeting. "That is a confusing point," said Traci Sheehan, coordinator of the Foothills Water Network. "At this point, it just looks like piecemealing the cost." Sheehan also questioned the construction timeline, saying directors should know the project is politically charged and that legal challenges could appear.

Other meeting attendees speaking during public comment questioned the need for the dam. Dianna Suarez asked if directors had examined alternatives to the dam, like underground storage. "This has been going on for three years now," she said. Alternatives are expected to be part of ongoing environmental reviews by state and federal officials. Both reports likely are months away from completion. The Centennial project, which would impact 2,200 acres on the Bear River, would put a reservoir between the existing Combie and Rollins reservoirs. NID has pointed to climate change and future water needs as reasons for the dam. Detractors fear the dam will negatively impact the river and destroy indigenous cultural sites.

(Piled higher and deeper to make it safer.)

$800,000 berm planned to enhance dam's safety

By JOHN PFEIFER, paducahsun.com, 7/13/2017

When the Tennessee Valley Authority identified five dams within its system in 2013 which needed additional seismic analysis, Kentucky Dam was among them. Since then, the dam has undergone a stability analysis, regular inspections by civil, mechanical and electrical engineers, and regular "health checkups" – the latest in 2016. "There's nothing to worry about on the concrete portions of the dam," said TVA Senior Program Manager Mike Morrison. "Seismic issues are not a problem there." The lone recommendation from the stability analysis and multiple inspections was construction of a 400-foot long sand and stone berm adjacent to the earthen embankment that

runs southwest from the concrete portion of the dam toward Kentucky Dam Village, he said. When workers poked holes in the embankment, "We found a segment of the foundation that is susceptible to cyclic mobility softening," Morrison said. That phenomenon could present itself during an earthquake, when repeated increases in water pressure occur.

"The result of cyclic mobility softening within the foundation is a deformation, or sinking, of the dam crest," he said. "It is probable that a tension crack would form in the lower portions of the embankment, just above the foundation surface." Morrison minimized the likelihood of such an event at Kentucky Lake. He emphasized that the base of the embankment – the point to which deformation might reduce Kentucky Dam's earthen height — is still higher than the level of Kentucky Lake. "This is low-hanging fruit that will fix what would be considered a nagging problem," he said, adding his belief that even prior to berm construction, Kentucky Dam "will perform quite well in a seismic event."

TVA public relations spokesperson Scott Brooks put it this way: "This berm will take a safe dam and make it safer." Morrison estimated the cost of the berm at close to $800,000, with half the cost related to construction and the other half for additional studies, obtaining permits and administrative costs. He said the TVA should begin the final design phase in October with construction planned for a six-month period starting next spring. The probability of an earthquake affecting Kentucky Dam is low, according to TVA scientists. The most likely seismic activity would come from the New Madrid fault line —a roughly 150-mile long seismic zone that begins near Cairo, Illinois, and extends southwest toward Memphis along the Tennessee-Missouri border and into northeastern Arkansas. "Anytime there is a tremor along the New Madrid fault we have to come out to take a look," Morrison said. They look for wet spots along the embankment and could order new tests. He said instruments involved in the testing that identified susceptibility to cyclic mobility softening are state-of-the-art tools that measure pressure in both the concrete and earthen portions of the dam and take measurements that have no historical comparisons. As part of the dam's regular safety regimen, a civil engineer will be on site in August. Jennifer Dodd, general manager of TVA Dam Safety, said, "Our Dam Safety team (has) a monitoring system that includes monthly, 15-month and 5-year inspections at all our dams along with more than 7,000 instruments used to identify any signs of erosion or other issues." Morrison said TVA's ongoing training sessions emphasize public safety. He said Kentucky Dam Plant Manager Mark Simmons oversees all monthly inspections, which include plant personnel "walking the embankment with a checklist in their hands."

(They have spunk.)

Editorial | After three floods, Johnstowners still have fighting spirit

The Tribune-Democrat, 7/18/17, tribdem.com

The odds are astronomical that one town could be devastated by floodwaters three times in less than a century. It happened to Johnstown, PA on May 31, 1889; March 17, 1936; and July 20, 1977. Thursday, 7/20/17 is the 40th anniversary of the latest disaster. As was the case in all three events, heavy, persistent rainfall in a short amount of time pummeled the area, causing once-tiny rivulets to become raging rivers of death and destruction. Once the rains subsided, 85 people had lost their lives or were presumed dead, 2,696 were injured and $350 million in damage had been done. Tanneryville, in the Coopersdale section of Johnstown, was the hardest hit community. At about 4 a.m., the Laurel Run Reservoir could hold no more water and the breast failed.
The onrushing wall of water – 101 million gallons – took homes, garages, businesses and lives – about 40. Businessman and Tanneryville resident Ed Cernic Sr. couldn't believe the damage done by the force of the water. "You saw steel I-beams that were twisted by that force," Cernic told reporter David Hurst for a five-part series, " '77 Flood Reflections," that began Sunday and

will end on Thursday. In Dale Borough, Tom Apple and his family fretted in their David Street home. Rising water had already swept away their car, and Apple wondered what, or who, was next. “You’d see a gas pump floating down the street … and were just in awe of the power of the water,” he said. “I didn’t ever want to live through that again.” But just as it did in 1889 and 1936, Johnstown began to rebuild as the water receded.

The American Red Cross and the Salvation Army assisted flood victims. Members from Mennonite churches pitched in to help wherever they were needed. Neighbors assisted neighbors; those not affected by the flood volunteered in any way they could. Day by day, the thick mud and debris was trucked away, the dust subsided and the stench that permeated the region was gone. Families began to move back into their refurbished homes. But the retail sector would not be the same. Instead of returning to the downtown business district, many businesses moved to Richland Township. The Penn Traffic Co., which had weathered the first two disasters

An aerial view of Coope
PA., Wednesday, July 2
path of flood water dow
Tanneryville neighborho
brunt of the damage fro
Run Reservoir. •Chuck
Democrat

ores in downtown Johnstown, never reopened. The flood
Steel Corp., one of the major employers in the area. The
a multimillion-dollar basic oxygen furnace, which would
more cost-efficient. The cost of cleanup, coupled with
much for the steel giant to shoulder. “They didn’t have
wn plant’s improvements anymore,” Richard Burkert,
ecutive director, said.
up in 2001.
s three floods, it is that the region is better prepared for

ughout the city and state to alert residents to rising water

rkert said, “making it easier to get the word out through

y guidelines for Pennsylvania impoundments were
of the program, numerous reservoirs were either
hed, Burkert said. “Today, Pennsylvania has as good a
m as any other state in the country,” he added.
rvivor.
ghters with a never-surrender attitude. We’ve been
ee times, but each time we got back to our feet and
persevered. And we will continue to do so. It’s in our nature. Our roots are deep because our forefathers settled this area, raised families and built the city. We feel an obligation to stay – come hell or high water.

(Let’s hope we don’t get the big one.)

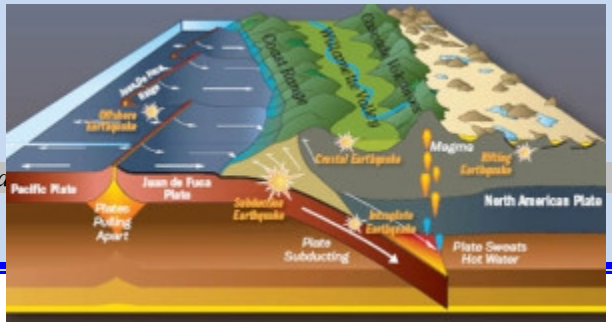
Feds work to get Scoggins Dam ready for The Big One

Scoggins Dam was built in the 1970s and is safe as is -- for now

By Tim Becker and KOIN 6 News Staff, July 18, 2017, koin.com

GASTON, Ore. (KOIN) — The federal government will begin work next week to determine the best way to improve the earthquake resistance of Scoggins Dam in Washington County. The dam, which creates Henry Hagg Lake – a major county water source – was built in the 1970s, and so not designed to withstand intense earthquakes. This has become especially concerning as fear over The Big One grows. “Scoggins Dam is at threat of failure in a major earthquake just like much of the infrastructure in the Northwest,” said Mark Jockers, a spokesman for local water utility Clean Water Services. “[With] the science that has emerged on the Cascadia Subduction Zone… there’s a recognition we need to shore up on this infrastructure.”

Should the dam collapse in the event of such a quake, it would not only cause massive flooding in the Forest Grove area, but



severely damage water access, and “water is a lifeline resource after an earthquake,” Jockers said. While CWS uses water from the lake, the dam itself is run by the federal Bureau of Reclamation. Of all the dams controlled by that bureau, Scoggins is the farthest west, and the closest to the Cascadia Subduction Zone. That’s made it a top concern for the feds, too. Funding for an upgrade was included in the omnibus spending package signed by President Obama in 2015. In late July, the bureau and CWS will take the next step, studying their options. Crews will drill, collect samples, and take tests all around the site for several months.

The studying and planning phase will be extensive. It will likely be another 6 years before any construction begins, and an additional 3 years before upgrades are completed. That’s because of the uniquely powerful and complex threat posed by The Big One, according to bureau engineer Chris Regilski. “It’s not like the most standard kind of work that we’ve done before,” said Regilski. “It’s very difficult to model, to analyze, and to make sure that we do the most cost-effective method.” At the moment, engineers are considering two specific methods of improving the dam’s seismic stability. One is to raise and reinforce the existing dam. The other is to add a second dam downstream, taking pressure off of Scoggins and adding a second layer of protection against massive flooding. “Initially we were working with the federal government to get permission to pile our dirt on their dirt… simply to raise the existing dam,” said Jockers. “As this new science emerged… we started looking at other options.” “What we find attractive about the downstream dam option… there’s a narrow spot a mile and a half down from the existing dam… it could allow for us to build a smaller, shorter, stable concrete facility,” he said. “That’s attractive because it could be the most cost-effective measure, [plus it provides] the stability of a concrete facility.” Jockers said they should determine which option they’re going with sometime within the next 3 years. He also said the dam is currently structurally sound, and that the upgrades are needed only because of the relatively newly-discovered threat of The Big One. “The dam is safe as it’s designed,” he said. “The challenge is a major Cascadia Subduction Zone earthquake, which this dam was never designed for.”

Hydro:

(A little hydro education.)

See the science behind the magic of hydropower at Rocky Reach Dam

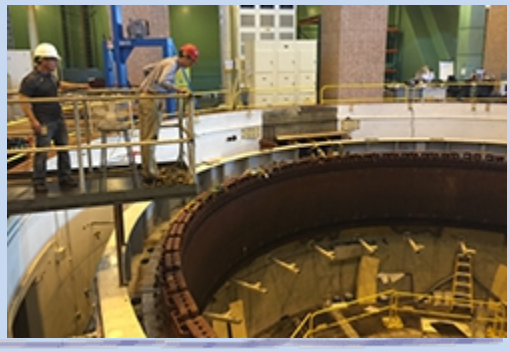
By Kimberlee Craig | Jul 12, 2017, chelanpud.org

It’s easy – flip a switch, complete a circuit and now you have light! Electricity may look simple, but there’s a lot that goes into harnessing the power of falling water to make electricity. It’s as much a marvel of modern science as it is magic. “All of this happens at the speed of light, which is more than 186,000 miles per second,” Gallaher said. “It takes longer to explain it than for all of this to actually happen!” You can see this fascinating process in action on a hardhat tour of Rocky Reach Dam. These free 90-minute tours offer a behind-the-scenes glimpse into the people and technology that power more than 50,000 retail customers in Chelan County, plus utilities that serve customers across the Pacific Northwest. At the same time, Chelan PUD is protecting salmon and steelhead swimming past the dam and wildlife along the river shore.

People love the opportunity to go down and see the enormous size of the units,” Gallaher said. “Visitors can feel the vibration, hear the hum and see the tools that are used. They learn more than they ever thought when they started the tour.”
Here’s what you’ll see:

- Rocky Reach’s 11 massive generators up close, each weighing about 1.4 million pounds.
- The Columbia River in mid-stream from the forebay deck
- History come alive in the Museum of the Columbia
- Thousands of salmon and steelhead headed up the fish ladder

The Visitor Center café offers food and treats including ice cream, plus there are acres of lawns and gardens, a playground and hands-on fun for adults and kids. The hardhat tours are this Saturday, July 15 and next Saturday, July 22, for those 12 and older, who can comfortably walk up to 1.5 miles and climb flights of stairs. “I think there is something for everyone to learn,” Gallaher said. Reserve your own hardhat tour now to get an inside look at the shocking science of hydroelectricity and the magic behind a light switch. Call 663-7522 to reserve your spot.



(Want it bigger.)

Utilities pitch expansion at Bradley Lake hydroplant

By:Elwood Brehmer, Alaska Journal of Commer, 07/12/2017 - alaskajournal.com

Railbelt utility leaders want the Alaska Energy Authority to approve a $46.4 million expansion of the Bradley Lake hydroelectric plant.
AEA management is on board with the proposal, but during the June 29 AEA board meeting, members questioned both as to why they should approve the project when transmission line constraints already prevent what is the lowest cost power source in the region from being used to its full potential.
The Battle Creek diversion project would add about 37,300 megawatt hours per year to Bradley Lake’s current power production, which is nearly 10 percent of its average annual output. That would supply enough additional hydropower to meet the needs of about 5,200 households in the region, according to AEA Owned Assets Manager Bryan Carey. Specifically, the Battle Creek project consists of constructing a 16-foot high, 60-foot wide concrete dam to divert water into a five-foot diameter, high-density polyethylene pipe. The pipe — using natural elevation changes — would carry the water 1.7 miles to the Bradley Lake facilities. A 2.9-mile gravel road would be built to access the dam and most of the road would be built directly on top of the buried water pipe to make the most use out of the pipeline corridor.

The water from Battle Creek would be stored in Bradley Lake, thus providing additional water to be run through the existing powerhouse, Carey said. AEA estimates the final cost of wholesale power from the Battle Creek diversion would be 7.35 cents per kilowatt-hour if it can be debt-financed over 30 years at 4 percent interest. AEA owns Bradley Lake, which is about 30 miles east of Homer at the head of Kachemak Bay, and would also own the Battle Creek project, thus the project needs to be approved by the authority’s board. The Railbelt electric utilities each purchase a prescribed share of power from Bradley Lake to cover its costs and would do the same for the portion of power attributable to Battle Creek. Chugach Electric Association CEO Lee Thibert said to the AEA board that the Battle Creek power would initially be slightly more expensive than some other generation options but over the life of the project it would provide rate stability that would be a benefit to Railbelt ratepayers. “(Battle Creek) is in our best interest for long-term energy needs,” Thibert said.

Currently, there simply isn’t enough water behind the 125-foot high Bradley Lake dam to run the two 60-megawatt generators full-bore full-time, he explained. According to Thibert, the utilities want to get the project, which has gone through environmental reviews, out to bid this year.

Aquatic monitoring found no fish within several miles of the proposed dam site, according to the authority, and it believes salmon habitat near tidewater could be improved because the dam would remove glacial water and moderate summer stream flow. The run-of-river Battle Creek diversion would be shut down in the winter when there is no water flow from Battle Glacier, Carey noted.

AEA Executive Director Michael Lamb said federal interest rate hikes are the driving force for wanting to move quickly. "There is a sense of urgency because the cost of money is going up. That changes the dynamics of what the cost of (Battle Creek) is in the long run," Lamb said. The board did not take any action on the Battle Creek proposal at its latest meeting, but a resolution to approve it will likely be put before the board soon, according to AEA officials. Bradley Lake has largely been a success story. As it stands, Bradley Lake supplies 9 percent of the Railbelt's electric supply and is the lowest cost power in the region at about 4 cents per kilowatt-hour, according to AEA. The 120-megawatt hydro project, which was finished in 1991, has a cumulative cost of $328 million when post-construction capital improvements are added in. Carey said AEA estimates Bradley Lake's replacement costs to be in the $500 million range.

Overcoming constraints

While expanding what has worked well would seem to be a sure-fire win, AEA board members expressed a little skepticism about the necessity of the Battle Creek project given authority management recently finalized a study that contends the Kenai Peninsula electric transmission system needs more than $400 million in upgrades to run at peak efficiency. Currently, there is just one 75-megawatt capacity transmission line connecting Bradley Lake to the Railbelt grid, meaning the 120-megawatt hydro project already can't be utilized to full capacity. AEA board Vice Chair Dana Pruhs, owner of Anchorage-based Pruhs Construction, likened Battle Creek to building a four-lane bridge on a two-lane highway. However, the utility leaders said the benefits of the Battle Creek project could still be realized, even if the transmission situation is less than ideal, because of the options hydropower affords. Unlike most other forms of renewable energy, traditional hydropower such as Bradley Lake allows managers to schedule power production because the power is essentially stored in the water behind the dam. It is not dependent upon uncontrollable forces such as wind or sunlight; adding Battle Creek water would allow the Bradley Lake generators to be run at the maximum transmission capacity longer and displace some of the higher cost natural gas-fired generation the Railbelt relies on heavily, Chugach Vice President Paul Risse explained. "If that (transmission) constraint were lifted it would be of greater value," Risse said, but operating under the constraint still allows the utilities to use all the power, just not to its maximum economic benefit. AEA's Railbelt Transmission Study estimates that $885 million of investment in major electric upgrades from Homer to Fairbanks — including multiple segments of wholly new lines — could save the region's ratepayers up to $80 million collectively by the time the work is done in 2030.

The utilities don't dismiss the fact that the upgrades would provide for a more efficient, reliable transmission system as a whole, but stress the economics simply don't work out for entities that must answer to their own ratepayers first. Matanuska Electric Association holds rights to a 14 percent share of Bradley Lake power, which is about 10 megawatts, MEA General Manager Tony Izzo said. At the same time, the utility has a 171-megawatt high efficiency gas-fired plant that can reliably supply many times more power to his ratepayers without hundreds of millions of dollars in transmission investments. Battle Creek is an opportunity to diversify the utilities' fuel supply and add to what is a long-term, low-cost power option, while the transmission infrastructure is a different debate entirely, Izzo said. "We prioritize things all the time," he said. "In today's economics with declining kilowatt hours (of demand) we're focused on trying to find the lowest cost energy, not build a system that is as redundant as the Lower 48 without the ratepayer base to possibly afford it." Chugach's Thibert said that today's economics, particularly with oil prices making diesel-fired generation competitive with natural gas in Fairbanks, don't allow the transmission intertie improvements to pay for themselves.

Brad Janorschke, general manager of Homer Electric, which serves most of the Kenai Peninsula, reiterated the sentiments of Izzo and Thibert. He said he would like to see some of the transmission improvements made, but a lack of load growth — from residents using power more efficiently and stalling economic growth — challenges those projects. “When it boils down to economics adding a more robust transmission system on the Kenai Peninsula, for my members, does not give me an opportunity to secure more less expensive power than what I already have today,” Janorschke said. “So for me the numbers don’t pencil out.” AEA board member and state Commerce Department Deputy Commissioner Fred Parady said the disagreement between AEA and the utilities over what needs to happen to the electric transmission system is a fundamental issue that needs to be settled. “Something’s missing here. The gap between the utilities and AEA over how the list (of transmission projects) gets prioritized or what we do have in common, that we agree with, that should be tackled. It’s just got to be resolved,” Parady said. “This is an engineering question, an economics question; the gap in perception of that is dysfunctional for all of us.”

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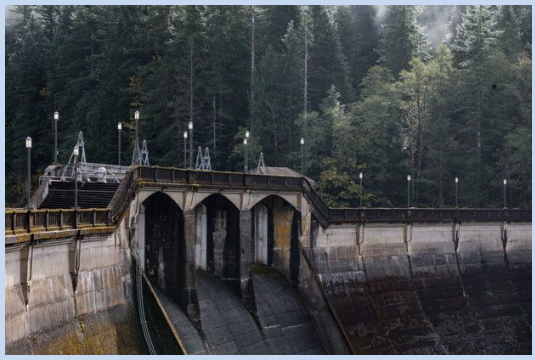
(Is this a good or bad deal?)

Portland on track to pay $8 million for hydroelectric plant operations with risk of losses

By Jessica Floum. The Oregonian/OregonLive, July 13, 2017, oregonlive.com



Portland is prepared to pay a Washington energy agency at least $8 million to operate a hydroelectric project at a city-owned Bull Run facility for the next five years with no guarantee that the city will make a profit. It's possible that taxpayers would actually lose money on the deal. The City Council was scheduled to vote on the contract Wednesday but postponed the item by one week after The Oregonian/OregonLive questioned the Water Bureau about potential risks and benefits. For decades, Portland paid Portland General Electric to operate and maintain the facility, then sold the utility the resulting electricity. The city made an average of $300,000 in annual profits from this agreement for the last four years. But that deal expires in August, and PGE decided to stop operating the hydropower plant. The power company doesn't have the same nearby staff and facilities to assist with operations that it did when it started running the facility in 1982, PGE spokesman Steve Corson said. "It's no longer that same no brainer for us," he said.

Corson said PGE still intends to purchase power from the project, which produces up to 36 megawatts of power per hour. Commissioner Nick Fish's Portland Water Bureau oversees management of the Bureau of Hydroelectric Power responsible for the project. The utility office has asked the City Council to okay an $8 million, 5-year agreement with Energy Northwest to operate the facility. The operating and maintenance contract is one of four new contracts the city must finalize to ensure continued operations and power sales from the plant, according to city documents. The city must also pay contractors to coordinate the delivery of power and to keep up transmission of the power. The only aspect the city stands to profit from is selling the power, which it is still negotiating with PGE. The water bureau asked the council to consider the $8 million agreement on July 5, three weeks before bureau leaders planned to bring the council a proposed sales agreement. Fish introduced the $8 million plan at the early July meeting, which Mayor Ted Wheeler did not attend. Water bureau officials insist the city will profit from the operating agreement. But because the city has yet to finalize a sales deal with PGE, "it is uncertain whether the (hydroelectric project) will have sufficient revenue from power sales to cover the estimated total cost," a financial analysis by the City Budget Office concluded. Bureau officials refused to acknowledge the uncertainty identified by the budget office, saying revenue "will" exceed expenses over the life of the contract. Bureau officials said they asked the council to

OK the $8 million deal before PGE agrees how much it will pay for the electricity to give Energy Northwest time to hire and train employees in time to start operations in September.
"We let (the city) know...we'll need 60 days to hire people to run the project and basically ramp up the operations," Energy Northwest spokesman John Dobken said. "We're already within that 60 day window on that, so I don't know if that's driving them to move quickly on it." David Peters oversees the hydroelectric project as a principal engineer for the Water Bureau. He told the council on July 5 that negotiations with PGE have "been going positively." They "indicate we'll have a positive outcome through the life of this contract," he said.

However, energy consultant Robert McCullough said the price of energy next year is the "lowest price in history" due to a surplus of energy. Wind and solar power continue to increase, and most experts believe energy costs will continue to trend downward, he said. In reaching its deal with Energy Northwest, however, the city relied on its own estimates showing that, in every possible scenario, it will reap substantially more from electricity sales in 2021 and 2022 than it did this year. "It's unlikely the city of Portland will make out like bandits because PGE will have many options," McCullough said. "It makes perfect sense for PGE to say to Portland, "'Sure we'll buy your power. Look at how low the prices are all over the region.' " If PGE purchases the same amount of power next year that it has over the last four years at the rate that McCullough says wholesale power buyers are paying in the coming year, Portland will lose $300,000 next year, an analysis by The Oregonian/OregonLive shows. Peters on Tuesday presented projected revenues to the Portland Utility Board, a citizen body that oversees the bureau. The figures he provided, which vary as widely as from $2.1 million to $4.9 million in the same year, estimate the city would lose more than $3 million over the next five years in the worst-case scenario or make around $9 million in the best-case scenario.

Peters, in a statement provided by Water Bureau spokeswoman Jaymee Cuti, wrote that the high, low and median sales estimates he presented to the utility board "represent the modelled range of revenues that could be anticipated under the conditions of the proposed contract. The model incorporated information about the historical generation and market prices...We cannot predict future weather or market conditions, which is why we have a range based on what we have experienced in the past." "The financial forecast is still a work in progress," Peters added. "Output from the forecast will be available by the time we present to council." Peters said the bureau is "still working to create a narrative of the risk," which he said the bureau will provide to council July 26, a week after the council is scheduled to vote on the contract. The City Budget Office's financial analysis this week noted: "If revenue is not sufficient to cover unmet hydropower liabilities, then the general fund may be liable under the new agreements." Commissioner Amanda Fritz urged the water bureau to make sure they protect the general fund during last week's meeting. "That should be a bottom line in your negotiations," Fritz said. "The general fund should not be at risk to bail out these operations."

(Good question that needs an answer.)

Workshop probes hydropower potential on Mississippi

By Alma Gaul, qctimes.com, Jul 14, 2017

What is the potential for producing electricity on the Mississippi River? That is the question that will be discussed Tuesday in a daylong conference at Western Illinois University Quad-Cities, Moline, co-hosted by River Action Inc., Davenport and Western. The Mississippi River certainly contains enough water to produce electricity; the drawback is that there is not much fall in elevation, according to a paper prepared by Western Illinois professor Roger Viadero and two graduate students in advance of the workshop. The two exceptions are at Lock and Dam 19

at Keokuk, Iowa, where there is a commercial-scale hydropower facility, and at Lock and Dam 2 in Hastings, Minnesota, where there is a smaller one. Any new electricity-generating structure — either a retrofit of an existing dam or the building of a new facility — would be a "low-head" facility, where the fall of the water is less than 30 feet, Viadero's paper states. These low-head systems have correspondingly low electric generating capacities. In low-head systems, water is collected at an elevated upstream location and is conveyed via gravity through a pipe to a turbine that is situated at a lower elevation. Prior to discharge into the turbine chamber, the velocity of water is typically increased by reducing the cross-sectional area of the pipe to create one or more "nozzles," the paper states. These systems use a small fraction of total river flow and generally don't require significant infrastructure changes to existing waterways, according to the paper.

There are many challenges, however. Among them, according to the paper:

- The lengthy licensing process.
- Coordination among levels of government, regulators and private industry.
- Costs and financing. "The upfront costs associated with the licensing and/or the license exemption processes can be prohibitive for investors," the paper states.

Topics at the workshop will include the history and future of hydropower, the latest technology in turbines, the history and future of hydroelectricity at the Rock Island Arsenal and Lock and Dam 15, environmental designs for low-head waterways, "who foots the bill" and regulations. The conference is designed to bring together developers, dam owners, energy utilities, clean energy and environmental groups, engineers, public works professionals and city officials.

(If you can't build new, go up.)

To meet future water and power needs, streamline federal process

By The Denver Post Editorial Board | July 14, 2017, denverpost.com

As we take a moment to celebrate a key milestone in Denver Water's plan to expand Gross Dam, let's also take a moment to reflect. It took a staggering 14 years of red tape, environmental study and public debate for the project to get the critical approval of the Army Corps of Engineers last week. And yet, while now very close, the project isn't a done deal. Denver Water has been wise to pursue increasing the capacity of their water delivery system to the north; Gross Reservoir would hold an additional 77,000 acre-feet of water once the dam expansion is complete. That's enough extra water to serve 54,000 single-family residential homes a year.

Much of that additional water will come from the other side of the Continental Divide, sent through existing pipes in Moffat Tunnel during wet years to prepare the Front Range for times of drought. Additionally, Denver Water remains in the process of getting its permit approved by the Federal Energy Regulatory Commission to modify the dam's small hydropower element so it can produce an estimated 8.1 megawatts of energy. That'll be an additional megawatt of renewable energy coming from an existing turbine operation. One megawatt is enough to power 750 homes.
Both of those approvals have hinged on the Environmental Impact Study process, which we fully support as a way to ensure projects like these don't do more harm than good in the effort to meet future water needs without harming our environment or leaving other cities and states high and dry.

But certainly there is a way the federal government can streamline these processes so they don't stretch on for decades. The National Hydropower Association says that the average permitting time through FERC is eight years. The association's goal is to increase the existing hydropower

capacity in the United States from 101 gigawatts to 151 gigawatts by 2050. Innovation in turbines and pumped storage will be part of that, but the nation needs a streamlined permitting process that maintains the existing requirements for environmental study and impact, while making the decision-making process much more expedient. The same goes for water storage projects that get mired in bureaucracy and intense non-negotiable opposition. Long have we supported the Gross Dam expansion project and we urge the project's main opposition group — Save the Colorado River — to drop their threat of filing a lawsuit to stop the permit. We agree that in an ideal world additional water storage wouldn't be needed and the Front Range could meet demand through increased conservation. But we also trust the facts that Denver Water's CEO Jim Lochhead presents that indicate even with a significant decline in per-household use, the booming population will increase demand.

According to Colorado's Water Plan, the municipal and industrial gap between demand and supply could be as much as 560,000 acre feet by 2050. The plan's goal is to reduce that projected gap to zero by 2030. Hydropower is the most consistent renewable energy and can be used to provide a base-load capacity alongside less reliable energy sources like wind and solar. It makes sense to pursue maxing out our dams' capacity. As Colorado works to fulfill the mission of the Water Plan and Gov. John Hickenlooper's renewable energy plan to reduce heat-trapping emissions, it makes sense for Congress to consider ways for the environmental impact assessment process to remain just as thorough and protective, but also more efficient and faster. To send a letter to the editor about this article, submit online or check out our guidelines for how to submit by email or mail.

(It's all about saving the fish.)

Editorial: Interest in Butte Creek hydroelectric system is good news

07/18/17, chicoer.com

We're glad to hear there are some entities that might be interested in taking over PG&E's DeSabla-Centerville hydroelectric project. It suggests a better future ahead for the system. It's a sprawling system, reaching from east of Butte Meadows down to Centerville, that takes water from one river and puts it into another. It's another one of those projects that could not be built today. A proposal to put two dams in Butte Creek and one in the West Branch of the Feather River would probably be enough to kill it outright. But the audaciousness of adding in a couple of reservoirs high in the mountains and 20 or 30 miles of canals and flumes to make the thing work would blow the minds of today's utility managers, not to mention today's environmental regulators. But it's there and it works. It's probably still profitable, though on PG&E's scale of operation, the pain of keeping it going doesn't make economic sense. It has all those miles of infrastructure to maintain and only generates 26 megawatts when all three powerhouses are working. With the Centerville Powerhouse down due to problems with the penstock, the system is down to 20 megawatts. For comparison, PG&E's project on the North Fork of the Feather River generates 360 megawatts or so. The Hyatt Powerhouse at Oroville Dam can top 650 megawatts, when all six turbines work.

But the DeSabla-Centerville system has morphed into something more than a power system. Philbrook Reservoir is the "go-to" recreation spot for a lot of people. The flumes in Butte Creek canyon have become popular with hikers, although that's really trespassing. Then there are the fish. Butte Creek hosts the healthiest population of threatened spring-run chinook salmon in the Sacramento River system, and the fish need cool water in summer to thrive. Cooler water than Butte Creek provides. That cooler water comes from the system's mountain lakes, which drain into the Feather River system. You kind of wonder how the salmon survived all those years

without it. The fact is, a project has been developed that an endangered fish depends on, and the law as it exists won't allow such a project to be abandoned. There is no "walk away" option for PG&E. The system could probably be downgraded to just delivering cold water from the mountain lakes to Butte Creek without bothering to generate power, but that cold water will continue to flow. It would be a shame to see the power plants taken off line. It's an established sustainable energy source, capable of more than helping endangered fish and providing recreational opportunities. It might not make sense for PG&E, but might for a smaller guy. PG&E has said money isn't the sole consideration. It wants someone who can take over the system and run with it. We're pretty sure the utility company wants to be good and done with it. There seem to be good options among the entities that have shown interest. One of the firms even operates a hydroelectric power plant on Butte Creek, just upstream from DeSabla. The Paradise Irrigation District doesn't have experience with running a hydroelectric project, but it's right there. A third interested firm also has a power plant in Butte County, over by Feather Falls. There may be more when it comes to making formal offers. The next few months will tell us more.

Water:

(San Diego planned for the future.)

Water Authority Celebrates Award for World's Top Civil Engineering Project

BY CHRIS JENNEWEIN, JULY 11, 2017, timesofsandiego.com

The San Diego County Water Authority celebrated Tuesday its award for the world's top civil-engineering project — a network of dams, pumps and pipelines that can protect the region's water supply for six months. The $1.5 billion Emergency & Carryover Storage Project received the 2017 award from the American Society of Civil Engineers earlier this year, beating out the iconic new One World Trade Center in New York and the Chhatrapati Shivaji International Airport Terminal 2 in Mumbai, India, among other projects. On Tuesday a plaque was officially unveiled at the remote Olivenhain Dam, one of the four key parts of the project. The plaque will ultimately be mounted at the top of the dam.

Norma Jean Mattei, president of the 150,000-member, Virginia-based engineering society, said the award recognizes innovation, originality and vision. "The water authority planned for the future, making an investment that ensures the public's health, safety and welfare in case of disaster," Mattei said. The 318-foot tall dam — the tallest built using a new concrete construction process —

nearby Lake Hodges pump station, 11-mile San Vicente Pipeline and newly raised San Vicente Dam can together store six months of water supply in case the region is cut off from Colorado River aqueducts. The project was fully completed at the beginning of the recent drought. “The timing could not have been more fortunate,” noted Maureen Stapleton, general manager of the water authority.

Mark Muir, chairman of the water authority, thanked San Diegans for supporting the project over a 25-year-period. “A special thank you to our ratepayers who have invested a significant amount of money in this project,” he said. Mattei said it’s somewhat sad that few of the 3 million people protected by the project with ever see it because of the remote locations of the dams and pipelines.

Environment:

(It was bound to happen.)

Scientists say Conowingo dam no longer stopping pollution; Hogan seeks solutions

By Erin Cox, Contact Reporter, The Baltimore Sun, baltimoresun.com, July 16, 2017

A year ago, Gov. Larry Hogan put out a call for private industry to suggest how Maryland should address the pollution that was quickly piling up behind the Conowingo Dam — a staggeringly expensive problem that many policymakers thought could wait. For nearly a century, the dam had stopped silt and polluting muck in the Susquehanna River from spilling into the Chesapeake Bay. There was wide agreement the reservoir behind the dam would eventually reach its capacity, and stop holding back the pollution. But scientists now agree the dam is not stopping anything at all.
"I wouldn't so much say it's worse than we thought," said Robert M. Hirsch, a research hydrologist with the U.S. Geological Survey. "It's come upon us sooner than we thought it would." When Hogan requested proposals last August, the U.S. Army Corps of Engineers' most recent estimate to dredge the reservoir of 25 million cubic yards of silt stood at $3 billion. That was way too high for the state to undertake the job alone and, some argued, more money than should be spent on a problem that scientists say isn't the largest source of pollution flowing to the bay.

Exelon Corp. could be denied a key Maryland permit — at least for now — that the company needs to keep generating electricity at Conowingo Dam for decades to come. Saying there's not enough information on the dam's impact on the Chesapeake Bay, the state Department of the Environment has declared. (Timothy B. Wheeler) It also didn't address the roughly 3 million additional cubic yards of silt that flow down the river every year, mostly from Pennsylvania and New York. Now, the scientific consensus that the dam is not holding back any pollution has given Hogan ammunition to forge ahead. The Republican governor says he's about to announce a plan to make "some real progress" at the dam, based on some of the proposals the state received.
He says he will seek a contractor next month to deal with the sediment and dissolved phosphorous and nitrogen pollution that weakens the bay's health. And he'll convene a summit to discuss what he wants to do.

The deluge that's fouled the Chesapeake Bay with mud, debris and pollution could pose a severe test for the efficacy of state and federal efforts to restore the ailing estuary. As I reported in The Baltimore Sun the deluge that's fouled the Chesapeake Bay with mud, debris and pollution could pose a severe test for the efficacy of state and federal efforts to restore the ailing estuary.
As I reported in The Baltimore Sun, scientists are warning that the floodwaters that poured through Conowingo Dam's spillgates. (Tim Wheeler) Hogan promised to address the dam during the 2014 campaign. "Most people didn't seem to agree that it was a problem," he said. "Now everyone seems to agree that it's a problem." A dozen companies responded to Hogan's call for innovative ideas to save money on the project, according to a review of public records obtained by The Baltimore Sun.

Arcadis, based in the Netherlands, suggested buying 2,400 acres of low-quality agricultural land, smearing it with the nutrient-laden sediment and selling it for a higher price. Immix, a Colorado firm, pitched a physics process advertised as using earthquake-strength forces to compress the sediment into pavers and countertops that could be resold at a profit. Brinjac Engineering, headquartered in Pennsylvania, suggested a two-mile long "biological dredging" operation that would use microbes on the river bottom to chew through sediment, cleaning the water and reducing how much needed to be dredged in the first place. The firm estimated it would cost about $23 million and take five years to deal with just 1.5 million cubic tons of material, but said it could generate pollution credits Maryland could sell to other states that haven't done their share in cleaning up the bay. Donge Flushing Yard, also based in the Netherlands, offered to build Maryland a custom dredging boat for 18 million euro — about $20.6 million — to pull up muck 24 hours a day and then dump it in the ocean. Once the state owned the boat, the operation would cost $52,000 a week just to bring the material ashore. The boat could be resold, the firm said, for about 70 percent of its initial price. Harbor Rock, headquartered in New Jersey, said that for $100 million a year, it would dredge up the gunk and build a processing plant to feed it through 2,000-degree kilns, which would turn it into a material that can be used to make concrete.
The firm said it would need about three years to get the operation moving, could deal with 2 million cubic yards per year, and would keep the profits. Cold Harbor, another Colorado company, offered a mobile sediment processing system that could quickly set up in an existing parking lot. It said sand from smaller projects has been used to make boat slips in South Carolina, agricultural topsoil in Indiana and berms at a Florida gun range.

Hirsch, the hydrologist, wrote some of the first papers suggesting the problem couldn't wait another 15 years. But he qualified the urgency. Although the Susquehanna River is a major contributor of nutrient pollution, he said, much of it flows into deep areas of the bay that aren't as ecologically sensitive. Lower amounts of pollution in shallower and more fragile areas can have a bigger overall impact on bay health. While there's wide consensus the Conowingo reservoir is now full, Hirsch said, not everyone agrees on how quickly there needs to be a solution, nor what it should be. "There's consensus about the nature of the problem," Hirsch said. "There needs to be a lot more analysis of these alternatives."

Hogan said he also plans to lean on the federal Environmental Protection Agency and use his chairmanship of the Chesapeake Executive Council to make states upstream of the Conowingo — Pennsylvania and New York — take more responsibility for pollution that's now cascading over the dam. Sediment scours the waterways. But the bigger problem, scientists say, is the release of nitrogen and phosphorus it brings with it. An abundance of those nutrients kicks off a cycle that harms the bay: the nutrients feed algae blooms that block light and kill underwater plants, which in turn depletes oxygen in the water, choking fish and other wildlife that help keep the bay clean.
While the administration declined to offer details on the request for proposals the governor will issue, Environment Secretary Ben Grumbles pointed to a road map the state released this year on beneficial ways to use sediment dredged out of the waterways. That plan, Grumbles said, helps make dredging projects more affordable. Sediment brought up from the Chesapeake can be reused to build roads, restore eroding shorelines, or cap landfills — aftermarket uses that make the sediment a valuable commodity, rather than just expensive waste.

"We're gaining momentum on the Conowingo challenge," Grumbles said. He also said it was "short-sighted" to view dredging as the entire solution to the problem. He touted the benefits of creating a marketplace to sell and trade pollution credits, an initiative the administration pitched unsuccessfully to the General Assembly this year. Grumbles said the state also plans to use any regulatory leverage it has to force others to help cut pollution before it gets into the watershed and pay to remove it from the reservoir dam. Among those tools: Hogan's ability to effectively veto Exelon energy's bid to renew its license to operate the hydroelectric dam. Under federal laws, the governor has the authority to halt relicensing of the dam if he does not believe it adequately meets the state's clean water standards. Hogan said the company has "got to be part of the solution, but it would be crazy to expect them to do the whole thing." A spokeswoman for Exelon said the company already is working with the government and others. "Exelon Generation believes protecting the vitality of the Bay is a multi-stakeholder, multi-state issue," spokeswoman Deena O'Brien said in a statement, "and we continue to work with all parties, including Gov. Hogan and his administration, to ensure the Lower Susquehanna River retains its important environmental and recreational benefits."

(Look like worms.)

'Eelevator' helps young eels migrate in Hudson River tributaries

By Christopher Cameron, July 16, 2017, amny.com

Two years after the completion of a dredging project in the Upper Hudson River, a new device is helping revitalize the ecosystem in the river's tributaries. The "eelevator," designed by the New York State Department of Environmental Conservation, helps young American eels access the waters above dams, which in turn feeds every level of the river's ecosystem, said Chris Bowser, coordinator for education at the DEC Hudson River Estuary Program. "We designed an eel ladder that could literally be lifted and raised [out of the water]," Bowser said. "We haul them up, we let them go, and then we lower the thing back down." Since 2008, citizen science programs working with the DEC have caught, counted and released more than half a million juvenile eels across 14 barriers in the tributaries of the Hudson River. These "trap-and-pass" devices would hold the juvenile eels until researchers could count the fish and release them upstream.

"Imagine the Hudson River in early springtime, when the water's just warming up," Bowser said. "Along comes this migration of millions of Sargasso Sea-flavored snacks into the estuary at exactly the time when the river needs those nutrients the most." However, residents of the Village of Piermont in Rockland County wanted a lower-cost solution for a dam that was impeding eel migration in Sparkill Creek — one that could be operated by trained volunteers in the village community in addition to ecologists and researchers. Enter the "eelevator." "Now that we know [the eelevator] is functional, we're starting to look at the next few dams upstream to see if we can retrofit those dams with these passages to allow them more access all the way up the river," said Michelle Luebke, ecology director at the Bronx River Alliance. Luebke manages the trap-and-pass device for eels at the dams on the Bronx River, and said passageways for eels have been established in other New York City waterways, such as the tributaries running from the East River. Bowser added that the DEC is taking a "measured, steady approach" to expanding the eelevator program with other communities on the banks of the Hudson River and its tributaries in the future.

Other Stuff:

(Best run cities out west mostly, except for KY.)

You Probably Haven't Heard of the Best-Run City in US

Louisville is No. 10, but No. 1 is Nampa, Idaho

By Newser Editors, Newser Staff, Jul 10, 2017, newser.com

(NEWSER) – Seems like everyone likes to complain about the way their city operates, but WalletHub decided to make things a little more tangible. It looked at 150 of the biggest cities in the US, then crunched data on the size of the local budget and the quality of services offered. By this criteria, the best-run city in America is ... well, one you've probably never heard of.

The top 10:

1. Nampa, Idaho
2. Provo, Utah
3. Boise, Idaho
4. Missoula, Mont.
5. Lexington-Fayette, Ky.
6. Las Cruces, NM
7. Billings, Mont.
8. Bismarck, ND
9. Fort Wayne, Ind.
10. Louisville, Ky.

And the bottom performers:

141. Memphis, Tenn.
142. Chattanooga, Tenn.
143. Flint, Mich.
144. Oakland, Calif.
145. Hartford, Conn.
146. Cleveland
147. San Francisco
148. New York
149. Detroit
150. Washington, DC

Click for the full rankings, along with an explanation of how they arrived at the results..
https://wallethub.com/edu/best-run-cities/22869/

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