June 5, 2017

Ms. Grace Appelbe
Legislative Clerk
Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

Dear Ms. Appelbe:

Please find, attached, Mr. William Robert Irvin's responses to questions from the Hon. Frank Pallone, Jr., following Mr. Irvin's testimony before the Subcommittee on Energy on Wednesday, May 3, 2017, in the hearing entitled "Legislation Addressing Pipeline and Hydropower Infrastructure Modernization." A copy of the responses was also emailed to Mr. Wyatt Ellertson, pursuant to the instructions contained in Chairman Upton's letter to Mr. Irvin dated May 19, 2017.

If you have any questions, please feel free to contact me at [redacted] or at [redacted]

Sincerely,

[redacted]

Jim Bradley
Vice President, Policy and Government
American Rivers

Questions from Hon. Frank Pallone, Jr. to Mr. William Robert Irvin

Q1. *Mr. Irvin, in your oral testimony, you referenced methane emissions from hydroelectric reservoirs as contributors to global warming. Recent meta-analyses have indicated that the greenhouse gas emissions associated with these reservoirs are higher than previously believed. Are you aware of academic, private, or governmental surveys of methane emissions from reservoirs attached to hydroelectric projects or potential hydroelectric projects?*

A recent meta-analysis by Deemer et al. (2016; attached) synthesizes all of the published data on greenhouse gas emissions (i.e., methane, CH_4; carbon dioxide, CO_2; nitrous oxide, N_2O) from hydroelectric reservoirs as well as those used for flood control, irrigation, navigation, and recreation. This global dataset includes methane emissions data from 21 hydroelectric reservoirs in 11 states and Puerto Rico (AL, CA, CO, GA, ID, NC, OR, SC, TN, WA, WI, PR). American Rivers believes that based on this meta-analysis, a comprehensive survey of American hydropower projects to determine methane emission levels is overdue. As the Committee continues to grapple with the issue of regulating and limiting the emission of greenhouse gas pollutants from the electricity sector, it is important that methane emissions from hydropower projects be fully accounted for so that other electricity producers are not compensating for the hydropower industry.

A plain language overview of the findings of the Deemer et al. study was published in a September 2016 article in the Washington Post titled "Reservoirs are a major source of global greenhouse gases, scientists say." The full dataset from this meta-analysis is available online: Deemer BR, Harrison JA, Li S, Beaulieu JJ, DelSontro T, Barros N, Bezerra-Neto JF, Powers SM, dos Santos MA, Vonk JA (2016) Data from: Greenhouse gas emissions from reservoir water surfaces: a new global synthesis. Dryad Digital Repository. http://dx.doi.org/10.5061/dryad.d2kv0

Could you provide more information on what the current research has shown and what the committee should consider as it conducts oversight of hydroelectricity in the United States?

Hydropower is often thought of as "green" energy; however a growing number of scientific studies document hydroelectric reservoirs as a source of greenhouse gas. All hydroelectric reservoirs are a source of methane to the atmosphere (Barros et al. 2011) and methane emissions are responsible for the majority of the climate change impacts of hydropower (Deemer et al. 2016). Methane is a powerful and fast-acting greenhouse gas that can trap 34 times as much heat as carbon dioxide over a 100-year period (Shindell et al. 2009). Deemer et al. (2016) estimate that global hydroelectric and non-hydroelectric reservoirs emit approximately 13.4 million metric tons of methane per year, with nearly half of that coming from hydroelectric reservoirs. Calculated reservoir methane emissions are 25 percent larger than previous estimates and greater than those for natural lakes, ponds, rivers, or wetlands.

Methane is produced through the decomposition of organic matter (e.g., leaves, trees, algae) under anoxic (i.e., no oxygen) conditions that are common in reservoir sediments. Methane is emitted from manmade reservoirs through a number of pathways including: (1) continuous diffusion across the surface of the reservoir, (2) bubbling ("ebullition") from sediments, and (3) transport through plants growing within the reservoir (Beaulieu et al. 2014, Deemer et al. 2016, Harrison et al. 2017). Because decomposition of flooded vegetation and soil organic matter fuels greenhouse gas production, the first 10 to 20 years after dam construction is often associated with particularly high greenhouse gas emissions (Barros et al. 2011) though emissions persist for the life of the reservoir. The operation of hydropower dams creates two additional pathways for greenhouse gas emissions, which lead to hydroelectric reservoirs producing double the amount of methane produced by non-hydroelectric reservoirs; these include: (4) degassing at turbines and spillways as a result of rapid depressurization of water leaving the reservoir, and (5) emissions resulting from drawdowns of greater than 0.5 meters that cause increased bubbling of methane and periodic exposure of flooded, methane-producing sediments to the atmosphere (Deemer et al. 2016, Harrison et al. 2017). Rivers segments downstream of hydropower dams are also associated with increased methane emissions, especially if anoxic, methane-rich water from the bottom of the reservoir flows through the turbines (Deemer et al. 2016).

While the amount of methane emitted by individual reservoirs is variable, scientists have shown that on average nutrient-rich ("eutrophic") reservoirs emit ten times more methane than nutrient-poor ("oligotrophic") reservoirs (Deemer et al. 2016). This is because decomposing algae generates more methane than decomposing leaves or wood and algal blooms are common in nutrient-rich systems. Eutrophication also magnifies the effects of reservoir drawdown on methane emissions (Harrison et al. 2017). It was previously believed that low-latitude reservoirs (and Amazonian reservoirs in particular) produced the most methane per unit area, but it is now believed that reservoirs with warm waters and high algal growth emit more methane per unit area, regardless of latitude (Beaulieu et al. 2014).

Future plans for hydroelectric development should not only aim at minimizing the overall environmental impacts of the dams themselves, but also to minimize greenhouse gas emissions per unit of energy generated through careful siting and operation (Barros et al. 2011). For example, by locating new reservoirs upstream of nutrient inputs that fuel higher methane emissions (Deemer et al. 2016) or reducing the frequency and magnitude of drawdowns (Harrison et al. 2017), methane emissions may be reduced.

American Rivers urges the Committee to conduct oversight on the issue of methane emissions from hydroelectric plants, both in the United States and overseas. As noted above, we believe that methane emissions need to be accounted for when creating a regulatory regime to reduce overall greenhouse gas emissions. We urge the Committee to direct federal agencies, particularly the Department of Energy, to facilitate, encourage, and conduct research into the greenhouse gas emissions from hydropower projects. Such research could build upon the work of scientists who have developed models for predicting methane emissions in the Amazon basin

(de Faria et al 2015). Further, we urge the Committee to examine the role that U.S. government financing of hydropower development overseas may be contributing to overall global greenhouse gas emissions.

Unfortunately, when FERC examines hydropower license applications, the Commission does not require methane gas emissions data. More concerning, the Commission does not require applicants to examine the impacts of climate change on the supply of fuel, in this case, river flows, over the proposed license term. It is evident to all that climate change is having dramatic impacts on hydrology; climate change is responsible for decreased snowpack, extreme rainfall, prolonged droughts, and changes to historic weather patterns. The failure of FERC to consider climate change in considering its license conditions and terms does a disservice not only to the applicant but also all other stakeholders who rely on healthy river flows at or about the project.

However, the failure to consider methane emissions may have even more broad impacts by exacerbating the very conditions causing climate change. Evidence for such a feedback loop is convincingly argued by Deemer et al:

{A] warming climate supports larger algal populations, larger algal populations provide more organic matter to support more methane production, and a portion of the methane produced escapes to the atmosphere, where it functions to further warm climate.

I urge the Committee and the Commission to take seriously the scientific evidence that hydroelectric dams are contributing to climate change. In doing so, I recognize the greenhouse gas avoidance that some, but not all, current or proposed hydroelectric projects provide. However, that avoidance is not 100 percent at most projects, in comparison to wind and solar which are truly carbon free and for which the fuel source is truly renewable, as opposed to hydroelectric dams which by their nature rely upon finite, and competed for, hydrologic resources.

Barros, N., J.J. Cole, L.I. Tranvik, Y.T. Prairie, D. Bastviken, P.A. del Giorgio, F. Roland, and V.L.M. Huszar. 2011. Carbon emission from hydroelectric reservoirs linked to reservoir age and latitude. Nature Geoscience 4: 593–596.

Beaulieu, J.J., R.L. Smolenski, C.T. Nietch, A. Townsend-Small, and M.S. Elovitz. 2014. High methane emissions from a midlatitude reservoir draining an agricultural watershed. Environmental Science and Technology 48:11100–11108.

Deemer, B.R., J.A. Harrison, S. Li, J.J. Beaulieu, T. Delsontro, N. Barros, J.F. Bezerra-Neto, S.M. Powers, M.A. Dos Santos, and J.A. Vonk. 2016. Greenhouse Gas Emissions from Reservoir Water Surfaces: A New Global Synthesis. BioScience 66(11):949-964.

de Faria FAM, Jaramillo P, Sawakuchi HO, Richey J E and Barros N. 2015. Estimating greenhouse gas emissions from future Amazonian hydroelectric reservoirs. Environmental Research Letters 10 124019

Harrison, J.A., B.R. Deemer, M.K. Birchfield, and M.T. O'Malley. 2017. Reservoir Water-Level Drawdowns Accelerate and Amplify Methane Emission. Environmental Science and Technology 51:1267−1277.

Shindell, D.T., G. Faluvegi, D.M. Koch, G.A. Schmidt, N. Unger, and S.E. Bauer. 2009. Improved attribution of climate forcing to emissions. Science 326:716–718.

Q2. *Mr. Irvin, Democratic Members of the Energy Subcommittee recently wrote to Chairman Upton and Chairman Walden to request a follow-up oversight hearing on hydroelectric licensing to receive testimony from Federal resources agencies, states and Native American tribes. These entities, as you know, have mandatory conditioning authority on hydroelectric licenses that is central to any discussion of legislative changes to the licensing process. As a member of the Congressional Native American Caucus, I'm particularly interested in ensuring the views of tribes are heard in this matter. Mr. Irvin, are you aware of any specific concerns by a Tribe with regard to the draft legislation?*

Many Native American tribes have long had serious concerns with the construction and operation of hydropower dams on or impacting their reservations. That is why the National Congress of American Indians passed a resolution in 2015 that stated in pertinent part:

> *[NCAI]opposes changes to the hydropower section of the Federal Power Act that: (a) weaken the current protections Indian tribes have through the Mandatory Conditions requirements under Section 4(e) of that Act; (b) overturn the watershed case of City of Tacoma, Washington v. F.E.R.C., 460 F.3d 53 (D.C. Cir. 2006), which affirmed the authority of federal agencies to address the impacts of water diversion taking place off reservation lands after decades of hard-fought litigation; (c) roll back efforts to restore fish populations through the requirement of fishways; and (d) unnecessarily limit the available time and scientific information available to federal agencies in deciding what Mandatory Conditions should be included with a license…*[1]

The experience of the Skokomish Tribe in Washington State illustrates the problems that tribes have faced in hydropower licensing, and has informed their position on the discussion drafts the Committee considered in the May 3rd hearing. Their concerns, while specific to their tribe, are shared by numerous tribes from across the country. I will attempt to summarize the Skokomish's concerns, as I understand them, but would urge the Committee to consider holding another hearing on the Discussion Draft, specifically on how it impacts tribes, in order to more fully and directly hear the tribal perspective.

The Skokomish Tribe in Washington State is concerned about the current draft of the Hydropower Modernization Act and the impact that the draft bill could have on the federal government's ability to meet its trust responsibility to protect Indian reservations, and treaty protected resources. While the Tribe, like all stakeholders, wants the licensing process not to be unnecessarily delayed or to be fraught with extraneous costs, they believe that truncated schedules and sloppy science will result in fifty-year dam licenses that will destroy watersheds and ecosystems, as was the case for the Skokomish Tribe with the licensing of the Cushman Dam.

[1] The National Congress of American Indians Resolution #SD-15-009

The City of Tacoma operated Cushman Dam without any license conditions for 80 years. The Interior Department's failure to exercise its statutory duty to impose any – let alone "appropriate-license conditions" in 1924 resulted in the destruction of the once plentiful Skokomish North Fork fisheries, the flooding of almost thirty percent of the Skokomish Reservation, the degradation of the entire Skokomish Watershed, and the devastation of treaty protected cultural and wildlife resources. FERC did not even require Tacoma to pay for the use of Reservation lands where some of the Project was located. The Skokomish Tribe had to fight at every step in the relicensing process to secure conditions to protect its Reservation and the reason it was established – to be a homeland and provide access to the natural resources that the Skokomish relied on for generations.

When the Interior Department finally imposed conditions on the Cushman Dam license, FERC decided that Interior's conditions were untimely. And it was the Tribe that had to fight in court to ensure that the conditions were enforced in the license. Even Interior was not willing to defend its conditions – but instead deferred to FERC regarding FERC's decision that the conditions that the Interior imposed were not timely and extended beyond the project works that were on the Reservation, and therefore were not mandatory.

The Skokomish Tribe prevailed, and the ruling is set out in a 2006 decision from the U.S. Court of Appeals for the District of Columbia Circuit, *City of Tacoma v. FERC.*[2] In that ruling, the Court agreed with the Tribe regarding Interior's authority to impose conditions on a project. The Court's decision established that FERC's deadline did not constrain Interior's mandatory authority under the Federal Power Act. The Court also upheld Interior's decision to impose conditions on the license beyond those project works that were actually on the Reservation, but including those necessary to protect the Reservation.

This decision was critical to the Tribe and Tacoma reaching an historic settlement, which made Tacoma and the Tribe partners in the management of the Skokomish River and the Skokomish Watershed. As a result of this settlement, there have been major improvements in the Skokomish River Estuary, improved habitat on the North Fork of the Skokomish River, and the construction of a Sockeye hatchery to restore this run up the North Fork of the Skokomish River.

The Skokomish Tribe's experience with the Federal Power Act demonstrates the critical importance that that the conditions set out in Sections 4(e) and 18 of the Act play in balancing the use of the Nation's waters for hydropower with terms and conditions essential to ensuring that hydropower is not developed at the expense of other vitally important resources.

This is why the Skokomish Tribe is concerned with the draft bill's impact on the ability of the federal government to uphold its trust responsibility to protect tribal lands and treaty resources.

[2] Note: American Rivers intervened in this case in support of the Skokomish Tribe.

Specifically, the draft bill would give FERC the ability to set deadlines on Interior and other agencies to set their conditions under the Federal Power Act, including Sections 4(e) and 18. While all stakeholders want the process to move in a prudent and timely manner, (after all, the licensee gets to operate the facility under annual licenses without any new conditions until a new license is issued), without the resources or personnel to do the job, it is very unlikely that Interior or other federal and state agencies will meet the deadline that FERC sets. In the Tribe's experience, FERC readily extended deadlines for the applicant and for itself, but only sought to impose unrealistically short deadlines on the other federal and state agencies which had equally important and distinct responsibilities under the Act. The Court in the *City of Tacoma v FERC* decision recognized this. But under the Discussion Draft, the consequence of failing to meet the deadline will be FERC's rejection of the conditions, essentially overturning a critical element of the *City of Tacoma v. FERC* decision.

The Tribe is also concerned about the provisions of the draft bill that delegate to FERC, an agency that has neither the manpower nor expertise, the ability to make critical environmental decisions regarding projects. The Federal Power Act was forward-thinking in recognizing the experience and expertise of other agencies and the need for them to play a role in the issuance of these licenses. In the Tribe's view, this proposal would make an agency that is not qualified to make environmental decisions, ultimately responsible for these decisions.

The Tribe has expressed the view that, as Congress considers changes in the Federal Power Act it should make changes that specifically strengthen Sections 4(e) and 18. Specifically, the Tribe asks that the Federal Power Act be amended to enable Tribes to assume the authority to impose 4(e) and 18 conditions to protect its Reservations and Treaty rights and resources. This would make the Federal Power Act consistent with other statutes like the Clean Water Act and Safe Drinking Water Act, where Tribes are treated as governments instead of wards of the government. In the alternative, if Congress insists on authorizing FERC to set deadlines for Agencies to impose 4(e) and 18 conditions, the Tribe asks that the Federal Power Act also be amended to mandate that federal agencies must impose conditions on licenses to protect Indian Reservations, Tribal Treaty rights, and Tribal Trust resources, and provide Tribes with a cause of action against the United States, if the Agencies fail to do their job.

Q.3 *Mr. Irvin, in your testimony, you state that FERC routinely denies study requests from state, federal, and tribal resource agencies because FERC itself does not believe the information is necessary for FERC to complete its own review. Further, because the state, federal, and tribal resource agencies, acting under separate statutory authority or pursuant to their directives under the Federal Power Act, are unable to complete their oversight of a license application until the requested information is provided by the applicant, FERC's refusal to transmit the study requests on the resource agencies' behalf causes unnecessary delays and confusion.*

Can you expand on the issue of study denial delays?

Do you know of instances in which applicants were aware that state, tribal, and federal resources agencies required information pursuant to their statutory authorities, that FERC had declined to include a request in its study plan, and the applicant chose to not collect the data necessary to establish a scientifically based and legally defensible condition on a license?

Denial of resource agency study requests by the Federal Energy Regulatory Commission (FERC) has long been a significant contributing factor in licensing delays. Federal, state, and tribal resource agencies have independent legal authorities granted to them by federal statutes such as the Clean Water Act, the Endangered Species Act, and the Federal Power Act that require them to complete their own reviews and place necessary conditions on a license for that license to be compliant with state and federal law. In order to complete a thorough, timely, and defensible review, it is critically important that resource agencies have scientific data from studies to inform their decision making.

Where the applicant-proposed study plan will not provide adequate information for resource agencies to carry out their reviews, resource agencies ask FERC to require the applicant to provide the necessary information. Frequently, these requests are rebuffed and resource agencies are forced into a situation where they must make resource protection decisions without sufficient information (leaving them vulnerable to legal challenge), deny the permit or certification, or use taxpayer funds from their budgets to conduct the studies themselves. The additional wrangling to get information deemed necessary, the study dispute process embedded within the licensing process, and the conducting of studies to get the necessary information that the applicant and FERC have refused to provide, all add time to the licensing process and divert agency attention and resources away from exercising their authority in a timely manner.

The following are several examples that highlight the challenge that resource agencies face in getting FERC to assist them in obtaining the information they need to thoroughly and timely exercise their independent reviews and authorities:

Conowingo Hydroelectric Project (P-405), Maryland

In 2009, the Maryland Department of Natural Resources (MDNR), on behalf of and in conjunction with the Maryland Department of the Environment (MDE) requested the applicant perform a Sediment and Nutrient Loading and Distribution Study in order to assess the project's impact on natural patterns of sediment and nutrient transportation and deposition in the impoundment, downstream riverine habitat and upper Chesapeake Bay. To support its request MDNR wrote:

> *[The] [l]ong-term consequences of sediment accumulation and its [effect] on downstream riverine and upper Chesapeake Bay habitat have not been adequately studied. This study will address missing information and data.*[3]

The applicant agreed to do a sediment study, but failed to include information on benchmarks for potential future mitigation that MDNR requested. FERC agreed and in its Study Plan Determination wrote:

> *Exelon's revised study plan includes projections of sediment accumulation and options to manage, mitigate, and remove accumulated sediment. However, it did not address benchmarks (triggers) for potential impacts and actions. Given the temporal variability of when the reservoir will reach its sediment storage capacity, the study report should include a sediment management plan that includes projections of sediment accumulation; benchmarks for potential impacts and actions; and options to manage, mitigate, and remove accumulated sediment.*[4]

Subsequently, the applicant again, failed to include the required information in its study report and despite objections from MDNR, FERC determined that the information was not required and declined to require the applicant to provide the requested information.[5] MDNR and MDE requested FERC reconsider its decision because it was not consistent with FERC's own prior study plan determination or FERC's regulations.[6] FERC declined to do so.

MDNR continued to raise the deficiency issues with the applicant and FERC and ultimately informed the applicant that it did not have sufficient information to process the 401 certification for the project. The applicant finally relented and in 2014 entered into an agreement with MDE to conduct a multi-year study to address the data deficiencies.[7] [8] As of March 2017, the project

[3] FERC Accession No. 20090710-5127
[4] FERC Accession No. 20100204-3055
[5] FERC Accession No. 20120521-3002
[6] FERC Accession No. 20120620-5101
[7] FERC Accession No. 20141218-3065
[8] http://news.maryland.gov/mde/2014/12/08/water-quality-certification-application-for-proposed-conowingo-dam-relicensing-withdrawn-january-7-water-quality-certification-public-hearing-canceled-exelon-agrees-to-fund-

still has not received a 401 and MDE has only recently determined it may have sufficient information to begin assessing the water quality impacts of the project.[9]

It is clear from the record that much of the delay on this project could have been avoided 1) if the applicant had simply provided the information it was required to provide in the study plan and 2) if FERC had required the applicant to provide the necessary information. Instead, this project is still awaiting its license because the State of Maryland did not have enough information to issue a legally defensible water quality certification.

El Dorado Project (P-184), California

In 2001, the California State Water Resources Control Board (SWRCB), California's agency with responsibility for implementing section 401 of the Clean Water Act, wrote to Congress in response to FERC's report pursuant to section 603 of the Energy Policy Act of 2000 to address the issue of study requests and delay. In that letter the SWRCB wrote:

> *In addition, FERC often delays requiring, or refuses to require, the applicant to complete the agency requested studies that were required as part of the first and second stage consultation requirements prior to submitting the license application to FERC.*
>
> *FERC's handling of El Dorado Project #184 is an example of this problem. The license application was submitted without completion of the water quality, fisheries, hydrology, recreation, or aquatic surveys for listed or sensitive species. The state and federal agencies commenting on the draft application concluded that the application was deficient. FERC nevertheless accepted the application for filing, thus triggering the requirement for water quality certification. Because the data will not be available for more than a year, the SWRCB is forced to either deny certification or waive its authority for certification. The other option is for the applicant to withdraw its request.*
>
> *This recurring problem is a product of FERC's own regulations. The failure to complete required studies, the absence of firm deadlines governing responses to [Additional Information Requests], and the premature requirement to request 401 certification, leaves the agencies uncertain about when or if they will receive necessary information. This uncertainty compromises the agency's ability to evaluate and analyze project impacts to natural resources.*[10]

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additional-study/

[9] FERC Accession No. 20170517-5130

10 California's Response to the Federal Energy Regulatory Commission Staff Report on Hydroelectric Policies, Procedures, and Regulations-Comprehensive Review and Recommendations Pursuant to Section 603 of the Energy Act of 2000, October 2001.

In this letter, the SWRCB very clearly lays out how uncertainty around whether they will receive the necessary information to complete the 401 compromises their ability to complete their water quality certification. The obvious solution would be for FERC to require studies that mandatory conditioning agencies need to complete their reviews.

Dorena Lake Dam Hydroelectric Project (P-11945), Oregon

The Oregon Department of Fish and Wildlife (ODFW) became concerned about entrainment of fish in the project area and they requested an entrainment study. The applicant declined to provide the study and FERC agreed, also declining to require the applicant to conduct the study. ODFW submitted 10(j) recommendations to FERC asking that a fish screen be required to prevent entrainment and FERC, in its October 2008 license order, rejected the 10(j) recommendation, citing a lack of information on entrainment of fish in the project area :

> *As discussed in the final EA, staff found no evidence to suggest that downstream migration of fish from Dorena Lake currently is occurring in large numbers, or that loss of fish through the dam is currently having a negative effect on populations of fish in the lake... For these reasons, staff concluded that there would be little biological benefit associated with installing an exclusion screen on the intake and subsequently performing a performance evaluation, and therefore, the measures would not justify an annualized cost of $56,240.*[11]

In its December 2008 response to the license order, ODFW sent a letter pointing out the unfairness of refusing to require a study ODFW requested, then refusing to incorporate their 10(j) recommendation on the basis of lack of information:

> *Symbiotics and ODFW developed a settlement agreement, outside of the FERC process which, in this case, adequately addresses ODFW's concern with project entrainment of the state's fish and wildlife resources. While ODFW is satisfied with the outcome it has reached with Symbiotics, we note that there are several conclusions for which the Commission should provide more explanation. For example, the Order at 42 suggests there was no evidence that large numbers of fish were migrating downstream. However, the order omits the fact that FERC did not require a study to obtain information on fish migrations, and further, FERC rejected ODFW's Additional Study Request to conduct an entrainment study necessary to collect the information. Essentially, FERC refused to require the collection of data, then concluded that there was no evidence that large numbers of fish were migrating.*[12]

11 FERC Accession No. 20081017-3023

12 FERC Accession No. 20081226-5004

Merced (P-2179) and Merced Falls (P-2467), California

In 2009, the State Water Resources Control Board (SWRCB) requested a mercury bioaccumulation study for the Merced and Merced Falls Hydroelectric Projects because they had information that indicated there may be a mercury problem in the project area:

> *At the meeting on the Water Quality Study Plan, staff requested that the Licensee include an examination of whether and to what extent bioaccumulation of mercury may be occurring in fish that reside in the Project impoundments. This request is due, in part, to information contained in an October 2004 Technical Memorandum prepared by Stillwater Sciences for the CALFED Ecosystem Restoration Program entitled: "Mercury Assessment of the Merced River Ranch1" that shows that the mercury content of biota collected below the Merced Falls Project is considerably higher than biota collected above Lake McClure. State Water Board staff has consulted with the Office of Environmental Health Hazard Assessment (OEHHA) to determine the appropriate level of effort required to collect the data needed by that agency to make a determination regarding potential human health hazards associated with mercury bioaccumulation.* [13]

The bioaccumulation study went to dispute resolution and FERC declined to require the study despite evidence that there may be a mercury problem in the project reach and the implications thereof to human health:

> *Finally, we disagree with the Panel and the Resource Agency's Panelist's assessment that the proposed study identifies an appropriate nexus to potential project effects. As stated in the Determination, the baseline for our NEPA review is existing conditions, not the original construction of the project reservoirs. MID is not proposing to alter project operations, to increase water fluctuations, or mobilize substrates. Therefore, as proposed, the project is not performing any actions associated with the release of methylation of mercury. For the reasons cited above, we maintain that a study of mercury bioaccumulation is not warranted.*[14]

This determination would be reasonable if the SWRCB had not told FERC it had information in its possession indicating that a problem may exist under *current* operations of the project.

In 2011, the SWRCB used its own authority to issue an investigation order to get the required bioaccumulation information. The investigation order notes:

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[13] FERC Accession No. 20090302-5139

[14] FERC Accession No. 20091222-3035

> *Division staff have participated in the Commission relicensing proceeding and have provided input regarding the information that will be needed to develop the water quality certification. The study plans proposed by MID did not address the full range of information needed by the State Water Board to develop the certification. The Study Determination issued by the Commission's Director of Energy Projects on September 14, 2009, was likewise deficient by not requiring that MID implement additional studies or study modifications requested by the State Water Board and other participating agencies and non-governmental organizations, in particular those that deal with resource issues downstream of Crocker-Huffman Diversion Dam.*[15]

In this particular situation, the SWRCB was able to obtain the needed data. However, the order required additional staff time and resources that would not have been necessary had the applicant or FERC agreed to implement the study when first requested. The applicant was not successful in avoiding providing the information, but did manage to delay doing necessary studies for two years.

Chasm Hydroelectric Project (P-7320), New York

In 2013, the United States Fish and Wildlife Service (USFWS) and New York Department of Environmental Conservation (NYDEC) requested additional studies related to base flow and bypass flow. The agencies had previously agreed with the license applicant on a study to determine flows. This agreement on the study methodology was based on the understanding that the project would continue to spill approximately 80% of the time, contributing an extra 50 cfs in flows to the river. After the study was complete, the license applicant later revealed that it intended to change operations to spill only 25-30% of the time. The anticipated change in operations made the information provided by the study irrelevant to the potential new operations. Writing to FERC to explain why it needed additional information, the USFWS explained:

> *The management objectives were designed to reflect the current operational mode…During settlement negotiations, Erie indicated that they have been inefficiently utilizing the power generating capabilities at this site. In the future, Erie plans to reduce spillage to the maximum extend practical. Erie estimated that the project would spill about 25-30% of the time in the future. Based on this determination, the Delphi Team members other than Erie determined that the study was conducted under false pretenses and rescinded their recognition of the scoring system that occurred.*[16]

In its denial, FERC did not address the change in operations proposed by the license applicant or the assertion of "false pretenses" by the U.S. Fish and Wildlife Service. Instead, they denied the

[15] California State Water Resources Control Board Investigation Order WR 2011-0003-EXEC, pg. 4
[16] FERC Accession No. 20130827-5195

study requests on the basis that its staff looked at the information and determined that it was sufficient for another agency's review process:

> *Based on staff's review of the study and other information provided in the application, including information related to habitat suitability, existing information is adequate to serve as the basis for an independent analysis of bypassed reach flows. Therefore, the agencies requested additional studies related to bypassed reach flows are denied.*[17]

The USFWS and NYDEC are exercising authorities separate from FERC's licensing authority. FERC does not have the expertise or authority to determine what is sufficient to satisfy the needs of another agency's authority. Denying their study requests on the grounds that FERC thinks it is sufficient is substituting FERC's judgement for that of independent agencies. The NYDEC noted afterwards in a letter to FERC, that it did not receive adequate information and would use the 401 process to obtain the desired bypass reach flow number necessary to protect aquatic resources and maintain water quality standards.[18]

Lower Barker Hydroelectric Project (P-2808), Maine

On March 21, 2017, the Maine Department of Environmental Protection (Maine DEP), which has statutory authority to issue a Water Quality Certification under Section 401 of the Clean Water Act, requested additional water quality sampling in the deepest area of the impoundment to determine whether waters in the project area meet existing surface water quality criteria or adversely affects Dissolved Oxygen (DO) levels. Maine DEP had specifically requested that water quality sampling occur in the deepest part of the reservoir, but the applicant instead collected samples from half the depth of the deepest part of the reservoir:

> *The study objective is to demonstrate attainment of Maine Water Quality Standards for Class C waters at the Project and is required by the Department before issuance of a water quality certification. This additional data is needed because the applicant did not sample in the deepest area of the impoundment, as required by the Department.*[19]

On April 13, 2017, FERC denied Maine DEP's request stating that:

> *…[S]ampling in 2015 demonstrated that the project impoundment meets the state standard for DO…All measurements of water quality demonstrated that the beneficial uses of the waterway are met, and that existing surface water criteria*

[17] FERC Accession No. 20140422-3002

[18] FERC Accession No. 20140716-5144

[19] FERC Accession No. 20170321-5153

> *are attained. Further, there is no indication that operation of the project adversely affects dissolved oxygen.*[20]

In this case, FERC denied the request of a state agency because FERC itself felt that the information was sufficient to meet state water quality standards. FERC has neither the authority nor the expertise to make this determination.

Additionally, because this study request denial just happened, it is impossible to know if this will result in delay. However, it is not hard to see a pattern of behavior here and how this could easily add to the processing time if Maine DEP is forced to require the additional sampling during its 401 certification process.

Upper Pelzer (P-10254), Lower Pelzer (P-10253), and Piedmont (P-2428), South Carolina

In 2016, the U.S. Fish and Wildlife Service (USFWS) and the South Carolina Department of Natural Resources (SCDNR) requested studies of water quality conditions in the bypass reach and the tailrace area. In its comments on the license application and study requests, SCDNR writes:

> *SCDNR has previously requested information to assess water quality conditions in the bypass reach of the Project. This request was made once in our comments to FERC regarding the PAD and Study Requests (DNR letter of July 26, 2013) and again in our comments on the DLA. This information is needed to help us assess the need for additional minimum flows in the bypass reach to be protective of aquatic habitat in the bypass area, which we have estimated to be approximately two acres in size. SCDNR concern that the current flow may not be sufficient to protect habitat appears to be justified by the results of the mussel study, which found only one species of mussel in the bypass.*[21]

In its comments, the USFWS noted its previous request and the lack of suitability of the data collected:

> *Contrary to the Study Plan, the Applicant positioned this downstream station in a location immediately below the powerhouse for Units 2 and 3 and upstream of the tailrace for Unit 1 without notifying the Service. Therefore, the study provides insufficient water quality data for the Project's bypassed reach and the area below Unit 1, and we cannot evaluate the Project's influence on water quality.*[22]

FERC did not require any of the studies writing:

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[20] FERC Accession No. 20170413-3012.

[21] FERC Accession No. 20160129-5019

[22] FERC Accession No. 20160128-5306

> *We find that the data collected downstream of the powerhouse provides sufficient water quality information to characterize the conditions downstream of the dam, including in the tailrace area. Therefore, we do not require FWS's and South Carolina DNR's requests for additional temperature and DO sampling, or surveys of macroinvertebrates within the tailrace area…*[23]

For both of these study requests FERC determined that they had the information they needed for their purposes ignoring the information needs of other agencies- federal and state.

Braddock Locks and Dam Hydroelectric Project (P-13739), Pennsylvania

In 2012, during the licensing of this project proposed on their dam, the US Army Corps of Engineers (Corps) requested water quality monitoring upstream and downstream of the dam before and during construction. They cited their need to *"... protect basin-wide water quality benefits provided by the District's Monongahela River Basin reservoirs and the Braddock Dam water quality gate. Additionally, to assure compliance with Federal laws and regulations as they pertain to the Corps' water management/water quality and resource management missions."*[24]

FERC did not require the water quality monitoring study claiming that there was sufficient information already available:

> *We find that Hydro Friends Fund's water quality sampling, in conjunction with the abundant existing water quality data contained in its Pre-Application Document (PAD) is adequate to support the Commission's environmental review of the proposed project. As a result, we are not requesting the applicant to perform the requested additional monitoring.*[25]

This is an example where FERC determined the information needs for another agency, in this case the *owner of the dam*, to be sufficient when the agency said it was not. Many stakeholders have testified about the challenges that occur when developers propose adding hydropower to federally-owned and operated non-powered dams. Here is an instance where the owner of the dam, the United States Army Corps of Engineers, sought information about how development of hydropower at its dam would impact the dam's authorized purposes (for which the taxpayers paid capital construction costs and continue to pay operations and maintenance costs), but that request was denied by FERC. The Corps will undoubtedly refuse permission for any alterations to its structure without that information, which FERC and presumably the applicant, surely knew. In this case, the applicant has no one to blame but themselves, and FERC, for the failure to expeditiously get approval for development at a facility owned by the United States.

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[23] FERC Accession No. 20170322-3050

[24] Id.

[25] Id.

LaGrange (P-14581) and Don Pedro (P-2299), California

A particularly egregious example occurred in 2015 in the LaGrange (P-14581) and Don Pedro (P-2299) proceedings. NMFS requested study of habitat upstream of Don Pedro reservoir, in order to evaluate the appropriateness of fish passage past two FERC-jurisdictional dams: La Grange Dam and Don Pedro Dam. In making its request for these studies, NMFS explained how this information would help both it and FERC evaluate the impacts of the project:

> *NMFS' Requests are intended to provide information that directly applies to:*
>
> - *Inform NMFS, other ILP participants, and OEP staff about the Project's effects on anadromous fish passage, and to assist NMFS in exercising its Federal Power Act (FPA) § 18 authority, to either: 1) prescribe fishways at the Project, (2) not prescribe, or (3) reserve the prescriptive authority over the license term;*
> - *Inform NMFS, other ILP participants, and OEP staff with respect to future FPA § 10 (j) and § 10 (a) recommendations for protection, mitigation, and enhancement measures related to anadromous fishes or habitats affected by the Project;*
> - *Inform NMFS and OEP staff about potential Project effects to be discussed during Magnuson-Stevens Fishery Conservation and Management Act (MSA) consultation between the Commission and NMFS regarding the effects of the Project on Chinook salmon essential fish habitat (EFH);*
> - *Inform ESA § 7 consultation between the Commission and NMFS regarding Project effects on threatened species and designated critical habitats in the Tuolumne River, and in areas downstream.*[26]

FERC ordered an engineering study of passing fish past the dams, but declined to order an evaluation of the habitat upstream of Don Pedro because there were no "project effects" on that habitat. In the Director's study determination, the Director of OEP stated that FERC was not obligated to order studies to satisfy information needs of other agencies:

> *We recognize NMFS's statutory authority, and have provided a licensing process where applicants, agencies, and other interested parties can work together to ensure that necessary studies are performed. However, it is up to the Commission to determine whether a particular study is necessary for the Commission to fully understand the effects of licensing or relicensing a project, and we are not obligated to require a study to support another agency's decision making.*[27]

[26] FERC Accession No. 20150223-5175

[27] 151 FERC 61,240 p.9

This is the clearest example of FERC's view that it requires studies for itself and is little interested in the needs of other agencies. When FERC takes this approach to licensing, it is disingenuous to then go before Congress and claim that the exercise of other agencies authorities is slowing down the licensing process when FERC itself has done little to make the exercise of that authority easier or more timely. The paragraph cited above is the best example of why mandatory conditioning agency study requests should be required in FERC's study plan.

These are just a few of the myriad of examples whereby FERC and license applicants have wasted time and created difficulties for resource agencies trying to fulfill their authorities under federal, tribal, and state law.

Thank you for the opportunity to answer your questions and for the opportunity to testify. Please feel free to contact me, or Jim Bradley of my staff, if American Rivers can be of any further assistance.