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BUILDING A 21ST-CENTURY INFRASTRUCTURE FOR AMERICA: THE ROLE OF FEDERAL AGENCIES IN WATER INFRASTRUCTURE

(115–5)

HEARING

BEFORE THE

SUBCOMMITTEE ON
WATER RESOURCES AND ENVIRONMENT

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

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Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington DC 20515

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March 3, 2017

SUMMARY OF SUBJECT MATTER

TO:	Members, Subcommittee on Water Resources and Environment
FROM:	Staff, Subcommittee on Water Resources and Environment
RE:	Subcommittee Hearing on "Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure"

PURPOSE

The Subcommittee on Water Resources and Environment will meet on Thursday, March 9, 2017, at 10:00 a.m. in 2167 Rayburn House Office Building to receive testimony from witnesses representing academic institutions, non-governmental organizations, states, regional governments, and local governments.

BACKGROUND

The Subcommittee on Water Resources and Environment has several agencies, including the United States Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA), under its jurisdiction. These agencies are responsible for implementing permitting and other regulatory programs that may apply to the development and implementation of water infrastructure projects. Because of the importance of these regulatory programs in developing and implementing projects, the Subcommittee conducts oversight of these programs' federal and non-federal activities.

United States Army Corps of Engineers.

The Corps has regulatory authority from §404 of the Federal Water Pollution Control Act (commonly known as the Clean Water Act or CWA). Section 404 provides that any person who discharges dredged or fill material into a water of the United States must have a permit from the Secretary of the Army or an approved state authority. Waters of the United States include certain wetlands, including some swamps, marshes, bogs, and similar areas (which may often appear as dry land for part of the year). Characteristics of wetlands are established through regulation and §404 is the primary federal law regulating activities in wetlands. The EPA, in conjunction with the Corps, develops guidelines for the issuance of §404 permits and has authority to review and deny permits where the discharge will have an unacceptable adverse effect on municipal water supplies, fish and wildlife areas, or recreational areas.

There are two types of permits issued by the Corps: general and individual. A general permit is issued for activities that will result in only minimal adverse effects. There are three types of general permits – Nationwide Permits, Regional General Permits, and Programmatic General Permits. Nationwide Permits are issued by the Corps on a national basis and are designed to accelerate authorization of projects such as commercial developments, utility lines, or road improvements that produce minimal impact on the Nation's aquatic environment. An individual permit is issued when projects have more than minimal individual or cumulative impacts, and are evaluated using additional environmental criteria and involve a more comprehensive public interest review.

The Corps recently reissued 50 existing Nationwide Permits and added two new permits. These will take effect March 19, 2017, and will be in effect for five years. A Regional General Permit is issued for a specific geographic area by an individual Corps District. Each Regional General Permit has specific terms and conditions, all of which must be met for project-specific actions to be verified. Programmatic General Permits are based on an existing state, local, or other federal program and designed to avoid duplication of that program. A State Programmatic General Permit (SPGP) is a type of permit that is issued by the Corps and designed to eliminate duplication of effort between Corps districts and state regulatory programs that provide similar protection to aquatic resources. In some states, the SPGP replaces some or all of the Corps' nationwide permits, which results in greater efficiency in the overall permitting process.

The Corps also issues permits for the alteration of existing Corps projects and alterations to navigable waterways under Section 14 of the Rivers and Harbors Act of 1899, as amended, codified in 33 U.S.C. §408 (commonly called "Section 408"). The Corps provides certification authority for proposed alterations to existing Corps projects. The Corps ensures that any proposed alteration will not be injurious to the public interest and will not affect a project's authorized purposes.

Further, Section 10 of the Rivers and Harbors Act of 1899 (March 3, 1899), requires a permit from the Secretary of the Army for any alteration of a navigable waterway, dredging of a navigable waterway, or erection of any structure such as a wharf, pier, or dock in a navigable waterway.

In total, the Corps carried out approximately 80,000 final regulatory actions in fiscal year 2015. Over 90 percent of all regulatory actions are authorized by nationwide and other general permits.

Environmental Protection Agency.

The CWA provides the structure for the federal-state program to protect, restore, and maintain the quality of the Nation's waters. The EPA has the major responsibility for carrying out the CWA, but significant parts of the program may be administered by the states if approved by EPA.

The CWA generally has two major areas of emphasis: regulatory provisions that restrict the discharge of pollutants into navigable waters; and funding provisions that provide federal financial assistance for the construction of treatment works.

To protect the Nation's waters, the CWA imposes technology-based discharge control requirements for categories of industries. These industries must meet established requirements using the "best available technology economically achievable." For municipalities, secondary treatment (defined in regulation as an 85 percent reduction in certain conventional pollutant concentrations) must be achieved. EPA is responsible for defining what the required level of treatment is for municipalities and for each type of industry to meet their standards. However, where a technology-based standard is insufficient to meet state water quality standards, the CWA also requires the implementation of water quality-based permit limits to ensure that these state standards are achieved. EPA also must develop water quality criteria, specifying the maximum concentrations of pollutants allowable for different designated uses of waters. The states, with the review of EPA, establish water quality standards that designate uses of their waters and assign appropriate water criteria to attain and maintain those uses.

These requirements are implemented and enforced through permits. All point source dischargers that discharge pollutants directly into navigable waters are regulated through National Pollutant Discharge Elimination System (NPDES) permits. NPDES permits are issued by the EPA, or a state with an EPA-approved permitting program. Currently, 46 states have approved permitting programs. Permits are based on both technology requirements and water quality impacts, and they set the concentration of pollutants allowed to be discharged. Nonpoint sources of pollution are not directly regulated under the CWA; however, states are to prepare management programs for controlling nonpoint source pollution.

Indirect dischargers—industries that discharge to publicly owned treatment works (POTWs) rather than directly to navigable waters—must meet treatment standards similar to those established for direct industrial discharges since POTWs traditionally are designed primarily for the treatment of domestic sewage.

Title VI of the CWA provides grants to states and territories for the establishment of Clean Water State Revolving Loan Funds (SRFs) to assist in the financing the construction of treatment works. States contribute matching funds to their revolving fund. The SRFs are available to, among other things, make low-interest loans, make loan guarantees, buy or refinance local debt, and subsidize or insure local bonds. All projects financed through the SRFs must meet all enforceable requirements and maintenance of progress towards the goals of the CWA. The authorization for the SRFs expired in 1994 and the program has not been reauthorized.

National Environmental Policy Act.

Though not under the jurisdiction of the Committee on Transportation and Infrastructure, transportation and other infrastructure projects require multiple federal permits and reviews, including environmental reviews under the National Environmental Policy Act of 1969 (NEPA). This ensures that projects are built in a safe and responsible manner and that adverse impacts to

the environment and communities are avoided, minimized, and mitigated, and that public input is obtained on the development of a project.

The NEPA review analyzes the potential impacts of the proposed action and investigates reasonable alternatives. It also provides a framework for meeting other environmental review requirements, such as those under the Endangered Species Act of 1973 (ESA), the National Historic Preservation Act of 1966 (NHPA), the Clean Water Act (CWA), the General Bridge Act of 1946 (General Bridge Act), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and the Marine Mammal Protection Act of 1972 (MMPA).

NEPA requires federal agencies to assess the environmental effects of proposed actions prior to making decisions on projects that are not categorical exclusions. NEPA also ensures the public is informed of, and may participate in, the decision-making process of any proposed major federal action. If the project clearly does not affect the environment, the review process does not require further assessment. All federal agencies comply with NEPA by preparing an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The EA is a brief document that provides evidence and analysis to determine whether an EIS is necessary. If the EA determines that an EIS is not necessary, the agencies issue a Finding of No Significant Impact (FONSI). An EIS is a full disclosure document that details the range of reasonable alternatives, analyzes the potential impacts, and demonstrates compliance with applicable environmental laws and executive orders. A notice of intent (NOI) begins the EIS process and a record of decision (ROD) completes it.

Effective and early coordination among the diverse sets of participants in the NEPA review process, as well as funding for participating review agencies, are critical to completing NEPA reviews in a timely manner. The Water Resources Reform and Development Act of 2014 (Public Law 113-121) contained several NEPA process changes, and the Committee is working with the agencies on implementing these changes.

Regulation.

To carry out their authorities and implement the requirements of the statutes under their jurisdiction, agencies like the Corps and EPA will often prepare and release regulations, guidance, and other documents to help guide decision-making by the agency and help affected stakeholders comply with the applicable statutory requirements. These regulations, guidance, and other documents are sometimes required by law, are necessary to interpret the law, or are made necessary by compelling public need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well-being of the American people.

This regulatory system is intended to protect public health, welfare, safety, and the environment while promoting economic growth, innovation, competitiveness, and job creation. In addition, this process is intended to be based on the best available science and allow for public participation. Further, this regulatory process is intended to promote predictability and reduce uncertainty. Moreover, this regulatory process is intended to identify and use the best, most

innovative, and least burdensome tools for achieving regulatory ends, and is to take into account benefits and costs, both quantitative and qualitative.

Within the Administration, regulations and other guidance may not be released until reviewed by other Executive Branch Agencies. These include the Office of Management and Budget, the Council of Economic Advisors, and various other staff offices within the White House. The Regulatory Flexibility Act (5 USC 601 et seq.) requires federal agencies to take steps to collect input from small entities on regulations and to determine whether a rule is expected to have a significant economic impact on a substantial number of small entities. When a covered agency proposal is expected to have a significant impact on a substantial number of small entities, the agency must convene a panel to review the draft proposed rule and related agency analyses under the Regulatory Flexibility Act. In multiple instances, Presidents have issued Executive Orders in attempts to accelerate and improve the regulatory process, most notably Executive Order 12866 issued by President William J. Clinton on September 30, 1993, and most recently Executive Order 13777 by President Donald J. Trump.

CONCLUSION

This hearing is intended to provide Members with an opportunity to review solutions and opportunities to:

1. reduce inefficiencies and delays in project delivery,
2. include affordability considerations in the rulemaking process,
3. enhance state and local roles, and public participation,
4. use better data and better technology,
5. maximize benefits from existing resources, and
6. provide certainty for non-federal interests.

WITNESSES

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Mayor, City of Schenectady, New York
On Behalf of The U.S. Conference of Mayors

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On Behalf of the Environmental Council of the States

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BUILDING A 21ST-CENTURY INFRASTRUCTURE FOR AMERICA: THE ROLE OF FEDERAL AGENCIES IN WATER INFRASTRUCTURE

THURSDAY, MARCH 9, 2017

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:02 a.m. in room 2167, Rayburn House Office Building, Hon. Garret Graves (Chairman of the subcommittee) presiding.

Mr. GRAVES OF LOUISIANA. The subcommittee will come to order. Good morning, and thank you for being here. Before I begin introducing our witnesses and doing opening statements this morning, I want to dispense with some of the unanimous consent requests.

I ask unanimous consent that members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions. Is there any objection?

Without objection, so ordered.

I ask unanimous consent that written testimony submitted on behalf of the following be included in this hearing's record: from the Association of State Floodplain Managers; from Trout Unlimited, including attached report prepared for the Building America Investment Initiative;[1] from Food and Water Watch; from the National Rural Water Association; three articles by Peter Gleick; from American Rivers; from the Bay Planning Coalition; a publication from the American Geophysical Union; and a resolution from the Subcommittee on Sedimentation, a subgroup of the Advisory Committee on Water Information.

Without objection, so ordered.

[The information can be found on pages 136–201.]

I ask unanimous consent that the record remain open for 30 days after this hearing in order to accept written testimony for the hearing record.

Without objection, so ordered.

[1] The 100-plus-page report entitled "40 Proposed U.S. Transportation and Water Infrastructure Projects of Major Economic Significance" prepared for the U.S. Department of the Treasury on behalf of the Build America Investment Initiative can be found online at https://www.treasury.gov/connect/blog/Documents/final-infrastructure-report.pdf.

And finally, I ask unanimous consent that the record of today's hearing remain open until such time as our witnesses have provided answers to any questions that may be submitted to them in writing.

Without objection, so ordered.

Thank you very much, again, for being here today, and looking forward to hearing from our diverse witness panel today.

The impetus for this hearing was thinking about the fact that there has been a lot of talk about a major infrastructure package, about the talk of investment of $1 trillion in addressing some of America's infrastructure needs. If we are, say, a year out from beginning, from moving forward on that implementation, what are some of the things that we should be thinking about right now? What are some of the obstacles to delivering, to efficiently delivering infrastructure? What are some of the impediments or opportunities to improve our ability to quickly get these projects on the ground?

And that is what we are doing here today. We brought, again, a diverse panel of witnesses to come provide to us their insight and thoughts on some of the things that we could be doing to help improve this process.

In the short time that we have been named subcommittee chair, we have met with dozens and dozens of non-Federal sponsors, of local governments, of State governments, and other organizations from across the country, raising strong concerns about regulations and permitting processes that are in place that simply do not provide value.

And I want to be clear: the need for regulations that ensure the protection of our environment, ensure the protection of the health and safety of Americans, things that look to make sure of the efficacy of investments, the cost-to-benefit ratios are all things that make a lot of sense. But in many cases, we have found regulations are solutions in search of problems. And that raises strong concern.

So, again, looking forward to hearing from our witnesses today.

And, with that, I am going to turn to the ranking member, Mrs. Napolitano.

Mrs. NAPOLITANO. Thank you, Mr. Chair, and welcome to the Subcommittee on Water Resources and Environment as the new chairman.

Mr. Chairman, when you and I met just over a month ago to discuss a potential agenda for Congress, I suggested we start those areas where we could find common ground. This subcommittee is most successful when we work together in a bipartisan fashion to rebuild our Nation's crumbling infrastructure and prepare our communities for challenges they will face in decades to come.

Without question, this Nation is witnessing a changing water-related environment, and those changes are having a profound implication on our local communities, our national environment, and our overall way of life. Ironically, our respective districts are facing very different challenges: yours with too much water, and mine, too often, too little. But the reality is that both districts must adapt and adequately prepare for what lies ahead.

I am pleased that our first hearing focuses on an area that we should find common ground: the need for increased investment in

our Nation's water-related infrastructure, especially Federal investment. We all know that the challenges facing our communities are in addressing the local water resources needs and adapting to a changing world, whether the issue is crumbling dams and levees, outdated sewers and stormwater conveyances, inefficient navigation corridors, or large-scale ecosystem restoration authorities.

I am certain that every Member in this room can point to water-related challenges facing their constituents at home. Yet, if your elected officials are like mine, the central theme in meeting these challenges is the help needed for additional funding. As former chief of engineers once noted before this subcommittee, by failing to officially fund projects, we ultimately fail the American taxpayer by delaying the realization of project benefits, and by unnecessarily increasing costs due to these delays.

Similarly, when we fail to provide the necessary resources to invest in, update, and adequate maintain our infrastructure, we should not be surprised when systems fail when communities are placed at risk, and the cost begins to become greater, and when our State and local economies underperform.

My communities want to do the right thing. They want to provide our citizens with safe, reliable, affordable water and wastewater services, but they cannot do it alone. They are calling on us in Congress to renew the Federal commitment on—to our water-related infrastructure.

I was excited when infrastructure investment became a recurring theme during the 2016 Presidential election. I was equally pleased when the President made his commitment to triple the funding level for the Clean and Drinking Water State Revolving Funds.

This subcommittee needs to take the next logical step and advance legislation like a reauthorization of the Clean Water State Revolving Fund, to renew the Federal commitment to meeting our community's infrastructure needs. This straightforward legislation last approved on a bipartisan basis by this committee in 2009 will help our communities meet the challenge of a changing water-related environment and create well-paying jobs in the United States.

But we need to do much more. We need to address the very real affordability concerns raised by the communities in a way that does not weaken the Clean Water Act protections, and ensures our neighborhoods have access to clean, safe water and reliable waters—local environments. We need to look at targeting more additional Federal resources to our urban and rural communities when the traditional tools fail to meet the financial challenges these communities face on a daily basis.

Mr. Chairman, I believe this committee can play an integral part in creating and sustaining family-wage jobs, and ensuring U.S. economic competitiveness and improving the daily lives of all Americans. And I do look forward to working with you on a bipartisan basis to honor these commitments to our communities. And I yield back.

Mr. GRAVES OF LOUISIANA. Thank you. And again, I look forward to working with you and continuing to find common ground.

With that, I yield to the chairman of the full committee, the gentleman from Pennsylvania, Mr. Shuster.

Mr. SHUSTER. Thank you, Chairman Graves. And this is a great way to start off your first hearing as chairman of this subcommittee, with a hearing like this. So I appreciate it. I won't tell anybody our private advice I gave you beforehand, but I know you will do extremely well.

This is an important hearing. And, as the chairman mentioned, the President of the United States has said that he wants to figure out how to spend $1 trillion on infrastructure. And look, $1 trillion is not going to come from the Federal Government. It has got to come from a number of different sources. There has to be a Federal component to it. We know—look at the Highway Trust Fund, the Harbor Maintenance Trust Fund, the Inland Waterways Trust Fund, other sources of revenue. We have got to figure out how to get the Federal revenue up to help with these projects and do its fair share and do its important part of the work.

Public-private partnerships are part of that solution. I think it is a good tool in the toolbox, but it is not the toolbox. It is in there to help and assist, and we got to figure out ways to do that better. But there is a lot of private money and local money out there.

Just in my home State of Pennsylvania there are two $4 billion pipeline projects, 100 percent privately funded, and we have got Government agencies getting in the way of moving these forward. And I look across this country and there are billions of dollars across this country that are stuck in the mud, so to speak, with these Government agencies, and most of them, many times, it is the Federal agencies. And so reform has to be a huge part of this effort.

And I know that you folks here, you all deal with the Corps of Engineers. And I know, as my experience has been across this country, it takes far too long to get these projects approved. And, in many cases, they take years to do it, and the projects don't change that much because they were pretty sound projects to begin with. So it is not just the Corps, it is FERC, it is—again, you go across the Government agencies.

They have got to get to the table at the same time, they have got to get these projects done. Because if you think about the Interstate Highway System, they built 47,000 miles of road, of interstate highway, in 14 years. I have 60 miles of roadway that took 35 years to get through my district. And that is just unthinkable in today's society, with the technology, the science we have to be able to check these different projects out. We ought to be able to move them forward, and that is something that I know the chairman, this chairman, the former chairman, Mr. Gibbs, and myself are all committed to getting these reforms in place to move these projects forward.

When you look at the lack of investment in our ports, our harbors, inland waterways, the locks, the dams, flood protection, environmental restoration, these are all things that we need to move forward with much faster than we have in the past. And I think that we can do that.

One of the things that I will be supporting moving forward—that I have always supported, but we got to get the system put in place in the right way—is the Harbor Maintenance Trust Fund. Those dollars, $1.8 billion, we only spent $1 billion on harbors and ports.

The other $800 million, I am not sure where it goes, here and there and everywhere. But those dollars were put in that fund, and the trust was that it was going to be spent on those projects and those ports and those harbors.

So again, I talked with the President, his people. We have got to get that into their budget. It makes it easier for us to get it into our budget. So I am committed to working forward to see that those dollars get spent on what their intended purposes were.

And when you look at that $800 million, there is probably a three-, four-, five-, six-times multiplier, because when the Federal Government comes to the table with these dollars, the locals, the States, the private sector are all going to make the investments needed to do what they have to do in those ports and harbors around the country.

So again, for me this is an exciting time. Never did I think that a Republican President would be the one to stand up at an inaugural address and use the word "infrastructure," but it happened. And I am just glad to be here and be part of this, and I am really excited about this hearing today, and as we go forward.

So thank you all very much. I yield back.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman. And now I recognize the ranking member, Mr. DeFazio.

Mr. DEFAZIO. Thank you, Mr. Chairman. I want to both welcome the witnesses, and I want to congratulate you on your first hearing as chair. I know you are vitally interested in water issues, coming from a somewhat watery State, shall we say, and I am pleased to be working with you. And I am pleased that today we are jointly sending a letter to President Trump, urging him to fully utilize the Harbor Maintenance Trust Fund as a part of his $1 trillion infrastructure plan.

As Chairman Shuster noted, $9 billion have been diverted into a theoretical fund over at the Treasury. Every day, every American who buys an imported good pays a little bit more for it with the understanding that that is going to facilitate the movement of freight in and out of the United States through our ports, and that more efficient movement would actually pretty much offset the minuscule tax. Unfortunately, if you don't spend the tax, then you still have the delays, the ships parked miles out into the ocean, and so people are paying the tax, the money isn't being spent, and they are paying more for the imported goods because of the delays.

We are breaking faith with the American people. It seems kind of like a no-brainer. On a daily basis, our 59 busiest harbors have 35 percent availability of maximum depth. And that is not even to deal with the new challenges of the post-Panamax ships. So I am hopeful that we can move forward with that.

I did get a version of that, somewhat awkward and crippled, out of this committee because of the budget rules—which are waived on a daily basis around here, but in that case, boy, they had to be enforced—so I am hopeful we will do it honestly and just say, hey, forget about the stupid budget rules, let's spend the tax for the purpose for which it was collected, deal with the maintenance backlog in our harbors, and more efficiently move freight.

There is a regulatory pendulum. It can swing way over here and way over there. The sweet spot is in the middle. And it is always

difficult to get there. I believe there are unnecessary delays and impediments due sometimes to bureaucracy and to, you know, misguided regulations. I have been having an ongoing dispute with FEMA and National Marine Fisheries up in my region. So I can understand that, and I welcome an honest discussion of that.

But I also caution that you don't swing to the other extreme, which is, you know, we are just going to facilitate projects, whether or not they are well thought-out, whether or not they have community support, and whether or not they might have unintended consequences. Look at 50 years ago, the central and southern Florida project, which was authorized in 1948, which diked Lake Okeechobee, Kissimmee River. Part of the Everglades was drained. It is widely recognized by the residents, the communities, and everyone around there, as a disaster. And now Congress, 50 years later, passed a plan that cost $10 billion to reverse some of that.

So, if we approach some of these major projects in a more balanced way, I think we will be better off and not have to try and reverse their impacts later.

We have had significant testimony before this committee, including a former colleague who was head of the Corps of Engineers for a brief period of time until he came here before this committee, presented the Bush budget for Corps of Engineers, and I said, "Is that budget adequate to deal with these backlogs and all these other problems we have," and he said no. The next week he resigned to spend more time with his family.

So, you know, we need to encourage honesty. And the honest thing is the most major impediment is lack of funding, plain and simple. And then we can deal with any regulatory burdens that crop up in the interim. I mean, in surface, you can't say that the 150,000 bridges out there, 99 percent of which are not going to require any major environmental analysis, that need to be repaired or replaced, are not getting done because of environmental, you know, restrictions. They are not getting done because the Government isn't investing the money in the National Highway System. It is the same with our ports and harbors, which is under the jurisdiction of this subcommittee.

So, I welcome the witnesses here today. I want to hear and hope to hear about that kind of balance and the need to better invest. Thank you, Mr. Chairman.

Mr. GRAVES OF LOUISIANA. Thank you. With that, I would like to turn to our first witness.

We have Mr. Jerry Ellig, who is the senior research fellow at the Mercatus Center at George Mason University. Mr. Ellig, you are recognized for 5 minutes.

OK, this—is the timer working? OK.

TESTIMONY OF JERRY ELLIG, PH.D., SENIOR RESEARCH FELLOW, MERCATUS CENTER AT GEORGE MASON UNIVERSITY; GARY MCCARTHY, MAYOR, SCHENECTADY, NEW YORK, ON BEHALF OF THE U.S. CONFERENCE OF MAYORS; JOHN LINC STINE, COMMISSIONER, MINNESOTA POLLUTION CONTROL AGENCY, ON BEHALF OF THE ENVIRONMENTAL COUNCIL OF THE STATES; MIKE INAMINE, EXECUTIVE DIRECTOR, SUTTER BUTTE FLOOD CONTROL AGENCY; JONATHAN KERNION, PRESIDENT, CYCLE CONSTRUCTION COMPANY LLC, ON BEHALF OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA; KATHY L. PAPE, SENIOR VICE PRESIDENT REGULATORY POLICY AND BUSINESS DEVELOPMENT, AMERICAN WATER, ON BEHALF OF THE BIPARTISAN POLICY CENTER, EXECUTIVE COUNCIL ON INFRASTRUCTURE; AND KEVIN DEGOOD, DIRECTOR OF INFRASTRUCTURE POLICY, CENTER FOR AMERICAN PROGRESS

Mr. ELLIG. Thank you, Mr. Chairman. I guess I should say to multiple chairs and multiple ranking members, thank you for the opportunity to testify today. My name is Jerry Ellig. I am an economist and a senior research fellow at the Mercatus Center at George Mason University. And I come to approach today's topics a little bit differently, because I was asked to talk a little bit about some general problems and tendencies in the U.S. Federal regulatory process that may be the source of some of the frustrations that some of the members of the committee and the subcommittee just mentioned in some of the opening statements.

I come to this as a generalist. Most of my research in the past 15 years has focused on the Federal regulatory process and performance management of Federal agencies. So I don't come to this as an expert on the particular programs this committee has jurisdiction over. But, nevertheless, I was asked to talk about some general regulatory issues.

There is a tendency in our Federal regulatory process for folks to focus on intentions, rather than outcomes; intentions, rather than results. And there are at least three kinds of symptoms of this that I can mention.

One is a tendency of regulatory decisionmakers to focus on activities and outputs, rather than results. So we have, for example, a lot of folks in Federal agencies who honestly believe that their job and their success should be measured by production of regulations, or perhaps by enforcement activity, rather than how many problems did they solve, what did they actually accomplish.

A colleague of mine at the Mercatus Center interviewed a number of economists in Federal regulatory agencies a number of years ago, and one of them described the way his agency worked as, "Success is putting out 10 regulations a year, and bigger regulations are bigger successes." You notice there is nothing in there about actually achieving results, because we are focused on measuring activities and outputs, rather than focused on measuring what have you actually accomplished with the regulation.

And the solution really has to start with Congress articulating what outcomes it wants to achieve when it authorizes regulatory legislation, and then following up to ensure that retrospective as-

sessment is done to find out whether the regulation achieved the intended purpose. And, if so, at what cost.

Another related problem is there are often serious deficiencies in the analysis that Federal agencies are supposed to do. They are supposed to inform regulatory decisions. Now, a lot of water projects and other types of projects go through some type of benefit-cost analysis. And you might say, well, gee, what is sauce for the goose ought to be sauce for the gander. Folks who want to constrain what can be done in those projects through regulation should also be going through the same kind of analysis. And executive branch agencies are required to do this by Executive orders, but we often find that there are serious deficiencies and omissions in the analysis. I have seen that in my research. A lot of other folks who actually research the quality of agency analysis, regulatory agency analysis, find the same thing.

The final problem we often have is something I call ready-fire-aim regulation. Now, this occurs when regulatory agencies essentially decide what they want to do, and only then conduct the research that is supposed to inform their decisions. And the process of doing the research becomes the process of creating a litigation support document to support decisions that have already been made for other reasons.

One of my colleagues, who actually spent 27 years as an economist in the Federal Government, told me about an adventure he had where he was working on a regulation. The agency had already decided to issue it. He was still working on the analysis that was supposed to determine whether it was worth doing, and he was told on a Friday afternoon, "If you can't find more benefits over the weekend, don't bother coming back to work on Monday."

Folks, that is not the way that regulatory agencies should be approaching regulation. And again, this does not always happen. There are good, committed people at regulatory agencies who do a good job figuring out what they are supposed to do before they make decisions. But there is also plenty of research that demonstrates that there are often some pretty significant deficiencies in either the quality of agencies' underlying analysis, or maybe they do good analysis but they don't necessarily pay attention to it.

So, all three of these kinds of problems occur when we focus on good intentions, rather than focusing on outcomes. And if we want to fix the problem, we need to flip that around so that we are focused on regulatory outcomes first, and the evidence of what is happening, whether it is being done, and what agencies are actually trying to accomplish.

Mr. GRAVES OF LOUISIANA. Thank you.

Our next witness is the Honorable Gary McCarthy, mayor of Schenectady, New York.

Mayor McCarthy, you are recognized for 5 minutes.

Mr. MCCARTHY. Chairman Shuster, Chairman Graves, Mrs. Napolitano, members of the committee, thank you for the opportunity to be here this morning.

Since 2011, Schenectady has borrowed, collectively, just under $53 million to be spent on upgrading pipes, replacing equipment, and rehabilitating our wastewater treatment plant. In 2017 the

city is embarking on an SSO [sanitary sewer overflow] mitigation project, including a $24 million project to eliminate a sanitary sewer overflow, and $6 million to improve our system's overall resiliency.

Schenectady does not contest the importance of environmental protections and efforts, and has significantly invested in these projects. But we are being forced to expend even more funds, while we are still attempting to recover from the great recession and decades of population decline in an old industrial city. Our strong local economic recovery has been placed in a precarious situation by this significant burden.

In addition to the tax burden, the consent order the Schenectady operates under requires a 4-to-1 exchange for new connections. I want to emphasize that, that Schenectady is not allowed to do a new hookup unless I remove four other hookups or entry points within the system. This critically limits our economic development projects, and is totally counterproductive to what we have been trying to accomplish in our community.

While we face the burden of traditional infrastructure, we are only scratching the surface on what is possible through Smart City technology. Our partnerships with our business community have allowed us to install at this point roughly 200 smart lights, which will reduce our cost and improve the delivery of several key city services. This emerging technology allows us to use this platform for real change. Data will be collected and disseminated to users, allowing much more educated and appropriate decisions to be made.

Additional devices, such as analytic cameras, temperature and motion sensors, traffic monitoring devices, and the potential for interconnected health care and other life safety devices deployed on a network of over 5,000 city streetlights provides an opportunity to evaluate numerous core challenges in an urban environment.

This 21st-century infrastructure cannot be ignored while we bear the burden of investment in the more traditional infrastructure. To do so would be to put the city and the Nation's long-term—is a peril, as we have missed this critical opportunity for economic growth and improve educational opportunities and long-term efficiencies within our communities.

What I would ask today is that we need increasing partnership. We look to continue the SRF program, as well as CDBG, and looking to provide grants in the WIFIA funding in protecting municipal bonds.

And other ways that you can help would include passing the Integrated Planning and Affordability legislation, commonly referred to as H.R. 465. I want to thank Mr. Gibbs for listening to the mayors' concerns regarding unfunded mandates and affordability in his introduction of H.R. 465. This bill would allow local governments to work with the EPA to develop plans where we can comprehensively deal with the biggest environmental and public health needs first, and do it in a way that is more affordable to our citizens.

I have a letter that is signed by members of—representing the U.S. Conference of Mayors, asking for cosponsors in the passage of H.R. 465, and that has been attached to my testimony submitted to you.

By reauthorizing and fully funding the brownfields law, you will be encouraging the recycling and reusing of properties and upgrading of existing infrastructure. In addition, many communities redevelop brownfields to create more green infrastructure, which helps with stormwater controls.

And I have already mentioned how Schenectady is utilizing new technology for our above-ground systems. However, there can also be improvements that can be made below ground. All utilities can improve service through the incorporation of modern technologies specifically designed to increase efficiencies and reduce cost. Congress and the administration should be supporting the renewable public water and sewer infrastructure in America through new technology.

There is much Congress and the Federal Government can do to work in partnership with our Nation's cities to upgrade our infrastructure and invest in our future. And we need to end the siloed approach of handling issues, and think holistically on how to deal with our infrastructure, environmental, economic development concerns, as we work together.

Again, I thank the committee for the opportunity to be here today, and look forward to your questions.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Mayor. And to introduce our next witness, I am going to recognize Mr. Nolan.

Mr. NOLAN. Thank you, Chairman Graves and Ranking Member Napolitano, and members of the committee. As a member of the full committee, I am grateful for your allowing me to sit in on today's important hearing.

And by way of introduction, let me say, you know, one thing we all agree on is that our Nation's outdated and obsolete wastewater treatment and drinking water systems are desperately in need of repair. And in many cases, crumbling before our eyes and degrading our waters and the health of our people.

With that in mind, it is my honor to introduce my good friend, Minnesota's good friend, our commissioner of the Minnesota Pollution Control Agency, John Linc Stine, who is here on behalf of the Environmental Council of the States.

John has spent over 30 years as a powerful and tireless and gifted advocate in the fight to protect our precious air and water and land from pollution and degradation. We are all very proud of his great leadership, and I am very proud to have the opportunity to introduce him to the committee here today.

John, welcome.

And thank you to the committee for allowing me to make this introduction.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Nolan.

Mr. Stine, you are recognized for 5 minutes.

Mr. STINE. Thank you, Congressman Nolan. Thank you, Mr. Chair, for this opportunity, and Ranking Member Napolitano. I am John Linc Stine, I am commissioner of the Minnesota Pollution Control Agency, as Mr. Nolan said, and I represent also, as the president of the Environmental Council of the States, or ECOS, a nonpartisan national organization of my colleagues who lead State and territorial environmental protection agencies across America.

And, Chairman Graves, as you know, the Mississippi River begins in the State of Minnesota at Lake Itasca, and ends in your State. And I take it as my duty to deliver the cleanest water possible that Minnesota can send your way.

States hear every day from our citizens about the value of clean water, adequate flood control, and prevention of pollution. Infrastructure underpins every one of those issues, and we know that a society cannot thrive without clean water. Industry and jobs depend on a reliable water supply and the capacity to process wastewater.

Clean water is vital to manufacturing, recreation, and other industries that are central to our economy. The community of Worthington in southwestern Minnesota is making needed improvements to their wastewater treatment plant to accommodate a meatpacking operation that needs to expand. Nearby, Morris, another community, needs to make improvements to their drinking water system to provide water for their ethanol plant.

ECOS aims to strengthen the partnership between the States and the Federal Government to implement our Nation's environmental laws and policies while focusing on results. Water infrastructure is one of the focus areas of our ECOS document, "Priority Issues in a Time of Political Transition," which we produced to address the new administration's priorities. Our members identified 20 priority projects for wastewater and water supply, by State, that are ready to go in 2017. That list amounts to $18.2 billion in need.

Our country prospered and thrived, thanks to the investments that were made in water infrastructure 75 to 100 years ago. Some of the most significant of those have occurred since the passage of the Clean Water and Safe Drinking Water Acts. Federal, State, and local partnerships helped make those investments successful, and we need to continue to make investments that are critical to the upkeep of those initial investments. Federal funding, using portions of the EPA's State and Tribal Assistance Grants, which make up the Clean Water and Drinking Water State Revolving Loan Funds, are critical to those investments.

The revolving nature of those loan programs and States' efforts to maximize the Federal capitalization grants ensure a continuing return on investment. The successful history of national water and wastewater programs, however, is overshadowed by the enormous and extensive need. Estimates range from $384 billion through 2030 for our drinking water infrastructure, and $271 billion through 2022 for wastewater infrastructure needs.

Our distressed urban areas, small communities, and rural communities are particularly pressed to make the needed water infrastructure investments. Many of these communities find it difficult to keep up with the numerous increasingly complex Federal requirements due to a small tax base, lack of adequate financing options, management skills, trained personnel, and systems to manage environmental requirements.

ECOS continues to raise the importance of efficient, affordable, and timely financial award to these distressed communities. For example, the community of Gilbert in Congressman Nolan's district is a mining town that is facing an $8.6 million project to replace a old wastewater treatment plant to reduce overflows of raw sew-

age. They have a declining population and high unemployment. They simply cannot afford a project of that size without assistance.

Reliable infrastructure is critical to the protection of public health and community well-being because lack of clean water is a serious health threat. In the southern Minnesota community of St. Peter they had high nitrate levels in their groundwater because shallow groundwater is the only available water source in that part of our State. And in order to protect their community, they needed to make the investments to treat for nitrates. They did it to protect their children's health, and the health of their elderly.

Minnesota has invested in programs to monitor and regulate corrosion and aging water systems, and we need to continue to do that at the State level.

As science has increased the awareness of public health risks, and the environmental regulatory system has grown more complex, there are disagreements over the cost and levels of protection that continue to make national headlines. But we must remember our foremost obligation: to protect the environment and public health through investments in our country's infrastructure. Thank you very much.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Stine.

Our next witness is Mr. Mike Inamine, who is executive director of the Sutter Butte Flood Control Agency.

Mr. Inamine, you are recognized for 5 minutes.

Mr. INAMINE. Good morning, Chairman Graves, Ranking Member Napolitano, and members of the committee. My name is Mike Inamine, and I am executive director of the Sutter Butte Flood Control Agency. Thank you for the opportunity to address the committee on this most important timely issue.

Before beginning my testimony, I would be remiss if I did not acknowledge Congressmen LaMalfa and Garamendi who are not here right now. These are two members of the committee who have been true partners on these local efforts from the start. But for their efforts, I would be telling a very different story today.

Sutter Butte Flood Control Agency, or SBFCA, as it is known, was formed in 2007 to consolidate the efforts of several agencies and communities with flood management responsibilities and implementing locally led flood protection projects. SBFCA is a joint powers authority composed of the cities of Biggs, Gridley, Live Oak, Yuba City, the counties of Sutter and Butte, Levee Districts 1 and 9. SBFCA leads the planning and implementation of flood control projects in this historic agricultural basin.

The Sutter-Butte Basin covers 300 square miles along the west bank of the Feather River, immediately downstream of Lake Oroville. The basin is home to 95,000 residents and encompasses $7 billion of damageable assets. The region has sustained numerous floods, including the 1955 levee failure on the Feather River, which resulted in the deaths of at least 38 people.

The goals of the agency are to achieve 200-year level of flood protection for urban communities in the north, and 100-year protection or equivalent in the south, in the rural areas. Under State law, urban or urbanizing areas cannot be developed without achieving a 200-year level of protection—that is twice the FEMA level of protection—thus eliminating opportunities for risky residential devel-

opment. SBFCA is nearing completion of the $300 million Feather River west levee project that provides a 200-year level of protection for the northern basin.

The United States Army Corps of Engineers has traditionally been the most important builder of flood projects, as well as the most powerful regulator of these same projects. I would like to briefly comment on the local relationship of the Corps of Engineers under these two important processes.

Basically, there are two ways for a local agency to get a Federal project levee fixed in California: partner with the Corps of Engineers under the Civil Works Program and wait a couple of decades or more; the second path is for a local agency to pass a local assessment, often very difficult, then cost-share with the State of California and be consistent with the strategic Central Valley Flood Protection Plan, then seek permission from the Federal Government to fix their levee under an article of law called section 408.

This latter process is also quite slow, taking 3 to 4 years for large flood projects. This year, SBFCA will complete the Feather River west levee project, which improves about 30 miles of Federal project levee, without changing the design or purpose of the project, and without spending a dime of Federal money. Yet this permission process took 19 months, and is considered light speed, a world's record.

The Corps has recently improved the civil works planning process. SBFCA was pleased to be one of four pilot projects selected from throughout the country to test the 3x3x3 planning process. To the Corps' great credit, the Sutter Basin study was a great success, and met all objectives. The Corps delivered.

However, authorization is only part of the story. The appropriations process takes more Acts of Congress and takes several years, never mind construction. In the case of the Feather River west levee project, we have already constructed 80 percent of the Federal project with our own money, yet we are struggling to get the Federal Government to finish the job. Thus, the successes of the planning study, State/local innovative financing, and local initiative may be squandered on this traditional appropriations process.

There are a number of things the Corps can do to improve risk reduction, whether performed by local, State, Federal, or even private entities.

Prioritize work by risk reduction, not who builds the project. Incorporate the successful 3x3x3 process into the 408 permission. We are heartened and grateful that Civil Works Director James Dalton has already initiated changes, and we hope to see these expanded and codified. This is a big deal for local agencies.

Do not intermingle 408 permission processes with separate civil works processes. Otherwise, delays are inevitable.

Allow local, State, and even private entities to construct civil works projects. WRRDA 2014 [Water Resources Reform and Development Act of 2014] includes a provision to advance this concept. However, this pilot has not happened to date.

And finally, proactively consult with the Advisory Council on Historic Preservation on issues concerning Native American cultural resources.

This statement would be incomplete without noting the importance of the single most important flood control feature on the Feather River, Oroville Dam. Feather River is the discharge channel of Oroville's spillway. Dams and levees are a system, and as the ongoing crisis at Oroville Dam evolves, it is easy to forget that the primary failure mode that will result in loss of life and property is not necessarily dam spillway failure, but rather, levee failure. Oroville Dam has appropriately captured all of our attention at the moment, but we cannot neglect the vulnerability of our levees in the system that includes the Oroville Dam.

Thank you for holding this hearing and your continued attention to these important issues. Our lives and livelihoods depend on it.

Mr. GRAVES OF LOUISIANA. Thank you very much.

Next witness is Mr. Jonathan Kernion—thank you very much for being here—president of Cycle Construction Company.

Mr. KERNION. Thank you. Chairman Graves, Ranking Member Napolitano, Chairman Shuster, and other members of the committee, thank you for inviting me to speak before you today.

I am Jonathan Kernion, president of Cycle Construction Company, based in Kenner, Louisiana. Our company is a family-operated general construction firm founded in the late 1990s. We focus on heavy civil construction, marine construction, coastal restoration, environmental infrastructure, underground utilities, roads, bridges, demolition, waste management, and emergency response. I testify before you as a member of and representing the Associated General Contractors of America.

I want to add something in this—what I am talking, and I am going to plagiarize something I heard from one of our levee district heads in—down in South Lafourche. He has been waiting now to build the levee for 5 years to get a wetlands permit so he could build the levee to save, literally, hundreds of thousands of lives, money, property, everything else. And he still hasn't got a wetlands permit.

And he made a very, very unique reference to that, and he said that in 1941 Japan bombed Pearl Harbor. We were not a superpower at the time, but at the time we didn't have much, you know, as far as power. And what he said was, in the 4 years after that, we built close to 80,000 aircraft, 1,200 large combat ships, recruited and trained well over 7 million combat-ready troops, and we became a superpower of the world. But today, in 2017, he can't get a Federal wetland permit in 5 years to build a levee to save lives, which pretty much sums up the story and tells it.

I will go on from there. In order to build a 21st-century infrastructure, we need to be able to build it some time this century. Sadly, that is easier said than done. There are many kinks in the chain that can delay construction for years. In my testimony, I try to highlight some opportunities to more efficiently deliver water infrastructure projects during the preconstruction and actual construction phases.

Before construction begins, there are many—too many—Federal agency cooks in the environmental review and permitting kitchen. They follow laws and regulatory processes that came about independently, laid on top of one another with little or no regard for how they fit in the overall process. And even when you get to the

top of the environmental review ladder, a backyard lawsuit can shoot you down to the beginning of the game.

As such, projects can be delayed years and even decades, waiting for environmental reviews and permits to be completed. In my home State of Louisiana, we don't have years to protect and restore our environmental sensitive coastline. A football field worth of coastline erosion is caused, on average, every hour. It is alarmingly ironic that the lengthy environmental permitting and review processes that are intended to protect our coastline could, at least in part, lead to its further destruction.

AGC looks forward to working with this committee to better integrate the Federal environmental review and permitting process, building upon the reforms of NEPA and the past transportation reauthorization bills, and curving frivolous environmental lawsuits.

During construction, contractors face two primary problems: certain and reliable project funding streams, and Federal agency indecision. We do not build our homes from the ground up over a course of 30 years. However, we too often build our Nation's water infrastructure that way.

While we can point to Federal agencies as a cause for many problems, the buck starts and stops with Congress, literally. Until Congress allows water infrastructure projects to be funded outside the whims of the annual appropriation process, where funding comes in uncertain dips and drabs, we will continue to face unnecessary construction delays.

One of the greatest challenges contractors face on the Federal water infrastructure job site is obtaining decisions from Federal agencies. Former President Theodore Roosevelt is credited in saying, "In any moment of decision, the best thing you can do is the right thing, the next best thing is the wrong thing, and the worst thing you can do is nothing."

As with any construction project, unforeseen issues may and will emerge. The problem comes with getting the Federal agency to make a decision to act or not. Decisions may have to move up the chain of command. If the right person or persons are not available, the decision sits on their desks. AGC hopes to work with the committee to reduce the links in the chain of the command necessary to shorten and obtain timely decisions during construction.

Thank you again for inviting AGC to testify before the committee today. I look forward to answering any questions you may have.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Kernion.

Our next witness is Ms. Kathy Pape, senior vice president of regulatory policy and business development at American Water.

Ms. Pape, you are recognized for 5 minutes.

Ms. PAPE. Thank you, Chairman Graves, Ranking Member Napolitano, Chairman Shuster, and members of the committee. My name is Kathy Pape. I am senior vice president of regulatory policy and business development at American Water, which is the largest investor-owned water and wastewater service provider in the United States. We provide water and wastewater service to about 15 million people in 47 States, and that includes 12 military bases, as well.

I appear before you today on behalf of the Bipartisan Policy Center's Executive Council on Infrastructure. That group's goal is to

focus on how private investors can help to fund public projects. We have three recommendations for you today. But before I get into those three recommendations, I would like to give you a real-life example of a private company helping a public project about 110 miles north of here in Fairview Township, Pennsylvania, in late 2015.

Fairview Township decided to sell its wastewater system to Pennsylvania American Water. As a result, that township was able to pay off all of its sewer debt, was able to reduce property taxes by 50 percent, and it was able to refund a $10,000 per-customer hookup fee that the township charged. Just one example of many that I could give.

We have three recommendations today, and the first one involves where investment goes. And our belief is—and recommendation is—that investment should go towards sustainable and compliant water and wastewater systems. That means spend Federal money wisely. The way the system is set up now, most Federal dollars will go toward the most noncompliant systems. There is points given for noncompliance. Our belief is that putting money toward a poorly run system is like a shot of Botox. It is short term, it won't erase years of abuse, and you will need it again and again and again.

Dollars should go towards those systems that are capital-efficient and that are also cost-transparent. And by that I mean systems that charge true cost of service. Many times true cost of service is not charged either because there has been an influx of Government money, or because Government leaders don't believe that charging true cost of service will help them politically. But a system is not sustainable if true cost of service is not charged.

Our second recommendation goes towards options and alternatives. As somebody said this morning, the Federal Government can't fully fund $1 trillion. But there are many, many private investors who are willing to help do that. We have 56,000 community water systems, 19,000 wastewater pipe systems, 14,000 wastewater treatment systems, many of which were funded in the 1970s by Government grants, and those Government grants aren't around any more.

So we have our economic vitality being challenged, as well as the health of our children and grandchildren. We need to look for new ways and break down regulatory burdens. More alternatives, more options.

And finally, the third recommendation is relatively simple, and that goes to the Clean Water State Revolving Fund. Private companies are not eligible for funding under the clean water or the wastewater part. We can access Drinking Water State Revolving Funds, so we would ask that that is one of the ways to help private companies help the Government to fund the infrastructure that is needed.

In summary, our recommendations are three: invest wisely, put dollars toward those systems that are most compliant, that are sustainable, and have a track record of doing what should be done; second, that is break down those regulatory barriers and offer more options—many of those barriers have been mentioned this morning; and finally, provide access to the Clean Water State Revolving Fund.

Mr. GRAVES OF LOUISIANA. Thank you, Ms. Pape. I appreciate your testimony.

And our last witness is Mr. Kevin DeGood, who is director of infrastructure policy at the Center for American Progress.

Mr. DeGood, you are recognized for 5 minutes.

Mr. DEGOOD. Thank you, Chairman Graves and Ranking Member Napolitano, and members of the committee, for inviting me to testify. It is an honor and a privilege to contribute to this committee's work.

Water is an essential element of our daily lives and vital to our economy. The start of the 115th Congress presents Members with the opportunity to review the investments and policies needed to move the country forward in the coming years.

And while the elections on November 8th produced a change in leadership in Washington, one thing remains clear: no one walked into a voting booth demanding dirtier water, lower wages, and higher profits for Wall Street. And yet, weakening the Clean Water Act, eliminating Davis-Bacon prevailing wage standards, and pushing high-cost equity capital through public-private partnerships will do all of those things.

Rather than rolling back the environmental progress of recent decades, this Congress has a clear mandate to build a stronger, cleaner future for our communities by providing direct funding to improve water quality and reliability, flood control, and navigation in a sustainable way.

State and local governments, as well as drinking and wastewater authorities face enormous infrastructure challenges. Many legacy facilities have come to the end of their useful life, requiring major rehabilitation or outright replacement. At the same time, population growth, source water pollution, and increasingly extreme weather patterns brought about by climate change have added to the complexity and cost of providing safe and reliable water and protecting against the ravages of flooding, drought, and sea-level rise.

The EPA estimates that the Nation will need approximately $655 billion to maintain current health and environmental standards. The recent winter storms that have lashed northern California offer a powerful lesson in how rapid swings from intense drought to intense precipitation can overwhelm critical facilities that were designed using more stable climactic assumptions.

More than 180,000 residents in the Oroville region had to be evacuated on short notice due to spillway failures. This episode highlights the fragility of older facilities, and the essential role that water infrastructure plays in supporting public health, safety, and economic productivity.

California is not alone in facing water infrastructure challenges from climate change. For example, south Florida must modernize a host of facilities to deal with rising seas. For these communities, adapting to climate change is an issue of basic economic viability. Based on detailed technical work from Swiss Re, a company in the reinsurance industry, the Miami-Dade sea level rise task force determined that major improvements would be needed to "avoid or postpone wholesale abandonment due to noninsurability or the high cost of premiums."

The stress that climate change places on the built environment will only grow over time. We have a choice: invest and adapt, or pay an even higher price down the road.

In the Cleveland area, the Northeast Ohio Regional Sewer District faces significant challenges meeting Clean Water Act standards. Like many older communities, Cleveland has a combined sewer system that, during heavy rains, often discharges untreated wastewater into the Cuyahoga River and Lake Erie. On average, the district discharges more than 4 billion gallons of untreated sewage each year. In 2011, the district entered into a consent degree with the Environmental Protection Agency to make numerous upgrades to their system, including a combination of gray and green infrastructure.

These public agencies responsible for managing the water infrastructure highlighted by these examples share one key characteristic. They don't need another credit card from Washington or to saddle taxpayers with expensive private equity through public-private partnerships. What these jurisdictions need is a strong Federal partner ready to provide direct funding.

Proponents of public-private partnerships often state that there are billions of dollars of capital waiting on the sidelines. Implicit in this statement is that water agencies and other project sponsors face a lack of liquidity. This is simply not the case. Demand for public debt in the U.S. is robust. Moreover, the favorable tax treatment afforded to municipal bond investors means the public sector is able to secure municipal financing that is often three to five times cheaper than equity capital.

Today the public sector has access to municipal financing, as well as Federal credit facilities like WIFIA and federally supported State revolving funds at historically low rates. Simply stated, for many cities and water utilities, access to affordable credit is not the binding constraint. Instead, there is a shortage—the shortage of local revenues to support new project debts.

Many communities do not take full advantage of their capacity to generate additional revenue through taxes and user fees. However, even when they do, there are real limits on the total additional revenue they can reasonably generate, which often falls short of overall needs.

Increased Federal funding is needed to grow our economy, ensure timely compliance with water quality mandates, as well as to deal with changes presented by climate change. These resources should be used to leverage additional State and local dollars where possible, and to target those communities facing the greatest need.

Additionally, Federal funds should focus on those categories of projects that, all too often, take a back seat to traditional gray infrastructure, including efficiency upgrades, watershed restoration, and nonpoint source pollution mitigation.

Thank you again for the opportunity to address this committee.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. DeGood. I appreciate your testimony. We are going to go ahead and roll into questions, and I am going to recognize myself for 5 minutes.

Mr. Ellig, when I was reading your testimony last night I was really impressed with the thought process, and that you talked about appropriate metrics on regulations in ensuring that regula-

tions are truly focused upon outcomes that are in the best interest of the American public.

Just a few months ago, or a few weeks ago, we had bipartisan legislation that was included into the Regulatory Accountability Act, a bill that we had introduced last year called PROVE IT [Providing Retrospective Observations Validating Economics and Increasing Transparency]. And what that does is it requires that Federal agencies come back 5 years after a regulation has been finalized to collect actual compliance information from stakeholders. Not predicting, but actually collecting real information, doing a look back, determining the impact of—the true impact of those regulations, and we were shocked to find that there was little in—required of agencies to actually go back and true-up their cost estimates on—in terms of the cost of compliance with regulations.

Do you have specific examples of where you have seen regulations, or the regulatory process, improperly applied that you could say?

Mr. ELLIG. Well, I think some of the types of problems like that that I have seen, and that my colleagues at the Mercatus Center have seen in their research, involve barriers that maybe prevent better or more intensive use of some of the existing infrastructure.

For example, several of my colleagues have looked into the issue of supersonic flight and found that one of the biggest barriers to supersonic flight in the United States is it is banned in the Continental United States. And this was because of a legitimate concern about noise, about sonic booms. But with advances in materials, advances in engineering, it may very well be possible to design airplanes—probably not as big as the Concorde—but design airplanes that can actually travel supersonic speeds while meeting a reasonable noise standard that protects the public. And that is the difference between focusing on outcomes versus just focusing on intentions.

If we really want a regulation that focuses on outcomes, then have a noise standard that supersonic air transport needs to meet. Don't ban it, entirely. But those are the kind of barriers to innovation that we get when we just, you know, focus more on the process——

Mr. GRAVES OF LOUISIANA. Sure.

Mr. ELLIG [continuing]. Rather than getting results.

Mr. GRAVES OF LOUISIANA. Yes, thank you. And I think—I would love for you to give a clinic to Federal regulatory agencies to focus on outcomes and true interest to the American public.

Mr. Inamine, I want to ask two questions. Number one, you talked about the 408 process. And certainly that has been something that I think Ranking Member Napolitano and I have both heard a lot of concerns about, just predictability and timeframes associated with that review process. While certainly it is important to ensure that we understand the impact of any project to Federal infrastructure, Federal water resource infrastructure, can you talk about the timeline of—and I know you mentioned 19 months, lightning speed, but the timeline of that decision, and what would have happened if it was approved faster?

Mr. INAMINE. So for that specific incident—I say 19 months. It actually took much longer. And I want to point out—this is not a

hit piece on the Corps of Engineers. They are a really competent, well-meaning, smart people, people that are working on this 408 process. I think they are bound up in a very stovepiped organization, and it makes it very difficult to perform, because the outcome of this, as noted by a previous speaker, is public safety. It is very important. Most people are generally pointed in that direction.

Now, with regard to 19 months, what had to happen was the Corps of Engineers, in order to set that world's record of a very fast 408 process, they had to split the project up into two pieces. We had a levee at the time, just prior to construction, that was suffering some internal erosion. We just found evidence of that just a year prior. It is the site of the historic 1955—very dangerous site. It was recognized as the highest priority, highest risk levee on that system.

And so, staff—to their credit, Corps staff, to their credit—split the project into two pieces. But under the normal process——

Mr. GRAVES OF LOUISIANA. I have got 25 seconds left.

Mr. INAMINE [continuing]. We might still be waiting for that project to resolve.

Mr. GRAVES OF LOUISIANA. Last, very quickly, you are a non-Federal sponsor with a project with the Corps of Engineers. Can you just tell me the percentage of cost that you, implementing the project on your own, as opposed to doing it with the Federal Government—you compare those two?

Mr. INAMINE. So we have—so we prepared—so we were completing a locally—State of California and locally funded project. It encompasses the vast majority of the parallel Federal project. And so, our costs have been roughly half of what the Federal cost estimate is to do it under the normal process.

Mr. GRAVES OF LOUISIANA. Thank you very much. I recognize Ranking Member Napolitano for 5 minutes.

Mrs. NAPOLITANO. Thank you all for your testimony today. And as I stated in the opening statement, my communities often approach me about the need for increased Federal funding. That is why I am conflicted by the statements of President Trump. One hand, he called for tripling the amount of funding the Clean Water and Drinking Water State Revolving Fund. We call that a win. On the other hand, the forthcoming infrastructure proposal is reportedly to focus solely on increased use of private financing to close our Nation's infrastructure gap. It won't work for many of my communities.

Most recently we learned the President plans to cut the funding for EPA by close to 30 percent. It would have a devastating impact on the ability of my State and other State communities and communities to address the water quality challenges.

Starting with the State revolving fund authority, Ranking Member DeFazio and I are planning to reintroduce legislation to finally reauthorize clean water SRF.

To the panel, all of you, yes or no. Clean Water State Revolving Fund program is an important tool to address local water challenges. And would you urge this committee to authorize—reauthorize the program? Yes or no?

Mr. ELLIG. I would say yes and no, and use private capital when you can get it.

Mr. MCCARTHY. I would encourage it be reauthorized. Again, the revolving loan fund provides that mechanism for financing for municipalities that sometimes just is not there, otherwise.

Mr. STINE. On behalf of all States, we have several resolutions at ECOS that would say yes.

Mrs. NAPOLITANO. Thank you.

Mr. INAMINE. I will abstain, as the flood guy.

[Laughter.]

Mr. KERNION. I tend to agree with—that use a little bit of both——

Mrs. NAPOLITANO. When necessary.

Mr. KERNION. Yes, ma'am.

Ms. PAPE. I would say yes, and certainly give access to private companies, as well, and marry it up with private funding, as well.

Mr. DEGOOD. We strongly support the ranking member's proposal to reauthorize the SRF and to expand to $4 billion a year.

Mrs. NAPOLITANO. Thank you. Many of you directly utilize programs of—or funding provided through the EPA. What would be the impact of a 30-percent cut in these programs to the ability to meet your local needs?

Mr.—let's see, Mr. Stine?

Mr. STINE. Thank you, Mr. Chair, Mrs. Napolitano. The States have been working with the EPA and with OMB in the last 3 weeks to understand the magnitude of the cuts. At this point we have not seen the actual programmatic budget line items that are proposed.

However, a 30-percent reduction in the State and Tribal Assistance Grants, which include a variety of sources of revenue that States rely on for implementation of our basic water and air protection programs, as well as brownfield and superfund sites, would cut across approximately 15 to 25 percent of most State programs.

Mrs. NAPOLITANO. Thank you. Last week, Mr. Stine, the Environmental Council of the States submitted a letter to Mr. Trump and the administration on proposed cuts, which I ask unanimous consent to include in the record.

Mr. GRAVES OF LOUISIANA. Without objection.

[The information follows:]

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March 1, 2017

The Honorable Mick Mulvaney
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The Honorable Scott Pruitt
Administrator
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Dear Director Mulvaney and Administrator Pruitt:

The Environmental Council of the States (ECOS), the national nonprofit, nonpartisan association of state and territorial environmental agency leaders, is aware of the deliberative passback budget process between the Office of Management and Budget (OMB) and the U.S. Environmental Protection Agency (EPA). Passback does not include participation by directly affected states or other parties. Information released yesterday regarding the OMB passback for the Fiscal Year (FY) 2018 EPA budget proposed cuts of 30 percent to State and Tribal Assistance Grant (STAG) categorical grants, and cuts to infrastructure and other important state programs.

This new information is concerning as ECOS has long-standing positions, expressed in congressional testimony, resolutions, and letters, that robust STAG categorical grants are essential to implementation of environmental programs delegated to states. Further, state-EPA collaboration and partnership, and shared governance, are essential to protecting human health and the environment. ECOS today makes the state environmental agency position clear again – ***cuts to STAG categorical grants, or to EPA programs operated by states, will have profound impacts on states' ability to implement the core environmental programs as expected by our citizens.***

In a February 25 address, Administrator Pruitt said states and EPA are "partners, not adversaries" in carrying out the work of protecting natural resources and the environment, and that "help is on the way." We appreciate your remarks, which are consistent with the fact that states have taken 96 percent of the delegable authorities under the Clean Water Act, Safe Drinking Water Act, Clean Air Act, and Resource Conservation and Recovery Act, as Congress intended. ***Today, states on average provide well over half – and in many cases, three-quarters – of the funds needed to run core delegated environmental programs. States continue to fill the gap created by declining federal funds through increased fees on the regulated community and from other funding sources.*** By combining federal STAG categorical grants and state matches, with fees assessed on regulated entities and other state revenue sources, state environmental agencies serve the American public.

States issue permits, support the construction of critical water and wastewater infrastructure, conduct regional and waterbody focused activities, gather and manage data, set standards, clean up contaminated sites, monitor ambient conditions, conduct inspections and enforcement, and provide information and data – among other tasks. Many of these activities serve to strengthen our economy as well as to protect human health and environment. States have implemented innovation efforts; business process improvements; and E-Enterprise for the Environment with EPA – all to provide improved service to the regulated community and citizens, eliminate waste, and enhance certainty around decision-making. STAG categorical grants and other state program cuts jeopardize the ability of EPA and the states' shared efforts to efficiently implement these essential core programs.

We recognize and respect that you must evaluate EPA and its expenditures. At the same time, states and EPA together must continue our four-decade effort to preserve and protect our country's natural resources and Americans' health, while being nimble and effective enough to respond to new challenges and emergency situations. The time is now to meaningfully invest in state environmental agencies through robust – not redueed – STAG categorical grants. A robust request will ensure that states and EPA together will, in flexible, cost-effective, and accountable ways, deliver the clean and healthy environment all Americans value.

We look forward to the opportunity for a meaningful discussion about this important matter. Please contact me or ECOS Executive Director Alexandra Dunn with any questions.

Sincerely,

Commissioner John Linc Stine
Minnesota Pollution Control Agency
ECOS President

cc: U.S. House of Representatives and U.S. Senate Appropriations Chairs and Ranking Members
ECOS Members
State Association Directors (NACAA, AAPCA, ASDWA, ACWA, ASTSWMO)

Mrs. NAPOLITANO. In this letter you state the cuts to EPA budget "will have profound impacts on States' ability to implement the core environmental programs as expected by our citizens," including clean water programs and State permitting programs. Can you elaborate a little more?

Mr. STINE. Mr. Chairman, Mrs. Napolitano, yes. That is a statement that builds on my previous statement, which is States use the funds to leverage existing programs at the State level. For example, our clean water and drinking water revolving loan programs are matched in the State of Minnesota by capitalized bonds that the State issues to leverage the Federal dollars. So that would be one specific impact in my State.

But when you look at how States fund their existing environmental protection programs, whether it is air, land, or water, all of the States utilize Federal funds across a suite of activities. It is too soon to say what the direct impacts would be, but they would be, as I stated in the letter, profound.

Mrs. NAPOLITANO. To Mayor McCarthy, while not a direct focus of the hearing, I too support the EPA's brownfield program. That is why I am concerned to read the President may propose to eliminate all Federal funding for brownfield. Is that a proposal you would support?

Mr. MCCARTHY. No. I would encourage, you know, Congress represents the State level to look at those options, to remediate brownfields, to do conversions that bring them back as productive pieces of real estate.

Schenectady, my testimony reflects—the testimony submitted reflects an old brownfield site, which was the American Locomotive Works in the city of Schenectady. It sat there for 50 years. It was abandoned, underutilized, really an embarrassing piece of real estate. Everybody was afraid that it was beyond salvage.

When we actually got in and worked through in a systematic process, the remediation was not that—or the problems weren't that bad. We were able to put there—now there is a—we just opened a new casino, which is a $300 million project. We have underway a $150 million mixed-use housing project going immediately adjacent to the Mohawk River.

And so it shows that, again, working together, we are able to take that site that people had really ignored, and make it really an asset, not only for Schenectady, but the region.

Mrs. NAPOLITANO. Congratulations, sir. Thank you, Mr. Chair.

Mr. GRAVES OF LOUISIANA. Thank you. We are going to go to the chairman of the full committee, Mr. Shuster, for 5 minutes.

Mr. SHUSTER. Thank you, Mr. Chairman.

Ms. Pape, I appreciate your testimony. Besides upsetting the Botox world——

[Laughter.]

Mr. SHUSTER [continuing]. It was fantastic, fantastic testimony, and I think a great example, too.

When I talked earlier about private-sector dollars, I think the water systems, wastewater, clean water, is—this is an option for us. And only 2 percent—I think was your testimony, you said—of water systems are operated by companies like yours. Do you see

that growing? Do you see people coming to you more and more, saying we need to use the private-sector solution?

Ms. PAPE. Sir, we have certainly seen it more and more as municipal governments, especially, have dealt primarily with underfunded pension issues.

Mr. SHUSTER. Right.

Ms. PAPE. They have looked around and just tried to decide what assets can we sell. Scranton, Pennsylvania, is one that we recently acquired at the end of 2016.

Mr. SHUSTER. And you always buy them? Do you lease them, or——

Ms. PAPE. We always buy.

Mr. SHUSTER. Always buy.

Ms. PAPE. And I would like to explain one of the reasons why, because it goes to the affordability question. One of the methods we have in Pennsylvania is that we can spread the cost, the expenses and the capital cost of our assets, over our large base of customers, which is 700,000 in Pennsylvania. So we can use that law when we acquire assets. We couldn't use it if we leased.

Mr. SHUSTER. And your rates, when they go up, do you do that by yourself, or you have to consult with somebody to——

Ms. PAPE. The rates have to go through the Public Utility Commission——

Mr. SHUSTER. Right.

Ms. PAPE [continuing]. Through a long 8-, 9-, 10-month process. Again——

Mr. SHUSTER. So there is protection for the citizens if you—somebody saying, "Oh, that is a private company, they are going to jack our rates up." Because one of the biggest challenges I face in my district, a rural district, a high senior population, incomes declining, and half the district flows into the Susquehanna, which is the Chesapeake water—and which causes us a lot of problems with water.

So again—and I have many, many water systems, old systems that, you know, we have tried to push them this way. But it is a challenge to get them to consider this, because they are afraid they are going to give up their water, and not have any kind of control over it. So I appreciate what you are doing. And I would like to see more examples, because I have seen the—many examples where you are rebuilding their systems, and their rates have not gone through the roofs. In fact, some cases they stay relatively stable, so——

Ms. PAPE. We do have a customer assistance program also for people who cannot pay the rates.

Mr. SHUSTER. Thank you.

Mr. Ellig, have you seen any examples of good governance in—when it comes to these regulations, in either the U.S. Government or in foreign governments that you can point to to say this is how it should run, this is how we see it, so we can use it as examples to demonstrate to other agencies that there are cases where this can be done?

Mr. ELLIG. Yes, let me highlight one example. One of the things that I have spent a lot of time looking at is how well Federal regulatory agencies account for costs. And typically, what they do when

they are issuing regulations, most of the agencies that do a good job, they are still only counting compliance expenditures as a measure of cost, and not looking at broader costs to society. And some of those costs have been mentioned here. In general, agencies are not good at taking account of the costs that arise when regulations make people wait for stuff.

Now I am going to give you the good example. The good example is, the U.S. Department of Transportation is actually better at this than most, maybe because it is transportation, and they realize that waiting time and transit time are important. And so, I will single out USDOT as being pretty good at trying to take into account the effects of making people wait when it is issuing regulations. And they actually have values that they ascribe to people's travel time and waiting time. So that is a good practice that a lot of other agencies could learn from.

Mr. SHUSTER. It is good to hear there are some good examples. I would like to continue talking to you in this discussion to try to identify more and more of these types of good programs that are out there.

A final question to the mayor. You are under a consent decree. One hookup for every four you have to de-hookup. What is—why—what is the ratio? Who came up with that, and what is the sense in that? I don't——

Mr. MCCARTHY. In New York State we work with the New York State Department of Environmental Conservation, which acts as the EPA's representative. And it was the terms that they put forth on the city to enter into the decree and move forward. And we want to remedy the problem, where we have the outflow, but that is the terms that they gave us.

Mr. SHUSTER. Right, but what is it based on, just their—they just pulled it out of the sky and said, "one to four sounds good to us"? Because it sounds to me like, from your testimony, it causes you a lot of harm.

Mr. MCCARTHY. We have right now a project where—it is an old industrial city. We have—a number of partners have come forth within the community, and we are doing a new construction housing project, fair market, within the city. We are having trouble getting the approval to be able to hook those houses up within the city of Schenectady to handle the wastewater because of the consent order.

And over—we are permitted at 18.5 million gallons a day. Our average now is running about 11.8 million last year. And over the last 7 or 8 years, we have reduced the flow within our systems by about 4 million gallons a day, through dealing with I&I [inflow and infiltration] issues. So we have tried to do that. But again, it is that regulatory environment that sometimes logic just is not part of the discussion.

Mr. SHUSTER. I went over my time, Mr. Chairman. Thank you very much for letting me.

And you mentioned the important word, because my father keeps staring me on the wall. He would always say that people come in his office—when you start talking logic, he says that is the greatest sin in Washington, DC, is to think logically. So I think all of you are sinners at the table today.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Chairman. We are going to go to the gentlewoman from Illinois, Mrs. Bustos, for 5 minutes.

Mrs. BUSTOS. Thank you, Chairman Graves and Ranking Member Napolitano. I appreciate you holding this hearing. And I also want to thank all of our witnesses for being here today.

In Illinois—I represent the northwestern region of Illinois—we have a real problem. Our aging water infrastructure is inefficient and can even put public health at risk. On top of that, we know that our fix-as-fail approach to locks and dams puts our growers and manufacturers, as well as the navigation industry, in a guessing game of whether they will be able to deliver to consumers on time. So, simply unacceptable.

When we invest in our water infrastructure we create good-paying jobs, protect our public health, and help get goods to market more efficiently. There is no reason we shouldn't work together to make sure our country's water infrastructure programs work for users and help address the massive backlog many of our communities face.

So, again, my district, northwestern Illinois, live along the Mississippi River. The Illinois River runs through the southern part of my congressional district. So locks and dams are absolutely critical. So when I think of the water infrastructure, certainly I also think of water lines and the Clean Water Act. But in my district we also, as I said, think about navigation.

So, for the panel, is anyone here prepared to discuss the navigation infrastructure on our rivers? And just wondering if that is something that any of our panelists would care to address. And that can be addressed to any one of you. Anybody want to volunteer for that?

Mr. DEGOOD. I would go ahead and just say that I think, as part of a broader infrastructure package, that inland navigation has to be a part of that. And we support efforts to try and take both the Harbor Maintenance Trust Fund and Inland Waterways Trust Fund off budget, so that the full amount of revenue that is paid in by users through excise taxes on barge fuel and through the goods that are moved through our ports can be put to good use constructing the kinds of projects and making sure that the number of days that locks and dams are out of service due to maintenance and delays goes down.

Mr. STINE. Mr. Chairman, I am just going to speak to one project that I am familiar with in my role on the Great Lakes Commission, which is the replacement of the Soo locks, which is a critical piece of infrastructure, vital to the economy of the Great Lakes. Our harbor of Duluth and Superior in Minnesota/Wisconsin is a key piece of the national infrastructure, creates a vulnerability in our processing of goods and services across the Great Lakes, St. Lawrence Seaway, and that is one critical project that the Great Lakes Commission has passed resolutions supporting and has spoken up clearly on.

So that is in a different hat that I wear on a different day. I will be back next week on behalf of that organization.

Mrs. BUSTOS. Anybody else have anything to add on that topic?

[No response.]

Mrs. BUSTOS. All right. So this one I will address, Mr. Stine, to you. And then also, Mayor McCarthy. You guys had mentioned the State revolving funds in your testimony. It has been really important to my congressional district. The Clean Water State Revolving Loan Fund has been an invaluable resource in our area. We have got—including an $11 million sewer improvement project that wrapped up last year in a town called Rock Island, Illinois.

Also, in a community called Galesburg, in my congressional district, incredibly important to replace about 2,000 solid lead lines that are going to people's homes from the water main. And so very important.

Wondering if you have thoughts about the demand for these revolving loans, and whether the demand is outpacing what Congress provides annually in appropriations for that fund.

Mr. STINE. Mr. Chair, Mrs. Bustos, yes, the demand far outstrips the available funding. States apply various approaches to leverage those dollars through their own resources. But the need is somewhere in the area of a couple hundred billion dollars over the next 5 years. Just for drinking water systems alone, it is probably $300 billion over the next 15 years. And as for clean water and wastewater infrastructure, the appropriations through the revolving funds are a significant source of revenue for States and local communities to meet those needs.

Mrs. BUSTOS. Mayor McCarthy?

Mr. MCCARTHY. Thank you. It is really critical for a lot of municipalities, and also smaller levels of Government, where the revolving loan funds—you know, New York you also have a set of expertise from that side, where they are doing unique projects that are in water and wastewater, so that they add a little bit of value to the community. And the no-interest and low-interest loans are, again, sometimes deal-makers in terms of allowing communities to go ahead with the projects, to meet the regulatory requirements that we are all dealing with.

So I would encourage Members to look at funding those at levels that provide adequate resources for the local governments.

Mrs. BUSTOS. All right, thank you. And I have used up my time. I yield back, thank you.

Mr. GRAVES OF LOUISIANA. Thank you. And I am going to turn to the former chairman of this subcommittee and mentor, Mr. Gibbs from Ohio, for 5 minutes.

Mr. GIBBS. Thank you, and I want to congratulate Chairman Graves on your new position. I look forward to working with you in the majority.

Anyways, Mr. Ellig, it is really refreshing to hear somebody talking about challenges we have with regulations. And your comment about the—some of our agencies using research to support their agenda, and then also using the media or social media—I can think of one example, and that was the United States rule that was pushed through I think was biased. Would you agree that that was an example of research that—to drive an agenda, a political agenda? And the——

Mr. ELLIG. Oh, yes. I am aware of that example, and it was highly controversial. I think, from my perspective, the bigger problem is when you have agencies that are supposed to be doing objective

analysis, and then that gets turned into something that is supposed to be used for advocacy, rather than something that is supposed to inform decisions.

Mr. GIBBS. Mayor McCarthy, thank you for referencing my integrated planning permitting bill. I really appreciate the support from the Conference of Mayors.

Can you elaborate a little bit on your consent decrees? You know, this permitting planning bill, you know, it is really to develop a long-term plan and set benchmarks on goals. But when you are on a consent decree and under the restrictions of the permit, how is that—on hindering—is it—on the cost side, what would this bill—how would it really help you on the cost side?

Mr. MCCARTHY. Our—some quick background on the overflow that we are dealing with is a valve in the city of Schenectady that we——

Mr. SHUSTER. Can you pull the mic closer? Pull the mic closer to you a little bit——

Mr. MCCARTHY. I am sorry. It is a valve in the city of Schenectady that we would open two or three times a year for hours during the day to handle high-water events. And that is the decree that we had to enter into. It is, you know, $14 million that we are addressing to remediate that.

We want to stop the outflow. But again, the cost and then the criteria where you have the 4-to-1 offset, it is very frustrating. We are taking an old, industrial city, we have got a lot of good things happening, we are seeing new investment, we are seeing people view the community differently. It is the birthplace of GE celebrating its 125th anniversary as a company. They are looking at opportunities within the community. And the 4-to-1 is, again, extremely restrictive.

And where we have met all the other criteria—we have taken—we are permitted at 18.5 million gallons a day. We are only running about 11.8 million. And the last 4 years, through management, we are reducing the I&I inflow into the system. We have reduced that by about 4 million gallons a day. And if I would be able to——

Mr. GIBBS. Yes, but having a longer framework than 5 years—the permit is 5 years, I believe, that—you know, set benchmarks that reach that.

Are you under—being fined in this consent decree, or not?

Mr. MCCARTHY. We have not—well, there is always the threat of being fined. But we are, again, working in a manner where we have entered into the consent decree. We have negotiated with it, and trying to remediate the issue and again move forward so it is in everybody's best interest, even though the terms are frustrating to try and manage a city on a daily basis.

Mr. GIBBS. Mr. DeGood, you brought up Cleveland and their challenges of having—I am from Ohio. The integrated planning permitting bill, how would that—in your instance, you brought up Cleveland. Would that be a benefit to them? Can you expound on that?

Mr. DEGOOD. Well, I think it is important to note that, in the Cleveland example, they signed on to that consent decree in 2011. And the program of projects that they put forward that the EPA

agreed to includes a combination of gray and green infrastructure. So I think we are supportive, broadly, of the concept of integrated planning. But it is not necessary for that legislation to be passed for people to be able to use green infrastructure as part of a consent decree.

I think our only concern with the legislation as is currently drafted is that some of the language comes precariously close to allowing affordability to be a mechanism by which we actually are reducing or weakening the limitations that we would normally put into our NPDES permitting processes. And I think, for us, that is probably a break point.

Mr. GIBBS. My intent is really for the EPA and the local entities, districts to work together to come up with a long-term solution. Because the problem you have, they can't charge the ratepayers enough, they can't always do everything at once, and give them that flexibility. But if you—a long, multiyear, long-term plan and set benchmarks, and you can get there.

Mr. DEGOOD. Sure.

Mr. GIBBS. I think that——

Mr. DEGOOD. In the Cleveland example, they signed a 25-year agreement. So I think, you know, the EPA was cognizant of the fact that Cleveland had financial restrictions, and that the level of improvements that they were asking for were substantial enough that they went ahead and gave them what, at the time, was one of the longest consent decree implementation windows that had been ever given. So I think the EPA is aware of those challenges that local districts face.

Mr. GIBBS. Thank you, Chairman. Time is up.

Mr. GRAVES OF LOUISIANA. Thank you. I recognize Mrs. Lawrence for 5 minutes.

Mrs. LAWRENCE. Thank you, Chairman and Ranking Member, for this opportunity. Thank you all so much, panel.

I am—I represent the—a part of Michigan. And so the Flint water situation was something that was extremely emotional, and something that has reconfirmed my commitment to clean water in America, and protecting our families and our health through water.

Months after warning signs, the water in Flint, Michigan, as you know, did not meet the levels of—in lead that would be healthy for children in a city that depended on that. A man-made disaster is a tragic outcome.

We have found that in September 2016 the U.S. GAO released its study of water infrastructure for selected mid-sized and large cities with declining population, and it was alarming, what they found. They found many of them have lost a substantial percent of their population, as you mentioned, Mayor. And, because of that, they are seeing declining revenues, which makes it difficult to address the infrastructure needs. And in our investigation of Flint we found the finance and revenue of maintaining a water system was part of the equation that was used to make a very unfortunate decision.

So my question is to you, Mayor McCarthy. In your written statement you talk about how your city is not atypical. It is older, it is industrial. I know a thing or two about that, being a mayor, myself.

Can you talk about the water and infrastructure challenges in cities? Because you hear, as—U.S. Conference of Mayors.

And if any other member wants to talk about that, because it is important that, as we move forward with the matches that we are talking about, that is the challenge—that we are very clear on investment in water infrastructure is not a luxury or a pretty thing, it is a necessity.

So, Mayor, please.

Mr. MCCARTHY. Thank you. The water in wastewater systems are key, in terms of basic quality of life, and then also, trying to rejuvenate and reinvigorate older communities. You want to be able to attract people there, you want to attract business, and you have to have those systems in place. We want them to maintain and be able to produce the highest quality water, treat wastewater.

But the numbers, to be able to finance those systems, are a lot of times a burden on the community, and it comes a point where businesses, families, individuals choose to live in other places, as opposed to the older urban areas that you have some of the infrastructure in place that really just needs to be upgraded and modernized.

Mrs. LAWRENCE. So I know in Flint—and you are seeing it, too—is economics. It is housing, and it is also—builds a community or—but most of all, it is a health component. Some people say quality of life. It is a necessity.

Mr. MCCARTHY. Absolutely.

Mrs. LAWRENCE. OK. Anyone else want to comment on that?

[No response.]

Mrs. LAWRENCE. Mr. DeGood, in your written statement you talk about the need for sound regulations such as the Clean Water Act, which restores and maintain the chemical and physical integrity. Are the regulations the reason we have a crisis in our water infrastructure in America today?

Mr. DEGOOD. I think the answer to that is a resounding no. I think we have a crisis of underinvestment that is, in some cases, a shared burden for locals in the Federal Government.

There are certainly places where we can point to where water services are underpriced. And I think, rather than trying to point to the regulations that we ask EPA and our State partners to enforce as being the problem, what we need to do is put some additional money on the table.

I think what the construction grants program—from the original 1972 Clean Water Act—demonstrates for us is that when the Federal Government shows up with resources, often times local elected officials find the courage to raise money themselves. That is not always the case. There are certainly communities that are so economically challenged that you need to have different matching requirements and an understanding and a sensitivity to that.

But those initial construction grants were, for the most part, a 55/45 Federal/local match. So our local communities stepped up and did what was asked of them. But I think, when you are faced with a bill and somebody is telling you it is all on you, go ahead and borrow the money, go ahead and do a P3, that is really not the answer.

Mrs. LAWRENCE. Thank you. I want to close with this. In America we are going to start seeing water affordability being an issue in our cities, because we have to fund them, we have to provide safe, clean water. And when cities step up to make those investments, they have to get the revenue. And water affordability is going to be a issue we are going to talk about.

Thank you. I will yield back.

Mr. GRAVES OF LOUISIANA. Thank you. Next is the gentleman from Pennsylvania, Mr. Smucker. Five minutes.

Mr. SMUCKER. Thank you, Mr. Chairman. As a member of the Transportation and Infrastructure Committee, but not a member of this subcommittee, I appreciate the opportunity to be here this morning. Thank you for allowing me to do that.

I specifically want to highlight an issue that is important in the district that I represent in Pennsylvania, the Chesapeake Bay watershed.

Mr. Ellig, this was brought up earlier by Mr. Gibbs. And I appreciated, as well, your testimony in regards to the—some of the problems with our regulatory process which produces undesirable results at times. And specifically for our community, the interpretation of the EPA in regards to wOTUS, Waters of the U.S., and the extension of what is considered waters of the U.S., is a major problem.

This was also briefly mentioned by Mr. Kernion. I was a contractor, as well, and so I understand the impact on development projects of interpretation of that law.

But the Pennsylvania Farm Bureau president, Rick Ebert, noted after President Trump's Executive order that virtually all of Pennsylvania's land mass can be claimed by EPA officials as regulated water, subjecting land owners and communities to extreme and needless Federal permitting requirements and land use restrictions.

These farming groups have also claimed that if they were to dig a drainage ditch on their property, it would potentially become a United States waterway under the WOTUS provisions. This is an example that I think—some of what you were describing—of an overreach of regulations.

So, Mr. Ellig, I just—you know, how is it, if we have a regulation like that in place, how could groups go about trying to find a better balance between the goal that we want to achieve and that overreach?

Mr. ELLIG. Well, yes. I understand why this is a difficulty for development. Also, for farmers in Lancaster County. I think we have to go back to basics and insist that our discussions of regulation be based on actual fact, and investigation of whether regulations really are likely to create the intended benefits, and whether they actually do, after they have been implemented, create the intended benefits.

Because, unfortunately, an awful lot of the debate over regulation, particularly environmental regulation, has become kind of a holy war, where everybody argues on the basis of their intentions, rather than what actually happens as a result of the regulation.

Mr. SMUCKER. Thank you——

Mr. ELLIG. So I would say, first things first, let's get back to factual investigation of what the actual likely results and the actual——

Mr. SMUCKER. Thank you——

Mr. ELLIG [continuing]. Results of regulation——

Mr. SMUCKER [continuing]. Thank you, and completely agree. One of the other points you made, which I thought was very good, you said regulatory agents often act as if enforcement is more important than compliance or achievement of regulatory outcomes.

And just recently, farmers in the Chesapeake Bay watershed did a voluntary study and highlighted some of the actions that have already been taken, for which they are not recognized. So, for instance, 475,800 acres of nutrient manure management; 97,562 acres of enhanced nutrient management; 2,164 animal waste storage units; 2,106 barnyard runoff control systems. You can go on and on.

And the point I want to make is what farmers in my area want to see is more collaboration and less enforcement. Why can we not see that occurring by some of our agencies?

Mr. ELLIG. Well, you would get that if agencies were rewarded—individual agencies were rewarded for actually achieving results, rather than for achieving outputs or activities that are measurable—that may or may not produce results.

Mr. SMUCKER. And again, additional point to make is farmers, builders, contractors, the municipalities in my area want to see clean water. They all enjoy clean waters on their farms. They want the Chesapeake to be clean. But again, they want to see more of that collaboration, which, I think, is sorely missing.

So I—again, I appreciate your comments. I know we have taken the first step in this regard with the President's Executive order. And I know that this is of concern to the chairman of this subcommittee, as well, and I look forward to us continuing to work on this issue. Thank you.

Mr. ELLIG. Thank you.

Mr. GRAVES OF LOUISIANA. Thank you. We are going to go to the gentleman from California, Mr. Lowenthal, for 5 minutes.

Dr. LOWENTHAL. Thank you, Mr. Chair and Ranking Member Napolitano. I am honored to join you as a new member of the Transportation and Infrastructure Committee, and the Water Resources and Environmental Subcommittee. I look forward to working together to improve the work of the Army Corps, to protect the Clean Water Act, and to build upon its successes, and that we craft a robust and equitable Water Resources Development Act. I want to thank you for convening this hearing, and for the people on the panel, for highlighting the importance of water resources and the relevant Federal agencies and the role they play in our Nation's infrastructure.

First question I have is for Mr. DeGood. Recent reports—and certainly not—we are not clear yet, but they seem to indicate that President Trump plans to propose devastating cuts to the EPA's funding and staff levels. Several of its most important programs may face elimination all together. Your testimony, and the written testimony, highlighted the importance, the enormous importance of

the EPA to communities across the country, from protecting clean water infrastructure to safeguarding public health.

What do you think that these cuts that we have been at least hearing about to EPA would mean for the Federal Government's efforts to maintain and improve clean water infrastructure?

Mr. DEGOOD. So I think I would make three points to that question.

One, we have had a lot of talk already this morning about frustrations that people have—I think often legitimate—with the length of permitting processes. I think when you are talking about potentially a 30-percent or greater cut to EPA's budget, you are talking about eliminating many of the positions, many of the people whose job it is to try to review these applications and to provide timely determinations. So, if our goal here is to give people greater certainty and to speed those processes up, I don't see how cutting Federal staff and Federal budgets are going to do that.

But I think, more importantly, we really undermine our long-term productivity and long-term community health. As just one example, the section 106 grants program provides money directly to States to allow them to do the very implementation work of things like the Clean Water Act, right. This is monitoring and assessing water qualities, developing water quality standards, determining total maximum daily loads, ensuring compliance, taking enforcement actions. This is really the core of laws like the Clean Water Act. We hand off to States to do that work. And when we take money away through EPA budget cuts, we take away their ability to enforce those laws.

And the last thing I will note is about the brownfields program. These are very productive dollars. And it comes down to a question of efficiency, and it comes down to linear infrastructure. If you allow a parcel that has been polluted over time through a prior industrial use to sit idle, and you go out and you have to build new infrastructure—that is water, that is sewer, that is roads, stop lights, all the things that go along with that—to try to attract new housing or new commercial development, you are creating additional facilities that you are going to have to try to maintain for decades into the future.

When we remediate parcels that have existing pollution, what we are really doing is creating a pathway for future economic development at that site that will generate tax revenue on top of existing infrastructure. It is not something we have to go out and build new. So we are really cutting off our nose to spite our face when we talk about zeroing out the brownfields program.

Dr. LOWENTHAL. Thank you. Next question I want to clarify something that I am not really clear on.

Mr. Kernion, you brought up the issue of funding for Federal water agencies. And we have heard already of the backlog the Army Corps has for authorized but unconstructed projects, which—where the valuing is estimated at over $56 billion.

Now you talked about—in your written testimony, especially—that environmental review processes have played a major role in some of the backlog, or holding up the process. But we also heard from the opening statement from Ranking Member DeFazio that the Corps budget cannot deal with the backlog. It is not only—or

it is not really the burdensome regulations that are leading to the backlog, but the lack of funding for the Army Corps.

Could you kind of deal with this relationship and where you see this relationship between the funding and also the regulations?

Mr. KERNION. Personally, I have seen both. And I am just speaking offhand. I have worked for—as a contractor for the Corps of Engineers now for over 30 years. And I have seen quite a bit of the both take place. In waiting on funding, I have seen projects shut down because they didn't have funding, where they have actually gone to contractors and said, "Look, in order to keep going, you have to finance your project, or stop and take the brunt of it until we get more money appropriated for the project."

I have also seen the environmental things which I alluded to when I spoke about before. One of the biggest things that I have seen personally it wetlands issues. Now maybe EPA issues in other States—of course, where we are, it just seems like it is more wetlands.

Congressman here talked about diverting water. Every time you divert water, it is not opening up another waterway, but, uh-oh, is that water going to go to an area that is now going to become a wetlands, and it is not dry—it is now dry, but you run water through it, it might be wet, and then you can't use the land again.

And so, I have seen, actually, both of them. I don't know if I am answering your question right, but that is my personal experience with it.

Dr. LOWENTHAL. Thank you, and I yield back.

Mr. GRAVES OF LOUISIANA. Thank you. Next we are going to go to a gentleman from Illinois, Mr. Davis.

Mr. DAVIS. Thank you, Chairman Graves. Congratulations. I had a quick question for you that—you know, I kind of injured my finger on the chair, scooting my chair in earlier. Do you think the Corps could use some investigations money in their account to help me get to the bottom of why you have tried a conspiracy in your first hearing to attack my finger? I mean this is just outrageous.

Mr. GRAVES OF LOUISIANA. I think the Corps would love to investigate that.

Mr. DAVIS. First off, it is great to have Chairman Graves and the Water Resources and Environment Subcommittee here, and I appreciate all of the testimony. We are all in the same boat. We all want to see infrastructure built in this country.

Mr. Stine, you mentioned that the Mississippi River starts in Minnesota and ends in Louisiana. Well, you know what? It digests through Illinois. And our navigation system and the infrastructure that it needs to continue to keep our navigation system moving from north to south and south to north is right in my district. So it is imperative that we see action.

And that is what we haven't seen. Twenty years ago I saw which plan the Corps was going to use to update the locks and dams in the Illinois and Upper Miss systems, and we have seen nothing since then, except the plan that they wanted to use. We see no investment. And we have seen, from the last administration, since 2010, that we have invested nothing in NESP to try and upgrade those antiquated systems. So we have got to have the progress in

the middle of your area and his area to ensure that our products get from point A to point B and out into the global marketplace.

That being said, Mr. Kernion, great to see you again. We met last night. One of the things that I proposed in the last WRDA [Water Resources Development Act] bill was to require a GAO study to study alternative models for management of the Inland Waterways Trust Fund, including a possible not-for-profit corporation or Government-owned corporation that would actually put us on a path to have a continuous funding source for doing what the Corps of Engineers should do, and has done well in the past. That is to build infrastructure and design infrastructure. Seems pretty simple to me. Seems like sometimes over the last few years they may have lost their mission.

That being said, you are a builder. What would more certainty, faster project delivery of navigation projects for someone like you, what would that mean to your employees? And what would it mean if we had a continuous funding source that industry could utilize to actually do what the Corps should be doing, build things?

Mr. KERNION. Well, I am going to answer it like this. I think the Mississippi River, if you look at it, is probably—and you compare it to a human body, it is one of the largest arteries, or the largest artery in the body. And at that point I believe you have to do everything you can to keep that river flowing, keep it from overflowing, and keep commerce up and down that river, because commerce is as important as anything.

One of the things talked about is dredging the river deeper to get the Panamax ships into the river. If that was done, we would actually get—more commerce going up and down the river would flow, and it would be a different way to run, you know, goods through that artery.

At the same time, the river is treacherous and is deadly. I have seen the river do some devastating things. I didn't realize water was as dangerous as it could be until I had a levee break years ago—I tried to stop it—after a hurricane, and it is brutal, what it can do and the damage it can do to people.

But also, and what you had alluded to last night, was getting the projects funded for up there. For us, of course, we are 100 percent behind that. We would love to see it happen. The more projects up and down the river, we are happy. I was last year's president of Mississippi Valley—Mississippi River Valley's Associated General Contractors, and a lot of the contractors in our district work on that river, and they depend on getting the funding to build that infrastructure.

Mr. DAVIS. Well, a lot of the contractors in my district work on that river. And you are absolutely right, we have got to have some movement.

And I don't have much time left, and I know the chairman, he is not going to give me any extra time. So I want to make sure you—the witnesses know my opinion. You know, I think a body resembling the inland waterway users board and including other key stakeholders like many of you at this table, including Government representation, like the Corps of Engineers, would do a much more efficient job of identifying a project schedule and making expendi-

tures to priority projects that have already received approval from Congress.

After all, you guys are the people paying for the projects, right? Let's actually make sure they get done.

And, with that, I have got about 2 seconds left, and I am going to yield it back, Mr. Chairman.

Mr. GRAVES OF LOUISIANA. That is impressive efficiency. Thank you, Mr. Davis.

With that, we are going to yield to the gentlewoman from Connecticut, Ms. Esty.

Ms. ESTY. Thank you, Chairman Graves and Ranking Member Napolitano. And thank you to the entire panel. Many of us are bouncing between committees. I have got all three of mine going simultaneously at this hour.

A couple of quick comments. To Mr. Stine, greetings from my husband, former commissioner of DEEP in Connecticut, and thanks for the good work ECOS does, in having grown up, in part, in Winona.

To Mr. Kernion, father and grandfather, both AGC contractors, and my grandfather built locks and dams on the Mississippi River. So some experience with that.

To Mr. Inamine, I grew up in northern California, in part. Very familiar with the Feather River and challenges there.

So, to Mr. Ellig, I want you to know that there is support on both sides of the aisle for focusing on technology and outcomes. And I think it is vitally important, with constrained budgets, having been a local town council member, State representative, and now in Congress, we have got to figure out how to be faster and more efficient. And I appreciate you flagging time as a real cost. And that is something we really need to focus on, and I think we need to streamline our systems and get better outcomes with less time, and free up those resources to actually be spent on getting the outcomes.

I wanted to turn to the issue of brownfields. And I think Mr. Katko is going to join me on that. We have legislation we are putting back in in this Congress. We need funding and to really focus on the vital importance of that, and rebuilding communities.

And it is actually related to some of the issues Ms. Pape raised, too. If we don't get the funding in those communities—and I represent Connecticut, I have got cities like Waterbury, Connecticut, which has major parcels of land right in the middle of downtown. If we don't rehab those, we are not going to be able to create jobs, we are not—we are going to be chewing up farmland elsewhere. So it is bad for the ecology of other communities. And, frankly, we are not going to have the jobs.

So I would like, if you could, Mayor, if you can talk a little bit about how important brownfields are for revitalization of our communities, and which of the grants that are most important to you. Because, again, if we are looking at a 25-percent or anything like that kind of cut, we are going to be really challenged in figuring out how to work through that backlog on brownfields.

Mr. MCCARTHY. Thank you. Brownfields, as you point out, they are underutilized, they are a negative influence on communities. And they have, largely, a proud history. There was something there at one time that added value. For whatever reason, it is no longer

there. And so you have to have the tenacity and the systematic approach to work through whatever the problems may be.

And a lot of times people will—they think that you can't solve the problem. But you can. And it is—requires the partnership that State, local, Federal-level, the private sector to come up, to do the evaluation, to look at the opportunities that are there, to create real value, and so that the funding from the Federal level is key in driving that overall discussion and the partnerships that can form if the funding mechanism is in place.

Ms. ESTY. We would love to cycle back with you on some specific proposals we were looking at to include P3s and other ways of leveraging those resources, whether it is for parks, which are part of creating that quality of life, or repurposed industrial sites, or shopping malls, or whatever it may be. We are trying to put some urban greenhouses in one of ours to bring food back into the city, cap those sites, but then actually repurpose them for use.

Mr. DeGood, you talked a little bit about that. Can you speak both about brownfields and the importance of that, and also return a little bit to the importance of leveraging that Federal funding? Because I saw it at the local level. If communities don't have those match for water systems, they can't get the goodwill of local residents to raise the property tax to pay for those projects.

Mr. DEGOOD. I think that is absolutely right. I think one of the hardest things, as an elected official, is when somebody tells you that it is your responsibility, and your responsibility alone. And it is a hard thing to go out into your community, even if you passionately believe in the value of something like the Clean Water Act or the flood control standards that the Army Corps has, even if you want to try to engage in redevelopment, if you are saying, "We are on our own here."

And so, that is why, when we start hearing stories about the kinds of budget cuts that this administration is contemplating for the Environmental Protection Agency, it is disheartening because we know that, ultimately, for an administration that has spent so much time talking about jobs, taking these dollars out are actually going to do just the opposite. It is going to take the stick out of local elected officials' hands and make them unable to deliver for their communities.

Ms. ESTY. I see my time is expiring, so I am going to yield back my 5 seconds. Thank you.

Mr. GRAVES OF LOUISIANA. Thank you, Ms. Esty. With that we are going to turn to the gentleman from New York, Mr. Katko, for 5 minutes.

Mr. KATKO. Thank you, Mr. Chairman, and congratulations on your chairmanship. I look forward to working on this committee.

Mr. McCarthy, welcome, and I appreciate your testimony thus far. As you may or may not know, I am from upstate New York, in Syracuse, and spent a lot of time in Schenectady. And in so doing, I led—it led me to the conclusion that Schenectady is very much in this same boat of all the upstate New York cities. We have lost tremendous amounts of manufacturing and tremendous amounts of tax base over the last several decades, and that has led to profound infrastructure problems, which I am not quite certain

that this—we have delved into it with enough detail. That is what I want to do for the next few minutes.

As you may or may not know, in Syracuse we still have—we have such a profound problem with our water infrastructure that some of the pipes we use in the city of Syracuse are still wooden from, like, the late 1800s, early 1900s, which is unbelievable to me. Last year we had well over 100 water main breaks in the city of Syracuse. And some of the really up-and-coming areas, like Armory Square were often peppered with back hoes digging up lines and fixing them and water problems, and it just seems, in this day and age, that is crazy.

So, with that as a backdrop, if you could describe for me, you know, the state of your water infrastructure, and then I have some followup questions from there.

Mr. MCCARTHY. Schenectady is fortunate for its water supply. We get that from the Great Flats aquifer, the recharge—it is the Mohawk River. And so we have a high quality, really, low-cost source of water.

Mr. KATKO. Same in Syracuse, yes.

Mr. MCCARTHY. Again, it is one of the great things about upstate New York. And at the same time, as you point out, we have infrastructure that was put in 100 years ago, 125 years ago, sometimes longer. And it just has a realistic life span.

And so, you have to be able to manage those resources. And without—you know, you hope that those pipes are going to last another 50 years. The reality is they are not going to. And the ability to predict when something happens is unfortunate—it is just that element of randomness, so that you are dealing with a major break in a water line or sewer line, and it is always occurring at 2 o'clock in the morning on a weekend, and you are having to mobilize crews that would be normally doing other things.

But if we can get ahead of that problem, those cities in upstate New York—and mirrored across the country—have long, distinguished histories of significant economic outputs, centers of innovation, technology, and you want to have that water and sewer system in place so that we can position the communities for, really, that next generation of innovation and evolution of urban life.

Mr. KATKO. Right. And I totally agree with you. And from an industry standpoint, I can only note that we really have a limitless supply of water between Lake Ontario, the Finger Lakes—it is just amazing, in upstate New York, that the quality of water that we have is consistently some of the best in the country, and we don't have systems to deliver it.

So how do you, in your mind, assess the adequacy of the funding to replace these—to fix these projects? And what would you suggest we try to do, from a legislative standpoint?

Mr. MCCARTHY. In Schenectady, we have largely dealt with it ourselves, even though we have had some assistance from the State, some assistance from—some Federal money in the funding streams. But Schenectady gets referenced continually as having one of the highest tax rates, not only in New York State, but in the country. And it is because we are paying for those things. And it is not only water and sewer, but it is other—roads, school district—other community assets.

And you get to the point where, even though you are trying to keep up and keep ahead of the curve, it creates a negative influence where it, in fact, deters our ability to attract residents, to attract business, to plan the assets of the water and other natural resources that exist not only within Schenectady, but in upstate New York.

Mr. KATKO. All right, so how would you—I understand the problem, but how would you fix it? What would you think we need to do?

Mr. MCCARTHY. I would like a funding formula that has participation at all levels, so that you have Federal money, there is State money, there is local money. Some of the highway and bridge money, it is a good formula, it is 80 percent Federal, 15 percent State, and then 5 percent local.

Mr. KATKO. Well, how about the Clean Water State Revolving Fund? Is that a fund you can access? And, if you can, is that adequate for the job?

Mr. MCCARTHY. We have found it adequate, because, again, we have had low cost for our water source. I am not sure that is shared by other communities across the country, and I don't have some of that information directly available, but we will have it forwarded to you at the conclusion of today's hearing.

Mr. KATKO. I appreciate it. Thank you. I yield back my time. Thank you, Mr. Chairman.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Katko. And, with that, we are going to recognize the gentleman from California, Mr. Garamendi, for 5 minutes.

Mr. GARAMENDI. Chairman Graves, thank you—congratulations—Ranking Member Napolitano, and what is left of the committee.

Just a couple of comments before I ask a question. Mike Inamine is here. He faced a most difficult situation over the last month, when the floods occurred in California when the Oroville Dam spillway failed and—releasing an extraordinary amount of water down the Feather River through his responsible area on the west side of the Feather River and the community of Yuba City, causing—the failure of the spillway caused a massive evacuation of over—almost 200,000 people, of which about 100,000 of those were in the community that he was trying to protect by flood-fighting.

An extraordinary piece of work, fighting a flood while everybody was leaving town. And I know you and your crews did not leave town, you stayed there and fought the flood, even though you might have been under 20 feet of water had that spillway actually failed. That is the emergency spillway actually failed. Within 7 hours you would be under 20 feet of water. Courageous, necessary.

One of the major—as I understand it, Mr. Inamine, is that the—one of the significant flood fight areas—that is a levee that was failing—was to become a part of a Corps of Engineers project, but had not yet been designated in the New Start programs that we receive occasionally from the Corps of Engineers.

My point here is that if that particular 1-mile stretch of the levee—I think there was two, two stretches, actually—had been designated in the 2017 work plan, would you have been fighting floods?

Mr. INAMINE. There are really two parts to respond to that question. And it gets back to my earlier comments about how flood control projects are repaired or improved. And it is that we collaborate with Corps of Engineers to get New Start designations, new projects constructed by the Corps. And, in fact, that reach of critically deficient levee has been a source of a couple of failures, protects 20,000 people, just by itself, was part of the Federal project authorized by Congress in 2014.

But through the State of California, we—for these critically damaged sites, we can't wait. And so we applied, while we were working with the Corps on the civil works process, we worked through the Corps of Engineers under the 408 process, and used our own money, and just do it ahead of time.

Well, under that circumstance, in fact, we had applied to repair that reach of levee, or a portion of that critically damaged reach of levee, last year. We were lined up to do it last year. And because of some cultural resource issues, we had to go through another—a second 45-day review period through the 408 process. Rather extraordinary. As a result, killed our construction season.

Fast forward to last month. We are flood-fighting that reach that would have normally have been repaired under a normal construction season. That is money out of our pockets. We are hopeful that the State will reimburse us at the end of the day. And that was work that could have been done in a normal construction season.

Mr. GARAMENDI. I think the point I want to make here is that there are all kinds of projects. There are the nice-to-do projects, there are the necessary projects, and then there are those projects upon which human life depends. And in this case, these levee improvements, they are known levee weaknesses. It is not just in my district, although I have 1,100 miles of levees, but around the Nation.

There are known weaknesses in levees upon which human life is at risk. And we ought to be prioritizing, you know, nice to, necessary, economic development or whatever, and then life threatening. And we should urge the Corps of Engineers, in the process that we have now established, where they come to us with their proposed projects, that we keep in mind the life-threatening projects.

And so, we have more than enough in my district, but I suspect that the Members of Congress, some of whom are still at this committee hearing, have similar necessary-to-preserve-human-life projects.

I am going to be out of time in 6 seconds, but I want to really congratulate, Mike, you and the work you have done. You have taken more than 40 miles of levee, you have upgraded those 40 miles of levee in a very rapid process. Had you not done that, surely, even without the failure of the emergency spillway, there would have been lives lost, had you not been on top of these projects over the last several years. Congratulations to you and thank you for that effort.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Garamendi. Next we are going to go to the vice chair of the subcommittee, Mr. Mast from Florida. You are recognized for 5 minutes.

Mr. MAST. Thank you, Chairman, and each of you for your testimony today. I really appreciate it. I enjoyed reading them.

You know, number one, you know, I live in one of those areas. Very similar issues as so many here, issues with the Corps of Engineers, issues with the infrastructure that is going on in my community. Personally, it is regularly plagued by massively harmful discharges coming out of Lake Okeechobee, and going out towards the east coast and west coast of Florida. They are implemented by the Corps of Engineers. Sometimes these discharges are—freshwater into our saltwater estuaries are as high as 7 million gallons a minute at their peak flows. It is very devastating. We get just absolutely devastating algae blooms.

And again, probably the most disconcerting part to me is that these are imposed by the Federal Government on us. But they are not cleaned up by the Federal Government, and that is one of the worst things that I can say about them.

Now, one of the other things that we could say about this is this is just freshwater that is simply lost out to sea. And, as we look at each of our areas across the country, where we see people—some people that don't have enough water—and, as was said before, some of us that have way too much water—it can become very troublesome and very frustrating to all of us. And that is just as an aside here.

Now, from my vantage point, one of the best ways to ensure that water is utilized in a beneficial way, instead of being wastefully discharged, is for the Corps of Engineers, in many of these cases, to marry their flood control efforts and that mission with their ecological restoration mission that they have in so many places.

For my area it is mirroring the flood control of the dikes surrounding Lake Okeechobee with the ecological restoration that is south of Lake Okeechobee that feeds into the Florida Bay and the Florida Everglades. And that means, in order for them to get this done in a timely way—which hasn't happened in my area—tackling what we are talking about today, these burdensome regulatory problems, construction issues, funding delays that are just slowing the Corps of Engineers from completing projects. In my area the Herbert Hoover dike rehabilitation, 60-plus projects. When they don't get done, it really adds up.

So what I really want to ask you all, this kind of, to me, is Exhibit A of how there can be otherwise well-intentioned rules and regulations that exist out there, but they actually end up hurting our communities and impeding environmental protection and impeding the progress of infrastructure.

So, with that in mind, I was particularly struck by your testimony, Mr. Kernion, when you said a couple of things. One, in order to build a 21st-century infrastructure, we have to build it some time this century. And I think that is a very important thing to say. But more specifically, when you talked about the Port of Savannah going through a 14-year environmental review process—14 years—and a 30-year-to-completion process.

So, in that being your testimony, I wanted to ask you two specific things. One, can you pinpoint one specific thing, the biggest bang for your buck, "This is what we do to enable this infrastructure to be completed to"—you know, which piece of it do we get out of the

way? What is your number-one piece to enabling this to get things done?

Mr. GRAVES OF LOUISIANA. Make sure your microphone is on, please.

Mr. KERNION. I said this earlier. The biggest thing that I have seen is the—lack of a better way to say it, red tape with the environmental procedures and approvals to get projects moving forward.

Mr. MAST. Now, you listed in your testimony a number of—you know, you listed wildlife, EPA, NOAA, and a number of others. Can you point to one specifically?

Mr. KERNION. Yes. Well, there is a lot of things. And I will give you an example. If we are building a levee, and there is a tree in the way and it has got an eagle in the top of the tree, that levee is going to be moved to buy houses, something is going to happen. Don't have anything against eagles, I think they are great. But it costs a lot of dollars to move it, you know, rather to go ask the guy if he could find another tree.

But—and I am not trying to be funny about it, but I will see some things that are—really get to be, like, major impacts to what we do, that is all. And it is the environmental things, more so than anything. Indecisiveness? Yes, big issue there. But a lot of the environmental red tape on some things that are really—you know, they shouldn't happen, that is all.

Mr. MAST. OK. I have another question for you—I got a couple more seconds here—and that is this. I get an answer often from the Corps of Engineers when I talk about timelines for getting things done that there is simply not enough manpower, not enough qualified crews to go out there and get some of the projects done, specifically in my area, around Lake Okeechobee, that the Corps of Engineers is conducting.

Can you speak to whether you think that is an accurate assessment? Is there enough crews out there to go out there and complete things in a faster way? Do you guys have the manpower, as general contractors, construction contractors?

Mr. KERNION. Do the contractors, or does the Corps?

Mr. MAST. The contractors.

Mr. KERNION. The Corps of Engineers—General Van Antwerp, years ago, asked us after Katrina if the contractors had the manpower to put it in place, all of the restoration efforts. And contractors stepped up to the plate and got it done. Corps of Engineers stepped up to the plate and got it done, also.

One of the things that I do not know is—I have never worked personally with that district around Lake Okeechobee. I have heard some rumors about guys that have worked with them, and I will refrain from comment on that, what I have heard, but it is a different district. And when you work for the Corps of Engineers in different districts, they operate totally different.

You know, we did FEMA trailers on a Corps contract after this most recent flood up in—around Baton Rouge, Louisiana. And dealing—they had one of the district—I think it was the northern Alabama—came down. Totally different ballgame than working with the New Orleans district. I mean totally different. Some of it was shocking, what we have to go through, be quite honest with you.

But I don't—I have never worked with the people in your area to be able to comment on that that much, as far as the Corps, then. But the contractors, I think contractors are—can come up to the plate and make it happen.

Mr. MAST. OK. My time has expired, so I thank you for your comments.

Mr. GRAVES OF LOUISIANA. Thank you, Mr. Mast. I am going to go to the ranking member, Mrs. Napolitano, for 5 minutes.

Mrs. NAPOLITANO. Just last one before we let you go. Mr. DeGood, if the President were to put forward a proposal that privatized leverage private equity capital as the primary Federal role in addressing water infrastructure projects, what would be the likely impact to communities like mine, or anybody else's, where local ratepayers already having a difficult time making ends meet in addressing the water quality in their area?

And the second question—and I will make it—I want to get over it—you described a recent trend for local communities to take on more debt to address local water challenges. Yet often the communities have insufficient tax and user fee revenues to cover these debts. I strongly believe they want clean water, just like anybody else, but often have competing needs for municipal service, fire, and police that need to be addressed. And the solutions for this change would be what? How can the Federal Government play in this?

Mr. DEGOOD. Right. I think it is important to understand that private equity, even with the presence of the tax credits that President Trump and some of his team have talked about, would have very little value for many communities. If you are already struggling to find the financial resources to repay municipal bonds at 3 percent or 3.5 percent, it is unlikely that you are going to magically have the resources to be able to cover the return on private equity that can be anywhere from 10 to 18 percent, depending on the project.

And again, even with the presence of tax credits bringing down the cost of that equity somewhat, it is still going to be a stretch for communities. And I think one of the things that I have found that is troubling about some of the public-private partnerships that have happened in recent years is the extent to which local communities are paying the premium price that goes along with a P3, but not receiving some of the benefits that we normally associate with this form of procurement. Specifically, if we compare this to the transportation side, we see that there is more of an opportunity for true risk transference, especially for projects that may exceed $1 billion or $1.5 billion.

But when we are talking about smaller systems, where the only infrastructure upgrades that are contemplated as part of these capital improvement programs are basic repairs and rehabilitation—replacing pump stations, we can't really honestly say that that private-sector contractor is taking on this risk payment because of the complexity of the work.

Again, some of these contracts have the public maintaining complete liability for any environmental discharges that violate Federal or State laws. They have the public on the hook for any rate increases for the water deliveries they may take for regional drink-

ing water providers. They have the public on the hook for any cost overruns in the infrastructure projects that they have in their capital plan.

So, to my mind, it is troubling for us to say to local communities, "Don't worry, you can always go out, take equity capital, take these tax credits from the Trump administration, and that is going to solve your problem." It just really isn't.

Mrs. NAPOLITANO. Anybody else?

[No response.]

Mrs. NAPOLITANO. Thank you, Mr. Chair.

Mr. GRAVES OF LOUISIANA. Ms. Pape, I am curious if you would care to respond to Mr. DeGood's comments.

Ms. PAPE. I would. I can't speak to a leased form of private equity investment, but I can speak to acquisition of assets by private entity. And in that case, in many instances, we can spread those costs, because we have a larger base. It is a very capital-intensive industry.

We also take on all risk. We don't leave risk with the community. We take it on, not only for the assets that we are buying, but for upgrading. And asset renewal is an ongoing effort. It is not a once and done, it is every day, every year, you are continually looking at what needs to be replaced, what condition do you have.

So, in terms of the private companies that buy assets, we do assume the risk, and we are able to spread out the cost, as well. So the impact on the customers is not as great.

Mr. GRAVES OF LOUISIANA. Great, thank you. I will tell you I have a number of other questions for all of you. You have been patiently sitting there for 2 hours, and we are most appreciative. We are going to have, I think, a number of questions for the record for each of you.

I just want to say, in closing, I am going to go back to home, and Mr. Kernion is from Louisiana. He made mention in his testimony about a situation at home where we have an eroding coast. We have lost approximately 2,000 square miles of our coast, wetlands. And we are all familiar with how important wetlands are, and we are familiar with the Clean Water Act, and 404 permits, and things along those lines.

Well, the primary cause of this wetlands loss in the State of Louisiana is actually the U.S. Army Corps of Engineers. And it is interesting to see this—kind of the irony in the regulatory program, in that they are making everyone else protect wetlands and restore wetlands and mitigate wetlands, yet in the case when their own actions cause loss, they literally are doing nothing. And, not only doing nothing, but in fact, impeding efforts, as was noted, by the State and others, in some cases, to actually restore wetlands.

And so, look, this isn't a partisan issue, this isn't—this is something that all of us need to be working very closely together on. Make note. The administration, again, announced that they intend to pursue a $1 trillion infrastructure package.

We have a project in south Louisiana called the Gulf Hurricane Protection Project that has been in the study phase since 1992. The Federal Government has not stuck a shovel in the ground. We have a hurricane protection project in Louisiana called the West Shore project. The project just came out of the study phase, and, thank-

fully, the committee authorized the project in the WRDA bill, but it was in the study phase for approximately 42 years before—I want to be clear—before a project recommendation was made, right? So not a single thing has been done, just a project recommendation.

We heard Mr. Inamine note that in his case, when he carried out the project on his own, that he was able to do it for approximately half the cost.

So this isn't anything to beat up on anyone, this isn't a partisan issue. This is all about the fact that we have limited resources. And many of you, in your testimony, talked about the need for greater investment. Well, one of the ways you get greater investment is by stretching your dollar, by ensuring that you are most efficiently using the resources that you have. If you can carry out a project for half the cost, you can do two of them.

It is a simple concept, and something that I think we need to be paying careful attention to, the amount of money that we are spending on administrative, on regulatory compliance, and on project implementation to ensure that we can sit here and tell taxpayers that we are maximizing the limited resources that are available.

So, with that, I again want to thank all the witnesses. You can expect questions for the record that we will be submitting, and ask for your response to those. And thanks again. It has been very helpful. And if no other Members have anything to add, the subcommittee stands adjourned.

[Whereupon, at 12:17 p.m., the subcommittee was adjourned.]

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TESTIMONY

CULTURAL AND INSTITUTIONAL BARRIERS TO SMARTER REGULATION

JERRY ELLIG, PhD
Senior Research Fellow, Mercatus Center at George Mason University

House Committee on Transportation and Infrastructure, Subcommittee on Water Resources and Environment
Hearing: Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure

March 9, 2017

Good morning, Chairman Graves, Ranking Member Napolitano, and members of the subcommittee. Thank you for inviting me here to testify today.

I am an economist and senior research fellow at the Mercatus Center, a 501(c)(3) research, educational, and outreach organization affiliated with George Mason University in Arlington and Fairfax, Virginia. I've previously served as a senior economist at the Joint Economic Committee and as deputy director of the Office of Policy Planning at the Federal Trade Commission. My principal research for the last 25 years has focused on the regulatory process, government performance, and the effects of government regulation. For these reasons, I'm delighted to testify on today's topic.

I'd like to discuss three broad problems with the US regulatory process, explain how those problems cause undesirable results, and suggest some solutions that focus on altering the underlying culture and incentives that gave rise to the problems. The three problems are: (1) a regulatory focus on activities and outputs, rather than results; (2) significant deficiencies in the underlying analysis that is supposed to inform regulatory decisions, and (3) "ready-fire-aim" rulemaking. This written testimony summarizes these points. Further explanation, along with supporting empirical evidence, can be found in the research papers cited in this testimony.

1. THE REGULATORY PROCESS TENDS TO FOCUS ON ACTIVITIES AND OUTPUTS, RATHER THAN RESULTS

Prospective regulations should be judged based on whether they are likely to produce siguificant benefits that improve Americans' quality of life. Existing regulations should be judged based on whether they actually produce those benefits. But, all too often, the federal government focuses on regulatory activities and outputs, rather than regulatory outcomes.

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This malady manifests itself in several ways.

First, regulatory agencies often act as if enforcement is more important than compliance or achievement of regulatory outcomes. For example, a colleague of mine who was advising the enforcement division of a regulatory agency on performance management in the early 2000s found that the enforcement officials objected strenuously to being held accountable for anything other than the level of enforcement activity and their win/loss record in enforcement cases. Effective performance management holds employees accountable for outcomes that benefit the public, not levels of activity.

Second, regulatory agencies often act as if their job is to produce regulations, rather than to produce outcomes.[1] As one agency economist noted, "Success is putting out 10 regulations a year, and bigger regulations are bigger successes. They don't say, 'We examined 10 [situations], and we decided that 8 did not warrant regulation.'" Pay, bonuses, career advancement, and recognition go to staff who successfully complete regulatory proceedings.[2] Scholarly research on implementation of the Government Performance and Results Act has found that regulatory agencies are less likely than other agencies to have outcome-oriented goals.[3]

Third, there is little systematic effort to evaluate the actual results (benefits and costs) of regulations after they are implemented and reassess whether a regulation should be eliminated or modified. As a result, new regulations accumulate on top of old ones, even if some of the old ones no longer achieve their intended purposes or do so only at high cost. Patrick McLaughlin, director of the Mercatus Center's Program for Economic Research on Regulation, and coauthors have estimated that the increase in the US regulatory burden since 1980 may have reduced gross domestic product by as much as $4 trillion in 2012, or about $13,000 per person.[4] Presidents customarily ask regulatory agencies to find regulations that could be eliminated or updated, and these efforts produce some useful results. But such reviews rarely assess whether existing regulations are producing the intended results, and at what cost. A study commissioned by the Administrative Conference of the United States indicates that the results of the most recent round of retrospective reviews in the Obama administration are typical in this regard:

> The vast majority of status updates on agencies' retrospective review programs do not include evidence of formal retrospective analysis, such as ex post estimates of benefits, costs, or efficacy. . . . Most of the analyses, such as estimated cost savings from removing regulatory burdens, in agency reviews focus on what can be achieved through reducing paperwork and reporting obligations, or transforming some of these obligations to electronic reporting. . . .
>
> Streamlining the way the government collects information on the actions of regulated firms is fundamentally different than an assessment of whether an economically important rule is delivering on societal objectives identified in authorizing legislation and doing so in a cost-effective and/or efficient manner.[5]

Several types of reforms would help refocus the regulatory process on achievement of beneficial outcomes for the public, instead of activities or outputs:

- Clearly indicate the desired outcomes Congress seeks to achieve in legislation that authorizes regulations.

1. Jerry Ellig and Richard Williams, "Reforming Regulatory Analysis, Review, and Oversight: A Guide for the Perplexed" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, August 2014).
2. Richard Williams, "The Influence of Regulatory Economists in Federal Health and Safety Agencies" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, 2008), 7.
3. Young Han Chun and Hal G. Rainey, "Goal Ambiguity in US Federal Agencies," *Journal of Public Administration Research and Theory* 15, no. 1 (2005): 1–30.
4. Bentley Coffey, Patrick A. McLaughlin, and Pietro Peretto, "The Cumulative Cost of Regulations" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, April 2016).
5. Joseph E. Aldy, "Learning from Experience: An Assessment of the Retrospective Reviews of Agency Rules and the Evidence for Improving the Design and Implementation of Regulatory Policy" (report prepared for the Administrative Conference of the United States, November 17, 2014), 52–53.

- Require regulatory agencies to develop and seek public comment on a plan for retrospective analysis of major regulations at the time these regulations are proposed.
- Require regulatory agencies to disclose in the Unified Agenda of Federal Regulatory and Deregulatory Actions when they have decided not to issue new regulations, so they can receive credit and be accountable for these decisions.
- Focus congressional oversight on regulatory outcomes. Challenge agencies to provide credible evaluations showing whether regulations have achieved the intended outcomes and at what cost. Oversight that focuses on levels of enforcement activity, production of regulatory outputs, or anecdotes provides little or no information about whether regulations are achieving the desired outcomes.
- Base budgeting for regulatory agencies on evidence that regulations are achieving their intended outcomes, not measures of activity or outputs.[6]
- To the extent possible, require agencies to reward managers and employees based on regulatory results, rather than activities or outputs. At a minimum, prohibit regulatory agencies from rewarding personnel based on the number or size of regulations they produce.
- Promote independent retrospective assessment and revision of regulations by creating one or more expert commissions modeled on the Base Realignment and Closure Commission.[7]
- To inform congressional decision-making about authorization, oversight, reauthorization, and budgeting, establish a unit within the Congressional Budget Office or Government Accountability Office whose job is to assess the benefits and costs of regulatory legislation and agency regulations.

2. THE UNDERLYING ANALYSIS THAT IS SUPPOSED TO INFORM REGULATORY DECISIONS OFTEN SUFFERS SERIOUS DEFICIENCIES

President Clinton's Executive Order 12866 requires that before issuing an "economically significant" regulation, executive branch agencies must understand the nature and cause of the problem they are trying to solve, develop alternative solutions, and assess the benefits and costs of each alternative.[8] Independent agencies sometimes face similar statutory requirements.

If the agency does not understand the problem and does not examine alternative solutions, the resulting regulations are likely to be less effective than they could be, excessively costly, or perhaps not needed at all. If the agency does not understand what caused the problem, then its estimate of the benefits of the regulation is suspect. How can the agency know that the regulation will produce benefits if it does not know whether the regulation will solve a problem?

Independent analysis consistently shows that agencies' assessments of the problem, alternatives, benefits, and costs are often seriously incomplete.[9] For example, out of the 130 economically significant, prescriptive regulations proposed between 2008 and 2013, 48 percent were accompanied by no significant evidence demonstrating

6. Jason J. Fichtner and Patrick A. McLaughlin, "Legislative Impact Accounting: Rethinking How to Account for Policies' Economic Costs in the Federal Budget Process" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, June 2015).
7. Joshua Hall and Michael Williams, "A Process for Cleaning Up Federal Regulations" (Mercatus Research, Mercatus Center at George Mason University, Arlington, VA, December 2012).
8. Exec. Order No. 12866, 58 Fed. Reg. 51735 (October 4, 1993). President Obama reaffirmed Exec. Order No. 12866 in Exec. Order No. 13563, 76 Fed. Reg. 3821 (January 21, 2011). "Economically significant" regulations are regulations with benefits, costs, or other economic effects that exceed $100 million annually, or meet certain other requirements specified in Executive Order 12866.
9. Jerry Ellig, "Evaluating the Quality and Use of Regulatory Analysis: The Mercatus Center's Regulatory Report Card, 2008–13" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, July 2016).

the existence, size, or cause of the problem to be solved.[10] For only 19 percent of the regulations did the agency consider a wide range of regulatory approaches or levels of stringency. Only 22 percent of the regulations were accompanied by reasonably thorough evidence that the regulation would achieve the intended benefits or other desired outcomes.

About 56 percent were accompanied by reasonably thorough estimates of compliance expenditures, but compliance expenditures are not the only cost of regulation. Agencies considered the effects of the regulation on prices for only 33 percent of the regulations, and they identified costs that stem from changes in behavior for only 12 percent of the regulations. Thus, costs are likely underestimated for the majority of regulations.

These deficiencies in analysis usually occur regardless of whether Congress has given the agency broad or narrow authority to decide whether to regulate, what form the regulation should take, how stringent the regulation should be, or who must comply. Several changes in the regulatory process would help remedy these deficiencies:

- Statutorily require all agencies to conduct regulatory impact analysis for regulations with economic effects exceeding a certain threshold, such as the $100 million per year threshold used in Executive Order 12866.[11] Indicate in the statute the topics the analysis must cover: assessment of the existence, extent, and cause of the problem; development of alternatives; and assessment of the benefits and costs of alternatives.
- Expand the resources and personnel of the Office of Information and Regulatory Affairs so that it can conduct more thorough reviews of regulations and the accompanying analysis from independent and executive branch agencies.
- Allow courts to review an agency's analysis to ensure that it covers the required topics and employs the best available evidence in the record. The court could set aside the regulation only if an error or omission in the analysis materially affected a decision about the regulation.[12]

3. AGENCIES ENGAGE IN "READY-FIRE-AIM" RULEMAKING

Even when regulatory impact analysis (or other economic analysis) is required by executive order or by law, regulatory agencies often make decisions first, then craft the analysis to support decisions that were already made for other reasons. This "ready-fire-aim" approach to rulemaking puts agencies in the position of selecting a regulatory option before they know whether there is a problem that regulation could solve, what caused the problem, or which solution might be most effective and efficient.

Several reforms could help raise the odds that agencies conduct a more complete and objective analysis before they make major regulatory decisions:

- Require agencies to consult with stakeholders before writing major regulations.
- Require agencies to publish for public comment their preliminary analysis of the problem, and the benefits and costs of each alternative they are considering, before they select a preferred approach and write a regulation.[13]

10. "Prescriptive" regulations are what most people think of when they think of regulations: they mandate or prohibit certain activities. This is distinct from budget regulations, which implement federal spending programs or revenue collection measures.
11. Of course, a regulation below this threshold may also have unintended and unpredicted economic effects exceeding $100 million. This is another reason why retrospective assessment is important.
12. For a study demonstrating that judicial review of agency economic analysis can motivate improvement in the quality of analysis, see Jerry Ellig, "Improvements in SEC Economic Analysis Since *Business Roundtable*: A Structured Assessment" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, December 2016).
13. Jerry Ellig and Rosemarie Fike, "Regulatory Process, Regulatory Reform, and the Quality of Regulatory Impact Analysis," *Journal of Benefit-Cost Analysis* 7, no. 3 (2016), 523–59.

- Within agencies, free economists and other analysts to conduct objective analysis by locating them in a unit other than the program office that writes regulations. Have analysts report to and be managed by other analysts, with clear criteria for career advancement based on the quality and objectivity of their analysis.

Far too much of the regulatory debate is an unproductive screaming match about intentions, rather than a reasoned discussion of results. Experience has shown that intentions do not automatically produce results.[14] For this reason, significant institutional and cultural changes are needed to refocus regulatory decision-making on regulatory outcomes, improve the quality of analysis that informs regulatory decisions, and ensure that agencies get the facts before they write regulations.

14. Jerry Ellig and Patrick A. McLaughlin, "The Regulatory Determinants of Railroad Safety," *Review of Industrial Organization* 49, no. 2 (2016): 371–98.

Written Testimony of Schenectady Mayor Gary McCarthy
For The U.S. Conference of Mayors
Before the House Transportation and Infrastructure Committee
Subcommittee on Water and the Environment
Thursday, March 9, 2017

"Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure"

INTRODUCTION

My name is Gary McCarthy, I am the Mayor of Schenectady, NY and have served as Mayor since 2011. Mr. Chairman and members of the Committee, I would like to officially submit my written testimony for the record.

I know the title of this hearing is "Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure" but I wanted to give a broader overview of the problems communities are facing and the solutions that are needed to move forward.

My city is not atypical of many cities throughout the United States. I have an older, industrial city that has aging and decaying infrastructure.

As a result, I am dealing with brownfield sites and costly consent decrees to deal with our combined and sanitary sewer overflows. And we are also trying to utilize new technology to reinvent and reinvigorate ourselves in order to provide economic and job opportunities for our current and future generations.

As a Mayor, I have to look at the big picture and take my limited budget and balance all the needs of my city including infrastructure, environment and public health, as well as economic development. And I'm here to tell you that it is possible but we need to be smarter in our priorities and investments. We need Congress and the Administration to not take a silo approach and instead, do what Mayors do every day – look at the big picture, figure out your resources, and implement your vision.

I know the T&I committee has jurisdiction over transportation, wastewater, brownfields, ports, and Army Corps issues and I can't touch on all of these subjects in 5 minutes but I wanted to provide a little sampling of how I, as the Mayor of Schenectady, have had to deal with some of these issues, what my vision is for my city, and what you can do to help make all of our communities better.

History

Schenectady is a city on the rebound. During the 1930s, 40s, and 50s, Schenectady's population reached approximately 95,000 powered by the growth of GE and of the American Locomotive Company and their

wartime production. But with the end of wartime production, followed by the onset of globalization came the decline of America's industrial centers. Like many industrial cities, Schenectady saw devastating job losses and population decline parallel by increases in poverty. A small city known for innovation saw 25,000 stable and well-paying industrial jobs eliminated and with that came a serious decline in both downtown and City neighborhoods. Today, the City has a third less population than it did at its height. The domino effect was seen everywhere. A bustling downtown known for iconic department stores hollowed out. Those with opportunity moved on either to a new region or to the suburbs, leaving behind the early-century neighborhoods built for multi-generational living. The City's tax base shrunk.

In the past fifteen years, we have stemmed that decline. Working regionally, we unified our economic development efforts and developed public-private partnerships to reinvigorate our downtown. We aggressively tackled our many brownfields to develop shovel ready sites for developers. This year celebrates the 125th anniversary of the founding of General Electric in Schenectady and our relationship with this major employer has never been stronger. The unified economic team has since generated almost $1 billion of new countywide investment with a revived Arts and Entertainment District at the downtown core, enhanced "smart growth" streets and utilities, and a $480 million riverfront development that will reopen the Mohawk River waterfront at the former American Locomotive facility where thousands of Schenectady citizens once built trains and tanks that won World War II. The former American Locomotive site was transformed from one of the nation's oldest brownfields into a nearly half a billion-dollar regional economic development project with over 1000 new jobs, in part through the support of the Federal Brownfield Program. This is one of thirteen brownfields throughout Schenectady County that was cleaned up to make way for new development.

Despite these major advancements, we face the continuing challenges of aging infrastructure and regulations that fail to account for our daily progress and changes in situation.

Water and Sewer Infrastructure

The City of Schenectady sewer system dates back over 100 years and until 2014 was considered a combined sewer system that consists of over 320 miles of public storm and sanitary infrastructure with a permitted Combined Sewer Overflow (CSO) and 18.5 mgd wastewater treatment plant which services multiple municipalities.

Since 2011, the City has undertaken large amounts of borrowing to upgrade its sewer and water system. From City Fiscal Year (CFY) 2011-2017, the City has borrowed collectively $42.9 million for sewer and $9.8 million for water, respectively. The City's sewer debt alone has quadrupled in the past seven years. The total borrowing for the City over seven years for both sewer and water was estimated at $52.8 million[1]. A majority of the borrowing went to upgrading the City's sewer and water system pipes, replacing aging and outdated equipment, and rehabilitating our water plant.

A large percentage of the borrowing for sewer—48.0%—came in CFY 2017 where the city recently borrowed approximately $20.7 million, with majority of the funds going to the city's Waste Water Treatment Plant due to the agreement with the New York State Department of Environment Conservation. Additionally, the city plans to rehabilitate and reconstruct the city's North Ferry Street Pump Station, with an estimated budget of $6.25 million. Of which, $3.25 will be financed from city borrowing and $3.0 million will be awarded from a Community Development Block Grant-DR grant.

During the mid to late 90's, the City of Schenectady embarked on a proactive approach to reduce Inflow/Infiltration (I/I) from within its sanitary sewer collection system to reduce sewage flows being treated at its wastewater treatment plant. As a result of reducing flows from within the sanitary sewer system the City's permitted Combined Sewer Overflow (CSO) was re-designated to a Sanitary Sewer Overflow (SSO). Accordingly, the City was issued an Order on Consent by the New York State Department of Environmental Conservation and a compliance schedule was negotiated between both parties to eliminate any future discharges of combined overflows from within the system.

In 2017, the City is embarking on a multi-year SSO mitigation project program including $24 million to eliminate sanitary sewer overflows to the Mohawk River and increase collection system and treatment plant capacity and $6 million to improve system resiliency to future Mohawk River flooding. This program has the dual benefit of protecting the environment and fostering economic development in a two county area. The City of Schenectady wastewater collection and treatment system serves a regional benefit, providing wastewater services to the City, Village of Scotia, Town of Glenville, portions of the Town of Niskayuna and Rotterdam and the Hamlet of Alplaus Schenectady County and portions of Rexford and Burnt Hills in southwest Saratoga County. This truly regional sewer system crosses multiple municipal boundaries to provide a central wastewater solution that maximizes shared services. This effort also creates the possibility for further consolidation of services and eliminates the need for the other municipalities that are serviced to create their own treatment plant. Many of the upgrades will be at the City's 18.5 million gallon per day (MGD) wastewater treatment plant and will improve operating efficiencies and reduce energy. The upgrades will also result in significant environmental benefits. The project will result in the mitigation of 20 million gallons of annual sanitary sewer overflows to the Mohawk River, elimination of wastewater collection system surcharging and overflows in the vicinity of Erie Boulevard and the Mohawk Harbor Development Site, increased resilience to future Mohawk River flooding, North Ferry Street Pump Station relocation, and a reduction of our electrical consumption and carbon footprint.

This builds on Schenectady's previous efforts, including the installation of a new 711 Kw solar array at the City's reservoir and the construction of a cogeneration plant at the Waste Water Treatment Plant. The 3,029-panel solar array is expected to save the City an estimated $840,000 over the life of the system, can produce 840,000 kilowatt hours of electricity annually. Additionally, the City's Combined Heat and Power or Cogeneration project was designed to recover heat generated from the engine exhaust and jacket water through a glycol/water plate and frame heat exchanger. The recovered heat provides heat for digester operations as well as building heat resulting in a $350,000 annual savings and the elimination of 1,883,000 lbs. CO^2 annually.

Schenectady does not contest the importance of environmental protection efforts and has significantly invested in these projects, but because of the change in our designation, in essence, Schenectady's forward thinking efforts to improve have forced the City to expend even more funds while we are still attempting to recover from the Great Recession and decades of population decline. Our strong local economic recovery has been placed in a precarious situation by this significant burden on the City.

In addition to the tax burden, the consent order required a four to one exchange for new connections. I want to emphasize this point – my city is not allowed to do a new hookup unless I remove four others. This critically limits economic development projects that create the tax base needed to fund such a major infrastructure project. It is totally counterproductive to what we are trying to accomplish of bringing in more jobs and more taxes which would actually help rebuild our older infrastructure.

Schenectady's Smart City Initiative

While we face the burden of traditional infrastructure, we are only scratching the surface of what is possible through smart city technology. Our partnerships with Cisco, GE, National Grid and others have allowed for the installation of roughly 200 smart lights throughout Schenectady. This project provides the opportunity for municipalities such as the City of Schenectady to reduce expenditures while embracing emerging technologies to improve delivery of several key services to our residents. The City of Schenectady has over 5100 HID street lights. Converting HID lighting to Wi-Fi enabled LED Smart Lighting will produce savings, improve maintenance, enhance public safety and public works, empower employees and conserve natural resources while fostering innovation in government and the community.

While one of the main objectives of this project is to reduce energy consumption, emerging technology allows us to use this project as a platform for real change. Data will be collected and disseminated to users allowing educated decisions to be made in countless areas. The savings to the City of Schenectady from pure energy costs can be over $370,000 / year. Case studies show that other long term cost benefits can be achieved with this technology. We look to evaluate some of these opportunities and quantify the savings that can be derived from them.

The yearly energy savings with a switch to Smart LED is calculated at over 2 million kilowatt-hours of electricity. Greenhouse gas calculators from the EPA show this as a reduction of 1,546 tons of carbon dioxide, equivalent to over 3.3 million miles of passenger car travel saved every year when the entire project is completed. Since dimming is a built-in capability of the Smart Lighting, the potential exists to reduce usage during peak electric use times in order to help prevent brownouts.

Maintenance of lighting has always been performed on a reactive basis, waiting for someone to tell us that a street light is non-functioning. These systems will alert us automatically to a failure or even a knockdown reducing repair times. Video cameras included as part of our scope will allow us to collect analytic data for traffic and pedestrian volumes, vehicle speeds and delay, parking patterns and notifications of parking violators to public safety. Triggers can be set to notify our police department when a vehicle has not been moved for a pre-determined time indicting a disabled vehicle in a roadway or even an abandoned vehicle in our neighborhoods. Sensors will provide additional data on temperature and road conditions assisting our road crews with advance notice on trends most likely to affect our streets.

A Wi-Fi component already deployed on a small scale allows our police department to continuously download in-car video to our secure network reducing downtime of vehicles stagnant at their station. City personnel across several departments including our Code Enforcement staff will be able to access data in order to make informed decisions out in the field instead of wasting time returning to their offices. Police and Fire Department personnel will see housing and building data during emergencies without the need for intervention from others empowering them to respond intelligently to disasters.

Additionally, Internet Access is the primary requirement for connected devices. We would use this network to provide communications between our "Smart Devices" and an open source platform to collect data and perform predictive analytics. Smart Connected Street lighting would be the base plan for deployment as the projected energy savings would help fund some of this project while providing sustainability. Additional devices such as analytic cameras, temperature and motion sensors, traffic monitoring devices and the potential for interconnected health care and other life safety devices deployed on a network of over 5000 street lights provide opportunities to evaluate numerous core

challenges in an urban environment. When we couple this data with information from social service agencies, school district, medical and health care providers and other governmental sources, we can start to look for trends in blighted areas and respond in a proactive way to improve conditions. Having the ability to provide internet access to a segment of the population that currently does not have it would improve the social and economic development of the community.

This 21st Century infrastructure cannot be ignored while we bear the burden of investment in the more traditional infrastructure such as pipes and streets. To do so would be at the City's and nation's long-term peril as we would miss this critical opportunity for economic growth, improved educational outcomes, and long-term efficiency. We find ourselves being passed by other cities throughout the world that are making these investments. To invest in our current infrastructure needs without making these critical advancements dooms cities to long term inefficient maintenance and a continuing cycle of overly burdening taxpayers and stagnating growth.

What Congress Can Do to Help

Of course, we need more resources and tools. Right now, cities spend $115 billion per year on water and wastewater operations and infrastructure while Congress provides around $2 billion. We would like Congress to step forward and do more to assist us by increasing the SRF program and making sure the states provide more money in the form of low-interest and zero-interest loans. We also need more tools such as grants, funding under WIFIA, removal of Private Activity Bonds from the state volume cap, and protecting our municipal bonds. Other, more non-traditional ways, that you can help include the following:

1) Pass Integrated Planning/Affordability Legislation (HR 465)

I want to thank Mr. Gibbs and Mr. Chabot for listening to the Mayors' concerns regarding unfunded mandates and affordability concerns and introducing HR 465, The Water Quality Improvement Act of 2017.

I have a letter, signed by the Leadership of the Conference of Mayors, asking for members to cosponsor and pass HR 465 that I've attached to my testimony.

HR 465 would allow local governments, if the affordability levels are triggered, to work with the EPA to develop plans where we can comprehensively deal with the biggest environmental and public health needs first and do it in a way that is more affordable to our citizens.

In my case, my state is the one who I have a consent decree with, and it would be my hope that if Congress would pass this bill, the EPA would start implementing it, and the states would follow suit. If this law was in place, this could potentially help us to develop a plan to address our combined and sanitary sewer systems but do it in a way that wouldn't put as high of a financial burden on low, moderate, and fixed income citizens.

We also may not have had to agree to shut off four hook ups for every new one. We need to work with our federal and state agencies and look at the situation comprehensively. It makes more sense to try to grow our economy and increase our tax base to help pay for the repair work to be done. Because now, we are potentially at a competitive disadvantage when we are competing with other communities to try to attract businesses and new residents.

2) Reauthorize the Brownfields Law

You may ask why reauthorizing and fully funding the Brownfields Law would be listed in a hearing about Building a 21st Century, but the fact is that brownfields are a problem in almost every community in the United States and we should be reusing these properties that already has existing infrastructure in place. By reutilizing and rebuilding these properties, we are recycling and reusing land and hopefully also upgrading existing infrastructure as opposed to continuously building additional infrastructure that also has be maintained.

In addition, some communities are using brownfields redevelopment as a means of creating more green infrastructure in order to help with their stormwater controls. For example, in Philadelphia, they have a comprehensive plan of placing a garden or park within 15 minutes of every household. In some cases, they have redeveloped brownfields to make this a reality. The side benefit is that by creating green spaces throughout the city, they have also created a means of naturally collecting rainwater that doesn't end up in the storm drains thereby decreasing the chances of a sewer overflow. So not only are you beautifying a neighborhood and creating gardens, you are also solving another environmental problem in a more cost effective and sustainable way.

The Conference of Mayors is asking Congress to pass a new brownfields law that contains the following:
Full Funding of the Brownfields Program –At the current funding levels, EPA only funds (roughly 30 percent) of the applications that make it to headquarters. This program should be fully funded $250 million or more.

Creation of a Multi-Purpose Grant –The Conference of Mayors would like to see the establishment of a multi-purpose grant. We believe by giving us that flexibility it will make the program even more useful to not only us but our business community as well.

Increase Cleanup Grant Amounts –The Conference of Mayors would like an increase in the funding ceiling for cleanup grants to be $1 million and in special circumstances, $2 million.

Allow Reasonable Administrative Costs - Brownfield grant recipients should be allowed to use a small portion of their grant to cover reasonable administrative costs.

Clarify Eligibility of Publicly-Owned Sites Acquired Before 2002 –As long as a local government did not cause or contribute to the contamination of the property but just happened to own the property prior to 2002, when the law was enacted, they should be allowed to apply for EPA funding for that property.

Remove Barriers to Local and State Governments Addressing Mothballed Sites – The Act should exempt local and state government from CERCLA liability if the government unit (a) owns a brownfield as defined by section 101(39); (b) did not cause or contribute to contamination on the property; and (c) exercises due care with regard to any known contamination at the site.

Encouraging Brownfield Cleanups by Good Samaritans – The Act should provide an owner-operator exemption from CERCLA liability for non-liable parties that take cleanup action or contribute funding or other substantial support to the cleanup of a brownfield, in conformance with a federal or state cleanup program, but do not take ownership of that site.

3) Encouraging /Funding New Technology - Digital Platforms

I've already mentioned how Schenectady is utilizing new technology for our above ground systems. However, there are also improvements that can be made below ground. There are some 16,000 sewer utilities, and over 53,000 water utilities in the United States that together serve over 250 million Americans. Three common challenges cities face in providing public water and sewer services include: infrastructure deterioration, sourcing financial support, and compliance issues.

Many communities trying to address one or more of these issues have made the hard choice to raise customer rates; but new information indicates that current water, sewer and flood control costs per household (the rate payer) in a growing number of communities is placing a disparate financial burden on low and middle income households. Thus, local utilities who are expected to provide uninterrupted service in compliance with a myriad of federal mandates are seeking ways to do more, often despite having an unfavorable balance sheet.

The alternatives to traditional utility investments and management have the potential to improve a local utility's financial sustainability. All utilities small and large can improve service through incorporation of modern technology specifically designed to increase efficiencies and reduce or avoid costs.

Yesterday's emerging technologies in municipal water and sewer utilities are now well demonstrated, and they have the potential to dramatically improve the current poor state of financial sustainability in a geographically diverse and fragmented inventory of plants and pipes in American communities.

For example, industry estimates suggest that water loss continues at rates that range between 15% and 30% percent: subsequently utility managers are losing customer revenues, wasting energy and generating collateral carbon dioxide emissions from treatment and distribution of water. One demonstrated technology application that provides managers with the means to correct these problems and leverage additional benefits from technology placement.

For example, medium and large facilities often install Supervisory Control and Data Acquisition (SCADA systems). SCADA systems can be enhanced by migrating to a digital platform utilizing smart grid technology on a facility scale. Digital technology helps managers apply supporting technologies such as sonar capabilities to detect pipe leaks with great accuracy and lead to quick repairs. Digital systems also work well with automated metering; which, in turn, provides managers with a way to accurately bill for services, communicate such immediate information on water conservation and water safety alerts directly to customers.

Federal water policy can pivot from prosecutorial zeal to a productive partnership if Congress and the Administration take the direction that the federal government should be supporting the renewal of public water and sewer infrastructure in America through new technology. This can be accomplished by providing grants, no- or low-interest loans to economically distressed communities, and by providing more options and incentives for communities to increase private sector involvement.

Conclusion

There is much that Congress and the federal government can do to work in partnership with our nation's cities to upgrade our infrastructure and invest in our future. We need to end this silo approach of handling issues and do what I have to do as a Mayor every day -- have a vision for my community and figure out how everything needs to come together in order to make that vision a reality. I thank the Committee for the time today to address you.

THE UNITED STATES CONFERENCE OF MAYORS

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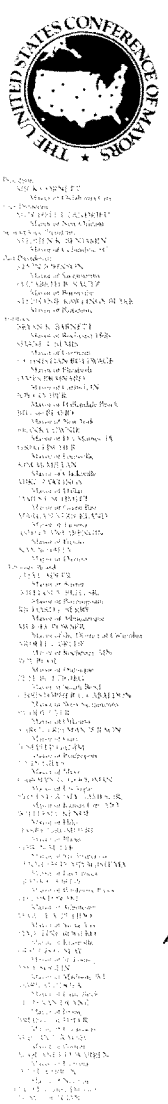

March 3, 2017

The Honorable Bob Gibbs
Former Chairman, House Transportation and Infrastructure
Subcommittee on Water Resources and Environment
US House of Representatives
Washington, DC

Dear Former Chairman Gibbs and Members of the House:
We, the leadership of The U.S. Conference of Mayors, want to express our full endorsement and support for H.R. 465, which would codify EPA's Integrated Planning and Financial Capability initiatives, and we ask your House colleagues to join you in your efforts by becoming cosponsors of your bill.

Local governments are at a crossroads when it comes to water and wastewater infrastructure. We spend $117 billion per year ($320 million/day) to provide public water and wastewater services while Congress provides approximately $2 billion per year. This is not nearly enough to maintain and replace our aging infrastructure and meet the numerous federal unfunded mandates that we face.

While we need more financial resources, we also need more common sense approaches. Your bill would allow local governments, who have households who are spending financially burdensome amounts on water and wastewater bills, to work with their state and EPA to implement comprehensive plans that sequence investments with environmental and health priorities.

Your bill would codify what EPA has sent forth in various memorandums and assure that it is a viable tool for local governments in the future. It is imperative that we spend our citizen's limited money resourcefully.

Thank you again for your leadership on this issue and we hope your colleagues join you for this much needed effort. If you have any questions, please contact Judy Sheahan of the Conference staff at 202-861-6775 (jsheahan@usmayors.org).

Sincerely,

Mick Cornett	Mitch Landrieu	Steve Benjamin
President	Vice President	2nd Vice-President

cc: Members of the House of Representatives

Mayor of Urbana, IL

Mayor of EASTON PA

Mayor of Tigard, OR

Mayor of Tigard, OR

Mayor of San Jacinto CALIFORNIA

Mayor of Lancaster PA

Mayor of Burton, MI

Mayor of Racine, WI

Mayor of Sumter, S.C.

Mayor of New Bedford, MA

Mayor of Tempe, AZ

Mayor of Allentown, PA

Mayor of Santa Barbara, CA

Mayor of MADISON, WI

Mayor of Little Rock, AR.

Mayor of Fontana

Mayor of Maui County Hawaii

Mayor of JAMES BRAINARD CARMEL, INDIANA

Mayor of City of Lafayette, Indiana

Mayor of [illegible], NJ

Mayor of Youngstown, OH

Mayor of Augusta, GA

Mayor of [illegible], MA

Mayor of

Mayor of

Mayor of Gary, IN

Mayor of Kansas City, KS

Mayor of Frisco, TX

Mayor of Rochester Hills, MI

Mayor of Hope, NJ

Mayor of Gresham, OR

Mayor of Beaverton, OR

Mayor of Rialto, Calif.

Mayor of

Mayor of Piscataway NJ

Mayor of

Mayor of Newton MA

Mayor of

Mayor of Burnsville

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Mayor of Akron, Ohio

Mayor of Dubuque, IA

Mayor of

Mayor of

Mayor of Lima, Ohio

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The following mayors also signed on in support.

Mayor Name	City, State
JEFF WILLIAMS	Arlington, TX
RICHARD KOS	Chicopee, MA
FRANK ORTIS	City of Pembroke Pines , FL
CAROLYN VAUGHN, MAYOR PRO TEM	Corpus Christi, TX
ROCHELLE ROBINSON	Douglasville, GA
CARLO DEMARIA	Everett, MA
LYDIA MIHALIK	Findlay, OH
DOUGLAS ATHAS	Garland, TX
ANDY HAFEN	Henderson, NV
SYLVESTER "SLY" JAMES, JR.	Kansas City, MO
KEN MIYAGISHIMA	Las Cruces, NM
CHRIS BEUTLER	Lincoln, NE
JOHN GILES	Mesa, AZ
GLENN LEWIS	Moore, OK
STEPHEN GAWRON	Muskegon , MI
JILL TECHEL	Napa, CA
CHRIS KOOS	Normal, IL
HARRY LAROSILIERE	Plano, TX
BILL GILLESPIE	Prattville, AL
GARY MCCARTHY	Schenectady, NY
DAVID CONDON	Spokane, WA
FRANCIS SLAY	St. Louis , MO
STEPHANIE MINER	Syracuse, NY
JERI MUOIO	West Palm Beach, FL

Gary McCarthy, Mayor, City of Schenectady, NY, on behalf of the U.S. Conference of Mayors, response to question for the record

Question issued by Hon. Grace F. Napolitano, a Representative in Congress from the State of California

QUESTION:
At the March 9, 2017, hearing you stated, "In addition to the tax burden, the consent order Schenectady operated under required a 4-to-1 exchange for new connections. I want to emphasize that: Schenectady is not allowed to do a new hookup unless I remove 4 other hookups or entry points within the system."

The Order on Consent approved by the Mayor on May 14, 2014, makes no mention of a requirement to remove four old hookups for every one new hookup to the city's sanitary sewer collection system, but rather it refers to a "4:1 offset" for any new connection to the collection system.

- Please clarify for the record the requirements under which the city of Schenectady operates under with respect to the "4-to-1" offset requirement mentioned in your testimony. Does this require the city of Schenectady to remove four old connections for every one new connection to the system, or does it apply to the city's overall sewage flow from the collection system?

ANSWER:
The 4 to 1 offset applies so that for every gallon of sanitary sewage flow received into the city's sanitary sewer collection system from new development or a new use of an existing connection, the city is required to offset that single gallon of new flow by the removal of 4 gallons of sewage flow from the collection system through other means (i.e., sewer pipelining, documented removal of existing connections, property demos).

Please let me know if I can be of further assistance or if any other clarification is required.

Thank you again for this opportunity to explain the challenges facing Schenectady and for the committee's support in helping Schenectady and other cities progress.

Minnesota Pollution
Control Agency

E C O S

Testimony

**"Building a 21st Century Infrastructure for America:
The Role of Federal Agencies in Water Infrastructure"**

**Subcommittee on Water Resources & Environment
House Transportation & Infrastructure Committee**

Thursday, March 9, 2017

by

**John Linc Stine, Commissioner
Minnesota Pollution Control Agency
and
President, Environmental Council of the States**

Main Points

1. Our nation's aging drinking water and wastewater treatment systems require federal investment in collaboration with states, so that innovative and affordable funding approaches, technical support, and leveraged funding solutions can be advanced to respond to the diverse need of American communities—small and large, urban and rural—across the United States. ECOS has several resolutions on this subject.

2. Distressed urban areas, small communities, and rural communities face unique challenges in operating and maintaining infrastructure assets.

3. Financial and capacity factors compound challenges of aging infrastructure in these communities and households, and must be addressed strategically. For example, in the 1970s federal dollars constructed 75 percent of wastewater infrastructure. States, like Minnesota, contributed approximately 15 percent, meaning localities contributed 10 percent. This partnership and sharing of costs modernized our nation's infrastructure. But time has passed, our population has grown, and our systems are aged and stressed. Federal infrastructure allocation needs to again fill that gap because many communities cannot exclusively finance the water needs required for this and future generations.

4. Clean water is essential for economic prosperity, health, environmental quality, and should be a legacy for the future. Failing to invest in water infrastructure needs leads to adverse economic, public health, and equity consequences. Keeping these connections in the forefront of funding, programming, and policy decisions allows leaders within our federal and state capitols and legislatures, executive agencies, and communities across the U.S. to focus limited resources on the most pressing environmental and health challenges, and serves to highlight distracting federal requirements and demands.

Chairman Graves, Ranking Member Napolitano, and Members of the Subcommittee, good morning. My name is John Linc Stine, and I am Commissioner of the Minnesota Pollution Control Agency. I appreciate the opportunity to share with you Minnesota's views on water infrastructure. I am also representing, as President, the Environmental Council of the States (ECOS), a national, nonpartisan organization whose members are the leaders of the state and territorial environmental protection agencies across America. ECOS proudly counts the Louisiana Department of Environmental Quality and the California Environmental Protection Agency among our membership. Chairman Graves, as you know, the Mississippi watershed ends in your state and begins in mine. I take it as a core responsibility to contribute to your state the cleanest water Minnesota can.

The subject of today's hearing could not be more pertinent. States hear from our citizens daily about the value of clean water, adequate flood control, and preventing pollution of lakes, rivers, and beaches. Infrastructure underpins each of these issues. An economy cannot grow without clean water. A society cannot thrive without clean water. Industry and jobs depend on a reliable water supply and the capacity to process wastewater. As you think of infrastructure necessary to promote economic growth, do not overlook the importance of clean water for manufacturing, recreation, and other activities that are vital to the American economy.

ECOS' Water Infrastructure Efforts. ECOS strives to strengthen the partnership between the states and the federal government in implementing our nation's environmental laws and policies. Water infrastructure is one focus of our *Priority Issues in a Time of Political Transition Paper*, written to document pressing concerns to be addressed by the incoming Administration. Water infrastructure is a non-partisan issue, and ECOS' resolutions on infrastructure needs (see 04-3, 08-1, and 16-5 (attached)) attest to the importance of federal and state collaboration in response to the economic and public health consequences of our nationwide water infrastructure gap.

ECOS recently formed an infrastructure workgroup of state environmental commissioners who are putting time and energy into evaluating administrative and legislative proposals that come forward (attached). In a related effort, ECOS asked each state for their top 20 water and wastewater infrastructure projects that are "ready to go" in 2017. These projects collectively make up a total funding opportunity of $18.2 billion across the country.[1] An investment in water infrastructure is an investment in jobs, communities, and America.

Federal Funding for States is Critical. America prospered and thrived because of investments made in water infrastructure 75-100 years ago, with some of the most dramatic since the passage of the Clean Water and Safe Drinking Water Acts. Partnerships among federal, state, and local entities helped make the investments successful. Continuing partnerships and federal funding for states is critical to the upkeep of those initial investments. A significant portion of the State and Tribal Assistance Grants (STAG) is comprised of monies from the federal Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF). These funds are among the most successful and cost-effective environmental programs enacted by Congress. States carry out these programs with EPA guidance. The CWSRF facilitates hundreds of wastewater, stormwater, energy efficiency, nonpoint source, and green infrastructure projects. The DWSRF addresses the costs of ensuring safe drinking water supplies and is especially significant in assisting small communities in meeting their responsibilities, though the funds also aid large communities. The funding assistance provided to both small and large communities through this state-federal partnership has been instrumental in delivering safe and clean water to the American public.

The "revolving" nature of the loan programs and states' efforts to maximize federal capitalization grants ensure a continuing return on federal investments. However, the successful

[1] See attached. Note, as of March 7, 2017, ECOS is still collecting information from three states: Georgia, Mississippi, and Pennsylvania.

history of national water and wastewater programs is overshadowed by extensive infrastructure needs. Cities and towns across the country face aging and decaying water and wastewater systems requiring major investments. I mentioned ECOS' figure just for calendar year 2017 and just for 20 projects per state. In its 2013 "Report Card for America's Infrastructure," the American Society of Civil Engineers awarded a "grade" of D for our nation's drinking water and wastewater infrastructure. In June 2013, EPA estimated that our drinking water infrastructure will require an investment of $384 billion through 2030 and, in January 2016, EPA estimated that our nation requires an investment of $271 billion over the next five years to address our wastewater infrastructure needs.

Revolving loan funds supplement other capital sources to upgrade water and wastewater treatment plants, support pipe-related repairs, control sewer overflows, reduce sources of lead in drinking water, fight algal toxins, and clean up water sources that are contaminated with a host of toxins and pollutants such as per- and polyfluoroalkyl substances (PFAs). This is a diverse group of compounds used in industrial applications and consumer products such as carpeting, apparels, upholstery, food wrappings, firefighting foams, and metal plating. States and other stakeholders are seeking innovative strategies to address water infrastructure needs. Minnesota's governor has clearly recognized that clean water is essential to our state's prosperity because he has prioritized water as a policy and budget issue. This approach engages multiple agencies – health, agriculture, natural resources, and pollution control – in addressing this issue.

A national conversation around these subjects is underway and must continue. ECOS is committed to being a constructive part of these conversations, including through documenting successes, best practices, and case studies in innovative funding and effective partnerships.

Difficulties Facing Small Communities. There is no lack of willingness and interest on behalf of small communities to comply with federal regulations. Distressed urban areas, small

communities, and rural communities are particularly pressed to make the needed investments to operate and maintain their infrastructure assets. Many of these communities find it difficult to keep up with increasingly complex federal requirements due to a small tax base, lack of adequate financing options, management skills, trained personnel, and systems to manage environmental requirements. Getting rid of the regulations will not solve these problems.

ECOS members continue to prioritize efficient, affordable, and timely awards to distressed communities. While states are committed to addressing the infrastructure needs of their small communities, states often do not possess adequate funding and resources to provide sufficient compliance and technical assistance. Often, these areas are not able to procure additional loans to confront substantial infrastructure deficiencies. For example, Gilbert, Minnesota, a small mining town in Congressman Nolan's district, is facing an $8.6 million project to replace an old wastewater treatment plant. The city has a declining population and high unemployment and cannot afford a project of this size without assistance. However, not replacing the facility means continued overflow of raw sewage. Gilbert is not alone. This is a common problem in American communities. I could provide you with many more examples, as I am sure my counterparts in other states could as well.

Make no mistake, infrastructure needs are directly connected to jobs and industry and the ability to expand local economies. Worthington, Minnesota is making improvements to their wastewater treatment plant to accommodate a meatpacking operation expansion. Morris, Minnesota is making improvements to their water treatment facility to provide the needed water for an ethanol plant. Meanwhile, in Luverne, Minnesota an insufficient water source is limiting the city's ability to expand residential housing.

Finding innovative solutions to give communities the resources they need to create environmentally safe and friendly atmospheres is compulsory to ensure protection of public health, consistent with ECOS' mission.

ECOS' Commitment to Public Health and Environmental Quality. Regulation of and investment in environmental infrastructure plays a critical role in protecting public health. For example, hazardous waste is regulated to ensure its proper management and to reduce potential human exposure. Pesticide application regulations guarantee the health and safety of workers applying pesticides and protect the public from chemicals that can drift into drinking water sources. Limits are set for air emissions to prevent asthma and other respiratory diseases.

Today, water infrastructure is critical to the protection of public health and the environment through the provision of clean and safe drinking water and the management of wastewater. Aging wastewater treatment facility infrastructures increase the likelihood of discharges that adversely affect human health. Drinking water standards ensure the public is consuming water that is safe to drink. As current water infrastructure continues to deteriorate and becomes obsolete, the threat to our public health escalates. In Minnesota, because of shallow groundwater sources, many drinking water systems are at risk of contamination. For instance, the City of St. Peter faced elevated nitrate levels in its drinking water, a serious health concern to the youngest and the oldest citizens. To its credit, St. Peter added the needed infrastructure to protect its most vulnerable citizens. But they could not have done so alone. Without the drinking water revolving fund, St. Peter would not have the treatment necessary to remove this groundwater contaminant.

Old water distribution and service lines also continue to present health concerns across the nation. My state has invested in programs to monitor and regulate corrosion in water distribution systems. Continued investment to oversee these corrosion management programs will ensure that

elevated levels of lead and copper – toxins we know are problematic wherever old distribution systems are in place – can be kept at or below levels that are safe for human health.

In response to these pressing issues, in April 2016, ECOS, along with EPA and the Association of State and Territorial Health Officials (ASTHO), signed a Memorandum of Agreement (MOA) to advance initiatives regarding protection of public health. ECOS continues to have conversations with EPA and state agencies to acknowledge the crucial nexus between public health and environmental safety.

As our federal environmental regulatory system has grown more complex, disagreements over the cost and levels of protection continue to make national headlines. With increasing stressors on limited regulatory and financial capacity, we must remember out primary obligation to protect the environment and public health through investments in our country's water infrastructure.

Conclusion. Mr. Chairman, Ms. Ranking Member, and Members of the Subcommittee, I thank you for the opportunity to present my views, and those of ECOS, to you today. I am happy to answer any questions.

ECOS

Resolution Number 04-3
Approved April 20, 2004
Hot Springs, Arkansas

Reaffirmed May 2, 2007
By mail vote

Reaffirmed April 14, 2008
New Orleans, Louisiana

Revised March 29, 2011
Alexandria, Virginia

Revised April 2, 2014
Sausalito, California

As certified by
Carolyn Hanson
Acting Executive Director

SMALL COMMUNITY CHALLENGES

WHEREAS, protecting public health is a major goal of the federal Clean Water Act and the Safe Drinking Water Act; and

WHEREAS, existing and pending federal environmental regulatory requirements for drinking water, such as the Ground Water Rule, Stage 1 & 2 Disinfection Byproducts Rules, Arsenic Rule, Radionuclides Rule, and new Operator Certification requirements, impose an increasing burden on the primacy agencies and the regulated water systems for ensuring small community compliance; and

WHEREAS, small communities have a willingness and interest in complying with federal regulations, but find it difficult to stay abreast of the numerous, increasingly complex federal requirements due to a small tax base, lack of adequate financing options, management skills, trained personnel, and systems to manage environmental requirements; and

WHEREAS, aging wastewater treatment facility infrastructures increasingly raise the likelihood of discharges that adversely affect human health and the environment; and

WHEREAS, aging infrastructures, both for drinking water systems and wastewater systems, further compound problems being experienced by small communities; and

WHEREAS, many small communities are financially unable to obtain new or additional loans to address infrastructure deficiencies and new federal requirements; and

WHEREAS, small communities of populations of 5,000 or less[1] are particularly impacted by these issues; and

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[1] **Compendium of State Assistance for *Small Communities* in *EPA* ...**
*www.**epa**.gov/rgytgrnj/government.../compendium_state_assistance.pdf*
Feb 7, 2008 - *Definition of Small Community*: For purposes of this guide, a *small* ... municipality, village, or township with a population base of *less* than *5,000*.

WHEREAS, States have a strong commitment to providing compliance and technical assistance to these small communities, however, States often lack sufficient resources or flexibility to use funds to provide these services; and

WHEREAS, U.S. EPA published its Small Local Governments Compliance Assistance Policy in June 2004 that begins to address the issue of flexibility regarding the use of funds.

NOW, THEREFORE, BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES:

Requests that U.S. EPA work with States and local governments to develop innovative strategies to address current and future small community drinking water and wastewater requirements;

Encourages U.S. EPA to support the use of flexibility in existing federal funding for small communities to lessen the financial burden on already stressed systems and continue to support U.S. EPA's Environmental Finance Center (EFC) Network[2] so it may continue to assist small communities manage their regulatory requirements;

Encourages the U.S. Congress to amend the Clean Water Act to give states the option of awarding deserving communities with principal forgiveness loans under the Clean Water State Revolving Loan Fund; and

Requests that all federal funding for small communities authorized as part of U.S. EPA's budget be directed to delegated or designated State agencies to provide to small communities the needed technical and compliance resources, including resuming state-led operational compliance assistance, establishing systems to manage environmental requirements, encouraging the implementation of alternative and less costly infrastructure technology and engineering techniques, and promoting the use of asset management.

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[2] The EFC Network provides state and local officials and small businesses with advisory services including education, publications, training, technical assistance, and analyses on financing alternatives. The EFC Network currently includes the following partners: Region 1: University of Southern Maine; Region 2: Syracuse University; Region 3: University of Maryland; Region 4: University of North Carolina at Chapel Hill; Region 4: University of Louisville; Region 5: Great Lakes EFC at Cleveland State University; Region 6 & 8: New Mexico Institute of Mining and Technology; Region 7; Wichita State University; Region 9: Dominican University of California; and, Region 10: Boise State University.

ECOS

Resolution Number 08-1
Approved April 14, 2008
New Orleans, Louisiana

Revised March 29, 2011
Alexandria, Virginia

Revised April 2, 2014
Sausalito, California

As certified by
Carolyn Hanson
Acting Executive Director

CONGRESS SHOULD REAUTHORIZE AND FULLY FUND THE SRFs

WHEREAS, much progress has been made toward meeting the goals of the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA) through the Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) programs, respectively; and

WHEREAS, the CWSRF and DWSRF are the largest federal funding programs for municipal wastewater and drinking water infrastructure projects in the country; and

WHEREAS, cumulatively through fiscal year 2014, U.S. Congress has appropriated more than $91 billion in CWA assistance, including $38 billion in SRF capitalization grants; as well as $16 billion in DWSRF capitalization grants; and

WHEREAS, authorizing legislation for both SRFs has expired (the CWSRF under the CWA was enacted in 1987 and expired in 1994; the DWSRF under the SDWA was enacted in 1996 and expired in 2003); and

WHEREAS, U.S. Congress has continued to provide annual funding for the SRFs through the congressional appropriations process; and

WHEREAS, the needs for both wastewater and drinking water infrastructure are enormous (the most recent wastewater needs survey, conducted in 2008 and issued in 2010, estimates that $322 billion is needed for projects and activities to address water quality or water quality-related public health problems in the United States over the next 20 years;while the most recent drinking water needs survey, conducted in 2011 and issued in 2013, estimates that $384 billion is needed to address drinking water-related public health projects in the United States over the next 20 years); and

WHEREAS, both statutes provide clear, ongoing justification for the SRFs (the CWA states "it is the national policy that federal financial assistance be provided to construct publicly owned waste treatment works"; and the SDWA states that "the Administrator shall…make capitalization grants to the State…to further the health protection goals of this title.."); and

WHEREAS, reauthorization of the SRFs, with the inclusion of state input through ECOS, would provide for an adequate and more predictable funding stream, crucial to ensuring the public's health and protecting the environment.

NOW, THEREFORE, BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES:

Urges the U.S. Congress to pass and the President to sign legislation to reauthorize and fully fund the CWSRF and DWSRF, and to:

1) Work with state agencies through ECOS to set realistic funding authorization levels for the next 5 years, taking into account the needs identified in the respective needs surveys for the two SRFs; and

2) Work with state agencies through ECOS to ensure that any authorization of appropriations to fund the SRFs provides an adequate and predictable federal funding stream for water infrastructure now and in the future.

ECOS

Resolution 16-5
September 28, 2016
Wheeling, West Virginia

As certified by
Alexandra Dapolito Dunn
Executive Director

ADDRESSING SERIOUS DRINKING WATER AND WASTEWATER INFRASTRUCTURE INVESTMENT NEEDS

WHEREAS, water infrastructure is critical to the provision of clean and safe drinking water and to the management of wastewater that is protective of public health and the environment; and

WHEREAS, America's drinking water and wastewater infrastructure is aging and an increasing number of local governments are unable to financially keep pace with growing demands and existing and new requirements; and

WHEREAS, extensive scholarly documentation shows that water infrastructure funding needs exceed the federal government's present investment levels; and

WHEREAS, funding to the drinking water and clean water state revolving loan funds (SRFs) has remained relatively static; and

WHEREAS, in January 2016, U.S. EPA estimated that an investment of $271 billion will be required over the next five years to address our wastewater infrastructure needs; and

WHEREAS, the Water Resources Reform and Development Act (WRRDA) of 2014 was signed by the President on June 10, 2014, and contains the Water Infrastructure Finance and Innovation Act (WIFIA) which establishes a new financing mechanism for drinking water and wastewater infrastructure projects to be managed by U.S. EPA; and

WHEREAS, distressed urban areas, small communities, and rural communities are particularly pressed to make these needed investments and to operate and maintain these assets; and

WHEREAS, U.S. EPA launched the Water Infrastructure and Resiliency Finance Center in January 2015 to improve funding of community water infrastructure and resiliency; and

WHEREAS, federal collaboration with states to advance innovative funding and technical support for our nation's aging drinking water and wastewater treatment systems is critical to the U.S. population.

NOW, THEREFORE, BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES (ECOS):

Supports the SRFs, as evidenced by ECOS Resolution 08-1: Congress Should Reauthorize and Fully Fund the SRFs;

Encourages identification of financing approaches to help communities make sustainable decisions for drinking water and wastewater infrastructure investment to protect public health and water resources;

Supports leveraging opportunities across federal, state, local, and private authorities to make more resources available to communities;

Supports efforts to prioritize efficient, affordable, and timely awards to distressed communities;

Supports U.S. EPA's continued efforts to work with states and localities to advance best practices and innovative use of SRF monies;

Recommends that funding for WIFIA not come at the expense of funding to the SRFs or the State and Tribal Assistance Grants, and that increases in funding to one SRF not adversely affect the other SRF, as these investments are essential in order to advance critically needed and important work to protect the environment and public health in communities across the nation; and

Urges continued, constructive national conversations around these subjects, including documenting successes, best practices, and case studies in innovative funding and effective partnerships.

January 18, 2017

CHARTER

The Environmental Council of the States hereby establishes

The Infrastructure Work Group

ECOS has long identified water infrastructure as a key priority – as reflected in *ECOS' Priority Areas for a Time of Political Transition (2016-2017)* and ECOS Resolution 16-5 *Addressing Serious Drinking Water and Wastewater Infrastructure Investment Needs.* Water infrastructure is critical to the provision of clean and safe drinking water and to the management of wastewater and stormwater that is protective of public health and the environment. Federal collaboration with the states to advance innovative funding and technical support for our nation's aging drinking water & wastewater treatment systems, and stormwater management systems, is critical to the U.S. population. ECOS is committed to being a constructive part of these conversations by providing a forum to share successes, best practices, and case studies in innovative funding and effective partnerships. It is essential that ECOS continue this discussion so that we can meet the demands of the future and be part of the effort to support the infrastructure needed to provide all Americans with clean and safe water and protect our water resources.

As documented in ECOS' resolutions and Political Paper, and in the cited U.S. Environmental Protection Agency (EPA's) *clean water and drinking water assessment reports,* the U.S. needs about $660 billion in investments for drinking water, wastewater, and stormwater infrastructure over the next 20 years. Current available funding sources are not sufficient to meet these extensive national water infrastructure needs. This underscores how critical water infrastructure is now and in the future. We can no longer postpone taking care of our nation's aging infrastructure. It is of the utmost importance that we work together in partnership with all levels of government, water utilities, industry, and other organizations to explore long term solutions to this enormous challenge.

The U.S. EPA announced on January 10, 2017, the availability of approximately $1 billion in credit assistance for water infrastructure projects under the new Water Infrastructure Finance and Innovation Act (WIFIA) program. As we look ahead, the new Administration's vision is to make clean water a high priority by developing a long-term water infrastructure plan with city, state, and federal leaders to upgrade aging water systems. The new Administration also is supportive of triple funding for state revolving loan fund programs to help states and local governments upgrade critical drinking water and wastewater infrastructure. ECOS can fulfill an important role in providing recommendations for long-term water infrastructure planning and the appropriate funding levels needed to implement those plans.

The Work Group will be established under the auspices of the Water Committee. Roles for this Work Group include:

- Serve as a focal point within ECOS for dialogue on infrastructure issues;
- Conduct such research on these issues as the Work Group deems necessary;
- Serve as a sounding board and provide advice to ECOS on a variety of infrastructure proposals; assess and respond to time sensitive requests on infrastructure;
- Share success stories, best practices, and case studies on infrastructure with ECOS members;
- Collaborate with various levels of government, associations, and organizations as needed to accomplish the goals of the Work Group; and
- Identify speakers on these issues for upcoming ECOS meetings.

Authority:
The ECOS Organizational Structure and Bylaws as amended on April 11, 2016, state that ECOS Work Groups are established at the direction of the President or a Committee Chair. In this case, both President John Linc Stine (MN) and Water Committee Chair Craig Butler (OH) support the formation of this Work Group.

Member Composition:
The Chair is Robert Martineau (Commissioner, Department of Environment & Conservation, TN) and the Vice-Chair is Drew Bartlett (Deputy Secretary, Department of Environmental Protection, FL). We are proposing approximately ten ECOS members for this Work Group. The ECOS members can have a proxy at the Deputy level if they are periodically unable to participate in meetings/calls. The Work Group will be supported by Alexandra Dunn (ECOS Executive Director & General Counsel) and Sonia Altieri (ECOS Senior Advisor, on loan from U.S. EPA).

Which duties it will carry out until:
January 31, 2018, unless extended or disestablished earlier by vote of the Executive Committee.

Established this 20th day of January in the year 2017 by direction of ECOS President Stine and Water Committee Chair Butler.

Water and Wastewater Projects Ready to Go Forward in 2017

State	Type	ONE SENTENCE DESCRIPTION Description	BRIEF 2-3 WORD DESCRIPTION (e.g., planning & design, approved pending funding, out to bid, under construction) Stage	SIMPLE DOLLAR AMOUNT (e.g., $500K, $3.2M) Amount
Alabama	Wastewater	Uniontown- Replace wastewater treatment and collection system		$20M
Alabama	Wastewater	Hayneville- wastewater treatment and collection system renovation		$15M
Alabama	Water	Centre- Installation of GAC filtration system and relocation of drinking water intake structure		$5M
Alabama	Wastewater	Triana- Wastewater collection system repairs and expansion		$1M
Alabama	Wastewater	Bayou La Batre- Wastewater effluent outfall extension to further protect shellfish harvesting		$5M
Alabama	Water	Marion- Upgrade drinking water treatment plant and distribution system		$5M
Alabama	Wastewater	Childersburg- Wastewater treatment system upgrade		$4M
			Total $ for state:	**$55,000,000**
Alaska	Water	Adak – Construct new water treatment plant for this remote Aleutian Island community. The community currently has no way to treat its source of surface water.	Planning and design	$15M
Alaska	Water and wastewater	Akiakchak – Completion of piped water and sewer system to provide first time service to the community. Only a portion of the homes in the community have running water and sewer.	Design	$15M
Alaska	Wastewater	Anchorage - Upgrades and expansion of the Girdwood Wastewater Treatment Facility to meet existing and future flows.	Design	$20M
Alaska	Water	Elim – Replace failing water storage tank that has resulted in water shortages, outages and rationing.	Planning	$2M
Alaska	Wastewater	Hooper Bay – Enhance existing wastewater lagoon with sludge disposal facility and secondary treatment and hydraulic storage cell. Wastewater lagoon is undersized by about half.	Planning and design	$15M
Alaska	Water	Juneau - Replace the water system within the Douglas Highway from the Juneau Douglas Bridge to Downtown Douglas at the Crow Hill pump station, approximately 8,500 feet of water system.	Final design and construction	$3M
Alaska	Wastewater	Juneau - Wastewater treatment plant headworks upgrades for two wastewater treatment plants.	Final design and construction	$5.5M
Alaska	Wastewater	Ketchikan - Replace failing water and sewer mains, including manholes.	Final design and construction	$5M
Alaska	Water and wastewater	Kivalina – Provide unserved homes with individual household water and sewer. Homes currently lack any running water or sewer. Upgrade water treatment plant in support of in-home service.	Planning and design	$5.5M
Alaska	Wastewater	Matanuska-Susitna Valley - Design and construct a new septage and leachate facility to minimize disposal costs and environmental impacts in the Matanuska-Susitna Valley.	Design	$1M
Alaska	Water	McGrath – Renovate water distribution system, converting it from a two-pressure driven system to a circulating distribution system with individual residential circulation pumps. Existing system is over 30 years old and subject to frequent failure.	Planning and design	$3.5M
Alaska	Water	Mountain Village – Replace upper water loop distribution system, repair services, and construct water storage tanks. Frequent pipe failure imposes a risk of catastrophic failure.	Planning and design	$9M
Alaska	Water	New Stuyahok – New water treatment plant to replace structurally failing facility that does not adequately treat the water for iron removal.	Final design and construction	$5M
Alaska	Wastewater	Nome - Replace aging wastewater collection piping.	Final design	$3M
Alaska	Water and wastewater	Shageluk – Construct a piped water and sewer system for this remote Alaska community. Homes currently have no running water and sewer.	Planning and design	$15M
Alaska	Water and wastewater	Shishmaref - Provide unserved homes with individual household water and sewer systems. Homes currently lack any running water or sewer.	Planning and design	$9M
Alaska	Wastewater	Sitka - Wastewater treatment plant heating ventilation and cooling upgrades.	Final design and construction	$3M
Alaska	Water	Unalaska, Alaska - Design and construct a second 2.6 million gallon chlorine contact tank at the water treatment plant.	Final design and construction	$10M
Alaska	Water and wastewater	Venetie – Replace structurally failed water treatment plant and washeteria. Community currently lacks a community potable water supply and basic sanitation facilities.	Planning and design	$4M

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State	Type	Description	Stage	Amount
Alaska	Water	Wainwright - Water treatment plant addition including garage/maintenance room, mechanical room for heat exchangers and pumps, chemical storage, office, and storage areas.	Final design and construction	$9M
			Total $ for state:	**$638,000,000**
Arizona	Wastewater	Nogales international wastewater treatment facilty International Outfall Interceptor (IOI) line rehabilitation project (US DOI, US International Boundary Water Commission)	Approved pending funding	$40M
Arizona	Water &Wastewater	Stabalize Nogales Wash-including stormwater erosion control and bank stabilization to protect the IOI thereby protecting the investment in the IOI rehabiliatation and the Santa Cruz river, an imporatant migratory pathway	planning & design	$10M
			Total $ for state	**$50,000,000**
Arkansas	Water & Wastewater	Arkadelphia - Planning and design services for water and wastewater service to new industrial plant		$5,000,000
Arkansas	Water	Bayou Meto Irrigation District- Continuation of construction - 65% Federal - 35% non federal		$582,000,000
Arkansas	Wastewater	Calion - Additional funds needed for sewer collection and treatment system to provide service to 120 residents within city limits		$230, 323
Arkansas	Water	CAW - Pump station rehab		$5,000,000
Arkansas	Water	Eudora - Water line replacement and rehab of water treatment plant		$3,400,000
Arkansas	Water	Faulkner County - Rocky Gap - Additional funds needed for water line extensions to provide service to approximately 49 residents		$900,000
Arkansas	Wastewater	Fort Smith - Collection upgrades and pipe replacement		$5,000,000
Arkansas	Water	Gould - Water line and meter replacement		$1,578,000
Arkansas	Wastewater	Little Rock - Collection upgrades and pipe replacement		$5,000,000
Arkansas	Wastewater	Lonoke County - Furlow - Wastewater treatment system for approximately 530 residents		$3,160,850
Arkansas	Water	Nashville- Treatment plant improvements		$1,100,000
Arkansas	Water	Scranton - Water line replacement		$250,000
Arkansas	Water	Turrell - Rehab of water distribution system and sewer treatment plant		$3,000,000
Arkansas	Water	White River Irrigation District - Continuation of construction - 65% Federal - 35% non federal		$380,000,000
Arkansas	Water	Wooster - Water System improvements		$2,530,000
			Total $ for state:	**$998,149,173**
California	CWSRF	Wastewater Treatment Plant Upgrades	Final Design and Construction	$12,000,000
California	CWSRF	Carson Regional Water Recycling Facility Phase IIB Expansion Project	Planning and Design	$15,725,526
California	CWSRF	Sanitary Sewer Rehabilitation - Phase 5	Out to Bid	$4,397,000
California	CWSRF	Joint Outfall "B" Unit 1A Trunk Sewer Rehabilitation Phase 1	Design	$14,700,000
California	CWSRF	Joint Outfall "A" Unit 6 Trunk Sewer Rehabilitation	Design	$17,000,000
California	CWSRF	Joint Outfall "D" Units 7 and 8 Trunk Sewer Rehabilitation	Design	$9,500,000
California	CWSRF	Wastewater Treatment Plant Upgrades Phase 2	Ready Construction	$2,444,569
California	CWSRF	Freedom Sanitation Trunk Sewer Line	Out to Bid	$3,007,579
California	CWSRF	City of Hayward Recycled Water Project	Planning and Design	$13,187,200
California	CWSRF	WWTP Head Works and Clarifier Upgrade Project	Out to Bid	$33,229,571
California	CWSRF	Padre Dam Water Recycling Facility, Phase 1 Expansion	Out to Bid	$101,200,000
California	CWSRF	La Piedra Recycled Water Pipeline Expansion Project	Out to Bid	$678,265
California	CWSRF	Headworks and Primary Treatment, Phase 1(A)	Out to Bid	$127,068,522
California	CWSRF	West Bay Sanitary District Recycled Water Project - Sharon Heights	Out to Bid	$12,028,200
California	CWSRF	Trampas Canyon Recycled Water Seasonal Storage Reservoir	Planning and Design	$47,012,000
California	CWSRF	Nevada County Sanitation District #1	Out to Bid	$2,200,000
California	CWSRF	North Point Facility Outfall Rehabilitation	Planning	$17,775,621
California	CWSRF	Phase II Recycled Water Distribution System Expansion Project	Out to Bid	$6,000,000
California	CWSRF	Treatment and Wet Weather Flow Upgrade Project	Planning and Design	$26,000,000
California	CWSRF	City of Shasta Lake Wastewater Treatment Facility Upgrade Project	Planning and Design	$14,000,000

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State	Type	Description	Stage	Amount
California	CWSRF	Wastewater Treatment Facility Improvements	Planning and Design	$2,529,550
California	CWSRF	Groundwater Replenishment Project	Planning and Design	$98,000,000
California	CWSRF	Pump Station 2 Power Reliability & Surge Protection Project	Planning and Design	$38,610,000
California	CWSRF	Recycled Water Supply Optimization Program	Under Construction	$57,015,640
California	CWSRF	Recycled Water Pipeline Project	Planning and Design	$25,564,000
California	CWSRF	Digester and Thickener Facilities Upgrade Project	Under Construction	$144,800,000
California	CWSRF	CWWSIPSE05 - SEP 521/522 and Disinfection Upgrades	Under Construction	$41,613,516
California	CWSRF	2015 Drought Relief - Napa Lateral	Out to Bid	$2,912,385
California	CWSRF	2015 Drought Relief - San Savaine Basin Improvements	Out to Bid	$3,762,802
California	CWSRF	San Francisco Westside Recycled Water Project	Planning	$171,220,000
California	CWSRF	CWWSIPSE04 - SEP Primary/Secondary Clarifier Upgrades	Under Construction	$32,308,985
California	CWSRF	Sludge Dewatering and Loadout Facility	Planning and Design	$30,000,000
California	CWSRF	Water Meter Installations Phase 2-5	Out to Bid	$14,010,534
California	CWSRF	Willow Creek Wastewater Project	Out to Bid	$6,900,000
California	CWSRF	Fairmead Septic to Sewer Project	Planning and Design	$4,000,000
California	CWSRF	Wastewater Facilities Improvement Project	Planning and Design	$2,300,300
California	CWSRF	WWTP Digester Upgrade Project	Planning and Design	$2,642,200
California	CWSRF	Collection System Improvements Project	Planning and Design	$2,800,000
California	CWSRF	Wastewater Treatment Plant Re-location	Planning and Design	$10,518,000
California	CWSRF	Effluent Management and Wastewater Treatment Project	Planning and Design	$9,500,000
California	CWSRF	Kern-Tulare Water District Oil Field Water Reuse Project	Planning	$7,000,000
California	CWSRF	Recycled Water Easterly Main and Tanks	Out to Bid	$4,000,000
California	CWSRF	Brine Line Broadway to HARRF	Out to Bid	$2,500,000
California	CWSRF	Recycled Water Line Phase 2	Out to Bid	$3,750,000
California	CWSRF	Wastewater Treatment Plant Expansion Phase III	Planning	$1,984,736
California	CWSRF	Paso Robles Recycled Water Project - Phase 1	Out to Bid	$17,230,000
California	CWSRF	South Recycled Water Project	Planning	$11,200,000
California	CWSRF	South El Monte Recycled Water Project	Planning	$1,693,825
California	CWSRF	Santa Clarita Valley San Dist Microfiltration/RO	Out to Bid	$56,001,000
California	CWSRF	Alessandro Pond Optimization Project	Planning and Design	$1,196,200
California	CWSRF	Regional Urban Water Augmentation Project	Design	$17,500,000
California	CWSRF	Temecula Valley Recycled Water Pipeline Project	Planning and Design	$9,478,100
California	CWSRF	SEJPA Treatment Facility Improvements - PHASE 1	Design	$6,300,000
California	CWSRF	SEJPA Recycled Water Phase II Project	Planning	$4,030,000
California	CWSRF	Sustainable Water Infrastructure Project (SWIP)	Planning	$57,048,637
California	CWSRF	Upper Salinas River Basin Conjunctive Use Project (US CUP)	Planning	$3,043,000
California	CWSRF	San Jose Creek Water Reclamation Plant Flow Equalization Facilities Phase 1	Out to Bid	$55,360,000
California	CWSRF	2015 Drought Relief - RP-1158 Recycled Water Pump Station Upgrades	Out to Bid	$2,329,908
California	CWSRF	2015 Drought Relief - RP-5 Recycled Water Pipeline Bottleneck	Out to Bid	$757,220
California	CWSRF	2015 Drought Relief - Recycled Water Pressure Sustaining Valve Installation	Out to Bid	$495,106
California	CWSRF	2015 Drought Relief - RP-1 Parallel Outfall Pipeline	Out to Bid	$3,320,119
California	CWSRF	2015 Drought Relief - Baseline Extension Project	Out to Bid	$2,038,670
California	CWSRF	Mid Basin Centennial Park Injection Project	Out to Bid	$34,121,612
California	CWSRF	City of Calipatria Sanitary Sewer Improvement Project	Design	$655,000
California	DWSRF	Treated Water Project, Phase 2	Out to Bid/ Ready for Construction	$6,042,729
California	DWSRF	New SWTP [Construction Phase]	In Construction	$3,000,000
California	DWSRF	Oak Creek intermediate School Consolidation with Hillview Water Company	Out to Bid	$569,480
California	DWSRF	Shasta CSD Tanks/Pump Stations Replacement Project	Out to Bid	$4,292,840
California	DWSRF	Calpine Metering Project	Out to Bid	$397,300
California	DWSRF	Regional Benefit Arsenic Mitigation Project	Out to Bid/ Ready for Construction	$13,839,184
California	DWSRF	Reservoir No. 2 Pump Station and Water Line	Out to Bid	$1,578,800
California	DWSRF	Well 97 Replacement and Arsenic Treatment	Planning	$8,327,753
California	DWSRF	Installation of Arsenic Treatment Plant Components and Water Meters	Out to Bid	$1,984,400
California	DWSRF	Yosemite High School Uranium, Fluoride and Arsenic Exceedance-Remediation Project	Planning	$1,230,000
California	DWSRF	LMCSD Arsenic Compliance and Consolidation Project	Planning	$1,444,000
California	DWSRF	South Reservoir Replacement	Planning	$17,772,000
California	DWSRF	Elysian Reservoir Water Quality Improvement Project	Planning	$31,839,032
California	DWSRF	Feather Falls School Emergency Well Replacement #0400107	Planning	$325,000

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State	Type	Description	Stage	Amount
California	DWSRF	Palo Verde County Water District Improvement Project	Out to bid	$1,708,938
			Total $ for state:	**$1,577,546,554**
Colorado	Wastewater	City of Durango: The project consists of renovating the existing City of Durango Wastewater Treatment Plant in the current location, utilizing a Johannesburg secondary process to address capacity issues and to meet nutrient effluent limits, and includes additional facility upgrades and improvements.	Preparing final plans and specifications, WPCRF Loan	$62.2M
Colorado	Wastewater	City of La Junta: The project consists of wastewater treatment plant upgrade to include new influent headworks, pumps, metering, grit collector, new grit building, oxidation ditch, clarifiers, new return activated sludge building, generator, chemical storage, disinfection, waste sludge gravity thickener, digesters, and control building rehabilitation.	Preparing final plans and specifications, WPCRF Loan	$13,348,899
Colorado	Wastewater	Town of Bennett: The project consists of constructing a new mechanical wastewater treatment facility to replace the existing lagoon system.	Final Design stage, CWSRF	$5,994,000
Colorado	Wastewater	Town of Buena Vista: The project consists of construction of wells with treatment, a storage tank, and main lines.	Final Design stage, DWSRF	$1,920,000
Colorado	Wastewater	Town of Burlington: The project consists of constructing a centralized blending system to connect two new wells, and six existing wells to a central location; including transmission mains, ground storage tank, control system, and distribution system upgrades.	Out to bid, DWSRF project	$4,430,000
Colorado	Wastewater	Town of Crested Butte: The project will update the existing treatment facility and provide required redundancy by increasing the facility capacity to .75 MGD and 2,696 ppd of BOD5; improvements include replacing the existing UV disinfection system, replacing the mechanical bar screen and grit collection system, and constructing a second oxidation ditch.	Final Design stage, CWSRF	$3,307,000
Colorado	Wastewater	Town of Merino: The project consists of an ion exchange treatment system, distribution system upgrades, a new 90,000 gallon elevated water tank, water meters, a new treatment building constructed at the current well site, residuals transmission line, and residuals holding ponds.	Out to bid, DWSRF project	$2,315,000
Colorado	Wastewater	Town of Fowler: The project consists of upgrades to the wastewater treatment facility, aerators, and installation of ultraviolet light for disinfection.	Final Design stage, CWSRF	$1,800,000
			Total $ for state:	**$95,314,899**
Connecticut	Wastewater	Metropolitan District Commission - Hartford: Sewage sludge processing upgrades at the Hartford treatment plant	Design 90% complete and under review	$48M
Connecticut	Wastewater	Greater New Haven Water Pollution Control Authority - New Haven: Combined sewer overflow removal project in the West River watershed in New Haven	Project in design	$11M
Connecticut	Wastewater	Torrington: Treatment plant upgrade including nitrogen and phosphorus removal	Project in design	$65M
Connecticut	Wastewater	Metropolitan District Commission - Hartford: Removal of combined sewer overflows from the Kane Brook area in Hartford	Project in design	$21M
Connecticut	Wastewater	Plainville:Treatment plant upgrade including phosphorus removal	Project in design	$13M
Connecticut	Wastewater	Killingly: Treatment plant upgrade including phosphorus removal	Project in design	$22.5M
Connecticut	Drinking Water	GROTON UTILITIES/Groton: Water Treatment Plant Upgrade	Project in redesign	$42M
Connecticut	Drinking Water	METROPOLITAN DISTRICT COMMISSION/Bloomfield: Transmission Main Hydraulic Improvements	Design complete	$13M
Connecticut	Drinking Water	REGIONAL WATER AUTHORITY/Greater New Haven: Automated Meter Reading Phases III & Iva	Under construction	$8.6M
Connecticut	Drinking Water	METROPOLITAN DISTRICT COMMISSION/Greater Hartford: Automated Meter Reading - Phase IV	Under construction	$5M
Connecticut	Drinking Water	NORWICH PUBLIC UTILITIES/Greater Norwich: AMI Water Meter Replacement Program	Design complete	$3.6M
Connecticut	Drinking Water	METROPOLITAN DISTRICT COMMISSION/Bloomfield: Reservoir #6 Water Treatment Facility Filtered Water Basin Rehab	Design complete	$3M
Connecticut	Drinking Water	METROPOLITAN DISTRICT COMMISSION/Wethersfield: Garden Street Area Water Main Replacement	Project in design	$3M
Connecticut	Drinking Water	REGIONAL WATER AUTHORITY/West Haven: Burwell Hill Tank Replacement	Under construction	$3M
Connecticut	Drinking Water	REGIONAL WATER AUTHORITY/Derby: Ansonia-Derby Atm Storage Tank	Project in design	$2.5M
Connecticut	Drinking Water	NORWICH PUBLIC UTILITIES/Norwich: Mohegan Park Water Tank	Design complete	$2.4M
Connecticut	Drinking Water	WATERBURY WATER DEPARTMENT/Waterbury: Rehabilitations and Replacement of Water Mains 2016	Under construction	$1.6M

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State	Type	Description	Stage	Amount
Connecticut	Drinking Water	SOUTHINGTON WATER DEPARTMENT/Southington: Well #2A Construction Project (Well #2 Back-up)	Project in design	$1.5M
Connecticut	Drinking Water	BETHEL WATER DEPT/Bethel: Hoyts Hill Booster Pump	Under construction	$1M
Connecticut	Drinking Water	REGIONAL WATER AUTHORITY/Hamden: North Sleeping Giant Well Replacement	Design complete	$1M
			Total $ for state:	**$271,700,000**
Delaware	Wastewater	City of Rehoboth Beach - Ocean Outfall Disposal for Treated Wastewater	Permitting	$32.5 M
Delaware	Wastewater	City of Rehoboth Beach - Wastewater Treatment Plant Upgrade	Planning and Design	$10.5 M
Delaware	Wastewater	City of Rehoboth Beach - Wastewater Treatment Plant Biosolids Upgrade	Planning and Design	$12.5 M
Delaware	Wastewater	Sussex County - Route 54 Sanitary Sewer Extension Project	Planning and Design	$2.0 M
Delaware	Wastewater	Sussex County - Angola North Sanitary Sewer Extension Project	Out to Bid	$6.7 M
Delaware	Wastewater	Kent County - Air System (Blower) Optimization Project	Planning and Design	$1.3 M
Delaware	Wastewater	City of Dover - Del Tech Pump Station Replacement	Planning and Design	$400 K
Delaware	Wastewater	City of Dover - Lepore Road Sanitary Sewer Upgrade	Planning and Design	$250 K
Delaware	Wastewater	City of Dover - Tar Ditch Interceptor Project	Planning and Design	$250 K
Delaware	Wastewater	DNREC - NVF Wetlands Creation, Soil Contamination & Flood Mitigation	Out to Bid	$4.4 M
Delaware	Wastewater	City of Lewes - Savannah Place Sanitary Sewer Extension Project	Planning and Design	$1.7 M
Delaware	Wastewater	City of Harrington - Sewer Capacity Improvement Project	Out to Bid	$1.5 M
Deaware	Wastewater	Town of Smyrna - North Duck Creek Sanitary Sewer Extension Project	Out to Bid	$3.0 M
Delaware	Wastewater	City of Wilmington - Wetland Restoration, Conservation, Flood Mitigation	Planning and Design	$16.7 M
Delaware	Wastewater	Town of Millsboro - Pump Station Generator Installation Project	Planning and Design	$157 K
Delaware	Wastewater	Town of Millsboro - Pump Station Replacement Project	Planning and Design	$610 K
Delaware	Wastewater	Town of Milton - Wastewater Treatment Plant Upgrade Project	Planning and Design	$6.4 M
Delaware	Water	City of Wilmington - Water Main Improvement Project	Planning and Design	$5.0 M
Delaware	Water	City of Dover - Water Treatment Plant Improvements	Planning and Design	$2.5 M
			Total $ for state:	**$108,367,000**
District of Columbia	Wastewater	The Trash Transfer Station Improvement projects will divert polluted stormwater runoff at two trash transfer stations to pre-treatment facilities before stormwater is released to the combined or separate storm sewer system.	Planning and design	$2.1 M
District of Columbia	Wastewater	Green Infrastructure Right of Way Retrofits will fund impervious surface retrofits in the MS4 areas of the Anacostia watershed to reduce the impacts of stormwater runoff.	Planning and design	$5.0 M
District of Columbia	Wastewater	Oregon Avenue Watershed Green Streets will install bioretention, permeable pavement, and other appropriate volume reduction techniques to retain stormwater runoff that severely impacts Rock Creek.	Construction	$2.9 M
District of Columbia	Wastewater	Normanstone LID Retrofit will install bioretention and bioswale volume reduction techniques to retain stormwater runoff at 13 sites on two roadways that drain to Normanstone Creek.	Construction	$0.8 M
District of Columbia	Wastewater	National Arboretum Sewer Rehabilitation funds the structural repairs of the entire public sanitary sewer system inside the United States National Arboretum, including repair to the failed interceptor adjacent to Hickey Run.	Design	$8.5 M
District of Columbia	Wastewater	Gravity Thickener Upgrades at Blue Plains involves upgrading the current gravity thickeners to optimize performance by reducing the severity and incidence of high solids concentration in the gravity thickener overflow.	Design	$6.8 M
District of Columbia	Wastewater	District Stormwater Outfall Restoration Project will repair 13 damaged outfalls that have been identified as contributors to water quality degradation. These are located in watersheds in the District that are targeted for stream restoration.	Design	$4.2 M
District of Columbia	Wastewater	This project will rehabilitate approximately 17,000 feet of the B Street/New Jersey Avenue Trunk Sewer to reduce inflow and infiltration	Design	$1.7 M
District of Columbia	Wastewater	Storm Sewer Improvements at Bangor Street, SE and Park Street, SE, includes sewer rehabilitation to prevent flooding on Bangor Street and the rehabilitation of a degraded outfall on Park Street	Design	$1.7 M
District of Columbia	Wastewater	Potomac Pumping Station Phase III entails replacement of actuators, controls, bar screens, sluice gates, gate valves, and make improvements to the switch gear.	Design	$4.2 M
District of Columbia	Wastewater	Low Area Trunk Sewer Rehabilitation will rehabilitate approximately 11,700 linear feet of the sewer to eliminate minor structural defects and restore operational reliability.	Design	$7.5 M
District of Columbia	Wastewater	Main and O St. Pumping Station Intermediate Upgrade entails replacement of pumps, motors, and controls, discharge flap gates, a sanitary bar screen, sluice gates and gate valves.	Design	$5.2 M

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District of Columbia	Wastewater	Rehabilitation of Lower East Side Interceptor involves the rehabilitation of this trunk through cleaning, repair and pre-and post CCTV investigations.	Design	$6.2 M
District of Columbia	Wastewater	Tiber Creek Trunk Sewer Rehabilitation involves the rehabilitation of this truck through cleaning, repair and pre-and post CCTV investigations.	Design	$6.4 M
District of Columbia	Wastewater	Rehabilitation of Piney Branch Trunk Sewer involves the inspection and cleaning and lining of about 11,200 feet of defective trunk sewer and restoration of service and other connections.	Design	$19.0 M
District of Columbia	Wastewater	Combined Sewer Under Building Rehabilitation Phase II will rehabilitate a percentage of the combined sewer that is classified high priority due to their location.	Design	$1.0 M
District of Columbia	Wastewater	Georgetown Combined Sewer Rehabilitation will inspect and rehabilitate about 5,000 linear feet of large diameter combined sewers.	Design	$6.7 M
District of Columbia	Wastewater	Potomac Interceptor Rehabilitation Fairfax will rehabilitate two portions of the interceptor that have experienced severe internal corrosion.	Design	$5.0 M
District of Columbia	Water	Pinehurst Branch Stream Restoration will restore the stream from the MD border to Rock Creek, including protection of DC Water assets within the stream	Planning and Design	$5.0 M
District of Columbia	Water	Oxon Run Stream Restoration will return the concrete-lined channel of Oxon Run to a natural state, creating habitat and improving water quality	Planning	$15.0 M
District of Columbia	Water	Fort Dupont Stream Restoration will stabilize eroded gullies and restore habitat in the tributaries to the Anacostia River that flow through Fort Dupont Park	Planning and Design	$10.0 M
District of Columbia	Water	Fort Dupont Roadway LID project will install green infrastructure (e.g., bioretention) in conjunction with roadway repairs throughout Fort Dupont Park to treat roadway stormwater runoff	Design Complete	$5.0 M
District of Columbia	Water	Suitland Parkway project will stabilize eroded gullies and restore habitat in Stickfoot Branch, a tributary to the Anacostia River	Planning and Design	$2.0 M
District of Columbia	Water	RiverSmart Schools Stormwater Retrofits will fund schoolyard stormwater retrofits and provide teacher training for stormwater management and green infrastructure education	Construction	$1.0 M
District of Columbia	Water	Hamlin Street Stormwater Retrofits will capture and treat stormwater runoff from a portion of Hamlin St NE between 26th St NE and South Dakota Ave NE	Construction	$1.0 M
District of Columbia	Water	Carter Barron Stormwater Retrofits will provide green infrastructure to treat runoff from the Carter Barron Amphitheater parking lot; and restore and create habitat in several eroded gullies resulting from past stormwater runoff.	Construction	$2.0 M
			Total $ for state:	**$135,900,000**
Florida	Wastewater	Plantation Bay rehab and upgrade: Rehabilitation and upgrade of the Plantation Bay WWTP (Flagler County) to bring facility into compliance as required by FDEP's Administrative Order No. AO111NE.	Ready to bid	$5.7M
Florida	Wastewater	Avondale Stormwater improvements: Exfiltration trenches and stormwater pump station in Pompano Beach.	Ready to bid	$3.23M
Florida	Wastewater	Construction of a new lift station, installation of gravity sewers, and the installation of reclaimed water transmission mains in Sarasota.	Ready to bid	$27.8M
Florida	Wastewater	Reclaimed water augmentation: Stormwater pump stations and transmission mains to augment the reclaimed water system with stormwater in Deltona.	Ready to bid	$10.45M
Florida	Wastewater	Treatment Plant Electrical Upgrades: Provide upgrades to the various low voltage systems at the Iron Bridge Wastewater Reclamation Facility (Orlando) that have exceeded their useful life.	Ready to bid	$12.77M
Florida	Wastewater	Water reclamation facility upgrade: Upgrade and expand the Water Reclamation Facility (Apopka) to a flow rate of 8.0 million gallons per day.	Ready to bid	$67.5M
Florida	Wastewater	Palmetto Street force main (FM) project: Reroute flow from two 16" FM through a new 36" ductile iron FM (Daytona Beach).	Ready to bid	$29.7M
Florida	Wastewater	Sewer expansion: Construction of gravity sewers, a lift station and force mains to serve 775 residents and businesses and eliminate septic tanks (Miramar).	Ready to bid	$16.9M
Florida	Wastewater	Collection system expansion: Expand the city's existing collection system to approximately 3,000 homes on septic tanks in the North 2 service area (Cape Coral).	Ready to bid	$95M
Florida	Drinking Water	Water main replacements: Replacement of water mains in St. Augustine.	Contracts awarded	$9.4M
Florida	Drinking Water	Improve water treatment plant and replace all asbestos and lead service pipes in Highland Beach.	Contracts awarded	$4.7M
Florida	Drinking Water	New wellfield (water supply) and upgraded water treatment (membrane) in Miramar.	Design build contract awarded	$23.7M

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Florida	Drinking Water	Water system expansion: Expand drinking water and reclaimed water mains to residents in the North 2 service area in Cape Coral.	Bidding completed	$105M
Florida	Drinking Water	Water main replacements: Multi-phase water distribution system replacement project in South Miami Heights.	Ready to award contracts	$54.7M
			Total $ for state:	**$466,550,000.00**
Hawaii	WW	Hawaiian Homes Force Main Replacement	Out to bid	2.2 M
Hawaii	NPS	Central Maui Landfill (CML) Phase V Gas Collection System Expansion	Out to bid	2.5M
Hawaii	NPS	Ala Wai Golf Course Access Road and Parking Lot Improvements - NPDES Small MS4 Permit Program	Pending approval funding	4.5M
Hawaii	WW	Honouliuli Water Recycling Facility R-1 Pre-Treatment and UV Disinfection Improvements	Design	6.3M
Hawaii	WW	Lahaina Wastewater Reclamation Facility Modifications, Stage 1A	Out to bid	34M
Hawaii	WW	Ala Moana Wastewater Pump Station Force Main #3 and #4	Under construction	9M
Hawaii	Drinking Water	Iao Surface Water Treatment Plant Upgrades	under construction	$21.5M
Hawaii	Drinking Water	Piihonua-Kukuao Reservoir and Transmission Improvements	under construction	$9.5M
Hawaii	Drinking Water	Energy Savings Performance Contracting	obtaining permits and approvals	$32M
Hawaii	Drinking Water	Kalihi Pump Station Low and High Service Renovation	planning and design	$1M
Hawaii	Drinking Water	Pump Renewal and Replacement for Keanu Line Booster, Maunawili Booster, Mariner's Ridge	planning and design	$1.1M
Hawaii	Drinking Water	Pump Renewal and Replacement: Kaluanui Line Booster, Diamond Head Line Booster, Kaonohi Booster No. 1, Waihee Line Booster, and Punaluu Wells II	planning and design	$1.2M
Hawaii	Drinking Water	Punailuu Wells II Renovation	planning and design	$1.7M
Hawaii	Drinking Water	Kamaile Wells: Drainage Improvements and Control Building Repairs	planning and design	$292k
Hawaii	Drinking Water	Kapiolani Blvd 12-Inch Main CM	planning and design	$1.1M
Hawaii	Drinking Water	Pearl City Wells II Isolation Valves	planning and design	$258k
Hawaii	Drinking Water	Waialae Iki Well Renovation	planning and design	$150k
Hawaii	Drinking Water	Renovate/Replace Reservoir Altitude Valve Assemblies - Makiki & Waialae Iki 180 Reservoir	planning and design	$330k
Hawaii	Drinking Water	Mililani Wells II Improvements	planning and design	$118k
Hawaii	Drinking Water	Pearl City Wells I Renovation	planning and design	$238k
Hawaii	Drinking Water	Waikoloa Reservoir No. 1 Earthquake Damage Repairs	under construction	$5M
			Total $ for state:	**$133,986,000.00**
Idaho	Wastewater	Star Sewer and Water District:Construct lagoons	Design and Construction	$30M
Idaho	Wastewater	City of Blackfoot: Improve treatment and add interceptors	Design and Construction	$8M
Idaho	Wastewater	City of Malad: Add new lagoon and mechanical treatment	Design and Construction	$5M
Idaho	Wastewater	City of Kimberly: Upgrade collection system	Design and Construction	$5M
Idaho	Wastewater	City of Nampa: Upgrade treatment, collection lines and pumping	Design	$10M
Idaho	Drinking Water	City of Spirit Lake: Add new water source	Design and Construction	$0.5M
Idaho	Drinking Water	City of Rupert: Improve treatment and distribution, add source and meter	Design and Construction	$5.7M
Idaho	Drinking Water	City of Coeur d'Alene: Add new storage facility	Design and Construction	$1.8M
Idaho	Drinking Water	City of Filer: Improve treatment and distribution	Design and Construction	$5M
			Total $ for state:	**$71,000,000**
Illinois	Water	Central Park PS Electrification, Chicago- Cook Co.	Financial approval complete, final loan application complete, need to rebid. Construction 3-5 months	$103.6M
Illinois	CW	Phase 1B Biological Improvements, DeKalb Sanitary District- DeKalb Co.	Pending financial approval, final loan application and bidding. Construction 5/2017	$58M
Illinois	Water	Jardine Plant, Med. Voltage Electrical Improvements, Chicago- Cook Co.	Financial approval complete, final loan application complete, bidding needs to be completed. Construction 3-5 months	$52M
Illinois	CW	Wet Weather Treatment Facility, city of Joliet- Will Co.	Pending financial approval, final loan application and bidding. Construction spring, 4/2017	$50M

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Illinois	CW	Consolidate Treatment @ Regional Plant - Group II Projects, Frankfort- Will Co.	Final loan application complete, partial financial review complete, pending bidding. Construction 5/2017	$35M
Illinois	Water	New Filtration Facility, Rock Islans- Rock Island Co.	Pending financial approval, final loan application and bidding. Construction 4/2017	$30M
Illinois	Water	Transmission Main from Reich Complex to Marion - Part 4A village of Oak Lawn- Cook Co.	Financial approval needs completed, final loan application needs to be completed, needs to be rebid, construction 3/2017	$29.8M
Illinois	Water	New WTP, 2 new wells, & misc. improvements, Taylorville- Christian Co.	Pending financial approval, final loan application and bidding. Construction 3/2017	$29M
Illinois	CW	WWTP Improvements (Major), Batavia- Kane Co.	Financial approval complete, planning and bids need to be completed, construction 3/2017	$27.5M
Illinois	CW	Phosphorus Removal Aux Sable & Westside WWTPs, city of Joliet- Will Co.	Pending financial approval, final loan application and bidding. Construction 4/2017	$23.7M
Illinois	CW	WWTP #2 Expansion & Upgrade, Village of New Lenox- Will Co.	Pending financial approval, final loan application and bidding. Construction spring 2017	$19.7M
Illinois	Water	Transmission main extensions to serve 4 new communities - Phase 3 CLJAWA-Lake Co.	Bidding complete, financial approval complete, pending final loan application. Construction spring 2017	$15.3M
Illinois	CW	Critical Sewer Rehab Phase III, city of Decatur- Macon Co.	Financial approval complete, final loan application complete, bidding needs to be completed. Construction 3/2017	$15M
Illinois	CW	W. Washington St. Drainage Improvements Phase 2, city of Champaign- Champaign Co.	Bidding complete, pending financial approval and final loan application. Construction 3/2017	$12.1M
Illinois	Water	Jardine Plant, Chlorine Improvements, Chicago- Cook Co.	Financial approval complete, final loan application complete, bidding needs to be completed. Construction 3-5 months	$12.1M
Illinois	Water	Transmission main extensions to serve 4 new communities - Phase 2, CLCJAWA - Lake Co.	Bidding complete, financial approval complete, pending final loan application. Construction spring 2017	$10M
Illinois	CW	Melvina Ditch Streambank Stabilization, Metropolitan Wastewater Reclamation District of Greater Chicago- Cook Co.	Pending financial approval, final loan application and bidding. Construction spring 2017	$8.8M
Illinois	CW	WWTP Expansion, Beecher- Will Co.	Pending financial approval, final loan application and bidding. Construction 3/2017	$8.5M
Illinois	Water	New Meters, city of Lansing- Cook Co.	Bidding complete, pending financial approval and final loan application. Bids expire 3/2017 expected date of	$4.9M
Illinois	CW	Pump Station replacement and abandonment and force main relocation, city of Danville- Vermilion Co.	Environmental issues stalled, now restarting. Construction 3-5 months	$4.5M
			Total $ for state:	**$546,500,000**
Indiana	Drinking water	East Chicago- Replace deteriorating service lines, including over 4,000 lines that contain lead	Final design and could be bid under construction in 4 months	$16,545,000
Indiana	Drinking water	Newton County - new well field, treatment plant and distribution system to enable local commercial farm to expand and provide needed jobs	Ready to bid	$9,000,000
Indiana	Drinking water	Cayuga - New service line from Cayuga to local school to replace School's water supply	Bids received and ready to start construction	$1,300,000
Indiana	Drinking water	Atlanta - Loop and replace lines, hydrants and valves due to age	In design and will bid in June 2017	$1,400,000
Indiana	Drinking water	Cordry - line replacement, tower rehab and new water meters	Bids to be opened and construction to start first quarter of 2017	$1,600,000
Indiana	Drinking water	Greentown - Water & treatment plant rehab, water main replacement and SCADA	In design and will bid in June 2017	$1,114,000
Indiana	Drinking water	Hillsdale- treatment plant and distribution system improvements	Bids received and ready to start construction	$1,613,000
Indiana	Drinking water	Ingalls - two new wells and building rehabilitation	Bids received and ready to start construction	$1,400,000
Indiana	Drinking water	Ligonier - new filter piping and valves, SCADA, hydrants and water main replacement	In design and will bid in May 2017	$1,700,000
Indiana	Drinking water	Montezuma - distribution system rehab	Ready to bid	$1,223,000
Indiana	Waste water	Advance - treatment plant upgrade	In design and will bid in June 2017	$785,000

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Indiana	Waste water	Allen County - Elimination of septic tanks in six unincorporates areas of Allen County	Ready to bid	$7,535,000
Indiana	Waste water	Andrews - treatment plant upgrades	In design and will bid in June 2017	$4,000,000
Indiana	Waste water	Cromwell - Treatment Plant upgrades and collection system improvements	Bids to be opened in February, 2017	$2,000,000
Indiana	Waste water	Georgetown - treatment plant expansion	Bids to be opened in April 2017	$3,400,000
Indiana	Waste water	Greensburg - treatment plant expansion to accommodate Honda plant expansion	Bids to be opened in January and construction to start first quarter	$7,664,000
Indiana	Waste water	Jeffersonville - combined sewer overflow interceptor holding	Bids to be opened in April, 2017	$34,000,000
Indiana	Waste water	Western Wayne - treatment plant upgrades and expansion to enable local industrial park to expand, creating needed jobs	Ready to bid	$13,000,000
Indiana	Waste water	Romney - new treatment plant and collection system to eliminate failing septic systems	Ready to bid	$4,000,000
Indiana	Waste water	Crown Point - secondary treatment, eliminate leaking service lines and replace lift stations	Bids received and ready to start construction	$6,600,000
			Total $ for state:	**$119,879,000**
Iowa	Wastewater	Construction of the Eastside Interceptor Sewer and pump station to take increased sewage flows to the Wastewater Reclamation Facility	Ready to bid	$68,340,000
Iowa	Wastewater	As part of the City's Long Term Control Plan to reduce combined sewer overflows, separate sewers by constructing new storm sewers, regional detention, and a pump station	Ready to bid	$30,660,000
Iowa	Water	Design and construction of a new reverse osmosis water treatment plant	Ready to construct	$22,072,000
Iowa	Wastewater	Address infiltration and inflow into the City's sanitary sewer system utilizing a variety of rehabilitation techniques	Ready to bid	$21,432,000
Iowa	Wastewater	Replace aging equipment, repair structures, implement nutrient removal, add biosolids storage at wastewater treatment facility	Ready to construct	$19,927,000
Iowa	Wastewater/Stormwater/Water	Installation of sanitary sewer in area currently on septic systems, implementation of green storm water infrastructure practices, and replacement of aging water main	Ready to bid	$16,990,000
Iowa	Wastewater	Improve various treatment plant equipment to renew initial capicity, improve performance, improve reliability and improve life of treatment system	In design	$12,710,000
Iowa	Wastewater	Meet schedule to comply with bacteria and nutrient limits by connecting to the regional Wastewater Reclamation Facility and upgrade capacity of sewers and lift stations	In design	$12,537,000
Iowa	Wastewater	Sanitary sewer rehabilitation and replacement of lift stations to eliminate backup of sewage into residents' basements	Ready to bid	$10,900,000
Iowa	Water	Extension of water service to two small water systems to meet safe drinking water standards	In design	$10,801,400
Iowa	Wastewater	To meet new water quality standards, installation of disinfection and ammonia removal in wastewater facility, and other improvements	Ready to bid	$10,403,000
Iowa	Wastewater	Comply with current and future wastewater permitting requirements by construction of new extended aeration activated sludge treatment system	Under construction	$8,970,000
Iowa	Stormwater	Stream daylighting for improved water quality, to mitigate flooding, and to manage stormwater	In design	$7,716,000
Iowa	Water	To correct water system deficiencies in pressure and bacteria, replacement of elevated water storage, construction of booster station, installation of larger water main, and new wells	In design	$5,803,000
Iowa	Water	Address deficiencies in source water through construction of three new wells	In design	$5,368,000
Iowa	Water	Construction of a new water treatment plant, wells, and piping to increase reliability in the water system	In design	$4,608,000
Iowa	Wastewater	To meet new water quality standards, installation of disinfection and ammonia removal in wastewater facility	Ready to bid	$4,469,250
Iowa	Water	Upgrade of all water meters and addition of automatic reading system to improve accuracy of billing and financial operation	In design	$4,347,000

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Iowa	Wastewater	To comply with consent order to eliminate combined sewer overflows, construction of separate storm sewer system and replace deteriorated sanitary sewers	Ready to bid	$4,025,000
Iowa	Water	Replace aging water meters with a new advanced/smart metering system for increased accuracy and efficiency as well as enhanced customer service	Ready to bid	$2,902,945
			Total $ for state:	**$264,781,595**
Kansas	Water	City of Salina - New Water Treatment Plant	Planning	$31M
Kansas	Water	Public Wholesale Water Supply District # 25	Out to Bid	$20M
Kansas	Water	City of Junction City - Water Treatment Plant Improvements	Out to Bid	$13M
Kansas	Water	City of Manhattan - Water Treatment Improvements	Out to Bid	$7.3M
Kansas	Water	City of Moline - Water Distribution Replacement	Out to Bid	$2.1M
			Total $ for state:	**$73,400,000**
Kentucky	Wastewater	Augusta/Brooksville Regional Sewer Project- Construct a new regional WWTP to serve the cities of Augusta and Brooksville that are currently served by two plants that are failing	Design	$12.2M
Kentucky	Wastewater	City of Georgetown - Elimate two failing package treatment plants	Design	$3.4M
Kentucky	Wastewater	City of Winchester- Eliminate two SSOs by replacing 3,200 lf sewer line.	Plans submitted for approval	$1.5M
Kentucky	Wastewater	City of Maysville - WWTP Upgrade	Design	$4M
Kentucky	Wastewater	LFUCG - Stormwater Imptovements in Tuscon/Laramie Area	Planning	$2M
Kentucky	Wastewater	Daviess County Fiscal Court - Eliminate Friendly Park package plant and install a pump station and a forcemain to redirect flows to RWRA WWTP.	Design	$2.2M
Kentucky	Wastewater	City of Jackson - Rehabilitation of 12 lift stations	Planning and Design	$1.2M
Kentucky	Wastewater	LFUCG - Construction of Expansion Area 3 pump station and forcemain to eliminate SSOs.	Final Phase of Design	$17M
Kentucky	Wastewater	City of Ashland - 29th street storm water separation project	Planning	$4M
Kentucky	Wastewater	Knott County Water & Sewer District - Replace an existing WWTP with a new one and rehabilitate sewer lines	Planning and Design	$3.3M
Kentucky	Water	City of Nicholasville - Construct a line and booster pump station to connect the potable water systems of the City of Nicholasville and Jessamine South Elkhorn WD	Planning	$700K
Kentucky	Water	City of Salversville - Construct a 500,000 gallon water storage tank.	Plans under review	$800K
Kentucky	Water	City of Fleming-Neon - Water Treatment Plant Upgrade	Plans under review	$3M
Kentucky	Water	City of Louisa - Water line replacement to reduce water loss	Planning and Design	$700K
Kentucky	Water	City of Stanford - Water system upgrade to improve water pressure and replace aged lines	Planning and Design	$4.1M
Kentucky	Water	City of Olive Hill - Water line replacement in downtown area to reduce water loss	Planning and Design	$900K
Kentucky	Water	City of Parksville - Storage tank rehabilitation	Planning	$400K
Kentucky	Water	Big Sandy Water District - Water line replacement to reduce water loss	Planning	$250K
Kentucky	Water	McCreary Coutny WD - Water line replacement (Ph1 and Ph 2) to reduce water loss and improve service	Planning and Design	$330K
Kentucky	Water	Southern Water & Sewer District - Water line replacement to improve pressure	Planning and Design	$1.4M
			Total $ for state:	**$63,380,000**
Louisiana	Wastewater	ABITA SPRINGS Wastewater Rehabilitation	planning & design	$6,000,000
Louisiana	Wastewater	ADDIS Wastewater Rehabilitation	planning & design	$3,000,000
Louisiana	Wastewater	BOSSIER CITY Wastewater Rehabilitation	under construction	$10,000,000
Louisiana	Wastewater	BOSSIER PARISH SEWER DISTRICT NO. 1 Wastewater Rehabilitation	planning & design	$10,000,000
Louisiana	Wastewater	BREAUX BRIDGE Wastewater Rehabilitation	out to bid	$8,000,000
Louisiana	Wastewater	CARENCRO Wastewater Rehabilitation	planning & design	$5,000,000
Louisiana	Wastewater	DONALDSONVILLE Wastewater Rehabilitation	under construction	$7,156,000
Louisiana	Wastewater	EAST BATON ROUGE SEWERAGE COMMISSION Wastewater Rehabilitation	out to bid	$12,000,000
Louisiana	Wastewater	EAST COLUMBIA SEWER DISTRICT NO.1 Wastewater Rehabilitation	out to bid	$215,475
Louisiana	Wastewater	GEORGETOWN Wastewater Rehabilitation	planning & design	$648,000
Louisiana	Wastewater	JEFFERSON PARISH Wastewater Rehabilitation	planning & design	$20,000,000
Louisiana	Wastewater	LAKE CHARLES Wastewater Rehabilitation	planning & design	$15,000,000
Louisiana	Wastewater	NEW IBERIA Wastewater Rehabilitation	planning & design	$6,667,000
Louisiana	Wastewater	OAK GROVE Wastewater Rehabilitation	planning & design	$750,000

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State	Type	Description	Stage	Amount
Louisiana	Wastewater	PEARL RIVER Wastewater Rehabilitation	planning & design	$2,000,000
Louisiana	Wastewater	RAPIDES PARISH SEWER DISTRICT #2 Wastewater Rehabilitation	planning & design	$2,485,000
Louisiana	Wastewater	RAYNE Wastewater Rehabilitation	planning & design	$1,841,835
Louisiana	Wastewater	SHREVEPORT Wastewater Rehabilitation	out to bid	$20,000,000
Louisiana	Wastewater	ST. CHARLES PARISH Wastewater Rehabilitation	planning & design	$8,000,000
Louisiana	Wastewater	ST. MARTINVILLE Wastewater Rehabilitation	planning & design	$2,000,000
Louisiana	Wastewater	TANGIPAHOA PARISH GOVERNMENT Wastewater Rehabilitation	planning & design	$174,000
Louisiana	Wastewater	TERREBONNE PARISH Wastewater Rehabilitation	out to bid	$8,000,000
Louisiana	Wastewater	VILLE PLATTE Wastewater Rehabilitation	planning & design	$5,000,000
Louisiana	Wastewater	WEST MONROE Wastewater Plant Solar Upgrade	out to bid	$1,541,300
Louisiana	Wastewater	WEST OUACHITA SEWERAGE DISTRICT NO. 5 Wastewater Rehabilitation	planning & design	$7,710,750
Louisiana	Wastewater	ZWOLLE Wastewater Rehabilitation	planning & design	$1,059,440
Louisiana	Drinking Water	WWD#1 of Desoto Parish: Install 1 MGD pretreatment system.	Out to Bid; Closing by June 2017	$1,977,300
Louisiana	Drinking Water	Jefferson Parish: Construct a new 40 MGD treatment facility.	Planning & Design	$30,000,000
Louisiana	Drinking Water	Calcasieu Parish WWD#8: Rehab WTP, replace existing water mains, install new chlorine booster station.	Planning & Design	$2,200,000
Louisiana	Drinking Water	Hobert Water System: Distribution Rehab, construction of, new ground storage tank, new office building, and painting of existing elevated storage tank.	Planning & Design	$2,600,000
Louisiana	Drinking Water	Calcasieu Parish WWD#5 (Ward 3 & 8): Expansion of existing WTP, extend water lines to citizens on private wells.	Planning & Design	$15,000,000
Louisiana	Drinking Water	L & R Utilities: Consist of upgrading distribution and installing new ground storage tank.	Planning & Design	$966,000
Louisiana	Drinking Water	St. Bernard Parish Waterworks (Loan2): Replacement of existing waterlines, continuation loan from Loan 1.	Planning & Design; Closing by June 2017	$10,000,000
Louisiana	Drinking Water	Broussard Water System: Construciton of 3 new water wells and install mains to tie into existing distribution system.	Planning & Design	$3,750,000
Louisiana	Drinking Water	Belah Fellowship Water System: Construction of 2 new ground storage tanks, and rehab to WTP.	Planning & Design	$2,935,000
Louisiana	Drinking Water	Town of Livingston: Construction of a new elevated water tank and 2 water wells.	Planning & Design	$3,659,400
Louisiana	Drinking Water	Louisiana Water Company-New Iberia: Construction of new water well, improvements to distribution system, and new service pumps.	Approved pending funding: Closing March 2017	$7,500,000
Louisiana	Drinking Water	Town of Coushatta: Construction 2 new water wells and various other improvements to existing water infrastructure.	Planning & Design	$5,000,000
Louisiana	Drinking Water	Lafayette Parish WWD North: Rehab to existing WTP.	Planning & Design	$2,500,000
Louisiana	Drinking Water	Vernon Parish Water/Sewer Commission #1:Construction of new elevated storage tank, water well and installation of water mains.	Planning & Design	$2,330,000
Louisiana	Drinking Water	Lake Bruin Water District 1: Replace elevated storage tank,install new booster station and new water meters.	Planning & Design	$1,128,000
Louisiana	Drinking Water	South Grant Water Corporation: Construction of new water well, and replace 2 existing ground storage tanks.	Planning & Design	$1,450,000
Louisiana	Drinking Water	Zone Two Water System, Inc.: Improvements to distribution system.	Planning & Design	$660,000
Louisiana	Drinking Water	Town of Welsh: Replacement of existing ground storage tank.	Out to Bid; Closing by June 2017	$900,000
Louisiana	Drinking Water	Southeast Waterworks District #2 (Vermillion Parish):New automatic read water meters.	Planning & Design	$800,000
			Total $ for state:	**$259,604,500**
Maine	Wastewater	East Millinocket - Wastewater Treatment Facility Upgrades	Design	$11.5M
Maine	Wastewater	Machias - Pumping Station, Force Main and Sewer Replacement	Design	$6M
Maine	Wastewater	Calais - CSO Sewer Separation and Replacement	Design	$6M
Maine	Wastewater	Winterport Waster District - Upgrade Primary Facility to Secondary	Planning/Design	$11M
Maine	Wastewater	Vassaboro Sanitary District - Regionalization - Pumping Stations and Force Main	Design	$5.6M
Maine	Wastewater	Eastport - Wastewater Treatment Facility Upgrades	Design	$4.7M
Maine	Wastewater	Danforth - New Wastewater Treatment Facility	Planning	$6M
Maine	Wastewater	Calais - Pumping Station Replacement	Design	$1M
Maine	Wastewater	Lincolnville Sewer District - New Wastewater Collection System and Treatment Facility	Design	$3.5M
Maine	Wastewater	Mechanic Falls Sanitary District - CSO Sewer Separation and Replacement	Planning	$3.5M
Maine	Wastewater	Bath - CSO Sewar Separation and Wastewater Treatment Facility Upgrades	Design	$8.8M
Maine	Wastewater	Biddeford - CSO Sewer Separtation and Storage Facility	Design	$10M
Maine	Wastewater	Bridgton - New Wastewater Treatment Facility and Conveyance System	Planning	$21M

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State	Type	Description	Stage	Amount
Maine	Wastewater	East Machias - Wastewater Treatment Facility Upgrades	Planning	$3.2M
Maine	Wastewater	Bangor - Davis Brook CSO Storage Facility	Design	$22M
Maine	Wastewater	Portland - Back Cove South Storage Facility	Design	$30M
Maine	Wastewater	Randolph - CSO Sewer Separation	Planning	$2M
Maine	Wastewater	Baileyville - Sewer Replacement	Design	$7M
Maine	Wastewater	Milford - CSO Sewer Rehabilitation	Planning	$4M
Maine	Wastewater	Corinna - Sewer Replacement	Planning	$1.2M
Maine	Wastewater	Mapleton - Sewer Replacement	Planning	$1.2M
Maine	Wastewater	Calais - Wastewater Treatement Facility Upgrades	Planning	$4M
Maine	Wastewater	Kennebunkport - Pumping Station and Wastewater Treatment Facility Upgrades	Design	$2M
Maine	Wastewater	Winter Harbor - Pumping Station and Wastewater Treatement Facility Upgrades	Design	$5.5M
Maine	Wastewater	Ashland - Wastewater Treatment Facility Upgrades	Design	$1.3M
Maine	Wastewater	Bangor - Odlin Road Pumping Station Replacement	Design	$2M
Maine	Wastewater	Fort Fairfield Utilities Distrrict - New Facultative Lagoon Wastewater Treatment Facility	Planning	$10.6M
Maine	Wastewater	North Haven - Wastewater Treatment Facility Upgrades	Design	$500k
Maine	Wastewater	Paris - CSO Sewer Separation	Design	$700k
Maine	Wastewater	Pittsfield - Sewer Replacement	Design	$2.2M
Maine	Wastewater	Portland - CSO Sewer Separation	Design	$5M
Maine	Wastewater	Rockland - CSO Sewer Separation and Pumping Station Upgrades	Design	$2.6M
Maine	Wastewater	Stonington - Sewer Replacement and Pumping Station Upgrades	Planning	$100k
Maine	Wastewater	Kennebunk - Wastewater Treatment Facility Upgrades	Design	$19M
Maine	Wastewater	Norridgewock - Wastewater Treatment Facility Upgrades	Planning	$5M
Maine	Drinking Water	Kennebec Water District - Pump Station Upgrade	Under Construction	$3.0M
Maine	Drinking Water	Pittsfield Water Department - Water Main Replacement	Design	$1.3M
Maine	Drinking Water	South Berwick Water District - Install Arsenic Treatment System	Design	$527k
Maine	Drinking Water	Rumford Water District - Water Main Replacement	Design	$679k
Maine	Drinking Water	Searsport Water District - Water Main Replacement	Design	$200k
Maine	Drinking Water	Hampden Water District - Install Emergrency Backup Well	Design	$367k
Maine	Drinking Water	Calais Water Department - Water Main Replacement/New Water Main	Design	$457k
Maine	Drinking Water	Baileyville Utilities Diistrict - Water Main Replacement	Design	$986k
Maine	Drinking Water	Waldoboro Water Department - Water Main Replacement	Out for Bid	$208k
Maine	Drinking Water	Madawaska Water District - Water Main Replacement	Design	$1.5M
Maine	Drinking Water	Portland Water District (Project A) - Water Main Replacement	Design	$40k
Maine	Drinking Water	Bangor Water District - Water Main Replacement	Design	$696k
Maine	Drinking Water	Hebron Water Company - Transmission Main	Design	$2.2M
Maine	Drinking Water	Howland Water Department - Water Main Replacement	Design	$494k
Maine	Drinking Water	Bangor Water District - Water Main Replacement	Out for Bid	$921k
Maine	Drinking Water	Bangor Water District - Water Main Replacement	Design	$751k
Maine	Drinking Water	Kennebunk, Kennebunkport and Wells Water District - Water Main Replacement	Design	$164k
Maine	Drinking Water	Limestone Water District - Water Storage Tank Replacement	Design	$1.1M
Maine	Drinking Water	Portland Water District (Project I) - Water Main Replacement	Design	$613k
Maine	Drinking Water	Portland Water District (Project J) - Booster Station Installation	Design	$2.0M
Maine	Drinking Water	South Berwick Water District - Water Main Replacement	Design	$330k
Maine	Drinking Water	Southwest Harbor Water and Sewer District - Filter Plant Upgrade	Design	$84k
Maine	Drinking Water	Portland Water District (Project C) - Water Main Replacement	Design	$82k
Maine	Drinking Water	Portland Water District (Project E) - Water Main Replacement	Design	$61k
Maine	Drinking Water	Van Buren Water District - Water Main Replacement	Design	$38k
Maine	Drinking Water	Kittery Water District - Treatment Plant Upgrade	Design	$29.7M
Maine	Drinking Water	Ellsworth Water Department - Treatment Plant Upgrades	Design	$1.6M
Maine	Drinking Water	Boothbay Region Water District - Water Main Replacement	Out for Bid	$759k
Maine	Drinking Water	Pine Village Homes - Complete System Rebuild	Out for Bid	$415k
Maine	Drinking Water	Presque Isle Utilities District - Water Main Replacement	Design	$1.2M
Maine	Drinking Water	Rangeley Water District - Water Main Replacement	Design	$487k
Maine	Drinking Water	Winter Harbor Water District - Water Main Replacement	Out for Bid	$893k
Maine	Drinking Water	Kennebunk, Kennebunkport and Wells Water District - Water Main Replacement	Out for Bid	$188k
Maine	Drinking Water	Paris Utilitiy District - Storage Tank Repairs	Design	$121k
Maine	Drinking Water	Portland Water District (Project F) - Water Main Replacement	Design	$1.2M
Maine	Drinking Water	Bangor Water District - Pressure Zone Upgrades	Design	$28k
Maine	Drinking Water	Portland Water District (Project G) - Water Main Replacement	Design	$680k

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State	Type	Description	Stage	Amount
Maine	Drinking Water	Bangor Water District - Treatment Plant Upgrades	Design	$344k
Maine	Drinking Water	Portland Water District (Project H) - Water Main Replacement	Design	$1.3M
Maine	Drinking Water	Houlton Water Company - Storage Tank Repairs	Design	$518k
Maine	Drinking Water	Hampden Water District- Booster Station	Design	$559k
Maine	Drinking Water	Portland Water District (Project B) - Water Main Replacement	Design	$25k
Maine	Drinking Water	Portland Water District (Project D) - Water Main Replacement	Design	$20k
Maine	Drinking Water	Millbridge Water District - Tank Mixer and SCADA system installation	Design	$232k
Maine	Drinking Water	Howland Water Department - Storage Tank Repair	Design	$312k
Maine	Drinking Water	Kennebunk, Kennebunkport and Wells Water District - Storage Tank Mixers	Design	$68k
Maine	Drinking Water	Southwest Harbor Water and Sewer District - Pump Station Upgrade	Design	$214k
Maine	Drinking Water	Sugarloaf Water Association - Storage Tank Repairs	Design	$1.3M
Maine	Drinking Water	Southwest Harbor Water and Sewer District - Filter Plant Instrumentation	Design	$330k
Maine	Drinking Water	New Sharon Water District - Pump Station Upgrade	Design	$243k
Maine	Drinking Water	Kennebunk, Kennebunkport and Wells Water District - Water Meter Conversions	Design	$519k
Maine	Drinking Water	Winterport Water and Sewer District - Storage Tank Upgrade	Design	$525k
Maine	Drinking Water	Presque Isle Utilities District - Water Meter Installation	Design	$792k
Maine	Drinking Water	Maine Water Company - Biddeford/Saco Division - Treatment Plant Design and Construciton	Planning	$50.0M
			Total $ for state:	**$343,000,000**
Maryland	Clean Water	Baltimore SC-918H Back River Headworks	Under construction	$350M
Maryland	Clean Water	Baltimore WC-1211 Ashburton Reservoir	Design complete – bidding process	$150M
Maryland	Clean Water	Baltimore WC-1204 Druid Lake Tanks	Design complete – bidding process	$162M
Maryland	Clean Water	Baltimore Fullerton Reservoir	Design complete – bidding process	$78M
Maryland	Clean Water	Baltimore SC-921 Gwynns Falls Sewershed	Design	$29M
Maryland	Clean Water	Cumberland CSO Storage Phase I	Design complete – bidding process	$36M
Maryland	Clean Water	Prince George's Urban Stormwater Retrofit	Planning & design	$48M
Maryland	Clean Water	Westminster WWTP ENR Upgrade	Planning & design	$51M
Maryland	Clean Water	Conococheague WWTP ENR Upgrade	Under construction	$35M
			Total $ for state:	**$939,000,000**
Massachusetts	Wastewater	Lawrence - Sewer and Drainage Improvements to rehabilitate and replace sewer system defects and operational and maintenance issues.		$14,267,000
Massachusetts	Wastewater	Chicopee - Phase 5B Sewer Separation Project		$12,264,000
Massachusetts	Wastewater	Uxbridge - Wastewater Treatment Plant Upgrades		$35,300,000
Massachusetts	Wastewater	Hopedale - Wastewater Treatment Plant Upgrades		$6,180,000
Massachusetts		Brockton- Sewer Rehabilitation Project		$4,360,000
			Total $ for state:	**$72,371,000**
Michigan	Water-DWRF	Watermain Replacement in Burton	Final plans and Specs approved. In Bidding Process. Loan	$4,875,000
Michigan	Water-DWRF	Watermain Replacement Select area #3 within the Great Lakes Water Authority	Bid Award pending. Loan to close 3rd quarter	$17,125,000
Michigan	Water-DWRF	Cured in Place Watermain Rehab in Southgate	SERP in process, Plans and Specs in review. Loan to close	$3,250,000
Michigan	Water-DWRF	Trowbridge Area Watermain Improvement in Marquette Twp.	Draft Plans and Specs in review. Loan to close 3rd quarter	$3,265,000
Michigan	Water-DWRF	Distribution System Improvements and Service Lead Replacement in Flint	Planning, expecting alternative grant funds.	$120,000,000
Michigan	Water-DWRF	Watermain and Meter Replacement in Muskegon Heights	Planning. Loan to close 4th quarter	$5,735,000
Michigan	Wastewater-SRF	Chemical Addition for Corrosion Control in Collection System in Macomb Co Wastewater Drainage District	Plans and Specs approved. Bid selection completed Loan	$43,535,000
Michigan	Wastewater-SRF	Replace and Improve MBR and Screening and Extend Relief Sewer in Dundee	Plans and Specs Approved. In Bidding Process. Loan to c	$5,450,000
Michigan	Wastewater-SRF	Phase 2 for Influent Sewer Relief in East Lansing	Planning. Loan to close 3rd quarter	$30,230,000
Michigan	Wastewater-SRF	Lift Station Improvements in DeWitt Charter Township	Planning. May self-fund. Plan to constrsct 3rd quarter	$2,000,000
Michigan	Wastewater-SRF	Biosolids Treatment, Dewatering, Storage and Septage Receiving at the Pontiac Drainage District Wastewater Treatment	Planning approved. Design in review. Loan to close 3rd qu	$330,550,000
Michigan	Wastewater-SRF	CSO Improvements in St Joseph	SERP drafted, in Bid Phase. Loan Closing 3rd quarter	$585,000
Michigan	Wastewater-SRF	Rouge River Outfall Disinfection at the Great Lakes Water Authority Wastewater Treatment Plant	SERP clearance pending. Loan to close 3rd quarter	$37,490,000

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State	Type	Description	Stage	Amount
Michigan	Wastewater	Fraser sewer line collapse	Expect estimates in 1Q 2017	$100,000,000
Michigan	Nonpoint Source-SRF	Tree Plantings for Stormwater Retention and Pollution Control Within the Huron River Green Infrastructure Drainage District in Ann Arbor	Draft Design stage. Loan Closing 4th quarter.	$415,000
Michigan	Wastewater-SRF	Pump Station and Lagoon Improvements in Lawrence	Planning. May self-fund Plan to construct 4th quarter	$2,840,000
Michigan	Wastewater-SRF	Combined Heat and Power Improvements in Kinross Township	Planning. Loan Closing 4th quarter	$4,885,000
Michigan	Wastewater-SRF	Wastewater Treatment Plant Rehab and I/I Removal in Sewer Lines in Otsego	Planning. Loan Closing 4th quarter	$2,185,000
Michigan	Wastewater-SRF	Collection System rehab and New Headworks at Wastewater Treatment Plant in Hudson	Planning and Design. Loan closing 4th quarter	$5,000,000
Michigan	Wastewater-SRF	Sewer System rehab, Sectional and Full Cured in Place Pipeline Rehab	Planning. Loan Closing 4th quarter	$5,935,000
Michigan	Wastewater-RD	Ludington, City – Sanitary Sewer Imp Phase III	2nd quarter funding	$2,020,000
Michigan	Water – RD	Beulah, Village – Water System Imp	2nd quarter funding	$3,978,000
Michigan	Water – RD	Manton, City – Water System Imp	2nd quarter funding	$2,119,000
Michigan	Wastewater-RD	Iron Mountain-Kingsford Joint Sewage Authority – WWTP improvements	2nd quarter funding	$5,470,000
Michigan	Water – RD	Bay Mills Indian Community – Water	2nd quarter funding	$2,000,000
Michigan	Wastewater-RD	Bay Mills Indian Community – Sewer System Improvements	2nd quarter funding	$2,000,000
Michigan	Water – RD	Beecher Metropolitan District – Water System Improvements	2nd quarter funding	$6,000,000
Michigan	Wastewater-RD	Clio, City – Sewer system improvements	3rd quarter funding	$2,230,000
Michigan	Water – RD	Caledonia Township – Water system improvements	3rd quarter funding	$3,000,000
Michigan	Water – RD	Montague, City – Water system improvements	2nd quarter funding	$2,804,000
Michigan	Water – RD	Quincy, City – Water system improvements	2nd quarter funding	$2,142,000
Michigan	Water – RD	Farwell, Village – Water system improvements	2nd quarter funding	$2,283,000
Michigan	Water – RD	Gladwin, City – Water system improvements	2nd quarter funding	$1,450,000
Michigan	Wastewater-RD	Saginaw County – Hemlock storm sewer	3rd quarter funding	$8,800,000
			Total $ for state:	**$771,646,000**
Minnesota	Water	Bird Island - Watermain - SE Loop to Plant		$444,000
Minnesota	Water	Breckenridge -Treatment - Lime Softening Plant		$13,584,000
Minnesota	Water	Elbow Lake -Watermain - Replace for Division St.		$665,000
Minnesota	Water	Eveleth - Storage - Recondition West Water Tower		$673,149
Minnesota	Water	Frazee-Watermain - Replace Cast Iron Mains		$676,710
Minnesota	Water	Glyndon Watermain - Looping Two Areas		$535,000
Minnesota	Water	Greenbush- Watermain - Relocation Along Hwy 32		$155,000
Minnesota	Water	Heron Lake - Other - Connect to Red Rock Rural Water		$1,580,769
Minnesota	Water	Lowry -Storage - New 50,000 Gallon Tower		$675,583
Minnesota	Water	Morris - Treatment - New Softening Plant		$19,526,530
Minnesota	Water	New London - Watermain - Repl Various Blocks		$590,000
Minnesota	Water	Randall - Treatment - Remove Nitrate		$1,595,200
Minnesota	Water	Rice Lake - Watermain - East Calvary Road Loop		$2,908,538
Minnesota	Water	Saint James -Watermain - Repl TH 4		$2,900,000
Minnesota	Water	Stewart - Watermain - Looping		$311,021
Minnesota	Water	Stewart - Watermain - Replacement		$1,123,799
Minnesota	Wastewater	Chrisholm - Rehab collection system		$3,904,284
Minnesota	Wastewater	Elbow Lake - Rehab collection system		$665,000
Minnesota	Wastewater	Frazee - Rehab collection system		$418,506
Minnesota	Wastewater	Saint James - Rehab collection system		$2,900,000
Minnesota	Wastewater	Waverly - Rehab collection Ph 2. N.Shore Drive		$1,941,206
			Total $ for state:	**$57,773,295**
Missouri	wastewater	MSD - Deer Creek Tunnel, Schuetz Sanitary Relief Sewer, and Gaslight Sewer Improvements	Bidding, ready to construct subject to funding	$215.7 M
Missouri	wastewater	St. Joseph - Blacksnake Stormwater Separation Project	Planning & design	$35.3 M
Missouri	wastewater	Center Creek Wastewater Treatment Board - Wastewater Treatment improvements	Design	$4.9 M
Missouri	wastewater	Chamois Wastewater Treatment improvements	Bid awarded	$2.4 M
Missouri	wastewater	Ashland- New WWTP to meet permit limits and collection improvements	Planning & design	$6.6 M
Missouri	wastewater	Springfield - Sanitary Sewer Overflow and I/I Rehabilitation Project	Planning & design	$6.36 M
Missouri	wastewater	Silex -WWTP upgrades construct land app drip irrigation system	Out to bid	$250 K
Missouri	wastewater	Moscow Mills- pump station interceptor & abondon NW TP and reroute influent to increase capacity	Design	$2.3 M

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State	Type	Description	Stage	Amount
Missouri	wastewater	East Lynne - construction of no discharge land application system	Planning & design	$865 K
Missouri	wastewater	Meadville- construction of no discharge land app WWTP system	Planning & design	$950 K
Missouri	water	Campbell-distribution upgrades, tower maintenance	Design	$2.6 M
Missouri	water	Marshfield-2 new storage towers, tower rehabilitation, and addition of permanant chlorination	Planning & design	$3.9 M
Missouri	water	Scotland County #1-Distribution upgrades	Planning & design	$2.2 M
Missouri	water	Osage County #1-Distribution upgrades and new storage tank	Design	$2.0 M
Missouri	water	Osage County #3- distribution upgrands and storage rehabilitation	Design	$630 K
Missouri	water	Madison County #1-distribution upgrades, new well and new storage tank	Planning & design	$3.7 M
Missouri	water	Jackson #13-Distribution upgrades	Design	$3.0 M
Missouri	water	Clarksville-new well	Design	$270 K
Missouri	water	Bradshear-new storage tank	Planning & design	$800 K
Missouri	water	Missouri City-distribution upgrades	Planning & design	$1.1 M
			Total $ for state:	**$295,825,000**
Montana	DWSRF	City of Big Timber: WTP improvements		$2.5M
Montana	DWSRF	Billings Heights WSD: storage improvements		$2.2M
Montana	DWSRF	City of Conrad: distribution improvmeents		$1.8M
Montana	DWSRF	Dry Prairie Regional: distribution improvmeents		$2.8M
Montana	DWSRF	Dry Red Water Regional: distribution improvmeents		$70K
Montana	DWSRF	Town of Circle: distribution improvmeents		$305K
Montana	DWSRF	Town of Froid: storage improvements		$261.2K
Montana	DWSRF	Town of Fromberg: general improvements		$422.5K
Montana	DWSRF	City of Laurel: WTP improvements		$3.3M
Montana	DWSRF	City of Ronan: WTP improvements		$1M
Montana	DWSRF	Wilsall WSD: storage improvements		$203K
Montana	Municipal Water Pollution Control	Vaughn lagoon upgrade		$2.1M
Montana	Municipal Water Pollution Control	Red Lodge Force Main and Lift Station		$1.3M
Montana	Municipal Water Pollution Control	Polson new WWTP		$14.3M
Montana	Municipal Water Pollution Control	Colstrip Phase 1 WWTP Upgrade		$1M
Montana	Municipal Water Pollution Control	Cut Bank new WWTP		$8M
Montana	Municipal Water Pollution Control	Livingston WWTP Upgrade		$8M
Montana	Municipal Water Pollution Control	West Glendive Force Main and Lift Station		$3M
Montana	Municipal Water Pollution Control	Lewiston Riverdale Collection System		$175K
Montana	Municipal Water Pollution Control	East Clark Street Collection System		$463K
Montana	Municipal Water Pollution Control	Big Timber Lagoon Upgrade		$3.5M
Montana	Municipal Water Pollution Control	Billings WWTP		$65M
			Total $ for state:	**$193,699,700**
Nebraska	CWSRF	Remove nitrates from groundwater aquifer that is used for drinking water in Hastings, NE	Under construction	$46M
Nebraska	DWSRF	WTP Rehabilitation and Water Main Replacement in Omaha, NE	Start construction April 2017	$30M
Nebraska	CWSRF	WWTF upgrade; need final plans and specifications; are under an Order to upgrade facility in Fremont, NE	Plans expected by May 31, 2017	$26M
Nebraska	CWSRF	Construction of new WWTF in York, NE	Issued construction permit	$23M
Nebraska	CWSRF	Missouri River WWTP Improvement Phase B2 in Omaha, NE	Under construction	$15M
Nebraska	CWSRF	Routes storm water through ponds in park to keep out of the combined sewer system in Omaha, NE	Start construction April 2017	$11M

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State	Type	Description	Stage	Amount
Nebraska	CWSRF	Construction of new WWTF in Dakota City, NE	Out to bid	$10M
Nebraska	CWSRF	Sewer separation for 416 acre area, storm water retention facilities and wetlands in Omaha, NE	Start construction Sept 2017	$6.6M
Nebraska	CWSRF	Construction of collection system, lift station and force main in Gretna, NE	Issued construction permit	$5,147,000
Nebraska	DWSRF	Replace water tower, add well and transmission mains, and upgrade Water Treatment Plant at Adams, NE	Start construction Sept 2017	$3,832,316
Nebraska	DWSRF	Upgrade to Radio-Read water meters for Kearney, NE	Approved Pending Funding	$1.5M
Nebraska	DWSRF	New water well with new transmission main for Springfield, NE	Start construction Sept 2017	$1,112,000
Nebraska	CWSRF	Improvement to sanitary sewer system to reduce wastewater flows and install water meters in Clearwater, NE	Plans expected by Jan 31, 2017	$1M
Nebraska	DWSRF	Replace/Loop water main, replace water meters, and construct blending wells due to uranium and nitrate issues in Oshkosh, NE	Approved Pending EPA deviation approval	$876,400
Nebraska	DWSRF	Replace water well due to Selenium levels in Fullerton, NE	Start construction Sept 2017	$816,500
Nebraska	CWSRF	Rebuild the town's two-cell lagoon system and add a third cell in Hardy, NE	Agency Reviewing Plans & Specs	$700K
Nebraska	DWSRF	Interconnection with Washington County Rural Water No. 2 and a new public works building at Fort Calhoun, NE	Approved Pending Funding	$643,800
Nebraska	DWSRF	Water main replacements for Trenton, NE	Approved Pending Funding	$499,600
Nebraska	CWSRF	Construct 2-cell complete retention lagoon system in Gilead, NE	Funding Awarded Sept 2016	$473,600
Nebraska	DWSRF	Sandblast and repaint the interior/exterior of water tower and other appurtenances at Clarkson, NE	Approved Pending Funding	$320K
			Total $ for state:	**$184,521,216**
Nevada	Water	Dayton: 10-mile water storage tank	Design	$2.2M
Nevada	Water	Dayton: Rolling "A" Well #21	Design	$1.8M
Nevada	Water	Douglas County: Replacement of 100 feet of intake pipe & addition of in-lake booster pump for Cave Rock	Design approved for construction	$230K
Nevada	Water	Ely: Addition of 12-inch water main to supplement water to the City's main pressure zone	Design	$1,485,000
Nevada	Water	Fernley: System rehabilitation including waterline replacement, tank recoating, well VFD upgrade, fire hydrant replacement, pipe bridge rehabilitation	Design	$905K
Nevada	Water	Fernley: Systemwide meter rehabilitation/improvements	Design	$436K
Nevada	Water	Goldfield: Replacement of 62,590 feet of 6-inch AC transmission main from well field to treatment plant	Design	$5,461,815
Nevada	Water	Las Vegas: Water main replacements throughout City	Design	$13,209,100
Nevada	Water	Lovelock: 19,090 feet replacement/addition of transmission main for looping Lower Valley	Design	$1,356,315
Nevada	Water	Lovelock: Replacement of 58,080 feet of 16-inch AC transmission main from well field to storage tanks	Design	$3,315,490
Nevada	Water	N Las Vegas: West Cheyenne well replacement	Design	$2.5M
Nevada	Water	Reno/Sparks/Washoe Co (TMWA): Verdi small systems consolidation	Design	$1M
Nevada	Wastewater	Dayton: 12" effluent pipeline & new 0.5 MGD RIB	Design	$980K
Nevada	Wastewater	Dayton: Sludge dewatering facility	Design	$1.65M
Nevada	Wastewater	Douglas Co: Replacement of deteriorated Meridian lift station	Design	$300K
Nevada	Wastewater	Fernley: Donner Trails lift station	Design	$1,070,565
Nevada	Wastewater	N Las Vegas: Relinging of 30,000 feet of deteriorated concrete sanitary sewer	Design	$12M
Nevada	Wastewater	N. Las Vegas: NE interceptor - 5 miles of sanitary sewer to replace septic systems & provide for some growth	Design	$30M
Nevada	Wastewater	Sparks: Sewer main rehabilitation in the City	Design	$10,240,000
Nevada	Wastewater	Tonopah: Construct additional treatment, storage, & reuse pipeline to serve reclaimed water to the lower zone of town	Design	$5,622,877
			Total $ for state:	**$49,737,162**

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State	Type	Description	Stage	Amount
New Hampshire	Drinking Water Infrastructure	UNH/Durham Water Treatment Plant: UNH's water treatment plant was constructed in 1934 and is one of the oldest in NH. The current plant is in a vulnerable location next to the Oyster River and needs to be rebuilt to ensure safe drinking water to the UNH campus and Durham, NH. NHDES is also working with UNH/Durham/Lee on extending a water line to MtBE contaminated properties at the Lee traffic circle. UNH has awarded a design build contract and hopes to start actual construction of a replacement facility in 2017. Jobs will be created during construction and with the purchase of equipment manufactured in American.	Design phase with construction starting in 2017	$20M
New Hampshire	Drinking Water Infrastructure	Litchfield Merrimack River Crossing: Pennichuck Water Works needs an additional Merrimack River crossing and a new Merrimack River intake and connecting pipe to the treatment plant to ensure that sufficent drinking water is available to connect hundreds of PFC contaminated properties in Litchfield to public drinking water. The upgraded river crossing will also make future water extensions and development projects feasible beyond the immediate needs of the Litchfield connections.	Design phase	$8M
New Hampshire	Drinking Water Infrastructure	Crown Point Road Area Water Line Project in Rochester: The Crown Point Road area has an MtBE and BTEX contamination problem and a water line is proposed to address that problem. Along the water line path there is a significant problem with high naturally occurring concentrations of metals in groundwater in multiple communities that would also be addressed.	Conceptual design completed	$4 mil
New Hampshire	Drinking Water Infrastructure	Southern NH Regional Water System Interconnection Solution: Salem needs to have additional drinking water capacity, Plaistow would like to convert its fire supression system to a drinking water system and Windham would like to be able to connect the Exit 3 area to a public water system due to low aquifer yields. Severe drought in 2016 has impacted all of these communities and has created the need for a regional solution for the supply of safe and reliable drinking water.	Conceptual design phase	$14M
New Hampshire	Drinking Water Infrastructure	Epping Water Line Extension: NHDES would like to extend a water line from the Epping Water District to 35 contaminated water wells associated with the Epping Auto Salvage and Tim & Joni salvage yard sites.	Discussion phase	$2 mil
New Hampshire	Drinking Water Infrastructure	Coakley Landfill Water Line Project: There is interest in bringing water to properties surrounding the Coakley Landfill superfund site.	Discussion phase	$1 mil
New Hampshire	Dams	Reconstruction of Ossipee Lake Dam - Spillway of the 125-year-old dam has deteriorated and in need of repair. Reconstruction will increase the discharge capacity of the dam and reduce flood damages during storm events.	Fully designed and "shovel ready"	$4.9M
New Hampshire	Dams	Mendums Dam Phase III Construction/High Hazard Dam - construction of a stability butress on the downstream face of this 175-year-old dam to keep it from failing and inundate homes and major infrastructure downstream	Planning and Design	$2M
New Hampshire	Dams	Baker River Flood Control Dams/High Hazard Dams - Modifications necessary so that these flood control dams can safely store/pass that design floods without failing	Planning and Design	$5.1M
New Hampshire	Dams	Reconstruction of state-owned Bow Lake Dam (High Hazard), Chesham Pond Dam (High Hazard), Howe Reservoir Dam (High Hazard) and Lake Armington Dam (Significant Hazard) - Repairs to these deteriorated sate-owned dams to protect lives and property downstream		$3.5M
			Total $ for state:	**$64,500,000**
New Jersey		All projects listed here: http://www.nj.gov/dep/dwq/pdf/NJEIFP_Project_List.pdf		
New Mexico	DWSRF; water	City of Farmington: Zone 2P replacement of cast iron water lines	Funding approved	$3.6M
New Mexico	DWSRF; water	Town of Red River: Replacement of storage tank and install booster station	Funding approved	$1.7M
New Mexico	DWSRF; water	Dona Ana Mutual Domestic Water Consumers Association (MDWCA): Install new well, tanks, and lines to regionalize with and manage the out of compliance Picacho Hills water system	Under construction	$3M
New Mexico	State funds; water	Cloudcroft Water System: Lead service line replacement	Pending funding	$0.8M
New Mexico	State funds; water	Blanco NDWCA: Emergency connection from Harvest Gold water system to Bloomfield water supply in order to be able to serve compliant water	Emergency state funding approved	$0.085M

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State	Type	Description	Stage	Amount
New Mexico	State funds; wastewater	City of Carlsbad: WWTP effluent reuse phase 5B	Pending funding	$2M
New Mexico	CWSRF; wastewater	Alburquerque Bernalillo County Water Users Association: Wastewater collection to eliminate septic systems	Planning and Design	$1.9M
New Mexico	CWSRF; wastewater	Village of Bosque Farms: Addition of second clarifier to add capacity; build and equip new sludge processing	Planning and Design	$1.8M
New Mexico	State funds	City of Clovis: Water Conservation project, effluent reuse	Pending funding	$2.8M
New Mexico	CWSRF; wastewater	Anthony Water and Sanitation DistrictReplace blowers and UV disinfection equipment for increased flows	Pending funding	$1.3M
New Mexico	CWSRF; wastewater	San Juan County: Wastewater colection system to eliminate septic systems	Planning and Design	$6.1M
New Mexico	State funds	City of Portales: Water storage system improvements	Pending funding	$3M
New Mexico	CWSRF; wastewater	City of Santa Fe: Rehabilitate existing sewer lines with trenchless technologies	Pending funding	$3M
New Mexico	CWSRF; wastewater	Village of Eagle Nest: Close lagoon and remove sludge, liner and shed from site	Pending funding	$1M
New Mexico	CWSRF; wastewater	Bluewater Water and Sanitation District: Construct a storage lagoon and update treatment plant	Pending funding	$1.4M
New Mexico	State funds	City of Jal: Lake well project to offset potable water use	Pending funding	$0.58M
New Mexico	CWSRF; wastewater	Town of Red River: Replace and install Rotating Biological Contactors	Pending funding	$4.7M
New Mexico	CWSRF; wastewater	Town of Red River: Upgrade sludge handling system	Pending funding	$6M
New Mexico	State funds; water	City of Moriarty: New well	Pending funding	$1M
New Mexico	State funds; water	North Star MDWCA: Replace pipe	Pending funding	$0.4M
New Mexico	State funds; water	North Star MDWCA: Replace water meters	Pending funding	$0.4M
New Mexico	State funds; wastewater	Village of Cimarron: New Wastewater Treatment Plant and Disposal system	Pending Funding	$4M
			Total $ for state:	**$59,655,000**
New York	Water	Nassau County is planning design and construction of facilities to divert the treated wastewater from the Bay Park treatment plant to the Cedar Creek treatment plant and its ocean outfall.	Feasibility study to commence in February 2017. Planning design and construction to take five years with completion in 2022	$354M
New York	Water	Suffolk County is in the process of planning and design to extend sewers to three dense areas and is building a new wastewater treatment plant at the Forge River watershed; additional work includes the replacement of an aging ocean outfall pipe and implementing innovative/advanced onsite wastewater treatment units.	Planning and design are underway for all components except the ocean outfall pipe replacement are ready to go out to contract and notice to proceed by July 2017. County has secured about $325 million in grants and the rest in loans, but additional funding will be necesary	$383M
New York	Water	Binghamton and Johnson City have a jointly owned wastewater treatment plant that has been severely damaged by flooding in 2006 and by Hurricanes Irene and Lee. This project will rebuild the plant while adding resiliency to protect against future flood events.	Construction underway; completion expected in August 2017. Awarded Grant.	$220 M
New York	Water	Oneida County is commencing a multiphase project that will eliminate sanitary sewer overflows to the Mohawk River, which is of significant environmental concern, while supporting the proposed Marcy Nanocenter. Located at SUNY Polytechnic Institute, the Marcy Nanocenter is a 450-acre greenfield site being developed for the semiconductor industry and is the largest shovel-ready semiconductor site in the world.	Construction is ongoing through 2018. Awarded Grant.	$117M
New York	Water	The City of Schenectady has experienced sewer overflows during wet weather. This project will repair some sewer lines and a pump station, as well as add additonal capacity and upgrades to the treatment plant.	Construction will occur between Spring, 2017 through 2020. Awarded Grant.	$23.8M
New York	Water	The Village of Wappingers Falls is upgrading their wastewater treatment plant and sewer system. Originally built in the 1960's, the upgraded plant and sewers will provide better service and cleaner water.	Construction at treatment plant is complete; Sewer repair work is ongoing, expected to be complete in Summer 2017. Awarded Grant.	$20M
New York	Water	This project involves the consolidation of public water supply to serve contaminated wells as well as extend the distribution system in the Town of Orleans.	Construction through 2018. Awarded Grant.	$14M

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New York	Water	Buffalo Sewer Authority: Planning, design and construction of facilities to treat the discharge from the Smith Street CSO prior to entering the receiving water in order to improve water quality in the Buffalo River.	Construction during 2017 and into 2018. Awarded Grant.	$12M
New York	Water	The hamlets of Leeds and Jefferson Heights have failing septic systems that have resulted in unpleasant odors, potentially unhealthy conditions, and impacts on both surface and ground waters. This project will construct new sewers that will drain to the Village of Catskill wastewater treatment plant.	Construction ongoing through December, 2017. Awarded Grant.	$12.6M
New York	Water	The sewers of Ocean Beach regularly overflow when it rains. To solve this problem, the Village will replace the existing sanitary sewers and build a new stormwater collection sewer system.	Construction to start in Spring 2017 and will be complete in the Spring of 2018. Awarded Grant.	$12.4M
New York	Water	Construction of water storage tanks and replacement of aged water mains in the City of Poughkeepsie.	Construction through 2018.. Awarded Grant.	$11.7M
New York	Water	Wayne County's four Lake Ontario bays are Sodus Bay, Port Bay, East Bay, and Blind Sodus Bay. This project will provide sewers to the Port Bay area in the Town of Wolcott, allowing septic tanks to be abandoned and improving the water quality in Port Bay. Wayne County is pursuing similar projects in the other 3 Bays.	Construction to start in April 2017; completion expected in August 2018. Awarded Grant.	$10.5M
New York	Water	The Town of Babylon will begin resiliency and redundancy efforts and the upgrading of mains, a new water treatment plant, storage, well, pump station, emergency power as well as the elevating of critical components above flood level.	Construction starting in late 2016.. Awarded Grant.	$6.9M
New York	Water	The Village of Phoenix is upgrading their wastewater treatment plant and sewer system. Originally built in the 1970's, the upgraded plant and sewers will provide better service and cleaner water.	Construction underway; Completion expected in 2017. Awarded Grant.	$6.8M
New York	Water	The Villages of Watkins Glen and Montour Falls currently own and operate their own independent wastewater treatment plants, both discharging into Seneca Lake. The plants are in need of significant upgrades. The proposed project will remove the two existing plants from service and construct a single regional wastewater treatment facility at a new location. This project is a regional priority of the Finger Lakes Region. Upon completion, the waterfront property where the Watkins Glen plant is currently located on Seneca Lake will be available for redevelopment.	Construction to begin in Spring 2017; completion slated for December 2018. Awarded Grants.	$6.2M
New York	Water	The Village of Lake Placid will make improvements to the sanitary sewer system and install stormwater management practices on Main Street. The project will reroute upstream flow to a new sewer main, decommission an old pump station and install green infrastructure to improve water quality in Mirror Lake. Main Street runs along the perimeter of Mirror Lake and is the Village's business area and a major draw for tourists to the Village and the Adirondack region.	Construction scheduled to occur between August 2016 through December 2018. Awarded Grants.	$6.2M
New York	Water	New wells and treatment, a new storage tank and a new distribution system in the Town of Oneonta.	Construction start April 2017.. Awarded Grant.	$6M
New York	Water	Ellicottville is upgrading and expanding their wastewater treatment plant. This will help the growth of the community and the skiing resorts in the region.	Construction underway; completion expected in Spring 2017. Awarded Grant.	$5.76M
New York	Water	Marcellus is upgrading their wastewater treatment plant. Originally built in the 1970's, the upgraded plant will provide better service and cleaner water.	Construction to commence March 2017; completion in May 2018. Awarded Grant.	$5.5M
New York	Water	Replacement of existing water distribution mains, along with associated hydrants, valves and water service connections on select streets within the Village of Wappingers Falls.	Under construction through 2019.. Awarded Grant.	$5M
			Total $ for state:	**$1,239,360,000**
North Carolina	wastewater	Boonville - WWTP Improvements		$850,000
North Carolina	drinking water	Bertie Co Water District II - Installation of remote telemetry controls		$1,300,000
North Carolina	drinking water	East Spencer - Water line replacements and new water main		$2,400,000
North Carolina	wastewater	Henderson - Sewer Improvements		$1,800,000
North Carolina	wastewater	Hickory - Sewer System Rehabilitation		$3,500,000
North Carolina	drinking water	Lenior - WTP Improvements		$6,000,000
North Carolina	drinking water	Marshall - Water line replacements		$2,000,000
North Carolina	drinking water	Maxton - Water main replacements		$2,600,000
North Carolina	wastewater	Morehead City - Pump Station and Force Main		$2,500,000
North Carolina	wastewater	Raleigh - Sanitary Sewer Improvements		$37,500,000
North Carolina	wastewater	Stanley - Sewer Interconnection to Gastonia		$2,750,000
North Carolina	wastewater	Thomasville - Sanitary Sewer Improvements		$4,800,000
North Carolina	drinking water	Warsaw -Replacement of water lines		$3,000,000

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North Carolina	wastewater	Williamston - Sanitary Sewer Improvements		$4,200,000
North Carolina	wastewater	Winston Salem - Power Generation System at WWTP		$6,000,000
North Carolina	wastewater	Yadkin Valley Sewer Authority- WWTP Rehabilitation Project		$2,300,000
			Total $ for state:	**$83,500,000**
North Dakota	Wastewater	Grand Forks- Disinfection improvements	Design phase	$7,500,000
North Dakota	Wastewater	Harwood- Sanitary sewer main and forcemain improvements	Planning/Design pending fuding	$500,000
North Dakota	Wastewater	Jamestown- Lift station SCADA replacement	Planning	$420,000
North Dakota	Wastewater	Jamestown- Raker replacement, building update, and possible addition of grit screening equipment	Design phase	$2,751,200
North Dakota	Wastewater	Jamestown- Sanitary landfill expansion	Planning	$4,800,000
North Dakota	Wastewater	Jamestown- Storm sewer rehabilitation	Planning	$2,000,000
North Dakota	Wastewater	Jamestown- Storm sewer rehabilitation	Planning	$5,800,000
North Dakota	Wastewater	Jamestown- Wastewater mechanical treatment facility rehabilitation	Planning	$2,500,000
North Dakota	Wastewater	Kindred- Lift station, lagoon and forcemain	Planning/Design pending fuding	$3,600,000
North Dakota	Wastewater	Pick City- Lagoon expansion	Planning/Design pending fuding	$1,700,000
North Dakota	Wastewater	Wahpeton - Sanitary sewer improvements	Design phase	$5,244,000
North Dakota	Water	Enderlin- WM Replacement	Planning/Design pending fuding	$775,000
North Dakota	Water	Fargo- Sheyenne intake and pump station reliability improvements	Design phase	$3,886,000
North Dakota	Water	Fargo- water tower improvements	Design phase	$6,167,000
North Dakota	Water	Garrison - WTP & Supply	Design phase	$5,000,000
North Dakota	Water	Hazelton - Well House Improvements	Planning	$200,000
North Dakota	Water	Jamestown - water meter replacement	Planning	$2,677,000
North Dakota	Water	Jamestown- Filter bay renovations and media replacement	Planning	$840,000
North Dakota	Water	Jamestown- Watermain replacement	Planning	$1,759,000
North Dakota	Water	Jamestown- Watermain replacement(WTP to state hospital)	Design phase	$2,751,000
North Dakota	Water	Jamestown- WTP SCADA improvements	Planning	$455,000
North Dakota	Water	Lisbon- WM Replacement	Planning	$2,500,000
North Dakota	Water	Mapleton- Water Tower	Planning/Design pending fuding	$1,400,000
North Dakota	Water	Michigan - Water Tower Rehab	Planning	$1,400,000
North Dakota	Water	Oriska- Pump House	Planning	$550,000
North Dakota	Water	Sawyer- Water main replacement	Planning/Design pending fuding	$500,000
North Dakota	Water	Sykeston- Water tower and mains	Planning	$2,400,000
North Dakota	Water	Turtle Lake- Water tower replacement	Planning	$3,100,000
North Dakota	Water	Wing- Water tower replacement	Design phase	$1,000,000
North Dakota	Water and wastewater	Argusville- water and sewer replacement	Planning	$2,000,000
North Dakota	Water and wastewater	Cando- water and sewer replacement	Planning	$5,000,000
North Dakota	Water and wastewater	Cooperstown- water and sewer replacement	Planning/Design pending fuding	$500,000
North Dakota	Water and wastewater	Glen Ullin- water and sewer replacement	Planning/Design pending fuding	$5,000,000
North Dakota	Water and wastewater	Langdon- water and sewer replacement	Planning	$5,000,000
North Dakota	Water and wastewater	Makoti - water and sewer replacement	Planning	$2,000,000
North Dakota	Water and wastewater	McClusky - water and sewer replacement	Planning	$5,000,000
North Dakota	Water and wastewater	Medina - water and sewer replacement	Design phase	$7,000,000
North Dakota	Water and wastewater	North Prairie Rural Water District - upgrade transmission main to reservoir 9	Planning	$1,500,000
North Dakota	Water and wastewater	North Prairie Rural Water District - water supply to Plaza	Planning	$4,330,000
North Dakota	Water and wastewater	North Prairie Rural Water District - watermain upgrade in Surrey	Planning	$275,000
North Dakota	Water and wastewater	Southeast Water Users District - System Improvements (Arsenic)	Approved pending funding	$4,000,000

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State	Type	Description	Stage	Amount
North Dakota	Water and wastewater	Towner - water and sewer replacement	Planning	$2,000,000
North Dakota	Water and wastewater	Upham - water and sewer replacement	Planning	$2,000,000
North Dakota	Water and wastewater	Wallhalla - water and sewer replacement	Planning	$1,500,000
			Total $ for state:	**$121,280,200**
Ohio	Water	City of Napoleon WTP improvements to address HABs	Design approval pending	$14.5M
Ohio	Water	City of Avon Lake interconnection with City of Elyria to address HABs	Mid-design stage	$30M
Ohio	Water	Trumbull Co. water line extension to regionalize West Farmington	Initial design stage	$12.5M
Ohio	Water	City of Columbus projects (2) to improve Hap Cremean WTP	Design submittal	$25M
Ohio	Water	City of Cincinnati projects (13) to replace aging water mains	Awaiting project approval/funding	$21.4M
Ohio	Water	City of Athens WTP rehabilitation and upgrade	Awaiting design submittal	$6M
Ohio	Water	Village of Crookswille water line replacement project	Design approved	$7.2M
Ohio	Water	City of Saint Marys WTP replacement project	Initial design stage	$21.9M
Ohio	Water	City of Cleveland water service improvement (Richfield area)	Awaiting design submittal	$6.5M
Ohio	Water	SW Licking Comm. W&S District new WTP installation	Awaiting design submittal	$15M
Ohio	Wastewater	NE Ohio Reg. Sewer District Doan Valley Storage Tunnel to control CSOs	Received final design	$150M
Ohio	Wastewater	Hamilton Co. Metropolitan Sewer District Lick Run Valley Conveyance System CSO and green infrastructure project	Awaiting design submittal	$139.5M
Ohio	Wastewater	City of Columbus "Blueprint" projects (8) to control CSOs through I/I elimination and green infrastructure	Awaiting approval/out to bid	$32.8M
Ohio	Wastewater	Programs for 51 county health departments to repair or replace failed home sewage treatment systems	Awaiting plan approval	$13.1M
Ohio	Wastewater	Perry Co. – Moore's Junction project to provide sanitary sewers and a WWTP to a distressed Appalachian community	Awaiting design submittal	$2.9M
Ohio	Wastewater	City of Piqua WWTP capacity expansion and SSO elimination	Design under review	$48.5M
Ohio	Wastewater	City of Toledo underground CSO storage basin	Awaiting design submittal	$76.4M
Ohio	Wastewater	Hocking Co. – Murray City project to provide sanitary sewers and a WWTP to a distressed Appalachian community	Initial design stage	$5.6M
Ohio	Wastewater	City of Washington Court House WWTP expansion to eliminate wet-weather sewage bypassing	Planning/design stage	$26M
Ohio	Wastewater	Athens Co. – US Rte 50 corridor project to install sewers and a WWTP to serve over 3000 people	Design being completed	$25.65M
			Total $ for state:	**$680,450,000**
Oklahoma	DWSRF	Construct waterline to supply Town of Arcadia.	Funding approved; plans & specifications (P&S) approved	$2.5M
Oklahoma	DWSRF	Construct waterline to supply Sequoyah Co. RWD #5.	Construction contracts signed	$885K
Oklahoma	DWSRF	Construct treatment plant, tanks, pump stations, and waterlines to regionalize 5 small water systems.	Out to bid	$16M
Oklahoma	DWSRF	Replace Atoka waterline surge tanks	Funding approved	$30M
Oklahoma	DWSRF	Draper water treatment plant pump station and intake improvements	Funding approved	$17M
Oklahoma	DWSRF	Hefner water treatment plant electrical loop improvements	Funding approved	$7.5M
Oklahoma	DWSRF	Draper water treatment plant superstraper improvements	Funding approved; P&S approved	$2M
Oklahoma	DWSRF	Waterline replacements	Funding approved	$800K
Oklahoma	DWSRF	Water treatment plant improvements	Planning & design	$31M
Oklahoma	DWSRF	Construct water treatment plant to reduce arsenic and fluoride	Planning & design	$4.4M
Oklahoma	CWSRF	Wastewater treatment plant improvements and engineering	Planning & design	$3.5M
Oklahoma	FAP-DWSRF	Purchasing easements/design/environmental; construct waterline from Kaw Lake to Enid.	Planning & design	$400M
Oklahoma	CWSRF	Construct new Sequencing Batch Reactor wastewater treatment plant	Planning & design	$10M
Oklahoma	CWSRF	Lift station projects	Planning & design	$6.1M
Oklahoma	CWSRF	Wastewater treatment plant improvements	Planning & design	$3.5M
Oklahoma	CWSRF	Wastewater treatment plant improvements	Funding approved	$21M
Oklahoma	CWSRF	Lift station projects	Funding approved	$10M
Oklahoma	CWSRF	Construct new mechanical wastewater treatment plant	Planning & design	$21M
Oklahoma	CWSRF	Wastewater treatment plant improvements, sewer lines, and new interceptor	Planning & design	$38M

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State	Type	Description	Stage	Amount
Oklahoma	CWSRF	Construct sewer lines and acquisition of easements	Planning & design	$17M
			Total $ for state:	**$642,185,000**
Oregon	Wastewater	Installation of system to replace existing community septic with connection to wastewater treatment plan in Lincoln City.	Ready to proceed.	$600,000
Oregon	Wastewater	Purchase of land for effluent irrigation by Green Sanitary District to meet the excess thermal load limits during the summer months and eliminate summer discharge to the South Umpqua River.	Ready to proceed.	$600,000
Oregon	Wastewater	Expansion of irrigation system for treated effluent and rehab of interceptor sewer line by City of Dalles.	Ready to proceed.	$7,000,000
Oregon	Wastewater	Extension of sewer collection system and connection to main for City of Madras.	Ready to proceed.	$1,150,000
			Total $ for state:	**$9,350,000.00**
Rhode Island	Wastewater	Town of Middletown – Replacement of Undersized Sewers (Town/City Line)	Final Design Complete	$3.2M
Rhode Island	Wastewater	Town of Middletown – Upper Easton's Point Sewer Repairs	Final Design Complete	$3M
Rhode Island	Wastewater	Town of Middletown – Bailey Brook Interceptor Repair/Lining	Final Design Complete	$1M
Rhode Island	Wastewater	Narragansett Bay Commission – Greenville Avenue Sewer Extension	Final Design Under Review	$9.5M
Rhode Island	Wastewater	Narragansett Bay Commission – Contract 814.00C Bucklin Point WWTF Digester Gas Piping Replacement	Final Design Underway	$875K
Rhode Island	Wastewater	City of Newport – Marsh St. Outfall Stormwater Collection System Improvements	Final Design Underway	$2.5M
Rhode Island	Wastewater	City of Newport – Catch Basin Separation (2017)	Final Design Underway	$500K
Rhode Island	Wastewater	City of Newport – Ruggles Ave. Pump Station and Force Main Repair	Bid Awarded	$587K
Rhode Island	Wastewater	City of Newport – Sanitary Sewer Repairs	Bid Awarded	$1.5M
Rhode Island	Wastewater	Town of North Kingstown – Wickford Village Sewer Extension	Out To Bid	$4.6M
Rhode Island	Wastewater	Town of Warren – WWTF Nutrient Removal Upgrade and Miscellaneous Improvements	Final Design Underway	$20M
Rhode Island	Wastewater	Warwick Sewer Authority – NW Gorton Pond Sewer Extension	Final Design Underway	$6M
Rhode Island	Wastewater	Warwick Sewer Authority – Gov. Francis III Sewer Extension	Approved Plans & Specs	$5.8M
Rhode Island	Wastewater	Warwick Sewer Authority – Bayside Sewer Extension	Final Design Underway	$21M
Rhode Island	Wastewater	Warwick Sewer Authority – East Natick Phs. 3 Sewer Extension	Approved Plans & Specs	$1.6M
Rhode Island	Wastewater	Warwick Sewer Authority – Contract 95: Primary Settling Tank Rebuild	Final Design Under Review	$300K
Rhode Island	Wastewater	Warwick Sewer Authority – Cedar Swamp Pump Station Upgrade	Final Design Underway	$750K
Rhode Island	Water	Coventry Men's Club – new well	Final Design Approved	$10K
Rhode Island	Water	Cumberland Water – two new production wells	Borrowing in Spring 2017 for design, environmental review and construction	$6M
Rhode Island	Water	City of East Providence Water – water storage tank painting	Final Design Under Review	$2.2M
Rhode Island	Water	City of Newport – Water Main Improvements	Bid Awarded	$3.3M
Rhode Island	Water	City of Newport – Lawton Valley Reservoir Dam Repairs	Final Design Underway	$1.1M
Rhode Island	Water	Portsmouth Water – Union Avenue Pump Station Rebuild	Borrowing in Spring 2017 for design, environmental review and construction	$1.75M
Rhode Island	Water	Providence Water – water main replacement	Borrowing in Spring 2017 for construction	$18M
Rhode Island	Water	Woonsocket Water – design and initial construction of new water treatment plant	Out to bid for a DBO team	$40M
			Total $ for state:	**$155,072,000**
South Carolina	Wastewater	Town of Chapin Wastewater Treatment Plant Upgrade and Expansion. Upgrade/expansion to meet NPDES limits		$12,000,000
South Carolina	Wastewater	Greenville - Renewable Water Resources: Downtown Wastewater Conveyance Improvements. Underground sewer tunnel to convey wet weather flows to prevent SSOs		$50,000,000
South Carolina	Water	City of Rock Hill Drinking Water Treatment Plant and Lake Wylie Raw Water Intake Upgrade. DBP reduction, rehabilitation of aging infrastructure and WTP improvements		$42,000,000
South Carolina	Water	City of Walhalla 4.0 MGD Drinking Water Plant and New Water Intakte. Upgrade 52 year old plant to meet Drinking Water Standards		$17,000,000
			Total $ for state:	**$121,000,000**
South Dakota	Storm Sewer	Sioux Falls - Drainage improvements	Planning & design	$5,646,000
South Dakota	Wastewater	Sturgis - Wastewater treatment facility	Construction funding requested	$16,000,000
South Dakota	Wastewater	Sioux Falls - Primary digester mixing systems improvements	Ready to bid	$11,000,000
South Dakota	Water	Lewis & Clark RWS - drinking water supply system	Construction funding requested	$43,000,000

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State	Type	Description	Stage	Amount
South Dakota	Water	Yankton - 5 MGD drinking water treatment plant	Ready to bid	$39,275,000
South Dakota	Water	WEB - main line improvements	Planning & design	$22,500,000
South Dakota	Water	Rapid City - Extension of municipal drinking water distribution system to unincorporated area	Construction funding requested	$7,000,000
South Dakota	Water	B-Y Water - water reservoir	Construction funding requested	$4,800,000
South Dakota	Water and Wastewater	Dell Rapids - replace/upgrade water and wastewater lines	Planning & design	$14,427,000
South Dakota	Water and Wastewater	Garretson - replace/upgrade water and wastewater lines	Planning & design	$3,500,000
			Total $ for state:	**$167,148,000**
Tennessee	Water	Castilian Springs - Water Main replacements		$1,600,000
Tennessee	Water	Gainesboro - Water Main replacements		$648,000
Tennessee	Water	Brighton- Water Meter Replacement		$374,360
Tennessee	Wastewater	OakRidge - Collection Sys. Rehab.		$2,000,000
Tennessee	Wastewater	Dickson County -Water Meter Replacement		$5,100,000
Tennessee	Wastewater	Lincoln County - Water Meter Replacement		$1,250,000
Tennessee	Water	Hawkins County - Water Meter Replacement		$2,400,000
Tennessee	Water	Smith County - Water Main replacements		$1,464,500
Tennessee	Water	Parsons - WTP and Distribution Improvements		$1,800,000
Tennessee	Water	Cleveland - Water Transmission Main		$3,725,500
Tennessee	Wastewater	Millersville - SSES for I & I Correction		$518,000
Tennessee	Wastewater	Jackson -WWTP Improvements		$2,000,000
Tennessee	Water	Erwin - Distribution Sys. Improvements		$1,500,000
			Total $ for state:	**$24,380,360**
Texas	Water	Due to lead/copper issues, iron pipes, and old infrastructure, need pipe and service line replacement and updates to pump station, storage tank, meters, & SCADA (City of Ranger).	Planning and Design	$14M
Texas	Water	Due to numerous violations a water system has been referred to the Texas Attorney General for enforcement and the system needs a new distribution system, well, ground storage tank, pressure tank, and storage pumps (Aero Valley Water System).	Planning and Design	$300K
Texas	Water	Due to arsenic and a lack of operator this extremely remote site needs arsenic treatment, repairs, disinfection, meters, operation and maintenance, and an operator (Candelaria).	Planning and Design	$700K
Texas	Water	An abandoned system has had numerous violations and needs a new distribution system, well, ground storage tank, pressure tank and service pumps or interconnection with adjacent water system (W. Oaks Phoenix).	Planning and Design	$350K
Texas	Water	Due to violations of surface water rules and old infrastructure, need for a regional project to tie the City of Lawn and other area water systems into the City of Abilene (City of Lawn).	Planning and Design	$3.6M
Texas	Water	Due to radionuclides need treatment of tie into neighboring water system (Lake Texoma VFW).	Planning and Design	$830K
Texas	Water	Due to a failing sewer system, need to tie into the City of Kerrville for both water and wastewater service (Castlecomb Subdivision).	Planning and Design	$1.1M
			Total $ for state:	**$20,910,000**
Utah	Wastewater	Duchesne City Lagoons Upgrade	Funding Authorized / Design	$2.95M
Utah	Wastewater	Moab City Wastewater Treatment Plant	Funding Authorized / Bidding	$12.8M
Utah	Wastewater	San Juan Spanish Valley Sewers	Funding Authorized / Design	$5.5M
Utah	Wastewater	Roosevelt City Regional Interceptor	Funding Authorized / Design	$5.2M
Utah	Wastewater	Summit County Interceptor	Funding Authorized / Design	$1.1M
Utah	Wastewater	South Davis Sewer District Tertiery Treatment	Funding Pending / Design	$25M
Utah	Wastewater	Salem City Wastewater Treatment Plant	Funding Authorized / Design	$13M
Utah	Wastewater	Blanding City Sewers	Funding Pending / Design	$2.56M
Utah	Water	Springdale - surface water treatment plant	approved pending funding	$5.5M
Utah	Water	Hanksville Town- water line replacement	approved pending funding	$600K

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Utah	Water	Lizard Bench- chlorination System and water line	approved pending funding	$28K
Utah	Water	West Erda ID- connect to Stansbury Park	approved pending funding	$823K
Utah	Water	Filmore City- water line replacement	approved pending funding	$2.6M
Utah	Water	Corinne City - Radium Filter treatment plant	approved pending funding	$442K
Utah	Water	Eagle Mtn - 2MG Tank	approved pending funding	$1.8M
Utah	Water	Winchester - replacement well	approved pending funding	$587K
Utah	Water	Wales Town - New Well	obligated, begin construction Jan 2017	$250k
Utah	Water	Torrey Town - upgrade waterlines	approved pending funding	$1.7M
Utah	Water	Cove SSD - source improvement, waterline upgrade	approved pending funding	$1.1M
			Total $ for state:	**$83,540,000.00**
Vermont	Drinking Water	Alburgh Fire District #1 Intake and surface water treatment facility improvements	Planning /Design	$500,000.00
Vermont	Drinking Water	Bakersfield Town Fire District #1 -New source permitting, drilling and connection	Planning /Design	$350,000.00
Vermont	Drinking Water	Barre Town, Websterville Fire District #3 - Distribution and Treatments Improvements	Planning /Design	$5,000,000.00
Vermont	Drinking Water	Bennington Town - Water treatment plant upgrades	Planning /Design	$15,000,000.00
Vermont	Drinking Water	Bennington Town -Lead service line replacement	Planning /Design	$10,000,000.00
Vermont	Drinking Water	Bennington Town -Chapel Road tank replacement	Planning /Design	$3,000,000.00
Vermont	Drinking Water	Bennington Town -Municipal water line extensions	Planning /Design	$25,000,000.00
Vermont	Drinking Water	Bethel - New customer meters	Planning /Design	$400,000.00
Vermont	Drinking Water	Brandon Fire District #1 - Water distribution system improvements	Planning /Design	$2,556,940.00
Vermont	Drinking Water	Cambridge Village Water - SCADA, tank alarms and distribution	Planning /Design	$200,000.00
Vermont	Drinking Water	Champlain Water District - New 600,000 Williston High Service storage tank on Mountainview Rd	Planning /Design	$1,560,000.00
Vermont	Drinking Water	Fair Haven, Town - Replace approx. 5,975 linear feet of waterlines & SW Treatment Plant Improvements	Planning /Design	$6,100,000.00
Vermont	Drinking Water	Hardwick, Town - Church Street replacement	Planning /Design	$500,000.00
Vermont	Drinking Water	Ludlow, Town - Replacement of approx. 1,200 linear feet of waterline	Planning /Design	$629,000.00
Vermont	Drinking Water	North Hero, Town - Water treatment plant expansion	Planning /Design	$1,000,000.00
Vermont	Drinking Water	Rutland, City - Transmission main replacement	Planning /Design	$4,000,000.00
Vermont	Drinking Water	Rutland, City - Installation of permenant leak detection devices	Planning /Design	$500,000.00
Vermont	Drinking Water	St. Albans, City - New 1.5 million gallon storage tank	Planning /Design	$1,200,000.00
Vermont	Drinking Water	South Hero Fire District #4 -Water Treatment Plant upgrade	Planning /Design	$1,800,000.00
Vermont	Drinking Water	St. Johnsbury, Town - Transmission Main Moose River	Planning /Design	$800,000.00
Vermont	Drinking Water	St. Albans, City - New 1M gallon storage tank	Planning /Design	$1,500,000.00
Vermont	Wastewater Treatment	Addison - New WWTF Construction	Planning /Design	$498,000.00
Vermont	Wastewater Treatment	Castleton - Crystal Heights Sewer	Planning /Design	$333,400.00
Vermont	Wastewater Treatment	Colchester FD#2 - Gravity sewer to serve Malletts Bay	Planning /Design	$15,000,000.00
Vermont	Wastewater Treatment	Montpeleir - East State St CSO	Planning /Design	$903,308.00
Vermont	Wastewater Treatment	Montpelier - WWTF Refurbishment & P Reduction	Planning /Design	$4,200,000.00
Vermont	Wastewater Treatment	Royalton - WWTF Refurbishment & P Reduction	Planning /Design	$1,670,000.00
Vermont	Wastewater Treatment	South Ryegate - WWTF Filter Bed Replacement	Planning /Design	$90,000.00
Vermont	Wastewater Treatment	St. Albans City -WWTF Refurbishment & P Reduction	Planning /Design	$17,400,000.00
Vermont	Wastewater Treatment	St. Johnsbury - WWTF Refurbishment	Planning /Design	$2,900,000.00
Vermont	Wastewater Treatment	St. Johnsbury - Oak St CSO	Planning /Design	$1,650,000.00
Vermont	Wastewater Treatment	Rutland City - Northwest Neighborhood Stormwater Separation/CSO Abatement Project	Planning /Design	$1,629,071.00
Vermont	Wastewater Treatment	Springfield - J&L CSO	Planning /Design	$93,760.00

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State	Type	Description	Stage	Amount
Vermont	Wastewater Treatment	North Branch FD #1 - WWTF Refurbishment & P Reduction	Planning /Design	$4,100,000.00
Vermont	Wastewater Treatment	Bennigton - WWTF Refurbishment	Planning /Design	$8,060,000.00
Vermont	Wastewater Treatment	Hinesbury - WWTF Upgrade & P Reduction	Planning /Design	$2,400,000.00
Vermont	Wastewater Treatment	Williston - Various Stormwater Projects	Planning /Design	$2,241,729.00
Vermont	Wastewater Treatment	Winooski - WWTF Refurbishment & P Reduction	Planning /Design	$3,500,000.00
			Total $ for state:	**$147,261,208.00**
Virginia	Wastewater	Buchanan County Service Authority - Grundy VA wastewater plant		$18M
Virginia	Wastewater/water	City of Petersburg - replace pump stations		$10M
Virginia	Water	Wise County Pubic Service Authority - construction of new surface water intake rehab project		$710K
Virginia	Water	Town of Marion, VA - phase 2 waterline replacements		$470K
Virginia	Water	Town of Chincoteaque - water meter replacement project		$970K
Virginia	Water	Town of Colonial - Water Improvement Project (pumps, stroagetanks, water main and meters)		$4.1 M
			Total $ for state:	**$34,250,000**
Washington	Water Infrastructure	Yakima River Basin Water Project		$4,100,000,000.00
Washington	Wastewater	City of Seattle Ship Canal Water Quality		$430,000,000.00
Washington	Water/Inland Waterways	Pierce County's Floodplains for the Future		$7,500,000.00
Washington	Port Infrastructure	Port of Anacortes, Quiet Cove Cleanup		$3,727,000.00
Washington	Wastewater	Hanford Effluent & Tan Waste Facilities		$950,000,000.00
			Total $ for state	**$5,491,227,000**
West Virginia	Wastewater	City of Benwood - CSO Improvement Project	Design Approved Ready to Bid	$3,800,000
West Virginia	Wastewater	Town of Belle - WWTP Upgrade	Design Approved Ready to Bid	$5,000,000
West Virginia	Wastewater	Central Boaz Public Service District - WWTP Upgrade & System Improvements	Design Approved Ready to Bid	$2,100,000
West Virginia	Wastewater	Hancock County Public Service District - Extension project to serve 160 new customers	Design Approved Ready to Bid	$6,300,000
West Virginia	Wastewater	City of Pennsboro - WWTP Upgrade	Out to Bid	$5,200,000
West Virginia	Wastewater	Town of Cairo - WWTP Upgrade & System Improvements	In Design	$2,500,000
West Virginia	Wastewater	Harpers Ferry Public Service District - WWTP Upgrade and System Improvements	Design Approved Ready to Bid	$2,600,000
West Virginia	Wastewater	Town of Montgomery - Pump Station Rehabilitation and System Impovements	Design Approved Ready to Bid	$800,000
West Virginia	Wastewater	Town of Oceana - WWTP Upgrade	In Design	$5,400,000
West Virginia	Wastewater	Town of Oak Hill - WWTP Upgrade and System consolidation/WWTP Decommissioning with Arbuckle Public Service District	Final Design	$14,000,000
West Virginia	Wastewater	Greater Harrison Public Service District - Extension Project to serve more than 700 new customers	Final Design	$21,000,000
West Virginia	Wastewater	City of Winfield - New/upgraded WWTP	In Design	$7,500,000
West Virginia	Wastewater	Greater Paw Paw Public Service District - CSO abatment in compliance with Long Term Control Plan	In Design	$3,000,000
West Virginia	Wastewater	Logan County PSD - Extension project to serve 131 new customers	Design Approved/Preparing to Bid	$2,000,000
West Virginia	Wastewater	Piedmont Sanitary Dept.- Collection System Upgrade to eliminate sanitary sewer overflows	Design Approved/Preparing to Bid	$1,236,000
West Virginia	Water	City of Hartford - Replacement of the water system	Design Approved	$4,000,000
West Virginia	Water	City of New Haven - Replacement of the water system	In Design	$8,000,000
West Virginia	Water	City of Richwood - Water line extension	Design nearly complete	$7,000,000
West Virginia	Water	City of Chapmanville - Distribution System Replacement	Design Complete	$3,000,000
West Virginia	Water	McDowell County PSD - Water line extension	Design Complete	$7,000,000
West Virginia	Water	Morgantown Utility Board - Secondary Water Source/Generator project	Out to Bid	$15,000,000
West Virginia	Water	Frankfort PSD - Water treatment plant upgrade	Out to Bid	$7,123,000
West Virginia	Water	Preston Co, PSD #2 - Water line extention to 90 new customers	Design Approved/preparing to Bid	$900,000

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State	Type	Description	Stage	Amount
West Virginia	Water	Rowlesburg- Water line extention to 100 new customers	Design approved	$3,000,000
West Virginia	Water	Clay County PSD - Water line extention to 136 new customers	Design approved	$800,000
West Virginia	Water	Lewis County EDA - Water line extension to 145 new customers	Design approved	$1,715,210
West Virginia	Water	Lewis County EDA - Water line extension to 67 new customers	Design approved	$1,000,000
West Virginia	Water	Oakvale Road PSD - Water line extension to 154 new customers	Design Approved/Preparing to Bid	$3,338,206
			Total $ for state:	**$144,312,416**
Wisconsin	Clean Water	City of Algoma - Upgrade WWTP-Disinfection, Holding Tank/Screening/Controls/Elec	Approved plans & specifications. Bid ready/underway/completed.	$563,300
Wisconsin	Clean Water	Village of Clinton - Upgrade Pump Station No. 2	Approved plans & specifications. Bid ready/underway/completed.	$371,188
Wisconsin	Clean Water	Village of Clinton - Upgrade Pump Station No. 1	Approved plans & specifications. Bid ready/underway/completed.	$533,174
Wisconsin	Clean Water	City of Fennimore - Upgrade WWTP; headworks, sludge, clarifier, digester, septage	Approved plans & specifications. Bid ready/underway/completed.	$9,265,000
Wisconsin	Clean Water	Village of Denmark - Upgrade WWTP; clarifier drive and scum baffles	Approved plans & specifications. Bid ready/underway/completed.	$611
Wisconsin	Clean Water	Village of Orfordville - Upgrade WWTP - thickening, storage and processing	Approved plans & specifications. Bid ready/underway/completed.	$4,087,910
Wisconsin	Clean Water	City of Bloomer - Upgrade WWTP sludge handling capacity	Approved plans & specifications. Bid ready/underway/completed.	$1,081,700
Wisconsin	Clean Water	Village of Rib Lake - Upgrade WWTF; construct biolotical treatment	Approved plans & specifications. Bid ready/underway/completed.	$5,561,974
Wisconsin	Clean Water	Village of New Auburn - Replace main lift station	Approved plans & specifications. Bid ready/underway/completed.	$245,833
			Total $ for state:	**$21,710,690**
Wyoming	Drinking water	Kemmerer Diamondville Joint Powers Board Tank Mixing Project to Address Disinfection Byproducts	Planning and Design	$274,404
Wyoming	Drinking water	High Meadow Ranch Water District Source, Distribution And Storage	Planning and Design	$9,226,500
Wyoming	Drinking water	Melody Ranch I&S District Valve Replacements/Repairs	Planning and Design	$330,000
Wyoming	Drinking water and Wastewater	Town of Moorcroft Water and Sewer Main Replacements	Planning and Design	$2,430,456
Wyoming	Drinking water	Town of Pine Bluffs Water Tank Project	Planning and Design	$1,340,000
Wyoming	Drinking water	Town of Star Valley Ranch Water Main Replacement	Planning and Design	$2,946,900
Wyoming	Drinking water	City of Rawlins Water Mains Replacement Project	Planning and Design	$2,049,380
Wyoming	Drinking water	Town of Opal Transmission And Storage Tank Project	Planning and Design	$505,103
Wyoming	Drinking water	City of Gillette Water Pipeline	Planning and Design	540,000
Wyoming	Drinking water	Town of Glenrock Water Pipeline	Planning and Design	$380,000
Wyoming	Drinking water	Town of Thayne Storage Tank	Planning and Design	$880,000
Wyoming	Drinking water	Town of Wheatland Water Wells	Planning and Design	$1,485,000
Wyoming	Drinking water	City of Casper CY Booster Station Replacement	Planning and Design	$1,273,000
Wyoming	Wastewater	North Sweetwater Water & Sewer District Wastewater Regionalization & Sanitary Sewer Upgrades	Planning and Design	$6,859,042
Wyoming	Wastewater	Town of Pine Haven Sanitary Sewer Improvements	Planning and Design	$514,100
Wyoming	Wastewater	Town of LaBarge Lift Station Upgrades	Planning and Design	$421,713
Wyoming	Wastewater	Town of Buffalo Sanitary Sewer Lift Station Upgrade	Planning and Design	$466,200
Wyoming	Wastewater	City of Gillette Sanitary Sewer Main Replacement	Planning and Design	$3,642,975
Wyoming	Wastewater	City of Torrington Wastewater Treatment Plant Headworks Facility	Planning and Design	5,643,944
Wyoming	Wastewater	City of Cheyenne 26th Street Sewer Interceptor	Planning and Design	5,312,730
			Total $ for state:	**$35,024,773**
			Grand Total	**$18,202,748,741.00**

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House Committee on Transportation and Infrastructure
Complete Statement by Mike Inamine
Sutter Butte Flood Control Agency
March 9, 2017

Good morning Chairman Graves, Ranking Member Napolitano and members of the Committee. My name is Mike Inamine, Executive Director of the Sutter Butte Flood Control Agency. Thank you for the opportunity to address the Committee on this most important and timely issue. Before beginning my testimony, I would be remiss if I did not acknowledge Congressmen LaMalfa and Garamendi, two members of this committee who have been true partners on these local efforts from the start. But for their efforts I would be presenting a very different story today.

Background

The Sutter Butte Flood Control Agency (SBFCA) was formed in 2007 for the purpose of consolidating efforts of several agencies and communities with flood management responsibilities, and implementing locally led flood protection projects. SBFCA is a California Joint Powers Authority composed of the cities of Biggs, Gridley, Live Oak, and Yuba City, the counties of Sutter and Butte, and Levee Districts 1 and 9. SBFCA leads the planning and implementation of flood control projects in this historic agricultural basin.

The Sutter-Butte Basin covers 300 square miles along the west bank of the Feather River immediately south of Lake Oroville. The basin is bordered by the Cherokee Canal to the north, the Sutter Buttes to the west, the Sutter Bypass to the southwest and the 44-mile long Feather River to the east. The basin is home to 95,000 residents and encompasses $7 billion of damageable assets. The region has sustained numerous floods, including the 1955 levee failure on the Feather River, which resulted in the deaths of at least 38 people. Numerous projects and programs have been implemented in the basin over the years to reduce flood risk, including the SBFCA-led Feather River West Levee Project (FRWLP) that is nearing completion. The basin is divided into an urbanized area to the north and a rural area to the south that supports a vibrant agricultural economy in the deep floodplain (Figure1). The goals of the agency are to achieve 200-year level of flood protection for communities in the north and 100-year or equivalent protection in the south. Under State law, urban or urbanizing areas cannot be developed without achieving 200-year level of protection, thus eliminating opportunities for risky residential development. In addition to supporting this policy, SBFCA supports agriculture as wise use of the deep floodplain to further reduce risk and promote the rural economy.

California's greatest threat from riverine flooding resides in the Central Valley, where an elaborate system of 1,400 miles of federal project levees and hundreds of miles of appurtenant non-project levees has been constructed over the past 150 years to manage flood risk. In the past decade, California has invested and committed $4.1 billion in planning, designing and constructing flood infrastructure in the Central Valley, and has passed historic legislation linking floodplain management to traditional flood control measures. The Central Valley Flood

Protection Plan, authored by the California Department of Water Resources, is the strategic blueprint for flood management in the Valley. And as the dominant regulator and traditional funding partner for flood risk reduction projects, the US Army Corps of Engineers (Corps) plays a powerful and critical role in local flood project implementation.

USACE Civil Works

As this committee is well aware, the Corps process can take decades to move from feasibility study to authorized project to a congressionally funded and constructed project. SBFCA applauds measures that the committee has taken through various Water Resources Development Acts (WRDA) to address this lethargic process. SBFCA was pleased to have been one of the Corps' four pilot projects selected from throughout the country to advance the "3x3x3" planning process: complete the feasibility study within 3 years, within a $3 million budget, and undergoing 3 levels of Corps review (or fit within a 3-inch thick binder, depending on who you ask). To the Corps' credit, the Sutter Basin study achieved all objectives and tactically leveraged State and SBFCA in-kind technical work. After commencing in 2011, the pilot study resulted in authorization in WRRDA 2014. All of the successful methodologies and strategies were immediately promulgated throughout the country, and have become the standard for Corps feasibility studies.

Although tremendously successful, the planning study does not in itself provide any flood risk reduction. It is that second act of Congress—appropriations—that leads to design and construction of the physical flood protection measure. And due to the competing demands of other federal priorities, the success of an effective and rapid planning process is often squandered when appropriations and new start designations for construction can take many years following authorization, diminishing the cost effectiveness and public safety benefits for both those residents to be protected by the project, and taxpayers in general.

Section 408 Project

To deliver strategic, timely and risk-prioritized projects ahead of (or potentially instead of) the traditional Corps delivery process, California and partner agencies like SBFCA share the cost of constructing levee improvement and repair projects. In California's Central Valley, the money is provided by State bonds and local assessments. The strategic policy document and technical standards are encompassed in California's Central Valley Flood Protection Plan, including the Urban Levee Design Criteria, which has gained broad acceptance throughout the engineering and planning community. Passing a local assessment is no small feat under California law. Communities comprising SBFCA are economically disadvantaged; yet in 2010, during the height of the economic downturn, property owners overwhelmingly voted to tax themselves to pay for flood control projects, a testament to local support. Strategically, the State requires local sponsors to partner with the federal government on Corps Civil Works projects to garner federal investment in the region, with the goal of receiving federal credit. In other words, the locally-led project must be consistent with a parallel federal feasibility study to the extent practical, cost effective and timely.

When non-federal sponsors implement levee improvements, the Corps wears a different hat as the primary regulator of work performed on federal project levees. Under Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 USC 408 (Section 408), the Corps permits a non-federal interest to modify a federally-authorized structure such as a levee. Under the statute, the Corps must determine whether or not a non-federal action will be injurious to the public interest or will impair the usefulness of the federal project. In the case of the FRWLP, SBFCA sought federal permission to rehabilitate a federally-authorized levee with State and local funding. Under this permission, SBFCA is in the last year of constructing the $300 million, FRWLP that improves and rehabilitates an existing project levee. Within the last six years, SBFCA has planned, designed, permitted and constructed 29 miles of federal project levee improvements—levees that are among the most hazardous in California—without any federal investment.

While successful, SBFCA's experience with the 408 permission process has been beset with inefficiencies that subject people, property and the environment to undue risk. Delays due to lengthy and redundant reviews are commonplace, and because 408 projects are a secondary priority to the Corps Civil Works mission, even large scale projects that provide significant public safety benefits often take three to four years to obtain approval.

From the onset, the FRWLP was specifically designed to avoid even the perception of conflict with Corps policies, recognizing that long bureaucratic delays could otherwise result. For example, SBFCA levee designers replicated existing, non-uniform crest roads to avoid any inference that the original project purpose was being changed. Despite this extreme approach, the 408 review process still took 19 months start to finish—and this was viewed as light-speed. To achieve this record-setting timeline, Corps staff exercised heroic and creative effort to split the 408 permission into two reaches to allow construction to begin on a critically damaged levee in late 2013. As I speak today, SBFCA is completing flood fight measures (financed by SBFCA and the State), much of which would have been unnecessary had the Corps approved the repair of a one-mile reach of levee in a more timely manner this last year.

The final issue relates to the federal appropriations issue described previously. Despite successfully navigating a difficult 408 process and constructing the vast majority of the federally authorized project, we now struggle to secure federal funding to finish the final four miles. California flood agencies like SBFCA are models for innovative financing within the Corps process by bringing higher percentages of non-federal money to the table and delivering timely, Corps compliant projects; however, SBFCA's efforts are not reflected or prioritized by the federal government as the project moves from study to budgeting phases of implementation.

Solutions: Nexus of Corps Civil Works and Local Projects

There are a number of measures that would greatly improve risk reduction whether performed by local, State, federal or even private entities:

a. Prioritize work flow by risk reduction, not the project implementer. In California, 408 projects are often large strategic projects that should not take a backseat to Civil Works projects simply because someone other than the Corps is performing the work.

b. The new Corps Feasibility Study process made tremendous improvements in the way Corps manages reviews that could be directly applied to Section 408 processes. Notable among these were extensive use of the vertical team concept in which all levels of review were conducted simultaneously instead of through interminable routing up and down organizational chains. Local agencies are heartened by recent interim guidance provided by Civil Works Director James Dalton to make use of this mechanism. Mr. Dalton also proposes to delegate more decisions to Divisions and Districts, a move that recognizes the real-world difficulties of non-federal sponsors in navigating the former process. We are grateful for Mr. Dalton's attention to this important local issue and hope to see these changes expanded and formally codified.

c. Many of the policy issues associated with the 408 process were intermingled with the parallel Corps Feasibility Study process. However, they are two separate questions. Put simply, the 408 process asks "Will this project cause harm?" and the Civil Works process asks "Is this a wise federal investment?" Much of the unnecessary churning associated with these review processes could be alleviated by recognizing the comity between the overarching Central Valley Flood Protection Plan and Corps policy, and where there is conflict between the two, by reverting to these two essential questions.

d. Allow local, State and even private entities to implement Civil Works Projects. Rather than construct projects, the State has taken the strategic approach to fund local agencies in the Central Valley to finance, plan, design and construct levee projects. This bottom-up approach has resulted in more cost effective, timely, and efficacious risk reduction projects. The Corps could do something similar. WRRDA 2014 includes a provision to advance this concept; however this pilot has not been implemented to date. Other granting programs have also been discussed as a means to implement projects that have traditionally been the domain of the Corps, and we believe these should be investigated as well.

Section 106

Through regulation of locally-led projects or construction of federal Civil Works projects, the Corps plays a critical role in satisfying requirements of Section 106 of the National Historic Preservation Act, particularly in regard to the treatment of Native American cultural resources. In both types of projects, it is the Corps, not the local sponsor, who is required to fulfill Section 106, even in situations where a local agency is leading construction of a flood protection project.

California levees in the Central Valley are typically located on the fractious intersection of historic Goldrush-era pioneer settlements, prehistoric villages and sacred lands of a large and

vibrant Native American civilization. Today, comingling of historic and prehistoric infrastructure and cultural properties has caused a number of costly and time-consuming conflicts during the recent construction of billions of dollars of public safety infrastructure. California has also legislated a number of recent and relatively untested legal protections for Native American remains and properties. This scenario is further exacerbated by ambiguities in State and federal laws and assertion of rights by well-funded, experienced tribes that often manifest late in the design and construction process, causing costly delays of critical public safety infrastructure. The final destabilizing elements are: 1) inconsistent application of Section 106 throughout the Corps, including a hazy characterization of good faith tribal consultation; and 2) a lack of federal recognition of the real-world impacts of State laws on actual and necessary construction.

There are solutions availed to us right now. The federal government has a tremendous wealth of experience working with the tribes in varying institutional and cultural settings throughout the country, with many of the most difficult problems resolved by guidance from the Advisory Council for Historic Preservation (ACHP)—essentially the final board of appeal for disputes regarding Section 106 implementation. Despite this experience, improvements in the Corps' implementation of Section 106 could be achieved with more consistent policy guidance across Corps districts as well as objective, third-party guidance from experienced agencies outside the Corps. Proactive consultation with the ACHP would address both of these needs, and is critical to successful implementation of public safety infrastructure in the complex cultural and legal environment of the Central Valley.

Oroville Dam Spillway Incident

This statement would be incomplete without noting the importance of the single, most important flood control structure on the Feather River: Oroville Dam. The Feather River ***is*** the discharge channel of Oroville Spillway. Dams and levees are a system, and as the ongoing crisis at Oroville Dam evolves, it is easy to forget that the primary failure mode that threatens lives and property is not necessarily dam spillway failure, but rather ***levee failure***. Dam structures, even those as damaged as the Oroville spillways, are built to standards that are orders of magnitude greater than levee standards due to a variety of factors. In the last century, the devastation wrought by a single event, the levee/floodwall failures in New Orleans caused by hurricanes Katrina and Rita, probably killed more people than all dam failures combined[1]. Before the Oroville Spillway incident initiated on February 7, unimproved levees on the lower Feather River were already showing signs of distress. The loss of full functionality of both the service and emergency spillways significantly increases the likelihood that our levees, even in their vastly improved state, could experience flows and accompanying water surface elevations that exceed capacity. Under this foreseeable event, the unimproved levees protecting rural areas would be overcome and the improved levees would be at grave risk. Again, the Corps plays a crucial role in flood operations by governing the use of flood space in the reservoir, and through their investment in the first cost of Oroville Dam.

Oroville Dam has appropriately captured all of our attention at the moment, but we cannot neglect the vulnerability of our levees in the system that includes the Oroville Dam spillways.

Thank you for holding this hearing and your continued attention to these important issues. Our lives and livelihoods depend on it.

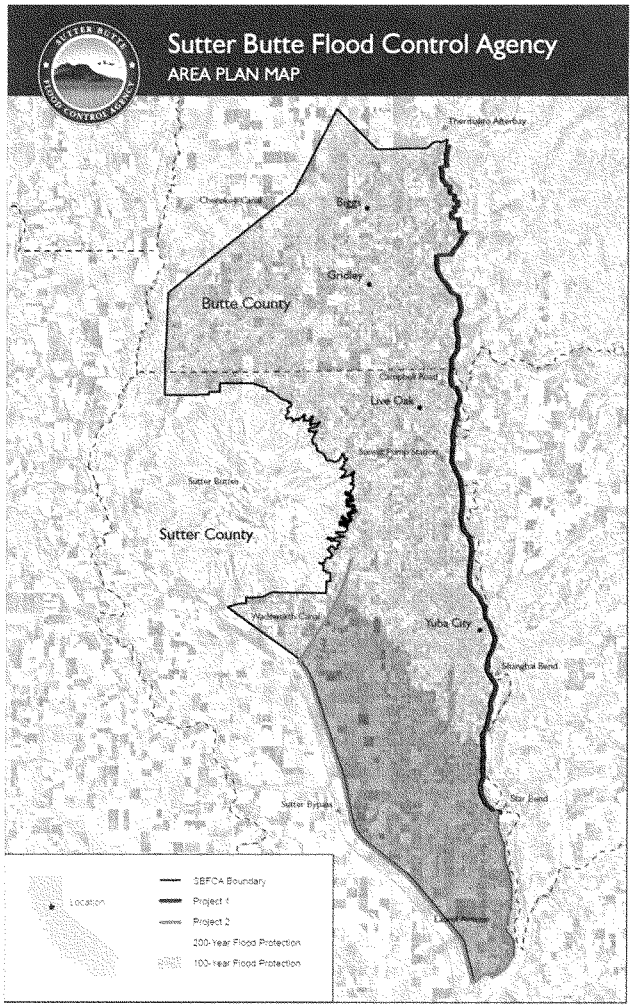

Figure 1. Sutter Butte Flood Control Agency boundaries

Reference:

[1]Harder Jr., Leslie F.; Hradilek, Peter J.; Krivanec, Christopher; Meyer, Barry J.; *Improving Flood Protection - Understanding How Levees Are Different From Dams (2008); Dam Safety 2008, 25th annual conference of the Association of State Dam Safety Officials; Sept. 7-11, 2008; Indian Wells, California.*

Statement of

Jonathan Kernion
President
Cycle Construction Company LLC

For

The Associated General Contractors of America

to the

U.S. House of Representatives

Committee on Transportation & Infrastructure's Subcommittee on Water Resources & Environment

For a hearing on

"Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure"

March 9, 2017

AGC of America
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
Quality People. Quality Projects.

The Associated General Contractors of America (AGC) is the largest and oldest national construction trade association in the United States. AGC represents more than 26,000 firms, including America's leading general contractors and specialty-contracting firms. Many of the nation's service providers and suppliers are associated with AGC through a nationwide network of chapters. AGC contractors are engaged in the construction of the nation's commercial buildings, shopping centers, factories, warehouses, highways, bridges, tunnels, airports, waterworks facilities, waste treatment facilities, levees, locks, dams, water conservation projects, defense facilities, multi-family housing projects, and more.

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Statement of Jonathan Kernion
President
Cycle Construction Company LLC
Kenner, Louisiana
Subcommittee on Water Resources and Environment
Committee on Transportation & Infrastructure
United States House of Representatives
March 9, 2017

Chairman Graves, Ranking Member Napolitano and members of the committee, thank you for inviting me to speak before you today. I am Jonathan Kernion, President of Cycle Construction Company based in Kenner Louisiana. Our company is a family-operated general construction firm. Founded in the late 1990's, we focus on heavy/civil construction, environmental infrastructure, underground utilities, demolition, waste management, and emergency response.

I testify before you as a member of and representing the Associated General Contractors of America (AGC). AGC is a national association of more than 26,000 businesses involved in every aspect of construction, with 92 chapters representing member companies in every state.

In order to build 21st century infrastructure, we need to be able to build it sometime this century. Sadly, that's easier said than done. There are many kinks in the water infrastructure project chain that can delay construction not only years, but even decades.

In my testimony today, I will try to highlight some opportunities to more efficiently deliver water infrastructure projects. As such, I will cover:

I. The Pre-Construction Phase
   A. Opportunities for Additional Efficiencies in Environmental Review/Permitting
   B. Opportunities for Additional Efficiencies in Project Study and Planning Processes

II. The Construction Phase
   A. The Need for Long-Term Funding and Certainty
   B. Incentivizing Efficient and Timely Construction Execution

I. The Pre-Construction Phase

There are many chapters in the life of a construction project. For simplicity's sake, today I will generally review the two major components—the pre-construction and construction phases—of a water infrastructure construction project. Two areas within the pre-construction phase where AGC would like to work with the committee to more efficiently and quickly deliver needed water resources infrastructure are: (A) the environmental review and permitting processes; and (B) the project study and planning processes.

A. Opportunities for Additional Efficiencies in Environmental Review/Permitting

Over the last 50 years, Congress enacted a host of laws that seek to ensure a balance among environmental, economic and health concerns. To implement those laws, Congress provided a range of federal agency review and permitting processes. Those federal processes that can impact water infrastructure projects include, but are not limited to:

- The National Environmental Protection Act Reviews and Approvals;
- Consultation with the Department of the Interior's (DOI) Fish and Wildlife Service (FWS) and the Department of Commerce's NOAA Fisheries;
- The Bald and Golden Eagle Protection Permit issued by DOI's FWS;
- Migratory Bird Treaty Act Permits issued by DOI's FWS;
- The Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System Permits and Spill Prevention and Control Countermeasures Program;
- Consultation with the Department of Commerce's (DOC) National Oceanic and Atmospheric Administration (NOAA) Fisheries under the Magnuson-Stevens Fishery Conservation and Management Act;
- Consultation with the DOC's NOAA Fisheries under the National Marine Sanctuaries Act;
- Fish and Wildlife Coordination Act Review with the DOI's FWS;
- Wild and Scenic Rivers Act Determination and Coordination under DOI's Bureau of Land Management;
- Flood Plain or Wetland Assessment which all the aforementioned agencies could have some role in when it comes to the Section 404 permit of the Clean Water Act issued by the Army Corps of Engineers.[1]

From this list, it should be apparent that there are many federal agency cooks in the environmental review and permitting kitchen. It should also come as no surprise that many of these laws and their implementing processes came about independently and are layered on top of one another with little or no regard for how they fit in the overall environmental review process of a water infrastructure project.

As such, water infrastrueture projects have been delayed years and even decades waiting for environmental reviews to be completed. Take the harbor deepening dredging project at the Port of Savannah for example. The environmental review there took 14 years and the project itself delayed for about 30 years.[2]

In my home state of Louisiana, we are trying to restore our coastline after the devastation of the BP Oil Spill and protect our wetlands from rising sea levels. Time is of the essence. Louisiana is losing on average a football field of coastline per hour.[3] However, as the environmental reviews may drag on for years, our environmentally sensitive coastline erodes away. It is alarmingly ironic that the lengthy environmental permitting and review processes that are intended to protect our coastliue, could—in part—lead to its further destruction.

The state this year released an updated version of its 50-year master plan for restoring the coast. It predicts that even if everything works as planned, 2,800 square miles of coast still could be lost in the next four decades.[4] In addition, about 27,000 buildings may need to be flood-proofed, elevated or bought

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[1] *See* THE FEDERAL INFRASTRUCTURE PERMITTING DASHBOARD, FEDERAL ENVIRONMENTAL REVIEW & AUTHORIZATION INVENTORY, OCT. 1, 2016 *available at*: https://www.permits.performance.gov/sites/permits.performance.gov/files/docs/Federal%20Environmental%20Review%20and%20Authorization%20Inventory_2016-10-01_2.pdf

[2] PHILIP K. HOWARD, TWO YEARS, NOT TEN YEARS: REDESIGNING INFRASTRUCTURE APPROVALS, SEPT. 2015 *available at:* http://commongood.3cdn.net/c613b4cfda258a5fcb_e8m6b5t3x.pdf

[3] *Rising water is swallowing up the Louisiana coastline*, CBS NEWS, Jan. 18, 2017 *available at:* http://www.cbsnews.com/news/louisiana-coastline-disappearing-50-billion-dollars-to-save-climate-change-erosion/

[4] Bob Marshall, *2017 Coastal Master Plan predicts grimmer future for Louisiana coast as worst-case scenario becomes best-case*, THE NEW ORLEANS ADVOCATE, Jan. 3, 2017 *available at:*

out, including about 10,000 in communities around New Orleans.[5] That's if we act now. But the longer we wait, the more expensive it will be to build. Delays in creating wetlands and ridges in open water with sediment dredged from elsewhere could balloon costs by 200 percent to 600 percent.[6] The cost per acre created for more than doubles in 20 years, and cost per acre continues to increase over time even for scenarios and fill criteria where less land is created over time.[7]

For more than a decade, the House Transportation and Infrastructure Committee has worked to find ways to make NEPA work in a more efficient, yet sufficiently thorough manner through reforms in SAFETEA-LU, MAP-21 and the FAST Act. AGC appreciates and thanks the committee for those reforms. However, many of them only apply to federal-aid transportation construction projects and not water infrastructure projects. Additionally, NEPA is only one part of the environmental review and permitting processes. More reforms are needed on a more global basis.

During this Congress, AGC would like to work with the committee on:

- Better integrating environmental reviews and permitting processes into a more cohesive, efficient—yet environmentally responsible—process starting with Section 404 permitting;
- Extending previous NEPA reforms in SAFETEA-LU, MAP-21 and the FAST Act to water infrastructure projects, where they do not otherwise apply;
- Eliminating agency vetoes of previously approved environmental permits;
- Granting final federal agency environmental review/permitting approvals deference as agencies are afforded under Supreme Court precedent in the federal rulemaking process;
- Investigating the rolling of environmental review and permitting responsibilities into a single or—at least—fewer agencies;
- Establishing a six month time limit for completing all federal NEPA reviews. If no decision has been made by the end of those six months, the project should automatically be allowed to be approved; and
- Instituting a loser-pays environmental citizen suit provision requiring any such plaintiff seeking to block an infrastructure project to pay all related legal fees if their challenge is unsuccessful as a means to deter frivolous lawsuits.

B. Opportunities for Additional Efficiencies in Project Study and Planning Processes

To build water infrastructure involves study and planning. The poster child for what was wrong with the federal study process is the Morganza-to-the-Gulf Hurricane Protection Project. A reconnaissance study began in 1992. A final Chief's Report from the U.S. Army Corps of Engineers was issued in 2013. A total of twenty-two years of study. Thanks in large part to members of this committee—through the 2014 Water Resources Reform and Development Act—who supported the 3x3x3 rule,[8] this will hopefully never happen again. Thank you.

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http://www.theadvocate.com/new_orleans/news/environment/article_5ac81e86-d1e7-11e6-9177-1bbd55b599b7.html

[5] *Id.*

[6] Mark Schleifstein, *Louisiana coastal work delays could cost billions of dollars, study says*, THE TIMES PICAYUNE, Dec. 13, 2016 *available at:* http://www.nola.com/environment/index.ssf/2016/12/delays_in_building_wetlands_pr.html

[7] *Id.*

[8] A planning study shall be no more than $3M, 3 years with 3 concurrent levels of review.

Nevertheless, there remains room for continued improvement elsewhere in the process, like the Preconstruction Engineering and Design (PED) Phase. PED is the phase during which project design is finalized, the plans and specifications are prepared, and the construction contract is prepared for advertising. The process requires more engineering studies on top of those already completed during the project study phase and multiple reviews and sign offs from various levels of Corps' offices.[9] It also requires reviews of plans and specifications for infrastructure project types that have been repeatedly built.

During this Congress, AGC would like to work with the committee on:

- Identifying duplicative and unnecessary review processes during the PED stage;
- Standardizing plans and specifications for project types to reduce project delivery time and maintain more consistent cost estimates; and
- Determining areas where concurrent reviews among Corps' components could expedite project delivery during the PED Stage.

II. The Construction Phase

The construction phase is when dirt is turned and the actual project is built. During this phase of a water infrastructure construction project three things are critical: (1) funding; (2) the contractor; and (3) the owner. Without funding, there will be no construction. How a project is funded impacts project execution. Similarly, the relationships between and incentives for the contractor and the owner of the project—public or private—impact project execution. Here, I will discuss: (A) the need for long-term project funding and certainty; and (B) incentivizing efficient and timely construction execution.

A. The Need for Long-Term Funding and Certainty

We do not build our homes from the ground up over the course of 30 years. However, we too often build our nation's water infrastructure that way. While we can point to federal agencies as the cause for many problems, the buck starts and stops with Congress, literally.

Congress ultimately provides federal construction agencies with funding necessary to execute water infrastructure projects. However, that funding is subject to the whims of the annual appropriations process. That process has been dysfunctional for many decades under the leadership of both parties. Since FY1977, all of the regular appropriations bills were enacted before the beginning of the fiscal year in only three additional instances (FY1989, FY1995, and FY1997).[10] Federal agencies have had to operate on uncertain funding levels based on continuing resolutions in every fiscal year since FY 1997.[11] Very few members of this committee have been in Congress long enough to remember when one appropriations bill was passed before October 1, let alone all of them.

It is not only incredibly difficult, but practically impossible to efficiently execute water infrastructure projects with the funding spigots opening and closing to varying degrees throughout the process. Building levees, locks, and dams, dredging harbors and rivers, and constructing clean drinking and wastewater facilities requires the use of very expensive, heavy equipment. When work must be stopped or slowed down because of funding restraints, those overhead costs remain. If demobilization and remobilization are

[9] *See* Engineer Regulation 1110-2-1150.
[10] James V. Saturno & Jessica Tollestrup, *Continuing Resolutions: Overview of Components and Recent Practices*, CONGRESSIONAL RESEARCH SERVICE, Jan 14, 2016 *available at:* https://fas.org/sgp/crs/misc/R42647.pdf
[11] *Id.*

required, that only adds to unnecessary and inefficient costs related to the use of that equipment. It is also difficult to maintain a qualified and reliable workforce when you have to ask them to move between projects or lay them off as a result of such work delays or stoppages.

These statements apply to water infrastructure funding for the Army Corps and the Environmental Protection Agency (EPA). Here, it must be noted that the State Revolving Loan Funds (SRFs) for drinking water and clean water are administered by the EPA. Through the SRFs, the EPA awards grants to states to help them meet their drinking water and waste water infrastructure and facility needs. The EPA, therefore, essentially acts as a pass through for funding state and local infrastructure needs. Arguably, these funds are subject to congressional budget cuts—at least in part—because of the agency through which these funds flow. Federal investments in water infrastructure also are often the best way to ensure the health, safety and economic vitality of sparsely populated rural communities. We must ensure that this committee meets its commitments to those populations and the needs of others facing clean and safe water issues.

As the authorizing committee, you do not have the ultimate say as to when or how the project funds will be appropriated. That is a decision that rests with your colleagues on the Appropriations Committee. That stated, the toughest battles are often the ones worth fighting. With this in mind, AGC would like to work with the committee on enacting mechanisms that will help ensure greater water infrastructure funding certainty, including:

- Allowing the biannual Water Resources Development Act bill to include contract authority for water infrastructure projects similar to what is done in transportation reauthorization bills;
- Making water infrastructure funding mandatory and not discretionary spending;
- Allowing for Civil Works funding to have treatment similar to Military Construction funding;
- Establishing a capital budget program—which some states have[12]—for water infrastructure funding; and
- Considering if another agency would be better suited to run the SRF programs.

B. Incentivizing Efficient and Timely Construction Execution

The construction business is a people business. The people on the jobsite—both contractor and owner—will ultimately determine project success. In the private sector, owners have various incentives to complete a project on time and on budget, or even ahead of schedule or under budget. An oil or gas company may need harbor work completed to enable its liquefied natural gas terminal to become fully operational and, hence, revenue generating. A non-profit organization may want environmental restoration work to be completed in time for tortoises to lay their eggs. These private owners have finite resources. Their employees can be hired, fired, rewarded or held accountable with relative ease based on performance. There are clear incentives for getting the job done as efficiently as possible.

In federal government water infrastructure construction, there are not always similar economic or ideological incentives to efficiently or quickly complete the job. Federal employees may be entrenched and protected—in many ways—from being held accountable. Jobsites can be in remote locations where field staff can be left to their own devices. The agencies are not paid based on how quickly or efficiently

[12] NATIONAL ASSOCIATION OF STATE BUDGETING OFFICERS, CAPITAL BUDGETING IN THE STATES, 2014 *available at:* https://higherlogicdownload.s3.amazonaws.com/NASBO/9d2d2db1-c943-4f1b-b750-0fca152d64c2/UploadedImages/Reports/Capital%20Budgeting%20in%20the%20States.pdf

they complete work. Rather, they are paid based on the amount of project funding Congress appropriates. To our knowledge, there is no clear, incentive-based payments for agencies or their employees to deliver a project on time or on budget, let alone ahead of schedule or under budget.

Lastly, one of the greatest challenges contractors face on the federal water infrastructure jobsite is obtaining decisions, especially timely ones, from federal agency employees. Former President Theodore Roosevelt is credited with saying, "[i]n any moment of decision, the best thing you can do is the right thing, the next best thing is the wrong thing, and the worst thing you can do is nothing."

As with any construction project, unforeseen issues may emerge. The problem comes with getting the federal agency to make a decision to act—or not. Decisions may have move up the chain of command. If the right person or persons are not available, the decision sits on their desks.

In the interim period, the contractor tries—as best as possible—to work around the issue. Depending on the issue, the contractor can be left in the precarious position of self-financing the work that needs to be done to meet the project schedule or stopping work altogether. Stopping work in the midst of indecision can lead to negative past performance evaluations issued by the federal agency for the contractor. Those negative evaluations play a role in whether the agency will give the contractor another job in the future.

What I have said above, however, is not applicable to every agency or agency employee. Just as there are good contractors and not so good ones; there are good federal construction employees and not so good ones. Just as the federal government tries to avoid the not so good contractors; I try to avoid the not so good federal construction employees or, at least, bid accordingly. And, after major disasters like Hurricane Katrina, no agency—state or federal—was more motivated and able to rise to the occasion to rebuild New Orleans better than the Army Corps of Engineers. It's those times when there are not major disasters or the eyes of the country are not on us that we must find ways to ensure federal agencies and employees are properly motivated—economic or otherwise—to perform in an efficient manner.

During this Congress, AGC would like to work with the committee on:

- Ensuring greater transparency in the agency decision making process—to help allow for greater accountability—during the construction execution phase of project delivery;
- Reducing the links in the chain of command necessary to obtain timely decisions during construction;
- Reevaluating how agencies are paid for the projects they deliver; and
- Rewarding federal agency employees based on project performance.

Thank you again for inviting AGC to testify before the committee today. I look forward to answering any questions you may have.

BIPARTISAN POLICY CENTER

Testimony of Ms. Kathy Pape
Senior Vice President Regulatory Policy and Business Development
American Water

U.S. House of Representatives
Committee on Transportation and Infrastructure
Subcommittee on Water Resources and Environment
"Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure"
Thursday, March 9, 2017

Chairman Graves, Ranking Member Napolitano, and members of the Committee, thank you for the opportunity to join you today to discuss the important subject of the role of federal agencies in water infrastructure and to offer our perspectives and recommendations.

I am Kathy Pape, Senior Vice President Regulatory Policy and Business Development at American Water, the largest publicly traded U.S. water and wastewater utility company. American Water is proud to provide water, wastewater and other related services to an estimated 15 million people in 47 states and Ontario, Canada. We treat and deliver more than one billion gallons of water every day through 49,000 miles of pipe.

I am here today on behalf of the Bipartisan Policy Center's Executive Council on Infrastructure. The Bipartisan Policy Center (BPC) is a non-profit organization that combines the best ideas from both parties to promote health, security, and opportunity for all Americans. BPC drives principled and politically viable policy solutions through the power of rigorous analysis, painstaking negotiation, and aggressive advocacy.

As the only Washington, DC-based think tank that actively promotes bipartisanship, BPC works to address the key challenges facing the nation. BPC's policy solutions are the product of informed deliberations by former elected and appointed officials, business and labor leaders, and academics and advocates who represent both ends of the political spectrum. BPC is currently focused on health, energy, national and homeland security, the economy, housing, immigration, infrastructure, and governance.

BPC works to reconcile the competing aims of highly interested advocates, corporations, and policy experts, and design politically viable consensus solutions. BPC seeks out individuals and organizations that are deeply vested in the outcome of its policy projects. They ask that their project participants check absolutely nothing at the door and bring all their passion, political perspectives, and interests to the table. BPC believes that the fundamental strength of American democracy is unity forged amid diversity, and BPC endeavors to represent this pluralism in all policy negotiations.

BPC funding reflects the character and diversity of the organization. The majority of BPC funding comes from charitable philanthropies. The remainder of BPC's support comes from individual donors and corporate donors (a list of BPC donors can be found in their latest annual report). BPC believes that all of its donors as well as its project members have interests. A strength of BPC's consensus-based negotiation process is that no single interest can unduly influence consensus outcomes.

BPC convened the Executive Council on Infrastructure in early 2015 with a goal of developing recommendations on how to enable private investors to help finance public infrastructure projects. The council defined infrastructure broadly to include transportation, energy, broadband, and water projects among other sectors.

American Water's President and CEO Susan Story is a member of the Council. She is joined by:

- Doug Peterson, President and CEO of S&P
- Eric Cantor, Vice Chairman and Managing Director, Moelis & Co
- Patrick Decker, the CEO of Xylem, Inc.
- Michael Ducker, President and CEO, FedEx Freight
- Jack Ehnes, CEO, California State Teachers' Retirement System (CalSTRS)
- Jane Garvey, Chairman of North America for Meridiam
- P. Scott Ozanus, Deputy Chairman and COO, KPMG, and
- Suzanne Shank, Chairman and CEO of Siebert, Bradford Shank &Co.

I want to commend the Committee for holding this hearing and for your focus on the importance of water and wastewater infrastructure. Clean, safe, reliable, and affordable water and wastewater service is essential for life and economic development. We know you care deeply about this, and so do we. Quite simply, at American Water it's our focus every day --- our vision is Clean Water for Life.

In order to obtain this vision, we know there are significant challenges and a hefty price tag. This is highlighted in the BPC's "Bridging the Gap Together: A New Model to Modernize U.S. Infrastructure" report. We are here to offer solutions because we know our lives and our future and the future of our children and grandchildren, depend on it.

We admire the recent bold infrastructure proposals, including the proposal that was highlighted by President Trump in his recent address to a Joint Session of Congress. Understanding that there are many competing demands for infrastructure resources, if we are to meet our nation's future needs and preserve our American quality of life, the public sector alone cannot continue to cover the cost and absorb the risk of degrading infrastructure. We would highlight that while some categories of infrastructure may benefit more from direct federal investment, water and wastewater infrastructure is particularly conducive to leveraging private sector resources.

The private sector stands ready to partner and assist bringing necessary capital. Investors with billions of dollars to deploy, including American Water, are actively seeking water and wastewater infrastructure projects to support. The top 5 investor owned water utilities have budgeted capital expenditures of more than $2B in 2017, with American Water budgeting $6B over the next 5 years. The private sector can also provide innovative solutions and valuable expertise that can save time, money and improve projects. One example of this is Fairview, Pennsylvania.

In late 2015, Fairview Township sold its wastewater system to Pennsylvania American Water for $16.8 million. This decision helped to pay off $21 million in existing sewer debt, avoided additional debt (approximated at $14 million), and allowed property taxes to be cut by 50 percent. Pennsylvania American Water is investing $13 million in capital improvements, as well as up to $1 million in reimbursement for the relocation of a sewer line. The system serves approximately 4,000 customers in Pennsylvania.

Together, the public and private sectors can work together more closely to propel America's water and wastewater infrastructure into a more modern, technologically advanced, and integrated network that enables prosperity long into the future. Unfortunately, there are not enough "Fairview, PAs" occurring. A number of barriers still exist which prevent the investment of private capital into U.S. water and wastewater infrastructure projects. As a result, America is leaving dollars on the table. Thus, the federal government's role in breaking down barriers and establishing the framework needed to unleash greater private investment is essential.

Extensive details on this subject are included in the BPC's "Bridging the Gap Together: A New Model to Modernize U.S. Infrastructure" report, which we have provided to the Committee. However, the report did not delve into regulatory issues specifically associated with the water and wastewater sector.

To that end, BPC has launched a new task force to examine the specific infrastructure needs of water and wastewater systems. The task force includes American Water and Xylem as well as former mayors Henry Cisneros of San Antonio, George Heartwell of Grand Rapids and your former colleague Steve Bartlett of Dallas. The task force will issue recommendations related to innovations, affordability, and regulatory relief later this year.

While BPC has not completed their analysis of the water sector, based on the work of the council, there are several steps that Congress can take to ease some of the regulatory burdens on both public and privately-held water utilities and promote technological and management innovation.

The Executive Council's May 2016 report included several key principles:

1) Projects proceed only after public benefits have been identified and clearly stated;
2) Infrastructure investment decisions incorporate full life-cycle evaluation, beyond upfront costs;
3) Project benefits, costs, and risks are completely accounted for and made publicly transparent;
4) The risk of not investing is quantified and compared against the costs of action; and
5) Public and private sector partners share these risks, costs, and benefits.

The council issued several recommendations pertinent to the water and wastewater sector. I will briefly discuss a few of the key recommendations.

Establish and consistently communicate a finding of public value

Every project should begin with a statement of public value. Stakeholder outreach, engagement, and education throughout project development are central to a project's success. In particular, BPC calls for public and private partners associated with a project to assess public value and consistently disclose that information to the public.

If there is a private sector partner, it should identify, standardize, and publish project data in an accessible format and develop customized training and technical assistance tools for understanding and participating in public-private partnerships.

Inventory all public assets

It's hard to believe that in the year 2017 there is not a comprehensive inventory of the physical and economic condition of our nation's public assets. How can policy makers address a funding gap without complete information about the true state of our infrastructure?

BPC recommends federal, state, county, and municipal governments and independent public authorities develop a complete list of all assets owned, including transportation (streets, bridges, stations), water, civic buildings (schools, courthouses, convention centers), vacant land, and underutilized real estate, including air rights. The inventory should include the physical and economic condition of each asset with estimates of the cost of maintenance over its remaining useful life, cost of replacement, and the potential impact of a failure.

Incorporate a life-cycle approach and screening for the full range of delivery and financing options (including P3 and alternative management structures)

As part of required certifications for federal infrastructure funding and other financial support, applicants should demonstrate that they have evaluated all delivery approaches allowed by state law to determine which would provide the best value for taxpayers over the asset's life-cycle.

Public procurements today tend to overvalue low initial costs and undervalue future obligations, rewarding bidders who can build cheaply, rather than those who offer the best value over a project's lifecycle. This can increase costs down the road - higher operations and maintenance costs, more need for repairs that often go unaddressed, infrastructure failing prematurely requiring expensive rebuilds, etc. This is fiscally irresponsible.

Public officials must also identify the infrastructure needs they can handle on their own, which could be shared with the private sector, and which could be fully transferred. BPC recommends state and local governments conduct an "optionality analysis" to match infrastructure projects with the most cost-effective delivery and financing options.

Applicants for public dollars should, therefore, demonstrate that they have fully accounted for the long-term costs of their projects, including any risks inherent in construction, operations, or maintenance, and have selected the project delivery model that provides the best value.

Recognizing that not all projects are of sufficient size to make this level of screening cost-effective, Congress could establish a cost threshold below which these requirements would not apply. However, such a threshold should be set at a level, or otherwise be constructed, to encourage opportunities for the "bundling" of smaller projects as was done for Pennsylvania's Rapid Bridge Replacement Project.

BPC does not believe that projects proceeding as a public private partnership (P3) should receive extra weight in the evaluation process or be otherwise favored simply because they are P3s; what matters is that the proposed project has been shown to deliver the best value to the public, whether a P3 or not.

Though BPC recognizes that this change will require some additional effort among applicants for federal funds, it should result in better projects and the more efficient use of limited federal dollars.

Enforce and expand expedited permitting and review

BPC believes Congress and the new administration can expedite permitting and various reviews without impacting the environment or public health. In fact, much progress has already been made. The Bush

Administration created a task force to help move complex projects through the permitting process. The Obama Administration launched an online dashboard to make the review schedule and process for high-priority projects transparent to the public. As Members of the committee are well-aware, most recently, the 114th Congress passed new provisions in the FAST Act (P.L. 114-94) designed to formalize these steps and improve coordination and schedule adherence in permitting decisions.

The president or Congress should designate a lead agency for multi-agency reviews, and direct CEQ and OMB to make final decisions and resolve disputes during interagency collaboration on permitting decisions. And agencies should conduct simultaneous rather than sequential reviews to increase the speed with which decisions are made. Further, agencies should be required to track and report on the time it takes them to make permitting decisions. Recognizing that not all delays are the fault of federal agencies, improved reporting processes should allow agencies to provide an explanation for any delay while increasing broader understanding of what can hold up a project.

Expand financial tools that attract private investment and ensure robust and stable federal funding

Any serious infrastructure proposal must find long-term, stable funding for federal infrastructure programs. Private capital does not eliminate the need for robust public investment. With regard to private financing, other financing tools should be authorized to ensure a wide range of options for capital markets participants to invest in U.S. projects.

I would also like to take this opportunity to highlight some of American Water's recommendations of particular importance to our customers and the constituents you serve. We believe these recommendations will help break down existing barriers to private investment, improve the way current government programs function, and maximize the options and opportunities available to communities.

Investment should drive compliant sustainable water and wastewater systems

Because private systems are regulated by state public utility commissions, they must demonstrate capital efficiency and cost transparency. Municipal systems have a combination of federal dollars, state dollars, local property tax assessments as well as customer water and wastewater bills. This layering of costs obfuscates the true cost of water and wastewater to the consumer.

Many of today's water and wastewater systems are in disrepair. Money is almost never the biggest issue and non-compliance is typically a symptom of the lack of financial and operational expertise, not a cause. A one-time injection of funds is akin to a band-aid approach, and within a short time, a challenged system will soon be in need of help again. It is critical that limited federal dollars are directed towards water and wastewater systems that are managed efficiently and effectively. It is important to explore as many other policy options as possible to achieve desired outcomes, some of which I will address shortly

Maximize the options and opportunities available to communities to enable investment and better operations

The water sector in the United States is highly fragmented. There are currently 56,000 community water systems in the United States, and most are quite small, with 92 percent serving fewer than 10,000 persons. There are currently over 19,000 wastewater pipe systems and over 14,000 wastewater treatment facilities in the United States. As recently as 2002, 98 percent of wastewater systems were municipally owned.

Too many of these systems are failing or are experiencing serious violations posing increased risks to public health. At the same time, water and wastewater infrastructure is capital intensive to upgrade, replace, and even maintain, and conditions are only getting more challenging for most small systems, leading to failing infrastructure and non-compliant water and wastewater systems.

Unfortunately, there are statutory and regulatory hurdles that stand in the way of addressing these significant issues. One example is that private water and wastewater systems are given a short time period to comply with consent decrees; whereas there are examples of public systems operating under consent decrees for decades. Another example is the lack of private ownership of water and wastewater systems in a number of states.

Regardless of ownership structure, all water and wastewater systems should be subject to the same enforcement actions and have the same access to federal funds. We suggest encouraging partnerships among public water and wastewater systems in communities which currently rely on under-performing or failing water systems. We believe such an approach could result in: better managed water systems via operational and financial expertise of skilled partners; reduced operational costs; improved reliability; and spreading capital investment costs among a larger pool of customers. These partnerships should be encouraged in all states, not just those currently allowing for private ownership of water and wastewater systems.

Rather than provide public funding to those systems which are out of compliance with environmental laws and regulations, we believe federal water and wastewater infrastructure funding programs should provide incentives for systems that have demonstrated an ability to maintain compliance and become sustainable; the adoption of asset management practices; and sustainable pricing. Many states have proactively passed "Fair Market Value" legislation to provide communities with troubled water and/or wastewater systems more options. The essence of this legislation is that it allows a regulated water utility to offer a community "fair market value" or appraised value for its water or wastewater system and the utility can then build that appraised value purchase price into its base rates. This approach provides communities more value for their system and allows the utility to earn a return on and of its investment. Rather than using federal funds to support communities whose water or wastewater systems are chronically non-compliant, federal funds could be used to incent the increased usage of a "Fair Market Value" approach.

Providing struggling communities with the option to partner with larger water and wastewater utilities has many significant benefits. Offering alternatives to grant funding for small systems by encouraging better performance for those systems unable to maintain the technical, managerial, and financial capacity requirements of the State Revolving Fund would save money for both the government and customers. It would also offer a choice to communities who otherwise might be subject to an enforcement action and costly civil penalties by EPA or a state, and helps public water systems in states be in compliance with the laws.

In March 2001, Pennsylvania American Water acquired the water and wastewater assets of the City of Coatesville Authority (CCA). The City of Coatesville gained long-term financial stability as a result of the sale. Funds from the sale, which exceeded $39.5 million after the debt was paid, were placed in a reserve fund. These monies were invested by the city to maximize their return in the form of investment income. At the blended investment rate of 6.8 percent, the return on the reserve fund was a minimum of $2.686 million annually, which was initially utilized for tax cuts and program enhancements.

Since the acquisition, Pennsylvania American Water has invested tens of millions of dollars to upgrade the water and sewer systems serving Coatesville and the surrounding communities including the Coatesville

Wastewater Treatment Plant, which replaced an antiquated facility dating back to 1932. The upgrades were required to address environmental issues that the Pennsylvania Department of Environmental Protection had identified in a Consent Order, pertaining to projected hydraulic overloads at the wastewater plant. The project also expanded the plant's treatment capacity from 3.85 million gallons per day to 7 million gallons per day.

Better use of existing federal programs through expanded access

First, expand access to the Clean Water State Revolving Fund (CWSRF). Unlike the Drinking Water State Revolving Fund (DWSRF), private wastewater service providers are not eligible for the CWSRF. This disparity prevents private wastewater service providers from leveraging federal investment in wastewater with private capital and expertise as they have done with the DWSRF since 1994. We strongly recommend that eligibility in the CWSRF under section 603c of the Federal Water Pollution Control Act be extended to all wastewater treatment providers, regardless of ownership. Doing so will allow the CWSRF to provide loans to private community wastewater systems, unlocking much needed wastewater solutions and service to underserved communities and non-compliant systems.

Second, review the CWSRF program is to make sure it meets your primary goals. For instance, if a goal of the CWSRF program is to make rates more affordable for lower income families in the face of large new investments, it makes sense to review whether the current approach of providing relief to systems as a whole instead of directly to the lower income families is the best approach.

Third, make sure systems requesting CWSRF funds have reviewed all of their options. Many systems do not realize all of the options that are available to them to fund needed investments, including consolidation with other neighboring systems. By encouraging systems to pursue all of their other options, existing CWSRF funds will be better used and more total investments will be made in the wastewater systems.

Reform tax regulations to better support infrastructure investment

Current IRS regulations that pertain to P3s are in many cases outdated and may present obstacles to communities seeking to upgrade their municipal infrastructure through P3s. We recommend that the US Treasury Department and the IRS broaden their remedial action regulations to provide more flexibility to municipalities on the use of proceeds from P3 transactions. Local governments commonly finance their infrastructure needs through tax-exempt municipal bonds. When a municipality decides to sell these assets or to enter into other forms of public-private partnerships, it must consider IRS rules that exist to prevent the tax-exempt benefits of municipal debt from transferring to the private partner. In these circumstances the IRS rules provide a municipality with three primary ways - the "remedial actions" - to repay or retain its tax-exempt municipal bonds. Regardless of whether there are monetary savings, these changes have the potential to enable more P3 transactions by eliminating ambiguity and potential regulatory issues.

Remove Tax-Exempt Bonds for Water Infrastructure from State Volume Caps

In addition to federal dollars, another effective option for the federal government in providing long-term, capital-intensive infrastructure projects is the private activity bond (PAB), or exempt facility bond. These bonds are a form of tax-exempt financing for state and municipal governments that want to partner with a private entity to meet a public need. This partnership approach makes infrastructure repair and construction more affordable for municipalities and ultimately for users or customers. Exempt facility bonds utilize private capital instead of

public debt and shift the risk and long-term debt from the municipality to the private partners. In addition, the tax-exempt bond provides lower cost financing, which translates to lower costs for the customer.

However, Section 146 of the Internal Revenue Code limits the amount of tax-exempt private activity bond debt that may be issued annually in a state, and historically most of the tax-exempt funding has been allocated to shorter-term projects, such as housing and education loans. The annual volume cap hinders the use of PABs for water and wastewater infrastructure, which are generally multi-year projects.

Amending the Internal Revenue Service Code (26 USC 146) to remove from the volume cap private activity bonds for public-purpose water and wastewater facilities would allow local communities to leverage private capital markets in combination with other finance mechanisms. We believe this change would provide an influx of private capital to finance water infrastructure projects.

It is also important to note that exceptions from the volume cap are already currently provided for other governmentally owned facilities such as airports, ports, housing, high-speed intercity rail, and solid waste disposal sites. Volume cap limitations are not issues in all states, but removal of the caps provides for competitive access to lower cost funding for private investors similar to municipalities.

While we understand these final two recommendations, though extremely important for water infrastructure, are not technically within the jurisdiction of your committee, we urge you to work with your colleagues on the Ways and Means Committee as they negotiate tax reform issues.

Conclusion

Finally, I would like to make three important points. The first is that investment should drive compliant sustainable water and wastewater systems. While we strongly believe the private sector can and should play an important and valuable role, providing flexibility and choice for communities is vital to achieve this objective.

Second, while federal funding for water and wastewater infrastructure plays an important role, federal investments should be made strategically in order to create the most cost effective solutions for all customers and constituents.

And finally, I would like to conclude by reiterating comments I made earlier. Clean, safe, reliable, and affordable water and wastewater are a critical necessity for every person. Every person wants to make sure our children and future generations have clean water and healthy environment. We hope the recommendations and solutions we put forward today can be constructive in addressing the significant challenges we face and we look forward to continuing to work with you on these critical issues.

Building a 21st -Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure

Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
U.S. House of Representatives

Testimony by Kevin DeGood
Director of Infrastructure Policy
Center for American Progress
March 9, 2017

Thank you, Chairman Graves, Ranking Member Napolitano, and members of the committee for inviting me to testify on the role of federal agencies in building 21st-century water infrastructure. It is an honor and a privilege to contribute to this committee's work.

Water is an essential element of our daily lives, and it plays a foundational role in the economy in everything from commercial navigation and recreation to industrial and agricultural production. Congress and federal agencies share a fundamental responsibility to ensure the ongoing protection and sustainable development of U.S. water resources.

The start of 115th Congress presents members with the opportunity to review the investments and policies needed to move the country forward in the coming years. And while the elections on November 8th produced a change in leadership in Washington, one thing remains clear above all else: No one walked into the voting booth demanding dirtier water, lower wages, and higher profits for Wall Street. And yet, weakening the Clean Water Act, eliminating Davis-Bacon prevailing wage standards, and pushing high-cost equity capital through public-private partnerships would do all those things. Rather than undoing the environmental progress of recent decades, this Congress has a clear mandate to build a stronger, cleaner future for our communities by providing direct funding to improve water quality and reliability, flood control, and navigation in a sustainable way.

State and local governments, as well as drinking and wastewater authorities, face enormous infrastructure challenges. Many legacy facilities have come to the end of their useful lives, requiring major rehabilitation or outright replacement. At the same time, population growth, source water pollution, and increasingly extreme weather patterns brought on by climate change have added to the complexity and cost of providing safe and reliable water and protecting against the ravages of flooding, drought, and sea level rise. The Environmental Protection Agency, or EPA, estimates that the nation needs nearly $655 billion to maintain existing health and environmental standards: $271 billion[1] for sewage systems and stormwater and $384 billion[2] for drinking water. In addition, the nation's water infrastructure needs could increase by an additional $448 billion to $944 billion by 2050 because of climate change and the additional stress that the increasing number of droughts, floods, and powerful storms and sea level rise will put on these systems.[3]

While no one weather event is dispositive, the recent winter storms that have lashed Northern California offer a powerful lesson in how rapid swings from intense drought to intense precipitation can overwhelm

critical facilities that were designed using more stable climactic assumptions. More than 180,000 residents in the Oroville region had to be evacuated on short notice due to damage to both the main and emergency spillways at the Oroville Dam complex—highlighting the fragility of older facilities and the essential role that water infrastructure plays in supporting public health and safety and California's overall economy.[4]

California is not alone in facing water infrastructure challenges from climate change. For instance, South Florida must modernize a host of drinking and wastewater facilities to deal with rising seas. For these communities, adapting to climate change is not merely a line item in the budget of a local drinking or stormwater management agency. Rather, upgrading facilities to become more resilient is an issue of basic economic viability. Based on detailed technical work from Swiss Re—a major company in the reinsurance industry—the Miami-Dade Sea Level Rise Task Force determined that major improvements to local facilities would be need to "avoid or postpone wholesale abandonment due to non-insurability or the high cost of premiums."[5] The stress that climate change places on the built environment will only grow over time. The nation already spends billions of dollars to repair and rebuild water facilities damaged in flood disasters. An analysis by the Natural Resources Defense Council found that the Federal Emergency Management Agency, or FEMA, has spent $10.3 billion since 1998 to repair and rebuild public utilities in the aftermath of declared flood disasters through that agency's Public Assistance grant program.[6] We have a choice: invest and adapt or pay an even higher price down the road.

In the Cleveland area, the Northeast Ohio Regional Sewer District faces significant challenges meeting Clean Water Act standards. Like many older communities, Cleveland has a combined sewer system that discharges untreated wastewater into the Cuyahoga River and Lake Erie during heavy rain storms. On average, the district discharges more than 4 billion gallons of untreated sewage each year.[7] As a result, the district has been unable to meet the effluent limitations required under the Clean Water Act. In 2011, the district entered into a consent decree with the Environmental Protection Agency to make approximately $3 billion dollars in upgrades to its system, including a combination of gray and green infrastructure investments.[8] When completed, these upgrades will ensure that 98 percent of all wet weather flows receive treatment.[9]

Pollution is not only an issue with surface waters. In Southern California, millions of residents rely on groundwater from the San Fernando Basin. In the past, the basin has been able to provide as much as 25 percent of all local drinking water. Today, the Los Angeles Department of Water and Power, or LADWP, must contend with a host of toxic pollutants, including perchlorate and hexavalent chromium, among others. Groundwater pollution has caused the LADWP to deactivate approximately half of all basin wells.[10] This has pushed the share of drinking water that comes from the ground down to approximately 12 percent, making it difficult for the city of Los Angeles to achieve its goal of receiving half of its water from local sources by 2035.[11] In response, the LADWP has undertaken a costly effort to restore more of the basin to beneficial use.

Project financing

The public agencies responsible for managing the water infrastructure highlighted by these examples share one key characteristic: They do not need another credit card from Washington or to saddle taxpayers with expensive equity capital through a public-private partnership. Instead, these jurisdictions need a strong federal partner ready to provide direct funding.

Proponents of public-private partnerships often state that there are billions of dollars of private capital waiting on the sidelines. Implicit in this statement is that water agencies and other project sponsors face a lack of liquidity, and if only they would tap into this pool of equity capital, the infrastructure backlog would be solved. This is simply not the case. Investors view U.S. public debt as attractive and overwhelmingly safe. Moreover, the favorable tax treatment afforded to municipal bond investors means the public sector faces borrowing costs that are three to five times less than equity capital. As a result, the municipal bond market is active and robust with more than $3.7 trillion in outstanding issuances at this time.[12]

A review of municipal bond market activity during the past 15 years reveals that the controlling factor limiting infrastructure investment is not access to credit but rather insufficient tax and user fee revenues needed to support additional project debts. From 2000 to 2008, total municipal debt increased by 138 percent or more than $2 trillion.[13] This amount is notable as the increase in total municipal debt outpaced overall economic growth.[14] This demonstrates the imprudent tendency of governments to tap capital markets and raise overall indebtedness when tax revenues show even modest growth.

This tendency is so strong, in fact, that the short-lived recession in 2001, which caused the economy to lose 0.6 percent[15] of overall economic output, did not slow the pace of public borrowing.[16] In other words, because the downturn was modest, state and local governments anticipated that tax revenues would rebound quickly enough to cover new debts.

By comparison, when state and local governments faced a rapid decline in tax revenues as a result of the Great Recession—with the expectation that the recession would endure for an extended period of time—they dramatically reduced their borrowing. According to data collected by the Pew Charitable Trusts, state tax revenues declined by 13 percent from the second quarter of 2008 to the fourth quarter of 2009.[17] Another way to quantify the magnitude of the decline is that the Great Recession resulted in a drop in GDP that was more than seven times greater than the 2001 downturn. Between 2008 and 2015, total municipal debt increased by only 6 percent, or $198 billion.[18]

Today, state and local governments and water authorities have access to municipal financing, as well as federal credit facilities and federally supported state revolving funds at historically low rates. Simply stated, for many cities and water utilities, access to affordable credit is not the binding constraint. Instead, there is a shortage of local revenue to support new project debts. Many communities often do not take full advantage of their capacity to generate additional revenue through taxes and user fees, but even when they do, there are real limits on the total amount of additional revenue they can reasonably generate from these sources, which often fall short of total need for infrastructure investment.

Increased federal funding is needed to ensure timely compliance with water quality mandates, as well as to deal with the challenges presented by climate change to both physical assets and natural systems. These resources should be used to leverage additional state and local dollars where possible and to target the communities facing the greatest need. Additionally, federal funds should focus on the categories of projects that all too often take a backseat to traditional gray infrastructure, including energy efficiency upgrades, watershed restoration, and nonpoint-source pollution mitigation.

President Donald Trump has repeatedly talked about the need to invest in infrastructure. Unfortunately, the only plan on the table envisions offering tax credits to equity investors rather than direct federal funding.[19] While tax credits help to lower the tax liability of wealthy Wall Street equity investors, they are of little value to project sponsors. First, even with tax credits, equity capital is significantly more

expensive than traditional municipal bonds. Second, in addition to being more expensive, securing equity capital through a public-private partnership entails substantial transactional costs. And third, many smaller systems do not have infrastructure needs that fit well with the public-private partnership model.

Public-private partnerships

The Bayonne, New Jersey, public-private partnership between the Bayonne Municipal Utilities Authority, or BMUA, and the joint venture of Kohlberg Kravis Roberts, or KKR, and United Water is often held up as an innovative model for future water investment. A review of the concession reveals that the only real innovations in this deal were layoffs affecting 37 percent of BMUA staff, 38 years of guaranteed rate increases, and no meaningful risk transference.[20]

Unlike many utilities, the BMUA is characterized as a distribution-only system, meaning that the utility is responsible for the distribution of drinking water and collection and conveyance of wastewater. The BMUA pays two regional utilities to provide drinking water and wastewater treatment. In other words, the deal involved the most basic elements of system maintenance over the 40-year life of the concession.

In order to garner political support for the agreement, city officials negotiated an initial rate increase of 8.5 percent followed by two years without any increases. After this brief moratorium, KKR has the right to increase rates using a formula that includes a base increase plus a measure of both macroeconomic and labor cost inflation.[21] In exchange for receiving revenues from ratepayers, KKR agreed to make system upgrades each year, as well as provide the BMUA with an upfront payment of $125 million to allow the utility to repay its outstanding debts. This resulted in Moody's modestly upgrading Bayonne's municipal bond rating from Baa1 with a negative outlook to Baa1 with a stable outlook.[22] This upgrade, while meaningful, is—from a broader policy perspective—a change in accounting more than a change in substance. While the debt no longer counts against Bayonne's books in the form of a contingent liability, the obligation has not been removed from ratepayers. The only difference is that water fees now flow to investors who purchased private, fixed-rate bonds from the KKR/United Water joint venture as opposed to investors who purchased the prior municipal bonds.

Proponents of public-private partnerships frequently talk about the ability of the public sector to transfer substantial construction or operational risk to the private sector. Yet in the Bayonne deal, the public retains a substantial amount of risk. Specifically, KKR is able to pass through to ratepayers any capital costs in excess of $2.5 million per year, cost increases from the regional utilities for water or wastewater services in excess of 2 percent per year, and regulatory changes that increase costs in other ways.[23]

Nothing about this deal points toward a realistic path forward to address the billions of dollars in drinking and wastewater needs that exist across the country.[24]

Clean Water Act

In 1972, Congress passed the Clean Water Act. This landmark legislation established a framework to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[25] To this end, Congress set the bold goal of eliminating all discharges of pollutants into our waters by 1985. While we have fallen short of this goal, we must not relinquish the mantle of environmental protection established by this law.

Implementation of the Clean Water Act has often required states and local communities to raise additional revenues to finance the construction and improvement of treatment works and other facilities. For some residents, higher water rates represent a real and substantial economic hardship. The appropriate response

to this situation is not to roll back environmental protections but rather to increase direct federal funding and technical assistance to the communities most in need—in combination with sustainable local rate structures and comprehensive asset management plans. In short, the problem is not the regulations that the EPA is asked to enforce but our political commitment to implementing the vision set out by Congress more than four decades ago.

Make no mistake: If we follow the logic of economic hardship to its conclusions, clean water would become the exclusive domain of wealthy communities. Allowing pollution to impair our source waters in the name of economic hardship simply passes the buck by creating additional burdens on local agencies charged with delivering safe, clean drinking water. Clean water is a basic human right. We cannot and should not allow a two-tiered approach to water quality.

Thank you again for the opportunity to address the committee.

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TESTIMONY FOR THE RECORD

Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure

Before the
House Transportation and Infrastructure Committee
Subcommittee on Water Resources and Development

By
Larry A. Larson, CFM, P.E.
Director Emeritus

Association of State Floodplain Managers

March 9, 2017

Introduction

The Association of State Floodplain Managers (ASFPM) is pleased to submit testimony for this hearing about role of Federal agencies in water infrastructure. Specifically, we would like to discuss our views and recommendations for improvement and for implementation of comprehensive flood risk management and associated infrastructure. We thank you, Chairman Graves, Ranking Member Napolitano and members of the Committee for your interest in this subject that has recently vividly presented itself as a problem.

ASFPM and its 36 chapters represent more than 17,000 state and local officials, as well as private sector and other professionals engaged in all aspects of structural and nonstructural flood risk management. This includes floodplain management and flood hazard mitigation, management of local floodplain ordinances, flood risk mapping, engineering, planning, community development, hydrology, forecasting, emergency response, water resources development and flood insurance. All ASFPM members are concerned with reducing our nation's flood-related losses. For more information on the association, its 14 policy committees and chapters, visit *www.floods.org*.

The extreme flooding in West Virginia, Louisiana, Missouri, South Carolina and California vividly illustrates the potential threat to public safety of inadequately maintained infrastructure, limitations of engineered flood control structures, the importance of public awareness of potential flooding and challenges of a changing climate. Dramatic rainfall events have led to failures of numerous smaller high hazard dams – notably 80 dam failures in South Carolina just in 2015 and 2016. The problem exists nationwide and we have received a wake-up call. Much of our infrastructure has exceeded its originally intended design life, which requires assessment, remediation or replacement.

One of the key issues the nation has chosen to ignore is the issue of residual risk. We have trillions of dollars of investment in this nation protected in some fashion by flood control infrastructure. We have seen in New Orleans and most recently in northern California the dramatic impacts failure or the threat of failure might bring. The failure consequences in New Orleans were dramatic and perhaps we were not far from a failure in northern California that would have immediate flooding consequences for tens of thousands of people and left the state's water supply vulnerable to severe shortage. Yet when FEMA attempts to show these residual risks on maps, they are overridden by concerns about releasing security information, even though nature continues to fail dams and levees each year while we have seen none of that from terrorists. When people mention that residual risk flood insurance is a good idea, they are shouted down for suggesting people are even at risk. Due to aging infrastructure, underfunded maintenance, significant development and population (and hence rapidly escalating risk) within "protected" areas, and finally an uncertain understanding of flood risk in the future due to climate, our nation and citizens perhaps have never been more at risk than they are today, and it will only be worse tomorrow

As the nation considers substantial investment in infrastructure, the undertaking must involve attention to flood control structures and their maintenance, upgrading and repair as well as conscious integration

with non-structural flood risk management techniques. These flood threats to public safety cannot be met by private financing alone, but will continue to require substantial federal investment.

Mapping of flood risk areas is woefully incomplete and requires a major commitment of resources to assure the availability of reliable, accurate flood risk information. ASFPM has estimated a further investment of $4.5 billion to $7.5 billion is needed to provide maps for every community in the nation that would cover all unmapped areas and to update existing, but very outdated maps.

The ongoing use of the 100-year event as the basis for both insurance risk and infrastructure design is placing communities at risk, especially when we consider the very real changes in future conditions that will occur from land use change and climate. We see many instances where protection of property with levees based on the 100-year standard means that we free up land for development that will be at risk to people and to the federal taxpayers.

Overview of Managing Flood Risk in America

Flooding is the most costly and most frequent cause of disasters in America. Flood damage has cost the nation's taxpayers more than $200 billion since 2005.We are seeing years with up to 14 separate billion dollar disasters, 85-90% of them from flooding. The recent and ongoing flooding in California is an example we can learn from, even though California probably manages flood risk better than most states in the nation.

The U.S. has a varied history of how we manage flood risk. Until the early 20th Century, managing flood risk was handled by local governments or private property owners. During this period, Congress authorized the Corps of Engineers to construct levees in Sacramento and on the Mississippi River.

The Corps' role expanded greatly with the devastating 1927 flood on the Ohio and Mississippi Rivers that saw hundreds of miles of levees overtopped and thousands of people in the lower Mississippi River basin displaced. Congress authorized a plan to provide flood protections from Cairo, Illinois to the Gulf of Mexico called the Mississippi River and Tributaries (MR&T) project. The Corps constructed a couple thousand miles of levees and included a number of relief outlets along the route to divert extreme flood flows into backwater areas to relieve pressure on the levees to prevent levee failure. The Corps purchased flowage easements in those overflow areas to allow them to be occasionally flooded. For example, the Birds point (opened in 1037) and New Madrid Floodway (opened 2011) to save the levees downstream. Other by-pass systems exist on the MR&T to utilize the approach the Dutch call "Room for Rivers." In other words, we accept that Mother Nature can always throw a larger flood at us than we can afford to design. So instead we can plan for emergency overflow areas that allow the river to flow into historical floodplain areas where damage is limited. These by-pass areas can be used for lower damage activities like farming that will not experience long-term damage from occasional flooding. Surprisingly, this approach is seldom used in the U.S., but MR&T and the Yolo by-pass on the Sacramento River are two successful examples.

In the 1936 Flood Control Act, Congress authorized the Corps to construct levees and other flood control structures. Most of the projects were only constructed by the Corps after a non-federal sponsor stepped up to acquire the right-of-way and promise to operate and maintain (O&M) the project after it was constructed. Since 1986, the non-federal sponsor must also cost share the construction, usually 35% of the cost. Unfortunately, many of those non-federal sponsors did not perform the necessary O&M and the "protected" populations cannot be assured the structures will protect them during flooding to the design level of protection. The Corps has a program called Rehabilitation and Inspection (RIP) in PL 84-99 that allows the Corps to come in and repair a levee that has been damaged or fails in a flood, at either 100% or 80% federal taxpayer cost. Concern has been expressed that some non-federal sponsors put off needed O&M, hoping the Corps will do some of that work under PL 84-99 after the levee is damaged.

In the 1950s and 1960s, visionaries like Gilbert F. White were proposing a new approach to managing flood risk: that is to adjust where and how people build instead of adjusting our rivers and ecosystems. The NFIP was designed to do that and ensure people living at risk paid at least some part of the cost of that risk. The NFIP would map the flood risk areas and make flood insurance available, and in return communities and states would guide new development and redevelopment to be less at risk. While the concept of that program makes sense, some elements, like subsidized flood insurance and its approach to managing average events (only the 100-year flood, but not extreme events) have led to a $24.6 billion program deficit. Most of this debt comes from extreme flooding events, such as Hurricanes Katrina, Rita, Wilma, Irene and Sandy, and the rainfalls that are becoming more extreme and frequent in the last decade, such as the one in Baton Rouge just recently.

The NFIP is the nation's primary flood risk reduction tool. The program helps to identify and map flood hazard areas, assess flood risk, implement strong land use and building standards to prevent future disaster losses, and undertake mitigation to reduce damage to older at-risk buildings. Other agencies like the Corps, USGS, NOAA and others work with the NFIP to collect and develop data and integrate federal actions. The adoption of floodplain management standards by more than 22,000 NFIP participating communities results in $1.7 billion in flood losses avoided every year according to FEMA data. The mitigation programs within the NFIP, Increased Cost of Compliance (ICC) and Flood Mitigation Assistance (FMA) have mitigated, on average, 1,850 buildings annually between 2010 and 2014. The NFIP is not an insurance program; rather it is a comprehensive flood risk reduction program that happens to also sell flood insurance as one of its tools.

Many federal agencies are involved in managing flood risk, and many programs promote using nature to reduce flooding. Examples include the conservation programs in USDA, coastal management programs in NOAA and water quality/stormwater programs in EPA. Agencies like HUD and DOT recognize the advantage of building in a way that will ensure housing, bridges and roads that are safe and resilient now and in the future.

In the past 30 years there has been a trend toward using more nature-based or nonstructural approaches. Important advantages of this trend are that communities and states can implement these approaches on their own due to smaller costs and the ability to integrate them into holistic approaches

that address more than just flood loss reduction. Especially important are social issues, local economic issues and long-term environmental considerations that are attractive to local residents and tourists.

Managing flood risk in the rest of this century

For decades, floodplain managers have been studying and seeing how flood risks change over time. When a watershed develops, unless there are sufficient land use and design standards in place, downstream flooding often gets worse due to a watershed that that is "hardened" with more concrete and other impervious surfaces. Because we have not mapped dam failure inundation areas, inadvertent development downstream of dams results in a formerly low hazard dam becoming a high hazard dam, triggering necessary – but costly - upgrades to the dam. Intense development in vacant lands protected by levees greatly increases the risks associated with catastrophic failure; yet we have no national levee design standards. All of these development related concerns are challenges for managing flood risk.

Perhaps a more significant challenge is the impact of climate change. The fact is, today, we are seeing flooded roads in residential subdivisions during regular high tide, storm drains flowing backwards, and buildings that are islands along our coasts. This is not a theoretical or abstract "what might happen" scenario; rather local floodplain managers are dealing with the conditions as they are happening today and those conditions are getting worse. In addition to sea level rise projections that are getting higher as we better understand the causal factors including the melting of the Greenland ice sheet, we are also witnessing more intense rainfall and extreme flood events in several areas of the nation. ASFPM is trying to do its part by assisting communities in preparing for these conditions. One project we have underway right now is to identify and mainstream techniques for incorporating future conditions into local capital improvement planning (CIP) so communities can account for the full costs and potential impacts of hundreds of billions of dollars in infrastructure investment along the coasts over the next several decades.

Investing in America's Flood Risk Reduction Infrastructure

We are keenly aware of the alarming state of infrastructure overall in this nation pointed out by the Report Card put out by the American Society of Civil Engineers—much flood control infrastructure is a "D". We are reminded of this problem every day when we use our roads, bridges and public transportation or drink water and use the bathroom. ASFPM is pleased that Congress and the Administration are contemplating a significant infrastructure investment package. ASFPM strongly recommends that a priority be placed on America's flood risk reduction infrastructure. This infrastructure includes the following types of projects:

- Data (mapping, topography)
- Dams
- Levees
- Stormwater management
- Nonstructural flood mitigation

Investment in these types of projects should be guided by the following principles:

- *Greater incorporation of nature based approaches.* Sometimes, a nature based approach is an effective alternative to a more traditional structural approach. However, far more often nature based approaches can be effectively incorporated into a flood risk reduction project to bring additional benefits to the community as well as the environment. For example, in Hamilton City, California a setback levee project is allowing for the reconnection and restoration of over 1,300 acres of floodplain riparian habitat. Making "room for the river" in this way reduced the construction cost of the levee and made the project cost-effective.
- *Account for future conditions and build in resiliency.* Flood risk changes over time. Given that our infrastructure projects are often nursed long past their expected design life, standards applied to infrastructure development must include full accounting of future conditions, as reasonably and scientifically possible. Otherwise, the federal taxpayer will be on the hook again and again for flood damage that repeats over and over. A basic resiliency standard that would be easily applied is a flood protection level that is at least 2 feet above (3 feet above for critical facilities) the existing 100-year flood elevation where appropriate. Critical facilities need added protection because they must be operational and accessible during major flood events.
- *No adverse impacts.* A basic legal principle in America is that one property owner cannot do something on their property that will adversely impact another person's property. Sometimes this legal principle has been ignored when building flood control structures. There are illustrations that property owners are seeing those impacts. For example, in floods along the Mississippi River, which splits Illinois and Missouri, property owners in one state attempt to breach the levee on the other state to relieve the pressure on their own levee. For structural projects like levees, these can have adverse impacts not only across the river, but also on properties upstream or downstream. It is important that all flood mitigation activities ensure the activity does not impact other properties or that the impact has been mitigated financially or by some other means.

Financing vs. Funding

We are pleased to see the strong discussion on the need for investing in repairing and improving that infrastructure, but our experience does not show that financing alone (i.e., private-public-partnerships (P3)) is a path to success. We believe there needs to be real dollar investments of taxpayer funding to save our crumbling infrastructure. Current taxpayers benefit, so we should not pass this cost to future generations.

In conversations we have had with large global capital investors, they indicate a hesitancy to invest in infrastructure like levees. They say it's because they have no way to determine if the levee is designed, constructed, operated or maintained to quality standards or if it will withstand expected future conditions. They indicate that if adequate national standards existed, and they were assured these kinds of projects meet all those standards, and that the owner has an assured source of revenue to pay off loans, they could be a partner. Similarly, a P3 roundtable hosted by USEPA in 2012 found that while P3

arrangements are somewhat common with some forms of water infrastructure (drinking water and wastewater systems), to help finance the construction, retrofit and/or operations of such systems they are essentially non-existent for urban stormwater retrofits, which is another kind of flood risk management infrastructure. The report noted that the P3 model is highly complex, needing expertise in contracting at the public level and is not a panacea for all types of infrastructure. So while financing is one tool in the toolbox, it is a minor one as applied to flood risk management infrastructure. Funding is a much more immediate and widespread need and a more successful tool.

What is included in infrastructure? While most consider any public transportation systems or water and sewer systems might be appropriate, we would urge all federal taxpayer investments in those or other systems must account for future conditions expected during the lifetime of that infrastructure. It will be costly enough to do this once. We cannot afford to rebuild that infrastructure time and again because we did not take into account expected sea level rise, future watershed development that increases runoff and floods, or predictable increased rainfall that creates the kind of extreme flood events we have seen in the last decade.

Furthermore, if any of this infrastructure is privately owned, the federal taxpayer investment must be tailored to provide only partial funding, and only then if it is conditioned on verifiable future funding by the responsible entity.

- **For the infrastructure package under consideration by the Administration and Congress, ASFPM recommends robust funding of infrastructure in addition to any financing incentives**

Data Infrastructure

Fundamental to any flood risk reduction infrastructure is data to understand how floods may occur (flood studies), where floods will impact people and property (topography and flood maps) and how any new infrastructure (both large flood control structures and smaller, non-structural measures) affects flooding. The data is important for the purposes of flood preparedness, response, recovery and mitigation. While significant investments have been made to better understand flooding and map such areas, we have a long way to go to identify all flood risks and how they will impact people and property.

Acquiring LiDAR Topography for the Entire Nation

One program ASPFM wishes to highlight is the 3D Digital Elevation Program (3DEP) at USGS. The primary goal of 3DEP is to systematically collect enhanced elevation data in the form of high-quality light detection and ranging (LiDAR) for the nation. With better topography, FEMA flood map updates could take much less time, flood maps would be far more precise, and flood forecasts can be more accurate and timely. Beyond flood, LiDAR based topography is helpful for infrastructure project planning of other hazards as well. For example, 3DEP data was used to discover a surface rupture along the Tacoma fault in the State of Washington. This discovery led to a redesign of the structural elements of a $735 million suspension bridge across the Tacoma Narrows, to mitigate against potential catastrophic failure.

- **ASFPM recommends completion of the 3DEP Program for the nation in 8 years by providing the necessary funding to accomplish that goal**

Mapping All Flood Risks for the Entire Nation

Communities and citizens need maps showing where and to what extent an area will flood. This is needed by the community to help direct new development and plan for notification and evacuation when it floods, and to inform property owners of their level of risk. This enables them to decide if and how to build, whether to buy flood insurance and how to evacuate when needed. Banks and real estate agents need that data so they can advise prospective buyers.

The NFIP has mapped about 1/6 of the nation's 3.5 million river and coastal miles. Most of those maps were completed where people already live in order to determine flood insurance rates. What are the aspects of flood mapping that need improvement?

- Map ahead of development so people and property are protected. Often people are surprised when they build, and then are told later that they are in a floodplain. That means we need to map cornfields and cow pastures because that is the land that will be developed next
- We must map residual risk areas, like dam failure zones and levee failure zones. People need to know they are living or buying in a residual risk area so they are not surprised when told to suddenly evacuate and they know where to go. NFIP maps do not show these failure zones because DHS has a fear terrorists will blow up dams! The actual probability of this occurring is very low; in the meantime, nature is failing dams every year and people have lost or may lose their lives and property. In just the last two years, South Carolina alone has had 80 dam failures due to back to back flooding events.
- Flood maps must be publically available. Unfortunately, most federal dam failure and inundation maps of emergency or uncontrolled spillway releases are classified as For Official Use Only (FOUO – see the Corps of Engineers Letter at the end of this testimony). While it is useful for the emergency manager to know the dam or levee failure zone, citizens who live there also need to know so they can take appropriate risk reduction actions (such as plan for evacuations or purchase flood insurance). It is almost unthinkable that the first time a citizen knows they are at risk is when law enforcement knocks on their door at 2 a.m. and tells them they have to evacuate NOW.
- The NFIP finally has a good process to acquire LiDAR for topography and updated computer modeling techniques to produce accurate flood mapping. What it lacks is financial resources and direction from Congress to get every one of the 22,000 NFIP communities an updated and accurate map in the next 10 years. A recent national survey by ASFPM of local floodplain managers indicates that the number one tool/data need is updated flood maps.
- Consideration of major infrastructure investment—public and private—highlights the urgency of providing accurate flood risk data and accelerating the pace of current mapping work at FEMA and the LiDAR data collection work at USGS.

ASFPM's *Flood Mapping for the Nation Report* estimates that the cost to provide flood mapping for the entire country will be between $4.5 billion and $7.5 billion.

- **ASFPM recommends full funding (to the authorized amount) for FEMA to implement the National Flood Mapping Program and complete flood mapping for the entire nation in 12 years**
- **ASFPM recommends that dam failure and inundation maps from emergency or uncontrolled spillway releases be publically available and no longer be classified as FOUO**

Dam Infrastructure

There are 90,580 dams in the nation, and about 3,300 of them are considered major dams (50-feet deep and store 5,000 acre-feet of water or a dam of any height with storage of 25,000 acre-feet). An acre-foot of water is enough for two families for an entire year. By 2025, 70% of the dams in the U.S. will be more than 50 years old, which is one reason ASCE gave U.S. dams a grade of "D" in 2013. Dams are classified by the hazard they present if they fail. A dam is classified "high hazard" if it is likely a person could die if the dam fails. As our population grows and development continues, the overall number of high-hazard potential (HHP) dams increases, with the number climbing to nearly 15,500 in 2016. Due to the lack of investment, the number of deficient high-hazard potential dams has also climbed to an estimated 2,170 or more. The Association of State Dam Safety Officials estimates it will require an investment of nearly $22 billion to repair aging, yet critical, high-hazard potential dams.

The federal government has built many dams and is responsible to maintain the ones it owns. While the federal portfolio is relatively small in number, it contains many of the most important and largest dams in the nation. FEMA and the Corps also have an inventory of dams in the U.S. called the National Inventory of Dams. Federal agencies suffer for lack of financial resources to maintain their dams, just as other owners do.

There are no national standards for the design, construction, operation and maintenance of dams and levees in the U.S. Different federal agencies may use the standards the Corps uses for its own dams or levees, but there is no agreed upon national standards. This practice must not continue.

ASFPM applauds Congress for creating a national dam grant program in FEMA in the 2016 WINN Act/WRDA to provide grants for the repair or removal of small dams. That program was also wisely designed to integrate such activities with ongoing local hazard mitigation planning and flood risk reduction programs and act as an incentive for states to maintain strong state dam safety programs. However, it has not been funded.

- **ASFPM recommends fully funding to the dam repair/removal program to its fully authorized limit**

Levee Infrastructure

The Corps of Engineers levee inventory seems to show about 2,000 miles of levees owned and maintained by the Corps; 12,000 miles of levees owned and maintained by non-federal entities that are in the Corps PL 84-99 program; and perhaps as many as 30,000-35,000 total miles of levees. FEMA coordinates its information of levees with the Corps, so those levees are included in these numbers. There are many small levees built by private owners to reduce flooding of agriculture lands, but there may now be people living behind those levees thinking they are somehow protected. There are also miles of levees with no known owner.

The ongoing use of the 100-year event as the basis for insurance risk and infrastructure design is placing communities at risk, especially when we consider the very real changes in future conditions that will occur from land use change and climate. We see many instances where protection of property with levees based on the 100-year standard means that we free up land for development that will be at risk from flooding in events that exceed the project design standard and often to depths of flooding that are greater than they would have been without the protection measure. A good example of this is leveed areas that receive overtopping upstream and fill the interior area like a bathtub to depths greater than would have been experienced without the levee system.

Congress created a National Levee Safety Program in the 2014 WRRDA. In that program, the Corps, in addition to a national inventory of levees, is to establish a Levee Safety Committee of national experts to work with the Corps, states and other federal agencies to establish national standards for design, construction, operation and maintenance of levees. This is an important first step, but it has not been funded. These standards must also take into account the population and land use in the residual risk areas to establish standards for public notification of risk and for emergency action plans. The nation is losing valuable time to get this effort of establishing standards underway.

Then national levee design standards must include design planned failure sections into the levee or overflow areas such as that employed in MR&T. Most countries utilize this approach, but in this nation we have not, meaning that any levee failure is likely to become catastrophic because everything in the failure zone is not designed for flooding, so it is extensively damaged. This and other forms of resilience in structural measures, such as designing for future conditions are critically important standards.

- **ASFFPM recommends immediate and full funding of the National Levee Safety Program at The Corps of Engineers**
- **ASFPM recommends that the national levee safety standards include programmed resiliency for all levees (such as failure sections), standards for managing land use and residual risk for areas protected by levees and areas subject to flooding if a levee fails, and a minimum protection standard of the 500-year flood or probable maximum flood for all levees protecting populated areas**

State Role in Dam and Levee Safety

Only states have the authority to enforce dam and levee standards directing owners to repair or remove non-federal dams or levees. The Corps and other federal agencies must operate and maintain the dams they own, but have no authority to force other entities to properly build or maintain those dams. There are some effective state dam safety programs, but all states need such programs.

The National Dam Safety Program in FEMA has been successful in assisting states set priorities for increasing the number of dam inspections and developing Emergency Action Plans. ASDSO indicates annual inspection percentages for high hazard dams have been near 100% for the past several years. Those inspections have shown that many dams are deficient and need repair, upgrading or removal. Funding for rehabilitation/removal of high hazard dams is often necessary to assist dam owners in making these necessary public safety upgrades.

The emergency action plans (EAP) percentage for state-regulated high hazard dams has reached 78%, a significant improvement from less than half about 10 years ago. Important work remains. The incident at Oroville Dam in California illustrates the importance of a strong EAP to help protect people in situations when operation of a dam does not go as planned. The NDSP has developed tools that provide low-cost alternatives to states and dam owners in the development of EAPs and also supported training on EAPs and dam safety emergency preparedness for dam owners, regulators and local officials.

Full funding of the NDSP is important to public safety to help ensure continued progress in inspection and identification of deficient dams and in the development of EAPs.

States should get credit for effective dam and levee safety programs under any disaster deductible that is being discussed as part of the Disaster Relief Act aimed at reducing federal disaster costs. Effective state dam safety and levee safety programs definitely reduce the cost and need for federal disaster declarations. Those state programs can be evaluated to provide credit for those that reduce risk of failure to the structure itself, and even more credit for those that address the flood risk associated with the residual risk failure zones.

- **ASFPM recommends that Congress fully fund the National Dam Safety Program to its authorized level**
- **ASFPM recommends Congress develop incentives for the creation of state laws that make inundation maps publically available and that address land use downstream of dams to prevent the intensification of downstream risk similar to the laws in Virginia and Wisconsin**

Appropriate Federal Role with Regard to Dams and Levees

The federal government has a role to help develop and oversee national standards and to provide technical assistance for the proper design, construction, operation and maintenance of dams and levees. Maintaining an inventory of dams and levees at the national level is a key data need.

We see that maintaining a structure like a dam or levee is so important, yet there is a huge failure to do that effectively by non-federal owners/sponsors nationally. This demonstrates that we should only permit dams and levees that are owned by an entity that has taxing authority and to obtain bonds or other assurances at the time of permitting to ensure that O&M and emergency repairs will be done. The federal taxpayer should not be responsible for repairing these structures if the owner/sponsor fails to do what they promised.

Stormwater Management Infrastructure

Stormwater is the accumulation of water from rainfall that is not from the overflow of streams or rivers. Most communities have stormwater systems that funnel water into pipes and usually into water bodies like rivers or streams. Managing stormwater is one of the biggest and most expensive problems facing cities across the nation. Damage due to urban stormwater flooding is increasing significantly. Consider that in Illinois and Michigan, the most costly flood events were urban stormwater events in the greater Chicago and greater Detroit areas (which is amazing in Illinois given past floods along the Mississippi River that runs along the entire western border of the state). The majority of flood insurance claims in the Chicago metro area are stormwater related. The EPA estimates funding needs for stormwater management and projects to correct sewers that overflow is in excess of $100 billion over the next 20 years.

Stormwater management infrastructure was initially developed to satisfy water quality standards and reduce pollutant loads. However, it also can reduce or increase flood risk. If undersized (as many old systems are) the stormwater management infrastructure can exacerbate flooding. However, with consideration of an area's flood potential stormwater management infrastructure can be designed to have co-benefits that improve water quality and reduce flooding impacts. Further, stormwater management infrastructure is often categorized as gray or green. "Traditional" gray stormwater infrastructure consists of engineered structures such as pipes, storm drains and concrete paved channels. Green infrastructure harnesses the power of nature to contain some of the initial runoff and includes things like permeable pavement, bio-swales, green streets, stormwater parks, etc. Green infrastructure can be paired with grey infrastructure to effectively meet a community's water quality goals and flood loss reduction goals. For example, with green infrastructure, demand on the existing gray infrastructure is reduced thereby raising the capacity of the gray systems.

Too often, stormwater programs and floodplain management programs are not integrated, even at the local level. This may be partly due to the programs coming to the local community in separate stovepipes—stormwater from EPA focused on water quality and flooding concerns focused on water quantity from either FEMA or USACE. An example of this disconnect is that the NFIP will provide flood insurance for stormwater flooding, but it does not map these risk areas or require communities to ensure development in them is properly protected.

- **ASFPM supports USEPAs ongoing leadership in developing tools and data as it relates to stormwater management, green infrastructure and flood loss reduction**

- **USEPA, USACE and FEMA should collaborate to address the disconnect between water quality and quantity that results in exacerbating current problems for one while mitigating the other**

Nonstructural Flood Mitigation Infrastructure

Aside from the three major categories above, there are other important components to the nation's overall flood risk reduction infrastructure that don't involve large flood control structures:

- Environmental restoration. These projects can be done in conjunction with other infrastructure projects such as levees. An example of such a project is when an existing deficient levee is replaced by a levee set back from a river channel and the land between the new levee and river is restored to a natural floodplain. Such natural floodplains serve to store, slow and filter water while providing water resources and the setback levee cost is reduced because it is subject to less erosion from the river and because it is on higher ground doesn't have to be as high to provide a specified level of protection.
- Floodproofing. Utilities such as water and wastewater treatment plants, as well as public buildings and other facilities can often be floodproofed through elevation, or making them watertight through floodproofing, or can be relocated to safer areas. Many of these may be critical facilities and if they are not functional during and after a flood the community greatly suffers. A source of largely shovel ready projects that have also been found to be cost effective is the FEMA Hazard Mitigation Assistance Program[1]. Typically there are about three times the numbers of projects submitted for HMA grants than there are funds available to implement these cost saving measures.

- **For the infrastructure package under consideration by the Administration and Congress, ASFPM recommends the inclusion of environmental restoration projects that help reduce flood losses as well as projects eligible under FEMA's Hazard Mitigation Assistance program**

Other Ways the Federal Government Can Help

While mapping flood risk areas and investing in flood risk reduction infrastructure are two major ways the federal government can help with reducing flood risk in the nation, there are other important ways the federal government can help.

First is to focus on building state-capability to manage flood risk. One trend we are seeing overall is that while the federal and local governments (and some states) are investing in flood risk management, many other states are not. ASFPM believes federal programs that help build state capability such as the National Dam Safety Program, National Levee Safety Program and the Community Assistance Program-State Services Support Element (CAP-SSSE) should be not only funded to their full authorized amounts, but also ensure they are being administered in such a way to incentivize states to bring as much as possible to the table. As stated earlier in this testimony, states have the ultimate authority over land use

[1] FEMA HMA projects also can include stormwater management projects and smaller/localizes flood protection projects such as retention/detention basins, channel modifications, etc.

(it is often delegated by states to communities) and many flood risk reduction programs are coordinated at the state level.

Second is providing technical assistance. FEMA's CAP-SSSE program helps build state capability by using states to provide technical assistance to communities. The Corps' Silver Jackets program is an innovative way of bringing the technical know-how of the federal family of agencies to states. Finally, small technical assistance programs like the USACE's Planning Assistance to States (PAS) and Floodplain Management Services (FPMS) are often oversubscribed, yet allow the Corps expertise to be applied in states and communities nationwide. ASFPM also supports the newly introduced Digital Coast Act (S. 110), which provides data and tools to coastal managers dealing with flooding and other coastal risks.

- **ASFPM recommends that technical assistance programs of the USACE (FPMS, PAS, and Silver Jackets) be expanded to meet demand from states and communities**

Third, there are many federal programs that actually act as disincentives to states, communities and individuals in reducing flood risk. For example, if a community does not participate in the NFIP – the most basic action any community can take to reduce flood risk, most forms of disaster assistance are still available. And even if it were unavailable, communities have six months after a disaster declaration to join the program and receive the assistance retroactively. Instead, what if federal policy were such that no disaster assistance in any form for anywhere in the community was available if the community didn't participate in the NFIP? This is why ASFPM is so supportive of the FEMA disaster deductible concept. At its core, it tries to incentivize states to take its share of responsibility of reducing flood risk and those that do more pay less of a deductible. Another example of a disincentive is the Corps of Engineers PL 84-99 program, which allows non-federal levee owners to shift much of the cost of ongoing maintenance of the levee after a disaster to the federal taxpayer without really requiring much of anything in return in terms of actions to more permanently reduce flood risk.

Finally, recognizing that Congress and the administration are looking to reform the U.S. Tax Code, ASFPM believes that tax incentives can be very beneficial. ASFPM is supportive of any of the following six ideas:

1. Exempt all flood loss reduction projects at the federal, state and local level from federal taxation.
2. Reform the casualty loss deduction to better target the deduction as well as incentivize those that have mitigated.
3. Develop a hazard mitigation tax credit much like the energy efficiency tax credits that are given to property owners.
4. Revise the historic rehabilitation tax credit to authorize hazard mitigation and extend to private historic homes.
5. Support the concept of a disaster savings account to support mitigation activity.
6. Develop a tax deduction to reduce flood insurance premiums for low to moderate income property owners who struggle with flood insurance affordability.

Conclusion

Flood risk reduction in the U.S. has relied on a multi-faceted set of measures. This includes structural approaches, such as levees, flood walls, dams and channels. Nonstructural methods such as ensuring development in flood hazard areas are built to reduce flood damage; using regional or watershed based stormwater retention ponds; land use management and hazard mitigation for individual structures in the form of elevation, buyouts or flood proofing. The nonstructural programs involve elements of the National Flood Insurance Program and Hazard Mitigation Grant Program authorized by the Stafford Act. They also include programs from agencies like USDA and others whose watershed conservation programs support utilizing nature-based approaches to reduce flooding. The Corps of Engineers works with non-federal sponsors on water resources projects to reduce flood losses and provide technical assistance to states and communities through programs such as Silver Jackets.

ASFPM recently updated our publication *National Flood Programs and Policies in Review* (*http://www.floods.org/ace-images/NFPPR_2015_Rev8.pdf*), which puts forth our positions on a variety of national programs and policies that can either help or hurt the nation's ability to reduce flood risk and damage. Section 2, beginning on page 24, highlights multiple flood loss reduction programs and policies in a variety of agencies, and on page 40, section *Structural Projects—Balancing Economics, Environment and Equity* discusses levees, dams and PL 84-99 Rehabilitation and Inspection Program (RIP) in USACE. We encourage you to read our positions and recommendations on the challenges of our national flood programs and infrastructure needs.

The Association of State Floodplain Managers appreciates this opportunity to share our observations and recommendations with the Subcommittee. For any further questions on this testimony, contact Larry Larson ASFPM Director Emeritus at larry@floods.org (608) 828-3000 or Meredith Inderfurth, ASFPM Washington Liaison at (703) 448-0245.

DEPARTMENT OF THE ARMY
[redacted]

Usage Rights for Government Furnished Information

I, [redacted] as the official representative of the [redacted] hereby consent to the terms in this Agreement in consideration of being granted conditional access to certain United States Government documents or material containing sensitive but unclassified information.

By being granted conditional access to sensitive but unclassified information, the United States Government, through the U.S. Army Corps of Engineers (Corps), has placed special confidence and trust in the Agency and the Agency is obligated to protect this information from unauthorized disclosure in accordance with the terms of this agreement.

The Corps' inundation maps for [redacted] Dam are being provided to the City of [redacted] expressly for purposes of supporting emergency response planning efforts. These maps are being provided as part of the 2015 [redacted] Dam Emergency Action Plan (EAP) updates. The inundation boundaries shown on the maps are for the following scenarios:

- Dam failure at normal high pool (10 percent exceedance duration)
- Dam failure at maximum high pool

A hard copy of the inundation mapping will be provided to you. In addition, the mapping will be provided in Adobe Acrobat (.pdf) format. Inundation mapping being provided is "FOR OFFICIAL USE ONLY." The information provided is for viewing only and should not be edited.

The information provided will only be used for internal Agency purposes. Should the provided information be requested by any third party federal, state or local entity, or individual, the Agency shall seek the written authorization of the Corps to allow the release of the information to the requesting entity or individual. Furthermore, the Agency agrees to not provide any requested information until such consent is received from the Corps.

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Data and documents provided in accordance with this agreement continue to be the records of the [redacted] Corps of Engineers, and shall not be released by the [redacted] under the Freedom of Information Act, or any other state access to information law. Any such requests must be forwarded to the [redacted] Corps of Engineers for evaluation and determination of releasability.

The Point of Contact for the [redacted] Corps of Engineers is [redacted]

[redacted] USA,

Date

U.S. Army Corps of Engineers

By signing, the City of [redacted] acknowledges the statement above and agrees to these usage rights.

Laura Ziemer
Senior Counsel and Water Policy Advisor

March 8, 2017

The Honorable Garret Graves, Chairman
Subcommittee on Water Resources & Environment
House Committee on Transportation & Infrastructure

The Honorable Grace Napolitano, Ranking Member
Subcommittee on Water Resources & Environment
House Committee on Transportation & Infrastructure

Re: Letter for the Record for the March 9, 2017 Subcommittee Hearing on Infrastructure

Dear Chairman Graves and Ranking Member Napolitano:

Thank you for the opportunity to submit for the record the following testimony in response to the Subcommittee's March 9, 2017 hearing on "Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure." The priorities for an Infrastructure Package, whether developed by the Trump Administration or by Congress, outlined below are critical to American infrastructure and jobs, and provide multiple benefits, for river health, transportation, agriculture, and water infrastructure.

Trout Unlimited (TU) represents more than 150,000 conservation–minded members, organized into 380 chapters in 35 state councils. Our mission is to conserve, protect and restore the Nation's trout and salmon fisheries and their watersheds. We have 280 staff spread across America who work with our members and a wide variety of partners – including farmers, ranchers, miners and state and local agencies – to accomplish our mission. TU works on projects that build drought and flood resilience for our rural communities and agricultural regions and address rural transportation infrastructure and public safety while simultaneously building partnerships on projects that provide multiple benefits. TU believes that linking investment in natural infrastructure with water infrastructure upgrades is essential in order to reduce inefficiencies and project delays, and maximize benefits, including improved trout habitat and watershed health.

A Comprehensive Infrastructure Package should feature strategic, cost –effective investments and promote collaboration of stakeholders, not ill-conceived process shortcuts.

The need for water infrastructure is great, but we must meet this need with smart and collaborative solutions. A recent Treasury Department study demonstrated these points. The House Natural Resources Committee's March 1, 2017 hearing aimed to identify examples of regulations and statutes that inhibit infrastructure growth, and to examine ways to remove unnecessary impediments from projects critical to American infrastructure and jobs. Background for the hearing came from the December 2016 Treasury Department's commissioned report of 40 proposed infrastructure projects of "major economic significance." Of the four primary challenges to completing the 40 projects identified in the report, the report concluded the following:

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- The report's major finding was that "lack of funds is by far the most common challenge to completing these [40] projects." (at pp. 2, 6).
- The smallest challenge (less than half of the next-smallest challenge of increased capital costs) was environmental regulation compliance and NEPA review; and, the report noted that recent legislative and executive reforms would be helpful in meeting that challenge (at p.6).
- Lack of consensus on multi-jurisdictional projects was a much larger source of delay and an obstacle to completion than either compliance with environmental regulations or increased capital costs (at p. 6).
- Three of the 40 infrastructure projects identified as being of "major economic significance" were investments in restoring aquatic ecosystem functioning to protect against flooding, and scored among the highest cost-benefit ratios of all the projects (at p. 4 ("planning underway" project numbers 5, 6, and 10) and pp. A-46, A-48, and A-56).

Investment in Natural Infrastructure should be Linked with Water Infrastructure Upgrades to Maximize Cost-Effectiveness and Create Multiple Benefits.

Every aging, century-old piece of irrigation and water delivery infrastructure in the West is an opportunity to build flood and drought resilience through improved water storage and delivery and improved river health. Every obsolete culvert on Eastern highways, and pollutant-leaching abandoned mine across the nation, offers opportunities to improve watershed health. Flood and drought resiliency, and improved fish habitat, come from functional watershed processes, which work more cheaply and more effectively with less capital investment than constructed structures. Restoration of watershed function is a sound investment that pays dividends over the long-term, without the depreciation in value and on-going, mounting expense of operation and maintenance of built structures. Linking a water infrastructure project with upstream or downstream investments in natural aquatic functioning increases the cost-effectiveness of the project and increases the range of project benefits. A Comprehensive Infrastructure Package should:

- Substantially increase funding for the State Revolving Fund (SRF) and link investments in water and waste-water treatment with substantially increased Section 319 investments in non-point source pollution control and watershed function. Linking Section 319 with SRF funding would help ensure that structural and watershed function investments are integrated in order to maximize cost-effectiveness.
- Prioritize those infrastructure investments that provide multiple benefits. These projects both upgrade existing infrastructure, but at the same time restore natural riverine processes that provide flood mitigation services through intact floodplains, for example. Other projects will relieve water delivery bottlenecks by improving natural flows that provide drought resiliency while upgrading water delivery infrastructure.
- Strongly support the regional, cooperative initiatives, which have taken watershed restoration and infrastructure reform to scale. Successful western examples are the Klamath and Yakima River basin collaboratives. **These multi-stakeholder investment plans stack benefits, and they recognize economic and business risks of avoiding upgrades and missing opportunities to promote resiliency.** These are investment plans that have been made with a whole-system view—not just straight update and replace, but based upon comprehensive, system-level evaluations. They are supported by a broad range of stakeholders, including states, counties and communities.

The cost is high of neglecting these essential water infrastructure upgrades. Neglect of water infrastructure risks floods from failing dams, under-sized culverts, and bridges that need larger spans across floodplains. Neglect of water infrastructure also makes the impact of drought worse by wasting water in failing water delivery infrastructure. We urge the Subcommittee to support an Infrastructure Package that provides multi-sector benefit, cost-effective projects that build partnerships and are smart, high-yield investments

Thank you for your interest in this important discussion. Please do not hesitate to contact me at lziemer@tu.org or (406) 522-7695 if more detail or specific examples would be of assistance.

Yours truly,

Laura Ziemer

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Public-Private Partnerships Cannot Solve Our Country's Water Problems

Written Testimony for Water Resources and Environment Subcommittee hearing on "Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure"

March 9, 2017

Dear Chairman Graves, Ranking Member Napolitano and distinguished members of the Subcommittee,

We strongly urge you to continue to support the State Revolving Fund programs for our water and wastewater systems and to reject any proposal that relies on public-private partnerships or massive tax credits for private equity investors and other large corporations to control local water projects.

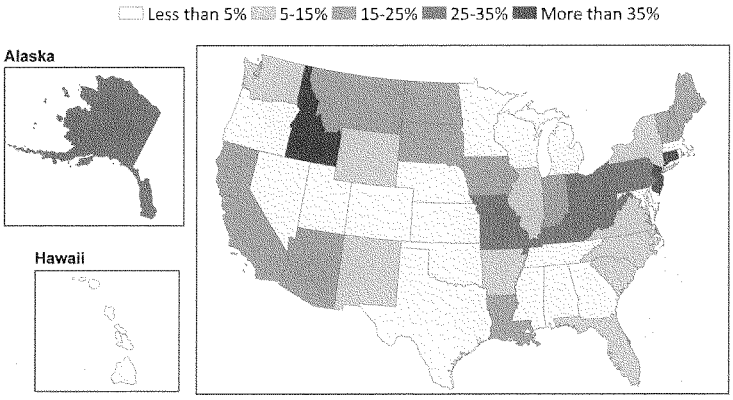
Several policy proposals seek to incentivize or facilitate private equity financing in water and other infrastructure through public-private partnerships, including by giving tax-credits for private equity investment. Despite their stated intentions, these ideas are off target and cannot address our country's growing water infrastructure needs. They will likely neither induce new investment in water systems nor reduce water and sewer bills for households and businesses.

Water service is unlike other infrastructure projects. Access to safe water is essential for public health, and water utilities are natural monopolies, so households and businesses have no choice in water provider outside of moving towns. The best way for Congress to address water infrastructure needs is through increased direct federal investment in the established, tried-and-true, state-managed Drinking Water and Clean Water State Revolving Fund programs.

Tax credits to big banks and other corporate investors in water projects will not help the more than 80 percent of Americans who receive their water service from publicly owned utilities, nor will they help nonprofit or rural systems. As its best, Congressional action to promote public-private partnerships in the water sector would be a red-herring that distracts from addressing the real, substantial issues facing our local water and sewer systems. At its worse, privatization could exacerbate the existing problems.

Local control of water is the American way. More than 80 percent of the U.S. population receives water service from a local government entity. Historically, private companies had controlled the water systems in many of our nation's cities — from New York City to Seattle, Washington, to Birmingham, Alabama — but around the turn of the 20th century, thousands of local governments had to take control of their water supplies to improve water quality to fight diseases and to improve water pressure to better fight fires.

Private Ownership of Community Water Systems by Service Population (2014)



Source: U.S. Environmental Protection Agency. Safe Drinking Water Federal Information System. FY2014 Inventory Data.

The above map shows the number of people served by privately owned community water systems as a proportion of the total number of people served by community water systems in each state. In this map, the privately-owned systems include both for-profit and nonprofit private systems. Only for-profit entities benefit from income tax credits.

This trend continues today in the Southern and Western regions of the United States. Last year, Missoula, Montana, won the right to buy its water system from the Carlyle Group, which — mid-trial and without state permission — sold the city's water system to a Canadian company. The city sought local control to provide long-term stability and better resource management, as well as to make necessary improvements. The system was losing more than half of its water through leaks. The Montana State Supreme Court affirmed that municipal ownership was more necessary than for-profit private ownership. The city is in the middle of securing the financing for the acquisition. Missoula is the last city in Montana with a privately-owned water system.

In Florida, a coalition of mostly senior citizens who were fed up with high-priced, poor quality water service came together and successfully convinced the state arm of Aqua America, a large national water company, to sell their water systems to the Florida Governmental Utility Authority in 2013.

In 2014, the city of Tega Cay, South Carolina, purchased its water and sewer system from a company ultimately owned by Canadian private equity investors. By 2016, the city had made substantial improvements to reduce sewage spills. Before the city purchased the system, it was averaging more than 4 sewage spills a month, spilling nearly 300,000 gallons in just the 10 months leading up to the purchase. In the first two years of public ownership, the city was averaging about one spill every other month. While more work is needed, the city had made great strides to eliminate the spills and protect its water.

In general, our local governments have done a good job of providing safe and affordable water and sewer service to their residents and local businesses, but they face daunting challenges. As our water infrastructure ages and quality standards get stronger, water and sewer systems must invest at least $35 billion a year into improvement projects to protect public health.

Privatization including public-private partnerships will not help rural water systems. Many rural communities depend on federal and state assistance to keep their water safe. They simply cannot afford to pay higher bills to allow large corporations to earn a profit, and they often do not have any industrial or wealthy customers to subsidize low-income and middle class households. Without support, they cannot make the improvements necessary to provide safe water. Reliance on higher water prices and corporate control of water systems could mean unsafe or unaffordable water service for millions of Americans.

Public-private partnerships simply cannot replace federal assistance to small, rural systems. These systems find it more difficult to borrow funds on the bond market for the very reasons that private companies do not want to take over them: high per-household costs and a low-income customer-base.

A large private water company will not invest in or buy a rural, remote water system. A water corporation buys small or struggling water systems only if they are contiguous to its existing network and if it can redistribute the costs to its other service areas within the state. Because water rates are regressive, this type of subsidization can be inequitable as it disproportionately burdens working and middle class families in other communities.

Private equity financing will increase water bills for households and local businesses. In the United States, the public sector is responsible for more than 90 percent of drinking water and wastewater investments, mostly through tax-exempt municipal bonds. Larger municipal water and sewer utilities usually do not have a problem accessing capital to finance water system improvements because they can readily issue low-cost, tax-exempt municipal revenue or general obligation bonds. The problem at hand is that these public utilities do not want to raise rates to levels that would be unaffordable for their customers. That is, our public water utilities have a *funding* problem, not a *financing* problem. A financing solution can address a funding problem only if it lowers the cost of capital, as the State Revolving Funds do.

Privatization is not a funding solution. Water corporations are businesses that need to raise water prices to earn profits. They may be able to provide upfront capital but that money is far from free. Private equity financing is significantly more expensive than government borrowing. There are several factors driving the cost of privatization, including that companies expect returns of at least 10 percent after tax on their equity investment. Utilities pass on higher financing costs to consumers through their bills. As a result, asset sales and public-private partnerships with private equity financing generally result in significantly higher rates than otherwise for households and businesses. In 2015, among the 500 largest community water systems in the country, privately owned systems charged an average of 59 percent more than government utilities. In certain states, the difference is

even greater. In New York and Illinois, water corporations charge about twice as much as government systems.

Water affordability is a growing national problem and privatization would make it worse. Localities across the country are grappling with water service costs that are increasingly unaffordable for more and more of their residents. This problem is especially complex in this period of widening income inequality and reliance on regressive water billing practices, which cause low-income and middle class households to pay a disproportionate amount of their income for their water bills.

A study from Michigan State University found that water rates are already unaffordable for nearly 12 percent of households in the United States. In the next five years, because of increasing water prices, more than one in three households could be unable to afford their water bills. Mississippi, Louisiana and Alabama have the most communities at risk of unaffordable water bills. According to the study, water privatization could make this affordability challenge more severe.

When families cannot afford their water bills, they could lose running water in their homes. For example, the Baton Rouge Water Company shut off service to nearly 3,000 customers for nonpayment of bills in the city of Baton Rouge after last August's historic floods, despite a state order halting shutoffs to protect people impacted by the flooding. The company said they made an honest mistake. The regulatory order banning shutoffs ended at the beginning of this month. Without running water, people cannot bathe, wash their hands or flush their toilets.

Flint, Michigan, is a bellwether in many ways. Flint today still does not have water that is safe to drink without a filter. It has been nearly three years since a state-appointed emergency manager made the disastrous decision to switch the city's water supply, which resulted in lead leaching into the drinking water and poisoning the entire city. Higher water prices and privatization cannot help Flint. As of 2015, Flint households were already paying the highest water bills in the nation, among the 500 largest water systems. Flint residents paid these steep prices for water that was unsafe to drink. Flint needed the $100 million in federal support for its drinking water infrastructure that Congress approved last year.

Flint residents cannot afford more rate hikes nor can they afford privatization. The State of Michigan has sued the local arm of Veolia, the French multinational and one of the largest water corporations in the world, for the company's role in the Flint water crisis. This company is facing a lawsuit in Massachusetts over sewage spills and an arbitration lawsuit by the city of Pittsburgh, Pennsylvania, related to erroneous bills and chemical changes that likely elevated lead levels.

Public sector partnerships offer viable solutions. Not enough attention is given by policymakers to value that public-sector partnerships can offer water and sewer systems. A public-*public* partnership, also known as intermunicipal or interlocal cooperation, is simply collaboration between two or more public entities to improve public services on a not-for-profit basis. Two or more public water utilities, government entities or non-governmental organizations join forces and leverage their shared capacities to improve water and sewer

services. The public partners pool resources, buying power and technical expertise to enhance public efficiencies and service quality. These partnerships promote public-service delivery through sharing best practices, and they have been shown to reduce operation and maintenance costs. Despite national attention on privatization, in the water sector, public sector partnerships are much more common than deals involving private operators and financiers.

Congress must not promote public-private partnerships as a way to supplant federal assistance for our water and sewer systems. That would be disastrous for the water systems that depend on federal support to provide safe water to their communities. Water systems serving rural areas, especially areas with declining populations, and cash-strapped cities share many challenges. Their water needs are growing beyond their ability to pay. For both rural water systems and disadvantaged cities like Flint, federal support will remain crucial for protecting human lives.

Congress can provide a real solution to our water utility needs by providing dedicated annual funding to the Drinking Water and Clean Water State Revolving Funds. These highly successful programs are the primary source of federal assistance to our water and sewer systems. Each state manages its own program with a well-defined project priority list that prioritizes assistance to projects with the biggest public health benefits. This is the right approach for Congress to support our water systems.

We urge you to support the State Revolving Funds and to oppose any federal action that would rely on public-private partnerships for our water and sewer needs.

Thank you for your time and attention on this important matter. I hope that we can work together to ensure that every American has access to safe and affordable water service.

Sincerely,

Mary Grant
Campaign Director, Public Water for All
Food & Water Watch

NRWA
America's Largest Utility Membership

National Rural Water Association
(Washington, DC)
www.nrwa.org

March 8, 2017

The Honorable Garret Graves
Chairman
Subcommittee on Water Resources and Environment
U.S. House of Representatives
Washington, DC 20151

The Honorable Grace F. Napolitano
California, Ranking Member Subcommittee
Subcommittee on Water Resources and Environment
U.S. House of Representatives
Washington, DC 20151

Dear Chairman Graves and Ranking Member Napolitano

The National Rural Water Association (NRWA) is the country's largest public drinking water and sanitation utility organization with over 31,000 members. Safe drinking water and sanitation are generally recognized as the most essential public health, public welfare, and civic necessities.

Our member communities have the very important public responsibility of complying with all applicable regulations and for supplying the public with safe drinking water and sanitation every second of every day. Most all water supplies in the U.S. are small; 94% of the country's 51,651 drinking water supplies serve communities with fewer than 10,000 persons, and 80% of the country's 16,255 wastewater supplies serve fewer than 10,000 persons.

When thinking about national water infrastructure proposals, please remember that most water utilities are small and have more difficulty affording public water service due to lack of population density and lack of economies of scale.

Over the last 50 years, through the combined financial assistance of the state revolving funds and the U.S. Department of Agriculture's rural water grant and loan initiative that has exceeded 100 billion dollars, the country has made great advancements in the standard of living in rural America. Millions of rural Americans now have access to safe public or "piped" drinking water that their parents did not have. Thousands of rural communities now have public sewer or wastewater systems that have allowed for elimination of millions of questionable septic tanks, cesspools, straight pipes, or worse.

This rural water infrastructure development has been the engine of economic development and agricultural technology advances in rural communities, and it has provided for dramatic improvements to the environment and public health.

President Trump has made improving the county's infrastructure, including water and wastewater, a priority. We are grateful for that. Regarding private or commercial funding as a source for investment in the country's water infrastructure, please know that there is currently no limitation on private or commercial investments in water utility infrastructure projects. Many water utilities currently rely on commercial or private investors (i.e. a local bank) for certain projects.

However, many water infrastructure water projects would become unaffordable if they were to rely solely on commercial or private financing. This means that the ratepayers would not be able to afford their water bills if the total cost of the project were financed by the ratepayers. This dynamic is especially acute in low-income communities with expensive water utility infrastructure needs.

Congress has determined that there is a federal interest in subsidizing some of these water infrastructure projects based on need – the community's lack of ability to afford the project combined with the public health or environmental urgency of the project. Congress appropriates finite water funding subsidies and communities compete based on need for these limited federal subsidies.

Under the Clean Water Act and the Safe Drinking Water Act, the state revolving funds' (SRFs) application processes require the prioritization of funding awards based on a meritorious needs-based evaluation conducted by the states. Under the U.S. Department of Agriculture's (USDA) water infrastructure funding program, communities must demonstrate they don't have the ability to obtain commercial credit (the "credit elsewhere" test) and then they are only subsidized by the amount to make the project affordable to that specific community based on a ratio of water rates and local median household income. There are never enough federal subsidies to fund every project.

We have concerns with proposals to extend new subsidies or tax preference to the private investment sector to support a new national infrastructure initiative:

- For private or commercial funding instruments to be able make projects more affordable by lowering interest rates, the federal government would have to offer some type of subsidy or tax-break to the private sector. This will have a cost to the federal government in decreased tax revenue or direct appropriations. If this cost is used to support the private sector it will result in a transfer or circumvention of public (taxpayer) subsidies from the public (local governments under the SRFs, USDA, etc.) to the commercial or corporate sector. We believe that federal water project subsidies should be used for the public/governmental sector water infrastructure projects determined to be a federal priority worthy of public subsidy.

- Private infrastructure financing does not require the prioritization of projects based on need (economical and environmental) like the current government water programs. It is in the interest of the private financing sector to fund the projects that would have the highest return on investments. Therefore, if additional federal subsidies were used to subsidize the private sector, if would have the effect of redirecting federal subsidies from the projects with the greatest need (economical, public health and environmental) to the projects with least need.

Federal water infrastructure subsidies should only be available to benefit the public – local governments who can't finance water projects on their own, and then the limited federal subsidies should be prioritized to communities in the greatest need. The current federal water infrastructure initiatives including the SRFs and USDA are required by statute to accomplish these public policy objectives and we have not witnessed any new private funding proposals that retain these objectives.

Again, there is currently no limitation of commercial or private investment in water infrastructure, our concern is limited to providing a new subsidy to the private or commercial sector that that could remain in a public sector dedicated to accomplishing federally identified priorities. Thank you your continued assistance and please contact NRWA Analyst, Mike Keegan (keegan@ruralwater.org) with any questions.

*The **National Rural Water Association** is the country's largest public drinking water and sanitation supply organization with over 31,000 members. Safe drinking water and sanitation are generally recognized as the most essential public health, public welfare, and civic necessities.*

POLICY FORUM

WATER

Water strategies for the next administration

Water policy offers opportunity for nonpartisan agreement

By **Peter H. Gleick**

Issues around fresh water are not particularly high on the U.S. political agenda. They should be. Water problems directly threaten food production, fisheries, energy generation, foreign policy, public health, and international security. Access to safe, sufficient, and affordable water is vital to well-being and to the economy. Yet U.S. water systems, once the envy of the world, are falling into disrepair, and new threats loom. Drinking water disasters in Flint, Michigan, droughts and floods increasingly attributable to anthropogenic climate change (*1*), and growing violence worldwide over water offer a glimpse of what we face unless new efforts are made to address failing infrastructure, worsening climate conditions, and ineffective policies and regulations (*2*). Yet, if there is any issue that offers the opportunity for nonpartisan agreement, it is to create and implement a 21st-century national water policy. In that vein, I detail national and international water challenges and recommendations for the next U.S. president, administration, and Congress.

Federal agencies, authorities, and policies are often inconsistent, overlapping, and inefficient. Addressing water challenges requires consistent, effective, and efficient management and institutions. Yet ~30 different federal agencies or departments have overlapping and conflicting responsibilities for fresh water. For example, the Bureau of Reclamation (BoR), Army Corps of Engineers, and agencies like the Tennessee Valley Authority each build and manage dams. The Environmental Protection Agency oversees tap water quality, but the Food and Drug Administration oversees bottled water quality. The National Park Service, BoR, Forest Service, and others manage water resources on lands under their jurisdiction, often within the same watershed. A mix of federal and state agencies and commissions manage international agreements over the shared waters with Canada and Mexico.

Production of food by U.S. farmers is at risk because federal water, energy, and agricultural policies often have conflicting and contradictory priorities and objectives (*3*). National policies designed to boost biofuels production had unanticipated impacts on food production and regional water demands. For example, an average of 780 liters of water are required to produce a liter of ethanol from irrigated corn, much of this from overdrafted aquifers in the Great Plains (*4*).

The next U.S. president should create a bipartisan water commission to evaluate and recommend changes to national water policies. The commission would provide guidance to reorganize and streamline the diverse and uncoordinated federal water responsibilities and laws, including better coordination among energy, water, and food policies. We have had no such guidance since the final report of the last U.S. National Water Commission in 1973, which first called for—and helped drive acceptance of—environmental water policies, improved water-quality regulation, and better economic tools for utilities (*5*). Such commissions offer the opportunity to generate nonpartisan recommendations that can overcome political barriers to action.

> ***"...if there is any issue that offers the opportunity for nonpartisan agreement, it is to create and implement a 21st-century national water policy."***

Basic water science and data collection remain undone. Vital water data are not collected or analyzed, and fundamental hydrologic science remains incomplete (*6*). There is massive groundwater overdraft in California and the Great Plains–Ogallala aquifer but little accurate information about withdrawals or recharge rates. The U.S. Geological Survey collects and publishes water-use data only every 5 years (*7*), and data are not collected in a comprehensive or consistent manner. Links between clean and adequate water and healthy aquatic ecosystems are strong, but little information is available on sustainable watersheds and freshwater management.

A national program to expand collection, management, and release of water supply and use data is key to developing sustainable policies and improving water sciences. This includes federal support for remote sensing platforms, such as replacing the SMAP (Soil Moisture Active Passive) satellite sensors and fully funding the National Oceanic and Atmospheric Administration's (NOAA's) Joint Polar Satellite System. Funding and expanding the new National Water Center, coordinated by NOAA, is a step in the right direction.

Critical water infrastructure is often obsolete and decaying. The United States pioneered and built water treatment and delivery systems that provide nearly all Americans with safe water and sanitation and eliminated cholera, dysentery, and other water-related diseases prevalent in other parts of the world. But hundreds of thousands—if not millions—of Americans still lack access to safe water. Recent failures—such as in Flint, Michigan, where bad technical, financial, and management decisions led to high levels of lead in the water—highlight underinvestment in system maintenance and replacement. Water in rivers, streams, and lakes is inadequately protected from contamination by weak or unenforced regulations, especially nonpoint sources of pollution from agriculture and urban development. Public and private water agencies are not adequately monitoring and enforcing existing laws and regulations.

The next president and Congress must work together to modernize water-quality laws—in particular the Clean Water Act and the Safe Drinking Water Act (SDWA)—and give federal agencies resources to oversee and enforce these laws. Challenges include improving our ability to understand and mitigate uncontrolled sources of pollution in streams, rivers, and lakes; adding regulations to address long-ignored risks to groundwater; and accelerating rules for new contaminants in drinking water. Hundreds of unregulated chemicals and microbes may pose health risks (*8*) but no new contaminant has been added under the SDWA for decades. Other priorities should be the complete elimination of lead fixtures in cities, the testing of water in every school, and remediation of any contamination problems, and investment in new water treatment and reuse technologies.

In regions where water availability is a

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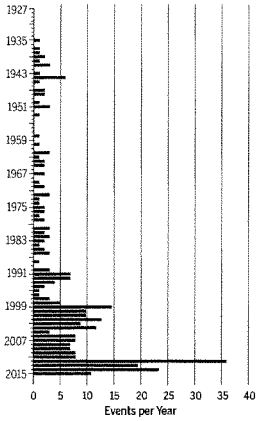
growing problem, especially the western United States, urban and farm water use can be made far more efficient with technologies such as precision irrigation, soil-moisture monitoring, and modern appliances and by using policy tools such as the Environmental Quality Incentives Program in the Farm Bill, trade laws, national efficiency standards, and tax-code revisions that promote water-efficiency investments for growers, industry, and communities. State revolving-loan programs, tax incentives, and direct support, especially for economically disadvantaged communities, can expand funds available for upgrading infrastructure. A 2013 report concluded that these strategies could produce hundreds of thousands of new jobs in urban and agricultural conservation and efficiency, stormwater management, alternative water supplies, and ecological restoration (*9*).

Links between water conflicts and national security are clear and growing. There is a long history of political insecurity and instability in regions where access to fresh water is a problem (see the figure). Recent experience in the Middle East shows that water problems contribute to food shortages, create environmental refugees, weaken governments, and worsen civil conflict (*10*). In Syria, severe drought contributed to economic and political destabilization, and attacks on water systems have led to a worsening humanitarian disaster and new tensions between the United States and Russia. There are ongoing examples of violence related to water scarcity and control in eastern Africa and central and southern Asia. An updated list of such conflicts can be found at the Water Conflict Chronology database (http://worldwater.org/water-conflict/). In 2012, the National Intelligence Council released an assessment of national security threats to the United States from global water challenges (*11*). Similar assessments show how climate change may contribute to state collapse and threaten peace and security (*12*). To understand and reduce these risks, the intelligence community must monitor water-related threats to U.S. security and interests. The Department of State should expand diplomatic efforts to prevent water-related conflicts worldwide, and the United States should ratify the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses—the major international agreement that provides guidelines for peacefully managing shared watersheds (*13*).

Many people still lack basic safe water and sanitation. More than 2 billion people—nearly a third of the global population—lack reliable, affordable access to basic water and wastewater services. Water-related diseases are prevalent in many developing countries, leading to nearly 250 million illnesses and

Water Conflict Events per Year, 1927–2015

Data from the Water Conflict Chronology List 2015.



millions of preventable deaths a year, mostly among children (*14*). Even in the United States, many communities continue to suffer from contaminated drinking water or lack the financial resources to install modern treatment and distribution systems.

As part of the international effort to reach the new Sustainable Development Goal of achieving 100% coverage of safe water and sanitation by 2030, Congress should boost the modest resources currently available for domestic and international programs to meet basic human needs for water and to monitor water-related diseases. The next U.S. president will be responsible for developing and issuing a Global Water Strategy in fall 2017, as required by the 2014 Paul Simon Water for the World Act (*15*). This law, passed with bipartisan support in Congress, aims to redirect and expand U.S. foreign aid to increase access to safe water, sanitation, and hygiene in high-priority countries; work to improve watershed management in such countries; and help reduce water-related conflicts.

Climate change impacts on water resources and systems are worsening. The most recent national scientific assessment of climate risks for the United States identifies a wide range of growing risks to water resources (*16*). Rising temperatures are increasing demands for water and rapidly melting snow and ice. Rising sea levels are threatening coastal aquifers and wetlands. Some floods and droughts, already the nation's most destructive natural disasters, are now more extreme because of human-caused climate change (*17*).

We need to integrate climate change into water management and planning to help adapt to unavoidable and increasingly harsh impacts of climate change. All federal agencies that manage land and water must integrate scientific findings around climate impacts and adaptation into long-term plans and current operations. The next administration will have to implement the provisions of the Paris Agreement that call for reducing emissions of greenhouse gases and work to prepare the country for the impacts of climate change that can no longer be avoided.

We have neglected the nation's fresh water far too long. The next administration and Congress have the opportunity and responsibility to ensure that federal agencies, money, and regulations work to protect our waters, citizens, communities, and national interests. ■

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Science
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Water strategies for the next administration
Peter H. Gleick (November 3, 2016)
Science **354** (6312), 555-556. [doi: 10.1126/science.aaj2221]

Editor's Summary

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Significant Figures by Peter Gleick

New Major US Water Policy Recommendations: "Water Strategies for the Next Administration"

Posted by Peter Gleick on November 3, 2016
(5)
More »

My new *Science Magazine* article "Water Strategies for the Next Administration" has just been released (embargo lifts 11am Pacific, November 3rd; the print version will appear in the November 4th issue of *Science*). It identifies six major water-related challenges facing the United States and offers explicit recommendations for strategies the next Administration and Congress should pursue, domestically and internationally. The article begins:

"Issues around fresh water are not particularly high on the U.S. political agenda. They should be. Water problems directly threaten food production, fisheries, energy generation, foreign policy, public health, and international security. Access to safe, sufficient, and affordable water is vital to well-being and to the economy. Yet U.S. water systems, once the envy of the world, are falling into disrepair and new threats loom on the horizon."

The six key challenges addressed are:

1. **Inconsistent, overlapping, and inefficient Federal responsibilities for fresh water.**
2. **Incomplete basic water science and data.**
3. **Obsolete and decaying critical water infrastructure.**
4. **Growing links between water conflicts and threats to US national security.**
5. **The failure to provide safe, affordable water to all Americans.**
6. **The worsening threat of climate change for US water resources.**

The paper also offers recommendations in each of these areas and suggests that water policy offers an opportunity for bipartisan agreement. National water issues have been sadly neglected for far too long. The new Administration has many opportunities to build a 21st century national water system with broad public support. During the 2016 campaign, both presidential candidates have indicated their backing for clean water and concern over recent water-quality problems in cities like Flint, Michigan.

Among the recommendations I make in the *Science* Policy Forum piece are a call for a bipartisan water commission to make specific policy suggestions to Congress and the White House, an

expansion of national efforts to collect, manage and share water data, modernization of federal water-quality laws, the testing for lead and other contaminants in every school in the country and remediation of any problems, new incentives for improved urban and agricultural water use technologies, an expansion of diplomatic efforts to reduce water conflicts, a boost in resources available for domestic and international programs to provide safe water and sanitation for all, and the integration of climate science into water management and planning at federal agencies and facilities.

The paper closes:

"We have neglected the nation's fresh water far too long. The next Administration and Congress have the opportunity and responsibility to ensure federal agencies, money, and regulations work to protect our waters, citizens, communities, and national interests."

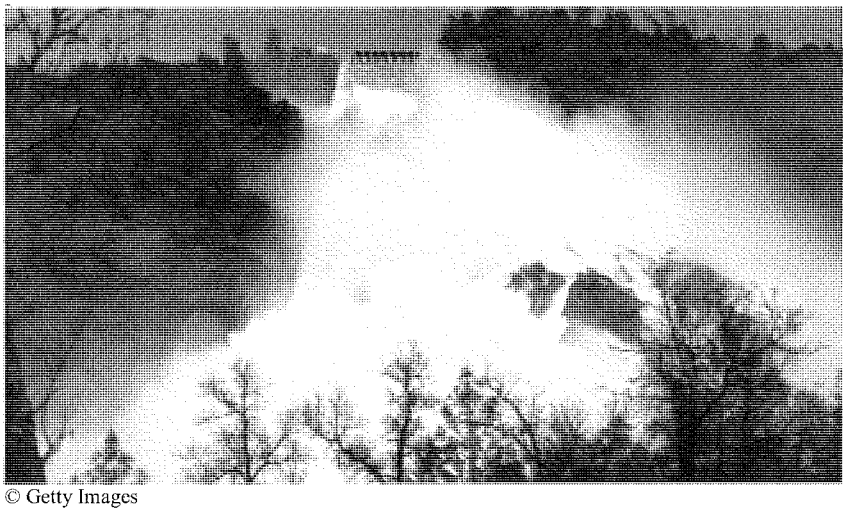
[**Update: November 8, 2016**: The full article can be accessed, for non-commercial use only, here:

[The author, Dr. Peter Gleick, is co-founder and president emeritus of the Pacific Institute and currently serves as chief scientist. He is a member of the U.S. National Academy of Sciences and a MacArthur Fellow.]

Copies of the embargoed Science paper are distributed only by the AAAS Office of Public Programs, to working journalists. Reporters should contact +1-202-326-6440 or scipak@aaas.org. Others seeking copies of the paper may order them from www.sciencemag.org.

Oroville Dam crisis shows why we can't take water infrastructure for granted

By Peter Gleick, opinion contributor for The Hill - 02/16/17 03:50 PM EST



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During the 20th century, the United States pioneered and built water-treatment and delivery systems that provide nearly all Americans with safe water and sanitation, and eliminated cholera, dysentery and other water-related diseases still prevalent in other parts of the world.

That is a set of achievements worth celebrating.

But recent disasters and crises around the country over the past few years have highlighted gaping holes in how we prioritize, maintain and fund critical water — and indeed, transportation, energy and communications — infrastructure.

Contamination, out-of-date pipes and treatment plants in places such as Flint, Michigan and other aging cities; failing flood levees in New Orleans and other coastal communities; and crumbling hydroelectric and water-supply dams in Western states — exemplified by the recent crisis at the Oroville Dam in California — have exposed a bigger systemic problem.

Solving these problems is a strength of American ingenuity, engineering and management. If our politicians set aside ideology, the country can move to protect the water system we have and modernize it for the challenges facing coming generations.

Inadequate funding for the nation's water infrastructure is well-documented. The average dam in this country is 50 years old. The Association of State Dam Safety Officials estimates the cost of needed repairs for just 2,000 of the country's most dangerous high-hazard dams is $21 billion.

A 2013 report from the American Society of Civil Engineers estimated overall unmet funding needs of our water infrastructure at $187 billion by 2020 (in 2010 real dollars). Simply fixing the recent damage at the main spillway at Oroville Dam alone could cost an astounding $100 million to 200 million, according to the state's Department of Water Resources.

The good news is that there is rare bipartisan support for boosting investment in "infrastructure." Both major party presidential candidates supported such investment, and the Trump administration and Congress have suggested this will be an early priority.

The bad news is that there are serious unresolved debates about how much money might be available, how that money should be spent, and who should decide where it goes.

In addition, the vast backlog of urgent projects will never be eliminated with federal funds alone. Many water projects are built and managed by state or local agencies. Thousands of public and private water utilities funded by ratepayers, not taxpayers, are responsible for providing much of the water and wastewater needs of homes, industry and businesses.

Where possible, money for adequate maintenance of our water system should come from the users who benefit. Most of us pay too little for the water we already get, and we should be willing to pay more, with the important caveat that economic support programs are in place to protect the poorest populations.

But there are certain things that the federal government can and must do. Any federal infrastructure program should carefully focus on these priorities.

At the top of the list is to protect and strengthen the critical federal laws that protect national water quality and human health: the Safe Drinking Water Act and the Clean Water Act. Weakening the laws or passing the responsibility for protecting water quality to the 50 separate states would lead to a human health and ecological disaster.

Other priorities are the complete elimination of lead fixtures in cities, the testing of water in every school, accelerated inspections and repair of dams owned and operated by federal agencies, remediation of pollution in public waters, improvements in irrigation and urban water-use efficiency, and investment in new water-treatment and reuse technologies.

Water infrastructure isn't just dams and levees, it's hundreds of millions of efficient washing machines, toilets, showerheads and irrigation systems.

Federal money can be applied through tools such as the Environmental Quality Incentives Program in the farm bill, trade laws, national appliance efficiency standards and tax-code revisions that promote water-efficiency investments for farmers, industry, and communities.

The Environmental Protection Agency's state revolving-loan program has been a huge, albeit underfunded, success story for local communities. These strategies could produce hundreds of thousands of new jobs in urban and agricultural conservation and efficiency, construction, storm water management and ecological restoration.

Finally, although the reality of climate change and changes in extreme weather events are not popular topics for some politicians, they are already practical threats to water systems around the world. Our superb water infrastructure, especially water supply, flood-control and hydroelectric facilities, were designed and built using assumptions about extreme events that are no longer valid.

We already see fundamental changes in storm frequency and intensity, increases in the size and duration of droughts and rainfall events, disappearing snow packs, growing agricultural water demands with rising temperatures, and more.

We cannot afford the luxury of pretending climate change isn't real, and we cannot afford to ignore the risks to our water infrastructure posed by these changes. Any investment in infrastructure must take climate change into account through smart flexible design, integration of better weather-forecasting and modeling tools, and adoption of new standards for facility construction and operation.

American science and engineering has produced some of the best water infrastructure in the world, but let's stop taking it for granted or it will erode away.

Peter Gleick is co-founder and chief scientist of the Pacific Institute. He is a hydroclimatologist and member of the U.S. National Academy of Sciences. Gleick is also a MacArthur Fellow. His writing has appeared in Science magazine.

The views of contributors are their own and not the views of The Hill.

Testimony of American Rivers
Hearing: "*Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure*"
House Committee on Transportation and Infrastructure
Subcommittee on Water Resources and Environment
March 9, 2017

American Rivers appreciates the opportunity to submit testimony for the hearing, "*Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure.*" The federal government plays a critical role in building, maintaining, and permitting water infrastructure, including providing consistent environmental protection across all states. Water is a precious resource and while infrastructure is necessary to convey, hold, and manage water, it is important that the construction and operation of infrastructure does not inadvertently diminish water quality and quantity. American Rivers commends the Subcommittee for supporting improvements to water infrastructure and affirming the federal government's role in protecting the environment as we move the nation's infrastructure into the 21st century. We respectfully ask the Subcommittee to please accept our testimony to that end.

American Rivers protects wild rivers, restores damaged rivers, and conserves clean water for people and nature. Since 1973, American Rivers has protected and restored more than 150,000 miles of rivers through advocacy efforts, on-the-ground projects, and an annual America's Most Endangered Rivers ® Campaign. Headquartered in Washington, DC, American Rivers has offices across the country and more than 250,000 members, supporters, and volunteers.
As the nation's leading river advocate, American Rivers seeks to ensure the quality and quantity of our nation's rivers and floodplains are protected as we rehabilitate our nation's water infrastructure. We would like the Committee to consider the following policies which are explained in further detail hereinafter.

- Maintain the federal role in implementing the Clean Water Act, the Rivers and Harbors Act, and the National Environmental Policy Act to ensure robust protections for the environment as well as to maintain the opportunity for public participation.
- Ensure the protections provided in the Clean Water Act for public health and the environment are maintained in all integrated planning and permitting policies.

Federal Regulation

In the 1960s and 1970s many of today's federal environmental laws were established in response to the crises caused by pollution and inadequate solutions to remedy them. The well-known pollution disasters such as the Cuyahoga River catching fire and hazardous waste leaking into a neighborhood in Love Canal causing children to become very sick were among the catalysts that started Congress on its mission to prevent such disasters from recurring. These disasters - accompanied by states' fear of regulating business out of their state- the so called race to the bottom, made it clear to lawmakers that it was time for the federal government to help. However, by the time the federal government created its own statutes most states had their own pollution control and conservation laws, and water rights and adjudication had traditionally been a matter of state law. Thus, the federal government sought to complement the state's role in environmental regulation in a partnership rather than usurp state power.

Cooperative federalism, collaboration between federal and state governments, is a guiding principal in U.S. environmental law. There is a place for both federal and state involvement in shaping and enforcing environmental laws, and it is important to strike the proper balance. If the federal government is too passive, some states will not move aggressively to control pollution. If the federal government takes too much authority, states feel threatened and local expertise may not be brought to bear.

Clean Water Act Section 404

The goal of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[1] Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands.[2] Section 404 requires that a permit be obtained before a water infrastructure project is started unless the project falls into a given exemption.[3] The purpose of Section 404 is to ensure that a permit applicant has sufficiently looked at all practicable alternatives to damaging a waterway and, if there are no practicable alternatives, steps are taken to minimize or mitigate any unavoidable adverse impact.[4] The U.S. Army Corps of Engineers is responsible for evaluating permits and developing guidance.[5] The Corps' statement on their 404 permitting program is as follows: "The Corps' Regulatory Program is committed to protecting the Nation's aquatic

[1] Clean Water Act Section 101(a), 33 U.S.C. § 1251(a) (2012).
[2] American Rivers fully supports the EPA and Corps Clean Water Rule which defines the term "waters of the United States." *See* 80 Fed. Reg. 124, 37054-37127(June 29, 2015).
[3] Clean Water Act Section 404(a) and (f) 33 U.S.C. § 1344 (a) and (f) (2012).
[4] *See* U.S. Environmental Protection Agency, "Wetland Regulatory Authority (2004), *available at* http://www.epa.gov/sites/production/files/2015-03/documents/404_reg_authority_fact_sheet.pdf.
[5] Michigan and New Jersey are authorized to assume Corps jurisdiction over 404 permits. See U.S. Environmental Protection Agency, "State or Tribal Assumption of the Section 404 Permit Program," *available at* https://www.epa.gov/cwa-404/state-or-tribal-assumption-section-404-permit-program.

resources and navigation capacity, while allowing reasonable development through fair and balanced decisions."[6] Thus, not only is the Corps mandated to ensure passage for navigation they are also charged with protecting aquatic resources in the process.

Wetlands provide extremely valuable ecosystem services. Wetlands provide clean water supply, groundwater recharge, and open space for recreation. They slow, store and infiltrate floodwaters, absorb pollutants, and provide habitat for wildlife. However, owners of property containing wetlands often seek to fill them in so that they can build structures on them- for example a riverfront home with a dock- something that provides a more tangible and immediate benefit to the owner. Unfortunately, it was not until recently that the U.S. government valued the ecosystem services that wetlands provide, and over half of the nation's wetlands have been lost to fill. Once a wetland is filled, it can no longer perform natural functions and provide the benefits described above.

The Corps' involvement in dredge and fill regulation is necessary to ensure that our waterways and wetlands will not be adversely effected by any one project. Waterways do not stop at our state borders- they flow freely from state to state. The Corps involvement helps to ensure that one state's priority does not adversely affect another state's use or enjoyment of the same waterway downstream. All waters are connected and federal oversight is important to ensure that what happens upstream does not degrade water quality or quantity downstream.

Wetlands are vital to the Clean Water Act's goal of restoring the chemical, physical, and biological integrity of our nation's waters and it is up to the Environmental Protection Agency as well as the Corps to ensure that they remain protected. Upstream waters can impact the chemical integrity of downstream waters through the transport of nutrients, dissolved organic matter, ions, as well as contaminants.[7] Physical connections include the act of transporting water, heat and energy (temperature), sediment, wood and leaves, and other materials downstream through the current.[8] Upstream waters can impact the biological integrity of downstream waters through the movement of organisms such as fish, invertebrates, plants, and even genes.[9] Wetlands are also chemically, physically, and biologically connected to downstream waters. They are intrinsically linked to rivers by providing a reserve of groundwater, a storage area for flood waters, a sink for excess nutrients, and a habitat for aquatic organisms.[10] These services help to maintain the water quality and flow of downstream waterways.

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[6] U.S. Army Corps of Engineers, "Regulatory Program and Permits," *available at* http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/.
[7] U.S. Environmental Protection Agency, Office of Research and Development, Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence, External Review. *See https://cfpub.epa.gov/ncea/risk/recordisplay.cfm;jsessionid=5F118560800222A31308BF5046EF41BD.cfpub?deid=296414&CFID=84143478&CFTOKEN=28240921.*
[8] *Id.*
[9] *Id.*
[10] *Id.*

Small streams and wetlands are the source of our nation's waters and their degradation can adversely affect all downstream waters including rivers, lakes, and bays. As headwater tributaries and wetlands are filled or paved over during land development, they lose their ability to provide important ecological functions that benefit downstream waterbodies. The loss of headwaters reduces the amount of rainwater and runoff that the stream network can handle before flooding, and the magnitude of flooding in downstream tributaries increases. Increased flooding leads to scoured channels that are prone to larger and more frequent floods and impaired in their ability to recharge groundwater, trap sediment, or recycle nutrients.[11] As a result, downstream receiving waters carry greater sediment loads, have poorer water quality, and less diverse aquatic life; all of which can lead to algal blooms, fish kills, and sedimentation.[12] This can compromise recreation, navigation, commercial and recreational fisheries, as well as increase the cost of water filtration for the drinking supply and industrial use.[13]

At the most basic level, the health of our rivers depends on the health of upstream waters. If a waterway is polluted, filled in, or otherwise compromised the stream network will be adversely affected. Not only will pollutants and fill material directly harm the waterbody they are discharged into but the overall effects they cause will disturb the chemical, physical, and biological processes that keep all our waterways healthy. It is important that we protect our rivers as well as their tributaries and wetlands in order to optimize the health of all our waterways.

The 404 permitting process allows the Corps to provide essential oversight to water infrastructure projects such as dams and levees as well as other infrastructure that may affect waterways and wetlands such as highways and airports built in close proximity to waterways and wetlands. The Corps independently evaluates the need and location for the infrastructure project to ensure the lowest impact on the waterway and wetland. The permitting process also allows for public participation. Public participation allows for those that may be affected by a water infrastructure project to convey their concerns or support. The 404 permitting process requires the Corps to provide public notice within 15 days of receiving an application. The public notice starts a 15-30 public comment period where they public can submit their concerns. After the comment period ends the Corps can then allow the applicant to respond to comments received from the public or request that the applicant provide additional information to resolve public concerns. There is even an option for a public hearing if necessary.[14]

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[11] J.L. Meyer, L.A. Kaplan, J.D. Newbold, D.L. Strayer, C.J. Woltemade, J.B. Zedler, R. Beilfuss, Q. Capenter, R. Semlitsch, M.C. Watzin, & P.H. Zedler, *Where Rivers are Born: The Scientific Imperative for Defending Small Streams and Wetlands. American Rivers and Sierra Club* 8 (February 2007), *available at* https://www.americanrivers.org/conservation-resource/small-streams-wetlands/.

[12] *Id.*

[13] *Id.*

[14] U.S. Army Corps of Engineers, "Permitting Process Information," *available at* http://www.lrl.usace.army.mil/Portals/64/docs/regulatory/Permitting/PermittingProcessInformation.pdf.

The Corps is not the only federal agency involved in 404 permitting. The EPA issues guidelines for dredging and filling that the Corps ensures are followed. The EPA also has "veto" authority on 404 permits. Specifically, the EPA can deny specification of a given waterway as a site for dredge or fill material. Also, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service may become involved if for example there is an endangered species that may be affected by the project.

Rivers and Harbors Act Section 408

Section 408 of the Rivers and Harbors Act authorizes the Corps to permit modifications and alterations to existing Army Corps constructed public works projects.[15] The Corps requires the permit applicant to meet their standards and to ensure there is no injury to the public interest or any effect on the Corp's projects' ability to meet its intended purpose.[16] The Corps will evaluate the project's impact on any alteration to flood conveyance, structural integrity, operation and maintenance, NEPA requirements, and flood absorption or blocking capabilities.[17] The Corps oversight in allowing an outside party to use their infrastructure is necessary to ensure the integrity of the Corps infrastructure as well as to ensure the outside party does not adversely impact the waterway or wetland where the project is located.

Recently there has been discussion about the Corps' 408 process being duplicative of the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP) in the permitting and licensing of hydropower projects to be added to currently non-powered Corps infrastructure. American Rivers agrees with the statement of then-Director of FERC's Office of Energy Policy Ann Miles, who testified before the House Energy and Commerce Committee that it might be preferable for FERC to relinquish jurisdiction over hydropower projects to be added at Corps facilities, but it is inappropriate to transfer such authority from the Corps to FERC.[18]

While some utilities would prefer the ILP to the 408 process, and indeed supported legislation in the 114th Congress (H.R. 8) which could have had the effect of granting FERC added authority over the issue, American Rivers agrees with FERC and the Corps that alterations to structures owned by the United States and operated and maintained by the Corps for purposes authorized by Congress should remain within the jurisdiction of the Corps of Engineers. Therefore we respectfully ask the Committee on Transportation and Infrastructure to oppose any efforts to

[15] 33 U.S.C. § 408(a) (2012).
[16] *Id.*
[17] U.S. Army Corps of Engineers, "Section 408 Permitting Information," *available at* http://www.spl.usace.army.mil/Missions/Section-408-Permits/.
[18] Testimony of Ms. Ann F. Miles before the House Committee on Energy and Commerce's Subcommittee on Energy and Power, May 13, 2015, Hearing: "Discussion Drafts Addressing Hydropower Regulatory Modernization and FERC Process Coordination under the Natural Gas Act" pg. 15, *available at* http://docs.house.gov/meetings/IF/IF03/20150513/103443/HHRG-114-IF03-Wstate-MilesA-20150513.pdf.

transfer from the Corps to FERC the responsibility for permitting power development at taxpayer owned facilities.

The National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires federal agencies to do an environmental impact statement (EIS) for all major federal actions significantly affecting the quality of the human environment.[19] Although the statutory requirements of NEPA apply only to federal agencies, in practice its affect is much broader as it applies to federal agency decisions regarding regulations, leases, contracts, permits, purchases, and other proposed actions.[20] It is often applied to water infrastructure projects due to the need for a Corps 404 permit.

NEPA requires federal agencies such as EPA and the Corps to administer an objective, impartial environmental analysis and alternatives review. This is critical as water infrastructure project proponents are necessarily biased parties in any NEPA process. The role of federal agencies in NEPA ensures that alternatives are incorporated and that the project proponents are asked the hard questions to ensure their justification for the project is sound. American Rivers finds this to be the case in many instances where water infrastructure storage or diversion projects are going through the NEPA process.

For example, the Nevada Irrigation District, a local water supply agency, is proposing to build a new supply reservoir on the Bear River in California. The Corps is the lead agency for the federal NEPA process in this instance due to the requirement of a Clean Water Act Section 404 permit. During the NEPA process, the Corps has a statutory obligation to look beyond the Nevada Irrigation District's justification and statement of need for the reservoir and conduct its own assessment of that need and justification. The Corps can and must also include within the NEPA scope issues that were not raised and would not be considered by the Nevada Irrigation District. Federal agencies that are charged with environmental stewardship must be able to review and supplement environmental impact statements.

The EIS that NEPA requires ensures disclosure of environmental impacts to the public that may otherwise go unnoticed. A draft EIS is released for public and agency comment. American Rivers has taken the opportunity in many instances to comment on draft EISs in order to bring to light specific knowledge of a river system that we possess of which the federal agency or project proponent may not be aware and if taken into account would benefit the public and the river. The final EIS has to take into consideration those comments and explain or reject any outside expert views. Not only is the public informed but they also are given opportunity to engage as NEPA

[19] National Environmental Policy Act Section 102(2)(C), 42 U.S.C. § 4332(C).
[20] Zygmunt J.B. Plater, Robert H. Abrams, William Goldfarb, Robert L. Graham, Lisa Heinzerling, & David A. Wirth, Environmental Law and Policy: Nature, Law, and Society 478 (Erwin Chemerinsky et al. eds., Aspen Publishers 3rd ed. 2004).

ensures public participation in federal agency planning. The NEPA process leads to better outcomes for communities by saving money, time, historical sites, and endangered species as well as providing transparency and accountability for federal agency actions as they affect our environment.

Integrated Planning

The EPA calculates that our wastewater infrastructure needs $271 billion in investments.[21] Water utilities across the country are oftentimes inadequately sized, rely on out of date technologies, or have been deteriorated due to decades of deferred maintenance. Fiscal pressures on municipalities are great and funding is limited. Many municipalities are growing and water systems cannot keep up with the demand. Other municipalities are not as populated as they once were which means fewer ratepayers and excess capacity in their water system. In addition to population shifts, municipalities have to deal with climate change impacts and changing weather patterns. Some communities are experiencing drought and others are experiencing increased flooding and storm surges. This exacerbates problems that they are already experiencing from outdated infrastructure. It is vital for our communities to develop sustainable strategies that maximize benefits per dollar investment. Municipal governments and wastewater agencies need real help in updating pollution control plants. However, the federal protections provided for in the Clean Water Act must be at the forefront of any solution and should not be ignored.

In 2012 the Environmental Protection Agency (EPA) released the *Integrated Municipal Stormwater and Wastewater Planning Approach Framework* (Framework). The Framework outlines principles for communities structuring plans for addressing multiple Clean Water Act obligations to sequence costs, which would help make compliance more affordable overall. The Framework explicitly disallowed for permits and enforcement actions to be delayed based on the new integrated plan. Clean Water Act protections for public health and the environment must be preserved and followed in an integrated approach. This ensures water services benefit the ratepayer, taxpayer, communities, and the environment.

Integrated planning and permitting offers a more holistic approach to the management of stormwater and wastewater. It allows municipalities and water utilities to better be able to use smarter and more sustainable approaches to protect clean water while still delivering reliable services. Natural and nature-based solutions such as green stormwater infrastructure reduce polluted runoff, recharge drinking water supplies, and increase community green space. Investment in green stormwater infrastructure provides cross sector benefits.

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[21] U.S. Environmental Protection Agency, Clean Watersheds Needs Survey 2012 Report to Congress, (2016) *available at* https://www.epa.gov/sites/production/files/2015-12/documents/cwns_2012_report_to_congress-508-opt.pdf.

Integrated Planning and Permitting, when done correctly, allows municipalities to meet the requirements of the Clean Water Act by sequencing investments in wastewater and stormwater infrastructure by highest priority, without changing existing regulatory or permitting standards. Affordability is a part of integrated planning and permitting, but it should not be used as an excuse to defer real progress in meeting water quality standards. Municipal governments and wastewater agencies need real investment led by local, state, and federal sources, coupled with utilities' adoption of well-known practices that reduce the costs of compliance for ratepayers. This will secure our communities and rivers against further pollution.

H.R. 465 Weakens the Clean Water Act

H.R. 465, the "Water Quality Improvement Act of 2017," is not the answer. Rather than providing municipalities with the resources they need to come into compliance with the Clean Water Act, this bill allows water utilities to regress in their progress towards meeting water quality standards. H.R. 465 allows utilities to claim that the cost of cleaning up pollution is too great, and therefore those utilities need not take the steps necessary to comply with the Clean Water Act standards for healthy rivers. The bill prioritizes the current finances of water agencies over the economic costs that pollution imposes upon our communities. It ignores the value of health, environmental, and economic benefits of clean water, and fails to provide solutions that make achieving those benefits more affordable to ratepayers. The bill aims to reverse more than 45 years of Clean Water Act precedent, and creates disincentives for timely action to restore our rivers and neighborhoods. It also makes it more likely that wealthy neighborhoods will have clean water, while poor neighborhoods are left behind. American Rivers opposes weakening Clean Water Act requirements.

H.R. 465 incorporates a wastewater utility's "integrated plan" for long-term compliance into the utility's permit and , upon permit renewal, allows for the plan's requirements to be "modified or removed" based on a skewed analysis of affordability, and in order to "help the municipality" comply – i.e., lower the bar for compliance. This potentially allows for permit requirements to be weakened, which is in conflict with anti-backsliding provisions of the Clean Water Act. The bill also appears to create an end run around compliance with existing water quality standards- which protect fishable, swimmable waters – by evading the provisions in existing law that guard against relaxation of these standards. The bill also identifies "reasonable progress… towards meeting permit requirements" as a guiding principle for compliance schedules, in tension with more protective existing law that requires schedules that "will lead to compliance… as soon as possible."

We support a holistic approach to achieving clean and reliable water for our communities by using cost-effective and innovative investments in water infrastructure. The approach taken must maintain protections for clean water and public health provided for in the Clean Water Act.

There is a benefit to moving towards more integrated infrastructure though better planning, evaluation, and sequencing of investments, but especially if smarter infrastructure is driving this process – specifically green stormwater infrastructure and water efficiency.

Conclusion

The issue of how to address outdated and failing water infrastructure and the future of infrastructure investments to protect clean water and public health is of critical importance to our nation. American Rivers appreciates the Committee on Transportation and Infrastructure's Subcommittee on Water Resources and the Environment for taking the time to have a hearing on this important topic. As the nation's leading advocate for protecting and restoring rivers and their floodplains, we respectfully request that the Subcommittee take our recommendations into consideration when formulating policy on water infrastructure.

If any questions arise please email or call Meghan Boian: mboian@americanrivers.org or 202-243-7037.

Bay Planning Coalition

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Chief Executive Officer

March 8, 2017

Chairman Garret Graves
Subcommittee on Water Resources and the Environment
Committee on Transportation and Infrastructure
U.S. House of Representatives
2251 Rayburn House Office Building
Washington, DC 20515

Re: Testimony for the March 9, 2017 Subcommittee Hearing on *Building a 21st Century Infrastructure for America: The Role of Federal Agencies in Water Infrastructure*

Dear Chairman Graves:

Thank you very much for allowing Bay Planning Coalition to submit written testimony to the Subcommittee on this important matter.

Founded in 1983, Bay Planning Coalition is a non-profit, 501(c)(4) membership-based organization that represents the interests of and convenes public and private entities involved in commerce, industry, infrastructure, recreation and the natural environment connected to the San Francisco Bay and its watershed. It has more than 150 members from across a range of relevant sectors, including business and industry, government, professional service firms, and various associations.

San Francisco Bay is the largest estuary on the west coast of North and South America, and one of the world's great natural harbors. It is home to seventeen federal navigation channels that serve five ports, seven marine oil terminals and refineries, and over 100 marinas and small recreational boating facilities. The continued operation of these ports and navigation channels is vital to the nation's movement of goods. A large number of critical imports and exports go through them, including agricultural products from California's expansive Central Valley, and a large number of consumer products – many of which are ultimately transported by rail throughout the United States. This activity is an important part of the state's economy, which currently ranks sixth globally.

The Bay is also a vibrant natural resource that serves as a nursery to the Pacific Ocean's fisheries and is home to native fish, migrating salmon, and hundreds of thousands of birds on the Pacific flyway. The health of the estuary is so important to Bay Area residents that, in 2016, voters in the nine counties that touch the Bay approved an annual parcel tax to protect and restore the Bay by a 70%-30% tally.

A REMARKABLY SUCCESSFUL COLLABORATION

Perhaps the best example of how local, state, and federal agencies can collaborate with a broad diversity of stakeholders for a common purpose started in the 1980s when the Bay's industrial, dredging, environmental, fishing and regulatory communities overcame an impasse known as "mudlock."

During this time, the fishing industry and environmental groups became increasingly concerned that dredged sediment dumped at authorized sites in the Bay was causing a decline of native fish due to increased turbidity and possible contamination.

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Concurrently, regulatory and resource agencies were not issuing dredging permits in a timely or coordinated manner due to conflicting policies and regulations. Indeed, it was not uncommon that one agency's permit would expire prior to other agencies issuing their related permits. In 1989, the Bay dredging conflict became so heated that the fishing and environmental communities used their boats to create a blockade around the main disposal site in the Bay, and dredging of the ports, marinas and federal channels came to a standstill.

In response, the U.S. Army Corps of Engineers (the Corps), the U.S. Environmental Protection Agency (EPA), the San Francisco Bay Conservation and Development Commission (BCDC), and the San Francisco Bay Regional Water Quality Control Board (Water Board) worked with stakeholders to create the Long Term Management Strategy for the Placement of Dredged Sediment in the San Francisco Bay Region (LTMS) Management Plan. It was adopted in 2001 and stands out as a remarkably successful collaborative effort.

In the Management Plan, which was created with a large amount of input from a wide variety of non-governmental institutions, including Bay Planning Coalition, the LTMS partner agencies (USACE, USEPA, BCDC and the Water Board) concluded that dredged sediment is a valuable natural resource, rather than a waste product, and that beneficially re-using dredged sediments could restore habitat, maintain levees, improve fisheries, and improve the estuary's water and sediment quality.

Also with extensive stakeholder input, the LTMS partner agencies drafted and adopted the following four goals:

- Maintain channels necessary for navigation in an economically and environmentally sound manner and eliminate unnecessary dredging activities in the Bay and Estuary;
- Conduct dredged material disposal in the most environmentally sound manner;
- Maximize the use of dredged material as a resource; and,
- Maintain the cooperative permitting framework for dredging and disposal applications.

Bay Planning Coalition is a strong supporter of the LTMS and beneficially using dredged sediment in the most efficient and environmentally sound manner. Since its inception, the LTMS has successfully reduced in-Bay disposal by 45% (to 1.25 million cubic yards per year). The LTMS is also responsible for beneficially using over 23 million cubic yards of dredged sediment to restore habitat at a wide variety of wetlands restoration projects. It is now actively seeking to support additional beneficial reuse sites throughout the region.

Just as important, the LTMS created the Dredged Material Management Office (DMMO), which has streamlined the dredging permit process and takes a programmatic approach to endangered species issues and sediment quality review necessary for the disposal approval process under the Clean Water Act. The DMMO coordinates permits, has reduced project approval periods, has increased certainty for the dredging community, and provided better assurances for the resource agencies and environmental groups. Throughout the history of the LTMS, navigation safety has been maintained and improved. The LTMS demonstrates the success that arises from integrating economic and environmental goals.

TWO MAJOR CHALLENGES

While the LTMS program has been relatively successful, it faces two major challenges due to the Corps' internal processes. Even while sediment is the building block of wetlands, which protect and buffer the

shoreline from storm surges and flooding, the Bay receives far less sediment now than it has in the past, which poses far-reaching challenges and requires a coordinated and proactive response to ensure wetlands can continue to accrete sediments at a sustainable rate.

First, the Corps' Civil Works Program has not met its commitments and has been less willing to partner in recent years to provide dredged material to wetlands restoration projects in need of sediments. Until approximately 2011, the Corps worked with LTMS to develop and support projects that provided multiple benefits, including navigation, flood protection, and ecosystem restoration, which are its three authorized missions. The Hamilton and Sonoma Baylands restoration projects, sponsored by the Corps and the California State Coastal Conservancy, were coupled mainly with the "new work" construction dredging performed during the Port of Oakland's deepening projects so that dredged sediment from these projects could be beneficially reused to provide flood protection to adjacent properties while creating much-needed wetland habitat to support federally endangered species. Both wetlands restoration projects were completed successfully and met their respective multi-benefit goals.

However, since then, there have been no additional "new work" dredging projects, and the Corps has consistently used its "Federal Standard" to perform annual maintenance dredging, which has resulted in millions of cubic yards of sediment being disposed of as a waste product. This unacceptable approach is viewed by the Corps as reasonable because it costs slightly less to dispose of sediment by dumping it into or outside of the Bay rather than beneficially reusing it for projects that significantly improve habitat, reduce storm surge impacts, and absorb floodwaters. Currently, the U.S. Fish and Wildlife Services' Cullinan Ranch Restoration Project, a federal wetlands restoration project located just four miles from a deep draft navigation channel maintained by the Corps (Pinole Shoal Channel), has only received a small fraction of the sediments dredged by the Corps since it was permitted to receive dredged material five years ago. In the meantime, the Corps continues to waste sediment by disposing most of it sixty miles out to sea. This is a tremendous waste of public funds and resources simply because the Corps narrowly limits its program via the Federal Standard, and has been reluctant to promote or engage with the LTMS over the concept of strategic in-Bay placement for the purpose of offshore "feeding" of Bay fringe wetlands as a potentially more efficient and environmentally sound beneficial reuse option.

Second, the Corps' contracting process has become so lengthy and cumbersome that projects regularly cannot be started or completed on time despite the best efforts of the Corps' partners and customers. The Corps' navigation dredging projects are rarely completed within the LTMS-established "environmental work windows," which are meant to help avoid impacts to listed species. At the same time, private dredging projects routinely accomplish their work within their designated work windows. The Corps' contracting process can also result in higher dredging costs and less beneficial reuse of available sediment because the Corps' Washington, D.C. headquarters refuses to include beneficial reuse in contracts as the priority placement option (with few exceptions).

While the LTMS partner agencies and the resource agencies have expended significant energy to work with the Corps to resolve this issue, it is oddly the Corps' lack of contracting clarity that has hindered its ability to beneficially reuse dredged sediment. NOAA's National Fisheries Service (NMFS), in collaboration with the LTMS, has recently promulgated an option for dredging projects to proceed or continue outside the LTMS work windows if the dredged sediment is beneficially reused at ecosystem restoration projects. As a result of this new requirement, the Corps was able to place nearly a million

cubic yards at wetland restoration sites in 2015 -- something its leaders said they could not do on their own.

LOOKING AHEAD

At the moment there is ongoing litigation between BCDC and the Corps regarding some of these issues. The next step as we understand it is for a settlement hearing on March 27 in San Francisco. Bay Planning Coalition and the business community in general encourage resolution of the litigation as soon as possible to remove the uncertainty that it has contributed to what is already a fraught situation.

Lastly, while NMFS has made an effort to aid dredging projects, including by addressing the work window challenge, the agency continues to encounter issues associated with insufficient staffing. One of the resulting problems is that, without enough NMFS staff, the requirements for dredging operations to meet timely environmental reviews and to satisfy key Marine Oil Terminal Engineering & Maintenance Standards (MOTEMS) is significantly impacted.

Bay Planning Coalition and the LTMS agencies will continue to work with the Corps' Civil Works Program at all levels to help it meet its commitments to the region and accomplish multi-benefit projects in the most efficient and environmentally sustainable manner. I appreciate this opportunity to provide these comments to the Subcommittee and would be happy to answer any questions that you may have.

Sincerely,

John A. Coleman
Chief Executive Officer
Bay Planning Coalition

AGU PUBLICATIONS

Water Resources Research

COMMENTARY

10.1002/2016WR019905

Key Points:
- Climate change projections suggest more hydrologic extremes. Are more dams subsequently needed?
- Most US dams now exceed their economic design life and represent a need for infrastructure investment and recognition of associated risks
- A national water assessment is needed to examine dam removal and modified storage provision options considering hydroclimatic risk exposure

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The future role of dams in the United States of America

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Abstract Storage and controlled distribution of water have been key elements of a human strategy to overcome the space and time variability of water, which have been marked by catastrophic droughts and floods throughout the course of civilization. In the United States, the peak of dam building occurred in the mid-20th century with knowledge limited to the scientific understanding and hydrologic records of the time. Ecological impacts were considered differently than current legislative and regulatory controls would potentially dictate. Additionally, future costs such as maintenance or removal beyond the economic design life were not fully considered. The converging risks associated with aging water storage infrastructure and uncertainty in climate in addition to the continuing need for water storage, flood protection, and hydropower result in a pressing need to address the state of dam infrastructure across the nation. Decisions regarding the future of dams in the United States may, in turn, influence regional water futures through groundwater outcomes, economic productivity, migration, and urban growth. We advocate for a comprehensive national water assessment and a formal analysis of the role dams play in our water future. We emphasize the urgent need for environmentally and economically sound strategies to integrate surface and groundwater storage infrastructure in local, regional, and national water planning considerations. A research agenda is proposed to assess dam failure impacts and the design, operation, and need for dams considering both paleo and future climate, utilization of groundwater resources, and the changing societal values toward the environment.

Plain Language Summary Water storage and control have been key elements of a human strategy to overcome differences between water availability and water needs. The future promises changes to when and where water will be available and many regions in the USA will likely see an increase in the imbalance between existing water storage and evolving demands for water. This indicates the need for more storage or new dams to meet human and ecological needs. The current trend for removal of old, hazardous or unpopular dams now and into the future may impact regional groundwater outcomes, food and energy production, migration, and urban growth. We advocate for a formal analysis of the role dams play in the future of the USA's water landscape. We also stress the need for national water planning considerations to develop environmentally and economically sound strategies to integrate the management of surface and groundwater storage infrastructure in the USA.

1. Introduction

Dams have been an integral component of economic and societal development across the United States. However, the construction and operation of dams have been controversial—several major dams have been seen as public infrastructure failures in terms of social equality, taxpayer investment, and environmental impacts [*World Commission on Dams*, 2000; *George et al.*, 2016]. Evolving environmental philosophies [*Sewell*, 1987], perceived fiscal waste [*Office of Inspector General*, 2013; *Gelman*, 2014; *Snyder*, 2016], and the mismatch between planned and actual dam use [*Economist Group*, 2010] are cited as reasons for diminished public willingness to relicense or authorize and construct new dams. However, a changing climate

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combined with projected increases in population and shifting water demands promises increased water risks and raises a debate as to whether we need dams more than ever, where and why, and how dams may need to be designed and operated differently to meet social and environmental goals for rivers.

It is likely that the economic and societal landscape of the United States would be unrecognizable without the ~85,000 dams that together store almost one year's mean annual natural runoff, the equivalent of around 5000 m^3 of storage per person [*Graf*, 1999]. These dams also produce hydropower and enable the production of high value irrigated produce [*Bureau of Reclamation*, 2016]. Around 20% of dams listed in the national inventory of dams are primarily used for flood control [*U.S. Army Corps of Engineers*, 2015], reducing the risks of loss of life and property to millions with potential flood exposure. Estimates indicate that over $5 billion of flood damage has been circumvented to date by flood control dams and levees in both the Central Valley, California, and the Tennessee Valley, respectively [*Stene*, 2015; *Tennessee Valley Authority*, 2016], while investments in U.S. Army Corps of Engineers (USACE) flood control structures have an estimated sixfold return in terms of flood loss prevention [*Comiskey*, 2010].

Legislation such as the National Environmental Policy Act (1970) requires all federally funded projects to address negative environmental impacts as part of the design. Subsequently, revised dam operation strategies have enabled the alleviation of some environmental impacts (e.g., sediment flushes [*Hsieh*, 1999; *Yin et al.*, 2014], optimizing release patterns [*McKinney et al.*, 2001; *Richter and Thomas*, 2007; *Kolesar and Serio*, 2011]). In some cases, the environmental impacts of dams are not clear cut [*Hard et al.*, 1996; *Soumis et al.*, 2004] and some dams have been considered as a tool to improve environmental streamflows [*McCartney*, 2005]. The sedimentation of existing reservoirs continues to be problematic with impacts on water quality and riverine systems around dams [*Webb et al.*, 2013; *George et al.*, 2016]. In time, unaddressed sedimentation will render many dams obsolete by reducing storage and flood control capacity [*Morris and Fan*, 1998] unless potentially costly maintenance practices are implemented. In deliberating the future need for dams, one needs to also consider the environmental and social impacts resulting from alternatives to dam services such as hydropower (e.g., coal mining and coal generators, nuclear power and nuclear waste, oil and gas) or water supply (groundwater sustainability and quality, desalination, water recycling) in planning for the future of water, electricity, and food infrastructure. It is currently unclear how such a comparative benefit-impact-cost analysis would result in general particularly when considering the newly released Principles Requirements and Guidelines [*Council on Environmental Quality*, 2014]. These guidelines aim to "allow communities more flexibility to pursue local priorities; take a more comprehensive approach to water projects that maximizes economic, environmental, and recreational benefits; promote more transparent and informed decision-making across the Federal government. . .."

In contrast to widely explored environmental and economic aspects of dams, hydroclimatic variability, climate change, and associated impacts on dam operation and risk have not been adequately evaluated for most dams, particularly non-Federally-owned dams that make up 97% of United States' dams. This is despite projected increases in the imbalance between water demand and supply in many regions of the United States [e.g., *Zarriello*, 2002; *Vicuña et al.*, 2007; *Goralczyk*, 2015]. An improved understanding of hydroclimatic variability and extremes using long, continuous instrumental records, paleoclimate records [e.g., *Cook and Jacoby*, 1977; *McCord*, 1990; *Therrell and Bialecki*, 2015], projected changes in hydroclimate conditions, land use, and subsequent water quality is needed to improve water management. Understanding the potential role of dams in exacerbating or mitigating hydroclimatic variability and change is critical [*Annandale*, 2013] yet has also not been thoroughly explored.

Many dams in the United States are nearing or have exceeded their design economic and physical life spans and the question now is what to do about the increasing costs and risks associated with aging dams? How will we maintain, restore, redirect, replace, or eliminate the need for the vital services that dams provide? In addition, what will our plan be for the role of dams in the United States in meeting the multiple needs (e.g., water supply, irrigation, hydroelectricity, flood control) of a growing population [*Colby and Ortman*, 2015] and the associated evolving demands for land, food, water, and energy? Given our understanding of dam impacts on the environment in addition to some environmental groups advocating for a return to unaltered streamflows, is it appropriate to remove all the dams? In contrast, should more investments in dam restoration and upgrades be made considering the economic benefits of existing dams, water supply, and flood control into the future, and the cost of dam removal? The peak of dam construction in the United States occurred when economic design life assessments focused on short-term benefits and costs, while

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discounting or ignoring altogether the long-term fiscal aspects of dam maintenance and decommissioning [*George et al.*, 2016]. Consequently, many dams are today perceived to be poor investments. This raises questions as to whether existing and future tax-payer-funded investments in dams should be avoided or if alternative decision mechanisms, funding structures, or ownership frameworks, including public-private partnerships, can be found and implemented?

This commentary discusses several critical questions addressing how dams have shaped our society and economic development and the need for a research agenda to identify safety concerns and examine the future role of dams in the United States. In this context, we consider the following issues:

1. potential dam failure risks and cascading impacts on critical infrastructure (e.g., other dams, energy, transportation, water treatment), and how extreme rainfall and regional flooding could act as a failure trigger. Quantifying these risks would provide a basis for prioritizing dam inspections, warning systems, restoration, recovery, and removal plans;
2. the large disparity between state and Federal dam regulations and resultant differences in safety, maintenance, and ensuing decisions and discourse regarding water management;
3. where dam removal, renewal, or new dam construction may be needed;
4. how a national water infrastructure investment, planning, cost recovery, and governance program can be informed using paleoclimate and future climate scenarios;
5. How local, regional, and national planning and guidelines for water resources could incorporate ecological, water allocation, risk management, cost allocation, and economic development goals of society.

The physical danger associated with inadequately monitored aging dams coupled with indications of future changes in the frequency and severity of droughts and floods in the United States means that there is a certain urgency with which such questions need to be addressed. Water assessment and planning processes are needed for addressing water requirements, accounting for regional and watershed differences in water supply and demand, and the role of dams in such a landscape [*Annandale*, 2013]. These decisions will shape the degree of economic viability and ecosystem equity that may be achieved into the future.

2. Dams: Development, Aging Dams, and An Uncertain Future

2.1. Dams and Economic Development

Dams were constructed as early as 3000 BC to regulate the spatial and temporal variability of water and marked the major episodes of human civilizations in Asia and Europe. Globally, greater seasonal and interannual variability is significantly correlated with lower per capita GDP [*Brown and Lall*, 2006] and higher water storage capacity emerges as a pathway to resilience and economic growth.

In the United States dams provided a gateway and supporting mechanism to industrialization, urbanization, and agricultural expansion. During the industrial revolution, the construction of small dams (< 15 m in height) in the Northeast provided on-site hydropower, water storage, and ensured reliable navigation. There are now over 6500 small dams (< 15 m high) in the East, accounting for around 90% of all dams in the region [*U.S. Army Corps of Engineers*, 2015]. In the Midwest, South, and Southeast, the widespread construction of levee systems by the USACE's implementation of the 1936 Flood Control Act encouraged urban and agricultural development on the fertile floodplains along the Mississippi River and in the Floridian wetlands.

The passage of the Reclamation Act by Congress in 1902 led to the creation of the Bureau of Reclamation and the construction of major dams for irrigation and hydroelectric production in the West, such as the Hoover Dam and Glen Canyon Dam, each over 200 m tall. This Act was perhaps the most transformative legislation in the history of the western United States enabling urban, energy, and irrigated agricultural development. Although only 17% of United States farmland is irrigated, irrigated produce accounts for approximately half of total agricultural revenue [*U.S. Department of Agriculture*, 2015]. Subsequently, over the last half of the 20th century demands for irrigation water sourced from reservoirs tripled [*Biemans et al.*, 2011]. In regions where surface water resources are not available, groundwater is typically used to supply the deficit [*Ho et al.*, 2016b].

2.2. Monitoring Aging Dams and Addressing Risks Across the United States

Across the United States, many dams are nearing or have already exceeded the nominal 50 year economic design life planned for government permitted dams (Figure 1). While the physical life span of dams is

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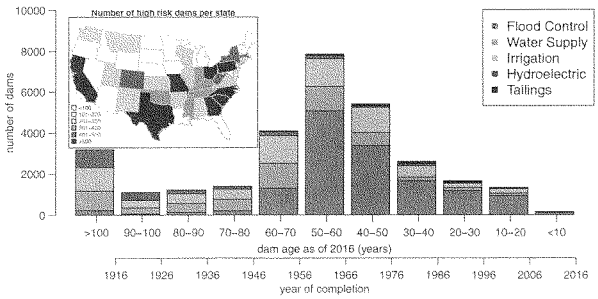

Figure 1. Age of dams in the United States (that meet the criteria of 1. Possible or likely loss of human life in the event of dam failure; 2. Dam height $\geq$ 7.6 m and reservoir storage $\geq$ 18.5 × 10^3 m^3; or 3. Dam height $\geq$ 1.8 m and reservoir storage $\geq$ 61.7 × 10^3 m^3) with primary uses of flood control, water supply, irrigation, hydroelectric, or tailings dams [*U.S. Army Corps of Engineers*, 2015] and (inset) Number of high-risk dams per state (where failure or misoperation would result in the probable loss of human life [*Federal Emergency Management Agency*, 2004]. Data from *Stanford University* [2016].

typically greater than 50 years, the physical diminishment of constructed dams and their components results in increased budgets needed for maintenance and repair. The subsequent *state of dams* in the United States is dire: the *American Society of Civil Engineers* [2013] recently awarded dam infrastructure in the United States a grade of "D," indicating poor maintenance of dams. State-directed and managed dam safety programs are responsible for inspections of around 97% of dams in the United States and are often inadequately funded. Each state's dam safety inspector is, on average, responsible for over 200 dams [*American Society of Civil Engineers*, 2013]. As a result the probability of at-risk dams going undetected is increasing. Furthermore, inspection requirements and emergency dam failure plan requirements differ from state to state. For example, in Alabama regulations for dam safety in design, construction, and ongoing inspections do not exist (a house bill for dam safety was introduced in 2014 but is yet to progress further). In Texas, a 2005 ruling by the Texas Attorney General resulted in limitations to accessing dam hazard information citing homeland security concerns [*Buchele*, 2013] and the ability of citizens to remain informed of proximal dam risks. In some other states, the qualifications for dam safety inspectors are not specified [*Association of State Dam Safety Officials*, 2000] and many of these dams are only physically inspected on a 10 year schedule.

The inability to adequately fund safety inspections and address dam vulnerabilities result in real societal risks in terms of public safety and potential economic losses. During the April 2016 floods, Houston residents were evacuated over flooded roadways out of the potential flood zone of two dams, both of which have exceeded their economic design life spans by around 20 years [*Borrello*, 2016]. Alabama, the state with no dam safety laws, is not immune to dam failures either: six families were evacuated after heavy rains in 1990 caused the face of a dam to slump [*Association of State Dam Safety Officials*, 2016]. In 2015, a single storm event in South Carolina triggered the failure of over 30 dams. Such an event may be a precursor of future flood destruction under both a changing climate and aging dam infrastructure.

Federal and some state agencies are beginning to consider a climate-informed risk model for dam safety by considering the occurrence of different types of extreme rainfall events (e.g., high intensity storms versus prolonged low intensity storms) [*Raff et al.*, 2009], similar to recent guidance for flood risk management [*Meadow et al.*, 2016]. Modeling the potential for dam failures or a series of cascading dam failures at a watershed or regional scale is needed across the nation to better inform risks to critical infrastructure that is operationally or physically linked to a dam break (e.g., power plants, highways, water treatment facilities) [*Rodrigues et al.*, 2002; *Perkins et al.*, 2011]. The catastrophe associated with such a scenario and potentially long-term recovery period warrant these investigations to enable adequate planning, preparation, and citizen outreach and education.

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Encouragingly, some recent efforts toward funding nonfederal dam safety works have been made through direction in the Water Resources Development Act of 2016 that would allow nonfederal dam owners to apply for grants to address high hazard dam issues. In addition, the USACE proposed the introduction of a nation-wide permit in June 2016 to streamline the removal of superfluous low-head dams in order to restore riverine systems and enhance public safety [*Department of the Army-Corps of Engineers*, 2016].

A method of prioritizing at-risk dams and determining appropriate funding structures is needed to ensure that dam safety improvements or dam failure emergency response plans are addressed and implemented. Metrics for the level of hazard associated with a dam exist and have been embraced by organizations and agencies at both federal and state levels (e.g., Federal Emergency Management Agency (FEMA), Bureau of Reclamation, U.S. Army Corps of Engineers, and Association of State Dam Safety Officials). These metrics use risk-based frameworks including consideration for probable loss of human life, environmental damage, and societal and economic disruption, but differ in the consideration of dam integrity, age, and potential failure causes and mechanisms. Although federal agencies conduct quantitative risk-based analyses to determine *hazard potential ratings*, ratings for non-Federally owned or operated dams may be qualitative and judgment based. The lack of rigor is reflected in the more frequent occurrence of dam failures amongst privately owned dams [*Costa*, 1985]. Approximately 15% of the 85,225 dams listed in the National Performance of Dams Program are identified as a high hazard (see Figure 1b). This suggests that either the risk metric is perceived as too general for prioritizing funding allocations or there is a serious issue with the increasing potential for dam failures across the country.

2.3. Dam Adequacy in the United States Considering Instrumental, Paleo, and Projected Climate

The peak period of dam design and construction in the United States occurred when there was a limited history and understanding of instrumental hydrologic and climatic data. For example, the Colorado River Compact of 1922, which stipulates water transfers from the upper to lower Colorado today largely regulated through water releases from Glen Canyon Dam, was predominantly based on less than 20 years of instrumental streamflow data. The limited hydrologic record was collected during the wettest decade in the 20th century and excluded data from an anomalously dry period prior to 1905 [*Hundley*, 1986; *Advisory Committee on Water Information Open Water Data Initiative*, 2014].

A major national question exists as to whether existing dams are able to meet their design objectives over a full range of probable hydrologic variability given that paleoclimate records show the occurrence of catastrophic droughts and floods larger than any event considered in the design scope of existing dams [*Cook et al.*, 2014; *Greenbaum et al.*, 2014; *Kwon and Lall*, 2016]. Furthermore, no dam design guidelines, including those that use stochastic models, consider the quasi-periodic, interannual to multidecadal variations in streamflow, which have been identified in paleoclimate records in the United States [e.g., *Cook and Jacoby*, 1983; *Gray et al.*, 2003; *Woodhouse et al.*, 2006a]. A recent evolution of stochastic models that consider such features is starting to inform operational aspects [*Kwon et al.*, 2006; *Kwon et al.*, 2007; *Nowak et al.*, 2011; *Erkyihun et al.*, 2016].

Despite the use of large dams, including Glen Canyon Dam, which allow for management and equitable distribution of water between upper and lower Colorado basin states (in addition to hydropower, flood control, and recreational services), there have been ongoing calls to remove Glen Canyon Dam [*Joint Hearing on the Sierra Club's Proposal to Drain Lake Powell or Reduce its Water Storage Capability*, 1998; *Lustgarten*, 2016]. Ongoing efforts, stimulated by persistent drought, have allowed research and study of approaches to managing Colorado River water supplies and demands informed by observed, paleoclimate, and climate-informed projections of water supplies and demands [e.g., *Bureau of Reclamation*, 2012]. To illustrate our point, we evaluate the performance of the Colorado River Compact's distribution of water between the upper and lower basins to complement existing *Bureau of Reclamation* [2012] studies. We consider the presence and the absence of Glen Canyon Dam and Lake Powell using a paleoclimate perspective.

The 1490–1997 tree-ring-based reconstruction of the Colorado River streamflows at Lee's Ferry is used. Lee's Ferry streamflow delineates streamflow between the upper and lower basins and was developed by *Woodhouse et al.* [2006a]. From this data, we developed 100 stochastic simulations using wavelet auto regressive models [*Kwon et al.*, 2007] that are designed to preserve the multitime-scale variability of streamflow. The Colorado River Compact stipulates a minimum delivery of 75 million acre feet of water over a 10 year period from the upper to lower basin. An average of 7.5 million acre feet per year was used to develop

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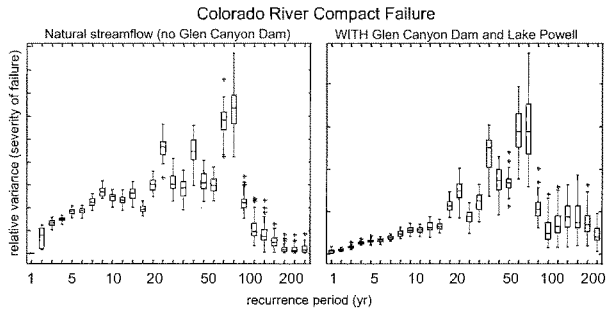

Figure 2. A wavelet analysis of failure to comply with the Colorado River Compact of delivering at least 75 million acre-feet of water over a 10 year period. The figures contrast variance of failure versus frequency under free-flowing conditions (left) and consider the operation of Glen Canyon Dam to provide water as needed. The wavelet analysis was performed on simulated time series of failure occurrences determined using simulations of paleoclimate streamflow at Lee's Ferry by *Woodhouse et al.* [2006a] generated using a wavelet autoregression model [*Kwon et al.*, 2009] by Francisco Assis Souza Filho.

a time series of shortages for each of the stochastic simulations with (using a water balance model) and without Lake Powell. With Lake Powell, reservoir mass balances are computed annually, and spills occur if the reservoir capacity is exceeded in a given year. This time series is composed of 0 values in years when the streamflow meets the target release and a negative value for years in which the target demand is not met.

An analysis of the frequency spectrum of shortages reveals recurrence intervals greater than 20 years (similar to findings in *Bureau of Reclamation* [2012]). The most severe hydrologic shortages have a recurrence interval of 60–80 years irrespective of whether or not the dam is in place (see Figure 2). Notable water shortages with periodicities of approximately 8, 20, and 40 years occur without Glen Canyon Dam (see Figure 2, left graph), with amplitudes of about 50%, 75%, and 75% of the spectral peak respectively with a peak period of 60–80 years. Including the dam, which has a storage volume of around twice the mean annual streamflow of the Upper Colorado River [*Woodhouse et al.*, 2006a; *Dettinger et al.*, 2015; *Goteti*, 2015], dramatically reduces the relative amplitude of the 8 and 20 year peaks to be 15% and 50%, respectively (Figure 2, right graph). The peak periodicity for severe shortages remains at 60–80 years even with storage in Lake Powell. Consequently, where streamflows display multiyear, quasi-periodic variability, as displayed in the Colorado River paleoclimate streamflow record, a dam with storage capacity of up to 2 years of mean annual streamflow could mitigate shortages associated with decadal and perhaps bidecadal variability. However, such a dam may have little functional impact in mitigating severe lower-frequency shortages such as those characterized in the Colorado River.

The primary utility of a dam such as Glen Canyon is the ability to meet administratively defined water allocation requirements. An even longer reconstruction of Lee's Ferry streamflow from 762 AD to 2005 (not included in the analysis here) highlights an even drier period in the 12th and 13th centuries [*Meko et al.*, 2007]. This drought is theorized to be a contributing factor to the disappearance of the Ancestral Pueblo civilization that previously populated the Four Corners region [*Cordell et al.*, 2007; *Kohler et al.*, 2008]. Consequently, even if the dam were not removed, one needs to think of financial, social, and ecological risk management strategies to mitigate the impacts of catastrophic adverse effects associated with extreme hydrologic events.

In addition to the consideration of past hydroclimatic variability informed by both instrumental and paleoclimate records, projections of future water availability across the United States show that changes in water supply should be expected. For example, *Christensen et al.* [2004] found that water shortages at Glen

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Canyon Dam increased from 8% to 25%–41% of the time under projected climate impacts. Projections also show shifts in the timing of peak streamflow earlier in the year away from the growing seasons in the West, a reduction of water stored in the snowpack, and a change in the phase (frozen/liquid) and intermittence of precipitation [*Barnett et al.*, 2005]. This is in addition to increases in evapotranspiration [*Walter et al.*, 2004] and increased extreme precipitation intensities in the North [*Wuebbles and Hayhoe*, 2004], increased variability in the Southeast (i.e., more extremes both wet and dry) [*Li et al.*, 2012], and increased winter precipitation and higher frequency droughts in the Northeast [*Hayhoe et al.*, 2008]. Flood risks will be further exacerbated through land use changes that increase runoff peaking and volume [*Kousky and Kunreuther*, 2009; *Ceylan and Devineni*, 2014] leading to higher sedimentation rates [*Kondolf*, 1997]. Projected increases in temperature would also enhance eutrophication resulting in anoxic conditions in reservoirs [*Paerl et al.*, 2011].

As understanding and detection of hydroclimatic variability and change improves with longer observations and subsequent analysis, we have come to the realization that many dams, particularly older dams designed with limited climate data, omitted extreme climate scenarios that are not or are no longer considered to be remote events. The recent record low reservoir water levels at both Lake Mead and Lake Powell, behind the Hoover and Glen Canyon dams respectively, exemplify the risks associated with prolonged droughts with return periods of more than 20 years (see right graph of Figure 2) and the inability to meet legal flow requirements. Both paleoclimate and future climate scenarios suggest that administrative and legal structures should be reformed to reflect and adapt to existing and future hydrological conditions.

2.4. Dam Capabilities in the United States Considering Social Expectations

2.4.1. Balancing Basin-Scale Water Demands Using Dams

The Delaware River Commission comprised of the Federal Government and the states of New York, New Jersey, Delaware, and Pennsylvania provides a forum for discussion, debate, and decision-making to facilitate appropriate watershed level management efforts and follows a complex history [*Albert*, 2010; *Ravindranath et al.*, 2016]. To address the challenges of managing the streamflow releases and water requirements from different sectors, *Kolesar and Serio* [2011] documented a citizen and Non-Government Organization driven process. Kolesar, a business school professor and, as a private citizen, an avid fisherman developed an optimization model for the timing and volume of releases from the Delaware reservoirs that maximize fisheries benefits while meeting water demands with no increase in drought exposure. Working with a number of fishing and ecological interests, he was instrumental in the Delaware River Basin Commission adopting a flexible streamflow management program using his modeling as a tool for making operational changes in water releases. The success of this assessment and implementation signals a significant change in the way ecological and water supply goals can be achieved using dams. Although the Delaware River Basin reservoirs are operated largely for seasonal storage, the need to have a management strategy for the financial, social, and ecological impacts remains given the risk of exposure to severe [*Namias*, 1966] and sustained [*Devineni et al.*, 2013] drought in the region.

The Delaware River Commission is one of only three River Basin Commissions in the United States that are currently functioning to address basin-scale water management. A number of states, such as Michigan, Massachusetts, Connecticut, and Colorado, have implemented river basin programs [*Kendy et al.*, 2012], while a joint project by the USACE and The Nature Conservancy aims to implement dam reoperation schemes for USACE dams within eight river systems across the USA to balance human water use and ecosystem services. The existence of watershed and river basin groups, state programs, and collaborations have enabled the management of basin-scale streamflows balanced for multiple user interests, suggesting that holistic approaches to water management in the United States are possible, but still wanting across much of the country.

2.4.2. Developing the Floodplain: The Perception of Safety Behind Dams

Although floodplains are, by definition, at risk of flooding, these areas also offer amenity values (e.g., views, recreation opportunities) and can be desirable locations to live. The fact that homeowners do not bear the full cost of building and locating in floodplains has led to substantial exposure of flood-prone areas in the United States and current trends indicate continuing development in these areas [*Pinter*, 2005]. In addition, many individuals, who are least financially capable of rebuilding, live in the most dangerous flood zones and are denied adequate emergency assistance when floods eventuate [*Barry*, 1998; *Gladwell*, 2015]. These locations continue to be liabilities to the National Flood Insurance Program, due to large insurance claims

and high prevalence of repetitive loss properties [*Kousky and Michel-Kerjan*, 2015]. Efforts to raise flood insurance rates in the aftermath of Hurricane Katrina in 2005, and other recent flooding events such as Hurricane Sandy in 2012, were intended to send a price signal that reflected the true cost of locating in a flood plain. These efforts have seen Congressional resistance and have had little success so far.

In addition to subsidies for flood insurance, the provision and maintenance of flood control infrastructure continues to encourage development in the flood plain. The Natomas subdivision in Sacramento, CA, is a case in point. Record flooding in 1988 and 1997 [*National Research Council et al.*, 1999] led to a reassessment of flood control infrastructure originally intended to protect Sacramento from flood events with a 1 in 100 year average recurrence interval (ARI). The subsequent revision found that the existing flood control capacity was as low as a 1 in 85 year ARI [*Governor's Flood Emergency Action Team*, 1997] or 1 in 77 when climate-informed analysis was considered [*National Research Council et al.*, 1999] resulting in a halt to further development in 2008. However, the 2014 Water Resources Reform and Development Act authorized the USACE to fortify levees encircling the Natomas basin "much to the excitement of developers, realtors and Sacramento City Hall—all of whom are ready to cash in" [*Maiman*, 2014]. The occurrence of a flood event similar to the 1862 flood with an estimated 1 in 500–1000 year ARI [*Porter et al.*, 2011] would still likely overwhelm the upgraded flood control infrastructure. Putting Natomas in the context of such a scenario is downright scary, and speaks to the human tendency to discount low probability, high impact events [*Kousky and Kunreuther*, 2009].

2.5. The Environmental and Social Costs of Dams

The present-day public perception of dams in the United States is vastly different from that in the early 20th century. We are now conscious of the environmental impacts caused by dams. These include fragmentation of water ways [*Graf*, 2001], obstructing movements of keystone fish species or rearing habitats and resulting impacts that propagate through the watershed [*Bednarek*, 2001], trapping sediment and altering river beds and banks [*Kondolf*, 1997; *Wisser et al.*, 2013], replacing riverine habitats with thermally stratified reservoirs [*Poff et al.*, 1997; *Elçi*, 2008], greenhouse gas emissions [*St. Louis et al.*, 2000], modifying water quality, and altering seasonal streamflow variability [*Nilsson and Berggren*, 2000] to name a few. There are now multiple environmental coalitions and advocacy groups emphasizing river restoration ecology and recommending direct intervention.

Historically, the social and economic benefits of dams were perceived to be high and took precedence over environmental degradation, the protection of downstream water supplies [*Lawson*, 1994; *Pitt*, 2001], and indigenous communities, which have often been displaced without adequate compensation [*Babbitt*, 2002; *Cernea*, 2008]. The trade-offs between dam construction and maintaining ecosystem health and services, food growth, and the provision of clean water [*Foley et al.*, 2005; *Young*, 2013] are now better understood. Federal agencies and watershed commissions now address some concerns through the Secretary's Indian Water Rights Office to facilitate settlements of Native American water rights claims [*Department of the Interior*, 2009] and addressing climate change and environmental streamflow requirements through more flexible water release policies.

In summary, a discussion as to whether or not to renew or remove dams in the face of age related structural decline and an unfavorable climate immediately takes on larger social dimensions. These decisions consist of a set of trade-offs between the often-conflicting objectives of developing capacity to manage climate variability, environmental and social justice, and economic activity and development. The social aspect of dams requires an examination of the variety of interventions, ranging from structural to financial to non-structural, and the notion of acceptable risk for society and for individuals. There have been strong calls to remove dams to restore riverine systems, such as calls to remove Glen Canyon and the Snake River dams but the question remains: Are we prepared to live without some of these dams?

3. Are We Prepared to Do Away With Some Dams?

The national rhetoric surrounding dams has moved from one of "monumental dams" to one of "healing" rivers (the latter made by Californian Governor Jerry Brown [*Showstack*, 2016]), calls to "protect the arteries of our planet" [*Bosshard*, 2015], and more extreme calls to "tear down" the dams [*Beard*, 2015]. The converging issues of growing populations [*Colby and Ortman*, 2015], evolving demands for food, energy, and water,

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aging dams, and reduced water storage capacity through decommissioning and sedimentation highlights the pressing need for a national water assessment and a subsequent national water plan. Past national assessments of water are somewhat limited in scope and have in general focused on environmental impacts at the expense of considering economic impacts [e.g., *Caldwell et al.*, 2012] or omitted the consideration of water storage influences [e.g., *Hurd et al.*, 1999]. The consideration of economic impacts and water storage in these national assessments of water would have likely resulted in quite different conclusions. While such results have sometimes been used to highlight regional dependencies on stored or imported water [*Devineni et al.*, 2015], the consideration of stored water such as reservoirs, groundwater, or lakes, can change conclusions regarding water scarcity and economic risk [*Padowski and Jawitz*, 2012]. Although national assessments of water storage risks have been made [*Gleick*, 1990; *Lane et al.*, 1999; *Vogel et al.*, 1999], consideration of water demands, environmental impacts, water storage potential, and infrastructure risks are still needed to inform a holistic national water assessment and a subsequent national water plan. These are needed to identify dam service requirements, solutions for water storage [*Annandale*, 2013], potential for water reallocation [*Qureshi et al.*, 2009; *Kirby et al.*, 2014; *Marston and Cai*, 2016], and conservation in order to determine the role of dams in the United States into the future.

Debates over dams are typically based around ideology with limited scientific analysis, incomplete knowledge of the arguments for or against dam removal, or adequate policies to guide and govern dam removal [*Doyle et al.*, 2003; *The Heinz Center*, 2003; *Jørgensen and Renöfält*, 2013]. While ideology will always influence decisions, systematic evaluations of the value of a dammed versus a free flowing catchment are fundamental to providing the debate with scientifically sound reasoning. Evaluations of dam removal have typically emphasized environmental streamflow restoration [e.g., *Grantham and Viers*, 2014], structural age, and related failure risks [*International Rivers*, 2007; *Struck*, 2014] but also need to consider the likely socioeconomic and ecological responses within the context of climate risk. A thorough economic assessment should consider subsidies, regional benefits, passive-use benefits, and the ability of a regional economy to adjust to changes in water storage through changes in sectorial production [*Whitelaw and Macmullan*, 2002].

The decommissioning and removal of non-Federal dams for financial, environmental, and safety reasons is not uncommon [*Walton*, 2015]. A small number of large Federally owned or regulated dams, such as the Elwha Dam in the state of Washington, have recently been removed and plans exist for the proposed removal of four dams on the Klamath River in Oregon and California, and another four on the Lower Snake River. While the removal of small dams that no longer serve their purpose makes economic and common sense, the same conclusion cannot be applied automatically to larger dams in the West. In addition to the higher costs of removal, large dams in the West typically serve numerous functions (e.g., hydropower, water supply, irrigation, navigation, flood control) and alternatives for these services would need to be found.

4. Deciding the Future of Dams and Research for A Way Forward

As we noted earlier, dams have supported human civilizations since the very beginning, and now, at a time when climate challenges, global population, and demands on United States' resources are all increasing, we appear to be on the verge of having a national discussion regarding the need to dismantle dams [*Shuman*, 1995]. A decision matrix is introduced in Table 1 to help structure and direct thinking as to some of the factors that need to be systematically analyzed as we consider dam removal or rehabilitation. In all such decisions today, we need to consider expected impacts, costs, benefits, and adaptations over multiple decades. Over such a long period, our exposure to climate risk will change in significant and unpredictable ways. Furthermore, consideration needs to be given to potential changes in demand for water and flood protection. These include changes in demographics, preferences, and the mechanics, demands, and efficiencies of agriculture, energy production, and industry.

Sustainability, resilience, hydromorphology, social hydrology and system complexity have been popular concepts and have expanded thinking in the recent literature [*Sivapalan et al.*, 2012; *Lall*, 2014; *Montanari*, 2014; *Gober and Wheater*, 2015; *Vogel et al.*, 2015]. These concepts will help inform the future of dams on the United States landscape.

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Table 1. Options for Balancing Water Supplies and Demands

Impacts and Adaptations	Options for Aging/Inadequate Dams				
	Expand/ Retrofit[a]	Preserve/ Restore[b]	Replace	Replace With Smaller Dams	Remove
Costs					
Deconstruction			$$$[c]	$$$	$$$
Construction	$$	$$	$$$$	$$$	
Loss of services			Temporary loss of services	Temporary loss of services	Permanent loss of hydroelectricity/flood control/storage capacity and controlled releases (e.g., for water supply and irrigation)
				Loss of reservoir storage for controlled low flows	Loss of reservoir storage for controlled low flows
Change in environmental impacts/management	Changes in storage and/or release capacity			Spatially distributed environmental costs (e.g., increased surface areas and habitat for disease carriers)	Temporary impacts associated with release of water, sediment, and restoration of riverine environment and reservoir footprint
Benefits					
Change in environmental impacts/management				Spatially distributed environmental benefits (e.g., reduced barriers for fish migration)	Eventual restoration of riverine habitat
Reduced risk of catastrophic failure	✓✓[a]	✓	✓	✓	✓✓✓
Potential adaptations			Temporary conservation or increase in service imports	Temporary conservation or increase in service imports	Develop alternative energy (e.g., gas, distributed storage) or accept reduction in electricity supply
				Change in reservoir and catchment management—develop multisite reservoir management	Develop alternative flood protection (levees, rezone developments, relocate populations) or accept increase risk of property damage and loss of life
					Develop alternative water resources (groundwater, aquifer storage, desalination, reuse, rainwater harvesting) or adopt water conservation or accept drought risk and resultant loss of production (e.g., manufacturing, irrigation) or abandon the region

[a]Add to existing capacity through additional dam wall height or additional spillway capacity.
[b]Restore aged dam to original design strength and capacity.
[c]$ and ✓ symbols are intended to portray a relative cost or benefit amongst alternatives.

4.1. Research Agenda: Dams and Climate in the 21st Century

Suggestions regarding the future of dams in the United States have been proposed by various institutes [e.g., *Aspen Institute*, 2002; *The Heinz Center*, 2003]. However, a search on Google Scholar reinforces the extreme paucity of critical research on water infrastructure planning and development in the United States,

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especially on the need for dams or an assessment of their potential risk of failure, in the context of climate change adaptation, hydroclimatic risk mitigation, aging infrastructure, and modification of river basin water flows and water quality. These deficiencies in research point to the need for a holistic water assessment. From this assessment, a strategic approach to rivers, dams, and water use across the country could be assembled that considers local and regional jurisdictions, priorities, and perspectives.

As a conclusion to this paper, we sketch some areas that could form the core of a basic and applied research program focusing on two key components of dam failure risks and water storage solutions in the United States.

4.1.1. Dam Failure Risk Assessment

1. *Hydroclimatic considerations*: Many existing dams were designed using relatively short instrumental records. The use of longer accurate instrumental records, paleoclimate records, and future climate modeling is needed. Projections of regional climate aspects relevant to river and dam management and risk assessments will require adequately constrained projections of climate change that reflect observations of both long-term variability (i.e., paleoclimate records) and recent hydrological change. Research is needed for developing suitable methods of assessing dam risks with respect to climate in conjunction with dynamic risks associated with sedimentation and subsequent changes in flood control capacity.

   An understanding of interannual to decadal-scale hydrological variability is needed to inform multiannual predictions of regions that may be transitioning to a riskier regime (either prolonged drought or increased flood risk). The degree to which protracted dry and wet spells influence pore pressures, water table levels, and subsequently impact on the structural safety of dams requires investigation.

   Research on shorter timescales is also needed—both individual and sequential severe storms are a significant risk to interconnected reservoir systems. An approach to modeling extreme hydrologic events that utilizes the complete range of available data from radar rainfall fields as well as hydrometeorological models could be developed. Quantifying how the risk associated with such storms changes over space and time in response to changing climatic conditions can improve risk characterization, conjunctive reservoir management, and flood insurance pricing.
2. *Failure impact dynamics*: Given that an extreme regional rainfall event could be a trigger for dam failure, research is needed to develop assessments of potential impacts from flooding that may result with and without dam failure. These include quantifying the potential of cascading failures of multiple dams and subsequent impacts on critical infrastructure elements including power plants, bridges and highways, and water and wastewater treatment plants. Such an approach could inform the probability of property and life losses, health impacts, and interruptions to business and services. An understanding of these impacts would enable elements critical to the physical and socioeconomic recovery of the region to be informed.
3. *Risk-based portfolio management*: A strategy for prioritizing dam safety requirements in the United States needs to be developed given the large portfolio of dams with mixed ownership and responsibilities (Federal dams with risk-informed portfolio management strategies versus variable state plans for state, public, local, or private dams) and the general public exposure to dam failure risk. This prioritizing strategy should be developed to inform the financing and cost allocation of dam monitoring, downstream warning programs (field sensors, remote sensing), emergency management and response planning, risk reduction activities, insurance or other financial interventions, and, if appropriate, the potential for dam removal. This strategy would need to be informed by accurate hydroclimatic factors and assessments of failure impact dynamics articulated in the previous two points.

4.1.2. Strategies for Managing Climate-Induced Flood and Drought Risk in the 21st Century

1. *A water storage portfolio for the nation*: Dams with reservoirs holding multiyear or seasonal storage in addition to groundwater from shallow or deep aquifers are critical reserves of water in the United States and their use varies regionally. Changes in deep groundwater systems, driven by withdrawals, rapidly responds to wet and dry periods on interannual to decadal timescales [*Russo and Lall*, 2017], while agricultural and municipal water demands appear to drive groundwater use in many systems [*Ho et al.*, 2016b]. Addressing persistent and recurrent climate anomalies would certainly be easier if both surface and groundwater storage options were considered. Conjunctive surface and groundwater use, including consideration of reservoir development, has been studied in academia for at least 40 years [*Burt*, 1964; *Yu and Haimes*, 1974; *Lall*, 1995; *Pulido-Velazquez et al.*, 2016]. However, in almost all of the United States, there is no regulatory structure or physical infrastructure in place to easily optimize conjunctive surface and groundwater management [*National Research Council*, 1997]. The implementation of regulatory

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structures that do exist are relatively new [e.g., *California Department of Water Resources*, 2015]. Rapid groundwater resource development combined with ill-suited groundwater policies has meant that conjunctive use management is often implemented retrospectively [*Schlager*, 2006]. Metering of surface and ground water use is critical to understanding how water storages are used and are needed to permit the market based trading of these resources. In order to understand and optimize water use from both surface and groundwater storages information is also required on who could potentially use these resources, the current condition of aquifers and surface storage infrastructure, and the associated economics of cost allocation and regulation of water use across these users. This would inform a strategy to assess which dams can be removed and where new dams or other mechanisms to deal with imbalances in water supply and demand may be needed from a regional and a national perspective. In addition, suitable policies would need to be developed in parallel to facilitate such a transition to ensure that ecological objectives are met and that the potential for extreme volatility in spot market prices under climate exigencies are regulated.

2. *Exploring climate scenarios*: An appropriate set of climate scenarios is required (e.g., ranging from single large runoff events to seasonal and multiyear streamflow anomalies) to explore portfolios of surface and groundwater storage relative considering water use requirements (e.g., urban, industrial, energy, minerals production, and food) under flood and drought scenarios. The climate scenarios should include information from both paleoclimate reconstructions and climate change projections. A national-scale reconstruction of drought over the past 2000 years could be utilized [*Cook et al.*, 1994, 2010] in addition to a recently developed 500 year-long national reconstruction of paleoclimate streamflow [*Ho et al.*, 2016a]. There is an indication that extreme rainfall could also be reconstructed using similar proxies [*Steinschneider et al.*, 2016]. While there is much research on producing future climate change scenarios, in this specific case, research that considers both the spatial correlation of climate projections over river basins and the interannual to decadal variations in the context of hydrologic extremes is needed. No such national or even regional analysis of conjunctive water management considering this range of climate scenarios exists to date.
3. *Institutional coordination and operation of dams*: The ability to balance the competing demands of water use sectors was exemplified by *Kolesar and Serio* [2011] for the case of the Delaware River Basin Commission through the modification of water releases. The management of multiple dams within the same river system requires integrated management of both storage and release patterns often involving different countries, agencies, and private entities (e.g., Colorado, Rio Grande, Columbia, and Snake River Basins) with different operation objectives and varying design capacities. Developing suitable institutional and legal reforms to help manage these basin-scale activities are critical to developing solutions that respect physical hydrology. Dynamic frameworks updated under different climates for storage assessment, capacity expansions, and interbasin water transfers and rights need to be codesigned with real-world stakeholders in a mutual learning mode.
4. *Role of conservation and smart management*: The amount of required water storage reflects the cumulative imbalance between supply and demand. It is therefore critical to examine water use to identify opportunities for improvement. As a result, the reliability and marginal cost of reducing demand can be compared with the marginal cost of improved storage and hence supply during critical periods. There needs to be continued research in water conservation, the economics of water use, valuation of ecosystem services, and the value of flood risk mitigation using nonstructural measures. Such economic assessments at regional and national scales are currently limited by systematic data collection and analyses at these larger scales. Research is needed on improving these aspects to help provide insights into a water risk mitigation strategy that considers both structural and nonstructural measures. Innovative smart water management that balances multitime-scale forecasts of reservoir inflows with flood reduction goals and demand for different water uses, including ecosystem uses, requires coordination as well as management of the associated residual risks. In addition to the development of technical innovations, social and financial factors associated with such innovations need to be understood.
5. *Role of financial instruments and markets*: Given the need for significant financial outlays for removing, restoring, or replacing dams, research is needed to understand the potential role of public and private partnerships for financing and operating large water infrastructure. Appropriate regulatory, cost recovery, and cost allocation mechanisms need to be considered and integrated in a financially sound manner. As one considers such a trajectory, emerging questions include how the role of public and private

marketing mechanisms and financial instruments could be used to address the residual risks of dam failure. These mechanisms and instruments could include option contracts, forward contracts, and insurance of operation rules and contracts [e.g., *Brown and Carriquiry*, 2007; *Khalil et al.*, 2007; *Sankarasubramanian et al.*, 2009; *Zeff and Characklis*, 2013], reduction in subsidies for federal flood insurance to improve awareness of true flood risks, and catastrophe bonds amongst others. Research is needed to understand the utility of such mechanisms, who could participate in them, and how they would affect water management and risks for specific societal groups and the nation as a whole.

6. *Legal, social and institutional factors*: Existing water laws are not unchangeable and these laws and management regimes should be evaluated and, where appropriate, modified to reflect current and future conditions. The governmental and institutional constraints on the development of water policy and the role of the states and local communities in facilitating effective water governance [*Kirchhoff and Dilling*, 2016] need to be studied. There is a need to thoroughly explore water management strategies and reforms that have or have not been successful in other countries and couple these with economic policies [*Young*, 2014] to appropriately evaluate and reform water management, including the use of dams, in the United States. Decisions regarding the future of dams and water management, potential implementation of forecast-based management and financial risk management systems, and changes in the role of the private sector and water costs are imminent and will be disruptive and controversial. Understanding the social dynamics and the mechanisms that may lead to conflict resolution and cooperation across different affected actors is needed as part of the process that determines the sociopolitical acceptability, and hence the viability, of any plans related to dams and water management.

We suggest that the water resource community can take this on as a very practical challenge that is universal in its scope. Using the United States as a case study, the water resource community may foster directed research efforts on understanding and guiding our future. It is time to move beyond statements as to the putative impacts of climate change and the need for adaptation strategies to address a timely set of questions. This can lead to a research agenda that is central to the academic and professional water community, and clearly has a bearing on the water-energy-food nexus as well as aging water supply infrastructure into the future.

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Resolution on Reservoir Sustainability, Presented by the Subcommittee on Sedimentation, a Sub-group of the Advisory Committee on Water Information

Continued sedimentation threatens the project benefits for many of the Nation's reservoirs. The SOS encourages all Federal agencies to develop long-term reservoir sediment-management plans for the reservoirs that they own or manage by 2030. These management plans should include either the implementation of sustainable sediment-management practices or eventual retirement of the reservoir. Sustainable reservoir sediment-management practices are practices that enable continued reservoir function by reducing reservoir sedimentation and/or removing sediments through mechanisms that are functionally, environmentally, and economically feasible. The costs for implementing either sustainable sediment management practices or retirement plans are likely to be substantial, and sustainable methods to pay for these activities should also be identified.

Federal agencies are encouraged to start developing sustainable reservoir sediment-management plans now for one or two reservoirs per year on a pilot basis. From this experience, interagency technical guidelines will be developed for preparing sustainable reservoir-sedimentation plans.

This resolution was presented to the Advisory Committee on Water Information (ACWI) at their annual meeting, August 19-20, 2014. Subsequently the Subcommittee on Sedimentation made some revisions (which are reflected in the text above), and ACWI voted on this resolution via email and approved it with 22 "yes" votes and 4 abstentions.

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