[H.A.S.C. No. 116–89]

ADDRESSING THE LEGACY OF DEPARTMENT OF DEFENSE USE OF PFAS: PROTECTING OUR COMMUNITIES AND IMPLEMENTING REFORM

HEARING

BEFORE THE

SUBCOMMITTEE ON READINESS

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

HEARING HELD
SEPTEMBER 15, 2020

U.S. GOVERNMENT PUBLISHING OFFICE
47–046 WASHINGTON : 2022

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ADDRESSING THE LEGACY OF DEPARTMENT OF DEFENSE USE OF PFAS: PROTECTING OUR COMMUNITIES AND IMPLEMENTING REFORM

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON READINESS,
Washington, DC, Tuesday, September 15, 2020.

The subcommittee met, pursuant to call, at 1:05 p.m., in Room 2118, Rayburn House Office Building, Hon. John Garamendi (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. JOHN GARAMENDI, A REPRESENTATIVE FROM CALIFORNIA, CHAIRMAN, SUBCOMMITTEE ON READINESS

Mr. GARAMENDI. Okay, ladies and gentlemen, I call this committee of the Readiness Subcommittee to order. I have to do the boilerplate so stand by. I will do it as quickly as I possibly can.

I would like to welcome the members who are joining today's markup remotely. Those members are reminded that they must be visible onscreen within the software platform for the purposes of identifying verification when joining the proceeding, establishing and maintaining quorum, participating in the proceeding, and voting.

Members participating remotely must continue to use the software platform video function while attending the proceedings unless they experience connectivity issues or other technical problems that render the member unable to fully participate on camera. That does not mean hit the mute button or the do not—or the video button. Keep it on. If a member who is participating remotely experiences technical difficulties, please contact the committee staff for assistance and you have a reasonable chance of getting help and reconnected. When recognized, video of remotely attending members participation will be broadcast in the room via the television internet feeds.

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keep the software platform's video function on for the entirety of the time they attend the proceedings.

That is the third time I have said that. These members may leave and rejoin the proceeding. If members depart for a short period for reasons other than joining a different proceeding, they should leave the video function on so that we can see the room in which you are sitting or were sitting. If members will be absent for a significant period or depart to join a different proceeding, they should exit the software platform entirely and then rejoin it if they return.

Members are also advised that I have designated a committee staff to, if necessary, mute unrecognized members' microphones to cancel any inadvertent background noise that may disrupt the proceeding, or if you intend to disrupt the proceeding, we will mute you. Members may use the software platform's chat feature to communicate with staff members regarding technical or logistical support issues only. Finally, remotely participating members should see a 5-minute countdown clock on the software platform's display but, if necessary, I will remind the members that their time is up.

Doug, did I complete my work?

Thank you, Doug.

Now, following this meeting and before the next meeting, we will ask all of the members participating in the hearing to repeat verbatim what I have written because you have heard it enough times to have memorized it.

Okay, deep breath and move on to the real hearing.

With these administrative remarks out of the way, I move on to the substance of the hearing.

The scourge of contamination from PFAS [per- and polyfluoroalkyl substances] and PFOA [perfluorooctanoic acid] and other perfluorinated compounds is being experienced by communities across the country and, indeed, around the world. Our constituents are worried. They are afraid that they are being poisoned by their drinking water or that PFAS is going to contaminate their livestock or produce and impact their ability to earn a living and support their families.

This is not a partisan issue. Communities in my district surrounding Travis and Beale Air Force Base are dealing with DOD [Department of Defense]-originated PFAS contamination and the fear and anxiety of going with not knowing what that means for their health or how long they will have to wait for polluters—in this case, the military—to clean up the contamination.

I know that many members of this committee on both sides of the aisle represent communities with similar concerns. While the task of addressing PFAS contamination must eventually fall on all polluters, this committee's mandate is to ensure that the Department of Defense is acting to address its legacy of contamination. The Department must keep faith with communities that host its installations and that are now being asked to shoulder this contamination burden.

With this history in mind, we have required DOD to phase out AFFF [aqueous film forming foam] by 2024. This is the firefighting foam. We are not blind to the enormity of this task, but with the focus provided by a looming deadline we are confident that with

the Department's resources they can find a solution that protects both our communities and the aircrews and shipmates who rely upon the protection currently provided by AFFF.

We are confident this year's NDAA [National Defense Authorization Act] also aims to increase the transparency by requiring the Department of Defense to publish on a public website the results of drinking water and groundwater testing conducted on military installations or former defense sites and to notify the congressional defense committees when there has been an uncontrolled release of PFAS-containing firefighting agents. We also established a prize program to incentivize research into viable replacement agents and authorized additional funding for cleanup and research into PFAS disposal technologies.

Now I look forward to this hearing from the witnesses about the Department's ongoing efforts to develop solutions to the myriad of problems presented by these forever chemicals and how the Department is implementing the requirements of the fiscal year 2020 NDAA to address the Department's PFAS legacy impacts on human health and the environment.

With that, Mr. Lamborn, I believe you are remote, so, Doug, it is your turn. Welcome, and thank you for joining us remotely.

[The prepared statement of Mr. Garamendi can be found in the Appendix on page 29.]

Mr. GARAMENDI. Well, Doug, you are not with us.

Mr. BROOKS. Yo, over here.

Mr. GARAMENDI. Mr. Brooks, I understand you are the stand-in.

Mr. BROOKS. I am the stand-in.

Mr. GARAMENDI. So it is all yours.

Mr. BROOKS. Thank you, Chairman Garamendi. My remarks will be very brief. Ranking Member Lamborn and many of our GOP [Republican Party] members are at a signing ceremony for the Abraham Accords at the White House and should be joining us shortly.

I thank our witnesses for their testimony. You, not me, are who we want to hear from today. So with that I conclude my remarks with, let's get to it. Thank you, Mr. Chairman. I yield back.

Mr. GARAMENDI. Without objection, the remarks of Mr. Lamborn or other members that are not with us at the moment will be entered into the record. So ordered.

Let me introduce our witnesses.

First, Maureen Sullivan, Deputy Assistant Secretary of Defense for Environment. You have a fascinating record, some 40 years of participation in environmental issues at the Department. You and I were having a conversation earlier. I think we may have worked together in the late 1990s in the run-up to the Kyoto Climate Conference.

Also joining us is Dr. Herb Nelson, Director of Strategic Environmental Research and Development Program and Environmental Security Technology Certification Program.

I understand that Dr. Rauch will not be able to join us. The edict coming from the White House is that all witnesses must testify in person and Dr. Rauch has a health problem which prevents him from venturing out into such contaminated places as the House of Representatives hearing room and will not be joining us.

I want to make it very, very clear that this committee leadership believes that that requirement from the White House is incorrect. It denies the Congress the opportunity to obtain valuable information. Dr. Rauch has a specific task as the Assistant Secretary of Health Readiness Policy and Oversight. We will not be able to have his testimony today. And, however, we do have his written testimony and, without objection, that will be entered into the congressional record.

Hearing no objection, so ordered.

[The prepared statement of Dr. Rauch can be found in the Appendix on page 47.]

Mr. GARAMENDI. So let us move on. One more thing before I move on to the testimony of Ms. Sullivan, I want to say happy birthday to Dr. Nelson. It is your birthday today. Thank you for coming across the river and joining us, Doctor. I will await your testimony.

Ms. Sullivan, you go first.

STATEMENT OF MAUREEN SULLIVAN, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR ENVIRONMENT

Ms. SULLIVAN. Chairman Garamendi, Ranking Member Lamborn, Mr. Brooks, sir, and distinguished members of the subcommittee, I am Maureen Sullivan, the Deputy Assistant Secretary of Defense for Environment. My portfolio includes policy and oversight of DOD's programs to comply with environmental laws such as the Safe Drinking Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act, CERCLA.

I want to thank this subcommittee for the opportunity to discuss per- and polyfluoroalkyl substances. We believe DOD has been leading the way to address these substances. Over the last 4 years, DOD has committed substantial resources and taken action to respond to concerns with PFAS. In July 2019, as one of his first actions, Secretary Esper stood up a task force to provide strategic leadership and direction to ensure a coordinated, aggressive, holistic approach on DOD-wide efforts to proactively address PFAS.

CERCLA provides a consistent approach across the Nation for cleanup. DOD, like other Federal agencies, is specifically authorized under CERCLA section 104 to take actions to address pollutants or contaminants like PFAS regardless of a CERCLA hazardous substance designation. DOD's priority is to quickly address PFAS and PFOA in drinking water above EPA's [Environmental Protection Agency's] lifetime health advisory where DOD is a known source. DOD actions are consistent with EPA recommendations. DOD prioritizes sites for action using the longstanding CERCLA risk-based process "worst first."

These known or suspected PFAS release areas are in various stages of assessment, investigation, and cleanup. To prevent further releases to the environment, DOD limits the use of aqueous film forming foam, AFFF, to responses to emergency events and no longer uses it for land-based testing and training.

The Department treats each release of AFFF as a spill response. Currently available AFFF meets the military specification, contains PFOS [perfluorooctanesulfonic acid] but does not contain PFOS or PFOA above the 800 parts per billion limit of quantitation. None

of the commercially available PFAS-free foams meet DOD's strict safety standards. The Department is working aggressively to meet the requirements of the fiscal year 2020 NDAA related to AFFF; however, this is a formidable task. There are many circumstances where we use AFFF, so we have been identifying those situations and evaluating what needs to be done. We have an inventory of facilities with installed AFFF systems. Our fire protection engineers are documenting the viable options and criteria per facility type, determining the best approaches in developing funding requirements and implementation schedules. The Department has identified over 200 airports—Active, Reserve, and National Guard—that are joint use airports.

These airports have a mixture of emergency response services with almost all currently using AFFF. We are partnering with the Federal Aviation Administration to ensure that these airports, ours and the commercial airports, maintain the current level of protection for passengers, crews, and equipment.

It is important to note that mutual aid is a cornerstone of fire and emergency services. Providing mutual aid can involve the use of AFFF. These emergencies range beyond aircraft crashes to include overturned vehicles, large industrial fires, or large structural fires. We need to maintain these levels of firefighting support and understand the feasibility of using alternative foams in the future.

In summary, DOD is taking actions to reduce the risks of PFAS. Our efforts reinforce DOD's commitment to meeting critical mission requirements while protecting human health and the environment. DOD recognizes that this is a national challenge involving a wide array of industries, commercial applications, as well as many Federal and State agencies. Therefore, it needs a nationwide solution.

We look forward to working with you as you move forward. Thank you.

[The prepared statement of Ms. Sullivan can be found in the Appendix on page 31.]

Mr. GARAMENDI. Thank you very much for your testimony. Your written testimony provides a lot more detail and I will bring that to the attention of the committee members and the general public.

I will repeat that. Thank you for your testimony. It is very complete. Your written testimony provides even more detail and I would advise members of the public who are interested to look at your written testimony. There will be questions, of course.

Dr. Nelson.

STATEMENT OF HERBERT H. NELSON, DIRECTOR, STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM AND ENVIRONMENTAL SECURITY TECHNOLOGY CERTIFICATION PROGRAM, DEPARTMENT OF DEFENSE

Dr. NELSON. Chairman Garamendi, Mr. Brooks, and distinguished members of the subcommittee, so as the chairman said, my name is Herb Nelson. I am the director of DOD's Strategic Environmental Research and Development Program which often is called SERDP and that is executed in partnership with the Department of Energy and the EPA, and also the director of the Environmental Security Technology Certification Program which is often

called ESTCP because there is no real good way to say that acronym.

So these are DOD's environmental research, development, and demonstration programs and our mission is to improve DOD's environmental performance, reduce cost, and enhance and sustain mission capabilities. I would like to thank Congress for the many years of very generous support for these programs and I would like to thank this subcommittee for the opportunity to discuss the PFAS and AFFF problem that we are going to talk about today.

SERDP and ESTCP are leading DOD's R&D [research and development] response to these issues and we do that through funding individual research projects that are led by academics, people in industry, people at DOD laboratories and other Federal agencies. These projects range from small-scale laboratory studies up to large-scale, almost pilot-scale demonstrations at DOD facilities, so we span the gamut from basic research through almost operational scale.

SERDP initiated research into the fate, transporting, and remediation of PFOS and PFOA shortly after the EPA released its provisional health advisory in 2009. It became clear pretty early on in this that this was a much more complex problem than many of the contaminants that we have dealt with in the past, so our research program has expanded into, really, four areas covering all of the scope of PFAS. That is sampling and analysis, fate, transport, and characterization of the compounds themselves, ecotoxicity of these compounds, and remediation, of course; the goal at the end, of course, is remediation.

Similarly, in the AFFF area, we have a four-prong line of approach to that also. We are looking to develop new PFAS reformulations. We are looking to demonstrate the performance of both commercially available and developmental formulations in large-scale tests where we can really document the performance of PFAS-free materials. We are also looking at the ecotoxicity of these potential replacement compounds.

And, finally, one that maybe is a less well thought of, we are looking at strategies for cleaning out the firefighting hardware. If we change over to a PFAS-free material, we obviously have to get it cleaned up in the hardware so we don't have to bear the price of replacing all the hardware. All of these efforts that we are working on are coordinated closely with our colleagues in the military departments, the EPA, FAA [Federal Aviation Administration], NASA [National Aeronautics and Space Administration], and also a number of international partners, and we do this through twice-yearly program reviews for each of these projects and periodic workshops where we all get together and talk about the issues.

So in summary, I think we have established a wide-ranging research and development program. We are confident that SERDP supported research and development will make a significant contribution to the solutions of this problem that is a national problem. Thank you.

[The prepared statement of Dr. Nelson can be found in the Appendix on page 38.]

Mr. GARAMENDI. I thank you very much, Doctor.

Normally, questions would go to—for my opportunity first, followed by Mr. Lamborn. I don't know if, Mr. Brooks, do you want to take up questions or do you want to await Mr. Lamborn's arrival?

Mr. BROOKS. I am happy to go ahead and get my questions in.

Mr. GARAMENDI. Why don't you do that.

Mr. BROOKS. With the chair's permission.

Mr. GARAMENDI. Before you do that, I am going to yield my questions to Ms. Slotkin and she can take my time. And when her time eventually arrives, I will take my turn then.

Ms. Slotkin.

Ms. SLOTKIN. Thank you, Mr. Chairman.

Thank you to our witnesses for being here. You know from our previous meetings that there is a lot of us who care a lot about this issue and I know that puts you in a tough spot because you are trying to navigate between the Department of Defense where I used to work and the communities who are really dealing with this problem.

I represent a community that has a number of PFOS contamination sites. People can't eat the fish from the rivers. They can't let their dogs or their children touch the foam that is coming up on their beachfront property. And they are concerned about their drinking water. So it is something that is pretty serious for our community. And in our last NDAA, we were able to pass six provisions on PFAS that the chairman went through.

The question I have is on an issue we have discussed, Ms. Sullivan, about adhering to the strictest possible standard when it comes to cleanup, State versus Federal. And in our State, we just promulgated a new, more stringent standard which is quite different from the EPA standards. And I know when we talked when you were generous enough to come to my office about your concerns about that provision, but could you elaborate for the communities that are living—why can't the Department of Defense clean up PFAS up to the most stringent standards, given the health implications?

Ms. SULLIVAN. Well, let me clarify, ma'am.

Ms. SLOTKIN. Of course.

Ms. SULLIVAN. So as part of the CERCLA process, the State standards do come in as part of the cleanup decision.

Ms. SLOTKIN. Right.

Ms. SULLIVAN. So when we get to the remedy selection, the State standards play an integral role in that remedy selection. So, ultimately—it is called an ARARs, applicable and relevant and—I always get this wrong—applicable and relevant, required, appropriate standards—so the State standard, the Michigan standard, will come in, actually, in the remedy selection when we get to that phase of the process. Absolutely.

Ms. SLOTKIN. Yeah. I understand that. But factoring it in and having to live by it are very different things. And in our experience of sort of these painstaking and somewhat painful negotiations on some of—around some of our retired military bases in Michigan, you may have considered that standard but not used it in the end. And we haven't seen any movement by the Department of Defense to do anything other than the EPA standard.

So I guess my question is, wouldn't it just be easy enough to replace the EPA's Federal standard with the State standard given that we are talking about people's health here? What is to prohibit us from doing that?

Ms. SULLIVAN. So let me distinguish two things.

Ms. SLOTKIN. Yes.

Ms. SULLIVAN. So one is the actual remedy, the cleanup, the long-term decision. We are not at that point in those sites in Michigan.

Ms. SLOTKIN. Yeah.

Ms. SULLIVAN. And that is where it will come in. Where you are talking about is a decision point earlier in the process which is called a removal action. The way the current CERCLA process works, it is unclear, legally, how those standards come in. So I am trying to work through this with our general counsel to get a clarity in terms of that. But right now, the State standards come in at the remedy selection, the long-term solution. I need clarity from our attorneys on the issue of how it plays in, in a removal action which happens before, early, much earlier in the process.

Ms. SLOTKIN. Yeah. And I do understand removal versus remediation.

Ms. SULLIVAN. Right.

Ms. SLOTKIN. And again, we are not—I understand the complications that this would cause the Defense Department to have to live by these different State standards, but we are only doing it out of sheer desperation because the EPA won't do their job and set a clearer standard that is based on science.

So based on science, sir, if I can turn to you—and happy birthday, by the way—Michigan State University, which I represent, is one of the few PFAS research institutes in the country. Can you talk to us about what is needed on remediation? We know it is difficult. We know there is not a lot of answers. What would kickstart the investigation and support of remediation methods?

Dr. NELSON. Well, I actually don't know that it needs a kickstart. I think we are starting to move some remediation methods out of SERDP which would be the R&D, the laboratory scale and maybe a small, little plot in the backyard, out to installations. So we had a few successes. What is not so far successful is bioremediation. That is used a lot in other contaminants where there is some, you find some microbes that will help you break down the compounds.

Since the carbon-fluorine bonds in PFASs are very, very strong, it is really difficult to find candidates for bioremediation. So I guess I just answered the question without answering the question. If we could find some more, make some more progress in bioremediation I think this whole thing would go faster.

Ms. SLOTKIN. Thank you.

And I know my time has expired. Thank you, Chairman, for yielding your time.

Mr. GARAMENDI. I thank you very much, Ms. Slotkin.

Mr. Brooks.

Mr. BROOKS. I had turned it off rather than on.

Just for the benefit of everyone who is watching, PFAS refers to per- and polyfluorinated alkyl substances and it is called PFAS, for short.

This question is for Dr. Nelson. In your written testimony you state "none of the commercially available PFAS-free foams meet the Department of Defense's strict safety standards to rapidly extinguish dangerous fuel fires and prevent their reignition during rescue operations."

Are you confident the Department of Defense will be able to not only identify an effective PFAS-free foam, but also by 2024 install PFAS-free foams on all Department of Defense installations that use aqueous film forming foam?

A lot of tongue twisters.

Dr. NELSON. Absolutely. So that is why people say AFFF instead of trying to say that whole—I don't know if confident is the right word, but quite optimistic. We are making good progress in the research program on identifying substances that can meet the extinguishment requirement. All the PFAS-free foams meet the reignition standard, so it is get the fire out and then keep it out while the rescue people go in or something like that.

So they all meet the reignition standard. They don't yet meet the 30 seconds for a 28 square-foot gasoline fire. That is the qualification test for the military specification. Many of the PFAS-free foams can do it in 40 or 45 seconds. So we are making progress. We are not there yet.

Mr. BROOKS. Ms. Sullivan, this is for you. Our forces operate on several joint use airports across the Nation where they share firefighting responsibility with their civilian counterpart. How is that impacting the PFAS replacement effort and can you give us some insight into the Department's collaboration with the Federal Aviation Administration or other Federal agencies to address PFAS use in these cases?

Ms. SULLIVAN. Thank you, sir. It is actually quite a complicated situation because we have basically four types of joint use airports where DOD provides all of the support, DOD provides partial support, provides minimal support, or none. Where we provide partial or minimal, we have to ensure whatever foam that we are in fact using is compatible with the foam that the commercial airport is providing so that the foams can interact properly and don't discount each other. So we are working very closely with FAA on demonstration, validation, sharing test results to be able to make sure that the foams are in fact compatible. The other thing is we really need to be careful in terms of not going down a sole-source type of airport foam. We need to have multiple types of foams so we have multiple sources and ensure how they can all interact together while in fact continuing to support at the level of protection that the airports need.

Mr. BROOKS. This question is for either one of you concerning PFAS alternatives that are now being looked at, researched and developed. Has there been any environmental testing done of these alternatives to determine their level of risk compared to PFAS?

Dr. NELSON. So we have just started that. Normally, of course, we would develop something that worked and then we do environmental testing. Since we have the short deadline, we are having to do everything in parallel, so we have six projects started this fiscal year looking at the environmental impacts of these alternatives.

So some of that effort is going to end up being wasted because we are having to test things that haven't quite proven themselves out yet in the firefighting, but that is what we have got to do to get this to go on. So I think that we are adequately covering that issue.

Ms. SULLIVAN. So if I could add to that, we are also in addition to the work that Dr. Nelson's group is doing, we are partnering with the National Toxics Program to look at the human health aspects of these alternatives. That studying takes a lot of time so we need to be patient and work with them. That is part of NIH so, because that is their mission to look at human health.

Mr. BROOKS. Are there any early indicators as to whether these PFAS alternatives are going to be environmentally safer or more hazardous if used?

Dr. NELSON. I think it is too early to answer that question. We are just getting started. Normally, on this day I could give you some early indicators, but as like everyone else on this Earth, they have really taken a delay because of the COVID [coronavirus] situation. Many of the people are out of their laboratories, so maybe they are 6 months further behind than we would expect them to be.

Mr. BROOKS. Thank you, Mr. Chairman. I yield back.

Mr. GARAMENDI. I thank you, Mr. Brooks. A very good line of questions along the way.

I will simply add one thing to your question about the 2024 deadline. I suspect there may be one or two of us in this room that did all of its work before the final exam, or did we wait until the final exam deadline? The deadlines are necessary for that purpose. A lot of work, obviously, needs to be done.

Our next—let me run down the gavel order here—Horn, Stefanik, Houlahan, Slotkin, back to Slotkin again.

Ms. Horn.

Ms. HORN. Thank you, Mr. Chairman, and thank you to our witnesses. I want to ask about our assessment and understanding of contamination. Specifically, in my district and home State, Tinker Air Force Base, which is right at the edge of my district and is incredibly important, we have seen five sites in Oklahoma City that have been identified to have PFAS in drinking water or groundwater and three of these sites were military related. And with seven bases across our State, five have had identified areas of contamination.

And this question is for both of you. So what I am trying to understand is that in the 2017 report, Secretary Sullivan, the 2017 report showed that Tinker had 73 to 170,000 points above the EPS—excuse me—the EPA's health advisory. But then there is also the March 2020 task force that claims that no one on or off base is drinking water above the EPA's level of 70 parts per trillion.

So I know there is issues of cleanup and adjusting the foam, but what I am trying to understand is those two things seem to be contradictory to me that we have identified sources of contamination but then there is another report that says they are not. So how do we address this?

Ms. SULLIVAN. Thank you, ma'am. Good question and I appreciate the opportunity to clarify.

So let me distinguish groundwater versus drinking water. So what is really important is we may have identified the presence of these compounds, PFOS and PFOA, in the groundwater. That does not mean it is in the drinking water. Not all sources of groundwater are used as drinking water. There may be treatment processes in between the groundwater and the drinking water. So I want to make that distinction in terms of there may in fact be presence in the groundwater, but it is not in the drinking water.

These are two separate tests and I will point out that EPA only has an approved test method for drinking water. There is no approved test method for groundwater. We have identified 676 installations across the United States where we need to go and look. We are looking in every one of them. But I will say that we have been studying cleanup issues in groundwater around our bases for decades now, so we have a lot of information about the groundwater flows which enables us to actually identify where we suspect it is in the drinking water outside the base and move quickly to do the testing. And if the water is above EPA's lifetime health advisory, we have the authority to act right away and work with either the private landowner or the municipality to treat the drinking water.

So that is the distinction I would want to make. Where we know it is in the drinking water and we are in fact the DOD source, we are acting right away. The other sites we are following the standard CERCLA process to do the full investigations.

Ms. HORN. Thank you.

Dr. Nelson, do you have anything to add to that?

Dr. NELSON. No, ma'am. I think I have covered it pretty well.

Ms. HORN. Okay. A few, a couple more questions, actually. I want to change directions just a little bit and talk about our veterans and preparing the VA [Department of Veterans Affairs], because what we know is that there are—we know about the implications of PFOS and PFOA contamination for the health of our current and former service members, and as I mentioned seven military installations in Oklahoma and five have tested positive for PFOS. And then there was a 2012 report that estimated about 750,000 veterans and family members qualified for filing a claim related to incidents between 1953 and 1987.

So my question is what we need to be doing to prepare for health impacts now for our veterans.

Ms. SULLIVAN. Most of that, ma'am, I am going to have to refer to Dr. Rauch who is not here today. But I can tell you, one of the things I was very specific about in that we have done is we tested back in 2016, all of the drinking water that we provide on our bases as well as working where we buy water, and all that information I have made sure is archived in our safety and occupational health databases.

So we will have that data readily available for historic questions so people will know what the levels were now. We also just updated all our policies that are going to do another round of drinking water testing on all of our bases. Again, all that information will be readily archived and available for future use.

Ms. HORN. Thank you very much, and my time has expired so I yield back. Thank you, Mr. Chairman.

Mr. GARAMENDI. I thank you, Ms. Horn. I appreciate your work on this as well as your work on the housing issues. I enjoyed our visit to your district and where we went into both of these questions.

Ms. Stefanik.

Ms. STEFANIK. Thank you, Mr. Chairman.

Assistant Secretary Sullivan, in June of this year, the Department of Defense released the report titled "Remediation Plan for Cleanup of Water Impacted by PFOS and PFAS." Within the report are outlined steps for DOD to investigate and clean up contaminated sites. I represent Fort Drum and the 10th Mountain Division in Upstate New York which has been identified as having PFAS detections on the installation. Can you provide an update on the status of DOD's remediation plan for the Fort Drum community?

Ms. SULLIVAN. Sorry. Yes.

Ms. STEFANIK. Great.

Ms. SULLIVAN. Too many things at once.

Yes, the preliminary assessment site investigation is ongoing and actually it is supposed to be completed in the first quarter of 2021, so this coming fall. That collects all the information that they have, does some testing, and determines the levels of unacceptable risks that are in the community and what the path forward should be.

Right now, the Air Force is predicting that it will go to the next step which is a remedial investigation sometime in 2021, which is a much more in-depth look, a lot of engineering, water modeling data collection. So that is well on its way at Fort Drum.

Ms. STEFANIK. Thank you very much. I yield back.

Mr. GARAMENDI. Thank you, Ms. Stefanik.

Ms. Houlahan.

Ms. HOULAHAN. Thank you, Chairman, and thank you all for being here today. I think that some of my questions are probably better served for Mr. Rauch, Dr. Rauch, so I will start with what I can ask here today.

One of the questions that I have follows along Mr. Brooks' line of questioning. I am intrigued because it sounds as though in an effort to find substitutes for PFOS there is a concurrent, you know, accelerated program ongoing where we are finding them, studying them, investigating, you know, their hazardousness, and it sounds an awful lot like what we are doing in response to COVID in terms of our rapid fire, rapid, you know, response plan for COVID vaccine.

It sounds for me based on what you guys are talking about that this is a relatively unique approach to a very acute problem that we are having. Is this a new idea to be effectively doing a warp speed project on something like PFOS?

Dr. NELSON. So I would be loath to call it a new idea. It is not the normal way the Department does it. Normally, a much more staged approach to things. Obviously, in this case we don't have the time to do that so we are having to do things in parallel. Others have done this, of course.

Ms. HOULAHAN. Is there any, has there been any thought to sort of a postmortem of sorts when we get to the point where we have passed the deadline, so to speak, when the term paper is due, to

see if that accelerated approach has been more effective than not or more cost-effective than not?

Dr. NELSON. Actually, that is a great idea. Yeah. I think it will turn out to be there will be some inefficiencies. We are going to study some compounds that are not going to make the final cut, so that is just what is going to happen when we do this quickly. But did we get there quicker? Is it net a good thing? That is a very good idea.

Ms. HOULAHAN. And also maybe some of the compounds that don't make the cut maybe they make some other cut, they are useful for some other purpose.

Dr. NELSON. Absolutely. And on that line, ESTCP, the demonstration program, is clearly aimed right at the deadline because we have to have something ready to go. The SERDP program, which is the R&D program, will continue on this and there can be a generation 2 and a generation 3 and a generation 4 as we learn more things in the laboratory. So that won't stop when we get to the deadline.

Ms. HOULAHAN. Excellent. I think that maybe we should take a look at that together. I think it would be an interesting problem set to solve.

My next question is also for you, Dr. Nelson. And you mentioned in your introduction some of the cross departments that you are working with. One of the things that I was able to introduce in this NDAA, this year's NDAA, was the Interagency Research Coordination Strategy Act to make sure that we are coordinating efforts across the Federal Government in addition to the DOD, but with others.

So could you describe briefly what is going on to make sure that we are—the DOD's PFOS activities are integrated with other agencies and if there are any challenges that you have encountered coordinating those activities.

Dr. NELSON. I don't think we have encountered any challenges. My colleague, Andrea Leeson, who is the program manager for this particular area, convenes a periodic call with the people and all the other agencies that are supporting PFAS remediation. So we are talking about the remediation now. And they kick around what they are doing, what are the big problems that come up, and of course we invite them to all of our workshops.

The outputs of our workshops are generally a short-, medium-, and long-term research plan so everybody gets to be involved in that and we publish those on our website so that every agency can take a look at what we are going to do in the short, medium, and long term. So I think it is going on. It will be more formalized after this, you know, if the provisions in the NDAA pass that there will be maybe a more structured approach, but it is going on informally.

I think the same thing in AFFF. It is a pretty small community. There was this talk about communicating with FAA. One of our big investigators helped the FAA design their test facility at the Atlantic City Technical Center, so they are all really interconnected. FAA is just getting back to work from their COVID break. We have set up a call once a month with our two testing places at Tyndall Air Force Base and at the Naval Research Lab with the FAA Technical Center people so that everybody knows what they are doing,

what they are getting ready to do. So I think at a working level it is well-coordinated.

Ms. HOULAHAN. Okay. And I look forward to seeing when it is more formalized what——

Dr. NELSON. Absolutely. And then it will be a higher level and—yeah.

Ms. HOULAHAN. And with the last minute of my time, I believe my questions are, as I mentioned, for Dr. Rauch, but I will put them out there in case you guys have something to add to them.

I am looking to understand what sort of measures—and this piggybacks on what Representative Horn was talking about—that we are doing to make sure that our military members both existing and veterans are continuing to have good health, and I am specifically wanting to understand if there is any ongoing blood testing for military firefighters. Have you begun that testing? Will this testing include civilians as well as DOD firefighters?

Ms. SULLIVAN. It is Dr. Rauch's area, but I will answer. Yes, we will be starting in October to test all of the firefighters that work for DOD both military and civilian. We have got all the protocols in place, the labs all certified, the fact sheets for both the clinicians and the firefighters, and so we are doing the final dotting the i's and crossing the t's to get all the instructions out, but it will start October 1st.

Ms. HOULAHAN. Thank you. And I yield back.

Mr. GARAMENDI. Thank you, Ms. Houlahan.

I believe it is time for a Republican question. Mo, do you have another question, series of questions?

Mr. BROOKS. Yes, sir, Mr. Chairman, I have just been handed one. This question is for both Dr. Nelson and Ms. Sullivan, so whoever wants to take it on, please feel free.

My understanding is that incineration is the primary method used to dispose of PFAS materials during remediation and removal. Are you aware of any alternative methods that are mature enough and scalable enough to provide a viable alternative to incineration?

Dr. NELSON. Sorry. I didn't know that was going to end up being for me. So no, I am not aware of anything that meets the criteria you just outlined currently available. There are certainly things in the research program. The EPA though is conducting a study of all available destruction methods and are looking to provide some guidance by the end of the year, I believe. Don't maybe hold the EPA to my deadline, but shortly they are going to do that. So I think we in DOD will take guidance from this EPA study.

Ms. SULLIVAN. I am sorry.

Yes, Dr. Nelson is right. We are looking for EPA to issue their guidance which is due out by the end of this year in this area. But I will say that we have an ongoing need to dispose of streams coming from AFFF replacement, from the cleanup activities that we do have going on, from water treatment practices—that there is an ongoing stream of materials that has to be disposed of, just day-to-day operations that we need alternatives available to us.

Mr. BROOKS. Would the Department have any concerns if it was required to stockpile PFAS?

Ms. SULLIVAN. This would be a significant challenge for the Department. We do not have the space to store large amounts because

we are generating—we are in the process of changing out the legacy AFFF to the newer versions which is a safer, more environmentally, solution. And we would have to stockpile all of that material, take up valuable storage space, plus we have ongoing waste that is being generated associated with these remedial actions that we are taking, you know, soils, waters from dewatering at construction sites.

There are a lot of day-to-day waste streams that are being generated just to meet what we have today. We don't have the space on military installations to store all that material. It would require us to stop certain activities.

Mr. BROOKS. Dr. Nelson, do you have anything to add?

Dr. NELSON. No, sir. I think that covered it.

Mr. BROOKS. Mr. Chairman, I yield back.

Mr. GARAMENDI. Thank you, Mr. Brooks.

My understanding is our remaining Republican colleagues will be here in a few minutes and so we are going to keep this rolling along until they come because I know that they also have questions and we would like to have their questions on the record and the information available.

In the meantime, it is my turn for questions. First of all, I want to thank our colleagues and the witnesses for the questions and the answers that we have received thus far. There are just an overarching strategy that this committee is employing and has employed for the last 3 to 4 years, and that is we don't know the answers but we are going to get the answers. We don't know exactly what PFOS and PFOA does to the human body and to the ecosystem. We don't know exactly what the toxicity to the ecosystem is and, therefore, we are going to keep the pressure on until the answers are forthcoming.

We do know that there is contamination. We don't know what the appropriate maximum level of exposure is or the longevity in which that exposure would take place. However, we are going to do everything we can to find out those answers, which means keeping the pressure on the Department to search for the answers.

Within the Congress and the Senate, we have our own problem; there is a jurisdictional issue, and what this committee wanted to do we have not been able to do in the NDAA for jurisdictional issues with other committees. However, we will work our way through that problem, but I want to note that is a problem, one that has retarded much of what we would want to do in the NDAA. Nevertheless, we do expect to continue process.

So my first question goes to the overall intensity and way in which the Department is addressing the issue. Do you have the necessary authorities and money to carry out the tasks that have presently been assigned to you? I will start with Ms. Sullivan and then Dr. Nelson.

Ms. SULLIVAN. I would say the Department is really focused on this. We are putting all of the attention, you know, we have the task force that is chaired by the Assistant Secretary of Defense for Sustainment and includes the three assistant secretaries of the military departments. They meet every other week to go through all the things that are on the list that we have to address.

We have issued multiple policies and directions. We are collecting tremendous amount of data and setting the standards pretty high for our folks to address. They range everything from drinking water, to firefighter testing blood, to wastewater, to cleanup standards, to AFFF replacement. We are covering the whole gamut including what we are doing overseas. So I think there is a lot of attention being focused on this.

I will say, to me, the biggest challenge is going to be the resources that we need to do the AFFF replacement. To fully understand where we have—it is not just the air rescue firefighting vehicles that are on the flight line which we have a lot of, but it is all the facilities, all the hangars, all the fuel infrastructure, all of the hazardous storage facilities where we have AFFF systems installed, fully understanding the scope of that and what it is going to take to actually change out those systems.

In addition to the cleanup, we have to be able to grapple with that. That is a—the cost and the workload of that is an unknown that we really have to understand and fully be prepared to deal with.

Mr. GARAMENDI. Given that problem, in your research for a replacement are you taking into account and directing that research in a way that could utilize the existing infrastructure? Is that your priority or are you just searching the world and all the encyclopedias to figure it out?

Ms. SULLIVAN. So let me—there are multiple responses to that. We are looking at not just AFFF replacement for facilities, that there are other firefighting solutions that don't involve foam and so we have a pretty wide aperture of solution sets that we are looking at. But as Dr. Nelson mentioned, one of the big things is if we can clean the insides of the equipment, we won't have to replace it.

And so that is why we are doing that parallel investment in cleaning the equipment so it won't require us to replace large infrastructure with facilities or with the trucks, the inside, what I call the guts of the truck, in order to provide. So to try and get ahead of this problem so that when we do have a solution that comes forward that we can do a drop-in and minimize the disruption in the process.

Mr. GARAMENDI. Dr. Nelson, would you like to expand on those?

Dr. NELSON. I think Ms. Sullivan covered it pretty completely. Obviously, it is—the big unknown is how much we have to replace in equipment, and a lot of our work is trying to get some numbers next to that so we can write down on a piece of paper what it is going to actually cost to do this changeover.

As to this, you sort of brought up a drop-in replacement, you know, where you trying to find something to just go in the current equipment and, of course, that is the gold standard. If we could find something that we take out the old, wash it, put in the new, we are all in good shape. That may not happen.

But we are looking at and as part of our demonstration program we are really trying to expand the horizon of variables. What happens if you up the pressure a little bit in the tanks? What happens if you use a different nozzle? And then we will present all that to the fire protection people and then they will make their decision on

what they need, knowing what is the impact of higher temperature, higher pressure, bigger nozzles, whatever.

Mr. GARAMENDI. In the current legislation, the current NDAA, we are providing more money and a prize for some brilliant person or group out there that can figure this out. What do you make of that?

Dr. NELSON. I am quite hopeful of that. You may know that right now the EPA is running a prize for PFAS destruction. We are cosponsoring that with them. And the way I think of it is there are a lot of clever people in this country. We know a lot of them, but we don't know them all. So this is a way to get some people that we are not—that aren't familiar with our problems and that we are not familiar with their work, to get involved in this. So I think it is a good idea.

Mr. GARAMENDI. There is a series of questions that have already been asked. I want to go into them a little further, and that has to do with exposure, existing and past exposure that firefighters and others have had to the AFFF chemicals. We required last year that blood testing take place. What else is the Department doing to protect first responders from ongoing exposure?

Ms. SULLIVAN. Actually, sir, I am going to have to defer to Dr. Rauch's organization. They have occupational health and exposure. I don't have that in my portfolio any longer, sir.

Mr. GARAMENDI. We note that Dr. Rauch in his written testimony he speaks to this generally. Unfortunately, and I am going to go back and beat this drum one more time, I think it is extremely foolish for the administration to prohibit testimony in formal hearings from witnesses that cannot or should not appear in person. So we will have to ask a written question of Dr. Rauch about that issue.

Dr. Nelson, if you would like to expand on that you are welcome to do so.

Dr. NELSON. No, that is really outside of my area of expertise. It would not make much sense for me to discuss that.

Mr. GARAMENDI. I thought it might be, but one never knows what might be hidden somewhere in your brain.

Dr. NELSON. Well, good try, but different kind of doctor.

Mr. GARAMENDI. One of the purposes for the blood testing is to establish a foundation of data and information. That fits with another law that is in last year's NDAA and expanded this year, that the military keep records, personnel records and health records of every individual who is exposed to known chemical contaminants from the firepits in Iraq to PFOS going forward.

All right. So that probably fits in with—and I understand Mr. Lamborn is on his way.

I do have another set of questions. I mentioned that this committee has jurisdictional issues with other committees, at least two, Transportation and Infrastructure, specifically the FAA, and the Commerce Committee who has EPA. We have our own issues. I want to question both of you about the ongoing work within the administration, the coordination, you have spoken to coordination with EPA and FAA.

What I am interested in are problems. Stop signs or other kinds of problems that may exist as a result of authorities, that is the

laws and the regulations that exist. Your ability to work with them, is it in any way retarded by a lack of authority to allow for the coordination?

Ms. Sullivan.

Ms. SULLIVAN. I think right now we are closely coordinated with EPA. We are waiting on several things from them that they are required to provide, such as the disposal guidance document that they need to get out, which would help us tremendously in our disposal guidance that we are required to get out. I think the challenge is continuing to make sure that we all stay current on everything that is going on.

I think—we defer to EPA on a number of things and we look to them to be a source, where look to be a source on toxicity values, on guidance on discharge standards and things like that, test methods. Right now, the only approved EPA-approved test methodology is for drinking water. We don't have approved test methods that EPA has sanctioned for groundwater, for soil, for stormwater.

These present challenges to us while we move forward, and we continue to work with them to come up with—support them to come up with these standards so they can in fact help us as we proceed through our cleanup program.

Mr. GARAMENDI. Dr. Nelson.

Dr. NELSON. So I would echo that. I don't think we have much coordination issues. We fund some projects at the EPA working on these kinds of issues. All of our projects that I talked about earlier are selected and managed by what we call a technical committee, and since EPA is one of the partner agencies, EPA has representatives on these.

So they help us select projects. They help us put together our call for proposals, identify the issues, so I think we are quite well coordinated with them. We have sort of made the FAA people sort of an ad hoc member of those committees for the purposes of this problem, so at the technical level we work quite well with the FAA people also, so I don't see any barriers.

Mr. GARAMENDI. My questions, this particular set of questions is driving at the authorities that exist.

Ms. Sullivan, you mentioned four, three of them just a moment ago, having to do with drinking water of which there is a standard, and for contamination for which there is not a standard. This is less for the administration, but rather for us in Congress that we work amongst ourselves and the committees to close authority gaps, for example, where the EPA may not have the authority to do something that is necessary to deal with the AFFF or the PFOS/PFOA.

So that is what I am looking at is how—information we need to work with our committee, our other committees to carry it out. You spoke to EPA, Ms. Sullivan. How about the FAA?

Ms. SULLIVAN. Well, let me—can I touch EPA first?

Mr. GARAMENDI. I would simply say as a member of the T and I, the Transportation and Infrastructure Committee and the FAA, the subcommittee, there is a problem.

Ms. SULLIVAN. So FAA's deadline, their requirements are different than ours. They have a 2021 deadline and so that is a challenge. We are working very closely together because right now for

an airport to be certified—I have learned this so much I can't tell you—they have to have right now it requires them to use the MIL–SPEC [military specification] in order to meet the certification.

That requirement will go away come October 2021, so it won't be mandated. That leaves a free-for-all on types of what foams these airports are going to do. We are mutually concerned about that and we are actually actively talking about well, what is, you know, what is the standard? What level of support? There is a lot of work to be done there. I can say one of the EPA things that I want to make sure that we understand, there seems to be some confusion or common belief that because EPA has not declared PFOS or PFOA a hazardous substance under CERCLA that Federal agencies can't do anything. Because of the separate section 104 under CERCLA, Federal agencies already have an affirmative responsibility to move forward unlike anybody else across the Nation. So we, the Federal family, are already proceeding under CERCLA where nobody else is across the Nation.

These are the challenges that we have to say. You mentioned drinking water; it is a non-enforceable standard. We are testing all of our drinking water on our bases because we are concerned citizens for our service members, their families, our civilian workforce. Again, we look to EPA to what that standard should be across the Nation.

Mr. GARAMENDI. This set of issues is really important in that the solutions are going to be difficult to find and to certainly enforce if there is this ambiguity that you have described in at least two different places.

I am asking our staffs—Doug, your staff, my staff—to go into this in detail. We have known from our previous efforts on this area that there is this jurisdictional issue within our domain and we are going to need to work our way through that so that the administration is required by law to coordinate and to have a similar standard across the in this case FAA, EPA, and the Department of Defense.

So I have taken up well more than 5 minutes of Ms. Slotkin's time awaiting your arrival, Doug. I know that you were over at the White House for a very important event and so if you would like to take your 5 minutes to talk about the event you are welcome to do so or you can go to your questions. Thank you for coming back to join us.

Mr. LAMBORN. Well, I will go to the questions. Thank you, Mr. Chairman, for having this hearing, for keeping things moving along. I want to thank Representative Brooks for sitting in until I got here. I want to thank the witnesses for their testimony, and I do have a little bit of follow-up.

Representative Brooks asked some of what was concerning me, but just a little bit more follow-up and then I will turn the time back. And thank you, Mr. Chairman, for your dedication on this and the other logistical and environmental and readiness issues that we get to work on.

Mr. GARAMENDI. No, we don't do that by ourselves, do we? We do it across the aisle.

Mr. LAMBORN. That is right. We work together and we have got great staff who help us in so many ways.

Thinking about the CERCLA standards and what would happen if States stepped in and had a more stringent, I won't say higher or lower, but a more stringent, a stricter standard, are there risks if DOD had to comply with a State standard that was out of sync with the other 49 States, is there any kind of risk where that State standard may not be relevant or appropriate?

Just a little more detail. I know we have touched on this earlier but, Ms. Sullivan, if we could start with you on this.

Ms. SULLIVAN. Sure. So the CERCLA process, the cleanup process has been long established. We have been working under this law for decades now. State standards come in. This is something we do day to day whether it be PFOS, PFOA, arsenic, trichloroethylene, we are used to dealing with a State standard, so it does come in.

There is a whole process of how it comes in to the CERCLA process when we get to a remedy selection, so we already are addressing it where it—across the nation. So we will in fact every situation, every decision is site-specific; that remedy selection is site-specific. In the cleanup program this is what we do business day to day.

In drinking water, it is a little bit different. In drinking water, the standards, first of all, where we are the purveyor, where the military installation actually provides the drinking water, yes, we will follow the State standard under the Safe Drinking Water Act. We again, we have been doing that across the Nation with all sorts of other presence, all sorts of other chemicals.

Where it becomes more of a challenge is drinking water off bases that may have been impacted by the Department of Defense. Right now, our legal authorities are somewhat confusing. We are trying to work through them and that is where the biggest challenge is, in my mind.

Mr. LAMBORN. If you had to give—if a State standard was so stringent that maybe it is out of line with what science has said or EPA has said is necessary, is there a risk there that that stringent standard could impose?

Ms. SULLIVAN. It could be precedence-setting. So part of the process is there has to be a promulgation process that the State has to go through in order to be qualified to be considered, so that is part of the process as well so that if the process that the State went through to actually issue that standard is looked at as well as the science behind it to determine if it is applicable and relevant to be included as a cleanup standard.

Mr. LAMBORN. So it has to be applicable and relevant.

Ms. SULLIVAN. Yes.

Mr. LAMBORN. Okay. So if it is too much of an anomaly there is a way out?

Ms. SULLIVAN. It depends on the science and the process that they used.

Mr. LAMBORN. Okay.

And, lastly, Mr. Chairman, thank you for having my opening statement read into the record by unanimous consent. I will highlight one thing and that is, the City of Fountain is near Peterson Air Force Base and is maybe the first or one of the first commu-

nities in the country to be impacted by this and to realize, hey, we have an issue here we have to work on.

So I want to commend the people of the City of Fountain that they jumped in and they are doing everything they can, but they do have limited resources so that is why the Air Force and the DOD is a necessary partner in making sure that this problem is resolved and overcome for the people of Fountain. So, Mr. Chairman, with that I yield back.

Mr. GARAMENDI. I thank you, Mr. Lamborn.

I note that one of our committee members has joined us. Ms. Haaland is on remote. And, Ms. Haaland, you had some questions so it is your turn.

Ms. HAALAND. Thank you, Mr. Chairman, and thank you for convening today's panel. This issue affects communities across our country including at Kirtland Air Force Base which is in my district. And all three bases in New Mexico have to deal with the consequences of the continued use of PFAS including the community and farmers surrounding Cannon Air Force Base.

New Mexicans deserve clean water to raise their families, grow their businesses, and support agriculture, but harmful chemicals have taken a toll in our communities. I see what happens to the health of families and friends when toxic sites are not cleaned up, and it is not something that we should risk.

PFAS presents a clear and present danger to our children, to our farmers, and environment as a whole, yet in response to the requirement in last year's NDAA for the Department of Defense to provide its plan to clean up PFOS, all that was produced was an anemic 7-page document explaining the Superfund cleanup process. The report doesn't help my constituents. It doesn't help the hard-working farmers in my State worried about their livestock being contaminated, or struggling New Mexico families or children growing up with a host of health problems that we don't even fully understand yet.

You are hoping that by the end of fiscal year 2022, 96 percent of the installations where PFAS was released will have completed only the first step of the cleanup process, ignoring the dozen, the two dozen, the two or so dozen—excuse me—installations that won't even make it that far. You then move on to the next step that takes anywhere from 3 to 6 years before even starting to address the contamination.

And Secretary Sullivan—Secretary Sullivan is present; is that correct?

Ms. SULLIVAN. Yes, ma'am.

Ms. HAALAND. Okay. Thank you so much. Secretary Sullivan, if this committee told you that in anywhere from 3 to 10 years we will fund or otherwise address concerns that the Pentagon raised in its appropriations request you sent us in the spring, would that be helpful?

Ms. SULLIVAN. I am not sure I understand the question. I apologize. If you could clarify?

Mr. GARAMENDI. Ms. Haaland, you are—the sound system is not particularly good. Please repeat your question and we will see if we can pick it up here.

Ms. HAALAND. Okay, I apologize. Is that a little better?

Mr. GARAMENDI. Yes.

Ms. HAALAND. Okay. If this committee told you that anywhere from 3 to 10 years that we would fund or otherwise address concerns that the Pentagon raised in its appropriations request that you sent us in the spring, would that be helpful?

Ms. SULLIVAN. Right now, from my perspective, the money that Congress has so generously provided us has enabled us to really make tremendous progress in the cleanup program. Let me make it perfectly clear that our priority has been drinking water. If we in fact know that drinking water has been impacted by Department of Defense activities, we have all the tools in place, all the funding in place, the authorities in place to be able to address that immediately and we continue to thank the members for their support to do that.

The cleanup process is complicated. It takes time to be able to do all of the analysis and studying really to understand water flows, to understand the engineering, to understand how the fate and transport process works to be able to design the solution. You want to make sure you have all the information in place, in hand, so that you are designing the right solution up front and you don't have to go back and repeat work.

Ms. HAALAND. Thank you for that answer. One last question, Ms. Sullivan, Secretary Sullivan. You previously testified it can take 30 years to clean up the PFAS that has been confirmed. If PFAS is also confirmed at the sites where such contamination is now suspected, how much longer will cleanup take?

Ms. SULLIVAN. Well, it is really hard to say how long cleanup will take because it is going to be dependent on a lot of site-specific circumstances. That is why it is so important the work that Dr. Nelson and his team is doing to see if there are alternatives that will actually enable us to work on addressing the cleanup.

Remember, there is cleanup of groundwater. There is cleanup of soil. There is all sorts of aspects. We have really good solutions for drinking water, but we really need to work on more efficient and effective measures to treat groundwater, to treat soil, and see if we can accelerate that process in any way. But again, it is going to be site-specific how long that solution is going to take and the specific circumstances at that site.

Ms. HAALAND. Chairman, it looks like my time is up and so I will yield.

Mr. GARAMENDI. Ms. Haaland, thank you so very much for joining us remotely. I look forward to additional questions.

The members and Mr. Lamborn and I may have written questions that we would want to submit for the record and will do so. There are a couple of things here that I want to just pick up that we have talked about the disposal and, Ms. Sullivan, you just spoke to that issue. There are contaminated soils, water, and so forth.

The use of incineration has been discussed as a way of dealing with it. There is incineration and then there is incineration, pyrolysis, for example, of super high temperatures, other things. With regard to those incineration very broadly defined, are those, all of those types of incineration being considered?

Dr. NELSON. Yes, they all are in the research program, so you completely, correctly, outlined it. There is incineration and incineration. These are very stable compounds which means they take higher temperatures and longer time to break down than many of the contaminants we do.

So we moved a number of projects from the lab to a pilot-scale work. Among them are things like plasma destruction, which is higher energy; smoldering combustion, which is pretty high temperature but longer time. So we are trying to get at one of those two, either higher temperatures or longer time. And so we are now testing them at realistic sites to see how they do.

Of course, one issue in these things is we have to get down to very, very low levels at the end of this. You know, these compounds are hazardous at a very low level, so we can't have 99.9 percent destruction. We have got to have five 9s or four 9s or some number like that. So that complicates the issue, but we have some technologies we have hope for.

Mr. GARAMENDI. Well, the PFAS and PFOAs are not the only chemicals.

Dr. NELSON. Exactly. And that is part of what the problem is. They can break down into something equally hazardous that is halfway to destruction, so we have to not—and even larger contaminants can break down to PFAS and PFOA during the destruction process. So it is this whole cascading chain through the hundreds or thousands of these compounds.

So yeah, we are definitely alive to that. We don't want to make PFOS or PFOA go away and something else hazardous show up.

Mr. GARAMENDI. The chairman of this committee has an intense interest in these destructive technologies having worked on it since the 1990s when I suspect Ms. Sullivan and I were interacting at that time on some of these questions. Before we adjourn here, just a couple of heads-up to the Department. This committee and the full committee, in fact the entire Congress and Senate, have been working on PFAS issues at least since 2016 legislation. And I suspect before that there was without specific focus this issue was out and about and being discussed.

We are not going to let it go. We are picking it up again in this year's NDAA with several advancements in the law as well as the authorities and the funding. And so we will continue to press this issue in the conference committee. We have every reason to believe that the Senate is aligned with us on these issues, so we will carry out with additional requirements and as well as funding.

There is an issue within the Congress itself, and I know this issue exists over in the Senate, and that has to do with authorities. I have spoken to that Transportation and Infrastructure FAA, and Energy and Commerce with regard to EPA, so we are going to—and we also have the Resources Committee involved in some of these issues also. It is important for us to know where we bump up against the interagency authorities.

And so a question for the record to all three of our witnesses is, where are the interagency problems that prevent appropriate and timely resolution of those problems? They may very well be law or authorities or funding issues. I would like to know so that I can work with the other committees to resolve our side of the issues

and align the authorities in such a way that the administration is able to overcome whatever barriers may exist. So for the record, please provide us with that information.

[The information referred to was not available at the time of printing.]

Mr. GARAMENDI. We have talked about funding here. We will plus-up again this year the authorities and I believe the appropriations committees will follow along to address that. I think all of us are very concerned about the replacement for the AFFF. We understand the complexities. We understand the costs associated with something that is entirely different and that will come back to roost in this committee, so we will want to be aware of that.

We do have a problem and that is that, Ms. Sullivan, you are retiring without permission from this committee. We recognize that you have been at this some 40 years and we know that you are just an enormous wealth of information not only about the details of what these complex issues are—the science, the chemistry, and the like—but perhaps even more important the way in which the organizations function successfully. That is because you know where they function unsuccessfully and you are able to work your way through that. That is an incredible resource that we will be losing at least in your formal role. We do have your identification numbers and we may use the services of the intelligence, surveillance, reconnaissance efforts of the Department to reach out to you and put you on a temporary contract and make use of your extraordinary knowledge.

We will miss you. We thank you for those 40 years of service to America and to the world because it has been on the environment for 40 years. It is an incredible, incredible task and we thank you for that. Thank you so very much.

[Applause.]

Ms. SULLIVAN. Thank you, sir.

Mr. GARAMENDI. With that I think we have completed our hearing and we are adjourned.

[Whereupon, at 2:26 p.m., the subcommittee was adjourned.]

A P P E N D I X

SEPTEMBER 15, 2020

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

SEPTEMBER 15, 2020

Statement of the Honorable John Garamendi
Chairman, Readiness Subcommittee
"Addressing the Legacy of Department of Defense Use of PFAS: Protecting our Communities and Implementing Reform"
September 15, 2020

Good afternoon.

Ladies and gentlemen, I call to order this hearing of the Readiness Subcommittee of the House Armed Services Committee.

With those administrative remarks out of the way, I'll move on to the substance of the hearing. The scourge of contamination from PFOS, PFOA, and other per-fluorinated compounds is being experienced by communities across the country. Our constituents are worried. They are afraid that they are being poisoned by their drinking water, or that PFAS is going to contaminate their livestock or produce and impact their ability to earn a living and support their families. This is not a partisan issue. Communities in my district surrounding Travis and Beale Air Forces Bases are dealing with DOD-originated PFAS contamination and the fear and anxiety that go with not knowing what that means for their health or how long they will have to wait for polluters to clean-up the contamination. I know that many Members of this committee on both sides of the aisle represent communities with similar concerns.

While the task of addressing PFAS contamination must eventually fall on all polluters, this committee's mandate is to ensure the Department of Defense is acting to address its legacy of contamination. The Department must keep faith with the communities that host its installations and are now being asked to shoulder this burden.

With this history in mind, we've required DOD to phaseout "A triple F" (AFFF) by 2024. We are not blind to the enormity of this task but with the focus provided by a looming deadline, we are confident that with the Department's resources it can find a solution that protects both our communities and the aircrews who protect our nation. This year's NDAA also aims to increase transparency by requiring the Department of Defense to publish on a public website the results of drinking and ground water testing conducted on military installations or former defense sites, and to notify the congressional defense committees when there has been an uncontrolled release of a PFAS-containing firefighting agent. We also established a prize program to incentivize research into a viable replacement agent, and authorized additional funding for clean-up and research into PFAS disposal technologies.

I look forward to hearing from the witnesses about the Department's ongoing efforts to develop solutions to the myriad problems presented by these "forever chemicals" and how it's implementing the requirements of the FY20 NDAA to address its PFAS legacy's impacts on human health and the environment.

With that, I would like to turn to our Ranking Member, Congressman Doug Lamborn of Colorado, for any remarks he may have.

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House Armed Services Committee
Subcommittee on Readiness

By: Ms. Maureen Sullivan,
Deputy Assistant Secretary of Defense for Environment

Hearing: September 15, 2020

Chairman John Garamendi, Ranking Member Lamborn, and distinguished members of the Sub-Committee. Thank you for the opportunity to discuss DoD's actions related to per- and polyfluoroalkyl substances (PFAS).

Background:

PFAS refers to the entire class of per- and polyfluoronated alkyl substances, of which perfluorooctane sulfonate (PFOS) and perfluorooctanic acid (PFOA) are the most well-studied substances. These substances are present in many industrial and consumer products because they increase a product's resistance to heat, stains, water, and grease. As such, they are not uniquely attributable to Department of Defense (DoD) activities.

DoD's use of PFAS started in the 1970s, with the introduction of aqueous film forming foam (AFFF) for aircraft fuel fire-fighting purposes. DoD is one of many users of AFFF, with other major users including commercial airports, the oil and gas industry, and local fire departments. AFFF is mission critical because it quickly extinguishes petroleum-based fires, thus minimizing loss of life.

In July 2019, as one of his first acts, Secretary Esper stood up a Task Force to provide strategic leadership and direction to ensure a coordinated, aggressive, and holistic approach on DoD-wide efforts to proactively address PFAS. The Task Force has focused on three goals: Mitigating and eliminating the use of the current AFFF; Understanding the impacts of PFAS on human health; and Fulfilling our cleanup responsibility related to PFAS.

To accomplish these goals and support the Department's commitment to the health and safety of our Service members, their families, the DoD civilian workforce, and the communities in which DoD serves, priority Task Force actions include:

- Researching a PFAS-free firefighting foam;
- Providing information on health effects to DoD stakeholders;
- Ensuring consistent investigation and cleanup of past releases; and
- Coordinating DoD efforts with other Federal agencies.

Drinking Water On-Base:

On May 19, 2016, the Environmental Protection Agency (EPA) issued Safe Drinking Water Act (SDWA) lifetime Health Advisories (HA) and recommended actions for drinking

water systems with individual or combined levels of PFOS and PFOA greater than 70 parts per trillion (ppt). DoD began proactively taking action to address drinking water impacted by DoD releases of PFOS and PFOA, even though the lifetime HAs are not regulations under the SDWA and are not enforceable drinking water standards.

DoD provides drinking water to approximately 2 million people on its installations worldwide. The Department began testing DoD-operated drinking water systems worldwide in June 2016 to identify drinking water that exceeded EPA's HA levels. DoD completed testing of all 524 DoD-owned drinking water systems in August 2017. These tests determined that twenty-four DoD drinking water systems contained PFOS and PFOA above EPA's HA levels. These DoD installations followed the EPA recommendations issued with the HA, to include providing consumers with bottled water or additional water treatment. In cases where DoD purchases drinking water, the Department identified 12 drinking water systems where the results were above the EPA HA level. These installations worked with the drinking water supplier(s) to encourage appropriate actions. To ensure that we maintain this information, this sampling data has been archived in a centralized DoD database.

The Department issued a new policy in March 2020 for continued periodic testing of DoD-operated drinking water systems for certain PFAS, including PFOS and PFOA. Enhancing our vigilance, the Military Departments will resample any DoD-operated drinking water systems that have not been tested within the last year by December 31, 2020. DoD will resample periodically based on the results. For example, if PFOS and PFOA are detected, but are below EPA's HA levels, DoD will resample quarterly for one year and once every two years thereafter until results are below the method reporting limit. All data is to be made available on the installation's public website.

For consistency across the nation, in July 2020 the Department issued a policy for monitoring drinking water at installations where we purchase drinking water. The Military installations are required to reach out to their drinking water provider and request the most recent PFAS sampling data. If the recent PFAS sampling data is not available or the provider will not re-sample, the military installation is required to sample the drinking water supplied at the point closest to the entry into the DoD distribution system. All data is to be made available on the installation's public website also.

Remediation:

DoD has also addressed PFOS and PFOA in drinking water off our installations under the Federal cleanup law, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC § 9601 et seq.). CERCLA provides a consistent, science-based approach across the Nation for cleanup and includes environmental regulators and public participation. DoD follows the CERCLA process to fully investigate a release and determine the appropriate cleanup actions based on risk. The Department addresses on-base and off-base migration of its PFAS releases to protect human health and appropriately spend taxpayer dollars. The Defense Environmental Restoration Program (DERP) (10 USC 2701-2711) provides authorities to DoD to perform and fund these actions, and requires they be carried out in accordance with CERCLA. DoD, like other Federal agencies, is specifically authorized under

CERCLA Section 104 to take cleanup action to address "pollutants or contaminants" like PFAS. DoD is thus taking cleanup actions, even though PFAS are not designated as CERCLA hazardous substances.

DoD's priority is to quickly address PFOS and PFOA in drinking water above EPA's HA levels from DoD activities, under the CERCLA process. DoD's actions are consistent with EPA's recommended actions, which include treatment of drinking water or closing drinking water wells and providing alternative water supplies, such as bottled water or connecting private residents to public drinking water systems.

DoD prioritizes its PFAS sites for cleanup actions using the well-established CERCLA risk-based process. Under this process, the Military Departments will address sites that pose a greater potential risk to human health and the environment first. DoD uses the toxicity information from EPA's HA when assessing risk to human health under CERCLA. Under the EPA's longstanding risk assessment and hierarchy of toxicity value policies, the HA toxicity information is used to determine whether the use of CERCLA response authority at a site is warranted. In October 2019, the Department issued clarifying technical guidance to the Military Departments to ensure the consistent use of screening levels at DoD cleanup sites to determine if advancing to the remedial investigation phase is warranted. As the Military Departments move through the CERCLA process, we will follow the December 19, 2019, EPA "Interim Recommendations for Addressing Groundwater Contaminated with PFOA and PFOS."

The Department recognizes the importance of addressing PFAS in a consistent manner across DoD. To that end, we evaluated and established policies and reporting requirements to track progress toward and ensure a proactive and consistent approach to investigating and cleaning up PFAS. As a result of the DoD PFAS Task Force's efforts, the Assistant Secretary of Defense for Sustainment issued the following:

- Clarifying technical guidance to ensure a consistent approach to investigating PFAS within the DoD cleanup program;
- Guidance on the use of analytical methods for analyzing PFAS concentrations in media other than drinking water;
- A requirement for the DoD Components to report actual and planned obligations and estimated costs to investigate and clean up PFAS;
- Guidance for consistent communication and tracking of PFAS-related requirements at enduring installations outside the United States; and
- A requirement for the DoD Components to report quarterly on cleanup progress and drinking water responses at installations with known or suspected PFAS releases.

These policies and guidance documents will ensure consistency across the DoD Components and help DoD track its PFAS cleanup progress and investments. DoD works in collaboration with EPA, other Federal agencies, and communities as we move through the CERCLA process.

AFFF Replacement:

To protect our Service members and prevent releases to the environment, DoD issued a policy in January 2016 requiring the Military Departments to limit uses of AFFF to responses to emergency events and no longer use it for land-based testing and training. The Department treats each release of AFFF as a spill event, to limit environmental effects. The policy also requires the Military Departments to remove and properly dispose of local warehouse supplies of AFFF containing PFOS (other than for shipboard use), where practical. Each Military Department has been taking actions to remove this AFFF containing PFOS from its inventory.

Furthermore, in May 2019, DoD updated the Military Specification (MILSPEC) for AFFF to ensure that new supplies available for emergency firefighting responses do not contain PFOS or PFOA above the 800 parts per billion (ppb) limit of quantitation. We have also established a policy – issued in January of this year – requiring the DoD Components to track and report usage and releases of AFFF. The requirement is for annual reporting, with an additional requirement to report within 24 hours any usage or release that exceeds 10 gallons of AFFF concentrate or 300 gallons of mixed foam.

The Department is working aggressively to meet the requirements of the Fiscal Year 2020 National Defense Authorization Act (NDAA) requirements related to AFFF. There are many different circumstances where we use AFFF, so we have been aggressively identifying these situations and evaluating what needs to be done to meet the FY2020 NDAA requirements.

We are actively testing and evaluating the performance capabilities of commercially available PFAS-free firefighting agents to determine which ones may be viable alternatives to MILSPEC AFFF. We are also developing analytical techniques to test and determine that these PFAS-free agents meet the requirement to contain less than 1 ppb total PFAS, as required by the NDAA.

Facilities

The Department is implementing a comprehensive, methodical process to evaluate and determine the most appropriate and feasible alternatives to replace fluorinated AFFF in our facilities, such as aircraft hangars and bulk fuel facilities. In June, the Department issued a data call to collect the inventory of facilities with installed AFFF systems. This inventory is being assessed by our Fire Protection Engineers to categorize similar facility structures together and then identify viable fire protection options and criteria. We are evaluating several alternatives. One alternative could be use of a future PFAS-free MILSPEC firefighting agent as a drop in solution, if the current systems can be cleaned to ensure PFAS residues do not impact the new product. Research is underway to determine the level of decontamination possible, as this appears to be the most economical option. Other alternatives, such as conversion to high expansion foam or liquid floor drainage systems are being assessed, but would require complete system retrofit at increased costs. The Department is working to document the viable options and criteria per facility type, determine the best approaches, and then develop funding requirements and implementation schedules. Completing these actions and meeting the NDAA required schedules is a formidable task.

Joint and Shared Use Airports

Over the last several months, the Department evaluated over 200 bases – active, reserve, and National Guard – that have joint or shared use airports to determine the level of Air Rescue Fire Fighting (ARFF) support that the Military Departments provide or depend on. At these airports, there is a mixture of emergency response services with almost all currently using AFFF that meets the DoD MILSPEC. Regardless of whether the airport is joint or shared use, the level of ARFF support falls in to four categories: full, partial, minimal, or none. For context, currently the Federal Aviation Administration (FAA) requires the use of MILSPEC AFFF for civilian airports to receive Part 139 Certification to operate. However, the 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. While DoD and FAA are working on different timelines, DoD will coordinate with FAA/airports to ensure there isn't a mixture of incompatible foams (basically non-PFAS and PFAS foam) for some of the civilian/joint use airports that have both FAA oversight and DOD presence. Furthermore, we will continue to partner with FAA and the civilian airports where DoD provides full ARFF support on their Part 139 Certifications going forward. We must ensure that all of these airports – ours or the commercial airports – have the capability to respond to incidents that maintains the current level of protection for the passengers, crews, and equipment.

It is important to note that mutual aid is the cornerstone of National fire and emergency services response. The Department has well established agreements with the community fire departments surrounding our military installations. When requested by local departments, the DoD fire crews respond as an additional member and report to the Fire Incident Commander on scene. These emergencies range beyond aircraft crashes to include overturned vehicles on a highway, large industrial fires, or large structural or wildland fires. It is the collection of fire and emergency services capabilities, both military and civilian, which protect not only the lives of our Service members and their families, property, and the mission, but also protect the surrounding communities outside our installations. We will need to maintain these levels of firefighting support and understand the feasibility of using alternative foams in the future.

Finding an effective firefighting alternative that meets the life-saving performance standards of AFFF and does not have negative health or environmental effects continues to be one of the Department's top priorities. We have been and will continue to invest in research, development, testing, and evaluation to identify alternative firefighting material and practices.

There are many challenges associated with meeting the timelines established in the FY2020 NDAA. The Department is fully committed to finding and implementing solutions to successfully overcome these challenges while not compromising the safety of our service members, our firefighters, and the public that rely on our outstanding firefighting capability.

Exposure Assessment and Health Study:

We are working with the Agency for Toxic Substances and Disease Registry (ATSDR) to support their efforts to conduct an exposure assessment at not less than 8 military installations and a multi-site health study, as required by the FY2018 NDAA. To date, we have provided ATSDR $40M to begin conducting the exposure assessment and health study. DoD plans to transfer another $10M in FY2021.

Conclusion

As the Department addresses its part in responding to this national issue, we continue to work in collaboration with regulatory agencies and communities to ensure our resources are applied effectively to protect human health as part of a national effort. We must ensure our response and clean-up resources are effectively applied to result in reduced risk and exposure of personnel on our installations and in our surrounding communities. We are prioritizing our investments to those actions in order to address the greatest degree of risk. DoD has taken the lead in protecting the health of persons on and near DoD installations by following the CERCLA process to fully investigate releases and determine the appropriate cleanup actions based on risk. This is a national problem involving a wide array of industries and commercial applications, as well as many Federal and state agencies. Therefore, it needs a nation-wide solution.

In summary, DoD is proactively taking action to reduce the risks posed by PFOS and PFOA to human health. The Department is committed to mitigating PFOS and PFOA in the drinking water it supplies, as well as addressing releases to the environment under CERCLA that are the direct result of DoD's AFFF use. DoD is also investing in research to develop fluorine-free substitutes for AFFF that meet the military's stringent performance criteria, and to develop technologies to quantify and clean up PFOS and PFOA and related PFAS chemicals. These combined efforts reinforce DoD's commitment to meeting critical mission requirements while protecting human health.

Ms. Maureen Sullivan
Office of the Assistant Secretary of Defense for Sustainment
Deputy Assistant Secretary of Defense for Environment

Ms. Sullivan is the Deputy Assistant Secretary of Defense for Environment in the Office of the Assistant Secretary of Defense (Sustainment). She is responsible for DoD's policies and programs related to compliance with environmental laws; management of natural and cultural resources; cleanup of contaminated sites; fire and emergency services; green/sustainable buildings; installation emergency management; international environmental compliance and cleanup efforts; strategic sustainability planning; and planning to address emerging contaminants. Ms. Sullivan is also responsible for the DoD Native American program. She oversees the Armed Forces Pest Management Board, the Department of Defense Explosives Safety Board, the Environmental Security Technology Certification Program (ESTCP), and the Strategic Environmental Research and Development Program (SERDP). Ms. Sullivan is the Department of Defense Federal Preservation Officer and represents the Secretary of Defense on the President's Advisory Council on Historic Preservation. Ms. Sullivan is a member of the General Services Administration's Green Building Advisory Committee. She also represents the Department of Defense on the National Invasive Species Council and the Wildland Fire Leadership Council. Ms. Sullivan serves as the DoD Chief Environmental Review and Permitting Officer.

For the past 28 years, Ms. Sullivan has served in various leadership positions as a member of the Office of the Secretary of Defense environmental staff, and possesses wide ranging experience in numerous DoD environmental programs to include Pollution Prevention, Environmental Compliance, Historic Preservation, and the Clean Air Act.

From 2013 thru 2014, Ms. Sullivan served as the DoD member of the Federal Interagency Floodplain Management Task Force. From 2009 to 2012, Ms. Sullivan served as the Department of Defense member of the White House Interagency Climate Change Adaptation Task Force. She served as the DoD representative to the Office of Management and Budget Interagency Panel which negotiated the final Ozone and Particulate Matter National Ambient Air Quality Standards in 1997. She also served as the DoD Liaison to the President Clinton's Council on Sustainable Development.

Ms. Sullivan was a member of the team that authored Executive Order 13148, "Greening the Government Through Leadership in Environmental Management," which President Clinton signed on April 22, 2000. She also helped draft Executive Order 12856, "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements." After President Clinton signed Executive Order 12856, she was detailed to the Office of the Administrator, Environmental Protection Agency, to guide initial implementation.

Her total DoD career spans 39 years. Prior to joining the Office of the Secretary of Defense, she held positions with the Defense Logistics Agency in Virginia, Michigan, Ohio and Germany where she worked in hazardous waste management, international environmental activities and pollution prevention. Ms. Sullivan has been a member of the Senior Executive Service since 2008.

Ms. Sullivan holds a Bachelor of Science in Natural Resource Economics from the University of Massachusetts at Amherst.

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House Armed Services Committee
Subcommittee on Readiness

By: Dr. Herbert Nelson,
Director, Strategic Environmental Research and Development Program and
Environmental Security Technology Certification Program

Hearing: September 15, 2020

Chairman Garamendi, Ranking Member Lamborn, and distinguished members of the Sub-Committee. Thank you for the opportunity to discuss DoD's research, development, and demonstration program related to per- and polyfluoroalkyl substances (PFAS) and a replacement for Aqueous Film Forming Foam.

Background:

PFAS are a large class of chemicals which are present in many industrial and consumer products because of their unique properties that result from the strong carbon-fluorine bonds. As such, they are not uniquely attributable to Department of Defense (DoD) activities.

DoD began large-scale use of PFAS for firefighting in the 1970s, with the introduction of aqueous film forming foam (AFFF) for use against aircraft fuel fires. Other major users of AFFF include commercial airports, the oil and gas industry, and local fire departments. AFFF is mission critical because it quickly extinguishes petroleum-based fires, thus minimizing loss of life and secondary damage from munitions.

DoD has two related programs that involve environmental research, development, and demonstration. The first is the Strategic Environmental Research and Development Program (SERDP), as its title states, is our environmental research and development program, and is planned and executed in partnership with the Department of Energy (DOE), and the Environmental Protection Agency (EPA). The second is the Environmental Security Technology Certification Program (ESTCP) which is DoD's environmental demonstration and validation program. Both programs seek to harness the best science and technology to improve DoD's environmental performance, reduce costs, and enhance and sustain mission capabilities.

These two programs are leading the DoD's R&D efforts on PFAS remediation and a PFAS-free alternative to AFFF through individual research and demonstration projects led by investigators from academia, industry, DoD laboratories, and other Federal agencies. Each of the programs issues an annual call for proposals on topics developed with input from experts in the Military Departments and our partners, DOE and EPA. Potential investigators submit a brief pre-proposal and then, if requested, a full proposal for a research or demonstration project. The full proposals are ranked according to merit and DoD applicability by these same panels of experts and, based on available budgets, funding decisions are made. Both standard, multi-year projects and one-year proof-of-concept projects are supported.

Research and Development Efforts on PFAS Remediation:

The Department is investing over $95 million in research and development related to PFAS remediation. We are making significant progress on several fronts. In particular, there are currently final EPA-approved analytical methods for measuring 29 PFAS in drinking water only, and we're working closely with the EPA to develop new methodologies for PFAS analysis of soil, groundwater, wastewater, and several other mediums. We expect these draft methods to be available early next year. We also have several field demonstrations in place for treatment methods for PFAS in soil and water; these demonstrations should be near completion within the next 18-24 months.

SERDP initiated research into the fate, transport, and remediation of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) shortly after EPA released the 2009 Provisional Health Advisories for these compounds. Beginning in 2014, follow-on research has targeted developing several approaches for treating groundwater containing PFOS and PFOA. These efforts have matured from small scale laboratory projects to field demonstrations that began under ESTCP in 2017 and have continued into 2020 as new technologies mature and are ready for field demonstration.

We began with what we assumed would be fairly straightforward research to develop treatment technologies, but we soon realized that it was a much more complex issue, and our research expanded into four areas that cover the scope of PFAS in the environment:

- Sampling and Analysis. Sampling and analysis is critical to all of our work on PFAS; a few years ago, we didn't have the analytical capability to be able to measure these chemicals in all affected areas of the environment. Today, our methods are much improved and we currently have a program jointly with the EPA to expand our ability to measure PFAS so that we can have a more accurate assessment of which PFAS chemicals are present and at what concentration.

- Fate Transport and Characterization. We've also funded research to understand which PFAS chemicals are most likely to be present in association with DoD facilities and operations, and how they break down naturally and move in the environment. This helps us to better predict what types of sites may be more likely to be a serious concern. Our most recent focus in this area has been on developing a forensics approach so that we can understand the origins of PFAS found at a specific location; these studies were just started in 2020.

- Ecotoxicity. Our ecotoxicity program is focused on developing an understanding of how these chemicals affect sensitive wildlife species, such as fish and birds. We've been studying the impact of PFAS and recently have expanded to look at the ecotoxicity of some of the PFAS-free firefighting foams.

- Treatment. We've invested the most resources on improving treatment of PFAS impacted sites. This has included developing technologies to treat groundwater at its source as well as once it's pumped aboveground. The treatment approaches have included building on what

we already know by improving existing technologies, such as granular activated carbon or GAC, as well as developing new technologies once we've better understood the chemistry of these materials. We've also recently expanded our research work to explore technologies that could be alternatives to incineration; we have several promising technologies that have passed initial testing including, for example, plasma destruction, smoldering combustion and hydrothermal treatment. In support of these alternative treatment efforts, we've also had a small field effort with the EPA to assist in developing PFAS air emission detection methodologies. Much of this initial work is focused on developing the sampling and analytical methods so that we can detect these chemicals in the emissions.

We consider it essential that our investigators talk to each other and be aware of the methods and results of other work we're funding. To encourage this sort of interaction, we've hosted several workshops and project meetings over the last several years. These workshops have served the purpose of better investigator collaboration, but have also let us identify data gaps that have led to more targeted strategic plans for addressing PFAS in the environment. These workshops have become annual events as the program has grown larger. Summary reports for each of the workshops are available on the SERDP and ESTCP web site (https://www.serdp-estcp.org).

Research and Development Efforts on AFFF Replacement:

Currently available AFFF does not contain PFOS or PFOA, two legacy compounds, above the 800 part per billion (ppb) limit of quantitation. However, these AFFF still contain other PFAS. None of the commercially available PFAS-free foams meet DoD's strict safety standards to rapidly extinguish dangerous fuel fires and prevent their re-ignition during rescue operations. One of the Department's top priorities is finding an effective firefighting alternative that meets the life-saving performance standards of AFFF and does not have negative health or environmental effects.

SERDP and ESTCP are funding over $10 million in this area in FY 2020 with a total of $50 million partially spent and committed through FY 2025 for research, development, testing, and evaluation to identify alternative firefighting material and practices. SERDP and ESTCP are working to increase the world-wide investigator capacity through outreach efforts and technical workshops.

SERDP and ESTCP have initiated four major lines of effort directed toward a PFAS-free alternative to AFFF:

- Development of Alternative to PFAS-containing AFFF. SERDP initiated research into PFAS-free foam formulations in Fiscal Year (FY) 2017 and have since expanded the effort into investigations of non-foam firefighting and innovative equipment and techniques. There are ten active projects in FY 2020 with an additional call for proposals for FY 2022 under development. Some of these projects are producing formulations that will transition to demonstration testing this year and next with others focused on longer term understanding of foam performance that will support future improvements to firefighting formulations.

- Demonstration of PFAS-free Formulations. ESTCP has an on-going program to demonstrate both developmental and commercially available PFAS-free formulations against the requirements of the current Military Specification (MILSPEC). These demonstrations are designed to document in detail the performance of each formulation tested to both provide feedback to the researchers and developers of the formulations and to gather data to support a revised MILSPEC, if required. These demonstrations initially involve tests at lab-scale with promising formulations progressing to 28-sq-ft and then 400 sq-ft demonstration fires. As of the end of August, sixteen unique formulations have been tested using standard military delivery hardware as well as experimental delivery methods and nozzles. This has totaled over 300 28-sq ft tests and 36 400 sq-ft tests.

- Ecotoxicology of PFAS-free formulations. As discussed above, SERDP has an ongoing program examining the ecotoxicology of PFAS compounds. In FY 2020, we initiated six projects to investigate the ecotoxicology of the PFAS-free alternatives. These projects, which are focused on a variety of species and environments, are using both commercially-available and developmental formulations in their test programs.

- Cleaning Technologies for Firefighting Equipment. Once a PFAS-free alternative formulation is identified, existing firefighting equipment, both Aircraft Rescue and Firefighting (ARFF) trucks and hangar systems, will need to be cleaned of PFAS residues to avoid costly replacement of the equipment. It is known that the standard procedure of a triple-rinse with clean water does not remove sufficient residual PFAS to allow reuse of the equipment. ESTCP initiated six projects in FY 2020 to demonstrate technologies to clean the equipment of residual PFAS and decontaminate the rinsate.

To ensure that all participants in our research and demonstration projects are aware of results from other projects and to efficiently identify data gaps and needed investigations, SERDP and ESTCP have hosted three workshops and a number of project meetings on this topic in the last two years. The initial workshop, "AFFF Alternatives: The Art of the Possible" was held November 15, 2019, and allowed representatives from the research community, industry, academia, and international organizations to discuss the challenges with finding a fluorine-free alternative to AFFF and potential research opportunities. At follow-up workshops in January and August 2020, we focused on technical details of the issue; participants discussed the barriers to development of an alternative in the areas of formulations, delivery systems, and ecotoxicology. As in the case of the PFAS program, workshop summaries are posted on the SERDP and ESTCP web site as soon as they are cleared for release.

These workshops and project meetings also allow SERDP and ESTCP to coordinate our efforts with on-going work by other Federal agencies and international partners. We are closely coordinated with the Federal Aviation Administration (FAA), involving both engineers at the FAA Technical Center in New Jersey and at Headquarters. However, live fire testing with our interagency partners to find an effective alternative was delayed due to COVID-19. The testing facilities were shut down in March 2020, and have recently reopened to resume testing. We are in close contact with scientists at EPA and the National Aeronautics and Space Administration (NASA). Scientists and managers from the European Union countries, Canada, and Australia participate in our workshops and we are in contact with Japanese industries to involve their

formulations in our demonstration program. Finally, we exchange results with the testing being conducted by an international industry consortium looking at fires in large fuel storage tanks.

Conclusion

In summary, DoD is investing significant resources in research to develop fluorine-free substitutes for AFFF that meet the military's stringent performance criteria, and to develop technologies to quantify and clean up PFOS and PFOA and related PFAS chemicals. These are very difficult problems but we have assembled investigators from academia, industry, and DoD and other federal laboratories to solve them and several technologies have advanced from the laboratory to pilot-scale testing at DoD installations with more on the way. The work supported by SERDP and ESTCP, in conjunction with work on-going at other federal agencies and internationally, will contribute to the solution of these national issues.

Dr. Herbert H. Nelson
Executive Director Strategic Environmental Research and Development Program and Director Environmental Security Technology Certification Program

Dr. Herbert H. Nelson is currently the Executive Director of the Strategic Environmental Research and Development Program (SERDP), which is planned and executed jointly with the Department of Energy and the Environmental Protection Agency, and the Director of the Environmental Security Technology Certification Program (ESTCP) in the Office of the Deputy Assistant Secretary of Defense for Environment. Acting on behalf of the SERDP Council and the Assistant Secretary of Defense for Sustainment, Dr. Nelson is responsible for the overall direction and prioritization of topics in the two programs which support over $120M annually in research, development, and demonstration projects addressing DoD's environmental and energy resilience requirements.

Dr. Nelson also is the primary interface between the Office of the Secretary of Defense and the environmental research programs of the Military Departments and other federal agencies working on environmental problems that impact DoD's mission.

Dr. Nelson has nearly 40 years' experience in the DoD Science and Technology arena. He began his career as a National Research Council Postdoctoral fellow in the Chemistry Division of the Naval Research Laboratory in Washington D.C., moving on to staff scientist and then group leader positions. During this time, he authored over 60 papers in the archival literature and over 300 presentations to professional society meetings, Universities, and DoD audiences. In 2005, while still at the Naval Research Laboratory, Dr. Nelson began working with SERDP and ESTCP managing a program demonstrating technologies for wide-area assessment of former bombing and training ranges. He moved full time to SERDP in 2008 as the Program Manager for Munitions Response. In 2016, he assumed the positions of Executive Director of SERDP and Director of ESTCP.

Dr. Nelson received a Bachelor of Sciences degree in Chemistry from Tulane University in 1975 and a Ph. D. in Physical Chemistry from the University of California, Berkeley in 1980.

DOCUMENTS SUBMITTED FOR THE RECORD

SEPTEMBER 15, 2020

Not for publication until released by the Committee

PREPARED STATEMENT

OF

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ACTING DEPUTY ASSISTANT SECRETARY OF DEFENSE

HEALTH READINESS POLICY AND OVERSIGHT

REGARDING

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) UPDATE

BEFORE THE

HOUSE ARMED SERVICES COMMITTEE

READINESS SUBCOMMITTEE

September 15, 2020

Not for publication until released by the Committee

Chairman Garamendi, Ranking Member Lamborn, and members of the Committee, thank you for the opportunity to testify before the subcommittee today.

The Department's top priority is the health and safety of our personnel at home and abroad. We support the Department's PFAS efforts through public, environmental, and occupational health expertise and activities.

The Department collaborates with and relies on the Centers for Disease Control and Prevention (CDC) for development of occupational health guidance (National Institute for Occupational Safety and Health (NIOSH)) and public health guidance (Agency for Toxic Substances and Disease Registry (ATSDR)). Over the last several years, ATSDR has been conducting environmental assessments and public health studies associated with PFAS-impacted drinking water and other sources of PFAS exposures. The Department also uses the integration of toxicology, uptake and depuration, and fate-and-transport work of the U.S. Environmental Protection Agency, U.S. Department of Agriculture, and the U.S. Food and Drug Administration, and will look to findings and recommendations from the upcoming health- and exposure-related work by the National Academy of Science, Engineering, and Medicine (NASEM) for guidance when published. Over the next few years, as these science-based efforts are finalized, a better understanding of those at risk and potential environmental impacts from exposures to PFAS-will emerge. The science-based efforts may inform what people and wildlife are being exposed, to how much, for how long, and what health effects are associated with these exposures.

The Department continues to look at the number of potentially exposed Armed Forces members and veterans who consumed PFAS-impacted drinking water on military installations. The Department will rely on ATSDR and other public health groups over the next few years to assist in focusing this effort. The Department will work with NIOSH to refine the evaluation of

occupational exposures to PFAS, such as Military firefighters who work with Aqueous Film Forming Foam (AFFF) and wear turnout gear.

As part of National Defense Authorization Act for Fiscal Year 2020, Section 707, the Department is prepared to offer and provide blood testing to determine and document potential exposure to PFAS for each DoD firefighter during their annual physical exam beginning October 2020.

Active duty, Reserve, National Guard, and DoD civilian firefighters were identified through coordination with the Military Departments and DoD Agencies using job series, position description, and military occupational specialty titles for assessment and testing. Since conducting a blood test for PFAS is not routine, the Department coordinated with the CDC and Defense laboratorians to identify appropriate laboratories for testing. Identification of the appropriate laboratory was based on its capabilities and experience in analyzing PFAS, and capacity to analyze the approximately 20,000+ samples (one for each firefighter) from October 1, 2020 through September 30, 2021. Each firefighter's individual results will be added to their occupational medical records.

The Department also worked with our interagency partners to develop fact sheets for occupational medicine physicians and firefighters, and a letter template that will be provided to each firefighter with their individual results. As indicated by ATSDR, most of the U.S. population has some level of PFAS in their blood. With regard to interpretation of results, ATSDR clinical guidance indicates that "there are no health-based screening levels for specific PFAS that clinicians can compare to concentrations measured in blood samples. As a result, interpretation of measured PFAS concentrations in individuals is limited in its use."

I am grateful for the opportunity to provide further detail on our PFAS-related efforts to ensure the safety of our military members, civilian workforce, their families, and our Military Health System beneficiaries. Thank you to the members of this Committee for your commitment to the men and women of our Armed Forces, and the families who support them.

Dr. Terry M. Rauch
Acting Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight

Dr. Terry M. Rauch is currently the acting Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight (HRP&O). In addition, he serves as the HRP&O Director of Medical Research and Development (R&D) for deployment medicine and force health protection.

Dr. Rauch also represents the DoD R&D community in international health agreements and domestic federal agency and non-government partnership in an effort to better serve missions, and medical readiness for 2.3 million service members through cross-collaborations.

Dr. Rauch has more than 35 years of experience in many facets of the Military Health System and has held numerous senior level positions in the Army and the Office of the Secretary of Defense. As a senior military officer he served as the Chief of Staff to the Assistant Secretary of Defense for Health Affairs, and principal advisor to four Assistant Secretaries of Defense for Health Affairs on matters pertaining to biomedical research, development and acquisition as well as medical products and devices needed to protect U.S. military forces against Chemical, Biological, Radiological & Nuclear (CBRN) threats. He commanded the U.S. Army Public Health Command-Europe, a scientific and technical organization that provided comprehensive preventive medicine services to garrisoned U.S. Army forces in Europe. Dr. Rauch served as the Chairman of the North Atlantic Treaty Organization (NATO) Working Group on Preventive Medicine advising Stabilization Forces–Bosnia and Stabilization Forces–Kosovo on preventive medicine matters. As Deputy Commander, and then later as Chief of Staff, of the U.S. Army Medical Research and Materiel Command he supported the daily management and integration of a medical research, development, and acquisition program encompassing 11 subordinate laboratories in six countries, 3,000 personnel, and over $1 billion in funding.

After retiring from the U.S. Army in October 2005 at the rank of colonel, he joined Science Applications International Corporation (SAIC) as a Senior Principal Life Scientist. At SAIC, he focused on comprehensive strategic planning and analysis for the Office of the Secretary of Defense on matters relating to Defense biomedical research, development and acquisition investment strategies and their supporting infrastructure. He left SAIC in March 2009 for his current position.

Dr. Rauch received a Bachelor of Science degree in psychology from the University of Cincinnati, where he also earned his Ph.D. in biology and psychology. Dr. Rauch has served as an expert medical witness for the U.S. Department of Justice as well as private industry on anthrax vaccine safety and efficacy and authored numerous scientific and technical publications in the field of psychology, neurosciences, and national security matters.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

SEPTEMBER 15, 2020

QUESTIONS SUBMITTED BY MS. HOULAHAN

Ms. HOULAHAN. Has the Department of Defense assessed and compared other technologies already being used by the private sector that can treat PFAS contamination, including any that can treat groundwater within a contaminated aquifer rather than requiring it to be pumped out and then treated? What role does cost savings play in DOD decision making regarding the technologies chosen to mitigate PFAS contamination?

Ms. SULLIVAN. [No answer was available at the time of printing.]

Ms. HOULAHAN. Has the Department of Defense assessed and compared other technologies already being used by the private sector that can treat PFAS contamination, including any that can treat groundwater within a contaminated aquifer rather than requiring it to be pumped out and then treated? What role does cost savings play in DOD decision making regarding the technologies chosen to mitigate PFAS contamination?

Dr. NELSON. [No answer was available at the time of printing.]

QUESTIONS SUBMITTED BY MS. TORRES SMALL

Ms. TORRES SMALL. It has been nearly 2 years since the Air Force held a town hall to update the surrounding Cannon AFB communities on the status of the contamination and hear their concerns. This is unacceptable. Will you commit, today, to holding regular meetings with local residents and officials?

Ms. SULLIVAN. [No answer was available at the time of printing.]

Ms. TORRES SMALL. In Curry County, New Mexico, and the surrounding communities of Cannon AFB, it has been confirmed that the safe drinking water LHA levels of PFAS have exceeded the EPA's regulated 70 ppt standard. DOD has offered clean bottled drinking water to some of the affected farmers, but this does not address water for agricultural purposes used to produce products destined for human consumption as described by section 343 of the FY20 NDAA. It appears DOD does not see this as an unacceptable risk to human health or the environment. How have you determined that the losses suffered by agriculture assets are not due to contamination from PFAS as the farmers have themselves claimed?

Dr. NELSON. [No answer was available at the time of printing.]