SOUTH CAROLINA NUCLEAR ADVISORY COUNCIL MEETING

Gressette Building, Room 209, Columbia, S.C.

April 25, 2019

2:00 pm - 4:00 pm

Call to Order – Approval of Minutes, Next Meeting	Rick Lee, Chair *(5 minutes)*
SCDHEC Update • Barnwell Decision • SR Liquid Waste • Westinghouse Fuels Agreement	Myra Reece (Director of Environmental Affairs) DHEC *(15 minutes)*
Westinghouse Fuels • Clean-up Operations • Public Outreach • Consent Agreement with DHEC	Mike Annacone & Ed Wills *(15 minutes)*
SRS Update, • H-Canyon Funding • Liquid Waste Contract • Budget for Coming Years	Mike Budney, DOE-EM, SRS Site Manager (*20 minutes*)
NNSA Overview • Pit Production • Long Term Site Ownership • MOX Closure and status • Status of MOX Plutonium shipments from SC • Progress with the MOX Plutonium D&D Program	Nicole Nelson-Jean – NNSA Manager (20 Minutes)
Savannah River Nuclear Solutions Update	Stuart MacVean, SRNS, President and CEO (*15 minutes*)
Barnwell Solid Disposal Operations	Wayne Inabinett, Energy Solutions *(15 minutes)*
Meeting with NNSA on Spent Fuel, Renewables	Rick Lee, Chair *(5 minutes)*
Public Comments	5 minute presentations, TBD
Closing Remarks	Rick Lee, Chair *(5 minutes)*

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Rick Lee: Meeting called to order**…**Motion to approve minutes from October 15, 2018 meeting….motion approved.

Next, I wanted to go ahead and discuss our October, our next meeting which I would propose in late October. I don't have an exact date at this point, but we have a statutory obligation to have two meetings per year. In the past we've been holding as many as four, but to be perfectly honest, when you look out at the gallery that's here today, the people and the jobs that they have. Unless there's a compelling reason for us to hold more than two meetings that are required, I suggest that we stick with the routine of two a year, and if we have a special need we'll call a special meeting.

So, our next meeting will be in October, and I will request Dr. Van Brunt, if you would be so kind, I'd like to hold the meeting over at University of South Carolina, they have the only Master's Program in the state for Nuclear Engineering. We held our last meeting at South Carolina State University, where we had undergraduate program, and so our mission, one of the things we all agreed we were going to try to pursue was to support our educational institutions and see if we can help generate enthusiasm with the young people to get into the nuclear industry.

Dr. Van Brunt: I'll try to arrange that, talk to the Dean, and to Mechanical and in particular the Nuclear Engineering Program in Mechanical Engineering.

Rick Lee: Great. That would be appreciated. Maybe we can have a little tour to see what all's there, and we can do that before the meeting begins. I think it would be a good opportunity if they can turn out the students for the meeting, which I hope they're able to do. It might be a good chance for some of our nuclear industry partners who are here today to do a little recruiting and get face to face time with some of these kids. They're all going to be looking for jobs, and I think they have training that will aligns with much of what you need. Secondly, as I mentioned, sometimes we do some surprise things, I thought that I would try to reconstitute our ad hoc committee with the goal of going over to certain nuclear power plant. Plant Vogtle, over in Georgia, where I keep hearing great stories of success over in Georgia, that they're moving ahead, that two reactors are progressing well, and Bechtel has taken the helm over there and are leading the construction effort. I thought it would be worthwhile for us to go over if they'll have us visit and do a little feedback to the Governor on some of the successes they've had and why they're being successful and so forth as a means of sharing that information. So that would be Celeste and Mr. Little. I assume that you would accept this famous appointment. And I will notify Celeste accordingly.

So, also, I'd like to ask, we're pretty flexible on the time for this meeting. And many of you will be at our meetings in the future. And I wanted to see if there are any comments about the time of day when we hold these meetings to see if there's a time that's better suited to your schedule because I don't want to hold a meeting and consume your whole work day if it's possible. So, early? Late? Mid-day? Any comments from anybody about a time that you think would be acceptable?

Stuart MacVean: I'd say early in the morning or in the afternoon so that you can book end.

Rick Lee: So either? Does this 2:00 p.m. time work for you so you get a morning?

Stuart MacVean: Yes. So I get a morning and can finish up.

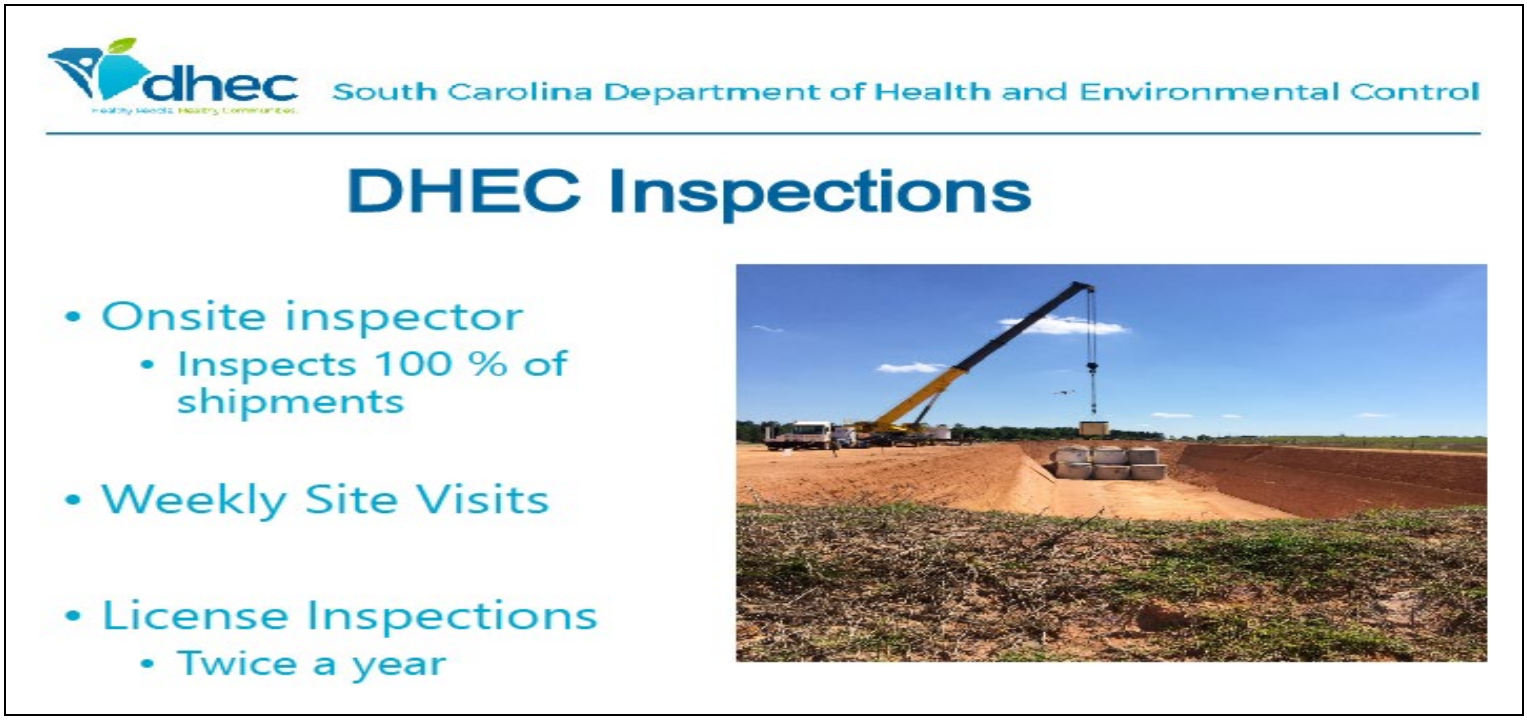
SCDHEC Update

Rick Lee: Thank you. Duly noted; we'll make sure that our next meeting is scheduled accordingly. So, I wanted to tell you that many of you know Shelley Wilson left DHEC; she'd been with us for a long time; she served as our representative from DHEC for many years, longer than I've been here. But, fortunately, she's going to be replaced by a lady who I actually just met here face to face but whose reputation for good management and for collaboration and team building is known throughout her organization. Myra Reece is the Director or Environmental Affairs for DHEC, and I have to tell you a little funny story. When I

talked to her after Shelley left, we were talking on the phone about her coming to the meeting and what we would do and all that, and I told her on the phone and I said, "now you know, we have to continue the tradition that we've had all these years," and she said, "well, what was that?" I said, "well, we hold these hearings in line with the old English style courtroom," and there was silence, and I said, "you have to wear a wig, a big, white wig on your head, so be sure to go see Shelley and get the wig from her." And there was a pause on the phone, and she said, "Really?" And I couldn't carry the joke on any further, but she was willing no matter what, she was coming to the meeting, so I'll turn it over now to Myra. Myra, thank you very much.

Myra Reece: Good afternoon. Chairman and members of the council, it is a privilege for me to be able to get to know you as a council, and I am greatly looking forward to supporting you and, as Rick mentioned, Shelley certainly, with her expertise and experience being a DOE liaison provided a lot of expertise, it's going to take several of us to fill those shoes. One of the members of the team that I have here with me today is Henry Porter, who is the Chief of our Land and Waste Management Bureau. And many of the key programs that play a huge regulatory oversight role of these facilities fall under our Bureau of Land and Waste Management, so Henry and I will be tag-teaming and supporting you as a council.

So, before I get into the details of talking, first, about the Barnwell Disposal Facility and give you a status of the license appeal update, I just wanted to refresh your memory a little bit as far as DHEC's role as far as regulatory oversight of the facility.



We have quite an extensive oversight function at the Barnwell site. We do have an onsite inspector that is there inspecting 100% of the shipments; we also have staff from our central office in Columbia who come out on a weekly basis and who do a very comprehensive inspection in looking at erosion control, looking at water management, vegetation control, inspections of onsite and off-site drainage. We also do a very comprehensive license inspection; the regulations require us to do that once a year, but we actually do it twice a year and those inspections are done, we do those unannounced inspections, and we're there for several days going through records and interviewing and any other things as far as oversight of the facility.

South Carolina Department of Health and Environmental Control

Groundwater and Surface Water Monitoring Program

- Chem-Nuclear - 180 sample locations
  - On-site wells
  - Off-site wells
  - Mary's Branch Creek
  - 4 times per year
- DHEC samples at least 21 of those locations
  - DHEC splits samples with Chem-Nuclear

The other area that I wanted to mention briefly is the number of the environmental monitoring locations that not only for the nuclear site has but us as well. The facility has 180 sample locations, on-site, off-site wells, sampling locations at Mary's Branch Creek. They do sampling four times per year. We sample at least 21 of those locations and we split sample with the facility.

South Carolina Department of Health and Environmental Control

2018 Annual Trending Report

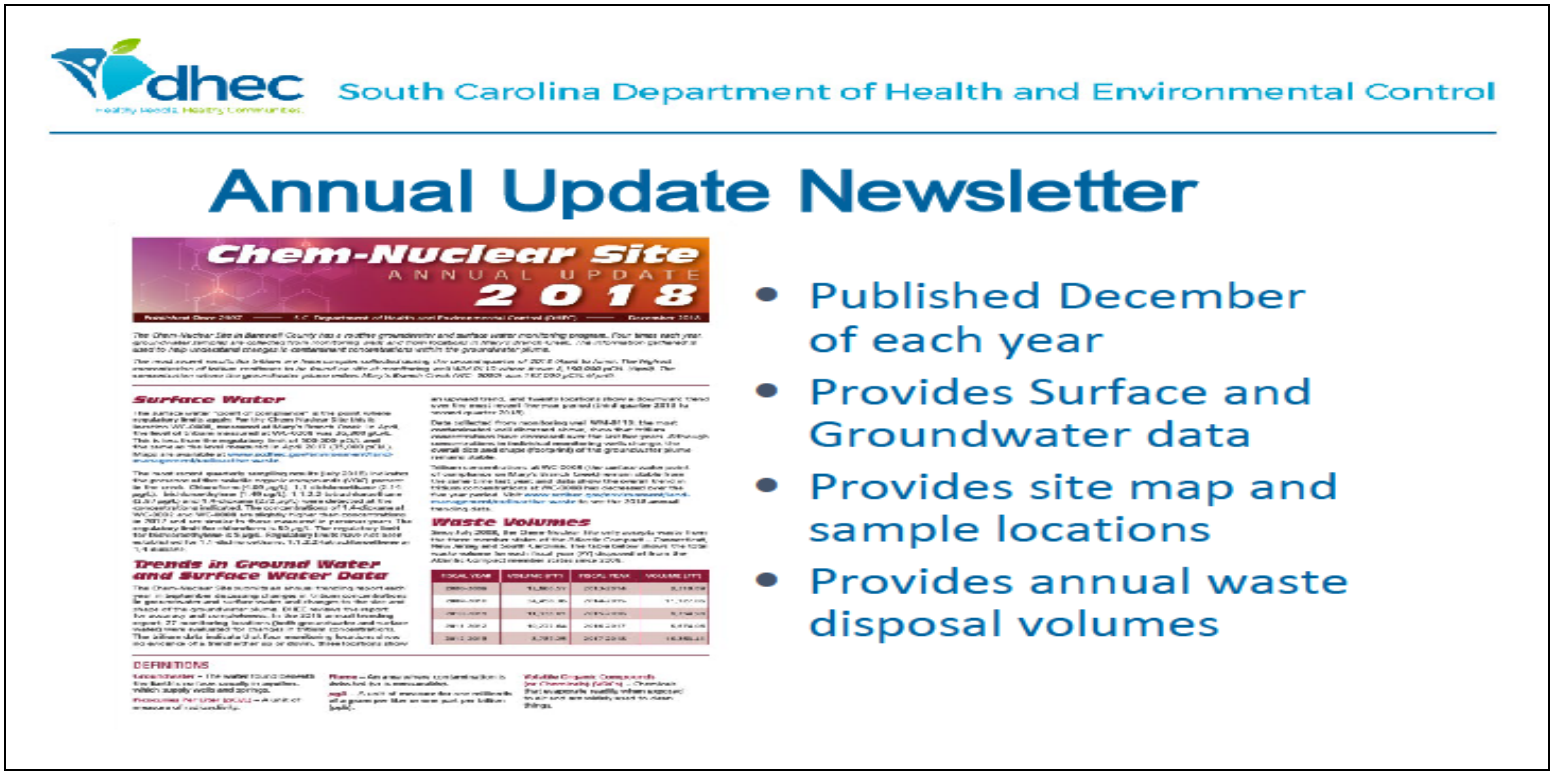
- 27 locations
- 3 – upward trend
- 20 – downward trend
- 4 – no trend
- Trend Data – most recent 5 year period

Tritium levels are closely monitored at the surface water compliance point to be sure they do not exceed regulatory limits

Report indicates Tritium levels are stable at compliance point and well below the regulatory limit.

One of the requirements of the facility is to submit an annual trending report to DHEC in September. And this report describes the changes in the Tritium concentration and changes to the size and the shape of the plume. So, this is just the data and the statistical analysis of the 2018 Annual Trending Report. In the 2018 report, 27 monitoring locations, both groundwater and surface water were evaluated for changes in Tritium concentration. The data indicates that three locations were showing an upward trend, twenty were showing a downward trend, and four locations showing no evidence of trend either up or down over the most recent five-year period. And, as I mentioned, this analysis just indicates that the footprint of the Tritium plume

remains well-defined and stable and, additionally, the 2018 report indicates that the Tritium levels measured at the surface-water compliance point are stable and well below the regulatory limit.



Once that data is submitted to us, that report, we publish a DHEC newsletter in December of each year, which includes the surface and groundwater data, site maps, sample locations, and additional annual waste disposal problems. And you can find copies of those newsletters on the DHEC website.

The decision that you've heard of recently, that might be of interest to you, is the South Carolina Supreme Court, it issued a decision on March 27th, 2019, about a month ago, concerning the license renewal appeal for the Sierra Club. Of course, it's been in litigation since 2004. And, what we've been doing since then, our program staff, in land and waste management have been meeting with our Office of General Counsel and certainly going through the Order and having those discussions about things that we need to be clearer on and to ensure that we meet the Supreme Court's decision within the Order.

South Carolina Department of Health and Environmental Control

License Appeal Update

- March 27, 2019 – After oral argument in April 2018, SC Supreme Court issued decision on license renewal appeal from Sierra Club (in litigation since 2004).
- Supreme Court focused on two subsections of R.61-63: (1) minimize migration of water onto disposal units, and (2) minimize migration of waste or waste contaminated water out of disposal units.
- Court found the record lacked sufficient evidence/consideration of methods to minimize rainwater from falling into open disposal trenches and seeping into groundwater.
- Court clarified they were not requiring complete prevention of rainfall onto disposal trenches, but migration of water should be minimized.
- Court did not require any specific actions by Chem-Nuclear or DHEC to achieve compliance.
- DHEC will be meeting with the facility to discuss our next steps to comply with the Supreme Court's decision.

So, some of the points that you might be interested in, from a summary standpoint, the Supreme Court focused on two subsections of Regulation 61-63, one was to minimize the migration water onto the Disposal Units, and two was to minimize the migration of waste or waste contaminating black water out of those disposal units. The Court found the record lacked sufficient evidence or consideration of methods to minimize rainwater from falling into the open trenches and seeping into the groundwater; the Court clarified they were not requiring complete prevention of rainfall onto the disposal trenches, but migration of water should be minimized. And the Court did not require any specific action by Chem Nuclear or DHEC to achieve compliance. As far as next steps, we will be meeting with the facility to discuss next steps to comply with that decision, and I would anticipate that happening maybe in the next two to three weeks.

Switching gears to the Savannah River site Liquid Waste update. DHEC, EPA and DOE agreed to extend the suspension of the liquid waste milestones as a result of ongoing issues.

dhec South Carolina Department of Health and Environmental Control

2019 Suspension Agreement

- DHEC, EPA & DOE agreed to extend the suspension of the liquid waste milestones as a result of ongoing issues (April 16)
  - Programmatic changes in the SRS liquid waste services requirements, which led to the cancellation of the liquid waste services solicitation for a new operations contractor.
  - Startup of SWPF delayed, scheduled to begin hot commissioning by 12/31/2019
- Will initiate discussion for the negotiation of the milestones within 30 days of DOE issuing notice to proceed with new LW contract

This was in accordance with the 2017 suspension agreement where the three parties began discussions to have kind of a touchpoint to cover the status of the delays that were still existing as far as the startup of the salt Waste Processing facility and the programmatic changes in the liquid waste service requirements and the liquid waste contract. We all agreed, DHEC, EPA and DOE, that this was a good thing to go forward with. We, DHEC and DOE have signed the suspension agreement; it's in Atlanta now awaiting the signature of the EPA, and we will initiate discussion for the negotiation of milestones within 30 days of DOE issuing the notice to proceed with the new liquid waste contract.

dhec South Carolina Department of Health and Environmental Control

SRS Agreed to:

- Remain committed to the focus on waste removal from **high risk** Type I & II tanks
- Continue accelerating F Tank Farm operational closure
- Accelerating other environmental projects listed in FFA

Now, in exchange for an extension of the suspension agreement, SRS agreed to the following: to remain committed to the focus on waste removal from high risk, Type 1 and Type 2 tanks, continue accelerating F tank farm operational closure and accelerating other environmental projects which were listed in the FFA.

Switching to the Westinghouse Nuclear Fuels Agreement, I want to give you a little backdrop as far as what we've been doing since the notification of the June 2018 release.

dhec South Carolina Department of Health and Environmental Control

DHEC's Response (June 2018 Release)

- Notified of leak inside process building – investigation begins
  - DHEC and NRC oversight
- Parallel track and priority – addressing community concerns

As you recall, Westinghouse notified us of a leak inside the process building in July, and immediately, we and NRC and Westinghouse started working very closely together to ask questions and working together to set a path forward to investigate exactly what happened, and as we were doing that, we had a parallel track in priority which was really addressing the concerns of the community especially the Hopkins community that is located nearby the facility.

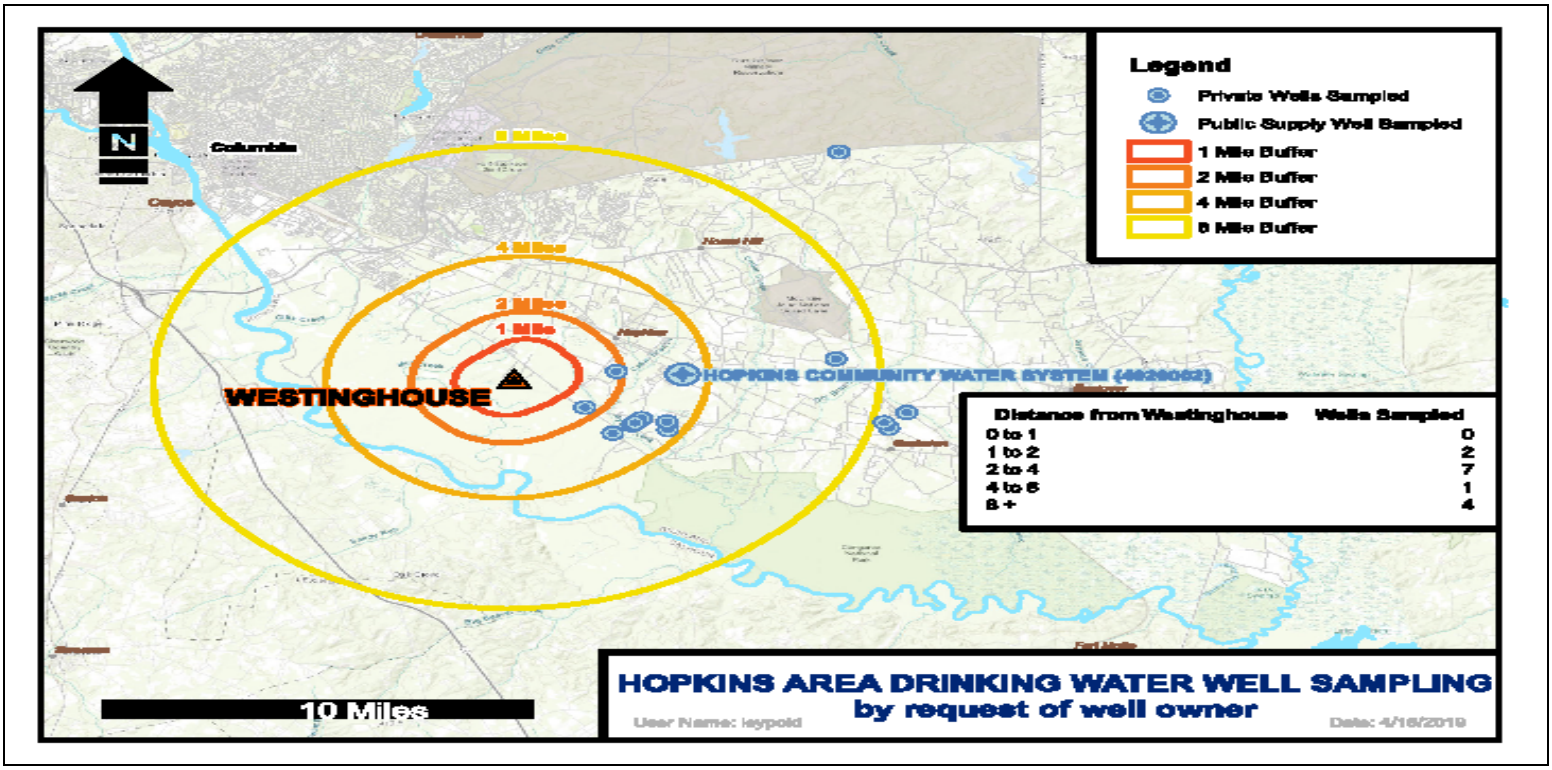
dhec South Carolina Department of Health and Environmental Control

Community Response

- Participated in several community organized public meetings
- Offered private well sampling in Hopkins/Lower Richland communities
  - Analyzed for a full suite of potential contaminants – including indicators of impact from a release from the facility
  - Results: 13 private wells and 1 community system
    - All (except 1 – naturally occurring radium)below EPA drinking water standards
    - No direct impacts from the facility
    - Richland County has also conducted well testing

We participated along with Westinghouse and NRC in several community organized public meetings to try to answer any questions, talk about next steps, to listen to their concerns, and set a path forward. One of the biggest concerns that we heard from the community was, well a couple of things, one was feeling they wanted us to look for ways that we could improve the sharing of notification and information to community members, more frequently with releases, that may occur not only with this facility but with other potential sources in their community.

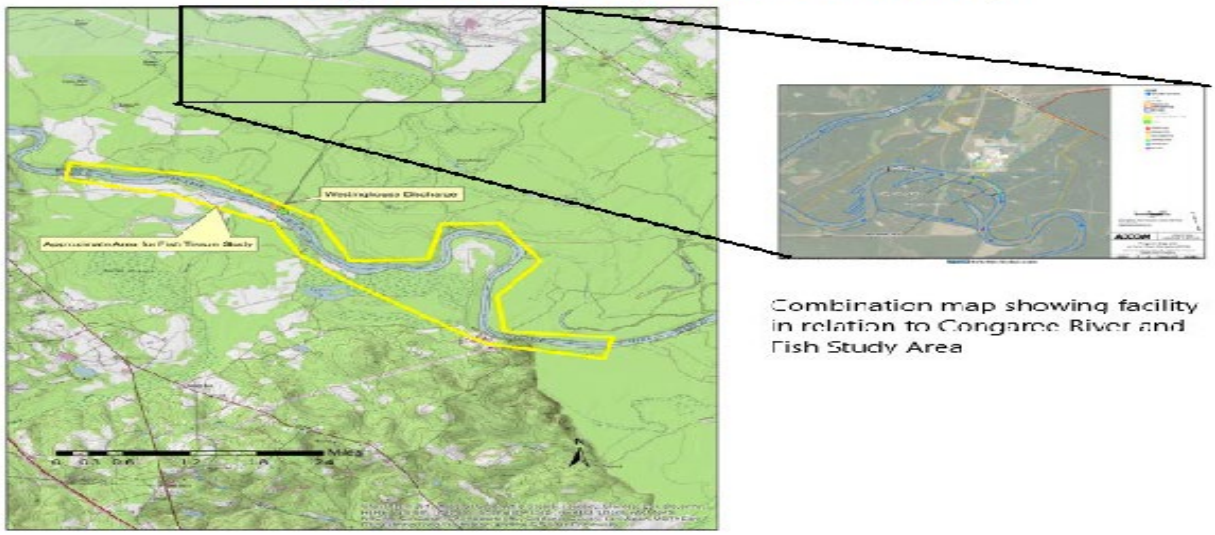
And they also were very concerned about private wells and any impacts to their water that's being supplied through the private wells. And so, we offered to the Hopkins community to come in and do free testing and not only look for indicators to answer their questions, could that release or any activities out at the site could that be impacting my private well, we went ahead and did a full sweep of potential contaminate. So many times, we have community members who have private wells, and don't realize the importance of maintaining that well and keeping it disinfected, you know, going through the disinfecting occasionally to eliminate any risk of bacteria and things of that nature and especially from flooding risk as well. And so, we actually had three residents, private well owners, that expressed interest in the testing, we also were aware of one community system in the area that we reached out to test and we were very happy to see that all of the results came back well within the EPA drinking water standards for the full sweep of contaminates that we checked for; I believe there was one private well, that we detected a hint of naturally occurring radium and because that has a tendency to kind of fluctuate, we have gone back and done some re-sampling at that private well, so we can determine if we need to advise that homeowner to install some type of filter or to look at making some changes to their well. But, at the end of the day, we were able to conclude that there were no direct impacts from the facility. I am also aware that Richland County has reached out to the community and offered some well testing as well. I think that they ended up sampling maybe about 30 wells in the vicinity and the results of those came back the same as ours did, as our round of sampling did as well, meeting the EPA standards and no hits of uranium.



This is just a map just for later for your reference, it lists the locations of the well testing and you can see, we were very open to address any concerns even as far as homeowners who may live eight miles away from the facility. We took it as an opportunity to educate them on proper well maintenance and, like I said, the results were really what we were expecting especially knowing that these wells are up gradient from the facility and from the ground water flow.

South Carolina Department of Health and Environmental Control

Upcoming Fish Tissue Study
- requested by community



Combination map showing facility in relation to Congaree River and Fish Study Area

Another concern that was expressed by the community was impact to the Congaree river and possible impact to fish, so we have agreed to start a new study as far as fish, and we will be starting that study probably within the next month or so. We are going to continue to reach out to the Community Advisory Group that exists and keep them updated, share our samplings plan, as we move forward to continue to address any concerns they have.

South Carolina Department of Health and Environmental Control

Consent Agreement

- Executed between DHEC and Westinghouse Nuclear Fuels – effective February 26, 2019
- Provides a unified approach to reporting, investigating and remediating any chemical or radionuclide releases from site operations to groundwater, surface water, soils or sediments, both historically and if a future release is discovered.
- Remedial Investigation workplan due end of April

As far as the consent agreement, you may be aware that we have executed a consent agreement, fully executed an agreement between us and Westinghouse that went into effect February 26, 2019. This, I do want to say, that the new management at Westinghouse has been very committed and eager to work with us in addressing the questions and the concerns that the community have and some of the questions we have about historical releases at the site and one of the most valuable things that we have happening and are considering is that it's going to provide this very unified, holistic approach to reporting, to investigating, and remediating all the chemical, radio-nuclide releases in site operations to all media, groundwater, surface water, soils, or sediment, and not only to allow us to have a very good understanding what is happening historically at the site, but it will allow us to establish a protocol moving forward for any potential future releases. And part of that consent agreement, Westinghouse is to submit to us by the end of April sometime next week a remedial investigation work plan.

And, with that, that concludes my report.

Dr. Carolyn Hudson: I have a couple of questions. One, Chem Nuclear is supposed to lower the migration. What is there exact plan to do that?

Myra Reece: Well, I think that's going to be part of our next steps. You know, as far as us sitting down with the facility, and have those discussions as far as what we need to do to satisfy the order. And certainly, I know that the court's decision was based on the record back in 2004; I do know there have been some process improvements since then, and we will be getting in to those discussions with the facility to see what we need to do, what the facility needs to do, to comply with that order.

Dr. Hudson: Thank you. My second question is, Westinghouse, I see all the testing is done of the wells, and the Congaree River, I'm glad to hear about the fish study, but it's also right at the edge of the National Park, which is so, so fragile; what's being done to test for migration there?

Myra Reece: Well, you know, that's, and you bring a good point, I think that's one of the things that we want to look and see where we feel like we've got some gaps. We know there's a lot of data out there. Not only do we have some data, but the site has some data, the Congaree River keeper has data, NRC is the recipient of a lot of the data that comes from Westinghouse. And, so I think us moving forward, expanding into the fish tissue is that we'll look and see if there are any other gaps so we can have a very comprehensive review and we can have data to support the questions and be able to answer those questions to stakeholders and the general public and the community as a whole.

Dr. Hudson: Thank you.

Dr. Vincent Van Brunt: I have a question about whether there's any interaction of understanding within the tritium, basically evaluations from Port Wentworth in Georgia. In other words, that's been a site where we know that tritium has been evaluated, particularly associated with the Savannah River. I was wondering if there was any, looking at tritium releases in general and looking at comparisons of your data. The other thing is that there are a lot of industries that basically dump into the Congaree River, such as DAK, and many other operations. And I was wondering is there any integration at say, looking at radioactive contamination from anyone else?

Myra Reece: I think that's, and I'm going to look to Henry to see if he's got anything to add to this, but you're right, I think one of the things that we do so many times is just look at one facility at a time with the impact, but we need to really look and see what additional impacts from other sources we may have. For instance, I know when you talk about the Westinghouse facility, we have a Superfund site that's in that vicinity. We had been following and watching very closely any impacts to groundwater contamination from that site, and that was one of the reasons when we tested private wells in that area, we also looked for volatile organic compounds that could be potentially coming from that source. So, we do a comprehensive evaluation. Now, your question about Port Wentworth, I don't know if you've got any information Henry, about that.

Henry Porter: The only thing that I'll add is that, particularly for Chem Nuclear and the tritium plume at Chem Nuclear, the outfall for it is into Mary's Branch which is a tributary that ultimately leads to the Savannah River. Years ago, Chem Nuclear did some modeling to see based on the concentrations that were reaching Mary's Branch, what kind of impact that would have on the Savannah River, and then ultimately that would be potential impacts that could be down river. And they were not significant, especially compared to the amount of tritium at the Savannah River site, and the impacts from the Savannah River Site. So, that has been evaluated, and I'm sure there's been, I'm looking at Wayne, there's probably some additional work that's been done, more recently, to look at what kind of impacts the tritium is out-falling in Mary's Branch has. As far as other industry, so the Clean Water Act allows us to regulate lots of different pollutants. It does not allow us to regulate radio-nuclides. So, facilities that have radio-nuclides and might have a release of radio-nuclides, through a wastewater discharge or something like that, are regulated either through the nuclear regulatory commission or through our agreement state program. So, if we have a facility in the state that would have a release of radio-nuclides at an industrial facility, not non-DOE facility but an industrial facility, those releases would be regulated through either the NRC or through the Agreements State Program.

Dr. Van Brunt: But you would presumably be able to detect them at some place like very down river, like Port Wentworth?

Henry Porter: Yes, and in fact we have a comprehensive environmental program that is funded by DOE that, a large component of that is monitoring the Savannah River. I think, Myra, you may remember better what the lowest monitoring point is, but I think it's close to the Jasper?

Myra Reece: Right. Actually, and I was part of establishing that program years ago when I was in the Aiken District office. But we wanted to set up an early warning trigger for the drinking water intakes daily downstream, Beaufort, Jasper water intake; and we're able to model and come up with triggers based on the river in different locations where we could kind of predict and we have kind of established a trigger. But once we through our monitoring, through this program, start detecting, and we check it on a daily basis, if we see levels that are starting to peak up, then we notify downstream, Beaufort/Jasper, and so if there were an extensive or significant release, they would be able to go to storage for a short period of time and certainly it includes notification downstream beyond that as well.

Rick Lee: Any other questions folks?

Scott Batson: Real quick, on the Barnwell site, is the profile of the plume, does it indicate that this is an on-going, continuous type input, or is it related to an event?

Myra Reece: I'll start that and Henry, you chime in, but based on the data and looking at the trends, over the last decade or so, the levels are continuing to trend down. And so, the shape and the characteristics of the plume are vey stable, and continue to be well-defined, so that suggests that the majority of the contamination is really coming back from the practices back in the 70's and stuff. When we look at some of the locations within the plume and some of the data occasionally, we'll see some of those concentrations kind of fluctuate a little bit, but that's a natural thing, but the important thing that really resonates with us, that compliance point. For years I think, the level we saw it steady around 2000, and the year 2000 we saw a steady value I think 100,000 picocuries per liter. Right now, we're seeing it continue to decline, and I think of the 2018 data report, it's around 37,000 picocuries Overall, we're seeing, when you look at the statistical analysis of all those monitoring locations, and trying to characterize the plume, it's continuing to trend down.

Scott Batson: That would indicate that current practices already reduced the amount of contamination that's entering.

Myra Reece: That's correct.

Henry Porter: What I'll add to that is certainly the source of the tritium for the plume is the waste that's been disposed of in the disposal site. And years ago, we recognized that there was a plume and looked for the best mechanism that could be used

to try to control that source. And the method that was chosen, which is typical of landfills, is to prevent migration of water through the waste by putting a comprehensive, multi-layered cap which is designed to have very low permeability which basically cuts off that source of water moving through the waste that carries the tritium out to the groundwater. So, that's what's been done to address that. I think about 90% of the site now has a final cap on it so in the early years, it was just a soil cover that was put on the trenches. And, so there wasn't much really that prevented migration of water through the disposal itself but now all of the trenches, including those very early trenches have these multi-layer, low permeability caps.
Scott Batson: So, based on the fact that the profile indicates that levels are actually decreasing in terms of what's currently going into the soil, did DHEC factor in those improvements that are already in place as you set the plan going forward?

Myra Reece: Yes.

Rick Lee: Thank you. Any other questions?

Dr. Musa Denjaji: How often are the caps changed? How long? What's the life span?

Henry Porter: The cap has a design life, um,

Wayne Inabinett: The design for the cap includes a bed night matting that goes down after we do soil backfills and compaction when we put down bed night matting, then we put down 60 ml plastic, and then we put a layer of soil and vegetation over that. When we get to my presentation, we will see some of those areas that have been capped; they have a toe drain around it so any rainfall coming down hits that 60 ml plastic and it sheds off and we have drainage features and collection ponds on the site so all runoff will be collected by those.

Westinghouse Fuels

Rick Lee: Okay, thank you very much. That was a great presentation. We appreciate it. Good information. We'll see you in October. So, next up is Westinghouse, I don't know if it's Mike or Ed who are going to present. We're looking forward to hearing good progress from our last meeting where we did have a briefing from Westinghouse on all the steps they were taking with regards to communications with their neighbors and process improvements in the plant.

Mike Annacone: Thank you Chairman Lee and Members of the Council. It's a privilege to be here with you today and talk about the progress that we're making and answer your questions that you may have for us. I know Ed introduced himself earlier, but I do want to provide a little bit of an introduction for Ed. Ed has 37 years of experience in the nuclear industry most of which has been in the operating industry. He's been a Radiation Protection Manager, Senior Reactor Operator, an Operations Manager, Plant Manager, Director or Site Operations, so extensive leadership experience, and I've had the fortune of working with him for a number of years and he did willingly come to Columbia to work with me here and help me build and implement the excellence plan that we shared with you last time. And, so recently, I've moved him over into our Environmental Health and Safety Organization to apply his operational and leadership experience to further build and develop that organization.

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Overview: Major Environmental Improvements & Progress

- Spiking Stations & Contaminated Wastewater Line
- Conceptual Site Model & Remediation Strategy
- SCDHEC Consent Agreement
- U.S. NRC License Renewal
- Community Engagement

Continued, enhanced commitment to transparency and excellence

Westinghouse

2

So, today, I'd like to provide for you an overview of our performance in these areas. We have made significant progress since the last meeting. And, beyond addressing the specific issues that started this off, we have self-identified a large number of improvements that are going to sustainably strengthen our performance. At the heart of that, in the environmental arena is our conceptual site model, and our remediation strategy document. These two things, which I'll cover in a little bit more detail shortly, have become the foundation for our regulatory commitment in our path forward. For both of our regulators, DHEC and the Nuclear Regulatory Commission. And I think it's important to note, as part of our commitment to be excellent stewards of the environment and public health and safety, it's a very important value for me personally, that we're working to build into the organization is the importance of transparency, and frequent interactions with our regulators to ensure that we are providing them with all of the information that they need to have to support them in meeting their obligations to have public health and safety and I believe that we've done an outstanding job of supporting that part of our value. And I also will provide you with an update today on the progress we're making with bettering the agent with the local public in the Hopkins area and the local area.

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Spiking Stations & Contaminated Waste Water Line

Spiking Stations

- Completed remediation for Spiking Station 2
- Filled excavated area with flow fill
- Installing improved Spiking Station
- Plant's chemical area treated as Operable Unit under Consent Agreement.
  - Recognize there is contamination underneath the chemical floor
- Plans for Spiking Station 1 replacement
- This and future remediation handled through site conceptual model, and under the Consent Agreement
- Expect Spiking Station 1 to be part of the whole operating unit decommissioning unless significantly different contamination is noted in testing

Contaminated Waste Water Line

- Completed an Inspection of lines outside of the building that tie into the contaminated waste water line; no issues
- Will be addressed under the Consent Agreement

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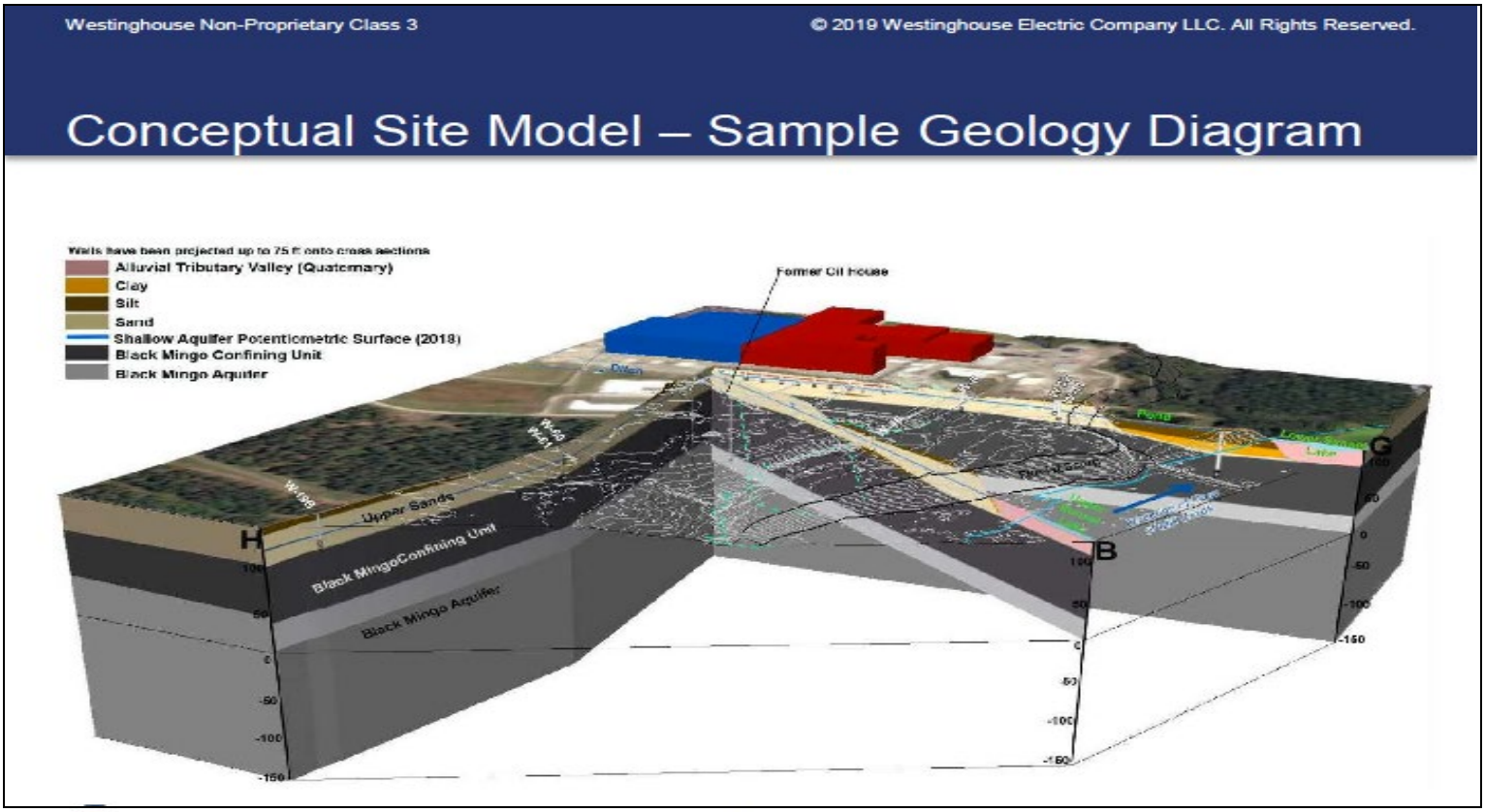
Remediation activities monitored by DHEC through Consent Agreement

So, as you recall last time we talked about issues with a spiking station inside the plant and then a contaminated wastewater line that starts underneath the plant building and then runs outside the plant building. With regards to the spiking station, we have completed remediation of the soil on the spiking station. We reviewed those results with DHEC and DHEC has reviewed and agreed upon the status of that remediation. We have filled that area with what's called flow-fill, so it's been back-filled, we've replaced the floor, and we are in the process now of installing re-designed, improved spiking station. I may have mentioned in our last meeting some of the changes, but basically, there will not be a liner underneath the spiking station, so we don't have an issue where any leakage is hidden underneath a liner; we've put a floor that's designed to handle that kind of acid environment so it won't leak through the floor. We've also reduced the connections and valves in the spiking station, and reduced leak points, and we've also installed and will be installing drip pans in that area. So that work is beginning to install the new spiking station.

Another important point with regard to our overall progress going forward, and this is captured in our consent agreement, we acknowledge not only the spiking station area but other areas underneath the chemical side of our plant that there's the potential or has been contamination underneath those floor areas. So, as part of our consent agreement going forward, we're treating the entire plant building as what's called an operable unit, and our remediation strategy that we're developing, that will be reviewed and approved by DHEC, treats that as one source, and we develop the necessary strategies to account for that as one source instead of individual collective sources in the building. We will continue to progress, as I told you last time, we have two spiking stations, so once we have the second spiking station back in service, we will remove the remaining spiking station and we will sample the soil, and then we'll work through the consent agreement to disposition whatever we find there. We do continue on with the actions that we took that I presented last time to further monitor the existing running spiking station to make sure that it is not a source of problem and those actions have been effective to date.
For the contaminated wastewater line, if I recall at the last meeting, we kind of broke the story with you that we had found a uranium issue localized in a couple of the wells that we drilled. We have since finished all that work and submitted that for review by both regulators, and we also have completed inspections of all if the lines in an out of my buildings that connected into that line just to sure there were no further issues associated with that contaminated wastewater line, and we did not find

any other issues. And again, the overall strategy for the contaminated wastewater line will be integrated to the plant building as part of that operable unit through our consent agreement.



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The next slide is a pretty busy, interesting picture; I don't intend to go into a lot of detail on it, but this is, as I mentioned, one of the key improvements that we made is the development and implementation of a conceptual site model. In the past, the way we were monitoring our groundwater contamination was through our wells; we have an extensive network of wells on the site, and what we would do is, we would plot graphically well results, and over time we would watch the "plume" so to speak move around on the site. What a conceptual model allows you to do is you can see from the picture, it's a 3D graphical representation of the topography of the site and then the different geographic features that are underneath the site, and by having that, what you're able to do is to better prevent how contaminates may flow around the site over time, and based on flow rates and features over what time span. So, it becomes a much more accurate predictive tool for the future, to better inform your decision making around remediation strategies. So, we have adopted that tool; it is in place in Columbia, and as I said, it's really foundational, along with a written remediation strategy document that defines different levels of contaminates that you would find based on industry operating experience of what kind of strategy should you adopt based on that. So, those two things in tandem put us in a very strong position to understand what our challenges are and to make sure we're making the right decisions and, again, all of that is integrated fully through our consent agreement with DHEC, and as part of our work with the NRC, helping them shape their decision making.

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SCDHEC Consent Agreement

- Structured process with DHEC oversight
- Uses conceptual site model and remediation strategy to inform the process
- **Next step**: submit remedial investigation work plan
  - Comprehensive – In addition to our environment program we are proposing:
    - 29 new permanent wells
    - 11 lithologic soil borings
    - 13 additional soil samples
    - 18 sediment samples
    - Complete round of testing for the existing groundwater well network
  - Informed by conceptual site model
  - Gain DHEC's approval – drafts shared to allow shorter review time, enabling closer start-time
  - Work to begin within 15 days of approval

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Future remediation works through legally binding Consent Agreement

As Myra said, we have entered a consent agreement with South Carolina DHEC; it's a very well- structured process to ensure that we're engaging effectively with them, and allows them to provide the necessary interactions, engagements, and oversight of our performance to ensure that we are meeting our obligations. I've already discussed the conceptual site model. As Myra said, we'll be submitting a remediation investigation work plan, that's the next step as part of that agreement, and in that plan, we basically will document a series of actions that we propose that we do to continue to further understand, develop and set a foundation for future actions. As you can see, we're proposing a large number of additional wells, permanent wells on our site, and a number of different soil borings and samples, to help characterize the site based on what we're learning from our conceptual site model. We will also complete additional testing of our existing groundwater wells, and we will provide that information to DHEC and then based on their review on that, when that's done, our next step as defined in our consent agreement is to issue what's called a feasibility study which is a series of evaluations that have to be performed with very set criteria around things like human health and environmental health considerations, compliance, effectiveness and permanence of actions and such, there's others. We provide that to DHEC once they review and approve on our recommendations there, then we are required, they provide what's called a 'Record of Decision' that they concur or hear some things that they want us to do differently, and then once that's approved by DHEC, we're obligated to provide a written action plan to DHEC on what we are going to do to address what was learned from that event. So, that's the rigor of the process that we've consigned up for through the consent agreement. I just wanted to share that with you.

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U.S. Nuclear Regulatory Commission License Renewal

- Received and provided answers to requests for additional information (RAIs)
- Submitted updated Environmental Report and Renewal Application
  - Past and present issues are being addressed through the consent agreement, which requires development of remediation plans
  - To ensure a consistent response if any future issue would arise, we have committed to:
    - A living conceptual site model
    - Implementation of remediation strategy process
      - Structured Decision making process
      - Informed by the *Industry Groundwater Protection Initiative* (NEI 07-07) and *Reg. Decommission Planning During Operations* (USNRC Guide 4.22)

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Regarding the Nuclear Regulatory Commission, as you know, we were in the process of requesting the renewal of our operating license, the operating license for the Columbia Fuel Facility currently expires in 2027 so we were doing it early, for a variety of reasons. As a result of the spiking station event and the information we learned around the contaminated wastewater line, NRC had put the approval of our license extension in abeyance pending a request for additional information to allow them to asses this new information and determine if it changed their posture on their evaluation of our environmental impact. So, where we are at in the process with them is that we have provided them those answers, and we are in the process of working with them on next steps. Basically, we've also submitted an updated environmental report and an updated license renewal application based on our own assessment of the information that we have and basically where we are at is that we're working with them on next steps. I think it's important too, as I wrap up and before I shift to the public interfaces, improvements that we've made, you know the consent agreement, I think, really does an excellent job, really helping make sure that we are effectively managing the past and today, and then in conjunction with our living conceptual site model remediation strategy document, by consent agreement, our work with the NRC ensures that we are doing the right thing long into the future.

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Community Engagement: A Structured Approach

- Lower Richland County Community Advisory Committee
  - Engaging with local leaders and community members to establish an open, transparent dialogue
  - Providing regular updates to leadership, including on Consent Agreement
  - Working with LRCAC to develop pathways for improving nuclear literacy in the community
- Established an Employee Community Engagement Council
  - Building on and expanding existing site-based programs
  - Driving ongoing community engagement, volunteer opportunities and local corporate social responsibility
  - Finalizing Employee Community Engagement Council charter
- South Carolina State University
  - Continue to work on improving connections between Columbia Fuel Fabricating Facility and the University
  - Exploring the potential to work collaboratively on developing nuclear literacy programming for the community
- Still to Come: Establishing a Community Advisory Board
  - Foster two-way communication between Westinghouse and stakeholders
  - Based on best practices across Westinghouse and Industry

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We continue to work toward stronger community relationships

And then lastly, on the community, a number of things that we're working on since we met last, we've had several interactions with the Lower Richland Community Advisory Committee, we've had several face to face meetings, and we've also had routine dialogue with them, sharing with them information as it comes up, for example, we shared with them, at the time that we were issuing the signed consent agreement that we had entered that consent agreement and high level what it was about, there were also some other issues on the site that we had shared information with them on, so we are continuing to foster that relationship with that group. We have established an employee community engagement council that's working to help shape future activities for our engagement with the community. We're working to shape an ongoing interrelationship with South Carolina State University based on some interfaces that we established at our last meeting while we were at SC State University. So, we continue to work to build that relationship, and we still have work to do to get our Community Advisory Board established. So, with that, basically I'll wrap up. We do remain committed to operating my facility at the highest standards and placing a high priority on safe, efficient, and excellent operations. We discussed the conceptual model our consent agreement and the ongoing work with our excellence plan to sustainably improve our performance as we go forward and, in total we believe these agreements that we're making are proactive to protect the health and safety of the public and through the improved communications we're making with the public, we believe we're strengthening our posture as good stewards of the local community.

James Little: I've got a couple questions. One deals with what regulatory framework are you dealing with there? I mean, you kind of reference as to what it looked like, operable units, and a rack closure plan. What's the regulatory framework you're operating under with DHEC and the NRC?

Ed Willis: So, the consent agreement closely mimics the serpla process.

Jim Little: So, you've got a consent agreement with DHEC, is NRC aware of that party to that consent agreement?

Mike Annacone: They are aware of the consent agreement and all of its contents. And so, what we're expecting from the NRC, the way the NRC is regulating me will be through my license.

Jim Little: Do you get a regulatory order or something?

Mike Annacone: No, we don't. We have no NRC regulatory violation or issue related to these items, so the way the NRC is dealing with us on these issues is through our license renewal. They've already completed an environmental assessment of my facility as part of the original application we made for a license extension. What they've chosen to do is hold that process, assess this new information, and then based on that, based on the information that was provided to them and what they know that we're committed to is, do they have to perform an environmental impact assessment or not?

Jim Little: The reason I'm asking is that you've got about eight years to the end of your license term.

Mike Annacone: We expect that we would be getting our license extension either late this year or early next year.

James Little: Okay, last question I have is with respect to this model, is that something you prepared in house? With outside help?

Ed Willis: Third party experts and actually things that Mike had on the slide, we've previewed everything with Myra's staff a couple times to make sure we're not off reservation and we're on the right shooting line, so we're, we feel very confident.

James Little: Will that be part of the consent agreement and the license?

Ed Willis: Yes.

Mike Annacone: I think I mentioned it last time; I didn't highlight it as much this time, but we have throughout all of the work we've done engaged a number of external experts throughout this process. We wanted to make sure, given some of the challenges we've had in the past that we were informing our actions and our decisions. We've had at least 3 or 4 different organizations representing the experts helping us.

James Little: So, this circle like activity RAF**?** has, you can evaluate some options and costs and methods?

Mike Annacone: That's correct.

Ed Willis: And then on the NRC piece, and Mike talked about our license, there are commitments in that license application to continue with the conceptual site model for the length of the license as well as the remediation process that steps you through a well-defined framework of how we deal with any future issue that may arise.

Dr. Van Brunt: What is the status of the community advisory board establishment?

Mike Annacone: We have not officially started that work yet. We were focused on the Lower Richland Community Advisory Council, some of the local things that we did and our next steps are to move towards the bigger community advisory board.

Dr. Van Brunt: So, do you have a time frame for that?

Mike Annacone: I don't have that memorized; I will find out. It will be this year, I just don't remember what month we start that. It'll be in June or July, I just don't have a time frame.
Dr. Van Brunt: Okay, so it's sometime soon.

Mike Annacone: Yeah, it'll be 2019.

Ed Willis: We have met with the Lower Richland Advisory Committee which is a group of citizens a couple of times before Christmas and actually went through all the results from the contaminated wastewater line as well as the spiking station and then what our long-term plans were that Mike alluded to. Every time that we felt like we had pertinent information, we'd call and email the two co-chairs of that committee and we're actively looking to get another meeting with them face to face to talk about some of the things.

Dr. Van Brunt: The other thing is, you sell nuclear fuel to other countries?

Mike Annacone: We provide components. Yes, we provide components of fuel assemblies and fuel assemblies to international corporations.

Dr. Van Brunt: Okay. You've mentioned NRC, and you've mentioned information local, has there been any required communication exchange with other countries?

Mike Annacone: No sir.

Rick Lee: And I just a couple of things myself. One, how long is the extension that you're trying to get from the NRC?

Mike Annacone: We requested a 40-year license.

Captain Claude Cross: How long is your current license?

Mike Annacone: It expires in 2027, and the current term is twenty years.

Rick Lee: And the other thing is, I've had some experience with Community Action Groups that are involved in issues and the trend usually is a lot of involvement initially, and then it tends to fall off a cliff. Have you been able to keep a sustained interest in the part of the community?

Mike Annacone: So, we have had two meeting in the fall, one in the fall, one in the winter, and then we have been staying in touch with them with communications, so yes, there's been constant communication, we need to have a face-to-face meeting with them soon, but yes, we have been in constant communication with them.

Rick Lee: I can say myself and for the members here, we're thrilled to hear the progress you've made. And I have to say I respect the fact that you disclosed the issue you had, at our meeting, while the governor was sitting there, and have taken such aggressive action to get the problem resolved, so well done.

You had offered for us to visit your facility, I was going to suggest that perhaps we could do that at our October meeting. We could go first thing during the day, and then to South Carolina after.
Mike Annacone: We would be glad to host you.

Dr. Musa Danjaji: The advisory board that you intend to make, what will be the composition of this board?

Mike Annacone: The advisory board, community wise, will be the local political leaders, emergency response organizations, citizens, and then personnel from my facility.

Senator Tom Young: When we were in Orangeburg last October, there were some questions asked about the extent of the leaks. It was my understanding at that time that there were three legacy leaks – '08 leak, '11 leak, and the most recent leak. At that time, you did not know the extent of those leaks. Do you know as of today, the extent of those leaks?

Ed Willis: Yes. We know that there is nothing active at this point. One of the things we will be doing with the remedial investigation plan is that we will be characterizing the plume that is adjacent to the building. That's the uranium. The two wells that showed above the drinking water standard, we are going to be drilling additional wells to the west to make sure we fully interrogate that plume, and that's really the only thing we have left on those three leaks.

Senator Young: Do you know how large that plume is?

Ed Willis: We believe, based on the data we have, probably about 50 feet west of the building and that is about one ½ mile from the site boundary.

Senator Young: Is that from the '08, 2011, or 2018 leak?

Ed Willis: It's really hard to characterize based on what we're seeing. It's uranium and the percent of U-235 is about the same in 2008 and 2011, so it's pretty difficult to tell. My belief is that it's from the 2008 leak because it was the one closest to those two wells. It was about 18 feet from those two wells.

Senator Young: Has Westinghouse had to pay any fines or fees related to the leaks that were discovered?

Mike Annacone: We do not have to pay any fines for the leaks, but as you can tell from the slides, we are making a significant investment into our facility and our program, and our processes to strengthen. I think, based on our demonstrated commitment to do the right thing and make the significant improvement and investment in our environmental protection programs I think that that shows that commitment. Usually you get fined when you are not demonstrating ownership of a problem, or you are not making the right decisions, and a fine becomes more of a signal that we can't count on you or we don't trust you.

SRS Update

Rick Lee: Any other questions? Thank you, Mike.

Mike Budney: I'm going to start with the budget.

SRS Environmental Management Budget FY18-20

Savannah River Funding ($K)		FY18 EM Enacted	FY19 EM Request	FY19 EM Enacted	FY19 Req/Enact Delta	FY20 EM Request
SR-0011C	NM Stabilization & Disposition	323,482	351,331	332,947	(18,384)	342,958
SR-0013	Solid Waste	43,386	42,145	41,425	(720)	48,562
SR-0030	Soil and Water	81,199	83,110	73,612	(9,498)	62,618
SR-0041	S&M and Deactivation	20,699	25,815	28,390	2,575	26,324
SR-0042	Infrastructure & Land Mgt	14,194	15,035	13,086	(1,949)	10,151
18-D-402	EOC Replacement	500	1,259	1,259	0	6,792
19-D-701	SR Security System Replacement			10,000		
20-D-402	AMC					50,000
SR-0014C	Liquid Tank Waste	637,105	805,686	696,869	(108,817)	797,706
SWPF	Salt Waste Processing Facility	150,000	65,000	130,000	65,000	20,988
SDU#7	Saltstone Disposal Unit 7	30,000	41,243	41,243		40,034
SDU#8/9	Saltstone Disposal Unit 8/9	500	37,450	7,577	(29,873)	51,750
SDU#10-12	Saltstone Disposal Unit 10-12					500
SR-0100	Community and Regulatory	11,249	4,749	11,249	6,500	4,749
SR-020	Safeguards and Security	159,124	183,357	163,357	(20,000)	179,377
Total EM SRS		1,471,438	1,656,180	1,551,014	(105,166)	1,642,509

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Our fiscal year [20]19 budget was almost 100 million dollars higher than the previous year, which was a good uptick for us. Our request in [20]20, is about 90 million more than our previous year. In our process, we get a top line number from headquarters, that we are allotted to budget to and then we put our primary emphasis on getting the liquid waste mission done first. That is the main environmental hazard is with those tanks in the ground. And we are well covered for it in our [20]20 request. You can see we are up to nearly 800 million in our liquid waste process. That's up about 100 million from the prior year. And there is another line from the Salt Waste Processing facility. All that increase really reflects bringing on the Salt Waste Processing facility, which we predict will go to commissioning before the end of the calendar year. It involves both funds to actually run that facility and because that's going to take us from processing about 1 million gallons per year of liquid waste to initially, 6 million gallons per year, that requires us to prepare a lot more feed for that facility than we had to do in the past, so we'll be at any one time working 15 tanks down there simultaneously back and forth to get enough feed right, so we have to stay ahead of the game on the feed so that the processing facility can operate at the intended rate. Sometime later, after it's initiated, we will bring on the next generation solvent capability and that'll get us up to about 9 million gallons a year. And that will get us to a point where we think if we keep the funding going in our system plan, we can see the tanks essentially closed out by about 2037. So, that's what we're targeting.

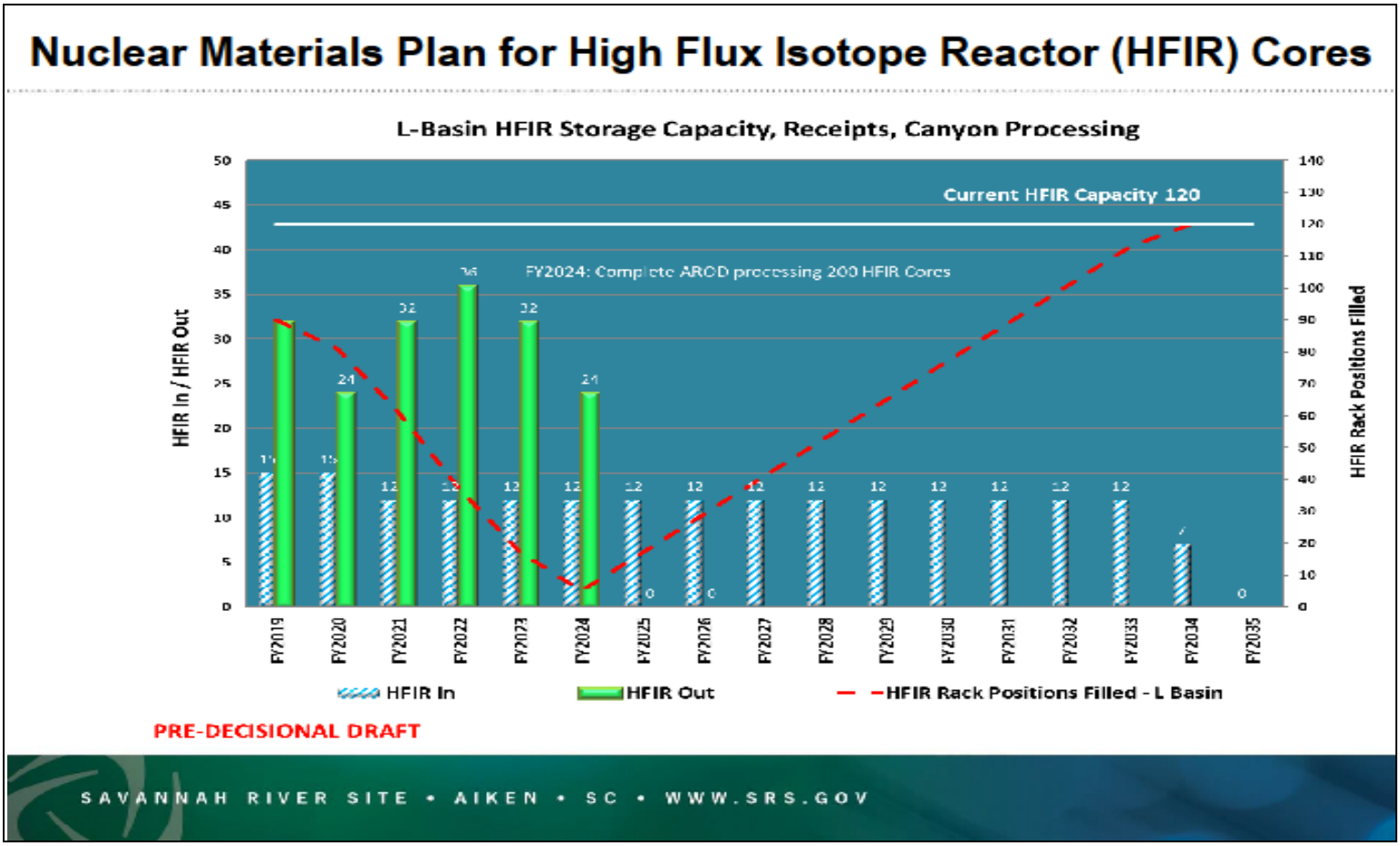
We've also, in coordination with DHEC, we've this fiscal year, we started up our first TCCR unit, the tank closure cesium removal process where we have a big ion exchanger that we can locate next to a tank and we take the feed, the material right out of the tank, right through the ion exchanger to remove the cesium that material for disposal. So that's been a successful operation getting that up and going, we only started about 2.5 years ago to bring that facility online and it's up and operating today.

Liquid waste is in pretty good shape and you also see that down there on one line there's a salt stone disposal unit 8 and 9. Our request is asking for funding to get those started and we've seen pretty good support for that so far. We need those tanks now to be built on schedule because it takes about four years, 3 or 4 years to build one of those tanks, but once the salt waste

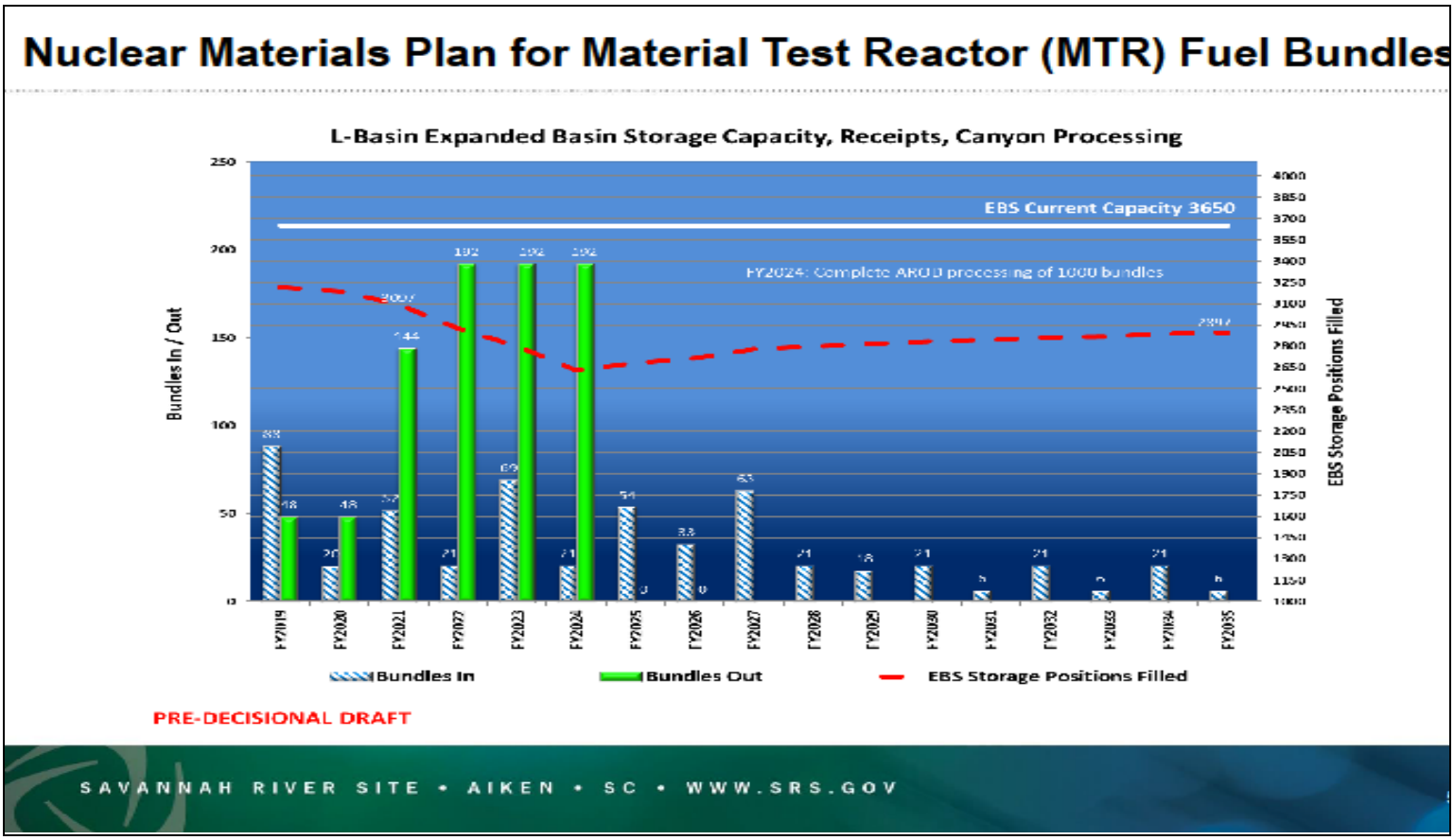
processing facility is up online and running, we're going to fill it in about 18 months. So, we've got a well-synchronized plan, to get this stuff done, so it's all got to stay together for us to hit that 2037 date. We've got to get them all processed; we've got to get the material processed to have some place to put it and these tanks here are where we're putting it, and we're making progress on Tank 7 down there, walls are going up on that and extensions, so everything's going along; we've got a good subcontractor, he's got a good schedule and keeping the costs down where it's supposed to be.

The other big item is H Canyon funding. You see that's about a 10 million dollar increase in our request from last year, that's what we can afford based on our top line. It doesn't actually increase the mission funding to accomplish that mission though. It'll actually be processing less material than it did the previous year, and I'll show you n the next couple of slides, that's just a function of how we can spread out the funding that we have. One of the reasons it doesn't increase our mission funding is because the stock market did not do well in December, and we have to use those numbers by law to calculate pension liability, and so that increased our liabilities, and we can amortize that over seven years, starting in the [20]20 Budget, so that takes a hit, in operations and ability. We're working with the NNSA we've all come to an agreement working with headquarters on a way of trying to stabilize this issue of that and think of future budgets. We're going to try to go to a level funding profile where we pay the same every year so we don't get big increases if we kept doing it the way we were doing it. The way we were doing the calculation before, we would have more significant increases coming up so we're going to try and do a level funding and keep that where we can understand what its ramifications are. We've got that bill to pay; there's no question we're going to pay it. But we've got to get it to where we can predict what's happening. So, those are the two budget issues.

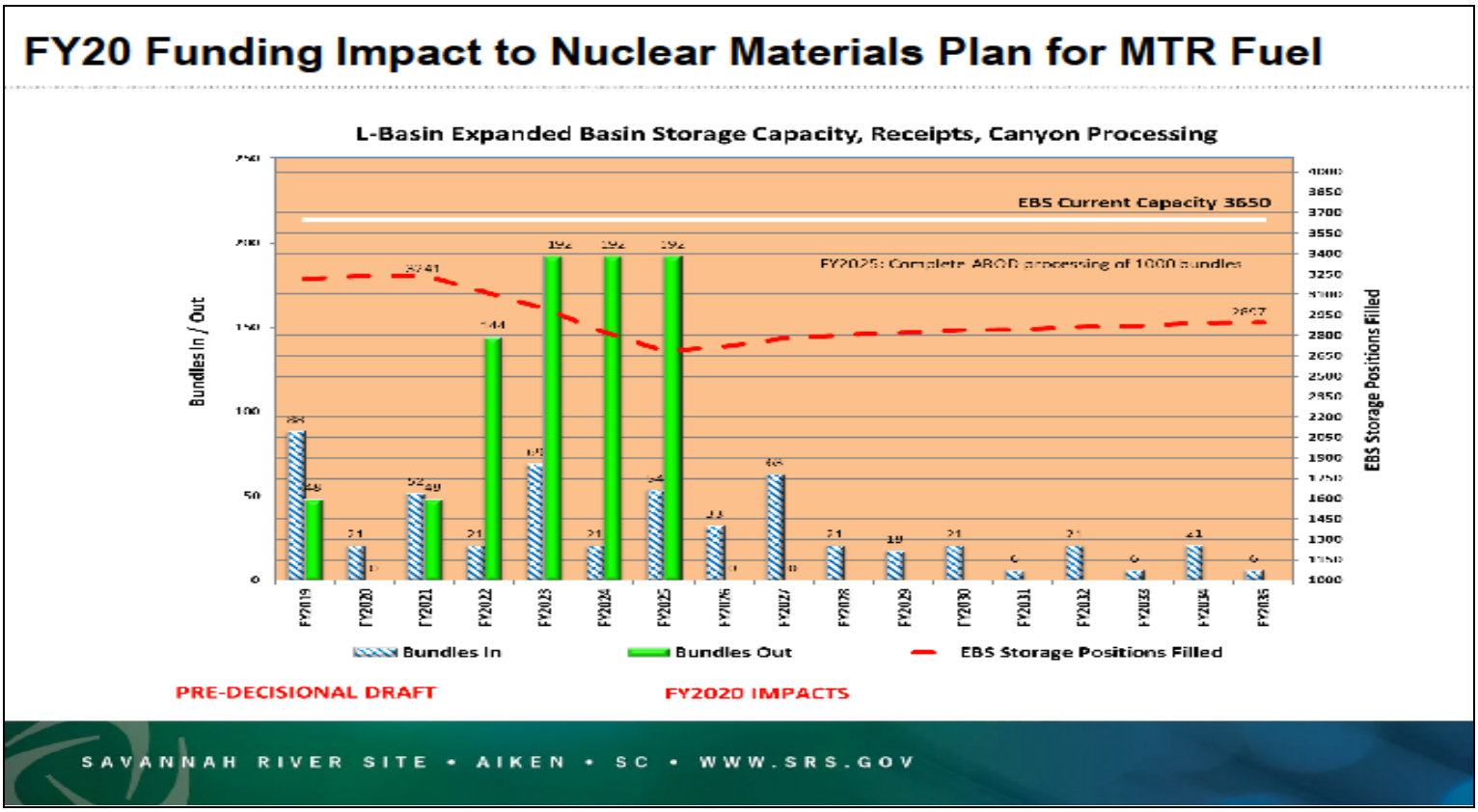
So, the H Canyon and the liquid waste contractor are intimately tied together, and I'll show you why in the next couple of slides. So, this would be our system plan for H Canyon.



You can see Fiscal Year [20]19 in terms of high-flux isotope reactor (HFIR) cores that we process coming out of Oak Ridge. And what we would, if we had our druthers, any budget we wanted, we would build these things based on our requirements of the direction we've given, agnostic to budget and we adjust them for when the budget comes through. This is billed out of requirements. The requirement comes from amended record of decision that tells us to process 200 HFIR cores and 1000 bundles of fuel. That was signed in 2013 when the expectation that it would be done by 2018; we're only about 25% of the way through that because that's the way funding goes. So, that would be our system plan. So what we can actually do with HFIR cores with our budget now you see, that number in [20]20 has dropped significantly. It pushes things out. It doesn't get us in trouble, we've got room right now, in the base that we've moved to maintain that level, but we do have to process that minimum amount of fuel because US Code, Title 50, Section 2633 requires H Canyon to be maintained in a high state of rate that's including personnel to maintain the personnel proficiency to gather and process. So, we're okay with the budget we have to do to meet the legal requirement which doesn't leave a lot of head room on the amount of space we have in the L Basin where all this fuel is stored.



The other thing we process is material test reactor cores and that would be our system plan and there you see open in future years as a ways help to increase the rate that it could go but, again, the budget is going to cause us to push all that out another year because that's where the funding is.



So, the reason that the liquid waste and the H Canyon are interlocked here and the reason we're going to change the way we cancelled the solicitation for liquid waste, and decided we're going to have a new solicitation called an Integrated Mission Completion Contract is because H Canyon, when you process fuel through it right now, you generate some waste, and that waste currently goes to the liquid waste program into their tanks and the high level waste is vitrified using a defense waste processing facility. DWPF is scheduled to shut down in 2030, but we don't have an end game for H Canyon yet. So, in order to get ourselves synchronized on this, and figure out the answer, we decided not to do these things under separate contracts and have them all in one place so we can get some innovation and figure out how we're going to do this. There's probably, we believe there's technology that's in H Canyon; one option would be to close the loop right within H Canyon and not have to send stuff to liquid waste. That'll take some investment to go down that road. Auxiliary concepts about building a separate facility, you can really, we don't have that much incoming in the future; we could probably do something with a smaller facility. So, obviously nuclear energy is involved in this, the NNSA is involved, the science is involved; we're involved, so not one person or entity gets to make the decision. We've put together an integrated project team that just started up, they'll be down to visit with us in June, looking at this whole issue of how we're going to handle the spent fuel going forward. Also examining in H Canyon to see if we're spending the money efficiently enough, if there's any way we can process more fuel than we are today, so that work is going to be coming on in the very near future. And, so, those are the major, I think that covers the three topics, I think, but I'm willing to answer any questions you've got, any budget questions or anything else. Well, that's what we're looking for to try to figure this out long term.

Rick Lee: H Canyon, I've spent some time looking at the numbers and the uniqueness of it and the national asset that it really is, and I never seem to hear that it's funded adequately to take care of the maintenance and repair and upgrades and things that are required for it to remain in top-notch condition and in service for the decades ahead of us. And I understand the priorities with regard to liquid waste, I think you and I have talked about this once before, whether or not there's something we can do, either from the Council or to help coordinate with the delegation, is there some way to put a focus on H Canyon for a special

dispensation from Congress for funding to get it to where you need it so that it's available to you at its operating efficiency for the future.

Mike Budney: Yeah, any advocacy to help us fund that thing to do an infrastructure, I think it would be important to get the IPT done so we know exactly what we're talking about as far as what we want to do but, certainly, even if you said you were going to build a new facility, which is not exactly what EM does, we're trying to close down, you'd be years away from doing that so we've got to maintain this thing in the meantime, and the law that keeps opening is really centered around the nation having the capability, it's not really so much about H Canyon, it's about having the capability, so to shut down H Canyon, we've got to have an alternative to execute that same mission. So, in the meantime, we think we ought to operate it closer to its rated capacity, and re-inventory L Basin as much as we can so that if we decide we want to have a smaller facility, the material that would be left would fit within the capacity of a smaller facility, or even not have to, not have to run H Canyon to be at full capacity to get to full volume where we could be. So, we've got to run in a more efficient manner now to prepare for the future.

Rick Lee: Do you have any material available that you could share with the Council on what the needs are for H Canyon? I don't know if this is classified material or not, dollar-wise and sort of the projects?

Mike Budney: Yeah, yeah, we can put that together. We can show you based on, you know, the dollars we have today, what capacity we can run at, and what incrementally more funds would cause us to do in terms of capacity and the kind of infrastructure stuff we'd like to get done. We have the process to upgrade a lot of the controls in there, and we've done some, but not nearly all that we'd like to do. I walk in there and it looks like an engineering room on my first submarine that was designed in the late '50's.

Jim Little: Mike, one of the questions I have is, outside of the capabilities of the facility running at, is there kind of a forecast that you people plan on the demand side? I'm saying, okay, never mind about the Canyon, but what's the demand look like over time?

Mike Budney: I don't think that's, it's not as refined as you might like it to be, but that, the A Rod that said process 1000 fuel bundles and the 200 HFIR cores, at the time, was designed to ensure we had enough room for future receipts. I don't know exactly what length of time that future receipt is or how long the L bridge is going to be producing HFIR cores and having to send them somewhere. Another option is to actually not process the material but put it in dry storage, the spent fuel, but that is a special case with the material we have, most all of the material we have there is aluminum clad, and there's still some technology development to make sure you can store that. It chemically traps water and can result in corrosion; you don't want to go back in there ten years later and find out problems.

Rick Lee: Do you generate any revenue from the programs that are repatriation of the HEU or that. We had the one case with Germany. Remember, we had the meeting if you recall with Mr. Hanlon, and is there any revenue that comes in and does it get to stay at your site?

Mike Budney: Well, there's some cases where revenue comes in that stays at our site. We're starting to process some material from Japan, and we received material from Canada and some of those cases. The cases where it's not a non-proliferation issue, the German fuel would be one case, we would require full-cost recovery. Whoever sent us material would pay us the full burden to process that. We don't require that through the NSA's repatriation program because it's expensive to do and we want those countries to cooperate with us and send the material back, so we don't; we fund that cost too.

Mike Budney: And then there's, make sure I get this right, Stuart, the material that we process in H canyon, make L-U, and have sent to TVA, the government gets that money back; TVA pays for that fuel but not the site.

Rick Lee: I'm sure it's all wisely spent wherever else it goes.

Mike Budney: I appreciate your optimism.

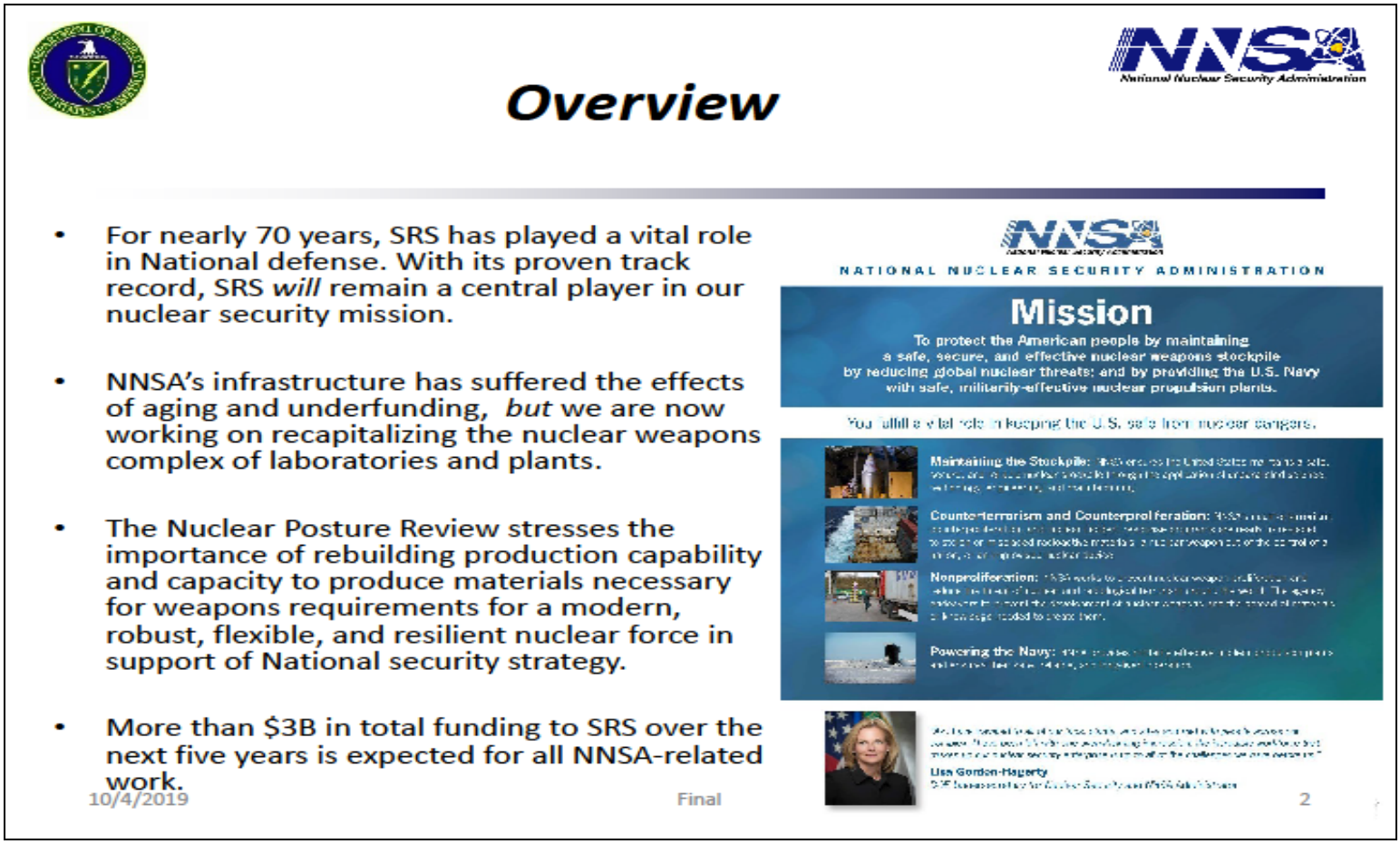
Rick Lee: Any other questions? Hearing none, thank you very much. We certainly appreciate it, and please, if you could send in information, I am more than willing as are other members to see if we can support your requests for funding.

Mike Budney: Okay, we'll do that.

NNSA Overview

Rick Lee: Next up, Nicole Nelson-Jean, NNSA Manager, and we're looking forward to your presentation.

Nicole Nelson-Jean: Thank you. I'll start by introduction of John Michael. He's the Plutonium Federal Manager from Washington, DC, and he is the one responsible for our pit production and our plutonium activities, not just at Savannah River, but across NNSA. So, I'm very happy he's here today, and I also have Bill Loberson, the Program Manager on our Non-proliferation programs and efforts. You had asked questions about our dilute and dispose activities, and I will address those in the slides as well.



I wanted to start with one of the questions that was asked on the agenda about NNSA's intention for the long-term activities of the site, as you know, and I'll talk about our Tritium mission that's there, and we'll also talk about some future mission activities that we have. But the site has been supporting our defense and non-proliferation efforts for a long time, almost 70 years, and it's our anticipation that it will be supporting those missions for a very long time in the future, as long as we have the nuclear

deterrent. So, in no way, is there any effort or activity to move or not have those activities happening at Savannah River; we are evaluating how we execute those activities through of course our pit production activities and with expansion of our infrastructure for our Tritium activities as well, and I'll speak on both of those.

NNSA's infrastructure not just at Savannah River but across our sites have suffered from not getting the attention necessary for our nuclear deterrent and our nuclear mission. So, we've re-focused our efforts on our infrastructure, frankly through the recent NPR, which has really forced us to focus on a robust and resilient nuclear deterrent overall. So, with that effort, you'll see several activities not just again, at Savannah River, but across the NNSA complex focused on infrastructure activities.

Specifically, at Savannah River, we're looking at spending anywhere from at least $3 billion dollars over the next five years for our infrastructure and our new mission activities overall.

MOX Termination

- Repurposing MOX for plutonium pit production will allow NNSA to move forward with a two-pronged approach to recapitalize U.S. defense plutonium capabilities.
- Three phase transition: Development; Implementation; and Operations & Disposition.
- NNSA is committed to the former MOX workforce – a resource that will continue to be very valuable.
- NNSA sponsored job fair for MOX employees.
  - Representatives from DOE/NNSA and contractors.
  - More than 200 former MOX employees hired thus far.

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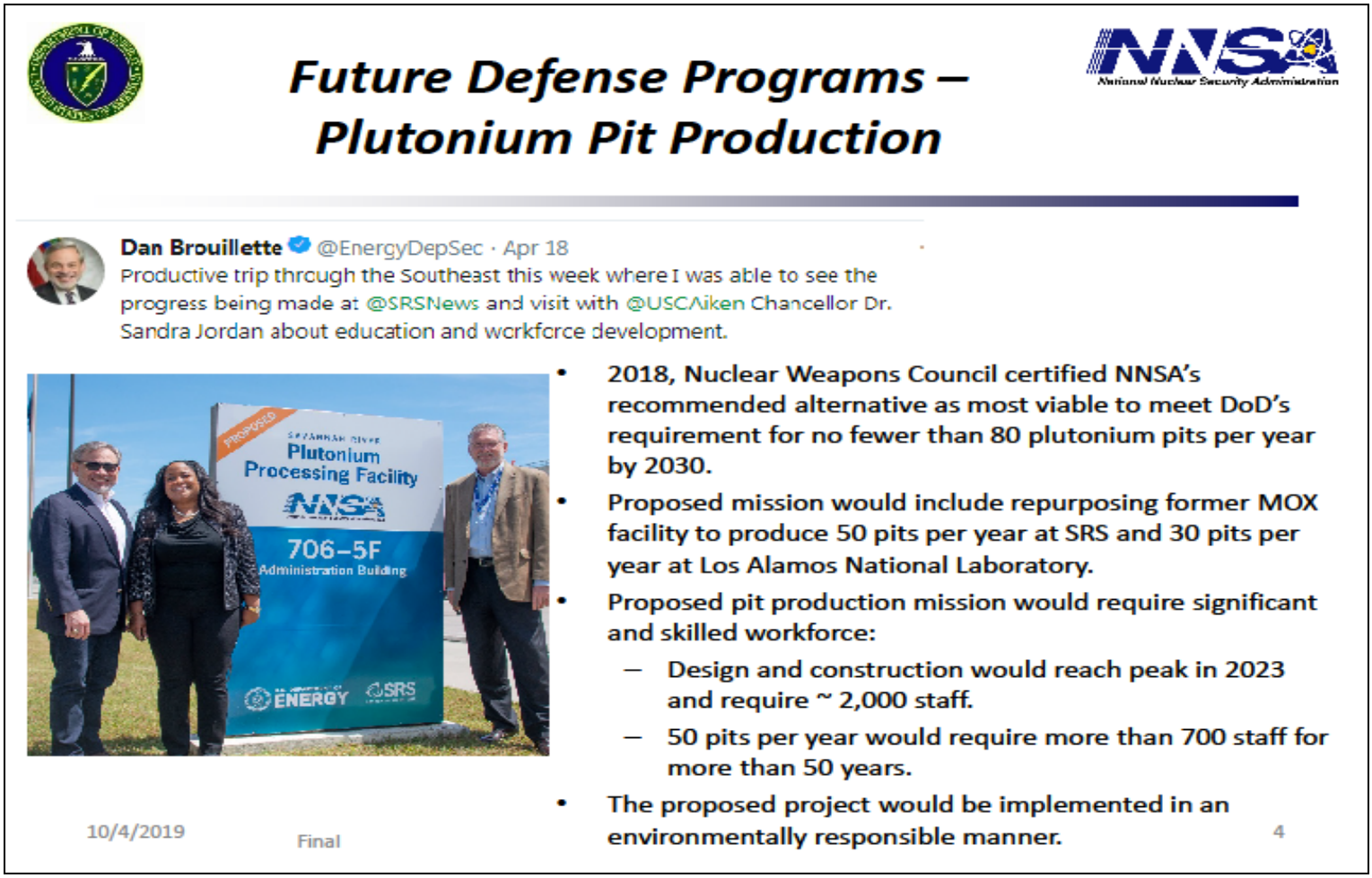
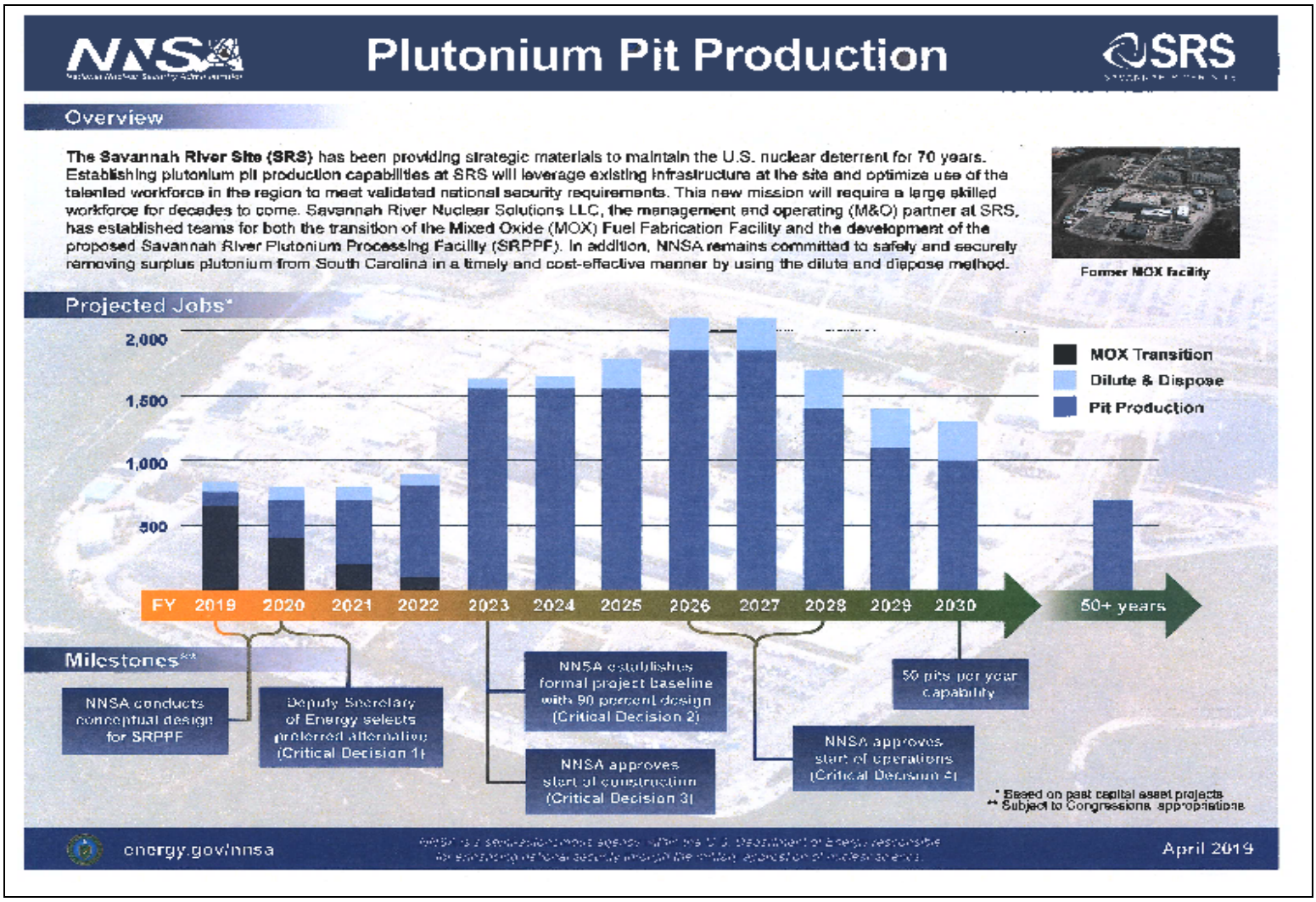
I'll start with MOX termination; you had requested an update on where we were on that termination. As you're aware, October 10th of last year, we delivered our final Notice of Termination on our MOX activities. But, our MOX termination activity is really done in three phases. The first phase is transition of the plan that was approved in January, the overall transition plan. That was approved by NNSA in January and we're moving forward with that plan as defined. Phase 2 is really the implementation phase, and that was just completed. And this included assessing and documenting facilities, equipment, and storage location. As you know, the MOX activities were activities that went on for several years, so there are several pieces of equipment that have to be dispositioned, and so we're working towards and implementing the plan that we developed. Phase 3 consists of the dispositioning of those facilities and equipment. NNSA will first prioritize any excess materials for NNSA use, utilizing them within the complex for NNSA activities. Then it will be followed by other DOE missions and other DOE activities across our DOE

complex. And then, additional disposal avenues will be opened if we find for example that we cannot utilize that equipment at the facilities for other items. This phase, the 3rd phase, will run through about 2021; that's the current plan. So, it's a process that will take some time. We have activities where we've been supporting the MOX services work force; you may have heard that in December, we had a MOX specific job fair in Aiken. We had about 850 MOX services employees come to that job fair, and so far, over 200 MOX employees have been employed by folks that were in attendance of that job fair, whether it was Savannah River site, in total, 12 contractors come and participate in that overall job fair, so that's going to be very successful. That was in December.

So now I'll touch a little bit on the future, and we do have handouts that you all have in front of you, and the poster boards there and, really, focusing first on defense programs and our activities there.



The photo is of the executive who ultimately would be the executive responsible for the plutonium pit facility, proposed plutonium pit facility out at the Savannah River would be the Deputy Secretary, and he was just recently here last week to walk through the facility. He had not been here in about a year and a half, and so he wanted to see where the facility was and where we were on our planning. So, he did have the opportunity to walk through the facility. So, NNSA is focused on the long-term vision. When the President released the NPR in 2018, it deemed that pit scale production was necessary, a necessary capability and imperative for the United States. Savannah River, Los Alamos, and Lawrence Livermore, all three are working cooperatively to re-establish and sustain this vital capability. NNSA's proposed course of action is to re-establish a pit production capability of no less than 80 pits per year, which would include 50 pits at Savannah River site by 2030 and, again, repurposing the former MOX facility, and 30 pits per year at Los Alamos at what we call PF4- our Plutonium Facility there.



One of the items you'll see in the handout and I'll discuss is our manufacturing in the workforce required for those activities. For the manufacturing of 50 pits per year at the SRS, that would require about 700 people for production, so that's for when we get to production capability. Prior to that time, there's of course going to be a construction and design phase activity. We're looking at ramping up in 2019 and reaching a peak in staffing in about 2023 which would require approximately 2000 people, or 2000 staff. Being ready to produce the quantity of pits required by the established due date would require a concentrated effort in this overall activity. We've already started that, working with our current contract partner, Savannah River Nuclear Solutions, in that process.

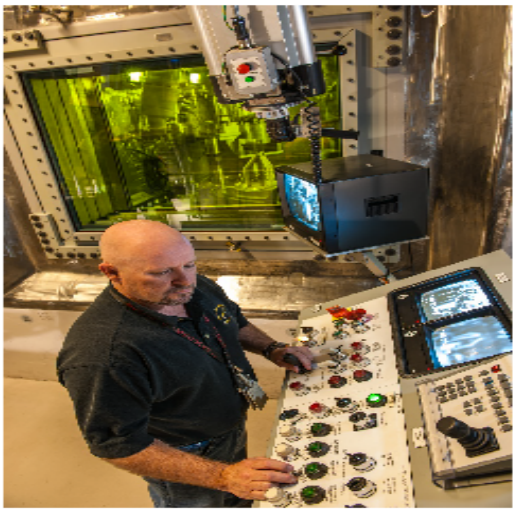
Future Defense Programs – Tritium Production

- Tritium is an essential material in nuclear weapons. Since the 1950s, SRS has been providing the tritium used in our nuclear deterrent.
- Tritium production is increasing to meet military requirements. Maintaining and improving the infrastructure to support this mission is a high priority.
- SRTE capital investments have grown from $1.8M in FY 2014 to $33.9M in FY 2018 and a planned $34.5M in FY 2019, to include plant preparation, people preparation, and performance improvement.

Since the 1950's, Tritium activities at the site have been an integral part of our overall defense mission and it continues to be. While the new proposed mission is very exciting and we're very focused on it, we still have a mission within our Tritium facilities that we must accomplish. And, as I've mentioned before, our infrastructure in those facilities are just as important.

Future Defense Programs – Tritium Production

- SRS hired an additional 134 people in FY 2018, bringing the total to about 700 federal and contractor employees.
- The Tritium Finishing Facility (TFF) is the last major project under our modernization efforts to improve 1950s vintage facilities.
- The number of extractions at Tritium Extraction Facility will increase tenfold over the next five to ten years, which will require additional personnel.



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We're currently working in vintage facilities from the 1950's, and we're looking at upgrading and recapitalizing and having new construction within our Tritium enterprise. In 2017, we conducted 3 extractions within our Tritium facilities, that's the first time since our Tritium extraction facility was commissioned in 2007 that we had 3 extractions. And, those extraction activities are doing nothing but going up in the future, so we are working very hard to ensure that we have all the capability necessary to give our Department of Defense colleagues what they need.

Our overall growing investment within Tritium specifically as far as capital investments, from 2013, we were looking at $33.9 million, and for 2018 and 2019, we're looking at $34.5 million overall for 2019.

Current Nonproliferation Work – Surplus Plutonium Disposition

- Repack and ship material for National security program
- NNSA is continuing to pursue the dilute and dispose approach to disposition surplus plutonium using an existing glovebox in K-Area for disposal at WIPP.
- Adding capability and capacity to improve EM's current downblending activities.
  - KIS Glovebox improvement modifications.
  - Establishing characterization and storage capability in K-Area.
  - Entry control facility modifications to improve personnel and material movements in K-Area.
- In addition to expediting the removal of plutonium from South Carolina, DNN also provides about $22M annually to SRNL for National security work.

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You also asked about our surplus plutonium activities, so I did want to touch on that. We are looking at expedited removal of the one metric ton. I will just speak on the current numbers that are public. We have already removed a half a metric ton, that is public, and folks are aware of that, and we're continuing to work towards our goal of removing one metric ton by January of 2020. Work has gone smoothly and actually ahead of schedule currently; we're adding capability and capacity to improve EM's downloading and characterization activities as well. So, we're working very hard to ensure that we are improving our overall dilute and dispose activities and EM has been a great partner in that with us as well, as well as SRNS.

Future Nonproliferation Work – Surplus Plutonium Disposition

Near Term Plan to Continue Efforts

- NNSA requested congressional appropriations in FY 2020 for the Surplus Plutonium Disposition project to install three additional gloveboxes with supporting systems in K-Area to expand dilution capability.
- Pursue opportunities for project acceleration

Longer Term Plan to Remove Plutonium

- Complete construction and installation and achieve operational readiness for the additional three gloveboxes and supporting processes.
- Complete hiring additional staff to support operations of SPD gloveboxes.
- Commence SPD downblend operations.

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We've requested Congressional Appropriations in FY 2020 for surplus plutonium disposition project to install 3 additional glove boxes, and we are working towards additional shifts at Savannah River Site as well.

So some of our near term efforts include again as I mentioned our overall request, while our longer term plan is to commence SPD dump when operations and complete hiring of additional staff towards those additional shifts that I mentioned.

NNSA – SRS Future

We are committed to an enduring future for the Savannah River Site. The Department continues to evaluate multiple options for the future of the site, all of which involve long-term visions.

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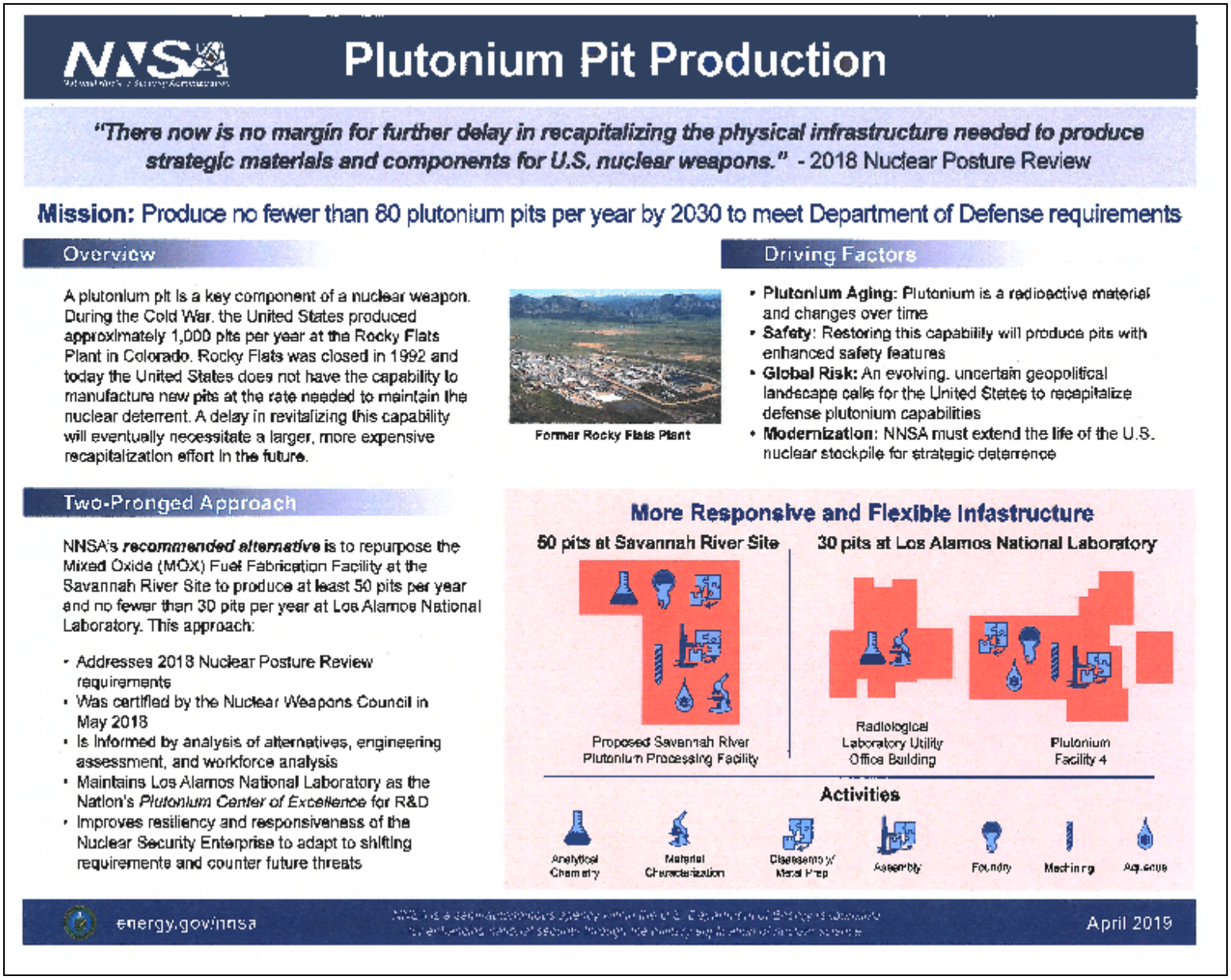
And I'll end with where I started, with our overall commitment towards the long-term future at the site for NNSA and the Department as a whole. We are evaluating exactly our posture and our execution of activities at the site, but there are no plans to change our current process and progress at the site and working with the Savannah River site as we are. And I will point you to the first chart, the chart with the lines that has our CD milestones and also our projected job levels, and there's also a comparison with MOX transition, dilute and dispose and pit production.



And then our second chart, which gives details about the mission to produce no fewer than 80 plutonium pits per year by 2030, which again I would emphasize is a requirement. So that's a requirement by DOD that we have been given that we will not change. So that's a requirement we must meet. So, with that, my colleagues and I are open to any questions.

Jim Little: Nicole, with respect to the shipment, the shipment of plutonium, you shipped a half a metric ton in the fall, I think some people in Nevada got a little vibrated about that. Is that tamped out for now, or where do we stand on that?

Nicole Nelson-Jean: Yes, there seemed to be quite a bit of energy around that shipment. We're working very closely with our colleagues in Nevada through working groups and interactions and at this point it is a positive interaction that we're having.

Rick Lee: So, this chart and the information, I appreciate the information. Is it possible to get this chart with a parallel line that indicates budget funding by year, what you anticipate funding for the year?

John Michael: yes, we can take that to current action and put that in there.

Rick Lee: Thank you. If you could do one, if you could perhaps send it to Jenny and she can do a distribution, and just make note of that Jenny if you will.

Nicole Nelson-Jean: We'll take that action.

Rick Lee: Okay, and so the design that you're working on for the pit production at Savannah River, you've mentioned the number 50 pits per year. . . You know, if you need 80 pits, and you have any disruption in the process, it instantly affects the schedule. Normally, you have a buffer that you would put into your design. Will there be a buffer in the Savannah River pit design?

John Michael: I can answer that. So, we are looking at different ways to create resiliency. At a primary level, we are creating resiliency in our infrastructure by doing pit production at two sites, so there is going to be some ability at one site or another to potentially offset shortfalls in production at the other site. And then, at the next level down, we're looking at ways, things we can do in design right now for the Savannah River facility to create redundancy in the equipment set, redundancy in the flow sheet, so that if one specific piece of equipment or part of the flow sheet goes down, you can continue to operate, and we're trying to build in flexibility from an operations prospective into the design now, so that we can mitigate that risk in the future.

Nicole Nelson-Jean: It's why the time between 2020 and, well really today, and 2023 is so important because this is our opportunity, because once we lock down scope in our activities to be able to make our goal, essentially, we'll have to move forward. So this time is very critical for us, within the critical decision process.

Rick Lee: So, the 2020 Budget has $410 Million in it. How will that money be spent? Is that all just preparation? Design? I didn't know where all that was going.

John Michael: So, that's for conceptual design activities. It'll fund things like the conceptual design itself. We have to do safety documentation as part of our critical decision process; we have to do, you know, security vulnerability assessments, all of those things that are part of that critical decision one package will be supported by the funding we've requested in 2020.

Rick Lee: Recently, IDA completed pit production strategy for the DoD; there's a document, I think it's finished. Is there a chance you could provide us with a copy it?

John Michael: They did provide that version to the Hill, the second one, the sued version, the one to be responsive to Senate Energy and Water, that language will be out later this month. The report is UCNI, Unclassified and Controlled Nuclear Information, so I'll work with our public affairs folks to see how we can support that.

Rick Lee: Okay, I would appreciate that. So, I know you're trying to get some additional funding for glove boxes, one to be held in reserve when one of the others malfunctions or needs servicing and such as that so you added two more glove boxes, how

long does it take you to get people from the beginning to end, from training to approved, to licensed to operate the glove boxes?

Nicole Nelson- Jean: I'll turn to Stuart, about 18 months, I believe.

Stuart MacVean: Yeah, we can do what I call raw training; we can get people so they can get their hands into the gloves at about 18 months. To become proficient, you've got to get up to the two year where you're actually working in the glove box. To make them weapons production material qualified, we think it'll actually take up to about 3 years for the extra quality control requirements that go into weapons production.

Rick Lee: So, if you're applying now for funds for glove boxes, is it for the 2020 Budget Year?

Nicole Nelson- Jean: Yes.

Rick Lee: So, the 2020 folks, you need to already have them hired, right?

Nicole Nelson- Jean: Yes**.**

Nelson- Jean: And this is actually a very good point, not only for our SPD and DND activities, but also for our pit activities. We are partnering; I was at Aiken Tech just yesterday or the day before yesterday and we're looking at partnering with local universities and colleges to get these workers certified and ready so they can move into the pipeline easier, particularly in unclassified areas. So, training for us is extremely important because it does take years to get the individuals that would be certified to be able to work in these environments. In addition to that, there are certain security clearances that are above and beyond just a regular, what we would call Q Clearance, they're above that to work inside these facilities as well and that, unfortunately, takes a year or so as well. So we're trying as hard as we can to start that earlier in the process to have a workforce pipeline that's ready.

Rick Lee: Other questions. Yes, ma'am.

Representative Sylleste Davis: Thank you very much Mr. Chairman. I'm looking at one of your charts here that outlines the driving factors that are supporting the additional plutonium pit production. And looking at the, specifically the modernization and extending the life of the nuclear stockpile, as we get to the point where we are producing pits, will we at the same time be putting aside or retiring the existing pits, or the existing nuclear material?

John Michael: Yes, ma'am. Part of modernizing, our deterrent is addressing through the deliberate, methodical replacement of aging pits with the newly manufactured pits, so those pits will be coming out of the stockpile and we use old pits as the feedstock to make new pits, so we break those down and get them in a lot of those.

Representative Davis: okay, so there's not a separate process that's required before, to get the old pits out of use? Cause we've used it to, basically, we're basically recycling them.

John Michael: Yeah, that's all a part of the production flow sheet is taking old pits in and putting new pits out.

Nicole Nicole-Jean: And we do the same thing with other commodities as well. For example, the same thing happens in Tritium and that's another reason why this site was chosen because that plant mentality, that opportunity of working multiple shifts with the recycling of, essentially components, weapon components is something we have experiences in. So, that recycling is not new; we do that in other areas as well and other strategic materials.

Representative Davis: So, the net result being that there's no new material being created.

Nicole Nelson- Jean: New Plutonium being created?
John Michael: We have enough to meet the pit production requirement.

Nicole Nelson-Jean: We have enough for our requirements.

Rick Lee: So, the processing of the pits themselves, the old pits, retiring them from service, where will that occur?

John Michael: It's a combination of places. Obviously, our assembly/disassembly activities take place at Pantex, and then the pits would be shipped to either place we would be doing production, Los Alamos or, as we've proposed for this project, here. And that's where they would be taken apart and put into the production flow sheet.

Rick Lee: So, is there a significant amount of treatment of the plutonium out of the pits required before you can reconfigure them, or is it a block that gets re-machined?

John Michael: I apologize for pausing; I'm trying to think of how much detail I can go into here, but yes, we do have to remove some of the decay products and things like that, and process that metal and then it goes through the entire flow sheet that you see on the poster here, the kind of dis-assembly, the foundry activities where it's cast and machined and reassembled. So, there are processing activities at the front end of the flow sheet.

Rick Lee: Thanks. It's a real manufacturing process then.

John Michael: Yes sir.

Rick Lee: So, the NDAA documents that were required as a report for Los Alamos, is that done?

John Michael: That report is in progress sir, we are working with them, Los Alamos, as a requirement to deliver our plan on an integrated schedule of 20 pits per year, that's in progress as well. So we want to make sure that whatever we provide to Congress to respond to that requirement reflected Los Alamos' current plans, so we're working with them to meet that requirement.

Rick Lee: I would be remiss I think in mentioning to you while you're here what an excellent work force South Carolina has. We can certainly address whatever needs the NNSA may have for pits. If you find yourself struggling at one location, unnamed, please don't forget us.

Jim Little: One last question, I know you've got to go, but will the budget be integrated for, we're not going to have, "Little vs. South Carolina" funding fights and Congressional delegations, "I need more money right now than you do," like it normally does. I mean, with respect to this program, you've got pits by pits at both sites. You've got some diverse capabilities. I'm just wondering about the vague reasons Congress, Congressional appropriations that New Mexico is doing better right now than South Carolina. How are you, is there a way that you approach that in your overall budget plan and so everybody is getting fed at the same time, you know, so some state isn't getting the leftovers and we got to the dinner early.

Nicole Nelson-Jean: Well, John is in Washington briefing but I think our approach is a two-pronged approach for a reason; we need both to be successful , and we need the funding in both areas to be successful because we are obviously at a different place with our recap than they are with PF4. We're in different places, so we need funding in both areas at the rates that the program has requested, and again, we need to be at that 80, at least 80, so they need to run essentially parallel as the program's presented.

John Michael: I think the only thing I would add to that is part of our job is to make sure that, it's a portfolio investment because we need both. We have to get to 80 as Nicole mentioned, we have to balance the risk without getting into what Congress may or may not do to us.

Rick Lee: Any other questions?

Senator Young: Thank you all for being here. I'd like to ask some questions to follow up. First of all, on the glove boxes, you have said that the request is in for Congressional appropriations for three additional glove boxes as supporting system for the K area. How many glove boxes do we have currently?

Nicole Nelson-Jean: One.

Senator Young: So this would take it from one to four?

Nicole Nelson-Jean: Yes.

Senator Young: So, currently, we only have appropriations in the system for one glove box?

Nicole Nelson-Jean: Yes, I believe that's right.

Senator Young: And there's no additional plan other than this request to get any additional glove boxes?

Nicole Nelson-Jean: Beyond the four?

Senator Young: Yes, these three additional ones are part of the four?

Nicole Nelson-Jean: Once we get the additional three, we would have four total that we would be working with, and our goal is to have, I believe four shifts total.

Senator Young: I know that, I've seen Mr. Walker in the audience. I know when I met with him and some other folks from DC and NNSA several months ago with some other folks in Aiken, prior to the MOX facility being discontinued, the projection was, I cannot remember how many glove boxes, but the projection was that, with the glove boxes operating 40 weeks per year, and, 12 weeks down for maintenance, that it would take until around 2049 or so to get all the plutonium processed. Does that sound correct?

Nicole Nelson-Jean: I'm not sure. . . Yes, that is, I believe that is the current plan and current scheduling.

Senator Young; That project completion schedule contemplates the four glove boxes?

Nicole Nelson-Jean: yes, the four glove boxes with four shifts.

Senator Young: But right now we don't have the appropriations but for one of those four boxes?

Nicole Nelson-Jean: For the additional, exactly. We are requesting appropriations for the additional glove boxes.

Senator Young: If we don't get the appropriations, then what is the timeline for processing the plutonium? 150 more years?

Nicole Nelson-Jean; It will take some time without the funding. We need the funding to be able to construct the glove boxes.
Senator Young: My recollection was that getting more glove boxes to do the projected time table of 2049 was not going to be an issue because that timeline was expected to be able to be as a better alternative than MOX. So now I'm hearing that "no, the funding for 75% of the glove boxes is still pending, and not assured." Is that right?

Nicole Nelson-Jean: Well, we are funded yearly, so no funding is necessarily assured. We do make the request, but I think the overall plan for our SPE activities are consistent, our current plans, are consistent with what the program talked to you about.

Senator Young: I may have more questions on this but not for today.

Rick Lee: Senator, if you would like, if you have additional questions, down the road, if you want to archive them in a transmittal, I'd be glad to send them and get a full response.

Nicole Nelson-Jean: Absolutely.

Senator Young: Okay, so let me follow up on a couple of things real quick. You were with us in October at SC State. In that presentation, you mentioned that we needed to initiate working with the universities and colleges to build a pipeline of workers for the PITS project and other nuclear missions at SRS, what is taking place on that front since last October?

Nicole Nicole-Jean: We have communicated, as I mentioned, again, I had an opportunity to visit Aiken Tech, we're working with EM on our current grants that we have in evaluating what type of certificate programs that we will need for our additional programs and we're working with our local colleges and universities like Aiken Tech, August Tech and others about the certification programs that would be needed for NNSA mission. So, there's just interaction not only here, but also in New Mexico. Because of our relationship and our activities at both sites, we're anticipating that there may be an opportunity to actually have workers coming from both locations, maybe some coming from South Carolina to New Mexico or vice-versa, and how we could work that exchange, so to speak, of either students and/or workers in both places. So that's the type of dialogue that we're currently having.

Senator Young: When will you know whether or not there needs to be additional infrastructure or support at Aiken Tech College for example to support the training of the workforces necessary for the PITS mission and other nuclear missions?

Nicole Nelson-Jean: I think one of the items that was done prior to the decision of going with the option of Savannah River site, there was a workforce analysis done that was considered as a part of this, and we found out very early on that the workforce here, one, it was a better location for the workforce for our overall mission activities, and it was taken into consideration that there is already a relationship with the local technical colleges and universities with Savannah River site that could be utilized. So, again, that's a discussion that we're having today because frankly, by I think we've discussed, this past week, when I visited , we really have to start infusing programs right around the 2022 timeframe to get the workers that we would need by the time the facility ran what we would call hot.

Senator Young: One other question I have, on the issue of annual report requirement to the Health Armed Services committee and the Senate Energy and Water Committee, when are those due? Do you know?

John Michael: The annual reporting requirement? I would have to double check the language, sir. I don't want to give you a bad date.

Nicole Nelson-Jean: You're talking about the NDAA requirements?

Senator Young: It was in your October presentation. You sent out a manual that it must be done for Congress starting in April 2019? Has that already been done?
John Michael: Yes, I think that's in the NDAA. No sir, that has not been done.

Senator Young: It says it has to be done starting this month, today's April 25th.

John Michael: We're, I think those memos are in progress.

Senator Young: Does that have to be done by next week? Do you know? Is it necessary to keep this moving forward?

John Michael: Yes. The NDAA, section 31-20 had an extensive reporting requirement that we have to comply with and we're working through those, one of which is the report that was previously mentioned. We're working through this to make sure that we're feeding those to the hill.

Senator Young: So are y'all going to meet the requirement?

John Michael: Yes, I believe our intent is to fulfill the reporting requirement.

Nicole Nelson-Jean: We're not, we wouldn't stop any of our planning activities through our critical decision process for that. That would be done in conjunction with our current activities.

Senator Young: And these annual reports, they will provide detailed information on pit production activity to these two agencies? Is that correct?

John Michael: Yes.

Nicole Nelson-Jean: To the Committees, yes.

Senator Young: But you don't know when those will be prepared?

John Michael: There were several requirements. One was in currents, the other one is unmentioned, I believe it was due 180 days from enactment. It is in process because we're working with Los Alamos to reflect their revised plans for 30 pits per year that they are updating and providing an integrated schedule for. So those are, we're trying to get those out as soon as we can.

Senator Young: 180 days from enactment would be when? That would be soon, I would think.

John Michael: I believe it was sometime this month, but I'd have to look exactly.

Senator Young: This month?

John Michael: Again, I'd have to look at the exact date, but I think so.

Senator Young: Can you let us know? Let Mr. Lee know.

Nicole Nelson-Jean: Sure. Absolutely.

Senator Young: Thank you very much.

Rick Lee: Thank you Senator. One last question as I'm listening to all of the different points where potential delays can exist, whether it's Congress and its funding, whether its laws that have to be changed out at WHIP in order to take material, etc., etc. What would be the effect if you encountered a delay, a significant delay, of years on the storage capacity, where the plutonium is currently stored at Savannah River. Would it affect your ability to receive other materials, to be involved in pit production or other such activities, or would you have adequate capacity to keep those tons of plutonium where they currently sit?

Nicole Nelson-Jean: If there was a delay at WHIP?

Rick Lee: Delay in your DND life cycle. There's a whole series of places where there's all kinds of unknowns that exist right now, so if you run into a bunch of those and it holds you up, how will you have the storage capacity at Savannah River should it be required to keep it another five years or ten years? I see Stuart's head bobbing up and down, so the answer must be yes.

Stuart MacVean: Yeah, we've actually got a large amount of storage capacity within the Canyon reactor building as it exists today, what we call K area storage, but we're also in the process of building what I'll call a waste storage pad that'll be able to take the back end so if there's any delay in being able to ship to WHIP, there's a very large scale, about 4500 drones worth of waste storage capacity that we're building outward right now.

Rick Lee: There's a, I think in the budget there's, you won't know about this, but there's a budget item, line item for Pantex, for a major storage facility down there of about $1 billion-four. Do you know if that is a location where some of this weapons grade plutonium might reside for an extended period of time?

Nicole Nelson-Jean: Yes, we do have a material storage activity that we have at Pantex, and we're currently evaluating exactly what would go into that facility. I can't say today exactly.

Rick Lee: I understand. Would you have any indication of it by our next meeting, six months from now, or is it a longer process than that?

Nicole Nelson-Jean: Let me go back and check.

Rick Lee: Thank you. Any other questions? Hearing none, we declare victory. Thank you.

Savannah River Nuclear Solutions Update

Rick Lee: Next up, Stuart MacVean will give us an update on Savannah River Nuclear Solutions

Stuart MacVean: It's nice to see everybody, it's actually been quite a while since I've been here. So I'll go into a little bit, kind of next level of detail. As you might imagine with the kind of size and scale of the program that we're running, I could talk for hours and hours about some of the details of this. So, you'll have to ask questions if you want to know the kind of next level below what we're talking about.

So just a reminder as the Management and Operations contractor of Savannah river, we've got a pretty broad scope of work that goes all the way across the board from the environmental clean-up and stewardship elements of our program that include: ground water, capturing / monitoring disposition, through demolition of buildings, ash-pile clean ups. We've got quite a wide variety of scopes that we manage. We then also have the weapons program, the tritium facility, I'm going to go into a little bit more detail on to the base of operations in tritium, and of course we have the nuclear materials program that makes up the L, K, and H canyon. HB Line is actually in the process of being idled at this stage of the game. We are within about two (2) months of a point of victory on a laid-up facility and are about to move quite a number of folks out of there over to K area to increase the staffing level over at K operations. I'll go a little bit more into detail on that. Those facilities are up and fully operational and working at a really strong operational pace. We've got a lot of activity going on in all those facilities.

Of course, we do manage the national lab. This year, it's about a $280-million program of work that the lab is doing. A fairly good size portion of that, about $40 million dollars this year, is going to be work for others. Meaning, outside the Department of Energy, for programs that are of interest to a number of federal 3-letter agencies, taking some of the innovation and skill sets that we've got from the site and deploying—that we've learned from the kind of operations we do—and deploying those to other places. So, we're actually seeing a fairly significant increase in that portfolio expansion.

We've also taken on legacy management, as one of their primary legs of long-term stewardship at facilities or sites around the country that are closed down. So, we're actually picking up quite a bit of ground water monitoring and treatment recommendations, for across the country with the legacy management portion of the Department of Energy. So, it's a pretty big portfolio.

And of course, you know, we handle all the support services for all of the tenants on site, which is a real wide variety of different kinds of things that can range all the way from something simple like, somebody's flushing a toilet, all the way to, we will install and test the high end nuclear ventilation systems and make sure they are staying operable at the level they are supposed to be.

IT platform and cyber has gotten to be a really big piece of our puzzle. We've got a lot of the accreditation boundaries that we've got to maintain. It has got to be a very large scope of work for us to be able to maintain the IT platform for this site. But we continue to do that really strongly. In fact, I'm probably going to jinx myself, about I'm a month away from hitting 25 million safe work hours, which is pretty incredible number; let's knock on wood here. If we can make it about another month which is incredible, that'd be the highest level we've gotten to in the 11 years of the contract. So, it's a pretty big statement to the level of safety performance. Especially in light of the number of new employees that I have, and the experience level that they got. It's really nice to see that we're performing with a really high level of safety. And I'll go into a little bit more of the changeover of personnel here with these slides.

Recent Accomplishments

Uranium Mission

- First time processing 3 uranium streams in H Canyon
- Spent fuel receipts increased this year

Plutonium Mission

- K Area posture from surveillance to operations
- Accelerated down-blend and repackage scope
- Delivered acceleration strategy for HB Line

Tritium Programs

- 100% national mission delivery
- Significant program growth

Project Execution

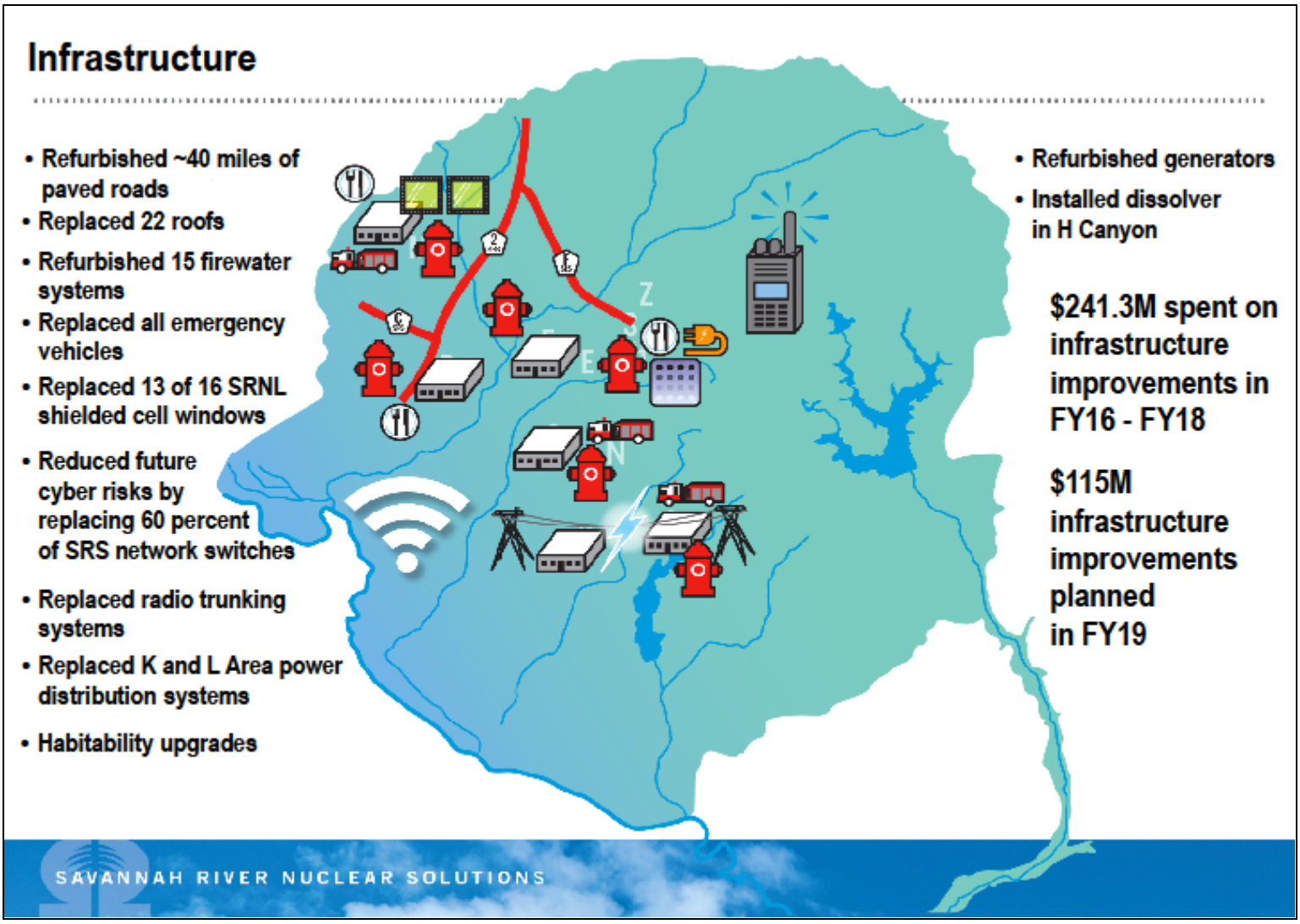
- 57 projects valued at $244M; final costs for all project forecasted to be $12M under budget
- Completed D Ash Basin remediation – 14 months ahead of schedule and $9 million under budget

Just a few of the really high-level accomplishments, so last year, for the first year ever, we got into a 3-uranium stream processing capability, in H canyon. In the past, the maximum had been 2, and we brought on a third waste feed stream that we then blend together, all high-end rich uranium feed streams, coming in from different locations. And at the same time, our Eloree operations have increased, fairly substantially. We're getting a much higher rate of material returns from around the country and the world and continuing to operate at a really high pace. We're at the point now, we're handling a cask of fuel about once a week in and out of that storage facility. So it's a pretty high pace operations for us. Along with the 3 uranium streams that we've got going into the canyon, we're about to add a third dissolver. So, the Department of Energy has just asked us to swap out the really aged electrolytic dissolver that exists in the canyon. That's a capability that was valuable back in the 1980's, but it's not been used since. It's got some specific mission needs going forward into the future, and we're starting the engineering program to start to be ready for the facility to be able to do the electrolytic dissolver change out. So that's a really big program of work.

K area—you've been hearing about plutonium and K area quite a bit here. I've got some more details here I'll go into, but it's a significant increase in pace of operations that we've got going on in our plutonium operations, pretty much across the board.

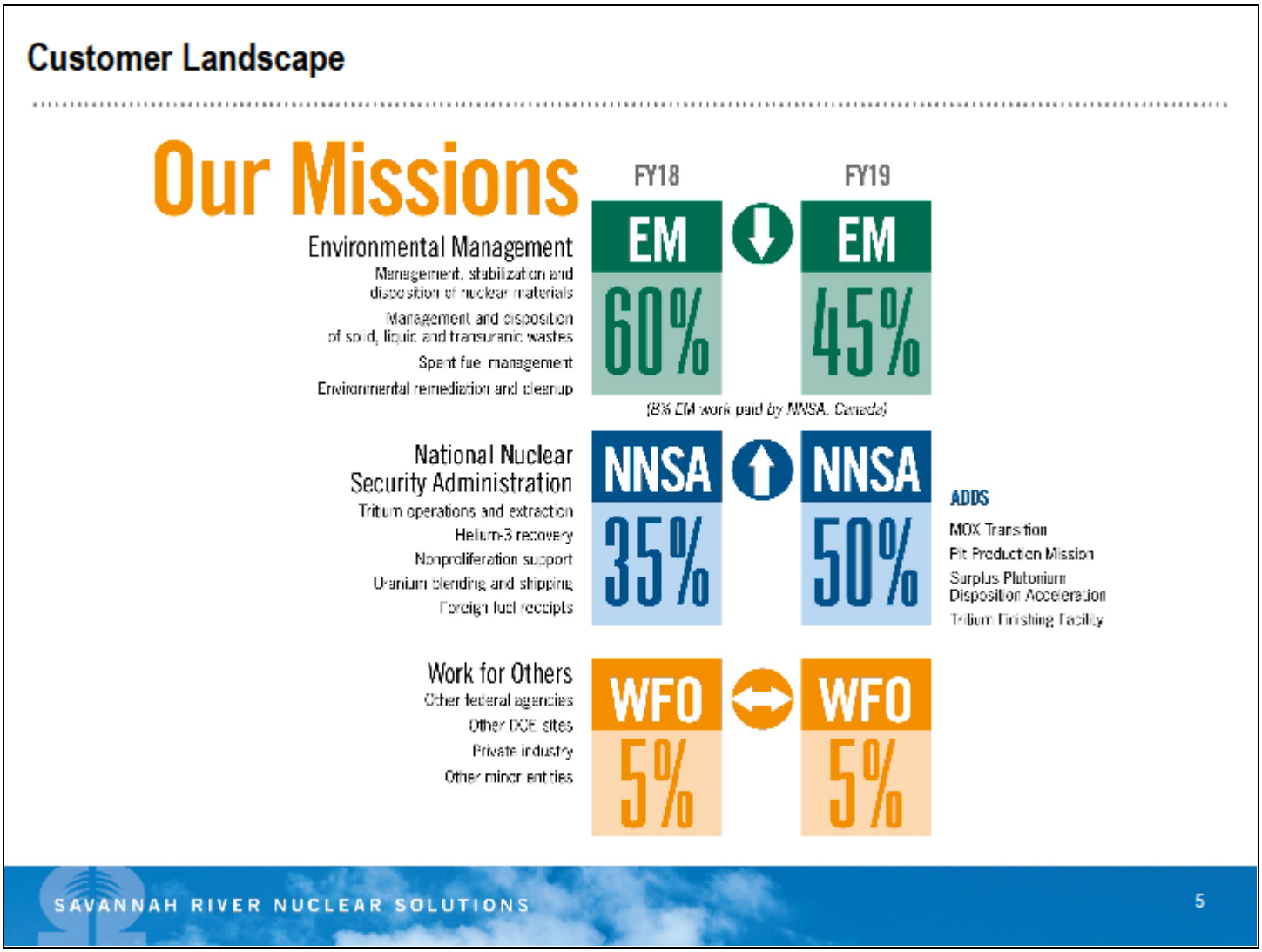
Treating programs—we're talking significant growth here. The Treating Program has increased in size and scale. And I'll use numbers, so you get a feel for it—from about a $190 million dollar a year program to about $350 million dollars a year, this year, substantial amount of infrastructure increase, along with a lot of hiring to get ourselves ready, and I'm going to go into a little bit more detail there.

And then of course as a contractor we are a very large project management construction outfit, so I like to every now and again throw out that at any given point in time, we are running about a quarter of a billion dollars' worth of projects. Usually in the 50 to 60 range, individual projects that make up that quarter of a billion dollars. We do a pretty good job of bringing those in on schedule and under budget, usually about 5% under budget, which is exactly where we want to be. The ash basin closure was the last really big one that we completed. Here's a couple of pictures of before and after. It was a sizable clean up and remediation, land filling operation, and we finished that up last year, very successful. We've now moved on to Dunbarton Bay, and we're doing a spill cleanup there from decades ago, as part of the work that we do in concert with DHEC's regulation of the different mile stones that we have available to us.



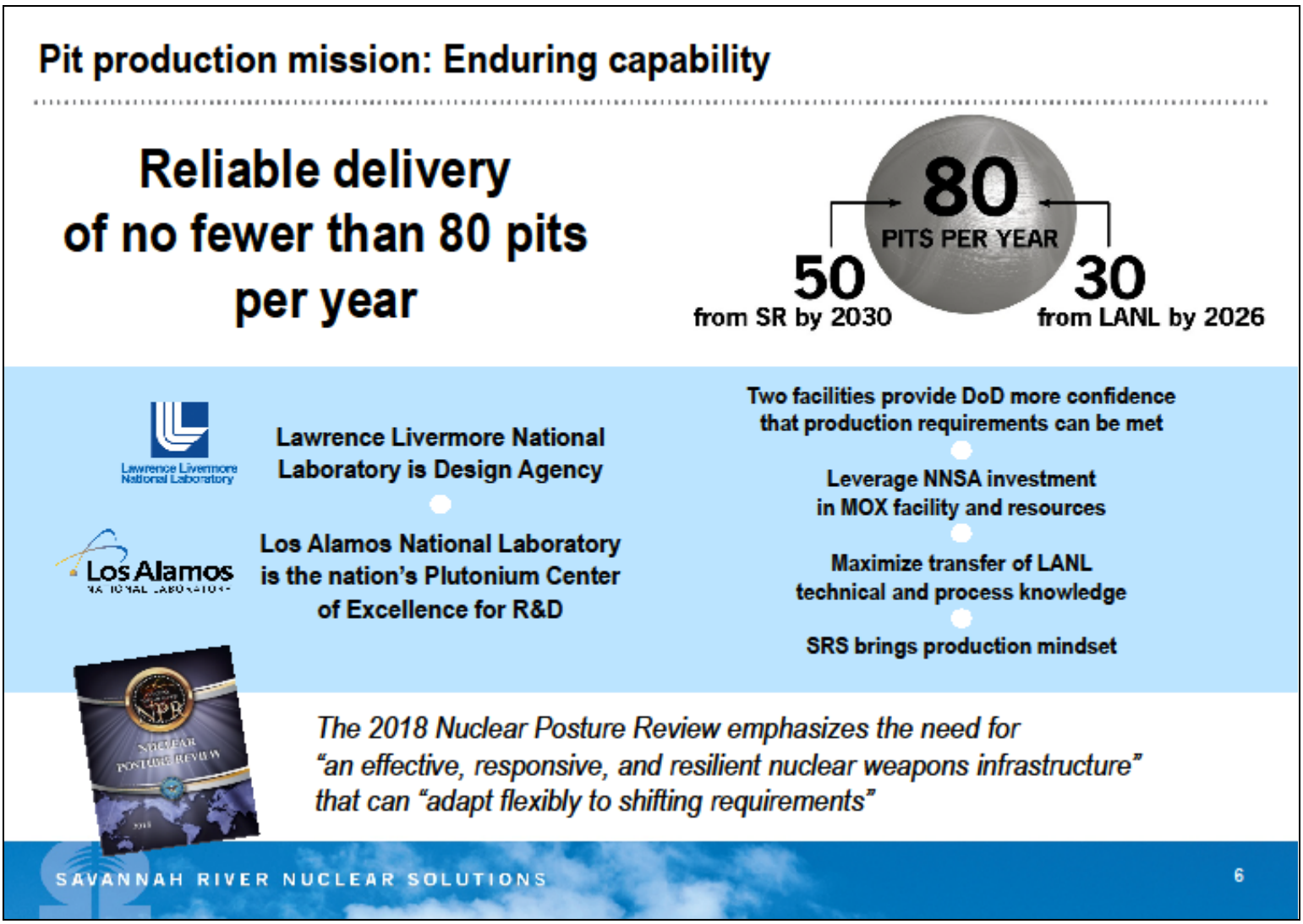
A few years ago, we were really struggling from infrastructure; infrastructure and the retirement clips were kind of the two big topics about three years ago, and I will tell you, we've licked both of those issues. This one happens to be the infrastructure one, I'll talk to people here in a few minutes but one of the things I discovered as I came on board the M&O was that we were spending a huge amount of money in reactive maintenance and realized, and everybody was saying, "We don't have money to invest in our infrastructure." Well, yeah, because we're spending it all on the maintenance side of our business. So, we started just chipping away at that and actually doing some investment and some upgrades to some of our infrastructure. Now we don't have to do the maintenance on it, we do a little bit of PM, but we don't have to do corrective, and we started rolling that forward. When I got there in late 2016, the infrastructure investment portfolio was about $35 million dollars a year; we've gotten that to the point where it's now up to about $115 million dollars a year and we've seen some significant successes, so it just started to snowball. We went from about 35 to 80, from 80 to 98 to 115 as we knocked off some of those maintenance headaches that we were having. I mean, some of the maintenance headaches were so bad that it was take systems down; we would have to go and search E-Bay to get parts so we could do an emergency repair to keep systems going. I mean, it was really ridiculous. And I'm really pleased to say that we've made significant strides and we've gotten to the point that we're repairing infrastructure that you would say is a little bit lower down on the list, so while roads are always important not to have big potholes in them, you wouldn't typically say let's go do a road instead of a nuclear safety system. So, we dealt with the nuclear safety systems, first got them more reliable, and then started moving out into roads, roofs and habitability projects that have made a huge difference. So, we've really had some big successes here in our infrastructure. But it does include some significant

items like shielded cell windows. If you've ever dealt with a shield window that you can't see through any more, because it's gone opaque, which is a little bit of a problem, and we've been able to replace thirteen of those windows and we've got two more onsite, the third one is in purchasing right at the moment, going to be delivered later on this fall, and we're going to replace those three windows next year as part of a program to work to get ready for a Mark 18 Plutonium 244 Recovery Program at the National Lab, so pretty big effort for us. And we're seeing some real successes there. I'm pleased to be able to say, and as easy as it sounds, it's nice to have the last of our fleet of emergency response equipment is finally replaced. We got our ladder truck here about a month ago, so that revamps our entire emergency response fleet, we've got a 24-7 fire department and EMS response capability there. We do about 500 calls a year; it doesn't do you any good if the truck doesn't start when you get ready to roll it out of the hall, so it's a big deal for us. So, you know it's a wide range of different infrastructure that we've been working on; we're really making good progress on roads today, so we're going to have the two main, three main arteries into the site are going to be completely milled out and repaved by the end of this summer, so it's making some really big inroads in terms of replacement.



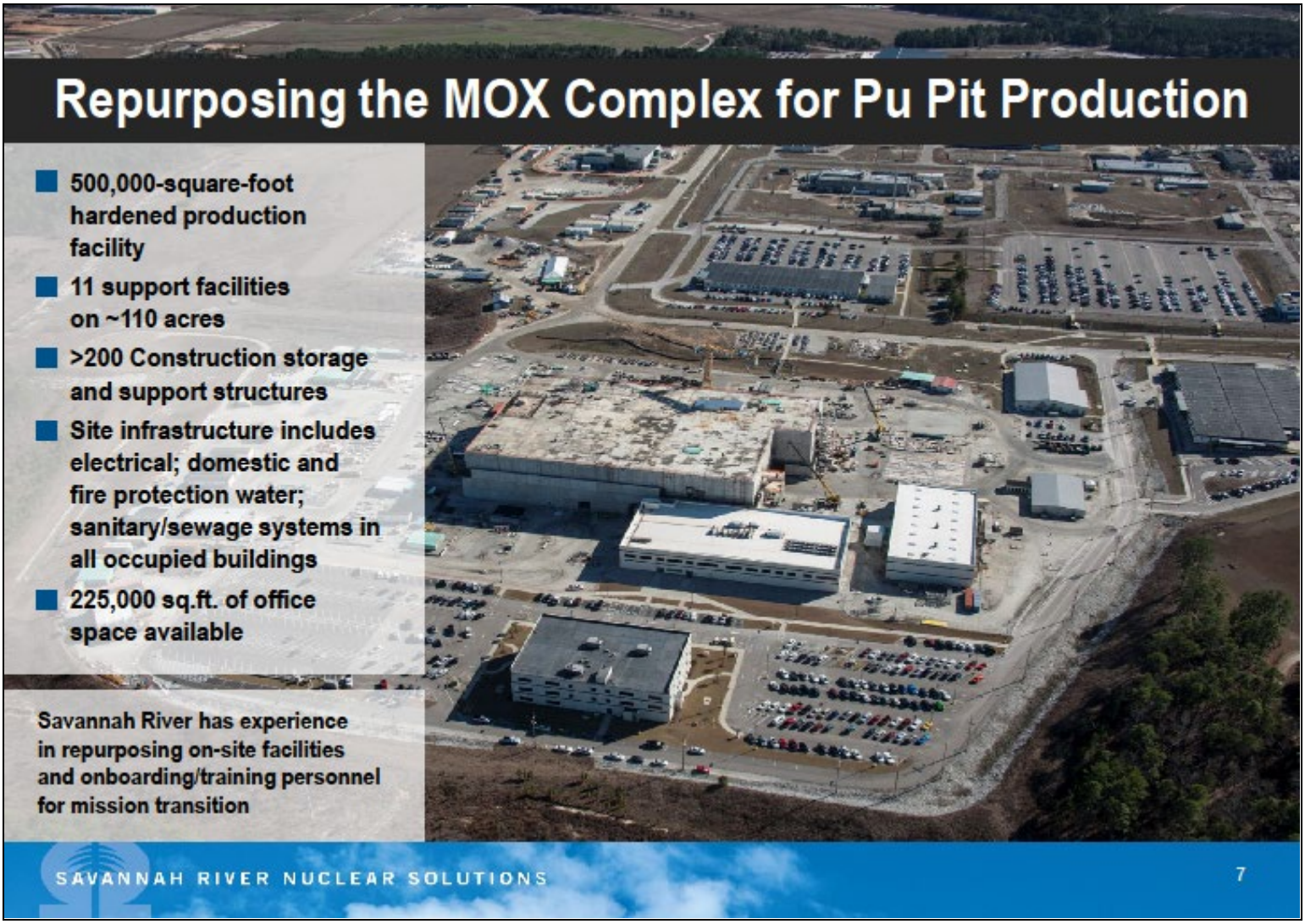
Our landscape of our mission profile is really changing this year and you just heard a bit about the plutonium side of that business. If I had come here six months or maybe even a year ago, what I would have said is, look at the left-hand column, and we're about a 60/35 mix between EM and NNSA, with the tritium program a little bit of NA20 program doing a little plutonium disposition but what we're seeing is a fairly significant shift, and so the NNSA is very serious about bringing new mission, scope

and the budget that it requires to the site, and so you see that there's this year a fairly big shift in terms of the balance, so the EM Budget hasn't gone down, but the NNSA Budget has gone up and it's gone up significantly this year. We have, for instance, gone from about a $5 million dollar spend in plutonium disposition to about a $45 million dollar spend. That doesn't count the $25 million on top of that that we've put into the SPE program or the glove box program we were just talking about here a few minutes ago. So, it's been a significant uptick this year and we knew it was going to be a big year for us starting back in the early part of the fiscal year, so we came out strong hiring and ended up having to actually about double what our hiring pace was for the year. I've got a slide that will demonstrate that here in a minute, but pretty significant growth in terms of mission and scope.



Different version of the same kind of slide in the posters that you see. I think the one thing that I will talk about is, this is an 80-pit mission. It's not a 50-pit and a 30-pit mission. It's an 80-pit mission, and what you're finding is that Savannah River and LANL are working really well together and are helping each other to figure out what's it going to take to do this. They've got a fixed footprint. PF4 is the facility they do plutonium operations in, and they've got a fixed footprint, and it is a limiting condition for them to be able to do the work that they've got to do. However, there is a lot of interface back and forth; they've got the technical wherewithal; we've got the production capability. We're swapping folks from site to site to share back and forth. I've got two of my lab engineers that are actually down operating one of their unit operations right now. So, they're actually in PF4 doing performance operations. And, we're going to tap their training programs so that we don't have to start from scratch, and

we can bring them our way, so there's a lot of synergy back and forth amongst the two production facilities. And of course, Livermore is actually the design agency so that National Lab has a design agency stamp, and their helping both sites fit the need. The other thing I would tell you is that parent companies from the LLC's at both locations have significant presence in the opposite location so, in particular Fluor and Huntington Ingalls, are my parent companies and they are also down at LANL, so we're getting a lot of parent company oversight and infusion of resources and capabilities to be able to pull off the plutonium production mission. It is a seriously challenging mission to be able to build out a facility in twelve years; we got a jumpstart at Savannah River, LANL is already producing some of the pilot program pits that they need to be producing, so I think we've got a good jumpstart, and I think while there are a lot of challenges, I think the two sites have a lot of capability to overcome the challenges and be able to meet the national need. I think we're in a really good place right at the moment in terms of where we're off to.



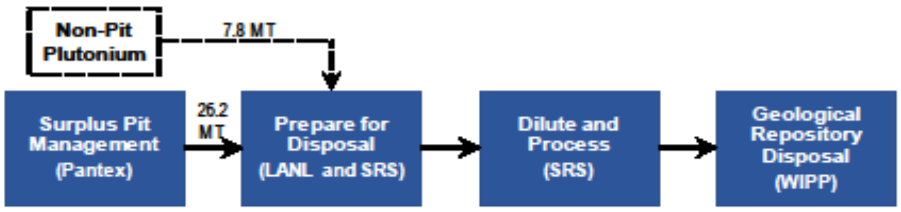
Now in order to get started on that, we assumed responsibility for the MOX facility complex on March 28th; that was a really tall order. In about six months we went from, we didn't even know that the project was going to be cancelled, or when it was going to get cancelled, to assuming responsibility for the facilities. I've got about 200 folks that have gone in there, assumed responsibility for the management and operation of those facilities, and we've got quite a bit of work going on; we've got to disposition the property and the assets that are available there. I will tell you that's about 9.5 million pieces of property and components so that's tallying up to about $1 billion and a half dollars, all sitting on the ground and in warehouses. We're taking

a good hard look at that to be sure that we can utilize as much of that as possible for a variety of different programs both SPD over in K area as well as there at the pit plutonium processing facility that's being proposed. One of the things that's interesting about this repurposing is that it has a lot of facilities already ready and available for construction activities. What you do when you're starting a program, you got to build out all your fab shops and all your store units and all that; they're way beyond that now so we've got a multi-year jumpstart on a big, capital build program. But the other thing I would tell you is that this is the first time that I've ever been part of a program that has something small that needs to go into something big versus something big that needs to get tucked into a much smaller facility. We've got a lot of experience trying to repurpose different facilities and I could rattle off right now a half a dozen that have been done at Savannah River just in the last ten years. So, it's an interesting program that we're working on, a huge amount of engineering and programming evaluation going on right now. In fact, we got talking about training her a few minutes ago. We just issued in draft our conceptual training program plan that is the first cut at what it's going to take to stand up training capability there at the site and through the local pipelines that we've got set up. It's out in review right at the moment; it gives us a good start. One of the things we're doing right now, functional operational requirements, design criteria. We're about to kick off seismic qualification of the existing building, so we're taking a look at all of the structural construction packages, verifying that they're complete, and the right quality standards. We don't have an NRC regulation to DOE regulation glitch in seismic qualification requirements for that plant. So, a lot of activity going on right now to just baseline the plant, where it's at, how many open work construction packages do we need to figure out how to close. So, a lot of activity going on right now over there with the pit program to get it to a point where we really understand how to deliver. We are on a fast track for the design. We get to take credit for the building so that's a big plus. There's already generators and fuel tanks and water tanks, and lots of things that we're going to take credit for, but we are expected to deliver a CD1 package which is a 30% conceptual design package with all the supporting documentation to the Department by May of next year. So, it's a pretty fast track for delivery of that package. But, we're well on our way; I've got about 150 folks working on it right now; I expect it will be plus 200 of that, so at about 350 by June. We're about to start ramping up our actual design activities; our final review of the functional operational requirements document and design criteria is May 3rd, so we're ready to kick off our design efforts. We're trying not to get ahead of ourselves; you know you do construction fast tracking and it can get you in trouble pretty quickly. I'm trying to make sure we get everything done and ready to go before we get back into construction activity. So, we're seeing that as a pretty positive stand right at the moment.

Surplus Plutonium Disposition Program

- Transition from MOX Fuel approach to Dilute and Dispose approach
- Modifying glovebox to increase throughput
- Increased staffing
- Currently operating 2 shifts; will extend to 4 shifts by 2022
- In design phase for a new $500M 3-glovebox line in K Area

Dilute and Dispose Approach to Surplus Pu Disposition



Plutonium disposition; we have dramatically increased the size of our staff and capacity and pace of operations so in the last year, we've gone from a storage, surveillance and maintenance mode to a hard-core operations mode over in our K area. Operations, we've boosted up to a 2-shift operation, so we're operating in the glove box right at the moment, seven days a week, twelve hours a day. We are about to shift all of the resources from HP, so we're about ready to be laid up there, other resources over there, and we've just hired a new cast of operators that will help us out to get us up to a full, four crew, 24-7 operation, which is where we're heading for. We've got a large-scale outage to make some significant changes in the glove box that we've got today to help with material flow and be able to get to the point where we can actually use it for dilute and dispose in its most optimized fashion. That's what we're actually calling it is an optimization outage. It was originally set up for interim surveillance of 30-13's which is the can that the plutonium is stored in. We're going to convert it to a dilute and dispose. We will still do some surveillance, but we're 15 years into a surveillance program; we've got an awful lot of data, and we're feeling pretty good about where we're at with being able to do about a half a dozen surveillances a year so we'll just do those kind of "on the fly" while we're doing dilute and dispose. So, a significant increase in the capability over there. Along with that goes, we've got to have office space, a number of different projects to build out, some footprint for additional material handling.

I just talked about the big waste storage pad; we're going to have about 4500 storage spaces for the waste that comes out of the back end of the program. It's about to launch into construction; we're doing some of the early work, relocating electrical lines, that kind of thing, and right now the schedule has us complete [June 2020]. So, summer of next year, we ought to be able to

get that done. So, we're making really good progress there. And then of course, I've got a design team that's actively working the three glove box line to replace the single glove box that we've got so that we would have four glove boxes available for use. We've actually already got the room ready and available and what we're going to do is go ahead and build out three glove boxes and all the nuclear ventilation, fire protection that's required to go along with that. That's about a $500 million-dollar project as it stands today. The physical activities are starting for prep outside of the main room that it's going to go in, so we need to new entry control facilities and access ability for the construction workers, that kind of thing, so they can get in and out of there fairly easily and not have access to drums of plutonium. So, we're off to work those kinds of projects, and we'll be working those over the next year, and I expect we'll start into heavy construction probably fall of the year after that. So, it's a pretty good program of work that we've got going on over there.

Tritium Operations: Increased Production Period 2020-2024

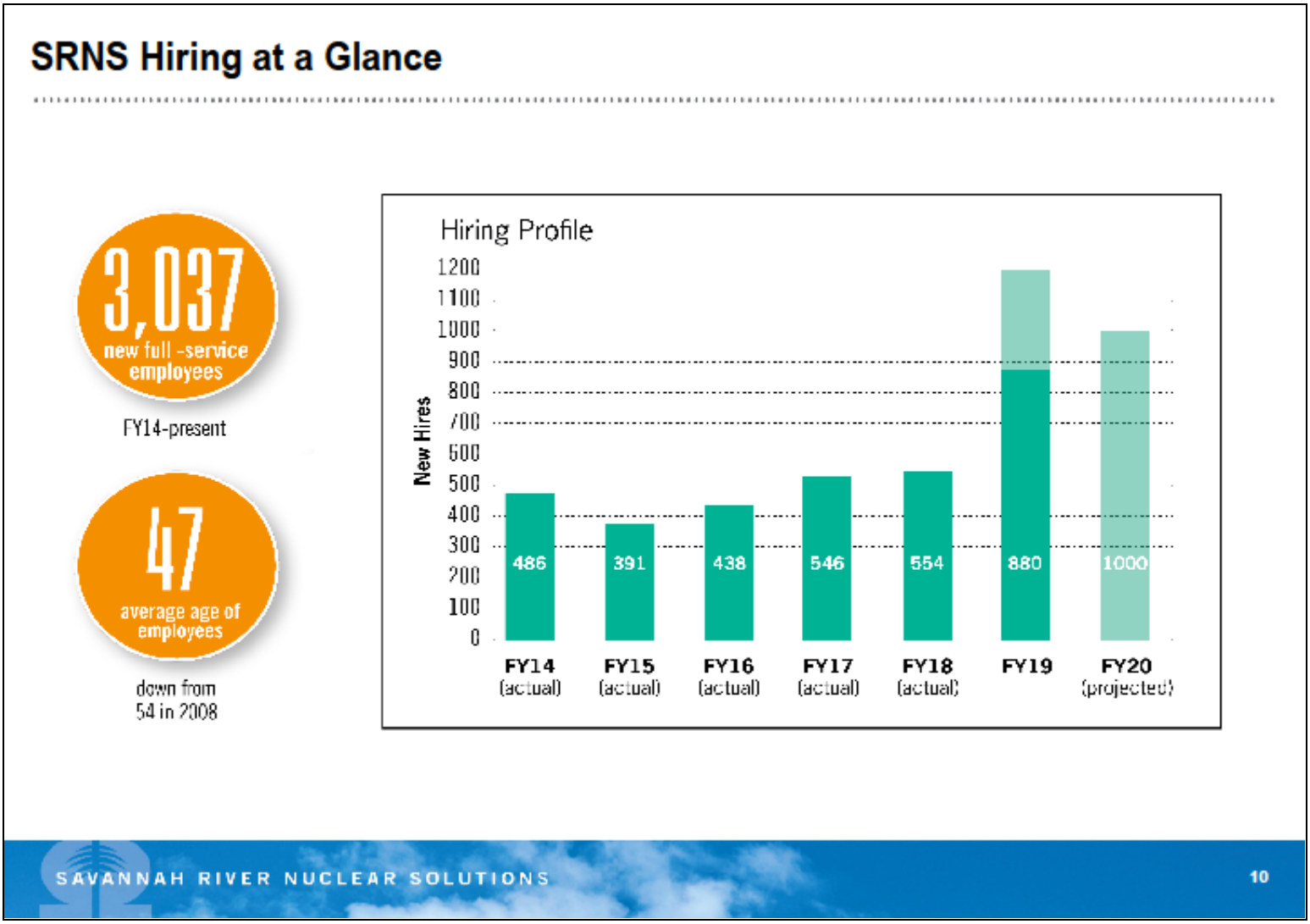
- Tritium production, extraction and processing capabilities must increase to meet demand
- Requires 7 extractions per year by 2023
- Reservoir loading and testing complexity will increase; more complicated surveillance
- Work in progress in 3 key areas
  - Plant Preparation
    - $74M Projects Execution Plan
    - Tritium Finishing Facility
  - Focused Hiring
    - 134 hired in FY18 and 47 in FY19
    - Total headcount - 668
  - Performance improvement
    - Maintenance and product quality
    - Improved efficiency and response capability

General John E Hyten, Commander of U.S. Strategic Command at SRTE

SAVANNAH RIVER NUCLEAR SOLUTIONS 9

Let me go back to tritium for just a minute. Nicole reflected on this when she was doing her presentation. We've been doing tritium operations for a very long time, but we've been doing tritium extractions in what we call a responsive operations mode, meaning keep the plant just operational enough to be able to show that it's going to continue to do its work. So, we've been doing one extraction per year ever since the facility went into operation in 2004. Last year, we did our first three extractions in a year; we'll do three extractions this calendar year as well, but we're moving to a 7X with the pace that we've been operating at. It takes a lot of people; it takes a much more reliable plant, so we've had a project running about 18 months now to hire the people, build out the plant, get it capable and ready to go so we can run at much higher pace of operations. Even the reservoir

loading that we do after you extract the gas, is going to get complicated by something on the order of 2 to 4 times more complicated, just new generation reservoirs coming online and so we've got a lot of activity going on to really be ready to operate at that pace. We're not going to be in a responsive, it's okay if it slips a couple of months, kind of methodology. We're going to be in hardcore you've got to operate that plant and it's got to run when you tell it to run methodology. Lot of activity there. A big piece of that has been infrastructure improvement. If you go back to just a few years ago, we were only doing about a million or two million dollars worth of infrastructure improvements. That's a 50-year-old plant, some of it, so TEF, the tritium extraction facility came on in 2004, but the other facilities are 30 years old and 50 years old. So, it's a significant issue for us to maintain the 50-year-old plant, so we're working on bridging strategies to be able to maintain those plants and maintain them in a reliable state. And so, we've been spending about 35 million dollars a year this year and last year on the infrastructure and getting it to a really good operating state. So, a lot of good work going on in tritium and we're going to be ready for the increased production rates that we've got to get to.



A review of how we are able to do all this: We've been working on about a 500 person hiring campaign now for several years, and you can see how we've done over the last five years; we went into the year thinking we were going to do about that 500 again, but with the increased missions and the expanded missions, and then bringing on the transition of MOX facilities, and then getting into pit production, we really bumped that up. We're at 900 hires so far, this fiscal year; we're going to be about 1200 by this summer, and I expect that we'll hire about 1000 again next year so you can imagine the amount of recruiting we're

doing right now to be able to bring that off. It's been a really busy time for us; that is a significant hiring campaign. I think, we'll probably be, right now, since a year ago, we've gone from about 5200 people to about 6000; I think we'll be at about 7500 by mid-next year. So, significant growth in terms of the size of the company. You can imagine all of the things that go on with that. You know, over half the folks are less than five years of service. You're teaching them and transferring knowledge as fast as you can. It's a concern of ours to be able to maintain those knowledge transfer programs; we've gotten very formal with some of our knowledge transfer programs to be able to make that happen. We've done a lot of mentoring, keeping people past retirement to bring them in on a part-time basis and help spread the wealth of that knowledge. So, we've got a lot of programs in place to be able to make that happen. But we are now over the 50% mark for, we've got more new hires with less than five years experience than we've got some of the older, more experienced folks. So, it's been a significant opportunity for us, which is why I'll go back to the first slide which said we're doing it safely, and I'm really pleased with the crop of folks we've been bringing in, how well they've been able to adapt to what we do, how we do it, and our performing at a very high level, so we've got a good team of folks that have been coming on, so we're feeling really good about where we're at with those people. And that's it.

Rick Lee: You've got a few things going on. That's just amazing, the numbers you have. Any questions, folks.

Jim Little: Stuart, what are you doing, on your knowledge transfer kind of things, are you doing it just kind of mentoring, or do you have something more formal and kind of a planned approach to bring them on board.

Stuart MacVean: So, we've actually got a number of different techniques that we use Jim, because you can imagine somebody that's doing kind of admin kind of work has a different, so we'll do desk guides with those folks. When you get into some of the engineering stuff, we're actually doing side-by-side so a lot of the new folks coming in don't have clearances, so we buddy them up so that they learn that way. But we do have some very formalized systems where we are documenting, we're videotaping, we're putting stuff that's actually on a little web based thing, so we've got quite a variety that we're using with go-pro cameras so a lot of our maintenance folks, there out in the field, so how are you going to do something? We'll Go-Pro them; we've have them actually go with somebody and then they'll do a job that'll be taped, and then he can ask questions along the way, and so one of the nice things about that is then the next person that watches the video, it's like they were there and asking questions.

Jim Little: The reason I'm asking is that I'm actually working with the American Nuclear Society. One of the things on the commercial side of the industry is this wave of talented boomers are going to the right of millennials coming in. I will say, they have a different work-style, not ethic, where they want to routine-ize a lot of the transaction al stuff, some of this AI and digital stuff, but you also need the knowledge base of that entire generation, so we will talk some more about that. There's a lot of interest in the commercial side of this and we've got to keep this facility running, and Old Joe is moving to the right and he's been here for 20 years. "Joe, could you write down everything that you do before you leave today," and that's not going to work, particularly as these facilities are getting older, you're dealing with older than they are.

Stuart MacVean: But one of the interesting things, you notice a lot of people are are like "oh, woe is us, everybody is retiring," but quite frankly, there's some of the knowledge I would just as soon go out the door.

Jim Little: Yeah, right, because it's the old way of doing it.

Stuart MacVean: Yes, the new folks coming in, they're just completely different paradigm on what you do and how you do it. They take that little bit of technical knowledge that they need to perform their job and they combine it up with a different methodology. What we're finding is, they're getting way more efficient and they're willing to change the way folks have been doing it for twenty years this way, that's the way they want to do it. Folks that are coming in don't have that bias so there have been changes.

Jim Little: I don't want to take your time, but I do want to talk to you some more about it because I've been dealing with Suzanne Jaworski up at DOE headquarters about how to get the millennials on track.

Stuart MacVean: Yep, we're having a lot of success.

Rick Lee: Thank you Stuart. That was very kind, good information. I don't see any other questions.

Captain Cross: I just wanted to pass on from experience that this national nuclear deterrent that we're building with these pits; it's so critical that I don't think you need to worry about funding. The people in Congress are more interested in getting the job done. You get the job done and make the schedule. That's the critical part, so that's where I think that's where the emphasis should go. We did that when we built the 41 nuclear missile submarines in just a few years, put all those weapons out. Now that's out number one deterrent we have today. And we've got to make sure that stays. That's a big critical thing. We talk about pits. Well what is pits? Pits is our deterrent; that's our safety, our security.

Stuart MacVean: And the thing we like to talk about in tritium is, when was the last time deterrent was used?

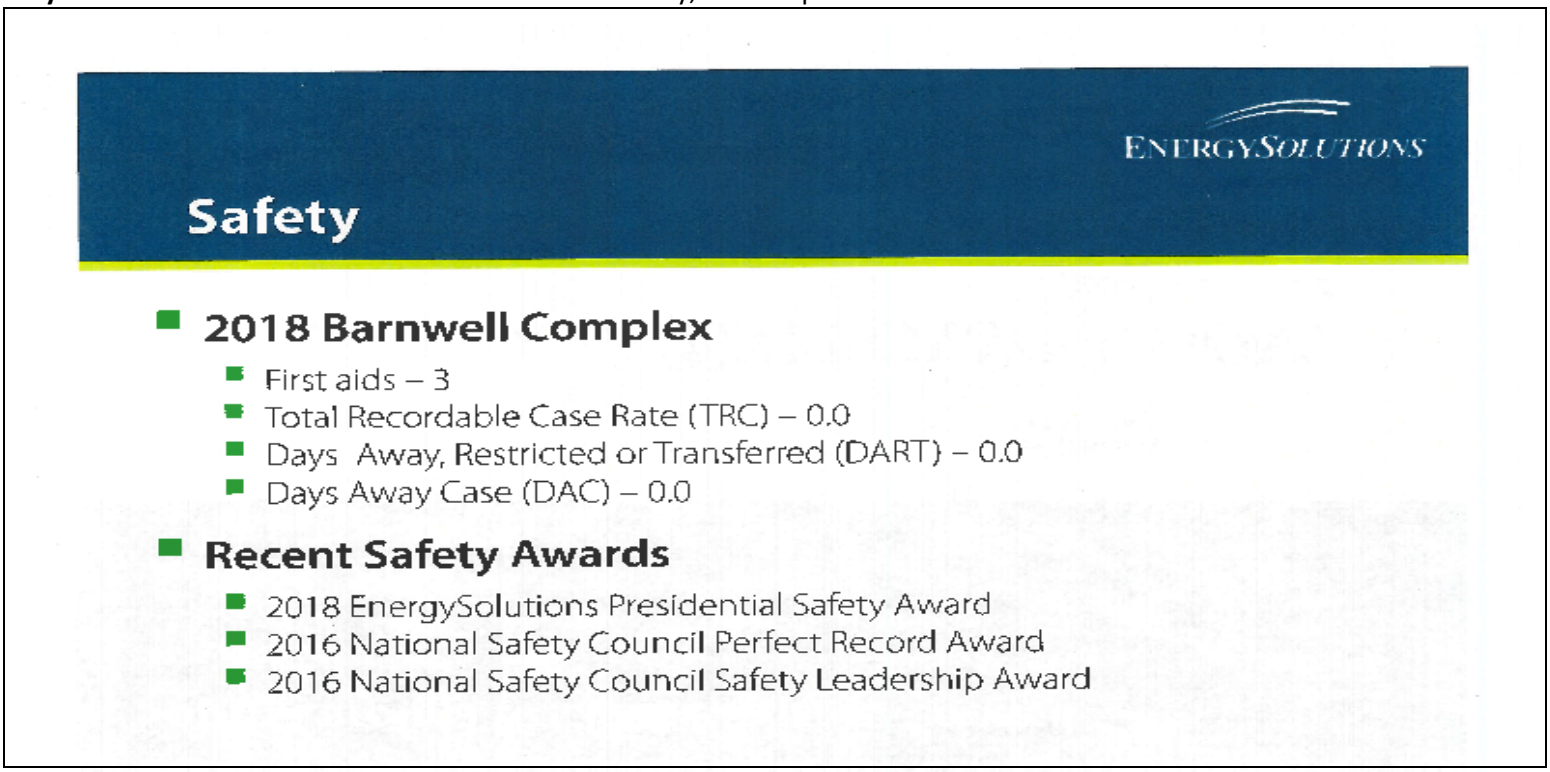
Barnwell Solid Disposal Operations

Rick Lee: Stuart, thank you so much. Wayne Inabinett with Energy Solutions, and the subject is the Barnwell Solid Disposal Operations. We haven't had an update from y'all in some time; it's good to see you here.

Wayne Inabinett: Thank you; thank you for letting us be a part of this.

Rick Lee: Please tell Ben thank you for sending you to visit with us.

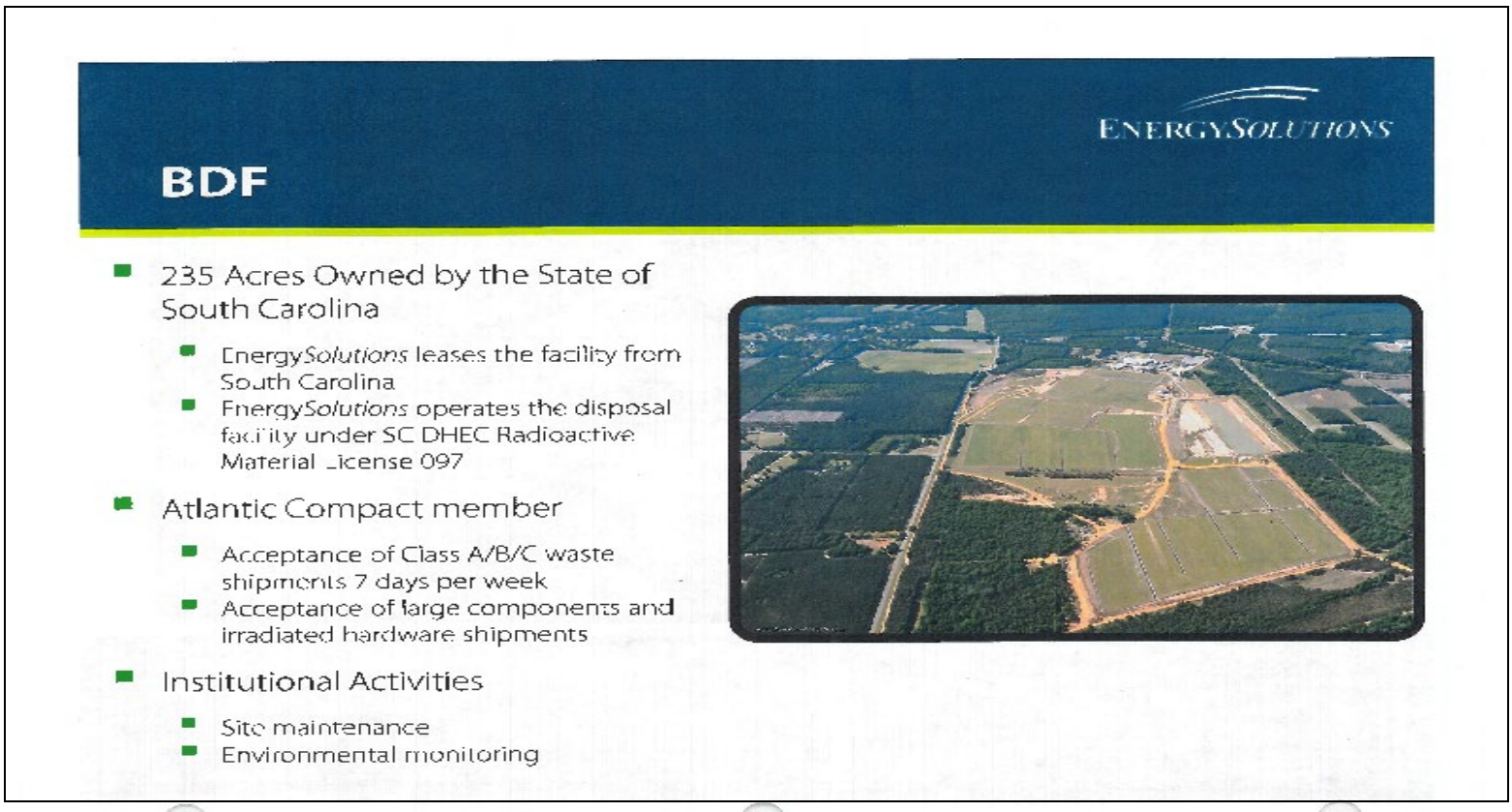
Wayne Inabinett: I do want to talk about Barnwell safety, the complex there.



2018, our safety record, we have only three first aid cases, the next three you want to see zeros in all of those, in days away and

restricted care. We're at zero's in all of those and actually we host five different business units at the Barnwell complex besides the disposal. One of those units has gone more than 21 years without any reportables. So safety is a big part of what we do. Just recently, one of the things that we're most proud of, the highest honor that you can get in energy solutions, is the Presidential Safety Award, and Barnwell was the recipient of that award in 2018.

Myra had quite a bit; I try not to duplicate some of the things that we've already talked about earlier, when Myra briefed the Barnwell complex. But, we talked about things that had been done in the tritium plume to make the situation better, the recent lawsuit, things that have been done.



If you look at the picture that we have here, you see all the green areas that we have swales and transitions in between them; that's the completed part of the disposal site. We're actually at 95% of the 235 acres that make up the site, are under what we call Institutional Care, meaning that they have the enhanced caps on top of them, and the only thing that we do there is mostly is monitoring and of course we cut a lot of grass in those areas once we put it there. Since 1971, the Barnwell complex has buried about 28 Million cubic feet of waste. Of that is 14.3 million curies; due to the decay factor, today it's approximately 3 million curies of radioactive material at the site. We have about, approximately 1 million cubic feet of waste still remaining at

the disposal site.

ENERGYSOLUTIONS

BDF Current Status

- **Atlantic Compact Host Site – SC, NJ, & CT**
  - ~ 95% of the 235 acres under Institutional Care
    - 28 million cubic feet of buried waste consisting of 14.3 million curies
  - ~ 1 million cubic feet of disposal capacity remaining

In 2008, Energy Solutions or Chem Nuclear closed to the nation; we were receiving waste from throughout the nation, and we entered into an agreement with the Atlantic Compact, and we are the host site for that, which includes South Carolina, New Jersey, and Connecticut. The one million cubic feet that we have at this time should take all of these utilities, their yearly waste that they generate, and it will also provide them over the next 25 years a place for decommissioning of that waste. That was the purpose behind the compact.

ENERGYSOLUTIONS

Class A/B/C Waste Disposal

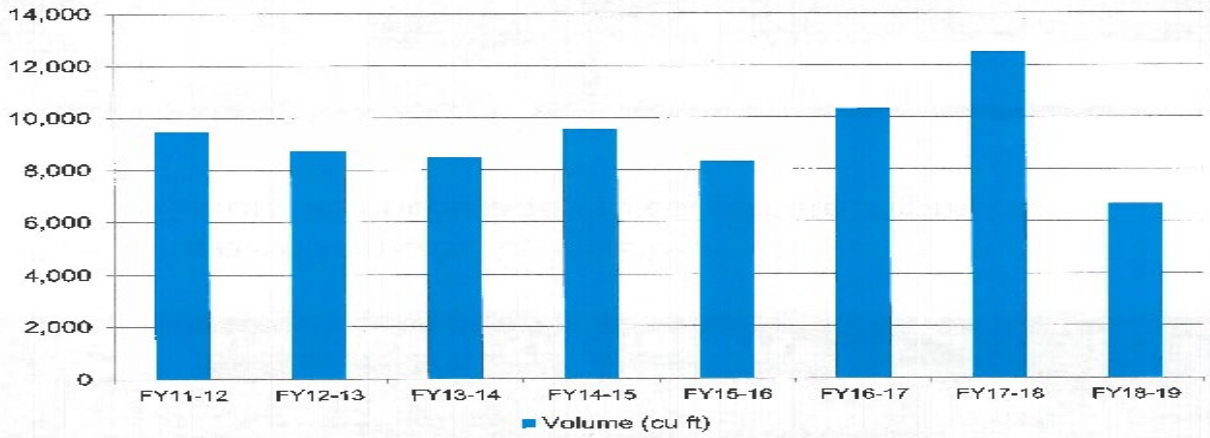
- All waste arrives by truck
- Most shipments are HIC liners
- Vertical crane lift to place liner in prepositioned DHEC approved vault
- All waste classes in same trench
  - Separate vaults for stable/unstable waste

Some of the things that we talked about the tritium plume that was from operations in the early 70's and of course technologies have changed greatly over the years and we have changed with those technologies. The one picture you see there, basically all our waste today arrives by truck and shipping casks that most of you have seen running up and down the highway. In our trenches, today's technology, everything is put into a concrete vault; that was not the case many years ago when we started, but today everything is place, as you see in the picture there, in concrete vault for the permanent storage of it.

Large components, irradiated hardware, are also part of the operation that we do there, and the picture you see two steam generators that were buried at Barnwell. These are the components that the 13 reactors that are currently part of the compact that we are trying to provide to space for, for disposal.

Recent Annual Waste Volumes Received (Fiscal Years)

ENERGYSOLUTIONS



ENERGYSOLUTIONS

Recent Waste Volumes

Waste Type	FY 12/13 cubic feet	FY 13/14 cubic feet	FY 14/15 cubic feet	FY 15/16 cubic feet	FY 16/17 cubic feet	FY 17/18 cubic feet	FY 18/19 cubic feet
Routine Utility Waste	8,582	8,366	9,424	8,123	6,510	12,255	6,385
Non-Utility Waste	171	13	140	68	44	235	112
Large Components	0	0	0	0	3,764	0	0
Irradiated Hardware	0	115	0	113	0	0	168
Total	8,753	8,494	9,564	8,304	10,318	12,490	6,665*

* as of April 1, 2019

Current waste volumes: I think we've got 7 years up there. So, there's two different ways that our customers today, there's two options for them to bring waste into Barnwell. You've got Option A, which is a Gate Rate, and then you have Option B, which is utilities pay a fee to have access to Barnwell. That fee is based upon the volumes of 7000 cubic feet a year. You can see we exceed that; throughout the years, fiscal year 2018-2019, we're expecting to be around 11,000 cubic feet. So, pretty consistent across the board over the years for the disposal.

ENERGYSOLUTIONS

BDF Regulatory Agencies

- SC Office of Regulatory Staff (ORS)
  - Sets prices for waste disposal
  - Detailed audits of actual costs
- SC Public Service Commission (PSC)
  - Determines allowable costs
- SC Department of Health and Environmental Control
  - Licenses Radioactive Materials – Disposal

Our regulatory agencies, South Carolina Office of Regulatory Staff, they're the ones that set the pricing for the utilities that use the Barnwell facility; the Public Service Commission determines what costs are allowable costs for us, and of course DHEC is our license holder.

ENERGYSOLUTIONS

Memorandum of Understanding

- Disposal rates and/or access fees cover operating costs plus margin only (Revenue neutral for SC)
- Institutional costs are disbursed from Decommissioning Trust Fund or Extended Care Fund for maintenance and monitoring of closed site areas

The disposal rates and access fees covered by the operating costs, plus a margin, it's a revenue neutral to the State of South Carolina. South Carolina allows us to operate it, to provide that access and ability to have a place for waste to go, especially for South Carolina; it's a big plus for South Carolina. The institutional costs, we have a trust fund set up; it's currently at about $149

million dollars in the trust fund, and the closure parts of the site, the 95% of the site that's closed, we use that money from our closure plan to do the institutional upkeep of the site.

ENERGYSOLUTIONS

Atlantic Compact Disposal Rates

- ORS Approves Rate Schedules
- OPTION A: Maximum Uniform Rate Schedule
  - Permanent ceiling on disposal rates applicable to Atlantic Compact waste
  - Adjusted each year in accordance with PPI
  - Pricing based on several factors including:
    - Density and weight
    - Dose rate
    - Radioactivity
    - Biological waste
    - Other charges (Irradiated hardware, SNM, Atlantic Compact Commission)
- OPTION B: Alternative Rate (Access Fee) Schedule for FY 2018/2019 approved by SC Energy Office – effective July 1, 2018

I mentioned earlier about the two options that are available to our customers, Option A is a maximum uniform rate schedule that some of the small generators in South Carolina that won't generate enough waste to pay the access fee, they would choose Option A and they would just pay based on the volume of waste that they wanted to get rid of.

ENERGYSOLUTIONS

Atlantic Compact Disposal Rates

- Option B Access Fee pricing
  - Quarterly Access Fee per reactor
  - Annual volume allocation: 538.46 cubic feet per reactor
  - Additional volume: $133 per cubic foot
  - Utilities can share annual volume allocation with appropriate contract changes

All of our utilities, the 5 nuclear power plants and the 13 reactors involved in them all chose Option B for their access where they pay an access fee per reactor, so as decommissioning starts to happen, we see Oyster Creek is the next nuclear power plant that's fixing to decommission; that will reduce the number of reactors to the compact in the years to come as that one comes off, so the cost for access to Barnwell will be divided among the 12 reactors versus 13, so every time one drops off, the cost is going to get incrementally more expensive to come to Barnwell.

ENERGYSOLUTIONS

Utility Agreements for FY 2018/2019

- All 5 utilities with 13 reactors chose Option B pricing
- Access Fee determined by Cost of Operations plus statutory margin (29%)
- Budget base is 7,000 cubic feet/year

I already talked about the 5 utilities, the 13 reactors, choosing that. That budget is based on 7000 cubic feet a year, but we do exceed that. Any volume over 7000 cubic feet, they have assessed at a rate of $133 dollars per cubic foot.

ENERGYSOLUTIONS

Trust Funds

- Extended Care Fund
  - Balance as of March 31, 2019 $149,864,491

The extended care fund as mentioned is at $149 million dollars and this money was accumulated from our shippers over the years; money was set aside, a certain portion, to make sure that there was money there to manage the site after closure.

Barnwell Environmental and Dosimetry Laboratory

ENERGYSOLUTIONS

- Environmental Monitoring
- Radiological Laboratory
- Radiation Dosimetry
- Engineering Support
- Site Characterization
- Hazardous Material Management

We have five, a total of six licenses, at the Barnwell facility. License 0-97 is the one that the disposal site operates under. We also have the Barnwell Environmental and Dosimetry Lab; that's the group that is responsible for doing the environmental monitoring as Myra talked about, they do split sampling with DHEC. This is the group that would do that, does the characterization, the environmental lab, that group, it's the one that is, that monitors the tritium plume, that tracks it, that models it.

ENERGYSOLUTIONS

BPF

- 17-acre facility that consists of two primary buildings
  - 101 – 7,500 ft^2
  - 201 – 24,500 ft^2
- Services provided
  - Volume reduction
  - Dewatering
  - Waste treatment
  - Decontamination
  - Water processing
- BPF shares a boundary to the west with the Department of Energy Savannah River Site

Our processing facility: it's across the street from the Barnwell disposal facility, it was originally built in, I think it was 1989 by the Department of Defense, to be used by the Department of Defense. After they finished their mission there, they turned that facility over to us, and it's now a commercial facility that we use for processing waste. The majority of the work done is in compact waste with the three states, host states, that we support.

The facility of 17 acres, as you can see there, it's got two buildings on the facility, a 7,500 sq, ft. and a 24,000 sq. ft. building. Services provided there is volume reduction, de-watering, waste processing, decontamination, and water processing. We do share a boundary fence with our neighbor, Savannah River Site, at that facility.

BPF Building 101

ENERGYSOLUTIONS

- Climate controlled concrete facility
  - 7,500 square feet
  - Large open work bay for processing and compacting various radioactive material and waste streams
- Sort and Segregation Facility (SSF)
  - 700 square feet
- Equipment Storage

The building, 101, the 7,500 square foot building, it's open work bay, we have a sort and save facility in there, and we also have the abilities to do compaction of waste in that facility. It's basically used for storage for the most part.

BPF Building 201

ENERGYSOLUTIONS

- 24,500 square foot climate controlled concrete facility
- Radioactive Water Processing
- 80-ton overhead bridge crane
- Special projects

Building 201, the biggest asset we have there is the size of it for one, we have the 80 ton overhead crane which allows us to do a lot of special projects in there; that's also where our de-watering and cask maintenance is performed, in that building.

Energy Solutions, we produce the majority of the containers that are used for shipping radioactive material throughout the country, through our commercial nuclear power plants, so although we only support the three states in Barnwell for disposal, Energy Solutions supports the nation's commercial nuclear power plants in many areas, one of them being the containers that are used for disposal.

ENERGYSOLUTIONS

Hittman Transport Services, Inc.

- Three Locations
  - Barnwell, SC
  - Oak Ridge, TN
  - Richland, WA
- Assets
  - 86 Tractors
  - Equipment
    - Flat Beds
    - Vans
    - Curtain Trailers
    - Cask Trailers
    - 80 ton Multi Axle Trailer
    - Tankers
- Capabilities
  - NRC NQA-1 Approved Program
  - New and Used Nuclear Fuel Transport
  - DOE Classified Shipments
  - RAMQC Shipments
  - Integrated Proprietary Cask Fleet
  - Oversize/Overwidth Project Management

HITTMAN TRANSPORT SERVICES, INC.

22

Hittman Transportation, one of the largest haulers of radioactive material in the country, is a wholly-owned subsidiary of Energy Solutions and that is housed at the Barnwell operations. Their terminals consist of 86 tractors and hundreds of flatbeds, vans and casks, that are used to ship waste.

ENERGYSOLUTIONS

Cask Logistics

- **Key Assets**
  - Proprietary NRC Type B Shipping Casks
    - 10-160B
    - 8-120B
    - 3-60B
  - DOT Type A and IP-II Shipping Casks
    - 8-120A
    - 10-142
    - 14-170 Series
    - 14-190
    - 14-195H
    - 21-300
- **Capabilities**
  - Cask Rental
  - Cask Sales and Maintenance
  - Specialty Package Design, Fabrication, and Licensing

EnergySolutions maintains the largest fleet of licensed shipping casks in the country!

Cask Logistics, another one of our divisions, we have I think the largest fleet of IP casks in the country, so we again support all of the nuclear power plants. Again, we have waste going to our facility in Flag, Utah; we have waste that goes to WCS in Texas, so we support safe transportation movement of waste across the country. Questions?

Dr. Hudson: Yes, I have one. When you fill up eventually and have to close, where will the waste from the Atlantic Compact go?

Wayne Inabinett: Well, our goal would be to make sure that we have enough space to take the Atlantic Compact utilities through closure. That was the original plan, for the decommissioning of all of those power plants. If that doesn't happen, I mean, currently today, for type A waste, we have our Clyde facility that has a lot of volume and room, WCS is recently opened in Texas that can take B & C waste, so there are other options, but today, as the law states today, we have what you see remaining, about 1 million cubic feet, and it's dedicated to those three states.

Scott Batson: That's just for the current license for those facilities. If there's subsequent license renewal?

Wayne Inabinett: Yes.

Rick Lee: Any other questions? Senator Young.

Senator Young: Thank you Mr. Chairman. Thank you for being here and for providing this presentation. I want to follow up on the question about the capacity that's remaining. It's my understanding it's about 1 million cubic square feet.

Wayne Inabinett: Correct.

Senator Young: In the presentation in 2017 before this Council, the remaining capacity was about 1 million cubic feet. Apparently, I asked the question then about how much is being used on an annual basis. The testimony as an answer was "about 8000 cubic feet." Is that still consistent today?

Wayne Inabinett: It is. From the baseline, we did have, I could go back to the slide, and show you how the volumes did change,

Rick Lee: You had a surge last year, right?

Wayne Inabinett: We did. Hope Creek, one of the utilities, went through a campaign of cleaning up, and that's what you see where it jumped to 12,255, and we'll see a little bit more of that this year from Hope Creek. Also, in FY 2016-2017, we had a large component, so one item that was 3764 cubic feet, but on average, it is around 8000-9000 cubic feet per year.

Senator Young; And there was also testimony two years ago that there was going to be a spike in FY 16-17.

Wayne Inabinett: That was it.

Senator Young: Okay, so the Extended Care Fund, I think I heard you say it has $149 million dollars in it?

Wayne Inabinett: Yes.

Senator Young: In 2017, it looks like it had $149 million dollars in it.

Wayne Inabinett: Extended Care Fund is basically set aside for long-term care, so we do draw from that, but with interest, it pretty well stays about the same as it is right now.

Senator Young: And the decommissioning fund has zeroed out as I understand it? Is that correct?

Wayne Inabinett: Yes.

Senator Young: It was close to zeroing out in 2017. My understanding from the testimony in 2017 is that once it zeroed out, that the expenses that were necessary for operating the site would come from the Extended Care Fund. Is that right?

Wayne Inabinett: I'll have to defer and get you an answer on that; I'm not sure exactly.

Senator Young: The question I have is that it looked like from the minutes that the money in the Decommissioning Fund, I think that's the correct name, was less than $5000 at this meeting two years ago in April of 2017. It looks like when we had testimony about this, we had zeroed out pretty quickly after that meeting. So, in approximately two years, if the Extended Care Fund is about the same as it was two years ago so, has the facility been breaking even with the money that's been coming in, in terms of operating the facility?

Wayne Inabinett: The facility operates at a 29% of allowable costs.

Senator Young: What does that mean?

Wayne Inabinett: Our regulators, the Office of Regulatory Staff sets the rates and the Public Service Commission, in fact that's why I'm here today, because Ben Smith was giving testimony at the Public Service Commission; they're the ones that determine our allowable costs.

Rick Lee: So, the question that you're asking, I think, if I understand it correctly, the costs for long-term care, are they increasing or depleting the $149 million dollars?
Senator Young: Yes, because it sounds like if two year ago, we had $149 million, and today we have $149 million, and you're drawing on that fund to operate the facility. . .

Wayne Inabinett: No, we are not drawing on that fund to operate the facility.

Senator Young: There's money coming in from the license fees; that money goes into that fund, correct?

Wayne Inabinett: Yes, a portion of that goes in; the majority of this money was done before 2008 if I'm not mistaken, and when we were open to the country is where that fund was established, so we would have money in the future.

Rick Lee: So you live off the income off of that $149 million to be the caretaker; is that how it would work?

Wayne Inabinett: That's what it would go to is the long-term care of the site, not the daily operations of the site. That does not come from that fund. The monies that we operate from come from the fees from the utilities that the utilities pay; each one of them pays an access fee to have rights to come to Barnwell.

Senator Young: So, do you anticipate that at this time next year, it will still be $149 million?

Wayne Inabinett: I would hope it would go up some with interest; I'm not sure if we were to have a large one, I showed you 95% of the site is in an institutional, a closure state; if we were to go and do another section of enhanced capping, it would pull money from that.

Senator Young: Do you know why it hasn't gone up in two years? Can you find out and let us know?

Wayne Inabinett: I don't. I can find that out and let you know. I'll get that to Jenny.

RESPONSE:

CHEM-NUCLEAR SYSTEMS - INC
ATOMIC WASTE BURIAL ESCROW ACCOUNT
(E16 4693 / SCEIS FUND 46930000)
On Deposit With South Carolina State Treasurer
- Fund History -

	Beginning Fund Balance	Escrow Deposit	Interest Earned	Funds Transferred Out	Ending Fund Balance
2016	149,425,438.59	21,387.43	2,093,048.49	(2,226,560.57)	149,313,313.94
2017	149,313,313.94	33,360.74	2,207,863.02	(2,207,889.68)	149,346,648.02
2018	149,346,648.02	31,557.69	2,596,936.80	(2,449,883.35)	149,525,259.16

Institutional invoices are currently paid from the Decommissioning Trust Fund (DTF) and the Extended Care Fund (ECF). Since 2016, the majority of Institutional Costs have been paid from the Extended Care Fund, because the DTF has been exhausted. The DTF continues to receive payments at $4.20 per cubic foot of waste received at Barnwell. The spreadsheet above shows flow of funds in the ECF.

The Extended Care Fund balance has been holding steady since 2016 because the amounts transferred out for Institutional invoice payments are offset by the following income amounts:

- The amount paid into the Decommissioning Trust Fund ($4.20 per cubic ft)
- The interest earned on the Decommissioning Trust Fund balance.
- The amount paid into the Extended Care Fund ($2.80 per cubic ft)
- The interest earned on the Extended Care Fund balance.

Rick Lee: Any other questions? Hearing none, thank you very kindly. We certainly appreciate the presentation and I believe that brings me to public comments. Anybody here from the public who has comments? Seeing none, we'll move into closing remarks.

I wanted to talk to you about a meeting that I had with Peter Hanlon but I'm going to save that for next meeting. Secondly, I wanted to bring up the subject of some of the State legislation associated with solar energy and the renewables and to have a discussion with regard to its impact on our nuclear power industry here in SC and other trades that are taking place between the one industry and the other, but we're running late, and I'd rather just reschedule that for next time unless somebody has a compelling reason to do it now.

So, I would ask for our next meeting, given that we have representatives from both houses of the State, if you all could come prepared to talk about some of the bills that have come up and you probably will have a resolution as to which has passed or not passed by that point. So, yeah, we can criticize you then. I'll get with each of you and give you an idea of a framework for a presentation.

And then, the last item I wanted to mention is that we did have an initiative that we started with South Carolina State University, and I thought I would just quickly recap that since we met over there, there's been a lot of progress on campus with regards to forming partnerships with Westinghouse, Savannah River Nuclear Solutions, the Department of Energy, and other folks, Duke and others, who are stepping up to the plate to recruit students at potential employees, to provide internships, to provide equipment to enhance their laboratories. I'm really pleased with the response that we've had and we'll hope that in a meeting with the President this week, where we went through these initiatives, and he's structuring his staff to take more advantage of all of the fine gifts and support that he's received to date, and we'll look forward to even better things in the coming year. So, my thanks to everybody who's contributed.
Kathryn, thank you for the information that you sent. I passed that on and they have started trying to digest that as a source of potential internships and scholarships for the kids. Thank you to Duke for your assistance with some of the equipment issues that we've had. Westinghouse, thank you for the work that you all have done; and I'm going to squeeze you some more, but I thought I'd just say thank you at this point. So, if there are no other issues or items to come before the Council, then I'll declare victory and wish everybody a great Governor's Nuclear Advisory Council year. See you in October.