Final LW Pre-Solicitation Tour Script 2016

NOTE: Read **non italicized** portion verbatim.

Guide visitors on to their bus(s) at 703-46A parking lot, collect the $10.00 for lunch, pass out the folders, discuss any safety and security information that needs to be shared with the visitors before departure, (no electronic recordings, videos or pictures with personal electronic devices are permitted during this tour) discuss escort requirements and any TLD/Rad Con requirements to be followed during the tour. Pass out the sign-up sheet. Site Security will check the bus and verify all visitors have their badges and the bus is ready to go. Security will escort the bus(s) to the barricade. Address any additional notification or escort requirements if foreign nationals are on the bus/tour. Pass out the sign-up sheet.

Formally start tour by introducing self. "My name is _____, I'm with the Savannah River Department of Energy. I will be your primary tour guide and your escort for today. I also have Mr/Ms _____ on the bus with me to assist with escorting you today. I request you stay within visual contact of me at all times except when we are in the facilities where your escorts will be the Savannah River Department of Energy Facility Representative. While you are in the facilities, your escort will be one of the Facility Representatives giving the tour. In the facilities the Facility Representatives will be divided into smaller groups to help facilitate the tours. At the facilities, the smaller groups will be taken to the same locations and shown the same parts of each facility just at different times.

Identify the DOE tour escort who will be collecting the 3x5 index cards at the end of the tour.

"This tour is scripted for consistency, and no questions will be answered during the tour by me, the DOE Facility Representatives, any escorts, or any persons you may encounter. Exceptions are only for an emergency. In all emergency situations follow your escorts. We will allot time for bathroom breaks along the tour at various stops and can provide bottled water at some of the stops if requested. We have two buses for this tour. Bus #1 will start at the F-Tank Farm. Bus # 2 will start at the DWPF. You are on bus #_____.

A tour guide packet has been provided to each of you which include the tour schedule for both buses, a site map, the HLW Tank Contents Summary Data sheet, a few aerial photos of the facilities, and 3x5 index cards. We will not discuss any of the information in the folder today, but is provided as visual aids to assist you in the tour. I recommend you refer to the aerial photos as we tour those respective facilities. If you have any questions, please use the 3x5 cards to jot down questions. I have extra cards available upon request. The cards will be collected at the end of the tour by me. Your questions may be answered during tomorrow's pre-solicitation conference, placed on the Savannah River Site Liquid Waste Acquisition website, or considered as feedback for industry input. Please provide your name/contact information on the first card and name on all subsequent cards you turn in so we can contact you if we have any questions regarding your requested information. Additionally, there will be designated question and answer sessions during tomorrow's pre-solicitation conference.

I would like to now give you a quick safety briefing. During the tour today we will be boarding and un-boarding the bus numerous times. Please use the hand rail at all times. We will be

walking through industrial type environments where work activities will be taking place. We ask that you stay with your group at all times, be aware of your surroundings, follow all signs and posting, do not cross any barricades, and please follow the instructions of the Facility Representative while in the facilities. You will be walking on uneven surfaces and using stairs. When on the stairs please use the hand rail at all times. We estimate the tour will encompass about a mile of walking and we expect the afternoon temperatures to be warm, so please stay hydrated and ask for water if you need it. If you need any assistance during the tour please don't hesitate to let me know and I will get you some assistance. Our number one goal today is to keep everyone safe. Thank you! We will start the tour now."

Pass out cards to anyone who needs them. Direct the bus driver to follow the security escort to the site barricade. Collect the sign-up sheet and keep for accountability to give to the FRs as we enter the facilities. As we leave the barricade indicate that we are now in the area of the site referred as "A-area" and reference the site map in their packet.

"We are now traveling through the portion of the Site known as "A-area". This area has gone through a major decommissioning and dismantlement effort during the 1990s and early 2000s but still houses vital portions of the Site's missions. On the left side of the bus is the Savannah River Ecology Laboratory which is run by the University of Georgia who conducts ecology studies on Site. On your right side of the bus you will see the Savannah River National Laboratory and its facilities. At the pre-solicitation conference tomorrow, you will hear about the support the lab is currently providing on the current LW Contract. *(Pause)* This might be a good time to jot down any questions you may already have since it will be a few minutes before our first stop."

Take this time to assist the bus driver with the directions and caution regarding the speed limits. There are two buses, one bus will proceed to F-tank farm and the other bus to DWPF. Let the visitors know that when they arrive at the tank farm/DWPF we will be joined by the DOE Facility Representatives who will be our escort while we are at their facility and they will have a safety briefing before we start the facility tour. Remind the visitors before we leave the tank farm/DWPF there will be an opportunity for a bathroom break for those who might need one. Once the bus have stopped for unloading at F-tank farm/DWPF, have the Facility Rep address the group and introduce himself and provide any safety briefing. After the briefing, have the visitors break into the smaller groups and follow their FR.

"We are now at the F-Tank Farm where 22 of the 51 liquid waste tanks are located. We will be getting off the bus for this portion of the tour and meeting two of Savannah River Department of Energy Facility Representatives to escort this portion of the tour. If you have any questions during this portion of the tour I ask that you write them down on the index cards provided to you today and turn them in to me or you can wait until tomorrow's pre-solicitation conference and ask it then. The Facility Reps will not be able to answer any questions. I'm now going to turn the tour over to Mr.(s) who will point out some of the structures of the F-Tank Farm facility."

Note: The F-Tank Farm script written by the FRs will be read verbatim at this point until the F-Tank Farm tour is complete and the visitors are ready to get back on the bus. The same script is used for both bus #1 and bus #2.

At the end of FTF tour, the FRs will bring their groups back to the bus location. The tour escort will assist the visitors in boarding the bus. Prior to boarding the bus all the visitors will have the opportunity to use the restroom. All visitors will maintain escort requirements.

"We are now proceeding to the H-area Tank Farm and Effluent Treatment Project. This is a good time to write down any questions you might have. I have additional cards if you need any."

Remind the visitors that when the bus stops at H- tank farm, the Savannah River DOE Facility Representatives will be our escort while we are at their facility and they will have a safety briefing before we start the facility tour. Once the bus has stopped for unloading in H-tank farm, have the Facility Reps provide any safety briefing if needed. After the briefing, break into two groups, and proceed to the H-area tank farm through L-gate. One group will walk north and take the stairs to the monument location while the other group will turn right after entering the gate and proceed up east hill toward the ARP/MCU location.

"We are now at the H-Tank Farm where 29 of the 51 liquid waste tanks are located. We will be getting off the bus for this portion of the tour and meeting two of Savannah River Department of Energy Facility Representatives to escort this portion of the tour. Remember the Facility Reps will not be able to answer any questions, so please use your index cards if you have any questions. I'm now going to turn the tour over to Mr.(s) _____, and they will point out some of the structures of the facility."

Note: The H-Tank Farm and ETP script written by the FRs will be read verbatim at this point until the H-Tank Farm and ETP tour is complete and the visitors are ready to get back on the bus. The same script is used for both bus #1 and bus #2.

After H-tank farm tour, the bus will head to the 704-S for lunch. Visitors will exit the bus in front of 704-S and be directed to Room 22 and the restrooms. Escorts will remain with the visitors during the lunch break. Lunches will be provided to the visitors and the visitors will remain in room 22 until time to resume the tour.

At the end of lunch period the tour escort for bus#2 will gather the visitors and escort them to their bus. The bus#1 tour group will remain in room 22 and meet the DOE FRs who will conduct the DWPF portion of the tour. The tour escorts will check accountability and make sure the groups get to their correct locations.

DWPF Tour

The DWPF DOE facility reps will join the tour in room 22 to see the video. After the video the group will be broken up into three smaller groups. Each group will be accompanied by a DOE Facility Representation who will be their escort and who will be pointing out things at the facilities during the tour. Each FR will read from their script but will start from differ points in the script to adjust where their group will start their facility tour.

"I would like to ask that everyone begin gathering to continue our tour for the day. Those of you who are on bus #1, I ask that you stay in here while the group on bus #2 please follow your escort to your bus out front. Once the bus #2 group has left, the Defense Waste Processing Facility (DWPF) FRs will enter the room and introduce themselves. We will remain here for a brief video then break into 3 smaller groups. The FRs will be your escort during this portion of the tour and I ask that you remain with them at all times. All the groups will have the same tour; we will just start you at different points in the tour. The Facility Reps will not be able to answer any questions, so please use your index cards if you have any questions. Once we complete the tour of DWPF and the Glass Waste Storage Building (GWSB), we will meet back in room 22 of this building before boarding the bus and continue our tour for a drive-by tour of the Saltstone Facility. If you need any additional index cards, I have extra. At this time, I would like to turn the tour over to Facility Representative Mr._____.

Note: The DWPF, GWSB and Saltstone Facility script written by the FRs will be read verbatim until the DWPF, GWSB and Saltstone Facility tour is complete. The same script is used for both bus #1 and bus #2.

After the groups have completed the DWPF portion of the tour, they will meet in 704-S room 22 to board the bus and continue the tour. The visitors will have an opportunity to use the restrooms in 704-S before moving to the next tour stop. The visitors board the bus for the Saltstone facility portion of the tour and just do a drive-by. A DOE FR will board the bus with the visitors and will conduct the Saltstone tour. The DOE FR will introduce himself and point out parts of the facility during the drive-by. The FR will read from the script for the Saltstone Facility portion of the tour.

SWPF tour

The bus will leave the Saltstone facility and SDU#6 and head back over to the DWPF parking lot and drive up to the front of the DOE SWPF office complex. The SWPF tour will be in two parts. Part one will be conducted by the DOE SWPF Project Manager. The second part will be a drive-by tour of the SWPF site and facility aby the DOE FR. The visitors will exit the bus and enter the conference room for the next stop on the tour.

"I would like everybody to please exit the bus and follow me over to a conference room for the Salt Waste Processing Facility briefing*."* *Everybody comes into the conference room and finds a place to be seated.* "At this time, I am going to turn the tour over to Ms _____."

The SWPF Project Manager will give a briefing on SWPF in their conference room. There will be no handouts but the room may contain some props the visitors will be allowed to view before heading to the bus for the drive-by portion. The briefing will be loaded on to the EMCBC SRS Liquid Waste Acquisition web page in the future.

After the SWPF briefing and after the visitors are ready to board the bus, ask if anyone needs a bathroom break and escort those who do. Escort everyone back onto the bus. The SWPF CE will board the bus at this time as well.

"We are now ready to board the bus and proceed to our next and final stop on the tour for today." *Everybody boards the bus.* "I will be turning the tour over to the SWPF Chief Engineer Mr. _____ who will give you a drive-by tour of the Salt Waste Processing Facility."

Note: The SWPF script and presentation will be read verbatim during the SWPF tour. The same script is used for both bus #1 and bus #2.

The DOE SWPF CE will inform the group since they have just had the SWPF Project overview, he will point out important features of the SWPF facility. The SWPF CE will read the bulletized list verbatim.

The bus will pull out of SWPF, drop of the SWPF DOE CE, then proceed back to 703-46A.

"That concludes the tour for today and we will now head back to the badge office. I suggest that if you have any final questions you will have time to write them down on your index card and give them to me. We will be collecting visitor's temporary badges as well as any TLDs from those of you with site badges and issued temporary TLDs."

When the bus arrives in A-area remind the visitor to gather up all their personnel belongings and you will collect their temporary visitor badges and any comment cards upon their departing the bus. Remind them that the pre-solicitation conference starts at 9am tomorrow at the Double Tree in Augusta and registration begins at 8am. Note that they will have an opportunity tomorrow to ask questions that come to mind tonight as they reflect on today's tour.

Pre-solicitation Conference Tour Script 04/19/2016

NOTE: Read **non italicized** portion verbatim.

Guide visitors on to their bus(s) at 703-46A parking lot, collect the $10.00 for lunch, pass out the folders, discuss any safety and security information that needs to be shared with the visitors before departure (no electronic recordings, videos or pictures with personal electronic devices are permitted during this tour), discuss escort requirements and any TLD/Rad Con requirements to be followed during the tour. Pass out the sign-up sheet. Site Security will check the bus and verify all visitors have their badges and the bus is ready to go. Security will escort the bus(s) to the barricade. Address any additional notification or escort requirements if foreign nationals are on the bus/tour. Pass out sign-up sheet.

Formally start tour by introducing self. "My name is _____, I'm with the Savannah River Department of Energy. I will be your primary tour guide and your escort for today. I also have Mr/Ms _____ on the bus with me to assist with escorting you today. I request you stay within visual contact of me at all times except when we are in the facilities where your escorts will be the Savannah River Department of Energy Facility Representative. While you are in the facilities, your escort will be one of the Facility Representatives giving the tour. In the facilities the Facility Representatives will divide you into smaller groups to help facilitate the tours. At the facilities, the smaller groups will be taken to the same locations and shown the same parts of each facility just at different times.

Identify the DOE tour escort who will be collecting the 3x5 index cards at the end of the tour.

"This tour is scripted for consistency, and no questions will be answered during the tour by me, the DOE Facility Representatives, any escorts, or any persons you may encounter. Exceptions are only for an emergency. In all emergency situations follow your escorts. We will allot time for bathroom breaks along the tour at various stops and can provide bottled water at some of the stops if requested. We have two buses for this tour. Bus #1 will start at the F-Tank Farm. Bus # 2 will start at the DWPF. You are on bus #_____.

A tour guide packet has been provided to each of you which include the tour schedule for both buses, a site map, the HLW Tank Contents Summary Data sheet, a few aerial photos of the facilities, and 3x5 index cards. We will not discuss any of the information in the folders today, but is provided as visual aids to assist you in our tour. I recommend you refer to the aerial photos as we tour those respective facilities. If you have any questions, please use the 3x5 cards to jot down questions. I have extra cards available upon request. The cards will be collected at the end of the tour by me. Your questions may be answered during tomorrow's pre-solicitation conference, placed on the Savannah River Site Liquid Waste Acquisition website, or considered as feedback for industry input. Please provide your name/contact information on the first card and name on all subsequent cards you turn in so we can contact you if we have any questions regarding your requested information. Additionally, there will be designated question and answer sessions during tomorrow's pre-solicitation conference.

I would like to now give you a quick safety briefing. During the tour today we will be boarding and un-boarding the bus numerous times. Please use the hand rail at all times. We will be walking through industrial type environments where work activities will be taking place. We ask that you stay with your group at all times, be aware of your surroundings, follow all signs and posting, do not cross any barricades, and please follow the instructions of the Facility Representative while in the facilities. You will be walking on uneven surfaces and using stairs. When on the stairs please use the hand rail at all times. We estimate the tour will encompass about a mile of walking and we expect the afternoon temperatures to be warm, so please stay hydrated and ask for water if you need it. If you need any assistance during the tour please don't hesitate to let me know and I will get you some assistance. Our number one goal today is to keep everyone safe. Thank you! We will start the tour now.

Pass out cards to anyone who needs them. Direct the bus driver to follow the security escort to the site barricade. Collect the sign-up sheet and keep for accountability to give to the FRs as we enter the facilities. As we leave the barricade indicate that we are now in the area of the site referred as "A-area" and reference the site map in their packet.

"We are now traveling through the portion of the Site known as "A-area". This area has gone through a major decommissioning and dismantlement effort during the 1990s and early 2000s but still houses vital portions of the Site's missions. On the left side of the bus is the Savannah River Ecology Laboratory which is run by the University of Georgia who conducts ecology studies on Site. On your right side of the bus you will see the Savannah River National Laboratory and its facilities. At the pre-solicitation conference tomorrow, you will hear about the support the lab is currently providing on the current LW Contract. *(Pause)* This might be a good time to jot down any questions you may already have since it will be a few minutes before our first stop."

Take this time to assist the bus driver with the directions and caution regarding the speed limits. There are two buses, one bus will proceed to F-tank farm and the other bus to DWPF. Let the visitors know that when they arrive at the tank farm/DWPF we will be joined by the DOE Facility Representatives who will be our escort while we are at their facility and they will have a safety briefing before we start the facility tour. Remind the visitors before we leave the tank farm/DWPF there will be an opportunity for a bathroom break for those who might need one. Once the bus have stopped for unloading at F-tank farm/DWPF, have the Facility Rep address the group and introduce himself and provide any safety briefing. After the briefing, have the visitors break into the smaller groups and follow their FR.

DWPF Tour

For bus #2, the visitors will get off the bus in front of 704-S and proceed to room 22. The DWPF DOE facility reps will join the tour in room 22 to see a video. After the video the group will be broken up into three smaller groups. Each group will be accompanied by a DOE Facility Representation who will be their escort and who will be pointing out things at the facilities during the tour. Each FR will read from their script but will start from different points in the script to adjust where their group will start their facility tour.

"I would like everyone to please exit the bus and follow me to 704-S room 22 to meet Savannah River Department of Energy Facility Representatives and see a brief video then break into 3 smaller groups. The FRs will be your escort during this portion of the tour and I ask that you remain with them at all times. All the groups will have the same tour; we will just start you at different points in the tour. The Facility Reps will not be able to answer any questions, so please use your index cards if you have any questions. Once we complete the tour of DWPF and the Glass Waste Storage Building (GWSB), we will meet back in room 22 of this building before boarding the bus and continue our tour for a drive-by tour of the Saltstone Facility. If you need any additional index cards, I have extra. At this time I would like to turn the tour over to Facility Representative, Mr.(s)_____."

Note: The DWPF, GWSB and Saltstone Facility script written by the FRs will be read verbatim until the DWPF, GWSB and Saltstone Facility tour is complete and the visitors are ready to get back on the bus. The same script is used for both bus #1 and bus #2.

After the groups have completed the DWPF portion of the tour, they will meet in 704-S room 22 to board the bus and continue the tour. The visitors will have an opportunity to use the restrooms in 704-S before moving to the next tour stop. The visitors board the bus for the Saltstone facility portion of the tour and just do a drive-by. A DOE FR will board the bus with the visitors and will conduct the Saltstone tour. The DOE FR will introduce himself and point out parts of the facility during the drive-by. The FR will read from the script for the Saltstone Facility portion of the tour.

SWPF tour

The bus will leave the Saltstone facility and SDU#6 and head back over to the DWPF parking lot and drive up to the front of the DOE SWPF office complex. The SWPF tour will be in two parts. Part one will be conducted by the DOE SWPF Project Manager. The second part will be a drive-by tour of the SWPF site and facility by the DOE SWPF Chief Engineer. The visitors will exit the bus and enter the conference room for the next stop on the tour.

"I would like everybody to please exit the bus and follow me over to a conference room for the Salt Waste Processing Facility briefing." *Everybody comes into the conference room and finds a place to be seated.* "At this time, I am going to turn the tour over to Ms_____.."

The SWPF Project Manager will give a briefing on SWPF in their conference room. There will be no handouts but the room may contain some props the visitors will be allowed to view before heading to the bus for the drive-by portion. The briefing will be loaded onto the EMCBC SRS Liquid Waste Acquisition web page in the future.

After the SWPF briefing and the visitors are ready to board the bus, ask if anyone needs a bathroom break and escort those who do. Escort everyone back onto the bus. The DOE SWPF Chief Engineer will board the bus at this time as well.

"We are now ready to board the bus and proceed to the second part of the SWPF tour, our last stop on the tour before lunch. I will be turning the tour over to DOE SWPF Chief Engineer Mr._____ who will give you a drive-by tour of the Salt Waste Processing Facility."

Note: The SWPF script written by the DOE SWPF Chief Engineer will be read verbatim until the SWPF tour is complete and the visitors are ready to get back on the bus. The same script is used for both bus #1 and bus #2.

The SWPF FR will inform the group since they have just had the SWPF Project overview, he will point out important features of the SWPF facility. The DOE SWPF Chief Engineer will read bulletized list verbatim.

After SWPF tour, the bus will head to the 704-S for lunch. Visitors will exit the bus in front of 704-S and be directed to Room 22 and the restrooms. Escorts will remain with the visitors during the lunch break. Lunches will be provided to the visitors and the visitors will remain in room 22 until time to resume the tour.

At the end of lunch period the tour escort for bus#2 will gather the visitors and escort them to their bus and resume the tour at the F-Tank Farm. The bus#1 tour group will remain in room 22 and meet the DOE FRs who will conduct the DWPF portion of the tour. The tour escorts will check accountability and make sure the groups get to their correct locations.

Bus #2 will leave the DWPF parking lot and proceed to F-tank farm. Take this time to assist the bus driver with the directions and caution regarding the speed limits. Let the visitors know that when they arrive at the tank farm we will be joined by the DOE Facility Representatives who will be our escort while we are at their facility and they will have a safety briefing before we start the facility tour. Once the bus has stopped for unloading at F-tank farm/DWPF, have the Facility Rep address the group and introduce himself and provide any safety briefing. After the briefing, have the visitors break into the smaller groups and follow their FR.

"We are now at the F-Tank Farm where 22 of the 51 liquid waste tanks are located. We will be getting off the bus for this portion of the tour and meeting two of Savannah River Department of Energy Facility Representatives to escort this portion of the tour. If you have any questions during this portion of the tour I ask that you write them down on the index cards provided to you today and turn them in to me or you can wait until tomorrow's pre-solicitation conference and ask your questions then. The Facility Reps will not be able to answer any questions. I'm now going to turn the tour over to Mr.(s), who will point out some of the structures of the F-Tank Farm facility."

Note: The F-Tank Farm script written by the FRs will be read verbatim at this point until the F-Tank Farm tour is complete and the visitors are ready to get back on the bus. The same script is used for both bus #1 and bus #2.

At the end of FTF tour, the FRs will bring their groups back to the bus location. The tour escort will assist the visitors in boarding the bus. Prior to boarding the bus all the visitors will have the opportunity to use the restroom. All visitors will maintain escort requirements.

"We are now proceeding to the H-area Tank Farm and Effluent Treatment Project. This is a good time to write down any questions you might have. I have additional cards if you need any."

Remind the visitors that when the bus stops at H- tank farm, the Savannah River DOE Facility Representatives will be our escort while we are at their facility and they will have a safety briefing before we start the facility tour. Once the bus has stopped for unloading in H-tank farm, have the Facility Reps provide any safety briefing if needed. After the briefing, break into two groups, and proceed to the H-area tank farm through L-gate. One group will walk north and take the stairs to the monument location while the other group will turn right after entering the gate and proceed up east hill toward the ARP/MCU location.

"We are now at the H-Tank Farm where 29 of the 51 liquid waste tanks are located. We will be getting off the bus for this portion of the tour and meeting two of Savannah River Department of Energy Facility Representatives to escort this portion of the tour. Remember the Facility Reps will not be able to answer any questions, so please use your index cards if you have any questions. I'm now going to turn the tour over to Mr.(s) _____, and they will point out some of the structures of the facility."

Note: The H-Tank Farm and ETP script written by the FRs will be read verbatim at this point until the H-Tank Farm and ETP tour is complete and the visitors are ready to get back on the bus. The same script is used for both bus #1 and bus #2.

After the tour of H-tank Farm, the bus driver will then be directed to proceed down road E and back to 703-46A Badging Office.

"This concludes the tour for today and we will now head back to the badge office. I suggest that if you have any final questions you will have time to write them down on your index card and give them to me. We will be collecting visitor's temporary badges as well as any TLDs from those of you with site badges and issued temporary TLDs."

When the bus arrives in A-area remind the visitor to gather up all their personnel belongings and you will collect their temporary visitor badges and any comment cards upon their departing the bus. Remind them that the pre-solicitation conference starts at 9am tomorrow at the Double Tree in Augusta and registration begins at 8am. Note that they will have an opportunity tomorrow to ask questions that come to mind as they reflect on today's tour.

F Tank Farm

Tour Script

Entrance and Safety Issues

During our tour, please watch your step, as there are potential tripping hazards such as uneven pavement, rocks, hoses, and extension cords that may be in our walking path. Also, when ascending or descending stairs, please use the handrails. In the event of an alarm or evacuation announcement, please follow your tour guide to the designated rally point. We will be entering a Controlled Area but will not enter any radiation or contamination areas. There will be no radiological monitoring required to exit the area at the completion of the tour. Please ensure you do not reach across any established boundary during this tour. Our tour will take us by the 241-16F Evaporator, Type IIIA Waste Tanks, Type I Waste Tanks, Type IV Waste Tanks, and a couple diversion boxes and pump tanks. Please follow me to the first stopping point.

Waste Categories

The waste currently stored in the waste tanks was received primarily from the F-Canyon process. This liquid waste received from the canyon is referred to as supernate. Supernate is an aqueous mixture of soluble salts and insoluble components. As the supernate sits in the waste tanks, the insoluble components separate from the water and

settle to the bottom of the tank. This is called sludge. To reduce the amount of liquid waste contained in the waste tanks, the supernate is processed through an evaporation process. The by-product of the evaporation process is called saltcake. In summary, the waste in the tank farms can be categorized into three groups: supernate, sludge, and saltcake.

Waste Tanks

We will now discuss the Type III Waste Tanks. On your left and right are Tanks 25 and 44 (point at each waste tank). As you can see, Tank 25 had infrastructure added to the tank top for waste removal activities and Tank 44 is still in its original design. There are 27 Type III tanks located at F and H-Tank Farm that were built between 1967 and 1981. They each have a 1.3 million gallon capacity and are 85 feet in diameter by 33 feet high. The Type III waste tanks have a full height secondary containment and leak detection systems. The main components of a Type III waste tank and associated systems are:

- The primary tank , which is the component of the waste tank that actually contains the liquid waste.
- The secondary containment provides a location for collecting any leakage from the primary tank. This area is called the annulus.

- The tanks contain numerous cooling coils located in the primary part of the tank. The cooling coils provide a means of cooling the tank contents.
- Each tank is equipped with a primary ventilation system. The system is designed to remove hydrogen and organic vapors from the waste tank vapor space while preventing the release of radionuclides to the environment.
- Each tank is equipped with an annulus ventilation system. The purpose is to prevent the accumulation of condensation within the annulus space.
- Waste tanks are also equipped with level measurement devices, conductivity probes for leak detection, hydrogen monitors, radiation monitors, transfer pumps, and waste mixing devices.

241-16F Evaporator

The large structure you see in the distance (point to the evaporator) is the 241-16F evaporator, which will be referred to as the 2F evaporator for the remainder of this discussion. The primary function of the 2F evaporator is to recover tank space through evaporation to support sludge and Canyon waste processing. The boiling action in the evaporator causes the liquid to separate from the waste. The separation of the liquid from the waste reduces the volume to approximately 25%-30% of its original volume. To obtain this waste volume reduction, it usually takes processing the waste three to four cycles through the evaporator. The 2F Evaporator requires scheduled and some unscheduled maintenance activities throughout the year. These activities can be minor in nature such as inspecting the evaporator pot, minor steam leak repairs or

instrumentation calibration and replacement. The current evaporator pot was placed in service in1990, but failed due to a leak in January 2013. The life expectancy of the evaporator pot is approximately 10 years. There is a replacement pot ready for installation, but it is planned for use in the 2H evaporator. This pot replacement would be an example of a major maintenance outage.

The basic operation of the evaporator system is to receive waste from the feed tank, currently Tank 26 (point in the direction of Tank 26). The waste is transferred through an underground transfer line into the evaporator pot by a feed pump. The waste in the evaporator is boiled using 150 pound steam and is separated into vapor and concentrated liquid. The boiled off liquid contents, referred to as overheads is then transferred to the Effluent Treatment Project for final processing and eventual permitted release to the environment. The concentrated liquid is transferred out of the evaporator pot and drains to a concentrate receipt tank, currently Tank 25 (point to Tank 25). As the concentrate receipt tank reaches its fill limit, the waste is transferred back to the feed tank, Tank 26 and the process is repeated. This is how the 25-30% waste reduction is obtained. We will now proceed to the Type IV waste tanks.

Type IV Waste Tanks (Walk towards Type IV Tanks and Point out 17 – 20)

There are 8 Type IV waste tanks (4 located in F-Tank Farm and 4 located in H-Tank Farm) that were built between 1958 and 1962. Four of the eight tanks, 17, 18, 19, and 20 are operationally closed. This process involved removing the waste to the maximum extent practical, isolating the tanks inlet/outlet capabilities, and filling them with grout and cement. This process was completed in 1997 for Tanks 17 and 20, and 2012 for 18 and 19. They each have a 1.3 million gallon capacity and are 85 feet in diameter by 34

feet high with a dome concrete roof. In addition, dirt covers the concrete dome that is used for radiation shielding. This type of tank does not have a secondary containment nor do they contain the thousands of feet of cooling coils as the other type of waste tanks. All other components are similar to the Type III waste tank components.

The structure in the middle of the waste tanks is the 1F evaporator. This evaporator was placed in service during the early 1960's and was shut down in 1988. Closure plans still need to be developed and approved for this evaporator.

Removal of the superstructure to support area closure is not part of this scope of work.

F Canyon (point out) – F Canyon is deactivated, and only minor surveillance and maintenance activities are still performed.

Type I Waste Tanks (Point out Tanks 1 through 8)

Between the F and H Tank Farms, there are 12 Type I tanks. They were built between 1952 and 1953. They each have a 750,000 gallon capacity and are 75 feet in diameter by 24-1/2 feet high. These tanks have a partial secondary containment for leak collection which has a leak detection system to provide notification of a leak into the secondary containment.

F-Tank Farm Diversion Box – 4 (FDB – 4)

Diversion boxes are used to receive, and direct waste to differing waste tanks based on the positioning of jumpers, and valves within the diversion box. FDB-4 is adjacent to F-Pump Pit – 2 (FPP-2) and F-Pump Pit -3 (FPP-3) which house F- Pump Tank – 2 (FPT-2) and F-Pump Tank -3 (FPT-3). The pump tanks are used to receive waste and send it to locations at higher elevations. (point to FDB-2 and FPP-1) This diversion box and pump

pit are known as FDB-2 and FPP-1, and can be used to transfer waste from F-Tank Farm to H-Tank Farm and vice versa.

This concludes our tour of F-Tank Farm.

H Tank Farm Tour

Tour Script

Enter H Tank Farm through "L" Gate on Road E. Park the bus across the street from "L" Gate, unload and walk across to "L" Gate. Escorts provide the accountability listing of personnel on the tour to the FR.

<u>Entrance and Safety Issues</u> – Cautions noted below will be read to visitors at "L" Gate

Note: All tour participants must remain with the group.

During the tour, please watch your step, as there are potential tripping hazards such as uneven pavement, rocks, hoses, and extension cords that may be in our walking path. In the event of an alarm or evacuation announcement, please follow your tour guide to the designated rally point. Our tour will take us to a vantage point overlooking the Effluent Treatment Project (ETP), also known as Effluent Treatment Facility (ETF), we will walk on roadways near Waste Tanks 49 and 51, the Modular Caustic Side Solvent Extraction Unit (MCU), and the Actinide Removal Process (ARP). We will then proceed to the 242-16H (2H) Evaporator, and then to another vantage point overlooking the remainder of H Tank Farm where you will be able to see several facilities including 242-25H (3H) Evaporator, Type I, II, and IV waste tanks, and the newest HTF Diversion Box, HDB-8.

Note to TOUR GUIDE --- Proceed through the gate and walk along the roadway leading up to H Tank Farm – East Hill. Stop near the top of the hill and direct attention to the right and the Effluent Treatment Project.

<u>Effluent Treatment Project (ETP)</u>

The Effluent Treatment Project (ETP) was designed and built to collect, treat, and process low level radioactive and chemically contaminated wastewater. Primary sources of wastewater include F & H Canyon Facilities, F-Area Laboratories, and F & H Tank Farm evaporator overheads. The ETP facility has been in operation since October 1988. The ETP facility typically discharges 6 – 10 million gallons of treated water annually. Operators in ETP maintain a Level "A" or Level "D" state certification as a physical / chemical treatment plant operator issued by the State of South Carolina. The ETP process is primarily located in building 241-81H with various other structures located in the vicinity of 241-81H. The ETP process also includes the following process locations which are managed by the ETP organization;

- F-Area Retention Basin
- F-Area Cooling Water Basin
- H-Area Retention Basin
- H-Area Cooling Water Basin
- Lift Stations, and the Force Main Valve Pit
- Piping systems leading from both F and H Areas to the ETP

Waste generators comply with their individual Waste Compliance Plans (WCPs) when sending their waste streams to ETP to ensure collectively that ETP stays within its approved Waste Acceptance Criteria (WAC). The WAC/WCP process ensures ETP stays within its processing capability and does not exceed its allowed radiolytic inventory.

ETP - Building 241-81H (Point out the three sections of the building as housing the control room, process, and evaporators)

The control room section of the plant contains the Control Room, break room, Shift Managers' office and change rooms. The ETP process is computer controlled via the control room computer console. The control room is manned 24 hours / day, 7 days / week.

The ETP process is as follows;

Wastewater collection - This process includes the receipt of wastewater into two 485,000 gallon collection tanks. (Located on the far side of ETP)

pH adjustment - From these tanks the wastewater is pumped inside of building 241-81H for pH adjustment.

Filtration – After the pH adjustment, solids are precipitated out and removed during the filtration process. Filtration is completed via a 3 stage ceramic Norton filter system. At various points throughout the process, waste streams are diverted from the process and sent to the ETP evaporators for volume reduction and the resulting evaporator bottoms are transferred to Tank 50 in H Tank Farm for storage. Evaporator overheads are returned to the ETP process for reprocessing.

Organic Removal - From the Norton filters the wastewater is sent to the Organic Removal system. Organic Removal includes Mercury removal columns (these columns are outside, next to the wastewater collection tanks) and activated carbon beds used to remove organic contaminates and heavy metals. These columns are periodically replaced.

Reverse Osmosis (RO) - From the Organic Removal system, the wastewater is then processed through the Reverse Osmosis system to remove dissolved solids.

Ion Exchange – Reverese Osmosis is followed by Ion Exchange columns used to remove heavy metals, cesium, and strontium.

Treated Water - The resulting treated water is stored in one of three 155,000 gallon treated water storage tanks. (The three treated water storage tanks are visible to the right side of ETP). Treated water is sampled for permit compliance and released from these tanks to Upper Three Runs Creek which feeds into the Savannah River.

We will continue to walk along the roadway to a point midway between Tanks 49 and 51 on your left.

Tank 48

Tank 48 is a Type IIIA Waste Tank. The primary tank is made of annealed carbon steel and is 85 feet in diameter and 33 feet in height with a maximum operating capacity of 1.3 million gallons. Tank 48 was previously part of a process called In-Tank Precipitation (ITP). Tank 48 contains large quantities of cesium and potassium tetraphenylborate as a result of the ITP process. Tank 48 has a unique feature and that is the ability to blanket the waste tank head space with Nitrogen (point to Nitrogen storage tanks to the left of

MCU). This is primarily used during mixing operations and is due to the presence of Benzene and its flammability concerns. It is the only Tank in both of the tank farms that requires this safety control.

Tank 49

Tank 49 is a Type IIIA Waste Tank. Tank 49 like Tank 48 was utilized for ITP and has the same ability to blanket the tank with Nitrogen. De-inventorying Tank 49 has allowed these controls to no longer be required. Tank 49 is now utilized as the waste tank to provide feed to the Actinide Removal Process (which will be discussed later).

Tank 50

Tank 50 is a Type IIIA Waste Tank. Tank 50 is currently utilized to receive and store low level waste from the 221-H Canyon Facility, the Effluent Treatment Plant (ETP), and the Decontaminated Salt Solution from the MCU facility. In addition, Tank 50 is used to store low level waste to support waste transfers into the Saltstone Facility. (you will tour the Saltstone facility later today).

Tank 51

Tank 51 is a Type IIIA Waste Tank. Tank 51 is currently used to process and store waste for new sludge batches ultimately destined for vitrification at DWPF. Tank 51 is currently storing Sludge Batch 9.

Now direct your attention to the building on the far side of Tanks 48-50, this is 241-96H and currently houses the Actinide Removal Process.

<u>241-96H Actinide Removal Process (ARP) Facility</u>

Building 241-96H was initially constructed to house the In-Tank Precipitation (ITP) process for disposition of salt waste containing cesium, strontium, and actinides. Due to Benzene and associated flammability issues, the ITP process was stopped and the building was de-inventoried and abandoned in place in December 1997.

In 2004, 241-96H was re-configured as part of the new salt processing initiative to contain a portion of the Actinide Removal Process; the remainder being located in building 512-S, which is located to the East (point towards 512-S).

The South end of building 241-96H was modified to contain two 6,450 gallon tanks placed in existing cells. The tanks are used to provide capacity for combining salt waste with monosodium titanate (MST). MST is used in this process because of its high selectivity for strontium and actinides via adsorption.

Salt waste is staged in Tank 49 in preparation for transfer to 241-96H. Via batch processing, approximately 3,500 gallons of waste will be transferred into the MST strike tanks in 241-96H where it will be combined with process water and MST. The tank contents are then agitated for approximately 8 hours while temperature is controlled.

The batch MST strike salt solution is then transferred to building 512-S for further processing. 241-96H system components include process water supply, MST addition station, chilled water system, process vessel ventilation system, and the MST strike tanks.

Now direct your attention to the right and at the base of the rock bank you will see our newest facility, the Modular Caustic Side Solvent Extraction Unit facility.

<u>241-278H Modular Caustic Side Solvent Extraction Unit Facility</u>

The MCU (point to Building 241-278H) was designed and constructed to:

- Receive batches of high cesium (Cs-137)/low actinide clarified salt solution (CSS) from the Actinide Removal Process (ARP) located in the 96H and 512S Buildings
- Process the salt solution to remove/reduce Cs-137 using Caustic Side Solvent Extraction (CSSX) technology,
- Transfer batches of the low Cs-137/low actinide decontaminated salt solution (DSS) to Tank 50 for feed to the Saltstone Facility , and
- Transfer batches of the strip effluent (SE) solution of cesium nitrate from the CSSX process to the Defense Waste Processing Facility (DWPF).

The CSSX technology utilizes multi-component organic solvent and centrifugal contactors located in the taller section of the MCU building to extract Cs-137 from salt

waste (point to the tall section of MCU). Coalescers and decanters located in the lower section of the MCU building process the decontaminated salt solution and strip effluent solutions to allow recovery and reuse of the organic solvent, and to limit the quantity of solvent transferred to the downstream facilities. (point to the lower area of MCU- below raincover) This lower section utilizes cell covers for access to these process areas.

The MCU is designed to treat high-level radioactive waste (HLW).

The MCU receives salt solution filtrate from the 512-S Facility. The filtrate containing cesium is transferred to MCU as a clarified salt solution (CSS). The CSS will be transferred to one of the two salt receiving tanks. One of the tanks is placed in the receiving mode while the second tank is in the processing mode. From the receiving tank, the clarified salt solution is transferred into the process feed tank. From the process feed tank the clarified salt solution is transferred to the first set of 7 centrifugal contactors called the Extraction Contactor Bank.

In the extraction bank, the clarified salt solution is mixed with the solvent material to extract the cesium (Cs-137) component from the salt. The clarified salt solution minus the cesium component referred to as Decontaminated Salt Solution (DSS) will be transferred to Tank 50 for later disposal in the Saltstone Facility.

The solvent/cesium mixture will be processed in three different sets of contactors which will scrub (Scrub Contactors) traces of salt coming from the extraction process, strip (Strip Contactors) the cesium from the solvent and wash (Wash Contactors) the solvent which allows the solvent to be re-used in the process. The strip effluent (Cesium

137 laden) solution will be transferred to the Defense Waste Processing Facility (DWPF) for vitrification.

Point to Tank 49 excavation.

This excavation allows for transfer piping modifications to be made to Tank 49 to allow it to transfer waste directly to SWPF once final tie-ins are complete and SWPF has completed Startup.

242-16H Evaporator

The large structure you see in front of you (point to the evaporator) is the 242-16H evaporator, which will be referred to as the 2H evaporator for the remainder of this discussion. The 2H Evaporator is centrally located among six (6) Type IIIA waste tanks. These tanks are tanks 38-43.

The primary function of the 2H evaporator is to recover tank space through evaporation, which includes Defense Waste Processing Facility (DWPF) recycle water transfers. The boiling action in the evaporator causes the liquid to separate from the waste. The separation of the liquid from the waste reduces the volume to approximately 25%-30% of its original volume. To obtain this waste volume reduction, it usually takes processing the waste three to four cycles through the evaporator. The 2H Evaporator requires scheduled and some unscheduled maintenance activities throughout the year. These activities can be minor in nature such as inspecting the evaporator pot, minor steam leak repairs, or instrumentation calibration or replacement. The 2H Evaporator was placed in service in 1985. The evaporator pot was replaced and returned to service in

1995. The life expectancy of an evaporator pot is approximately 10 years. Improvements in materials of construction and methods of chemistry control during idle periods make the life expectancy conservative.

Periodic acid cleanings are required for the 2H to remove scale deposits resulting from processing the DWPF recycle water which contains silica. These acid cleanings are examples of a major maintenance outage.

The basic operation of the evaporator system is to receive waste from the feed tank, currently Tank 43 (point in the direction of Tank 43). The waste is transferred through an underground transfer line into the evaporator pot by a feed pump. The waste in the evaporator is boiled using 150 pound steam and is separated into vapor and concentrated liquid. The boiled off liquid contents, referred to as overheads, is then transferred to the Effluent Treatment Project for final processing and eventual permitted release to the environment. The concentrated liquid is transferred out of the evaporator pot and drains to a concentrate receipt tank, currently Tank 38 (point indirection of Tank 38). As the concentrate receipt tank reaches its fill limit, the waste is transferred back to the feed tank, Tank 43, and the process is repeated. This is how the 25-30% waste reduction is obtained.

We will head back to the monument vantage point which overlooks the West Hill and the Type I and Type II tanks.

Scanning the facilities in front of you, you see the Type I and Type II waste tanks in the foreground, HDB-8 Diversion Box facility is beyond the Type II Tanks and 242-25H Evaporator is in the distance and to the right.

Point to Type I Tanks. These are the Type I tanks in H-Tank Farm. These are Tanks 9-12, with Tank 12 currently undergoing final grouting for tank closure

Type II Waste Tanks

There are four Type II waste tanks at SRS, all located in H Tank Farm. These are tank Numbers 13 through 16 and were built in 1955 and 1956 (point in direction of Type II tanks in the foreground). Type II tanks have a capacity of 1,030,000 gallons and are 85 feet in diameter and 27 feet high. Each tank has a 5 foot high and 90 foot diameter secondary containment creating an annulus space between the main tank and the secondary containment. Each of these Type II tanks has known leak sites with the waste level being maintained below the leak site except for Tank 15 which is preparing for bulk waste removal at this time. Tank 16 has completed bulk waste removal, been filled with grout and was closed in 2015.

Type IV Waste Tanks

The four Type IV tanks in H Tank Farms are located on the West Hill (point to the Type IV tanks). These are of the same design and construction as the Type IV tanks in F Tank Farm. Similar to the 1F Evaporator, the 1H Evaporator is located in the center of the Type IV tanks and has been removed from service. Closure plans still need to be developed and approved for this evaporator. The Type IV tanksin HTF, unlike in FTF, remain in operation.

HDB-8 Diversion Box – (point to the facility)

Diversion boxes are used to receive and direct waste to differing waste tanks based on the position of pipe jumpers and valves within the diversion box. HDB-8 is the newest diversion box in the tank farms and is the only fully enclosed diversion box with both cell and building ventilation systems. HDB-8 houses 4 pump tank sections in addition to the diversion box section. The pump tanks are used to receive waste and send it to locations at higher elevations. HDB-8 can receive low level waste from DWPF as well as waste from F Tank Farm and H Tank Farm. Additionally, there is extensive piping under ground between and within the F and H Tank Farms. The underground piping facilitates transfers between the tank farms and between tanks. The piping is placed under ground to provide shielding to protect workers and to protect the transfer system.

242-25H Evaporator – (point to the evaporator)

242-25H Evaporator commonly referred to as 3H Evaporator, is the newest and largest evaporator in operation at SRS. 3H Evaporator was placed in service in December 1999 and has an evaporator pot volume of 19,000 gallons; for comparison, 2H and 2F evaporator pot volume is 3,600 gallons. The 3H Evaporator system receives waste from Tank 32 and has the capability to drop concentrated waste to either Tank 30 or Tank 37. Waste processed in 3H Evaporator is primarily received from H Canyon or F Tank Farm. DWPF process recycle water is currently not processed in the 3H Evaporator. Operational control for 3H Evaporator is through a “computer controlled” system. 3H Evaporator uses 325 lb. steam to evaporate the waste, for comparison, 2H and 2F evaporators use 150 lb. steam. 3H Evaporator process is totally enclosed with separate

building and process cell ventilation systems. Enclosure of the evaporator permits maintenance operations to be performed without regard to wind and other limiting weather conditions. Process enclosure also permits better control over the spread of contamination. The evaporator has an adjacent service building which contains the overheads tanks, steam reducing stations, downstream tube bundle flash tank and condensate tank, building ventilation HEPA filter banks, gang valve assemblies, and flush water supply pumps.

(Point out H Canyon Facility and Tritium Facilities) – These facilities are not part of the Liquid Waste System and are outside this acquisition scope of work.

This concludes our tour of H Tank Farm. We will walk back out of the tank farm the same way we came in. Caution: Do not walk down the stairs at the rock bank.

Defense Waste Processing Facility

Tour Script

704-S Room 22

This is the Defense Waste Processing Facility (or DWPF) – a Vitrification plant operated to treat High Level liquid radioactive waste. The plant receives liquid waste feed material from the H-Tank Farm via underground transfer lines. The feed material is pretreated and fed into a Joule-heated Melter where it is heated into a molten glass and poured into stainless steel canisters. The material solidifies inside the canister into a glass form that encapsulates the waste.

First, we will watch an overview film that lasts about 5 minutes which briefly describes the DWPF process. We will split into three groups for the walking tour. When we get into the building, it is noisy in places, and access to some of the viewing windows is limited. We will cycle people through at the viewing windows, and repeat the information if necessary such that everyone can see and hear. Once inside the facility, we will be entering a Radiological Buffer Area. No food, drinks, or gum are permitted in these areas. Please dispose of these items before leaving this building or leave them here. For your safety, please watch your step, use handrails and do not approach any yellow and magenta boundaries unless instructed to do so.

Watch Film

704-S Lobby

Melter Feed Display

Sludge from Tank 40 is transferred to the Sludge Receipt and Adjustment Tank in batches where it is chemically treated and concentrated. In the Slurry Mixer Evaporator, the borosilicate frit is added and the waste is concentrated more. Ideally, the prepared waste is added to the Melter Feed Tank in time to allow continuous feeding of the Melter and simultaneous filling of a canister with molten glass. The Melter is about 8 feet tall and 8 feet in diameter. The shell is stainless steel with 1 foot of ceramic brick insulation around the inside. The waste/frit feed mixture is melted by 2 sets of electrodes. The vapor space is heated by dome heaters. Waste is introduced from the top at approximately one half to one gallon per minute. The Melter operates at ~ 1100 degrees Centigrade. Air pressure is used to control the pour, with a vacuum drawn in the pour spout to draw the molten glass up the riser until it falls through the pour spout into a canister.

Cut-Away Canister

This is a cut away view of a non-radioactive canister that was processed during startup testing. The glass material looks the same as the radioactive waste product. Note that long term credit is taken for encapsulating waste in the glass form, not the canister. The dose rates for cans presently being produced are over 100 Rem/hour on contact. In the future, when the facility begins to produce cans that contain waste processed through the Salt Waste Processing Facility, the contact dose rate will increase to over 1000 Rem/hour.

Empty Canister

This is an actual canister. It is made of stainless steel and is 10 feet tall, 2 feet in diameter, 3/8 inch thick and weighs ~ 1100 pounds empty. Canisters are manufactured offsite by a sub-contractor.

Vitrification Building Overhead Diagram

This is a diagram of the 3-story Vitrification Building. The remote processing area is in the interior. Due to the high radiation rates and high contamination levels, this area is mostly inaccessible. Some of the cells have provisions for personnel entry for decontamination operations and hands on maintenance on the Welder. The yellow area represents the operating space accessible to personnel.

Glass Waste Storage Building / Double Stacking

This is a cross-sectional view of Glass Waste Storage Building #1. Glass Waste Storage Building #2 was placed into service in 2006 and its design is very similar to #1. The storage vault is underground, with a storage rack for each canister. The vault is cooled by natural circulation flow from east to west, discharging up the chimney. The vault ventilation fans on building #1 are not currently used, as more detailed analysis determined that natural circulation would provide adequate cooling. For this same reason, Glass Waste Storage Building # 2 design did not include vault ventilation fans. The operating floor is at ground level. Building #1 contains 2286 storage locations, and Building #2 has 2340 storage locations. Over 4000 canisters have been filled and placed into the storage buildings. To increase the storage capacity of Glass Waste Storage Building #1, a project is underway to allow double stacking the canisters.

Canister Closure Demo

When a canister has been poured, a tapered plug is inserted into its neck to provide closure during the decontamination process. The hot can cools and shrinks around the plug to provide an airtight seal. After decontamination the tapered plug and sleeve are pressed into the can, and a weld plug is placed over the canister opening. The welder then presses the weld plug into place as the weld current is applied to permanently seal the can.

Hanford Connector/Melt Cell Picture

All piping and electrical connections inside the remote process cells are joined via jumpers which can be remotely moved using a crane. The end connectors are Hanford connectors which can be loosened or tightened by an impact wrench slung from the Main Process Crane. The jumpers have a loop that is engaged by a hook on the crane and are each balanced to maintain orientation during raising or lowering. The picture of the Melter in the Melt Cell shows numerous jumpers that have to be removed prior to replacing the Melter. The Melter has a design life of 2 - 5 years; however our performance to date has been better than this. The first Melter lasted for 8 ½ years, and the current Melter has been in operation for 13 years. Since this is the critical component with a significant lead time, a spare Melter must be available. Melter 3 and Melter 4 are currently in storage onsite.

Walk from 704-S to 210-S

The 2 large buildings off to the right are the Glass Waste Storage Buildings. The tall concrete structure is the Vitrification Building which houses the main processing equipment. 210-S houses the Control Room, Maintenance shops, operating areas for support equipment and office space for Operations and Maintenance personnel.

210-S

Canister Receipt Area

This is the Canister Receipt Area. The Canister Receipt Area is used for receipt and storage of new canisters, each in their own storage rack. New canisters are received from the off site manufacturer and cost about $15,000. The canisters are moved using a modified fork lift device. Each canister is weighed and placed on a turntable for visual inspection. Canisters are moved into the Vitrification Building using a grapple on an overhead rail. They enter through these double doors and will come out through another set of similar doors inside.

Supervisory Control Room

This is the Supervisory Control Room which serves as office space for the Shift Manager and as the Command and Control point during upset conditions or emergencies. The facility is staffed by four operating shifts, working 12 hour shifts on a rotating basis. The shifts consist of operators, radiological control technicians, maintenance workers, laboratory technicians and supervisors for each group. The facility operates 24 hours/day, 7 days a week, and currently fills a canister about every 30 hours. While a canister is being filled, a live view of the pour stream is available on the video display.

Vitrification Control Room

This is the Vitrification Control Room. The facility has a combination of remotely and locally controlled and operated processes. The Vitrification Control Room provides controlling stations for operators and a supervisor who operate the remotely controlled and automated processes. The process is operated using a Distributed Control System, with four operators and the supervisor having an individual station.

Crane Control Room

This is the Crane Control Room. The facility has a Main Process Crane which can remove cell covers, move equipment between cells and remove equipment for maintenance. The Crane Control Room is the controlling station for the Main Process Crane. It is operated by a joystick using cameras mounted on the crane. The crane is capable of lifting any equipment in the canyon including pumps, jumpers, and individual tanks including the Melter.

Canister Tracking Board

Serial numbers welded to the sides and shoulders of the canisters are used for tracking them through the process. A color-coded system lets operators know the status of each canister from receipt to placement in one of the Glass Waste Storage Buildings.

221-S Vitrification Building

We will pass through an airlock and into the Vitrification Building. We will be entering a Radiological Buffer Area and as a reminder eating, drinking, chewing, etc is not allowed. While it is unlikely that any contamination is present, the RBA is established to provide a buffer between the contaminated remote processing areas and the clean portions of the facility. Therefore, we will be monitored by Radiological Control Technicians prior to exiting across the yellow and magenta barrier.

Melt Cell – Window MC-5

This is the Melter. Note that all the connections can be remotely disconnected. Upon replacement, the entire apparatus and associated frame work come out. A drain valve is used to drain remaining waste into the five canisters pre-staged on a turntable just before Melter replacement. The Melt cell is inaccessible to personnel.

Melt Cell – Window MC-1

From this window we can see the Melter Riser and Pour Spout. A bellows provides a tight seal between the pour spout and canister to prevent air in-leakage so that the air pressure system can control pouring operations. The Pour Turntable will rotate a filled canister into the position directly in front of the window. Remote manipulators are used for placing the tapered plug into the canister and a tight seal forms as the canister cools and shrinks. The Tele-Robotic Manipulator can house a camera and various tools for inspection and maintenance of the pour spout and other Melt Cell equipment.

Canister Decontamination Cell - Window CDC-1

Note the double door which is the entry point for the empty canisters into the Vitrification Building. The grappled canister moves on the overhead rail. The hatch is raised, and the canister is lowered onto a trolley which moves the canister into the melt cell. An in-cell crane lifts the canisters from the trolley and places them on the Pour Turntable. Another trolley is used to move filled canisters from the Melt Cell into the Canister Decontamination Cell. The trolley is below the plug seen from this window. An in-cell crane removes the plug to access filled canisters ready to be placed inside a decontamination chamber.

Canister Decontamination Cell - Window CDC-3

There are two identical Decontamination Chambers which are locally operated from the field at this Operating Console. The Mechanical Manipulator is removed from the chamber via the in cell crane using a grapple. The canister is then placed in the chamber and the Mechanical Manipulator is replaced. The Mechanical Manipulator grapples the canister then raises, lowers and rotates the canister while it is blasted by eight nozzles. A mix of water and frit is propelled by 100 psi air to effectively sand blast the canister and remove the oxide layer and any contamination on the canister. The mixture of frit and water is captured in the chamber and fed back into the Slurry Mix Evaporator such that a separate waste stream is not generated.

Frit Drums

This is borosilicate frit. This frit will be used in the decontamination chambers but it is identical to the material added in the Slurry Mix Evaporator that mixes with waste to form glass.

Smear Test Station

The decontaminated canister is placed in the Smear Test Station to check the effectiveness of the decontamination process. The remote manipulators are used to manually swipe the canister using adhesive swipes attached to white, plastic cylinders called rabbits. The swipes are transferred to the counting station via an air driven tube similar to your bank's drive up window. The swipes are collected and counted in the Hood. If the canister is found to be contaminated, it is sent back to the Decontamination Cell to be blasted again. If it is clean, it is moved forward to the Weld Test Cell. The Smear Test Station is accessible to personnel when canisters are not inside.

Weld Test Cell

Note the sign regarding pacemakers at the steps to the Weld Test Cell viewing window. No welds are being performed, so there is presently no safety concern. The cleaned canister is placed on a trolley between the Press and Weld stations. First it is moved to the Press station where a hydraulic press forces the tapered plug and sleeve down into the neck of the canister. A weld plug is moved into the Weld Test Cell via the box and onto the chute. It is placed on the canister using a manipulator. The canister is next moved via trolley to the welder.

Weld Test Cell – Window WTC-3

The welder has upper and lower electrodes. The upper serves as the press, while the lower electrodes engage the canister around its neck. The welder power supply is on the next floor up and supplies 12 volt direct current. The weld process lasts ~ 1 ½ seconds, with ~240,000 amperes applied through the bus bars over our heads, while the press exerts a downward force of ~ 80,000 pounds. The weld process was qualified during startup, such that our welds are considered acceptable if the three weld parameters are maintained within tolerances. No physical weld inspection is required to qualify the canister weld. The canister is then swiped again and moved to the Shielded Canister Load Out Bay by way of an underground trolley. The Weld Test Cell is accessible, provided canisters are removed or stored in shielded racks, as hands on maintenance is required on the Welder.

Leave 221-S Building

Now, we will have ours hands and shoes monitored by Radiological Control Technicians before leaving the Radiological Buffer Area.

Transit to Shielded Canister Transporter Load Out Bay

Note the hardened structure which surrounds the safety grade nitrogen system. The nitrogen system serves as the backup purge ventilation source for process vessels to prevent flammable conditions in the tanks. The enclosure is designed to protect the system against damage from tornadoes.

Shielded Canister Transporter Load Out Bay

The Shielded Canister Transporter is used to move canisters from the Vitrification Building to one of the two Glass Waste Storage Buildings. It is diesel powered, with a primary and backup diesel engine, and is operated from the cab. It has two shielded chambers in the center. The tall one we can see is for housing the canisters and a smaller one behind it is for the floor plugs. Welded canisters will be retrieved one at a time from below a floor plug at the back of this bay and placed below plugs in the floors of the storage buildings.

Walking from SCT Load out Bay to GWSB

Sand Filter – The large white structure is the Sand Filter which filters primary ventilation exhaust from the shielded cells.

Fan House – The Fan House contains four primary ventilation exhaust fans which maintain a vacuum on the contaminated operating cells. It also houses two Standby Diesel Generators used to power critical loads in the event of a loss of normal electrical power.

Stack – The primary ventilation exhaust is monitored for contamination as it is discharged via the large stack.

Low Point Pump Pit – Waste feed is delivered from H-Tank Farm via underground transfer lines. The transfer lines go to an intermediate pumping station in the Low Point Pump Pit and then on to receipt vessels in the Vitrification Building.

Glass Waste Storage Building #1

There are two Glass Waste Storage Buildings, with this being the original. The Shielded Canister Transporter drives onto the operating floor. It grapples and lifts the floor plug, lowers the canister into its storage rack in the vault below, and then replaces the floor plug. Operating floor ventilation fans remove diesel fumes during Shielded Canister Transporter operation. The floor and plugs are five feet thick. Each hole originally represented one storage location. Modifications are in progress to allow canisters to be double stacked in this building. Double stacking canisters in this building delays but does eliminate the need for additional canister storage in the future.

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That concludes our tour of DWPF.

Saltstone Facility

Tour Script

Perimeter Road

This is the Saltstone Facility. Here, low level liquid waste is received from the H-area Tank Farm through an underground transfer line. That Salt Solution is combined with dry materials to form a grout. The grout, while in liquid form, is transferred to disposal units for permanent disposal. Although Saltstone is managed and staffed as a single facility, it is technically divided into two separate facilities. The Saltstone Production Facility receives the Salt Solution, mixes it with dry materials, and transfers it to the disposal units. The Saltstone Disposal Facility consists of the Saltstone Disposal Units used for permanent storage of the solidified grout.

The four silos on our right are used to separately store the three dry materials used to make grout: fly ash, slag, and cement. Tankers of dry material arrive at the facility and use their blowers to force it to the top of the respective silo. When needed for processing, the components are weighed, one at a time, in a weigh hopper below the silos. The weighed material drops from the weigh hopper to blend tanks where air is used to thoroughly mix it. The blended dry material is transferred to the Premix Feed Bin located above the process room.

The two major components in the process room are the mixer and the grout pump. Pictures of these components are located in your packets. The dry material is combined with the liquid waste in the mixer to form the grout. The grout pump sends the grout through a transfer line where diverter valves align the transfer path to the desired disposal unit. After processing is completed, the system is flushed with water, followed by launching a rubber ball called a pig through the transfer line to ensure it is clear.

Behind the process room is the Salt Feed Tank. It is a 6500 gallon tank used to simultaneously receive Salt Solution from H-Tank Farm and supply the mixer during processing. Two new Salt Solution Receipt Tanks were constructed to provided 120,000 gallons of buffer volume, allowing grout processing without receiving an interarea transfer or vice versa. These tanks will be partially used in the near future and will be fully operational to support the startup of the Salt Waste Processing Facility.

Salt Disposal Unit 6 Parking Lot

The Saltstone Disposal Facility currently has six disposal units using three different designs. The first two disposal units were large rectangular, concrete structures divided into cells 100’ x 100’ x 25’. These disposal units were partially filled but will no longer be used because of structural and contamination issues caused by liquid collecting around the solidified grout. The next set of disposal units were designed to eliminate these issues. A total of 6 pre-stressed, cylindrical, concrete tanks were constructed, then leak tested by filling with water. Three have been filled with grout from the processing facility. These tanks are 150’ in diameter and 22’ tall with a total volume close to 3 million gallons. Building upon the success of these tanks and the expected volume of waste to be disposed here, the third disposal unit design decreases the disposal cost on a per gallon basis. Salt Disposal Unit 6 is 375’ in diameter, over 40’ tall, and its volume is 32 million gallons. To complete the liquid waste mission, at least 7 more of these mega-tanks will be necessary.

A discussion of the SDU#6 status will be presented tomorrow during the pre-solicitation conference. SDU#6 is expected to be completed and in operation under the current liquid waste contract.

This concludes the tour.

Salt Waste Processing Facility Overview

Salt Waste Processing Facility
Project No. 05-D-405

(Savannah River Site- Aiken, SC)

Pam Marks, FPD, DOE-SR

April 19, 2016

Salt Waste Processing Facility

SWPF Administration Building and Process Facility

SWPF Facility Statistics (approximate values)			
Area	140,000sq. Ft.	Rebar	4,600 tons
Basemat	8 ft. thick	Actuated Valves	1,000
Concrete	40,000 cubic yards	Manual Valves	3,000
Pipe	23 miles	Instruments	1,500
Welds	5,000	Tanks	85
Wire and Cable	817,000 LF	Pumps	116

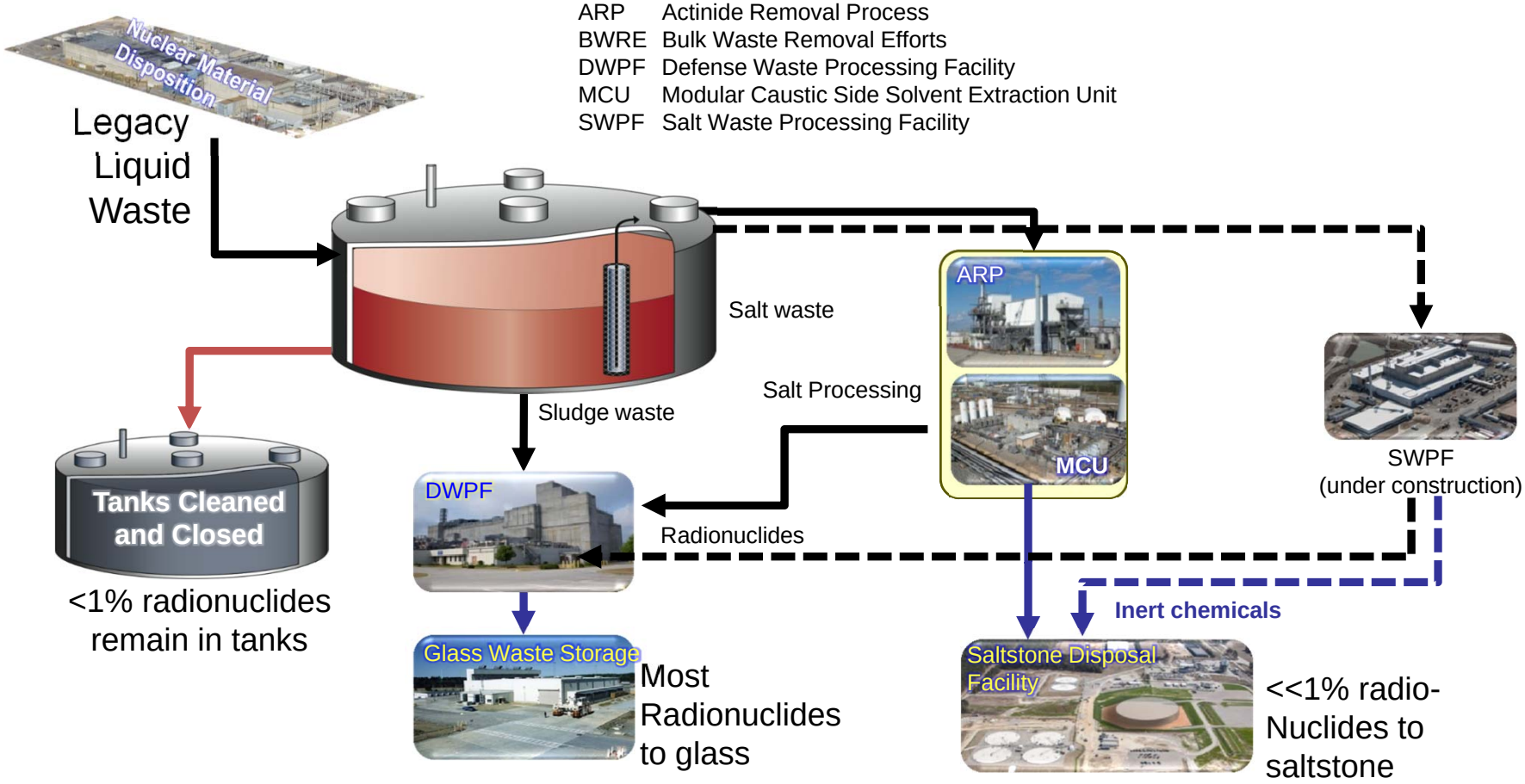
This essential facility will:

- Reduce radioactive waste volume requiring vitrification
- Utilize the same actinide and cesium removal unit processes as Interim Salt Processing Facilities (ARP/MCU)
- Process over 90% of Tank Farm liquid radioactive waste (97 Mgal. after dissolution)
- Have a nominal capacity of 6 – 9 million gallons per year

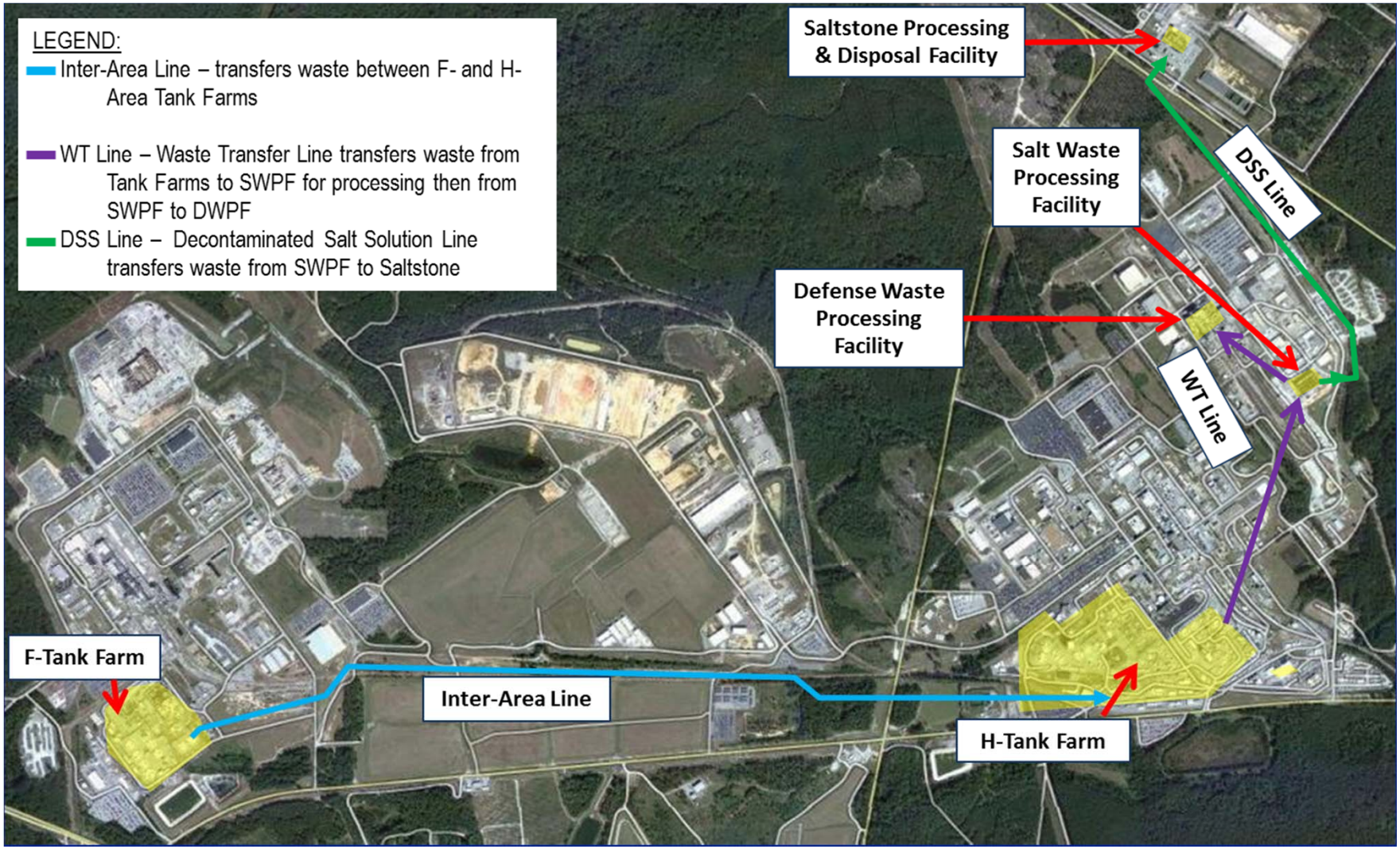
SRR Liquid Waste Program

Legend:

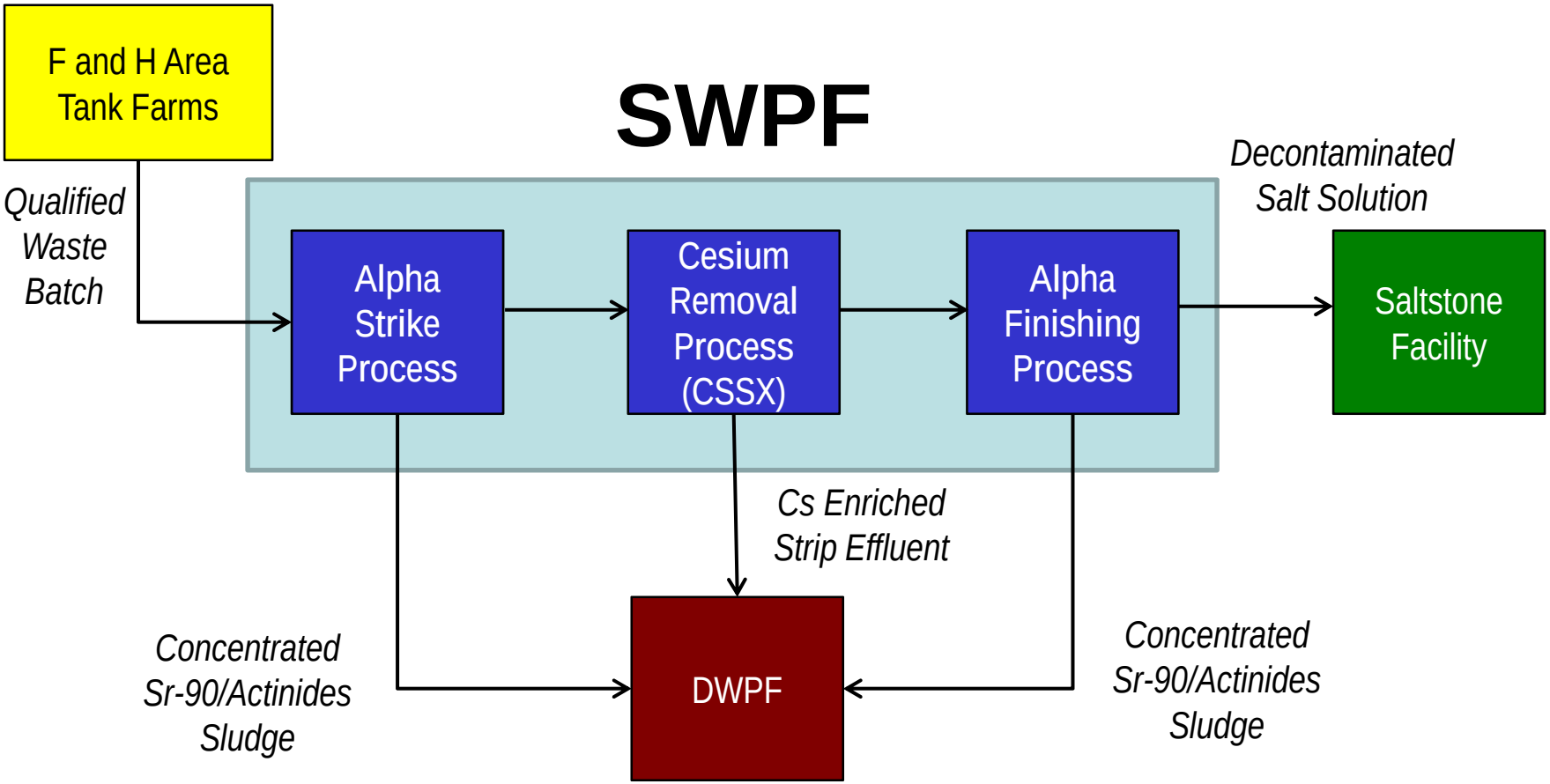
ARP	Actinide Removal Process
BWRE	Bulk Waste Removal Efforts
DWPF	Defense Waste Processing Facility
MCU	Modular Caustic Side Solvent Extraction Unit
SWPF	Salt Waste Processing Facility



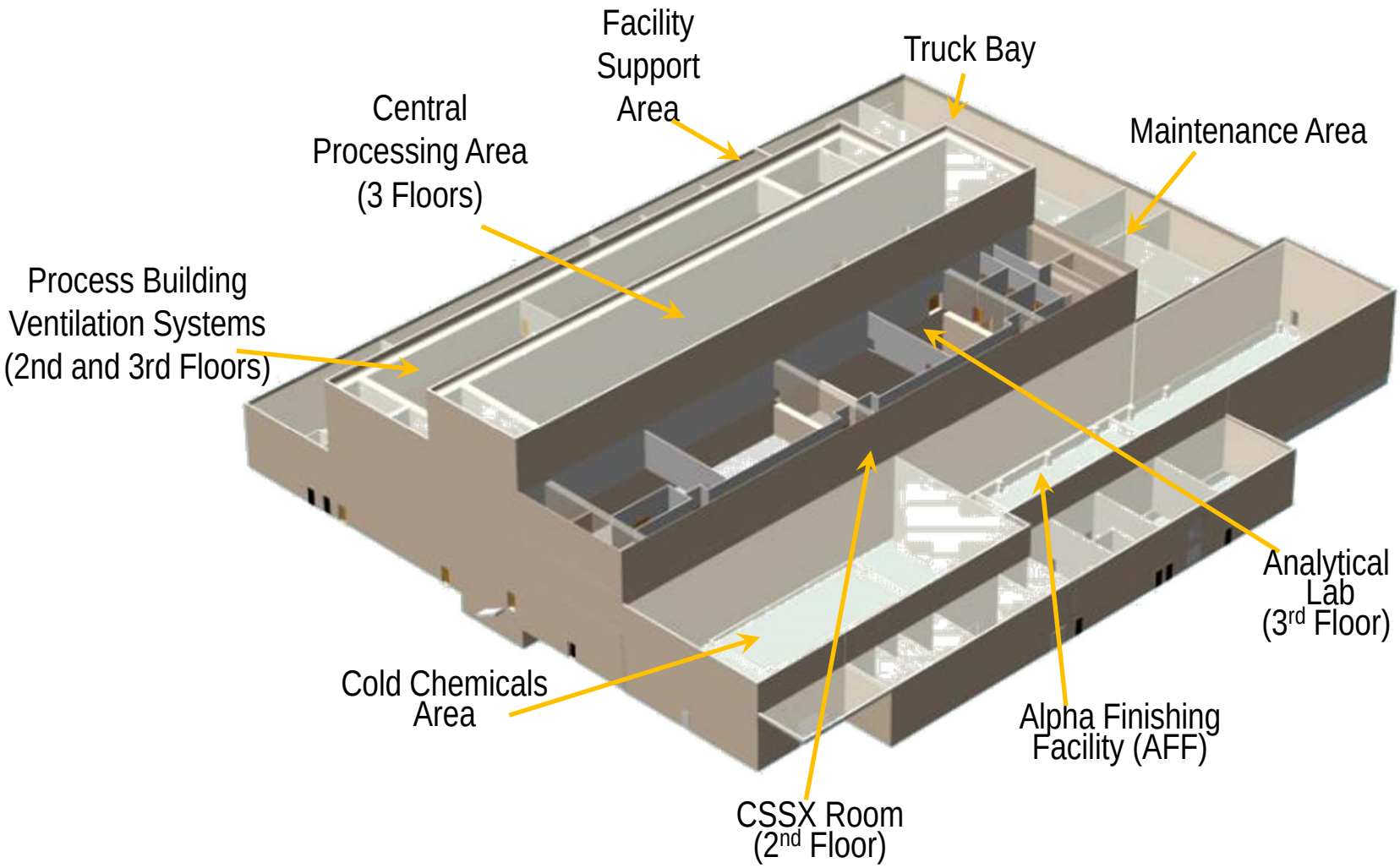
Waste Transfers



SWPF Process



SWPF Process Building Layout



Cold Chemical Area

CCA Truck Bay

Cold Chemical Area

- Cold Chemical Area contains 13 primary tanks that store 50% caustic (NaOH), 20% nitric acid, Monosodium Titanate, solvent, and process water needed for operations
- Tank size ranging from 70 – 10,000 gallons constructed of either stainless steel (11) or polyethylene (2 - deionized and Process water storage tanks)
- PC-1 Area to support operations
- CCA has its own truck bay for receipt of chemicals

Caustic Side Solvent Extraction (CSSX) Room

36 Centrifugal Contactors

Remote and Manual Operated Valve Bank

CSSX Motor Controllers and Vibration Monitors

- Contactors separate Cesium (Cs) from the waste stream at 21.5 gpm
- Uses 4-component solvent in a counter-current flow path
- Cs reduction through CSSX is greater than 40,000 Decontamination Factor
- Each contactor motor speed can be individually adjusted
- Vibration monitors for each motor/contactor

Alpha Finishing Facility (AFF)

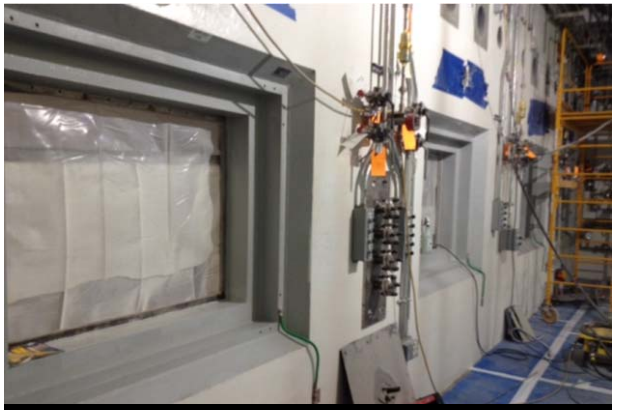
2 of 3 ~38,000 Gallon Process Tanks

Tank top View

- AFF is second strike for Strontium and Actinide removal (if necessary)
- PC-1 Facility housing 3 large vessels of approximately 38,000 gallons and one 43,000 gallon vessel (decontaminated salt solution hold tank – DSS/HT)
- Houses 3 cross-flow filters (2 in use at any time)
- Decontaminated Salt Solution is sent to Saltstone from DSS/HT

Analytical Laboratory

Radio Hoods and Glove Boxes



Four Hot Cells with manipulators

- Fully equipped and automated laboratory capable of analysis of all facility constituents.
- Samples can be drawn remotely from anywhere in the facility for analysis.

Laboratory equipment includes:

7 Gas Generators
2 Total Organic Carbon Analyzers
4 Laboratory Reagent Grade Water Systems
3 Gas Chromatographs
1 Inductively Coupled Plasma Mass Spectrometer
3 Titrators
1 Inductively Coupled Plasma Mass Spectrometer
1 Inductively Coupled Plasma Emission Spectrometer
2 High Performance Liquid Chromatographs

2 Fourier Spectrophotometers
4 Microwave Digestion Systems
1 Particle Size Analyzer
2 ViscometerIRhemometers
1 Methyl Mercury Analyzer
2 lon Chromatographs
3 Laboratory Refrigerators
2 Laboratory Freezers
3 Laboratory Ovens

2 Turbidity Meters
2 Nitrogen Evaporation Systems
7 Analytical Balances
2 Liquid Scintillation Counters
2 Gas Flow Proportional Counters
2 High Purity Germanium Detectors
2 Alpha Spectrometers
1 Cryogenic Storage Cylinder

Laboratory capabilities include organic, inorganic, and radiological analysis.

Maintenance Areas

General Maintenance Shop

Electrical Maintenance Shop

PC-1 Areas used for facility equipment, maintenance, calibration and repair (four total):

- General Maintenance shop
- Electrical Maintenance shop
- Mechanical Maintenance shop
- Instrument Calibration shop

Truck Bay

PC-1 Area used for receipt of and/or shipment of equipment and materials

Yard – North of Facility Support Area

Facility HVAC Chillers

Northern Switch Gear and Transformers

- Provides SWPF Facility Air Conditioning
- Once-through ventilation system
- Control room has dedicated HVAC system (subsystem)

- Full rated load for all equipment in SWPF is ~7 Mw
- Redundant feed at 13.8 kv
- Redundant supply at 480 v
- Similar Southern Switch Gear

Yard - West of Facility

Air Compressor Building

- Consists of 2 air dryers and 3 air compressors
- Provides instrument and plant air to SWPF

Backup Diesel Generator

- 1,000 kW Capacity
- Not credited for nuclear safety
- Approximately 10,000 gallon bulk double-wall fuel tank
- Provides power for basic ventilation and instrument control during loss of power

Yard - West of Facility

Low Point Pump Pit and Waste Transfer Lines

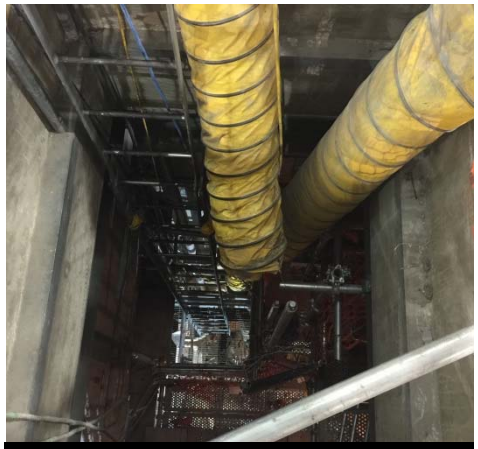
- Low Point Pump Pit (LPPP) located in S-Area
- LPPP is a junction of several waste lines in LW system
- Path of WTL to/from SWPF to DWPF and Tank Farms
- WTLs are two 3” SS Pipes inside a 10” CS Pipe (2 sets)

Pipe Fabrication Tent

- Used for on-site pipe fabrication during construction
- Available for use during commissioning

Central Processing Area (CPA)

Operating Deck



Typical Dark Cell Opening

Cell Cover for Dark Cells

Operating Deck Crane

- PC-3 portion of facility (3 Floors) with credited tanks/vessels and piping
- 6 dark cells (at or below grade) house 6 large ASME vessels (approx. 20,000 – 40,000 gal each) and 3 drain tanks
- No non-maintainable equipment located in the dark cells
- Dark cell entrance not planned or expected
- All maintainable equipment is located or maintained external to the dark cell (Pump and Valve Galleries)
- Operating Deck is located approximately 40 ft above dark cell floor (3rd story of facility)
- Concrete cell covers provide closure and shielding for dark cell openings
- Operating Deck Crane is a 20 ton bridge crane with 7.5 and 1 ton auxiliary hooks

CPA – Pump and Valve Galleries

Pump and Valve Gallery Corridor

Crossflow Filter Pump and Valve Gallery (4)

Typical Pump and Valve Gallery

- Located within the PC-3 Central Processing Area (1st Floor) on both sides of the dark cells
- Houses process pumps, valves and instruments directly adjacent to the dark cells
- Contains all components requiring maintenance, facilitating dark cells to have no maintainable equipment
- Pump and Valve Galleries are labyrinth design to minimize radiation exposure in the corridors
- Each gallery has an overhead crane for maintenance

Process Building Ventilation

PVV & PMV Filtration

Dark Cell Inlet HEPA Filters

Main HVAC Fans

Main HEPA Inlet to HVAC Fans

Facility Exhaust Stack

- Process Vessel Ventilation (PVV) & Pulse Mixer Ventilation (PMV) are dark cell vessel ventilation filtration
- Dark cell inlet air is filtered
- Main HVAC Fans operate at approximately 54,000 CFM
- Exhaust Stack capacity is 85,000 CFM

Process Building IT and Electrical

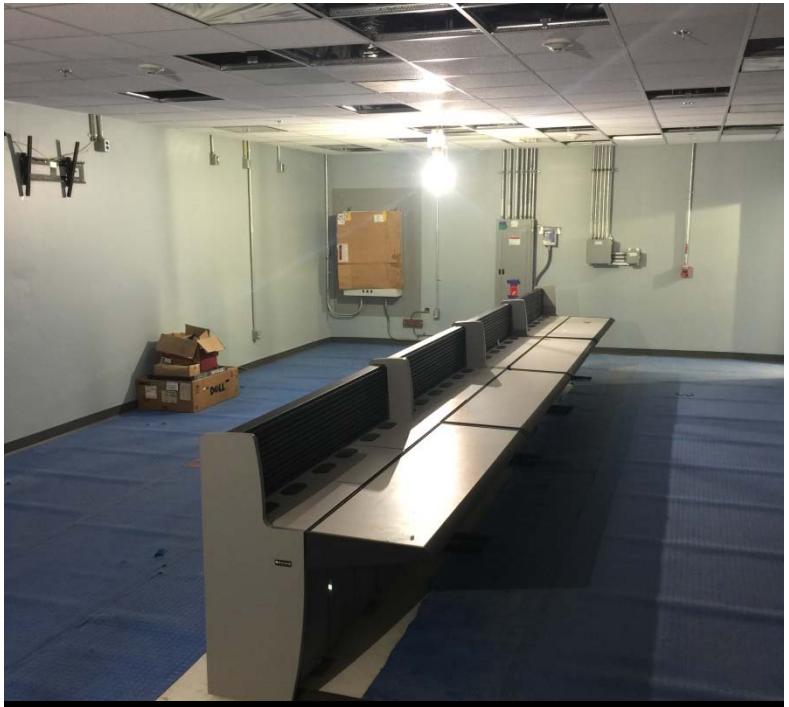
Information Technology Server Room

- Houses computer servers in a precise climate-controlled environment
- Houses Distributed Control System (DCS) equipment

Main Electrical Panels

- Located in PC-1 main switch gear room
- Full rated load for all equipment in SWPF is ~7 Mw
- Redundant feed at 13.8 kv
- Redundant supply at 480 v

Control Room



Four Workstations

Supervisor Office in Glassed Area

- One Workstation for each unit operation: ASP, CRP (CSSX), AFP and Balance of Plant
- Control Room is fully automated via the Distributed Control System
- Control Room has dedicated HVAC and restroom facilities

SWPF Bus Tour Script

Tour to be given by DOE SWPF Chief Engineer, who will join group on the bus at the beginning of the SWPF tour.

SWPF CE will inform the group since they have just had the SWPF Project overview, he will point out important features of the SWPF facility. SWPF CE will read the below verbatim as the bus drives around SWPF.

- "On the left is the SWPF Administrative Building. It currently houses ~200 construction personnel. Upon completion of construction, it will house commissioning and start-up staff.

- The next item to view is the facility exhaust stack. This stack operates at 85,000 cubic feet/min. Only filtered air from the plant HVAC system passes through the stack.

- Now you see the SWPF facility.

- This is the maintenance area truck bay to receive equipment and supplies, followed by the main pedestrian entrance to the facility.

- The taller portion of the concrete facility is safety significant PC-3 Central Processing Area. The lower portions of the facility are PC-1 Support Areas.

- The two gray boxes are the SS PC-3 electrical disconnect switches for the facility. This provides remote de-energization of the entire facility.

- As we move on, you will see the HVAC Chillers, which heat and cool all air entering the facility.

- Next are the northern switch gear and transformers (13.8 kv to 480 v)

- As we turn the corner, you will note the 1,000 kW diesel generator with a 10,000 gallon double wall fuel tank.

- To your right, is the 511-S Low Point Pump Pit Building and underground are the Waste Transfer Lines to/from the SWPF facility. This is where waste feed is sent to SWPF and where SWPF product streams are sent to DWPF. Presently the lines are installed up to the 511-S Building and the Liquid Waste Contractor will complete tie ins prior to Hot Operations.

- Next on your left, is the compressor building which houses 2 air dryers and 3 compressors.

- On your right is the Pipe Fabrication Tent, erected to support in-house pipe fabrication during construction. This tent is available to support commissioning.

- As we turn the corner, you will see the truck bay and cold chemical area of the facility. The Cold Chemical Area houses 13 vessels that store 20% nitrite, 50% caustic, monosodium titanate, and process water.

- Now you will see the southern switch gear and transformers.

- To the left of the transformers is the Alpha Finishing Facility, which is the second strike for Strontium and Actinide removal (if necessary)

- Lastly, as you look to your right, beyond the fence, you will see construction to tie in the Waste Transfer Line that runs from Tank 50 to Saltstone."