

MEETING NOTES

WMA A-AX Focus Area 2 Sample Depth Meeting (D0006) and 241-A-302B Catch Tank (PW-2)

Meeting Date: October 14, 2020

ATTENDEES:

Cindy Tabor (WRPS)
Becky Blackwell (DOE-ORP)
Rod Lobos (DOE-ORP)
Marysia Skorska (Ecology)
John Lindberg (Ecology)
Mike Barnes (Ecology)
Sarah Springer (CHPRC)
Kim Schuyler (Freestone)

BACKGROUND:

This meeting was part of the continuing effort to ensure communication between the Washington State Department of Ecology, the U.S. Environmental Protection Agency, the U.S. Department of Energy Office of River Protection, and Washington River Protection Solutions representatives regarding characterization activities in Waste Management Area A-AX. Specifically RPP-PLAN-63020, Rev. 1, *Sampling and Analysis Plan for WMA A-AX Focus Area 2 (Southwestern Area of A Farm)* states that “geophysical logging data, available quick turnaround analysis results (“quick turn”) for two mobile contaminants (technetium-99 and nitrate) along with a geologic summary of the area, operational history, and historical characterization data at that site may be used to aid in determining subsurface sample depths (deep samples from >4.6 m [15 ft] bgs) for direct push. The subsurface sampling horizons for direct push will be selected in an open meeting to which WRPS staff, DOE Office of River Protection (DOE-ORP), Ecology, U.S. Environmental Protection Agency (EPA), and other site contractors shall be invited.”

Purpose of Meeting: This meeting was called to review geophysical logging data results from direct push location D0005, discuss the sample depth selection process, and agree upon sample depth intervals for D0006. This meeting also included a discussion on selecting opportunistic sample depths at a boring, informally referred to as “PW-2”, to be installed near the 241-A-302B Catch Tank.

Discussion:

Ms. Tabor presented a map of the WMA A-AX Focus Area 2 push locations (Figure 1-1 in RPP-PLAN-63020) and identified that the meeting will cover the D0005/D0006 locations and opportunistic soil sampling at a planned groundwater well near the 241-A-302B Catch Tank. Ms. Tabor presented the information in Attachment 1.

It was identified that the location of the large diameter borehole (D0012) in WMA A-AX Focus Area 2 will be finalized after construction in the area has concluded. Ms. Tabor noted that this information was already discussed with Ecology during a prior meeting.

Ms. Tabor started the meeting by providing a status on WMA A-AX Focus Area 2 activities:

- Focus Area 2 location D0007 was pushed to a total depth of 290.0 feet below ground surface (ft bgs) and all geophysical logging was completed.
- Sampling at D0008 had begun.
- Focus Area 2 location D0005 was pushed to a total depth of 279.3 ft bgs. The push met refusal before reaching the planned total depth of 290.0 ft bgs. All geophysical logging was completed.
- Decommissioning and electrode installation has not yet begun at D0007 or D0005.

It was also noted that geophysical logging is not planned at D0008 and Table 1 of Attachment 1 should be “N/A” (not applicable) instead of “Not started.”

Sampling at D0008 was initiated before the Hanford Site was shut down due to the COVID-19 pandemic. Three shallow samples were collected (surface, 9-11, and 12-14 ft bgs) but could not be analyzed by the on-site laboratory before many of the holding times were exceeded. The samples were eventually shipped to GEL laboratory in late August. Ms. Tabor stated that some of the GEL analytical methods are slightly different than that of the on-site laboratory.

Four deep subsurface samples had been collected at D0008 before the casing broke at approximately 99 ft bgs. Ms. Tabor said that Marty Gardner from Atkins (drilling contractor) contacted Jon Lindberg at Ecology to discuss a path forward for D0008, including the issuance of a variance. On October 7, 2020, Mr. Lindberg agreed that Atkins could abandon the lower section of casing during the decommissioning process. The upper section of casing will be removed during decommissioning. Since the casing at D0008 broke before all of the soil samples were collected, the project will move a few feet away from D0008 and begin a new push identified as “D0008A.” Since D0008A is needed, the project decided to “re collect” the shallow samples (surface, 9-11, and 12-14 ft bgs) then push to depth and collect the final three deep samples previously identified for D0008. Ms. Skorska asked where the D0008A location will be and Ms. Tabor said it will be a couple feet away from the D0008 location.

Ms. Tabor noted that the “Quick Turn” sample results for D0008 will be discussed during the D0006 sample depth discussion.

Sample Selection at D0006 location:

A map of WMA A-AX Focus Area 2 push locations (Figure 1-1 in RPP-PLAN-63020) was presented and Ms. Schuyler identified D0005/D0006 as the location in which sample depths were to be selected. Per RPP-PLAN-63020, three shallow depths will be collected: surface, 7 to 9, and 12 to 14 ft bgs. Ms. Tabor identified that the meeting was to select the 7 “deep sample” intervals (those collected > 15 ft bgs). The map also depicts the location of three decommissioned groundwater wells with casing corrosion (299-E24-19, 299-E25-236, and 299-E25-46).

Ms. Schuyler presented the information in Attachment 1. As part of the “Special Study” identified in RPP-PLAN-63020, back to back samples will be collected at each of the deep sample intervals selected during this meeting. Those samples will be sent to Pacific Northwest National Laboratory. Ms. Schuyler indicated Ecology will be involved during the “Special Study” and a separate meeting will be held to discuss the path forward.

Ms. Schuyler discussed the information used to identify the recommended sample depths at D0006. Information on exploratory direct push locations D0005 and D0007 were provided to meeting attendees

for referencing and viewing on the computer screen and included a plot of a side-by-side comparison between D0007 and D0005. Ms. Springer asked what information was shown on the plots. Ms. Schuyler said the plots displayed the gross gamma (as a maroon-colored line), moisture (as a blue line), temperature (as a thin red line), and spectral gamma (potassium, uranium and thorium, displayed separately as a black lines). Ms. Schuyler said the side-by-side plots also include the sample depths selected at D0008 and the proposed sample depths for D0006. Mr. Lindberg also asked about brown/red line during recommendation discussion. Ms. Schuyler clarified that was the maroon-colored line for total gamma. Mr. Lindberg also asked at what depth groundwater was and Ms. Schuyler responded that it is at approximately 285 ft bgs. Mr. Lindberg asked if we pushed to the area where the corrosion occurred in nearby wells and Ms. Schuyler responded “yes”. Ms. Schuyler indicated that this depth was around 263 ft bgs.

The depths and rationale identified in Table 2 of Attachment 1 were discussed. Ms. Schuyler discussed the reason this location was chosen for characterization: D0006 is within the footprint of the 200-E-286 Ditch and is down gradient of Tanks 241-A-104 and 241-A-105. The “Quick Turn” results from the three shallow depths and four deep samples collected from D0008 were displayed on the computer screen and discussed. Ms. Schuyler identified that all available Tc-99 results from 7 samples are non-detect and low concentrations of nitrate is present and increases with depth. It was also noted that pH seemed elevated in the shallow samples (up to approximately 9.93).

There was a general discussion on the various recommended sample depths. The first interval discussed was 20-22 ft bgs which corresponded with a high moisture peak. The second recommended sample interval was 79 to 81 ft bgs. At interest was a corresponding signature in D0007 but 10 ft deeper with a higher moisture peak than what was seen at D0007. The meeting attendees agreed to collect a sample at the H1/H2 contact due to the elevated moisture at 132 to 134 ft bgs. The recommended sample depths at 179 to 181 ft bgs and 204 to 206 ft bgs correspond to moisture peaks. The 260 to 262 ft bgs sample interval was selected because it is at the depth in which casing corrosion was noted in 299-E25-236. The final sample was selected at 273 to 275 ft bgs due the extremely high moisture signature and the depth is consistent with casing corrosion at decommissioned groundwater wells 299-E24-19 and 299-E25-46. Ms. Schuyler noted that D0005 did not extend to the top of the Cold Creek gravel-dominated unit because the push met refusal before the unit could be encountered. Consequently, a sample of the Cold Creek gravel-dominated unit was not recommended at this location.

Ms. Skorska and Mr. Lindberg indicated that they concurred with all the recommended depths. Ms. Tabor asked if Mr. Barnes concurred and he did not respond. She asked if he was not ok with picks to email her. Ms. Blackwell also agreed with the recommended depths. No changes were made to the recommended picks. The list of sample depths is identified in Table 1 (below).

Table 1: Sample Depth Recommendations for D0005/D0006

Judgmental		Stratigraphy
Recommended Sample Depth (ft bgs)	Reason	
20-22	High moisture peak without corresponding increase in total gamma, similar signature to D0007, this approximate interval was selected for characterization at D0008.	H1

Table 1: Sample Depth Recommendations for D0005/D0006

Judgmental		Stratigraphy
Recommended Sample Depth (ft bgs)	Reason	
79-81	Corresponding signature in D0007 but 10 ft deeper, higher moisture peak than what was seen at D0007, this signature was selected for characterization at D0008.	H1
132-134	High moisture peak and increased gamma signature (at transition H1/H2)	H1/H2
179-181	High moisture peak, moisture content increased with depth from 152 to the peak at 180 ft bgs, can be used to compare any contaminant concentrations to 132-134 ft sample	H2
204-206	Increased moisture and gamma, similar signature isn't as obvious at D0007, could show localized facies change	H2
260-262	Near area of corrosion seen at 299-E25-236, increased moisture and gamma	H2
273-275*	Within approximate area of corrosion in 299-E25-46 and 299-E24-19, very high moisture content, elevated gamma, within the Cold Creek silt-dominated unit.	CCu (silt)

Note: The following are the stratigraphic units identified from logging hole D0005 (in ft bgs):
 Backfill = 0-8, H1 = 8-132, H2 = 132-273, CCu (silt): 273-total depth. D0005 met refusal before the CCu (gravel) was encountered.

*Highest moisture area

H1 = Hanford formation unit 1

H2 = Hanford Formation Unit 2

CCu = Cold Creek unit

ft bgs = feet below ground surface

Sample Selection at "PW-2" location:

Ms. Schuyler then discussed opportunistic samples collection from a CHPRC RCRA groundwater monitoring well (informally referred to as the "PW-2" borehole) adjacent to the 241-A-302B Catch Tank. The proposed boundary of WMA A-AX includes the 241-A-302B Catch Tank, which is located outside and adjacent to the eastern fenceline of A Farm. There is no history of leaks from the 241-A-302B Catch Tank. The purpose of these samples is to characterize the vadose zone soil adjacent to the 241-A-302B Catch Tank to see if there is any indication of an unknown release.

Ms. Springer provided some background information. "PW-2" will be part of the RCRA groundwater monitoring network for WMA A-AX. It is one of 4 wells being installed in the WMA A-AX area. "PW-2" was originally planned to be installed north of the 241-A-302B Catch Tank, but through integration efforts, CHPRC has moved the planned location closer to the 241-A-302B Catch Tank. CHPRC and WRPS will coordinate field sampling in order to address data needs for both projects. As identified in Attachment 1, the 241-A-302B Catch Tank is currently assigned to WMA A-AX.

Ms. Schuyler indicated that total gamma and moisture data from geophysical logging, driller and geologist logs from nearby 299-E25-54, 299-E25-2 and 299-E25-93 were used to help select the proposed sample depths. The number of deep and shallow sample intervals are consistent with the sample design in RPP-RPT-60227, WMA A-AX DQO Report, Rev. 1.

Per RPP-PLAN-63020, three shallow depths will be collected: surface, 7 to 12, and 12 to 17 ft bgs. These sample intervals may be modified due to selected drilling technology. The 5 ft intervals assumes a sonic drilling rig will be used.

There was a general discussion on the various recommended deep (>15 ft bgs) sample depths. The 24 to 29 ft bgs interval is of interest because the depth corresponds to the depth of the bottom of the 241-A-302B Catch Tank. The 35 to 40 ft bgs is an interval of elevated gross gamma, seen at 299-E25-54 and 299-E25-2. This may indicate a facies in the vadose zone with a tendency to slow vertical migration of contaminants. It is thought that if the 241-A-302B Catch Tank had leaked, this is the depth it is most likely to be observed. The 50 to 55 ft bgs interval was recommended due to a slight increase in total gamma at 299-E25-93, corresponding to change from gravelly sand to sand, which is more likely to retain moisture (or contamination if present). The 65 to 70 ft bgs was also recommended because a driller’s log from 299-E25-2 states the vadose zone formation is a “sandy silt, holds water.” Beyond 80 ft, the driller says “sandy, less silt, loses water.” If there were to be any contamination from 241-A-302B, it would be extremely unlikely to see any contamination below 80 ft bgs. Sample intervals 115 to 120 and 135 to 140 ft bgs were recommended because of the high moisture zones identified at the nearby boreholes. The final sample depth of 245 to 250 ft bgs was recommended because it is a deep sample and just above the localized, laterally-continuous high-moisture silty sand facies seen beneath WMA A-AX. Ms. Schuyler noted that the high-moisture silty sand facies may contain contamination unrelated to the 241-A-302B Catch Tank.

Ms. Skorska and Mr. Lindberg indicated that they concur with all of the recommended sample depths. Ms. Blackwell also concurred with the recommendations. Ms. Skorska then asked if the well (referring to “PW-2”) could be moved closer to the catch tank and why the shotcrete was there. Ms. Springer indicated that CHPRC would place the well as close as possible to the catch tank. The slope of the berm was discussed, along with the difficulties of drilling, maintaining and sampling a monitoring well on a slope. Ms. Tabor indicated that she did not think it would be good to disturb the shotcrete at this time for characterization. Ms. Skorska asked why and Ms. Tabor referenced UPR-200-E-82 with the gunite cap at WMA C. **Ms. Tabor recommended an action be taken to determine why the shotcrete was installed.** Additionally, **Ms. Springer took an action to perform a walkdown of the well area (nearer to installation time) in order to best locate the well.** She also indicated that the well was not planned to be installed until FY22 or FY23. Ms. Tabor indicated FY21 would be better. Ms. Springer said CHPRC could prioritize this well, if needed, so drilling could occur sooner. Ms. Tabor indicated that the meeting was successful in that the sample depths for the “PW-2” well were agreed upon, which was one of the purposes of the meeting. Ms. Tabor said ultimately, we are piggybacking on with CHPRC and it is their well and we are collecting opportunistic samples.

The list of sample depths agreed upon is identified in Table 2 (below).

Table 2: Sample Depth Recommendations for “PW-2” Borehole

Judgmental	
Recommended Sample Depth (ft bgs) ^a	Reason
Surface	Risk
7-12	Risk

Table 2: Sample Depth Recommendations for "PW-2" Borehole

Judgmental	
Recommended Sample Depth (ft bgs) ^a	Reason
12-17	Risk
24-29	24 ft bgs is the approximate bottom of the 241-A-302B Catch Tank ^b
35-40	Elevated gross gamma seen at 299-E25-54 and 299-E25-2. Increased gross gamma at 299-E25-2 appears to indicate radiological contamination. In 299-E25-54, 35-43 ft correspond with Eu-154, Co-60, and Pa-234 contamination.
50-55	Slight increase in total gamma at 299-E25-93, corresponding to change from gravelly sand to sand which is more likely to retain moisture (or contamination if present)
65-70	Drillers log from 299-E25-2 states "sandy silt, holds water." Beyond 80 ft driller says "sandy, less silt, loses water." If there were to be any contamination from 241-A-302B, it would be extremely unlikely to see any contamination below 80 ft.
115-120	High moisture zone, characterize intermediate depth.
135-140	High moisture zone, characterize intermediate depth.
245-250	Just above the high moisture silty sand interval.

^aSample intervals may be modified due to selected drilling technology. This 5 ft interval assumes a sonic drilling rig will be used.

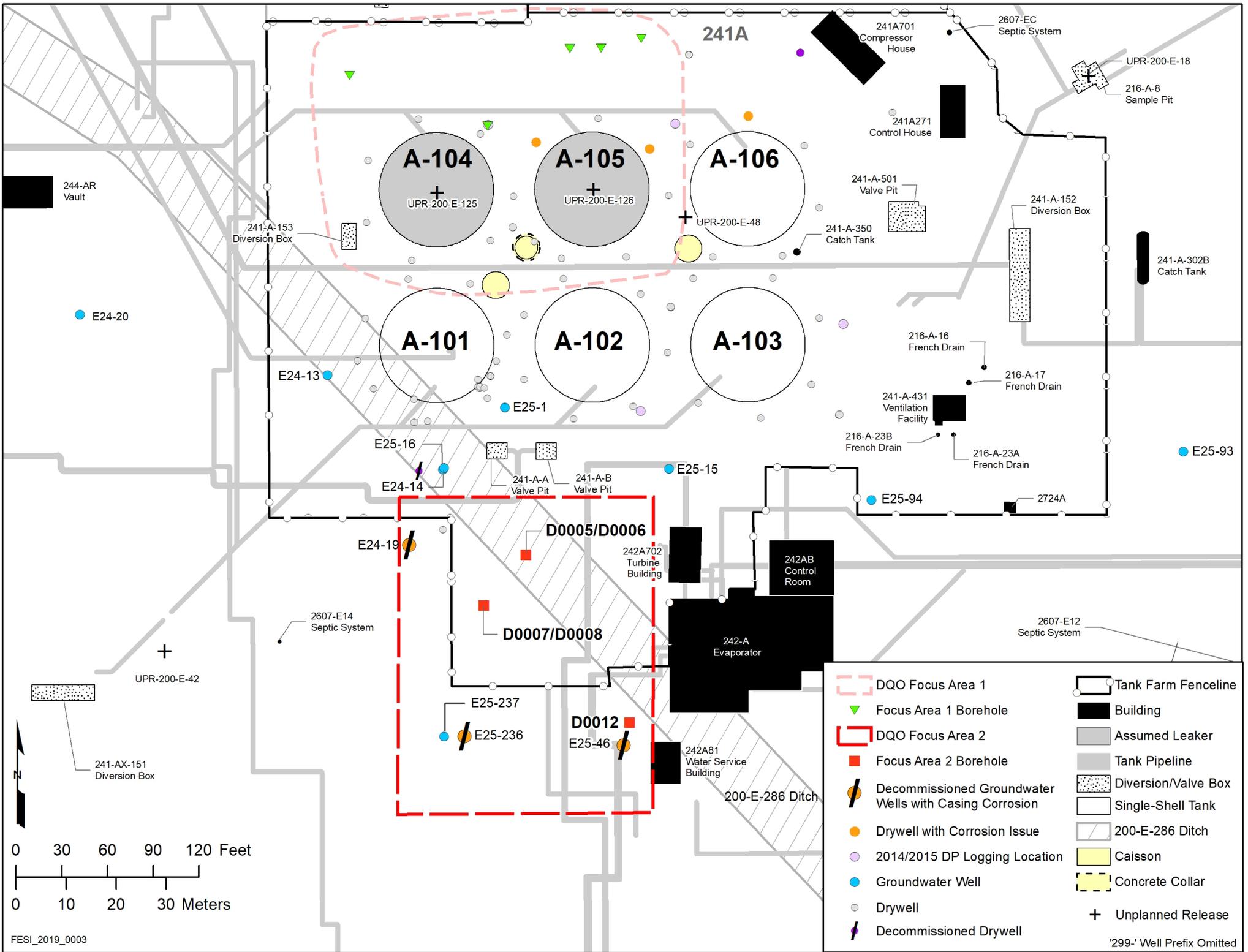
^bElevation of tank bottom is approximately 656 ft.

<p>Becky Blackwell</p> <hr/> <p>DOE Project Manager (print)</p>	<p>REBECCA BLACKWELL</p> <p><small>Digitally signed by REBECCA BLACKWELL Date: 2020.11.05 14:38:00 -08'00'</small></p> <hr/> <p>DOE Project Manager (signature)</p>	<p>Date</p>
<p>Michael W Barnes</p> <hr/> <p>Ecology Project Manager (print)</p>	<p><i>Michael W Barnes</i></p> <hr/> <p>Ecology Project Manager (signature)</p>	<p>11-5-2020</p> <hr/> <p>Date</p>

Figure 1-1. Study Boundary for WMA A-AX Focus Area 2

(First referred to in meeting notes on page 1 of 6)

Source: RPP-PLAN-63020, *Sampling and Analysis Plan for WMA A-AX Focus Area 2*
(*Southwestern Area of A Farm*)



Attachment 1

**WMA A-AX Focus Area 2 Sample Depth Meeting (D0006) and
241-A-302B Catch Tank (PW-2)
October 14, 2020**

Purpose of this meeting:

- Field and analytical status
- Judgmental sampling depths for D0006
- Opportunistic judgmental sampling depths from CHPRPC borehole “PW-2” adjacent to 241-A-302B Catch Tank

Field and Analytical Status:

Table 1: Focus Area 2 Direct Push Field Status

Location	Proposed Depth^a	Actual Depth^a	Logged	Decommissioned/ Electrodes Installed
D0005	290.0	TD = 279.3 ^b	Complete	Not started
D0007	290.0	TD = 290.0	Complete	Not started
D0008	286.0	In progress	NA	Not started

TD = total depth

^aInformation is in feet below ground surface (ft bgs).

^bDirect push met refusal before the total planned depth could be achieved.

D0008

- Three shallow samples were collected prior to COVID shutdown, quite a few hold times were missed. We recommended sending samples to GEL prior to additional hold times being missed and Ecology agreed. Samples were sent to GEL in late August. Note some of GEL methods are slightly different from 222-S methods.
- Pushing and sampling restarted in September and four deep samples were collected prior to a casing break at ~99 ft bgs (October 7, 2020).
- Casing break was communicated to Ecology (Jon Lindberg) regarding decommissioning on October 7, 2020.
- D0008A will be pushed a few feet away from D0008 and the three shallow samples, where hold times were missed, will be “re-collected” along with the three remaining deep samples.
- Available quick turn results will be shown during D0006 sample depth discussion.

WMA A-AX Focus Area 2 Sample Depth Meeting (D0006) and 241-A-302B Catch Tank (PW-2) October 14, 2020

Judgmental Sampling Depths for D0006:

Information Evaluated to Help Determine Possible Sample Depths at D0006:

- Gamma, moisture, and temperature data for D0005
- Gamma, moisture, and temperature data for D0007
- PNNL-15141, Rev.1, *Investigation of Accelerated Casing Corrosion in Two Wells at Waste Management Area A-AX*
- DOE/RL-2015-49, Rev. 0, *Interim-Status Groundwater Quality Assessment Plan for the Single-Shell Tank Waste Management Area A-AX*
- Quick turn results from D0008

General Notes:

The basis for standard sampling is described in RPP-RPT-60227, WMA A-AX DQO Report, Rev. 1 (Focus Area 2), which indicates that these samples are to be collected from:

- 10 sample depths: 3 sample depths of - surface, 7-9, and 12-14 ft bgs and 7 deeper samples (intervals recommended are identified in Tables 2).
- An additional back to back sample for “Special Study” will be collected after each “deeper sample” interval. The liners and shoe are sent to PNNL for additional testing and evaluations in accordance with Appendix D of the WMA A-AX DQO Report.

Reason for Sampling Source: RPP-PLAN-63020, Rev. 1, *Sampling and Analysis Plan for WMA A-AX Focus Area 2 (Southwestern Area of A Farm): Assess magnitude of contamination for modeling, risk, and nature and extent and quantify contaminant mobility, if contamination is found (“Special Study”)*.

- Within the previous footprint of 200-E-286 Ditch
- Downgradient of Tanks A-104 and A-105
- Quantify contaminant mobility, if contamination is found

**WMA A-AX Focus Area 2 Sample Depth Meeting (D0006) and
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79-81	Corresponding signature in D0007 but 10 ft deeper, higher moisture peak than what was seen at D0007, this signature was selected for characterization at D0008.	H1
132-134	High moisture peak and increased gamma signature (at transition H1/H2)	H1/H2
179-181	High moisture peak, moisture content increased with depth from 152 to the peak at 180 ft bgs, can be used to compare any contaminant concentrations to 132-134 ft sample	H2
204-206	Increased moisture and gamma, similar signature isn't as obvious at D0007, could show localized facies change	H2
260-262	Near area of corrosion seen at 299-E25-236, increased moisture and gamma	H2
273-275*	Within approximate area of corrosion in 299-E25-46 and 299-E24-19, very high moisture content, elevated gamma, within the Cold Creek silt-dominated unit.	CCu (silt)

Note: The following are the stratigraphic units identified from logging hole D0005 (in ft bgs): Backfill = 0-8, H1 = 8-132, H2 = 132-273, CCu (silt): 273-total depth. D0005 met refusal before the CCu (gravel) was encountered.

*Highest moisture area

WMA A-AX Focus Area 2 Sample Depth Meeting (D0006) and 241-A-302B Catch Tank (PW-2) October 14, 2020

Opportunistic samples from CHPRC RCRA groundwater monitoring well near 241-A-302B Catch Tank:

General Notes

- The proposed boundary of WMA A-AX includes 241-A-302B Catch Tank, which is located outside and adjacent to the eastern fenceline of A Farm.
- CHPRC already planned to install a RCRA groundwater monitoring well east of A Farm, they agreed to move location south so it would be adjacent to the 241-A-302B Catch Tank.
- WRPS and CHPRC will coordinate field activities.
- No history of leaks from 241-A-302B Catch Tank.

Information Evaluated to Help Determine Possible Sample Depths at “PW-2” borehole:

- Gamma and moisture data, driller and geologist logs from nearby 299-E25-54, 299-E25-2 and 299-E25-93.
- Number of samples and shallow depths per RPP-RPT-60227, WMA A-AX DQO Report, Rev. 1

Table 3: Sample Depth Recommendations for “PW-2” Borehole

Judgmental	
Recommended Sample Depth (ft bgs)^a	Reason
Surface	Risk
7-12	Risk
12-17	Risk
24-29	24 ft bgs is the approximate bottom of the 241-A-302B Catch Tank ^b
35-40	Elevated gross gamma seen at 299-E25-54 and 299-E25-2. Increased gross gamma at 299-E25-2 appears to indicate radiological contamination. In 299-E25-54, 35-43 ft correspond with Eu-154, Co-60, and Pa-234 contamination.

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Table 3: Sample Depth Recommendations for “PW-2” Borehole

Judgmental	
Recommended Sample Depth (ft bgs)^a	Reason
50-55	Slight increase in total gamma at 299-E25-93, corresponding to change from gravelly sand to sand which is more likely to retain moisture (or contamination if present)
65-70	Drillers log from 299-E25-2 states “sandy silt, holds water.” Beyond 80 ft driller says “sandy, less silt, loses water.” If there were to be any contamination from 241-A-302B, it would be extremely unlikely to see any contamination below 80 ft.
115-120	High moisture zone, characterize intermediate depth.
135-140	High moisture zone, characterize intermediate depth.
245-250	Just above the high moisture silty sand interval.

^aSample intervals may be modified due to selected drilling technology. This 5 ft interval assumes a sonic drilling rig will be used.

^bElevation of tank bottom is approximately 656 ft.