MONTHLY PROGRESS REPORT #319
FOR OCTOBER 2023

EPA REGION I ADMINISTRATIVE ORDERS SDWA 1-97-1019 and 1-2000-0014

JOINT BASE CAPE COD (JBCC)
TRAINING RANGE AND IMPACT AREA

The following summary of progress is for the period from 01 to 31 October 2023.

1. SUMMARY OF REMEDIATION ACTIONS

Remediation Actions (RA) Underway at Camp Edwards as of 27 October 2023:

Demolition Area 1 Comprehensive Groundwater RA

The Demolition Area 1 Comprehensive Groundwater RA consists of the removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. Extraction, treatment, and recharge (ETR) systems at Frank Perkins Road, Base Boundary, and the Leading Edge include extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and injection wells to return treated water to the aquifer.

The Frank Perkins Road Treatment Facility has been optimized as part of the Environmental and System Performance Monitoring (ESPM) program at Demolition Area 1. The treatment facility continues to operate at a flow rate of 175 gallons per minute (gpm), with over 3.042 billion gallons of water treated and re-injected as of 27 October 2023. No Frank Perkins Road Treatment Facility shutdowns occurred in October.

The Base Boundary Mobile Treatment Unit (MTU) continues to operate at a flow rate of 65 gpm. As of 27 October 2023, over 381.5 million gallons of water were treated and re-injected. No Base Boundary MTU shutdowns occurred in October.

The Leading Edge system continues to operate at a flow rate of 100 gpm. As of 27 October 2023, over 376.1 million gallons of water were treated and re-injected. The following Leading Edge system shutdowns occurred in October:

- 0311 on 17 October 2023 due to a power interruption and was restarted at 0800 on 17 October 2023.

The Pew Road MTU was turned off with regulatory approval on 08 March 2021 (formerly operated at a flow rate of 65 gpm). Over 672.9 million gallons of water were treated and re-injected during the RA.

J-2 Range Groundwater RA

Northern Plant

The J-2 Range Northern Treatment facility consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The Extraction, Treatment, and Re-infiltration system includes three extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and an infiltration basin to return treated water to the aquifer.

The Northern MTUs E and F continue to operate at a flow rate of 250 gpm. As of 27 October 2023, over 2.136 billion gallons of water have been treated and re-injected. No MTU E and F shutdowns occurred in October.

The Northern Treatment Building G continues to operate at a flow rate of 225 gpm. As of 27 October 2023, over 1.643 billion gallons of water have been treated and re-injected. No MTU G shutdowns occurred in October.

Eastern Plant

The J-2 Range Eastern Treatment facility consists of removal and treatment of groundwater to minimize downgradient migration of explosives compounds and perchlorate. The ETI system includes the following components: three extraction wells in an axial array, an ex-situ treatment process consisting of an ion exchange (IX) resin and granular activated carbon (GAC) media to treat perchlorate and explosives compounds, and three infiltration trenches located along the lateral boundaries of the plume where treated water enters the vadose zone and infiltrates into the aquifer. The J-2 Range Eastern system is running at a combined total flow rate of 495 gpm.

The MTUs H and I continue to operate at a flow rate of 250 gpm. As of 27 October 2023, over 1.777 billion gallons of water have been treated and re-injected. The following MTU H and I shutdowns occurred in October:

- 0544 on 13 October 2023 due to a power outage and were restarted at 0829 on 13 October 2023.

MTU J continues to operate at a flow rate of 120 gpm. As of 27 October 2023, over 832.4 million gallons of water have been treated and re-injected. The following MTU J shutdowns occurred in October:

- 0544 on 13 October 2023 due to a power outage and was restarted at 0705 on 13 October 2023.

MTU K continues to operate at a flow rate of 125 gpm. As of 27 October 2023, over 956.7 million gallons of water have been treated and re-injected. The following MTU K shutdowns occurred in October:

- 0544 on 13 October 2023 due to a power outage and was restarted at 0725 on 13 October 2023.

J-3 Range Groundwater RA

The J-3 Range Groundwater RA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The ETR system includes four extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater and utilizes the existing Fuel Spill-12 (FS-12) infiltration gallery to return treated water to the aquifer.

The J-3 system is currently operating at a flow rate of 255 gpm. As of 27 October 2023, over 1.761 billion gallons of water have been treated and re-injected. The following J3 system shutdowns occurred in October:

- 0544 on 13 October 2023 due to a power outage and was restarted at 0923 on 13 October 2023.

J-1 Range Groundwater RA

Southern Plant

The J-1 Range Southern Groundwater RA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds. The ETR system includes two extraction wells, an ex-situ treatment process to remove explosives compounds from the groundwater, and an infiltration trench to return treated water to the aquifer.

The Southern MTU continues to operate at a flow rate of 125 gpm. As of 27 October 2023, over 771.5 million gallons of water have been treated and re-injected. The following J-1 Range Southern MTU shutdowns occurred in October:

- 0544 on 13 October 2023 due to a power outage and was restarted at 0643 on 13 October 2023.

Northern Plant

The J-1 Range Northern Groundwater RA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The ETR system includes two extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and an infiltration trench to return treated water to the aquifer.

The Northern MTU continues to operate at a total system flow rate of 250 gpm. As of 27 October 2023, over 1.282 billion gallons of water have been treated and re-injected. The following J-1 Range Northern MTU shutdowns occurred in October:

- 1105 on 13 October 2023 to replace a pressure transmitter on the EW0002 influent pipe and was restarted at 1147 on 13 October 2023.

Central Impact Area RA

The Central Impact Area (CIA) Groundwater treatment facility consists of removal and treatment of groundwater to minimize downgradient migration of explosives compounds and perchlorate. The ETR system includes the following components: three extraction wells, an ex-situ treatment process consisting of an ion exchange resin and granular activated carbon media to treat explosives compounds, and three infiltration galleries to return treated water to the aquifer. The CIA systems 1, 2, and 3 continue to run at a combined total flow rate of 750 gpm. As of 27 October 2023, over 3.348 billion gallons of water have been treated and re-injected. No CIA system shutdowns occurred in October.

2. SUMMARY OF ACTIONS TAKEN

Operable Unit (OU) Activity as of 27 October 2023:

CIA

- Source Area investigations
    - Intrusive investigations in P4A3 grids and polygons

  - Routine visual check of consolidated shot structure (CSS) soil cover and surface area around the perimeter of the CSS
  - Conducted blown-in-place (BIP) demolition operations

Demolition Area 1
- Hydraulic monitoring event within Demo 1 Optimization

Demolition Area 2
- No activity

J-1 Range
- Groundwater sampling within J-1 Range Southern SPM
- Monitoring well installation, well development, surveying and groundwater sampling at J-1 Range Southern wells MW-733 M1/M2.

J-2 Range
- Monitoring well installations at J-2 Range Northern:
- MW-740 M1/M2
- MW-739 M2 (re-drill)
- Monitoring well development at J-2 Range Northern:
- MW-737 M1/M2
- MW-738 M1/M2
- MW-739 M1/M2
- MW-740 M1/M2
- Groundwater sampling of newly installed monitoring wells at J-2 Range Northern:
- MW-734 M1/M2
- MW-735 M1/M2
- MW-736 M1/M2
- MW-737 M1/M2
- MW-738 M1/M2
- MW-739 M1/M2
- MW-740 M1/M2
- Surveyed newly installed wells at J-2 Range Northern
- Groundwater sampling within J-2 Range Northern SPM
- Hydraulic monitoring event within J-2 Range Northern SPM
- Groundwater sampling within J-2 Northern PFAS Program
- Bag filters changed at J-2 Range Northern – Unit E

J-3 Range
- Groundwater sampling within J-3 Range PFAS Program

L Range
- No activity

Small Arms Ranges
- No activity

Northwest Corner

- No activity

Training Areas

- No activity

Impact Area Roads

- No activity

Other

- Collected process water samples from Central Impact Area, Demolition Area 1, J-1 Range Northern, J-1 Range Southern, J-2 Range Eastern, J-2 Range Northern, and J-3 Range treatment systems

JBCC Impact Area Groundwater Study Program (IAGWSP) Tech Update Meeting Minutes for 12 October 2023

Project and Fieldwork Update

Darrin Smith (USACE) provided the project and fieldwork update starting with the status of the groundwater sampling crews. He said that Koman Government Solutions (KGS) crews are still sampling the J-2 Range North system performance monitoring (SPM) wells (85 screens) and are expected to finish next week. They finished the hydraulic event consisting of 65 screens last week. After that, KGS crews will move onto the J-2 Range semi-annual PFAS sampling at nine screens, which should coincide with first round sampling at the seven new wells (14 screens). After the J-2 Range North is complete, crews will move to perform sampling at the J-1 Range South SPM (52 screens) and hydraulic monitoring (72 screens) wells.

Mr. Smith (USACE) noted that crews had to resample five wells at the J-3 Range for PFAS on 5 October 2023, and an expedited turnaround was requested. Jane Dolan (EPA) asked which locations had to be resampled and why. Mr. Smith (USACE) explained that there was a lab error. Michael Kulbersh (USACE) said that one location was the MW-242 well cluster and Gina Kaso (USACE) explained that the lab didn't run the quality control (QC) sample and didn't realize the error until after the hold time on the samples had expired. Shawn Cody (ARNG) said that IAGWSP will provide the other well locations. Ms. Dolan (EPA) asked if MW-125 was resampled. Jodi Lyn Cutler (IAGWSP) replied that it had not and that the team was waiting for all the PFAS results to come in before deciding where to sample next.

Mr. Smith (USACE) continued with a status of operations and maintenance activities. He noted that the October monthly process water samples were collected between 2 October and 5 October 2023. September 2023 monthly process water results showed that Central Impact Area (CIA) 3 had an estimated exceedance in the mid port of RDX of 0.28 µg/L, and the effluent port was non-detect. An expedited turn around was requested on the October samples to check that result before a decision was made on media change out. The Demolition Area 1 base boundary extraction well EW-3 packering synoptic event was completed at 64 wells. The influent and effluent PFAS samples at the J-2 Range North (quarterly) and the J-3 Range (semi-annual) were collected on 3 October 2023.

Ms. Dolan (EPA) asked if Fuel Spill (FS)-12 influent and effluent had been sampled for PFAS by the Air Force Civil Engineer Center. Eliot Jacobs (MassDEP) said the Air Force didn't sample for PFAS at FS-12 because they primarily sample where there are volatile organic compounds, and because the source of FS-12 was an underground pipeline leak, there would be no reason to suspect the use of PFAS at the surface. Ms. Dolan (EPA) asked Mr. Jacobs (MassDEP) if there was a fire at the soil vapor extraction system that was previously at the FS-12 source area. Mr. Jacobs replied that there was a fire at the FS-1 plant, not FS-12. Ms. Cutler (IAGWSP) said that she just received the remaining validated PFAS data from the J-3 Range except for the five locations that are being resampled and she noted that she would review and distribute the data to the agencies later today (12 October 2023).

Mr. Smith (USACE) provided an update on new well installations. Crews will be finishing MW-733 at Checkerberry Lane today. The only remaining task is to reinstall the shallow screen at MW-739 because there was a blockage that they were unable to clear. Well development at MW-734, MW-735, and MW-736 is complete.

<u>Central Impact Area 100% Verification Grid Presentation</u>

Ms. Kaso (USACE) explained that she would forgo her usual CIA update as the information will be provided as part of IE-Weston's 100% verification grid presentation. She introduced Bryan Hnetinka, IE-Weston Project Manager (Weston) to provide the briefing. Mr. Hnetinka (Weston) said that both he and Rachel Woolf (Weston), who is the project geophysicist, will be providing the presentation, which will present the results of the two 100% dig grids and update the current project status. Ms. Woolf (Weston) began the presentation by reviewing the metal mapper team members and showing a figure of the two validation gids selected by EPA and MassDEP, namely grids 50_44 and 49_33. She reminded the group of the goal set in the Decision Document, which was to remove 75-95% of unexploded ordnance (UXO) while maximizing removal of net explosive weight. There is also a classification goal of correctly classifying 95% of the targets of interest (TOI) while reducing clutter digs by greater than 70%. Ms. Woolf (Weston) noted that UXO-like items include inert rounds and seeds.

A figure showing the Metal Mapper data collected for all EM61 (high sensitivity metal detector model) anomalies for grids 49_33 and 50_44 was displayed. For grid 49_33, there were 525 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 191 anomalies met the dig criteria. This resulted in a recommended dig rate of 36.38%. The remaining 334 EM61 targets were dug for Quality Assurance (QA). Sixteen of the TOI digs produced UXO or UXO-like items including two QA and 1 QC seeds.

For the classification results, 100% of the TOI was correctly classified and 34.5% of the clutter was incorrectly classified as likely-TOI (176 digs that could have been safely left in the ground). Therefore, the results passed the AGC classification goal of 95% but were below the clutter rejection goal of 70%. Ms. Woof (Weston) explained that the reason a lot of the clutter ended up on the TOI list is because the large pieces of frag and/or large quantities of frag were classified as digs in some cases due to limitations of inversion algorithms. An average of 7.9 pounds of frag were recovered from each TOI dig that resulted in "clutter," and an average of 3.75 pounds of frag were recovered from each verification dig. Ms. Woolf (Weston) stated that all intrusive results were reviewed by QC and QA geophysicists and were determined to be acceptable. Ms. Woolf (Weston) reviewed a table that summarized the different UXO and UXO-like items recovered in the grid.

For grid 50_44, there were 560 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 226 cued measurements resulted in 229 TOI digs as three of the cued measurements resulted in two digs each. This resulted in a recommended dig rate of 40.36%. The remaining 334 EM61 targets were dug for QA. Twenty-six of the TOI digs produced UXO or UXO-like items including two QA and 2 QC seeds. Six of the verification grids produced UXO or UXO-like items, and five of the six items were deeper than the maximum classification depths in the data usability reports.

Ms. Woolf (Weston) reviewed two tables, one with the six items recovered and another with the maximum classification depth where you would expect to see items at JBCC. She noted that most items were recovered below the maximum expected detection and classification depth and did not end up on the dig list because the decay curve of the associated sources did not resemble TOI and did not meet the project size and depth. Ms. Woolf (Weston) displayed examples of decay curves for a 105mm recovered in the same grid, which showed the library match and the data collected, and noted it was almost a perfect match. In contrast, she highlighted the curve from dig 5207, which was a 4.2 inch illumination round and showed how it was not a good match for the library item. A photograph of the 4.2 inch rocket was shown, and it was noted that the walls of the illumination rounds are much thinner than a regular 4.2 inch rocket which can impact how the EM data looks.

For the classification results, 81.3% of the TOI was correctly classified, and 38.2% of the clutter was incorrectly classified as likely-TOI (203 digs that could have been safely left in the ground). Therefore, the results did not pass the advanced geophysical classification (AGC) goal of 95% and were below the clutter rejection goal of 70%.

To further explain how there was so much clutter on the TOI list, Ms. Woolf (Weston) said that large pieces of frag and/or large quantities of frag were classified as digs in some cases due to limitations of inversion algorithms. An average of 10.21 pounds of frag were recovered from each TOI dig that resulted in “clutter” and an average of 3.09 pounds of frag was recovered from each verification dig. Ms. Woolf (Weston) reviewed the table summarizing the TOI found in Grid 50_44. There were 32 total items, including 13 suspected UXO, 14 UXO-like items, and five QC seeds.
Ms. Woolf (Weston) reviewed the total verification grid results from the 2021 to 2023 field seasons and noted that during this time, 96.1% TOI was correctly classified, passing the goal of 95% for the six verification grids done over three seasons. In addition, the clutter rejection goal of 70% was also met with 73.4% of clutter correctly classified during this timeframe.

Mr. Hnetinka (Weston) continued the presentation with a project status update. Intrusive investigations of the ten acres in Phase IV Area 2 are 98% complete. There is one grid with a large polygon that remains. Mr. Hnetinka (Weston) explained that polygon days remaining on contract are currently being utilized to complete multiple grids in Phase IV Area 3 instead of completing the large polygon. The surface clearance, vegetation removal, dynamic (EM-61) surveys, and AGC cued (MM2x2) surveys are complete for all Phase IV Area 3 survey units, totaling 15.125 aces. Intrusive investigations completed in 2023 and as of 6 October 2023 include SU6 carryover (1.5 acres), including 518 TOIs and three polygons (1.25 acres). In SU12 (one acre), 634 TOIs and four polygons were completed; and in SU13 (7.25 acres), 3,325 TOIs and 21 polygons were completed. In SU14 (six acres), 1,099 TOIs and five polygons were completed. In SU15 (0.875 acres), no intrusive investigations have been conducted to date.

It is projected that the team will complete an additional 1.875 acres before the end of the field season for an approximate total of 8.375 acres completed in 2023. It is likely that approximately 8.25 acres will carry over to the 2024 field season. A figure showing the current and projected status was displayed.

Mr. Hnetinka (Weston) reviewed the intrusive investigation acreage completed for Phase IV Areas 1 through 3. For Phase IV Area 1 (SU1 – SU5), 15 acres were completed. In Phase IV Area 2 (SU6 – SU11), 9.75 acres were completed. In Phase IV Area 3 (SU12 – SU15), 5.25 acres were completed. This leaves approximately 1.875 acres projected to be complete, resulting in approximately 31.875 total acres projected to be complete by end of the 2023 field season.

Mr. Hnetinka (Weston) reviewed the demolition operations totals as of 6 October 2023. At the consolidated shot structure (CSS), 52 items were disposed of and 126 remain. Forty items with the 524 series fuzes were disposed of by consolidated shot in the CIA by remote pull and 37 items were blown-in-place (BIP) in the CIA. Prior to the end of the 2023 field season, 126 CSS items and 16 BIPs will be disposed of. Sampling of the CSS material will be conducted after the completion of the CSS disposal operations and prior to demobilization.

The status of the polygon investigations was reviewed. Mr. Hnetinka (Weston) noted that there was a total of 295 polygons days awarded on the contract and as of 22 September 2023, 247.5 days had been used. It is projected that there are an additional 22 days of polygon work in 2023 and 25.5 will carry over into 2024. He noted that the total number of days (not on contract) estimated to complete carryover (Phase IV Areas 2 & 3) and projected (Phase IV Area 4) polygons will be 179 days.

Mr. Hnetinka (Weston) continued with a status of documents and reports. The Final 2022 Source Removal Annual Report and the Final 2023 QAPP Update were delivered on 7 August and 11 August 2023, respectively. The 2021 Source Removal Annual Report, Revision 1 was submitted for EPA and MassDEP review on 27 September 2023 and was revised based on the final disposition of suspected UXO items that were discovered in 2021 but demolished in 2022 or 2023. The report was also updated based on comments received on the 2022 Source Removal Annual Report. A status map as of 06 October 2023 was displayed.

<u>Groundwater-Flow System Near J-Ranges and Snake Pond Presentation</u>

Denis LeBlanc from the United States Geological Survey (USGS) said Ms. Cutler (IAGWSP) had requested that he come in to give the team a brief update on some recent results and interpretations of ongoing water level monitoring and revisit some of the historical work that might provide insight into some of the questions occurring in the J-Ranges and around Snake Pond.

Mr. LeBlanc (USGS) explained that USGS continues to monitor water levels on the western part of the Cape near JBCC at several wells. He provided a figure showing well locations. He noted that the wells are monitored in real time and the water levels are posted on a website every 15 minutes. He noted that the USGS network wells show droughts and wet periods. Well SDW 253 has a total historical range of approximately 10 feet during 1962-2023. Mr. Leblanc (USGS) explained that there were major droughts in 1965-66 and 2004 and that there were more frequent occurrences of high groundwater levels.

Mr. LeBlanc (USGS) highlighted four wells located near the top of the mound and explained the altitude of the top of the water table varies seasonally and interannually. The location of highest point on the water table varies as altitude changes and the total historical range during 2002-2023 was approximately 11 feet. Mr. Jacobs (MassDEP) asked why the estimated recharged varied. Mr. LeBlanc (USGS) explained that even though the precipitation varies, it depends on when it rains and how much it rains. For example, over the summer there was significant rainfall over as short amount of time, overwhelming the evapotranspiration. He noted rainfall is much more effective at producing recharge in the winter when the leaves are gone.

Mr. LeBlanc (USGS) explained that the altitude of the top of the mound affects the position of the high point and the simulated flow paths. He noted the top of the mound shifts about 1,000 feet along the northwest to southeast line and the flow path direction from the starting point depends on the starting date. Mr. LeBlanc (USGS) explained that the recharge areas contributing water to the ponds are areally extensive and pointed out that most Cape Cod ponds are groundwater flow-through lakes, ponds are 5% of the modeled land area shown, and they capture 21% of recharge to the land area.

He continued by explaining that isotopic composition identifies lake water in downgradient groundwater. The lake-derived groundwater is overlain by recharge between shoreline and well and underlain by groundwater underflowing the lake. The lake-bottom properties affect lake/groundwater interaction, and the thickness of the lake effect is larger with more permeable lake-bottom sediments. The contributing area and lake water budget are larger with more permeable lake-bottom sediment. Mr. LeBlanc (USGS) reminded the group that perchlorate and RDX was detected in 2001 beneath the ephemeral island but was not detected in the groundwater underflowing Snake Pond.

Mr. LeBlanc (USGS) showed a figure of the historical maximum extent of IAGWSP plumes versus the extent of contamination today and noted that the J-3 plume extent has reduced significantly since the active remediation began in 2001. He showed a map of the water-table from measured and simulated water levels and pointed out that drawdown caused by withdrawals from extraction wells indicated by cones of depression. He said withdrawals alter pre-pumping groundwater-flow directions. The simulated flow paths from recharge points to extraction wells was shown and Mr. LeBlanc said the simulations indicate that contributing areas to extraction wells includes J-3 contaminant source areas.

Mr. LeBlanc (USGS) reviewed the simulated area contributing water to the Weeks Pond Well and explained that the USGS steady-state regional groundwater-flow model does not include plume treatment systems, and the simulated contributing area includes part of Snake Pond lake bottom (by seepage from lake to groundwater) and land area extending northwest from pond. The simulated contributing area is consistent with low to non-detect PFAS in Snake Pond (MADPH) and Weeks Pond Well.

<u>Action Items</u>

Jeff Dvorak (USACE) reviewed the tracking list to review and discuss documents and upcoming presentations.

JBCC Impact Area Groundwater Study Program (IAGWSP) Tech Update Meeting Minutes for 26 October 2023

<u>Project and Fieldwork Update</u>

Darrin Smith (USACE) provided the project and fieldwork update starting with the status of the groundwater sampling crews. He said that Koman Government Solutions (KGS) crews completed the J-2 Range North annual system performance monitoring (SPM) wells (85 screens) on 24 October 2023. They also completed the J-2 Range North semi-annual PFAS sampling at nine screens. The first round of sampling at the seven new wells (14 screens) began on 24 October and should be completed this week.

Jane Dolan (EPA) asked if the nine existing wells that were sampled were locations that had exceedances. Mr. Smith (USACE) replied that they did not and explained they were wells that had been identified in the J-2 North PFAS workplan. In addition, the resampling of five locations at J-3 Range were collected this week at MW-125S, MW-125M1, MW-356M1, MW-356M2, and MW-356S. Mr. Smith (USACE) said that today, 26 October 2023, crews began sampling at the J-1 Range South SPM (52 screens) and hydraulic monitoring (72 screens) wells.

Mr. Smith (USACE) continued with a status of operations and maintenance activities. He noted that the October monthly process water samples were collected between 2 October through 5 October 2023. Preliminary results showed breakthrough at Central Impact Area (CIA) 3, so a cease fire is being coordinated with the Monument Beach Sportsmen's Club to perform a media change out. Ms. Dolan (EPA) asked what concentration was detected. Mr. Smith (USACE) replied that he did not have the exact number on hand but recalled that it was just above the threshold of 0.25 µg/L. The influent and effluent PFAS samples at the J-2 Range North (quarterly) and the J-3 Range (semi-annual) were collected on 3 October 2023, and results should be available shortly.

Mr. Smith (USACE) provided an update on new well installations. Since the last tech update meeting, crews completed installation of MW-733 at Checkerberry Lane, and the redrill of the shallow screen at MW-739. All the monitoring wells have been developed and crews are currently installing the pumps and sampling the new wells as of 26 October 2023.

Ms. Dolan (EPA) asked if the IAGWSP had reinspected well MW-195 to determine if it was sampleable. Jodi Lyn Cutler (IAGWSP) explained that crews had looked at the well and found that there was not enough water in the well and it was dry; and it hadn't been sampled since 2008 and crews would not be able to sample it. Ms. Dolan (EPA) said she would be evaluating other wells in the area and for the time being IAGWSP doesn't need to go back to that well.

Gina Kaso (USACE) provided a Central Impact Area (CIA) update. There are four UXO teams in the Impact Area. One team is performing demolitions operations, which is expected to be continued until 9 November 2023. Two teams are digging on targets of interest, and one is working on the polygons, all in Phase IV Area 3. Ms. Kaso (USACE) said that demobilization is scheduled for 10 November 2023. Ms. Dolan (EPA) noted that she had mentioned during a previous site visit that she might want to see them sample the soils. Ms. Kaso (USACE) explained that the soil in the consolidated shot structure is scheduled to be sampled at the end of the season and Mr. Smith (USACE) will inform Ms. Dolan (EPA) a few days in advance of the sampling.

<u>Action Items</u>

Jeff Dvorak (USACE) reviewed the tracking list to review and discuss documents and upcoming presentations.

Jodi Lyn Cutler (IAGWSP) explained that a new policy was issued by the Department of Defense (DoD) that indicates that all requests from outside the Army for data on emerging contaminants must be coordinated with the Environmental Technology Office (ETO) prior to responding. Ms. Cutler (IAGWSP) asked Ms. Dolan (EPA) to provide written questions, so that IAGWSP can forward them to the ETO. Ms. Dolan (EPA) asked if she was referring to all her historical PFAS requests and Ms. Cutler (IAGWSP) explained she believed her primary question was whether there was PFAS in munitions and rather than try and summarize Ms. Dolan's (EPA) questions, it would be more accurate coming from her. Ms. Dolan (EPA) agreed. Ms. Dolan (EPA) asked if the new policy impacted the request for a briefing from Dr. Nagelli (US Military Academy West Point) and Ms. Cutler (IAGWSP) replied that it did, although a briefing could be requested through the ETO. Ms. Dolan (EPA) asked for a copy of the policy and Ms. Cutler (IAGWSP) responded that she would have to check with Shawn Cody (ARNG) to determine if it could be distributed. It has since been determined that this policy is in draft form and, therefore, may not be distributed.

Ms. Dolan (EPA) suggested that a brief discussion be held on next steps for PFAS and explained that normally, a preliminary assessment (PA), followed by site investigation (SI) and, if necessary, a remedial investigation (RI) would be performed. She noted that the current J-2 and J-3 Range workplans don't follow that path and suggested the group needed to determine if these efforts were SI or RI level work and name the documents accordingly. Ms. Dolan (EPA) recognized that IAGWSP would like to create a base wide PFAS operable unit. Ms. Cutler (IAGWSP) replied that was correct and within the comprehensive report would be separate sections based on where PFAS is found which may cross existing operable unit boundaries. Ms. Dolan (EPA) agreed but suggested that the group needed to consider naming conventions to keep things consistent with the CERCLA process. Ms. Kaso (USACE) asked why the same process that had been followed for post-Decision Document investigations couldn't be used.

Ms. Dolan (EPA) replied that was primarily for source work, not groundwater. Pam Richardson (IAGWSP) noted that this scenario was like what the program did when perchlorate was first identified as an emerging contaminant; there was a site-wide report until such time that it was an official contaminant of concern. Ms. Dolan (EPA) said that consistent with EPA and DoD guidance, the program needs to delineate to regional screening levels (RSLs). Ms. Cutler (IAGWSP) said the plan was to lay out all the data in the comprehensive PFAS report and see where next steps led. She noted the program proactively worked to expedite investigations where there were elevated detections but felt that with the other detections, it was appropriate to wait until the comprehensive PFAS report was available with all the data. Ms. Dolan (EPA) suggested that the report could be prepared while a plan is laid out for looking at the RSL exceedances.

Ms. Cutler (IAGWSP) reminded the group that flow in J-3 area is being captured by the extraction, treatment, and reinjection system, and we are not seeing PFAS in the infiltration data in J-3. Ms. Dolan (EPA) noted that not all the detections were in the capture zone and while there may be no drinking water wells in the area, the entire aquifer should be considered a receptor. Ms. Cutler (IAGWSP) noted she wanted to have a more in-depth discussion on the RSLs when Elliot Jacobs (MassDEP) and Mr. Cody (ARNG) were available. It was agreed that discussion topic would be added to the next technical meeting.

<u>J-3 Range Plume Shell Presentation: 3D Interpolation</u>

Mike Kulbersh (USACE) introduced part two of the J-3 Range RDX and perchlorate plume shell development presentations, which is the 3D interpolation phase. Mr. Kulbersh (USACE) began with RDX and a summary of the 2D RDX data points used in the 3D process. He explained that for the RDX 3D plume shell, there were 19 points used of which 14 were between the reporting limit of 0.2 µg/L and the risk-based concentration (RBC) of 0.6 µg/L. There were 5 points greater than the RBC once the attenuation formula was applied. Mr. Kulbersh (USACE) showed a figure and pointed out the RDX plumelets. He noted all the plumes were in the existing capture zones of the extraction wells.

Mr. Kulbersh (USACE) continued with an overview of the process for the RDX 3D plume shell development. He explained that he retained 2D data points along with control contours (x, y, z, c) and raster tops/bottoms (x, y, z, 0) were converted from 2D contours into points and were imported into GroundWater Desktop (GWD) Software. He continued to explain that there were 19 measured points retained, 1,084 vertices converted to points (0.2, 0.6, and 2 µg/L) and 9,364 points converted from raster tops/bottoms (0 µg/L). The data were then kriged to the J-3 Range MODFLOW Grid. Search radius and variogram settings were selected and a model versus experimental variogram was computed. The maximum kriged RDX value was 1.29 µg/L and the maximum value in the dataset was 1.52 µg/L (MW-233M1). The measured RDX concentration at 90MW0054 in July of 2022 of 4.4 µg/L was simulated to be extracted by 31 December 2022 by extraction well (EW) J3EW0032.

Mr. Kulbersh (USACE) explained that a control data point at 90MW0054 (3.9 µg/L) was added to help control the kriging in that area as without a point the kriged value at 90MW0054 was 0.68 µg/L. This is due to model grid size and contours (0.2, 0.6, and 2 µg/L) superimposed within one or two grid cells and the maximum kriged value with this control point only yielded a kriged value of 1.43 µg/L. Mr. Kulbersh (USACE) noted that a subsequent sensitivity run was done in the transport model to produce a similar measure concentration at 90MW0054 using a multiplier. Cleanup times were not affected in the sensitivity run as the travel time from the well to J3EW0032 is less than 6 months.

Mr. Kulbersh (USACE) explained that the mass of RDX > 0.6 µg/L is 0.009 pounds and the mass ≥ the EPA regional screening level of 0.97 µg/L is 0.0013 pounds. He noted that to date, a little over 7 pounds of RDX have been extracted from the aquifer since the start of the rapid response action/remedial action in 2006. He displayed slide 9 depicting RDX data interpolated to the MODFLOW grid and slide 10 showing the RDX imported and explained the interpolation of data was exported from GWD into the flow and transport model.

Mr. Kulbersh (USACE) continued with a review of updated cleanup timeframes. The Decision Document predicted that RDX would be below 0.6 µg/L site wide in 2021. Using the 2023 plume shell, the model predicts that site wide cleanup will occur in 2025. Zone 2, which is essentially the area off-base south of Greenway Road will be below 0.6 µg/L in 2023. Mr. Kulbersh (USACE) displayed and ran the animations.

Mr. Kulbersh (USACE) introduced Ryan Hupfer (USACE) to provide the presentation on the perchlorate plume shell development. Mr. Hupfer (USACE) explained that his portion of the presentation would provide the same information Mr. Kulbersh (USACE) had, but for perchlorate. Mr. Hupfer (USACE) provided a summary of the data used for the 2D interpretation. The total number of points used for the 3D process was 78 and only 40 of those had concentrations between the reporting limit of 0.35 µg/L and the Massachusetts Maximum Contaminant Level (MMCL) of 2 µg/L, and 38 had concentrations greater than 2 µg/L. He noted that the plume shell process for perchlorate does not consider attenuation. Ms. Dolan (EPA) asked Mr. Hupfer (USACE) to explain the points that were outside of the model domain. Mr. Hupfer (USACE) explained that those points were deeper than the bottom of the model and were all non-detect.

Mr. Hupfer (USACE) showed a figure with the contours for perchlorate from the 2D process that were between 2 µg/L and 15 µg/L and the associated points. He noted that somewhat like RDX, there was a plume upgradient of in-plume extraction well, J2EWIP2, and a few smaller lobes in the south. He said all the plumes are within the capture zone except for one small lobe just south of J3EW0032. That lobe is deep in an unproductive portion of the aquifer with low hydraulic conductivities, and it doesn't migrate much.

Mr. Hupfer (USACE) reviewed the 3D plume shell process for perchlorate and noted 78 measured points from the 2D process were used. There were 2,745 vertices converted to points (0.35, 2.0 µg/L) and 4,626 points converted from raster tops/bottoms (0 µg/L). The maximum kriged value 7.10 µg/L and the maximum value in dataset was 13.0 µg/L. Mr. Hupfer (USACE) explained that the mass of perchlorate greater than 2 µg/L was 0.11 pounds, and there was no mass ≥ 15 µg/L. He noted that to date, over 40 pounds of perchlorate have been extracted from the aquifer since the start of treatment. He said that slide 7 depicts perchlorate data interpolated to the MODFLOW grid and associated contours from 2D interpolation. The interpolation of data was exported from GWD into the flow and transport model. Mr. Hupfer (USACE) displayed a figure representing the perchlorate interpolated to the MODFLOW grid. Ms. Dolan (EPA) asked if the lobe closest to the source area would be captured at EW-2 or would it be captured by EW-1. Mr. Hupfer (USACE) noted that it was captured by EW-2 and the lobe attenuates as it migrates downgradient below 2 µg/L, which will be seen in the animation.

He continued with a summary of the predicted cleanup times based on the new plume shell. Mr. Hupfer (USACE) noted that the Decision Document predicted a cleanup time of 2022, and the most recent plume shell predicts a cleanup time of the productive portion of the aquifer in 2026. He explained that the productive portion of the aquifer is where hydraulic conductivity is greater than approximately 30 ft/day. The plumes are not predicted to appreciably migrate downgradient (south) after 2026. The plumes greater than 2 ug/L remaining after 2026 are relatively deep in the aquifer (- 60 to -90 ft mean sea level [msl]) and the highest concentration in 2026 is 3.47 µg/L (closer to 2 µg/L than 15 µg/L). He explained there is a relatively small amount of mass remaining in 2026 (0.013 lbs.) compared to 2023 (0.11 lbs.) and many of the points used to delineate the persistent, deep plumes are between 10 and 20 years old. Mr. Hupfer (USACE) reminded the group that attenuation due to dispersion is not considered in the 2D plume shell development for perchlorate. Mr. Hupfer (USACE) displayed the animations for perchlorate. He highlighted the area around J2EW0032 and noted that the plume east of this well had limited downgradient migration and the plume downgradient of J3EW0032 had negligible downgradient migration.

JBCC Cleanup Team Meeting

The next JBCC Cleanup Team (JBCCCT) will be held virtually on Wednesday, 30 December 2023 (previous meeting was 30 August 2023). Meeting details and presentation materials can be found on the IAGWSP web site at http://jbcc-iagwsp.org/community/impact/presentations/. The Cleanup Team meeting discusses late breaking news and responses to action items, as well as updates from the IAGWSP and the Installation Restoration Program (IRP). The JBCCCT meetings provide a forum for community input regarding issues related to both the IRP and the IAGWSP.

3. SUMMARY OF DATA RECEIVED

Table 1 summarizes sampling for all media from 01 to 31 October 2023. Table 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 01 to 31 October 2023. These results are compared to the Maximum Contaminant Levels/Health Advisory (MCL/HA) values for respective analytes. Explosives and perchlorate are the primary contaminants of concern (COC) at Camp Edwards. Table 3 summarizes the validated detections of per- and polyfluoroalkyl substances (PFAS) for influent and groundwater results analyzed by EPA draft Method 1633 and received from 01 to 31 October 2023. Table 3 PFAS results are compared to the Regional Screening Levels (RSLs) published by EPA in May 2023.

The operable units (OUs) under investigation and cleanup at Camp Edwards are the Central Impact Area, Demolition Area 1, Demolition Area 2, J-1 Range, J-2 Range, J-3 Range, L Range, Northwest Corner, Small Arms Ranges, and Training Areas. Environmental monitoring reports for each OU are generated each year to evaluate the current year groundwater results. These reports are available on the site Environmental Data Management System (EDMS) and at the project document repositories (IAGWSP office and Jonathan Bourne Library).

4. SUBMITTED DELIVERABLES

Deliverables submitted during the reporting period include the following:

- Monthly Progress Report No. 318 for September 2023 — 12 October 2023
- Final J-2 Range Eastern Environmental Monitoring Report for November 2021 through October 2022 — 04 October 2023
- Response to Comments on the Draft Demolition Area 2 Environmental Monitoring Report for June 2022 through May 2023 — 05 October 2023
- Emailed Response to Comments on Backcheck of "Response To Comments on the Draft J-2 Range Northern Environmental Monitoring Report for November 2021 through October 2022” — 18 October 2023

5. SCHEDULED ACTIONS

The following actions and/or documents are being prepared in November 2023.

- Response to Comments on the Draft Five Year Review Report
- IAGWSP Comprehensive PFAS Groundwater Sampling Summary Report
- Response to Comments on J-1 Range North 2022 Environmental Monitoring Report
- Response to Comments on J-1 Range South 2022 Environmental Monitoring Report
- Draft J-3 Range 2022 Environmental Monitoring Report
- Draft Demo 1 2023 Environmental Monitoring Report
- Draft CIA 2023 Environmental Monitoring Report
- Response to Comments on the Demolition Area 2 2023 Environmental Monitoring Report
- Memorandum of Resolution for the Northwest Corner Demonstration of Compliance Report (*on hold pending resolution of PFAS issues*)
- Central Impact Area 2021 Source Removal Report Addendum

TABLE 1
Sampling Progress: 01 to 31 October 2023

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J2 Range Northern	MW-736M2	MW-736M2_F23	N	10-30-2023	Ground Water	240	250
J2 Range Northern	MW-736M1	MW-736M1_F23	N	10-30-2023	Ground Water	285	295
J2 Range Northern	MW-737M2	MW-737M2_F23	N	10-30-2023	Ground Water	257	267
J2 Range Northern	MW-737M2	MW-737M2_F23	N	10-30-2023	Ground Water	257	267
J1 Range Southern	MW-403M2	MW-403M2_F23	N	10-30-2023	Ground Water	127.26	137.36
J1 Range Southern	MW-403M1	MW-403M1_F23	N	10-30-2023	Ground Water	159.9	169.89
J2 Range Northern	MW-738M2	MW-738M2_F23	N	10-30-2023	Ground Water	197	207
J2 Range Northern	MW-738M2	MW-738M2_F23	N	10-30-2023	Ground Water	197	207
J1 Range Southern	MW-669M2	MW-669M2_F23	N	10-30-2023	Ground Water	201.7	211.7
J2 Range Northern	MW-737M1	MW-737M1_F23	N	10-30-2023	Ground Water	327	337
J2 Range Northern	MW-737M1	MW-737M1_F23	N	10-30-2023	Ground Water	327	337
J2 Range Northern	MW-737M1	MW-737M1_F23-D	FD	10-30-2023	Ground Water	327	337
J2 Range Northern	MW-737M1	MW-737M1_F23D	FD	10-30-2023	Ground Water	327	337
J1 Range Southern	MW-669M1	MW-669M1_F23	N	10-30-2023	Ground Water	223.7	233.7
J1 Range Southern	MW-669M1	MW-669M1_F23D	FD	10-30-2023	Ground Water	223.7	233.7
J2 Range Northern	MW-736M1	MW-736M1_F23	N	10-30-2023	Ground Water	285	295
J2 Range Northern	MW-736M2	MW-736M2_F23	N	10-30-2023	Ground Water	240	250
J2 Range Northern	MW-740M2	MW-740M2_F23	N	10-26-2023	Ground Water	197	207
J2 Range Northern	MW-740M1	MW-740M1_F23	N	10-26-2023	Ground Water	247	257
J1 Range Southern	MW-131S	MW-131S_F23	N	10-26-2023	Ground Water	96	106
J2 Range Northern	MW-738M1	MW-738M1_F23	MS	10-26-2023	Ground Water	242	252
J2 Range Northern	MW-738M1	MW-738M1_F23	MS	10-26-2023	Ground Water	242	252
J2 Range Northern	MW-738M1	MW-738M1_F23	N	10-26-2023	Ground Water	242	252
J2 Range Northern	MW-738M1	MW-738M1_F23	N	10-26-2023	Ground Water	242	252
J2 Range Northern	MW-738M1	MW-738M1_F23	SD	10-26-2023	Ground Water	242	252
J2 Range Northern	MW-738M1	MW-738M1_F23	SD	10-26-2023	Ground Water	242	252
J1 Range Southern	MW-720M2	MW-720M2_F23	N	10-26-2023	Ground Water	126.2	136.2
J2 Range Northern	MW-739M2	MW-739M2_F23	N	10-26-2023	Ground Water	204	214
J2 Range Northern	MW-739M2	MW-739M2_F23	N	10-26-2023	Ground Water	204	214
J1 Range Southern	MW-720M1	MW-720M1_F23	N	10-26-2023	Ground Water	146.6	156.6
J1 Range Southern	MW-721M2	MW-721M2_F23	N	10-26-2023	Ground Water	138.5	148.5
J2 Range Northern	MW-739M1	MW-739M1_F23	N	10-26-2023	Ground Water	239	249
J2 Range Northern	MW-739M1	MW-739M1_F23	N	10-26-2023	Ground Water	239	249
J1 Range Southern	MW-721M1	MW-721M1_F23	N	10-26-2023	Ground Water	168.1	178.1
J2 Range Northern	MW-740M2	MW-740M2_F23	N	10-25-2023	Ground Water	197	207
J3 Range	MW-356S	MW-356S_OCT23	N	10-25-2023	Ground Water	105	115
J2 Range Northern	MW-740M1	MW-740M1_F23	N	10-25-2023	Ground Water	247	257
J3 Range	MW-356M2	MW-356M2_OCT23	N	10-25-2023	Ground Water	140	150
J3 Range	MW-356M1	MW-356M1_OCT23	MS	10-25-2023	Ground Water	185	195
J3 Range	MW-356M1	MW-356M1_OCT23	N	10-25-2023	Ground Water	185	195
J3 Range	MW-356M1	MW-356M1_OCT23	SD	10-25-2023	Ground Water	185	195
J3 Range	MW-125S	MW-125S_OCT23	N	10-25-2023	Ground Water	50	60
J3 Range	MW-125S	MW-125S_OCT23D	FD	10-25-2023	Ground Water	50	60
J2 Range Northern	MW-735M2	MW-735M2_F23	N	10-25-2023	Ground Water	190.3	200.3
J2 Range Northern	MW-735M2	MW-735M2_F23	N	10-25-2023	Ground Water	190.3	200.3
J2 Range Northern	MW-735M2	MW-735M2_F23D	FD	10-25-2023	Ground Water	190.3	200.3
J2 Range Northern	MW-735M2	MW-735M2_F23D	FD	10-25-2023	Ground Water	190.3	200.3
J3 Range	MW-125M1	MW-125M1_OCT23	N	10-25-2023	Ground Water	232	242
J2 Range Northern	MW-735M1	MW-735M1_F23	N	10-24-2023	Ground Water	250.2	260.2
J2 Range Northern	MW-735M1	MW-735M1_F23	N	10-24-2023	Ground Water	250.2	260.2
J2 Range Northern	MW-734M2	MW-734M2_F23	N	10-24-2023	Ground Water	205	215
J2 Range Northern	MW-734M2	MW-734M2_F23	N	10-24-2023	Ground Water	205	215
J2 Range Northern	MW-734M1	MW-734M1_F23	N	10-24-2023	Ground Water	265.5	275.5
J2 Range Northern	MW-734M1	MW-734M1_F23	N	10-24-2023	Ground Water	265.5	275.5
J2 Range Northern	MW-345M2	MW-345M2_F23	N	10-24-2023	Ground Water	236.62	246.62
J2 Range Northern	MW-345M2	MW-345M2_OCT23	N	10-24-2023	Ground Water	236.62	246.62
J2 Range Northern	MW-345M1	MW-345M1_OCT23	MS	10-24-2023	Ground Water	311.5	321.5
J2 Range Northern	MW-345M1	MW-345M1_OCT23	N	10-24-2023	Ground Water	311.5	321.5
J2 Range Northern	MW-345M1	MW-345M1_OCT23	SD	10-24-2023	Ground Water	311.5	321.5
J2 Range Northern	J2EW0002	J2EW0002_F23	N	10-23-2023	Ground Water	198	233

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 01 to 31 October 2023

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J2 Range Northern	J2EW0002	J2EW0002_F23D	FD	10-23-2023	Ground Water	198	233
J2 Range Northern	J2EW0002	J2EW0002_OCT23	N	10-23-2023	Ground Water	198	233
J2 Range Northern	MW-293M1	MW-293M1_OCT23	N	10-23-2023	Ground Water	296.26	306.27
J2 Range Northern	MW-340D	MW-340D_OCT23	N	10-23-2023	Ground Water	329.6	339.6
J2 Range Northern	MW-337D	MW-337D_OCT23	N	10-19-2023	Ground Water	310	320
J2 Range Northern	MW-330M3	MW-330M3_OCT23	N	10-19-2023	Ground Water	154.97	164.99
J2 Range Northern	MW-330M2	MW-330M2_F23	N	10-19-2023	Ground Water	238.01	248.04
J2 Range Northern	MW-330M2	MW-330M2_OCT23	N	10-19-2023	Ground Water	238.01	248.04
J2 Range Northern	MW-330M1	MW-330M1_F23	N	10-19-2023	Ground Water	313.1	323.13
J2 Range Northern	MW-330M1	MW-330M1_OCT23	N	10-19-2023	Ground Water	313.1	323.13
J2 Range Northern	MW-330M1	MW-330M1_OCT23D	FD	10-19-2023	Ground Water	313.1	323.13
J2 Range Northern	J2EW3-MW-2-B	J2EW3-MW-2-B_F23	N	10-18-2023	Ground Water	216.16	226.16
J2 Range Northern	J2EW2-MW2-B	J2EW2-MW2-B_F23	N	10-18-2023	Ground Water	209.79	219.79
J2 Range Northern	J2EW2-MW2-C	J2EW2-MW2-C_F23	N	10-18-2023	Ground Water	243.83	253.81
J2 Range Northern	MW-302M2	MW-302M2_F23	N	10-17-2023	Ground Water	194.35	204.43
J2 Range Northern	MW-337M1	MW-337M1_F23	N	10-17-2023	Ground Water	243.71	253.71
J2 Range Northern	J2EW3-MW-2-C	J2EW3-MW-2-C_F23	N	10-17-2023	Ground Water	251.13	261.13
J2 Range Northern	J2EW0003	J2EW0003_F23	N	10-16-2023	Ground Water	202	232
J2 Range Northern	J2EW0001	J2EW0001_F23	N	10-16-2023	Ground Water	179	234
J2 Range Northern	MW-322M1	MW-322M1_F23	N	10-16-2023	Ground Water	245.77	255.77
J2 Range Northern	MW-340M2	MW-340M2_F23	N	10-16-2023	Ground Water	215.83	225.08
J2 Range Northern	MW-340M1	MW-340M1_F23	N	10-16-2023	Ground Water	255.85	265.85
J2 Range Northern	MW-230M1	MW-230M1_F23	N	10-12-2023	Ground Water	130	140
J2 Range Northern	MW-234M2	MW-234M2_F23	N	10-12-2023	Ground Water	110	120
J2 Range Northern	MW-234M1	MW-234M1_F23	N	10-12-2023	Ground Water	130	140
J2 Range Northern	MW-234M1	MW-234M1_F23D	FD	10-12-2023	Ground Water	130	140
J2 Range Northern	MW-331M2	MW-331M2_F23	N	10-12-2023	Ground Water	195.27	205.27
J2 Range Northern	MW-331M1	MW-331M1_F23	N	10-12-2023	Ground Water	235.41	245.41
J2 Range Northern	MW-348M2	MW-348M2_F23	N	10-11-2023	Ground Water	206.54	216.54
J2 Range Northern	MW-293M2	MW-293M2_F23	N	10-11-2023	Ground Water	0	0
J2 Range Northern	MW-300M3	MW-300M3_F23	MS	10-11-2023	Ground Water	135.31	145.31
J2 Range Northern	MW-300M3	MW-300M3_F23	N	10-11-2023	Ground Water	135.31	145.31
J2 Range Northern	MW-300M3	MW-300M3_F23	SD	10-11-2023	Ground Water	135.31	145.31
J2 Range Northern	MW-300M2	MW-300M2_F23	N	10-11-2023	Ground Water	197.23	207.23
J2 Range Northern	MW-300M1	MW-300M1_F23	N	10-11-2023	Ground Water	293.03	303.02
J2 Range Northern	MW-620M1	MW-620M1_F23	N	10-10-2023	Ground Water	268.6	278.6
J2 Range Northern	J2EW3-MW1-B	J2EW3-MW1-B_F23	N	10-10-2023	Ground Water	210.66	220.66
J2 Range Northern	J2EW3-MW1-C	J2EW3-MW1-C_F23	N	10-10-2023	Ground Water	245.66	255.66
J2 Range Northern	J2EW1-MW1-B	J2EW1-MW1-B_F23	N	10-10-2023	Ground Water	205.82	215.82
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_F23	N	10-10-2023	Ground Water	240.8	250.8
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_F23D	FD	10-10-2023	Ground Water	240.8	250.8
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-181A	N	10-05-2023	Process Water	0	0
Lima Range	MW-595M2	MW-595M2_P23	N	10-05-2023	Ground Water	205.3	215.3
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-INF-J	J2E-INF-J-181A	N	10-05-2023	Process Water	0	0
Lima Range	MW-595M1	MW-595M1_P23	N	10-05-2023	Ground Water	255.3	265.3
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-181A	N	10-05-2023	Process Water	0	0
Lima Range	MW-242M3	MW-242M3_P23	N	10-05-2023	Ground Water	0	0
Lima Range	MW-242M3	MW-242M3_P23D	FD	10-05-2023	Ground Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-181A	N	10-05-2023	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-181A	N	10-05-2023	Process Water	0	0
J1 Range Northern	J1N-EFF	J1N-EFF-120A	N	10-05-2023	Process Water	0	0

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 01 to 31 October 2023

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J1 Range Northern	J1N-MID2	J1N-MID2-120A	N	10-05-2023	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-120A	N	10-05-2023	Process Water	0	0
Lima Range	MW-242M2	MW-242M2_P23	N	10-05-2023	Ground Water	165	175
J1 Range Northern	J1N-INF2	J1N-INF2-120A	N	10-05-2023	Process Water	0	0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F_OCT23	N	10-05-2023	Ground Water	0	0
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	FD	10-05-2023	Ground Water	0	0
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	N	10-05-2023	Ground Water	0	0
J3 Range	J3-EFF	J3-EFF_4Q23	N	10-05-2023	Process Water	0	0
J3 Range	J3-INF	J3-INF_4Q23	N	10-05-2023	Process Water	0	0
Lima Range	MW-242M1	MW-242M1_P23	N	10-05-2023	Ground Water	235	245
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-205A	N	10-04-2023	Process Water	0	0
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-205A	N	10-04-2023	Process Water	0	0
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-211A	N	10-04-2023	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-211A	N	10-04-2023	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-211A	N	10-04-2023	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-211A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1LE-EFF	D1LE-EFF-87A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1LE-MID2	D1LE-MID2-87A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-87A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-87A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1-EFF	D1-EFF-159A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-159A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-159A	N	10-04-2023	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-159A	N	10-04-2023	Process Water	0	0
Central Impact Area	CIA2-EFF	CIA2-EFF-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA1-EFF	CIA1-EFF-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-117A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA3-EFF	CIA3-EFF-88A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-88A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-88A	N	10-03-2023	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-88A	N	10-03-2023	Process Water	0	0
J2 Range Northern	MW-613M2	MW-613M2_F23	N	10-02-2023	Ground Water	246.1	256.1
J1 Range Southern	J1S-EFF	J1S-EFF-191A	N	10-02-2023	Process Water	0	0
J1 Range Southern	J1S-MID	J1S-MID-191A	N	10-02-2023	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-191A	N	10-02-2023	Process Water	0	0
J2 Range Northern	MW-613M1	MW-613M1_F23	N	10-02-2023	Ground Water	267.1	277.1
J3 Range	J3-EFF	J3-EFF-205A	N	10-02-2023	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-205A	N	10-02-2023	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-205A	N	10-02-2023	Process Water	0	0
J3 Range	J3-INF	J3-INF-205A	N	10-02-2023	Process Water	0	0
J2 Range Northern	MW-634M3	MW-634M3_F23	N	10-02-2023	Ground Water	170.6	180.6
J2 Range Northern	MW-634M2	MW-634M2_F23	N	10-02-2023	Ground Water	200.6	210.6
J2 Range Northern	MW-634M1	MW-634M1_F23	N	10-02-2023	Ground Water	305.6	315.6

N = Normal Sample
FD = Field Duplicate

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 2023

Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
J1 Range Southern	MW-591M1	MW-591M1_S23	200	210	07-11-2023	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.082	J	µg/L	0.60		0.043	0.20
J1 Range Southern	MW-402M1	MW-402M1_S23	190.14	200.13	07-11-2023	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.13	J	µg/L	0.60		0.043	0.20
J1 Range Southern	MW-647M1	MW-647M1_S23	211.3	221.3	07-10-2023	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.17	J	µg/L	0.60		0.043	0.20

J = Estimated Result
MDL = Method Detection Limit
RL = Reporting Limit
ND = Non-Detect

MCL/HA= Either the MCL or Lowest Health Advisory Limit

November 09, 2023

TABLE 3
VALIDATED PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) RESULTS
Data Received October 2023

Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
Lima Range	MW-595M2	MW-595M2_P23	205.3	215.3	10-05-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	0.72	J	ng/L			0.52	3.8
Lima Range	MW-242M3	MW-242M3_P23	0	0	10-05-2023	E1633DR	Perfluorodecanoic acid (PFDA)	1.7	J	ng/L			0.78	3.1
Lima Range	MW-242M3	MW-242M3_P23	0	0	10-05-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	1.9		ng/L			0.58	1.9
Lima Range	MW-242M3	MW-242M3_P23	0	0	10-05-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	16.0		ng/L			0.59	1.9
Lima Range	MW-242M3	MW-242M3_P23D	0	0	10-05-2023	E1633DR	Perfluorodecanoic acid (PFDA)	1.5	J	ng/L			0.75	2.9
Lima Range	MW-242M3	MW-242M3_P23D	0	0	10-05-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	1.8		ng/L			0.55	1.8
Lima Range	MW-242M3	MW-242M3_P23D	0	0	10-05-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	14.0		ng/L			0.56	1.8
J2 Range Northern	J2N-EFF-F	J2N-EFF-F_OCT23	0	0	10-05-2023	E1633DR	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	15.0		ng/L			1.1	8.0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.51	J	ng/L			0.50	2.0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.1	J	ng/L	990		0.45	2.0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.93	J	ng/L	6.0		0.37	2.0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	1.3	J	ng/L			0.55	4.0
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	22.0		ng/L			0.99	7.4
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluoroheptanesulfonic acid (PFHpS)	1.6	J	ng/L			0.37	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	1.0	J	ng/L			0.46	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	16.0		ng/L	39.0		0.36	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.1	J	ng/L	990		0.42	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	8.1	J	ng/L	4.0	X	0.41	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluorooctanoic acid (PFOA)	4.4		ng/L	6.0		0.34	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	0.34	J	ng/L			0.33	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23-D	0	0	10-05-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	1.2	J	ng/L			0.51	3.7
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	21.0		ng/L			0.99	7.4
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluoroheptanesulfonic acid (PFHpS)	1.6	J	ng/L			0.37	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.98	J	ng/L			0.46	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	15.0		ng/L	39.0		0.36	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.0	J	ng/L	990		0.42	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	7.9	J	ng/L	4.0	X	0.41	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluorooctanoic acid (PFOA)	5.0		ng/L	6.0		0.34	1.9
J2 Range Northern	J2N-INF-F	J2N-INF-F_OCT23	0	0	10-05-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	1.1	J	ng/L			0.51	3.7
J3 Range	J3-INF	J3-INF_4Q23	0	0	10-05-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	1.2	J	ng/L	39.0		0.36	1.9
J3 Range	J3-INF	J3-INF_4Q23	0	0	10-05-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.51	J	ng/L	4.0		0.41	1.9
J3 Range	J3-INF	J3-INF_4Q23	0	0	10-05-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.38	J	ng/L	6.0		0.34	1.9
J2 Range Northern	C-4S	C-4S_P23	200	250	09-14-2023	E1633DR	Perfluorodecanoic acid (PFDA)	4.8		ng/L			0.79	3.1
J2 Range Northern	C-4S	C-4S_P23	200	250	09-14-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	0.72	J	ng/L			0.59	2.0
J2 Range Northern	C-4S	C-4S_P23	200	250	09-14-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	13.0		ng/L			0.60	2.0
J2 Range Northern	C-4M	C-4M_P23	260	300	09-14-2023	E1633DR	Perfluorodecanoic acid (PFDA)	4.2		ng/L			0.80	3.1
J2 Range Northern	C-4M	C-4M_P23	260	300	09-14-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	0.74	J	ng/L			0.59	2.0
J2 Range Northern	C-4M	C-4M_P23	260	300	09-14-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	8.2		ng/L			0.60	2.0
J2 Range Northern	C-4D	C-4D_P23	310	350	09-13-2023	E1633DR	Perfluorodecanoic acid (PFDA)	3.5		ng/L			0.78	3.1
J2 Range Northern	C-4D	C-4D_P23	310	350	09-13-2023	E1633DR	Perfluorononanoic acid (PFNA)	1.2	J	ng/L	5.9		0.63	1.9
J2 Range Northern	C-4D	C-4D_P23	310	350	09-13-2023	E1633DR	Perfluorotridecanoic acid (PFTrDA)	0.46	J	ng/L			0.46	1.9
J2 Range Northern	C-4D	C-4D_P23	310	350	09-13-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	2.7		ng/L			0.59	1.9
J2 Range Northern	C-7S	C-7S_P23	199	239	09-13-2023	E1633DR	Perfluorodecanoic acid (PFDA)	2.1	J	ng/L			0.81	3.2

J = Estimated Result
MDL = Method Detection Limit
RL = Reporting Limit

MCL/HA= Either the MCL or Lowest Health Advisory Limit

November 09, 2023

TABLE 3
VALIDATED PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) RESULTS
Data Received October 2023

Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
J2 Range Northern	C-7S	C-7S_P23	199	239	09-13-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	1.6	J	ng/L			0.60	2.0
J2 Range Northern	C-7S	C-7S_P23	199	239	09-13-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	12.0		ng/L			0.61	2.0
J2 Range Northern	C-7M	C-7M_P23	247	287	09-13-2023	E1633DR	Perfluorodecanoic acid (PFDA)	3.2		ng/L			0.78	3.1
J2 Range Northern	C-7M	C-7M_P23	247	287	09-13-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	0.63	J	ng/L			0.58	1.9
J2 Range Northern	C-7M	C-7M_P23	247	287	09-13-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	5.2		ng/L			0.59	1.9
J2 Range Northern	C-7D	C-7D_P23	295	335	09-12-2023	E1633DR	Perfluorodecanoic acid (PFDA)	3.0	J	ng/L			0.78	3.1
J2 Range Northern	C-7D	C-7D_P23	295	335	09-12-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	1.4	J	ng/L			0.58	1.9
J2 Range Northern	C-7D	C-7D_P23	295	335	09-12-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	7.9		ng/L			0.59	1.9
J2 Range Northern	WS-2DD	WS-2DD_P23R	284.5	294.5	09-12-2023	E1633DR	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.59	J	ng/L			0.52	1.9
J2 Range Northern	WS-2BD	WS-2BD_P23R	283	293	09-11-2023	E1633DR	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.98	J	ng/L			0.54	2.0
Lima Range	90WT0015	90WT0015_P23	0	0	08-30-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	1.9		ng/L	39.0		0.34	1.7
Lima Range	90WT0015	90WT0015_P23	0	0	08-30-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.1	J	ng/L	990		0.40	1.7
Lima Range	90WT0015	90WT0015_P23	0	0	08-30-2023	E1633DR	Perfluorooctanesulfonamide (PFOSA)	0.42	J	ng/L			0.30	1.7
Lima Range	90WT0015	90WT0015_P23	0	0	08-30-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.35	J	ng/L	6.0		0.32	1.7
Lima Range	MW-239M3	MW-239M3_P23	60	70	08-29-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	1.4	J	ng/L	39.0		0.39	2.0
Lima Range	MW-239M3	MW-239M3_P23	60	70	08-29-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.39	J	ng/L	6.0		0.37	2.0
J3 Range	SP3-91M	SP3-91M_P23	50	70	08-28-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.93	J	ng/L	600		0.24	1.6
J3 Range	SP3-91M	SP3-91M_P23	50	70	08-28-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.50	J	ng/L			0.41	1.6
J3 Range	SP3-91M	SP3-91M_P23	50	70	08-28-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.62	J	ng/L	39.0		0.32	1.6
J3 Range	SP3-91M	SP3-91M_P23	50	70	08-28-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.76	J	ng/L	4.0		0.36	1.6
J3 Range	SP3-91M	SP3-91M_P23	50	70	08-28-2023	E1633DR	Perfluorooctanoic acid (PFOA)	1.3	J	ng/L	6.0		0.30	1.6
J3 Range	90MW0104B	90MW0104B_P23	115	120	08-23-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.58	J	ng/L	6.0		0.36	2.0
J3 Range	90MW0104C	90MW0104C_P23	84.8	89.8	08-23-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.56	J	ng/L	6.0		0.34	1.9
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.71	J	ng/L	600		0.28	2.0
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.64	J	ng/L			0.49	2.0
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.64	J	ng/L	39.0		0.38	2.0
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	0.55	J	ng/L	990		0.44	2.0
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluorononanoic acid (PFNA)	1.1	J	ng/L	5.9		0.64	2.0
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.89	J	ng/L	4.0		0.43	2.0
J3 Range	90MW0104A	90MW0104A_P23	0	0	08-23-2023	E1633DR	Perfluorooctanoic acid (PFOA)	1.2	J	ng/L	6.0		0.36	2.0
J3 Range	MW-196S	MW-196S_P23	32	37	08-22-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	3.0		ng/L	4.0		0.42	1.9
J3 Range	MW-196S	MW-196S_P23	32	37	08-22-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.60	J	ng/L	6.0		0.36	2.0
Lima Range	90MW0071	90MW0071_P23	0	0	08-21-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.36	J	ng/L	6.0		0.34	1.9
Lima Range	MW-236S	MW-236S_P23	96	106	08-16-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.32	J	ng/L	600		0.27	1.8
Lima Range	MW-236S	MW-236S_P23	96	106	08-16-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.97	J	ng/L			0.46	1.8
Lima Range	MW-236S	MW-236S_P23	96	106	08-16-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.42	J	ng/L	39.0		0.36	1.8
Lima Range	MW-236S	MW-236S_P23	96	106	08-16-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	1.8		ng/L	4.0		0.41	1.8
Lima Range	MW-236S	MW-236S_P23	96	106	08-16-2023	E1633DR	Perfluorooctanoic acid (PFOA)	4.3		ng/L	6.0		0.34	1.8
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.28	J	ng/L	600		0.27	1.8
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluorobutanoic acid (PFBA)	0.95	J	ng/L	1800		0.87	7.4
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	1.1	J	ng/L			0.46	1.8
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.46	J	ng/L	39.0		0.36	1.8

J = Estimated Result
MDL = Method Detection Limit
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November 09, 2023

TABLE 3
VALIDATED PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) RESULTS
Data Received October 2023

Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	0.81	J	ng/L	990		0.42	1.8
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	1.6	J	ng/L	4.0		0.41	1.8
Lima Range	MW-236S	MW-236S_P23D	96	106	08-16-2023	E1633DR	Perfluorooctanoic acid (PFOA)	3.9		ng/L	6.0		0.34	1.8
Lima Range	MW-529M1	MW-529M1_P23	107	117	08-16-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.72	J	ng/L	6.0		0.32	1.7
Lima Range	MW-530S	MW-530S_P23	97	107	08-16-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.49	J	ng/L	39.0		0.35	1.8
Lima Range	MW-651M1	MW-651M1_P23	242.3	252.3	08-14-2023	E1633DR	Perfluorobutanoic acid (PFBA)	2.3	J	ng/L	1800		0.81	6.9
J3 Range	MW-30	MW-30_P23	26	36	08-11-2023	E1633DR	Perfluorobutanoic acid (PFBA)	4.0	J	ng/L	1800		0.88	7.4
J3 Range	MW-30	MW-30_P23	26	36	08-11-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.55	J	ng/L			0.47	1.9
J3 Range	MW-30	MW-30_P23	26	36	08-11-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.4	J	ng/L	990		0.42	1.9
J3 Range	MW-30	MW-30_P23	26	36	08-11-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	2.8		ng/L	4.0		0.41	1.9
J3 Range	MW-30	MW-30_P23	26	36	08-11-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.69	J	ng/L	6.0		0.34	1.9
J3 Range	MW-30	MW-30_P23	26	36	08-11-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	1.7	J	ng/L			0.51	3.7
J3 Range	MW-181S	MW-181S_P23	32.25	42.25	08-11-2023	E1633DR	Perfluorooctanesulfonamide (PFOSA)	0.43	J	ng/L			0.32	1.9
J3 Range	MW-181S	MW-181S_P23	32.25	42.25	08-11-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	14.0		ng/L	4.0	X	0.41	1.9
J3 Range	MW-181S	MW-181S_P23	32.25	42.25	08-11-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.41	J	ng/L	6.0		0.34	1.9
J3 Range	MW-181S	MW-181S_P23D	32.25	42.25	08-11-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	16.0		ng/L	4.0	X	0.40	1.8
J3 Range	MW-181S	MW-181S_P23D	32.25	42.25	08-11-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.59	J	ng/L	6.0		0.34	1.8
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluorobutanoic acid (PFBA)	3.2	J	ng/L	1800		0.87	7.4
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluorodecanoic acid (PFDA)	1.5	J	ng/L			0.75	3.0
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	1.2	J	ng/L			0.46	1.9
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.1	J	ng/L	990		0.42	1.9
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluorononanoic acid (PFNA)	2.5		ng/L	5.9		0.61	1.9
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	7.1		ng/L			0.51	3.7
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluorotridecanoic acid (PFTrDA)	0.76	J	ng/L			0.44	1.9
Lima Range	MW-291M2	MW-291M2_P23	125.29	135.29	08-11-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	2.1		ng/L			0.57	1.9
Lima Range	MW-291M1	MW-291M1_P23	185.41	195.41	08-11-2023	E1633DR	Perfluorodecanoic acid (PFDA)	21.0	J	ng/L			0.75	3.0
Lima Range	MW-291M1	MW-291M1_P23	185.41	195.41	08-11-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	3.0		ng/L			0.56	1.9
Lima Range	MW-291M1	MW-291M1_P23	185.41	195.41	08-11-2023	E1633DR	Perfluorononanoic acid (PFNA)	18.0		ng/L	5.9	X	0.61	1.9
Lima Range	MW-291M1	MW-291M1_P23	185.41	195.41	08-11-2023	E1633DR	Perfluorotridecanoic acid (PFTrDA)	1.7	J	ng/L			0.44	1.9
Lima Range	MW-291M1	MW-291M1_P23	185.41	195.41	08-11-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	41.0		ng/L			0.56	1.9
J3 Range	J3EWIP2	J3EWIP2_P23	150.5	170.5	08-11-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	3.0		ng/L	39.0		0.37	1.9
J3 Range	J3EWIP2	J3EWIP2_P23	150.5	170.5	08-11-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.91	J	ng/L	4.0		0.42	1.9
J3 Range	J3EWIP2	J3EWIP2_P23	150.5	170.5	08-11-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.51	J	ng/L	6.0		0.35	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	2.5		ng/L	600		0.27	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.78	J	ng/L			0.46	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	38.0		ng/L	39.0		0.36	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	2.1		ng/L	990		0.42	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	2.4		ng/L	4.0		0.41	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.69	J	ng/L	6.0		0.34	1.9
J3 Range	MW-653M1	MW-653M1_P23	147.5	157.5	08-09-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	4.5		ng/L			0.33	1.9
J3 Range	MW-143M3	MW-143M3_P23	107	112	08-09-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.33	J	ng/L	600		0.26	1.8
J3 Range	MW-143M3	MW-143M3_P23	107	112	08-09-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.75	J	ng/L	39.0		0.35	1.8
J3 Range	MW-143M2	MW-143M2_P23	117	122	08-09-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	1.2	J	ng/L	600		0.28	1.9

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Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
J3 Range	MW-143M2	MW-143M2_P23	117	122	08-09-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	4.2		ng/L	39.0		0.38	1.9
J3 Range	MW-143M2	MW-143M2_P23	117	122	08-09-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	1.2	J	ng/L			0.34	1.9
J3 Range	MW-143M2	MW-143M2_P23D	117	122	08-09-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	1.1	J	ng/L	600		0.27	1.9
J3 Range	MW-143M2	MW-143M2_P23D	117	122	08-09-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	4.6		ng/L	39.0		0.36	1.9
J3 Range	MW-143M2	MW-143M2_P23D	117	122	08-09-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	1.4	J	ng/L			0.33	1.9
J3 Range	MW-143M1	MW-143M1_P23	144	154	08-09-2023	E1633DR	N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	4.1	J	ng/L			2.0	20.0
J3 Range	MW-143M1	MW-143M1_P23	144	154	08-09-2023	E1633DR	N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	2.7	J	ng/L			2.3	20.0
J3 Range	J3EWIP1	J3EWIP1_P23	153	193	08-08-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.52	J	ng/L	39.0		0.37	1.9
J3 Range	J3EWIP1	J3EWIP1_P23	153	193	08-08-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.45	J	ng/L	4.0		0.43	1.9
J3 Range	J3EW0032	J3EW0032_P23	102	152	08-08-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.48	J	ng/L	39.0		0.38	1.9
J3 Range	J3EW0032	J3EW0032_P23	102	152	08-08-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.51	J	ng/L	4.0		0.42	1.9
J3 Range	90EW0001	90EW0001_P23	83.1	143.8	08-08-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.49	J	ng/L	39.0		0.38	2.0
J3 Range	MW-197M3	MW-197M3_P23	60.2	65.2	08-07-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	3.0		ng/L	39.0		0.38	1.9
J3 Range	MW-197M3	MW-197M3_P23	60.2	65.2	08-07-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	0.48	J	ng/L	4.0		0.43	1.9
J3 Range	MW-197M3	MW-197M3_P23	60.2	65.2	08-07-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.37	J	ng/L	6.0		0.36	1.9
J3 Range	MW-197M3	MW-197M3_P23	60.2	65.2	08-07-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	0.34	J	ng/L			0.34	1.9
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.46	J	ng/L	600		0.29	2.0
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	1.1	J	ng/L			0.50	2.0
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	3.2		ng/L	39.0		0.40	2.0
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.5	J	ng/L	990		0.46	2.0
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	3.0		ng/L	4.0		0.44	2.0
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluorooctanoic acid (PFOA)	1.3	J	ng/L	6.0		0.37	2.0
J3 Range	MW-197M2	MW-197M2_P23	80.2	85.2	08-07-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	0.40	J	ng/L			0.35	2.0
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.43	J	ng/L	600		0.28	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.88	J	ng/L			0.48	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	3.3		ng/L	39.0		0.38	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluorohexanoic acid (PFHxA)	1.6	J	ng/L	990		0.44	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	2.8		ng/L	4.0		0.42	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluorooctanoic acid (PFOA)	1.2	J	ng/L	6.0		0.35	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	0.51	J	ng/L			0.34	1.9
J3 Range	MW-197M2	MW-197M2_P23D	80.2	85.2	08-07-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	1.2	J	ng/L			0.53	3.8
J3 Range	MW-197M1	MW-197M1_P23	120	125	08-07-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	7.3		ng/L	600		0.29	2.0
J3 Range	MW-197M1	MW-197M1_P23	120	125	08-07-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	1.8	J	ng/L			0.36	2.0
J2 Range Eastern	MW-128S	MW-128S_P23	87	97	08-02-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	1.3	J	ng/L	39.0		0.38	1.9
J3 Range	MW-163S	MW-163S_P23	38	48	08-02-2023	E1633DR	Perfluorobutanoic acid (PFBA)	1.6	J	ng/L	1800		0.91	7.8
J3 Range	MW-163S	MW-163S_P23	38	48	08-02-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.46	J	ng/L	39.0		0.38	1.9
J3 Range	MW-163S	MW-163S_P23	38	48	08-02-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	1.8	J	ng/L	4.0		0.43	1.9
J3 Range	MW-163S	MW-163S_P23	38	48	08-02-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.52	J	ng/L	6.0		0.36	1.9
J3 Range	MW-163S	MW-163S_P23D	38	48	08-02-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.53	J	ng/L	39.0		0.40	2.0
J3 Range	MW-163S	MW-163S_P23D	38	48	08-02-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	1.7	J	ng/L	4.0		0.45	2.0
J3 Range	MW-359M2	MW-359M2_P23	148.62	158.62	08-02-2023	E1633DR	Perfluorodecanoic acid (PFDA)	1.9	J	ng/L			0.80	3.2
J3 Range	MW-359M2	MW-359M2_P23	148.62	158.62	08-02-2023	E1633DR	Perfluorononanoic acid (PFNA)	1.2	J	ng/L	5.9		0.65	2.0

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J3 Range	MW-359M2	MW-359M2_P23	148.62	158.62	08-02-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	1.9	J	ng/L			0.61	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluorodecanoic acid (PFDA)	8.7		ng/L			0.79	3.1
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluorododecanoic acid (PFDoA)	0.61	J	ng/L			0.59	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluoroheptanoic acid (PFHpA)	0.61	J	ng/L			0.49	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	0.44	J	ng/L	39.0		0.38	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluorononanoic acid (PFNA)	8.5		ng/L	5.9	X	0.64	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluorooctanoic acid (PFOA)	0.41	J	ng/L	6.0		0.36	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluoropentanoic acid (PFPeA)	1.2	J	ng/L			0.54	3.9
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluorotridecanoic acid (PFTrDA)	0.47	J	ng/L			0.47	2.0
J3 Range	MW-359M1	MW-359M1_P23	184.26	194.26	08-02-2023	E1633DR	Perfluoroundecanoic acid (PFUnA)	8.0		ng/L			0.59	2.0
J3 Range	MW-193S	MW-193S_P23	32.5	37.5	08-02-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.39	J	ng/L	600		0.31	2.1
J3 Range	MW-193S	MW-193S_P23	32.5	37.5	08-02-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	3.7		ng/L	39.0		0.42	2.1
J3 Range	MW-193S	MW-193S_P23	32.5	37.5	08-02-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	1.1	J	ng/L			0.37	2.1
J3 Range	MW-193M1	MW-193M1_P23	57.5	62.5	08-02-2023	E1633DR	Perfluorobutanesulfonic acid (PFBS)	0.81	J	ng/L	600		0.28	1.9
J3 Range	MW-193M1	MW-193M1_P23	57.5	62.5	08-02-2023	E1633DR	Perfluoroheptanesulfonic acid (PFHpS)	0.40	J	ng/L			0.38	1.9
J3 Range	MW-193M1	MW-193M1_P23	57.5	62.5	08-02-2023	E1633DR	Perfluorohexanesulfonic acid (PFHxS)	9.2		ng/L	39.0		0.37	1.9
J3 Range	MW-193M1	MW-193M1_P23	57.5	62.5	08-02-2023	E1633DR	Perfluorooctanesulfonic acid (PFOS)	16.0		ng/L	4.0	X	0.42	1.9
J3 Range	MW-193M1	MW-193M1_P23	57.5	62.5	08-02-2023	E1633DR	Perfluoropentanesulfonic acid (PFPeS)	1.2	J	ng/L			0.34	1.9

J = Estimated Result
MDL = Method Detection Limit
RL = Reporting Limit

MCL/HA= Either the MCL or Lowest Health Advisory Limit
November 09, 2023