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Scoping Summary for the General Separations Area Western Groundwater Operable Unit (U)

SEMS Number: 85

ERD-EN-2005-0127

Final

November 2020

SAVANNAH RIVER SITE • AIKEN, SOUTH CAROLINA

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Printed in the United States of America

Prepared for
U.S. Department of Energy
and
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Aiken, South Carolina

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KEY CHANGES TO THE SCOPING SUMMARY

Section	Description of Change	Rationale for Change
4.1 and 4.2	Revised sections to include results from 2019 GW sampling.	These changes update the Scoping Summary to include results from sampling in 2019.
Figures 6, 7, and 8	Figures were updated based on the results of 2019 GW sampling.	These changes update the Scoping Summary with sampling results from 2019.
Appendix B	Data table was updated with the results of 2019 GW sampling.	These changes update the Scoping Summary with sampling results from 2019.

RECORD OF CORE TEAM AGREEMENTS

Agreement	Meeting
Core Team agreed to transition to annual sampling for locations FGW-023 and FGW-024.	October 2017
Locations FGW-023 and FGW-024 will be sampled at least 2 more times and results will be discussed in the 2016 Scoping Summary. Continued monitoring of these locations will be evaluated.	September 2015
Technetium-99 will be added to the analyte list for the South plume.	September 2014
Sampling data (one event) for new locations, FGW-023 and FGW-024, will be included in the final Scoping Summary for 2014.	September 2014
At the South plume, the Core Team agreed to move forward with installation of one surface water sample station and one shallow seepline piezometer on a tributary to the west of the Biomass Facility. The need for additional monitoring points will be evaluated based on monitoring results.	August 2013
Sampling of established wells will be performed annually. New monitoring locations added to the OU will be sampled semi-annually until a baseline is established.	August 2013
As documented in the GSA Eastern and Western GW OUs GW Monitoring Optimization White Paper, SRNS-RP-2012-00783, Rev. 1, January 2014, the Core Team agreed to discontinue monitoring at wells FNB-3, FNB-12, FBP-13D, FBP-44D, FBP-46D, FBP-47D, BRR-5D and UTR-7.	August 2013
As documented in the GSA Eastern and Western GW OUs GW Monitoring Optimization White Paper, SRNS-RP-2012-00783, Rev. 1, January 2014, the Core Team agreed to add alpha and beta/gamma speciation to analyte list for well FGW005C.	August 2013
The Core Team recognized the difficulty of installing a new well down gradient of UTR-18R and agreed that a new well is not needed at this time as long as SRS continues to monitor water at the seep in well UTR-18R.	August 2013
Add one monitoring well in the lower aquifer zone down gradient of FGW-012C, if possible.	August 2012
Add one seepline and one surface water monitoring location down gradient of FGW-012C along unnamed tributary, if surface water is present.	August 2012
Data are being collected and reported for future evaluation of VOC degradation as a remedial alternative.	August 2011
The Core Team agreed to include information on wells FBP 44D, 46D, and 47D in the August 2011 Scoping Summary instead of submitting the February 2011 white paper that was agreed to during the June 2010 meeting.	August 2011
FBP 44D, FBP 46D, and FBP 47D can be dry during periods of lower water table. This could represent a data gap if the UTR 18R seepline piezometer is also dry (monitors the same aquifer zone). UTR 18R typically contains water. Historical data associated with the dry wells will be evaluated with respect to contaminants to determine if modifications to the well network are necessary to define plume extent. The evaluation will be reported in February 2011 as a white paper.	June 2010

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1.0 PROJECT PHASE AND STATUS

The *Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI)/Remedial Investigation (RI) Phase 1 Work Plan for the General Separations Area (GSA) Western Groundwater Operable Unit (OU)*, Revision 1.1, was approved by the United States Environmental Protection Agency (USEPA) and by the South Carolina Department of Health and Environmental Control (SCDHEC) on September 9, 2004. A Field Start was achieved for the OU on September 20, 2004.

In 2007, SRS completed establishment of the groundwater (GW) monitoring network. The GSA Western GW OU is currently in a GW monitoring program. The purpose of this Scoping Summary is to present the analytical data obtained in 2019 from GW monitoring to the Core Team (i.e., representatives from the United States Department of Energy [USDOE], USEPA, and SCDHEC) to determine if the monitoring network and analytical suite remain appropriate for continued monitoring. In 2019, concentrations have remained consistent with results from 2018 and continued sampling of the GW monitoring network is recommended. GW plumes remain stable with respect to concentrations and extent, and surface waters are not above maximum contaminant limits (MCLs).

2.0 BACKGROUND

The GSA is located on a topographic ridge near the center of the SRS. The GSA Western GW OU is located in the northwest portion of the GSA on a GW divide. It encompasses the GW beneath approximately (~) 485.6 hectares (ha [1,200 acres {ac}]) in F Area. This OU is bordered to the south by the F-Area Hazardous Waste Management Facility and to the east by the Mixed Waste Management Facility (see Figure 1). Because the OU is located on a GW divide, shallow GW flows toward both Fourmile Branch and Upper Three Runs Creek (UTRC) (see Figure 2).

The GSA Western GW OU underlies many operating facilities and waste units in and around F Area that are potential sources of contamination. Some of these facilities and units have been investigated during previous RCRA RFI/RI characterization work. From

these investigations and from review of the existing monitoring well networks, three distinct GW plumes have been identified in the Upper Three Runs Aquifer (UTRA). The plumes are identified by geographic reference as the North plume, the West plume, and the South plume.

Some of the operating facilities in the area are undergoing decontamination and decommissioning and will be brought to closure in the near term. Because other facilities will remain active into the future, in September 2005, the Core Team determined:

- It is not appropriate to achieve a Record of Decision (ROD) on the GSA Western GW OU until all sources of potential contamination are brought to closure (including closure of the F-Area High Level Waste Tanks).

- The most appropriate action at this time is continued GW monitoring to ensure that surface water resources are adequately protected.

- If contamination in the GW is thought to represent a threat to surface water resources, the Core Team will reconvene to determine if early response actions are required.

SRS characterized the nature and extent of GW contamination. The primary GW contaminants are volatile organic compounds (VOCs), radionuclides, and nitrate. Tritium, iodine-129, and trichloroethylene (TCE) are sporadically above MCLs in GW at points of discharge at the seeplines. However, concentrations in adjacent surface water are consistently below MCLs.

3.0 LAND USE

The area encompassed by the GSA Western GW OU is heavily developed with many active industrial facilities. No future residential use of this area is anticipated. Land use of the entire GSA Western GW OU area will be controlled to prevent use of the GW that exceeds MCLs. The UTRA and Gordon Aquifer (GA) are not used as a drinking water source at SRS.

4.0 SUBUNITS

The GSA Western GW OU includes the following two subunits:

- GW (i.e., North Plume, West Plume, South Plume), including shallow GW discharging to surface at the seeplines, and
- Surface Water.

In September 2005, the Core Team determined that soil contamination from the potential source units will be addressed during closure of the individual waste units and operating facilities.

4.1 GW Subunit

The UTRA is the shallow-most aquifer beneath the GSA Western GW OU and consists of two aquifer zones; the Upper Aquifer Zone (UAZ) and the Lower Aquifer Zone (LAZ). The GA underlies the UTRA and is separated from the UTRA by the Gordon Confining Unit (GCU). Contamination is present only in the UTRA. Previous investigations have demonstrated that within the GSA Western GW OU, the GA is protected by a competent confinement unit (e.g., GCU) and contamination is not migrating into the aquifer.

In 2019, the GSA Western GW OU was under a GW monitoring program that consisted of sampling 33 monitoring wells, 4 shallow sampling points at the seeplines (i.e., seepline piezometers), and 4 surface water sampling stations (Table 1 and Figure 2). Starting in 2014, sampling of the monitoring network is performed annually for established wells except for the wells associated with the F-Area Retention Basin (281-3F). Wells FRB1, FRB2, FRB3, and FRB4 are sampled semi-annually according to the F-Area Retention Basin ROD. New wells for the GSA Western GW OU are sampled semi-annually until a baseline is established in accordance with Table 1. The results from the 2019 monitoring of the well network are discussed below for the North, West, and South plumes. The analytical data for 2019 are presented in Appendix B.

Beginning in 2011, all locations in the North and West plumes have been sampled for TCE and degradation products. This is necessary to ensure that sufficient data are available to

evaluate natural attenuation as a future remedial action. Currently cis-1,2-dichloroethylene is detected in the GW in the West plume; however, concentrations are very low (0.45 µg/L) and below the laboratory analytical quantitation limit (i.e., 1 micrograms per liter [µg/L]). Cis-1,2-dichloroethylene and vinyl chloride are both non-detect (less than detection limit 0.3 µg/L) in the North plume.

GW contaminants in the UTRA include VOCs, radionuclides, and nitrate. Tritium, TCE, and nonvolatile beta are recognized as the most widespread contaminants in the GW at the OU and thus are mapped each year. Other constituents are co-mingled with these primary contaminants. For example, TCE is the primary chlorinated solvent present yet the plume typically also contains limited quantities of tetrachloroethylene (PCE) and trichlorofluoromethane (TCFM) co-located with the TCE. Tritium and nonvolatile beta are the most widespread radioactive contaminants; however, other radionuclides such as iodine-129, strontium-90, uranium-238, etc., are also co-located within these plumes. Thus, mapping of the primary contaminants is useful to evaluate the distribution and nature of the plumes from year to year.

Beginning with the 2011 annual Core Team meeting, the TCE plume (Figure 3) was revised. The value of the contour line was changed from 10 µg/L to the MCL of 5 µg/L. Also, the general shape of the plume was modified to reflect the absence of TCE at the wells adjacent to the Old F-Area Seepage Basin (OFASB) (904-49G). This change resulted in two distinct plumes being interpreted (North and West plumes) and the reassignment of well FGW 003C to the West plume monitoring network.

North Plume

The North plume covers an area of ~20.2 ha (50 ac) on the north side of the F-Area industrial facilities. Within this portion of the OU, the water table and the plume are located completely within the LAZ of the UTRA. GW flow in this aquifer is north toward UTRC and its tributaries. During 2019, GW samples were collected from four wells, two seepline piezometers, and two surface water locations. All locations yielded samples in 2019.

Previous investigations have shown that elevated concentrations of TCE, gross alpha, and nonvolatile beta are present to the east and north-east of the OFASB. In 2002, depth discrete samples measured TCE concentrations up to 85 µg/L. Elevated concentrations of gross alpha and nonvolatile beta were also detected. Sample locations from this investigation were shown in the November 2005 Scoping Summary. This area of the plume is likely from sources within the F-Area fence line such as facilities associated with the now decommissioned Naval Fuels and the Fabrication Shop located north of F Canyon.

During the 2019 monitoring period, TCE concentrations were similar to 2018 concentrations and ranged between non-detect and 11 µg/L. The maximum concentration in the North plume was detected at well FNB 15 (11.3 µg/L) (Figure 3). At adjacent well FNB 13, TCE was 8.98 µg/L. TCE was only detected at one other location (0.72 J µg/L at UTR-016) in the North plume. Both PCE and TCFM were below the MCL in the North plume.

In addition to VOCs, gross alpha, nonvolatile beta, nitrate, iodine-129, strontium-90, and tritium have been present in the UTRA at levels greater than MCLs. In 2019, concentrations were similar to levels measured in 2018 and only slightly greater than respective MCLs at most locations. Near the OFASB at well FNB 2, the concentration of I-129 was 10.6 picocuries per liter (pCi/L) which was slightly less than the 2018 result. Tritium concentrations down gradient of the OFASB have been decreasing over the past eighteen years and are currently below the MCL as shown in Figure 4. The downward concentration trend since monitoring began in year 2000 is indicative of a plume that is shrinking and a tritium source term that is depleted. The maximum concentration of Nitrate was similar to last year at 19.5 milligrams per liter (mg/L) (FNB 15). Nitrate exceeded the MCL (10 mg/L) at wells FNB 13 and FNB 15 in 2019. Nonvolatile beta (63.6 pCi/L), Sr-90 (14.3 pCi/L) and iodine-129 (3.49 pCi/L) also exceeded their respective MCLs at well FNB 13 downgradient of the OFASB.

In 2019, shallow GW discharging at the seepline was monitored by two seepline piezometers (UTR 6 and UTR 16). Historically, tritium has been detected near or slightly above the MCL at location UTR 16 and I-129 has also been sporadically measured above

the MCL in the past. During the 2019 sampling at UTR 6 and UTR 16, tritium (2.21 pCi/mL and 4.11 pCi/mL, respectively) was below the MCL and I-129 was non-detect at both locations. Levels of tritium and I-129 were both similar to what was measured in 2018.

In accordance with the monitoring strategy, surface water samples are also collected near the points of GW discharge. Samples from surface water stations UTR 003 and UTR 004 had very low results for tritium, with the highest being 2.17 picocuries per milliliter (pCi/mL) (2019).

Overall, the 2019 results were similar to 2018 results. The data continue to indicate that the plume remains stable to decreasing with respect to extent and concentrations. Surface water is not being impacted above MCLs. Continued monitoring is recommended for the North plume. Monitoring results for 2019 are provided in Appendix B.

West Plume

The West plume occupies ~26.3 ha (65 ac) on the western side of F Area. The plume is located within both the UAZ and LAZ of the UTRA. GW flow in this area is generally west toward UTRC. During 2019, GW samples were obtained from all 12 wells. At the seepline, a sample was collected from piezometer UTR 18R, but surface water station UTR 005 was dry and unable to be sampled. Sampling results from the monitoring network are included in Appendix B.

Overall, the West plume is comprised primarily of VOCs (PCE, TCE, and TCFM), nitrates, and gross alpha/nonvolatile beta constituents. In 2019, the data show MCL exceedances for the following: PCE, TCE, TCFM, nitrates, gross alpha, nonvolatile beta, iodine-129, radium-226, radium-228, strontium-90, and tritium. In 2019, uranium 233/234 and uranium 238 were not sampled due to an administrative error. Concentrations of uranium 233/234 and uranium 238 are expected to have exceeded the MCL as they did in 2018. In 2020, uranium 233/234 and uranium 238 were sampled and results are included in Appendix A. VOCs and nitrates are the most widespread contaminants for the West plume.

VOCs are present beneath the F-Area Burning/Rubble Pits (FBRP) (231-R, 231-1F, and 231-2F) and up gradient of the FBRP toward the F-Area facilities. The most prevalent VOCs are TCE and TCFM. The highest concentrations of TCE are located at the northwest edge of the F-Area facilities at wells FGW 003C, FGW 005C, FGW 022C, and FBP43DL. In 2019, the maximum concentrations of TCE and TCFM were located at well FBP 43 DL, respectively (22.7 µg/L and 25.6 µg/L, respectively). TCE concentrations in this part of the plume (wells FGW 003C, FGW 005C, FGW 022C, and FBP 43DL) have been stable to decreasing over time (Figure 5), with the exception of FGW 003C which increased from 2016 to 2018 before decreasing in 2019.

In 2019, TCE concentrations remained steady at 7.941 µg/L in the distal part of the plume (Figure 6). PCE concentrations were also similar to last year's results (2019 maximum result of 5.26 µg/L). In 2019, TCFM exceeded the MCL at well FBP 6D (7.74 µg/L) but was below the MCL at FBP 2A (3.61 µg/L).

The maximum concentrations of nitrates, gross alpha, and nonvolatile beta are also present adjacent to the F-Area facilities and the F-Area Inactive Process Sewer Line (FIPSL) at LAZ wells FGW 005C and FGW 022C. In 2019, the maximum nitrate concentration was similar to last year's concentration at 41.4 mg/L (FGW 005C). Gross alpha and nonvolatile beta concentrations were similar to results from 2018; gross alpha 1,380 pCi/L (FGW 005C), nonvolatile beta 1,250 pCi/L (FGW 005C) (2019 results). At well FGW 005C, the specific isotopes associated with the elevated gross alpha are uranium-233/234 (395 pCi/L) and uranium-238 (1,240 pCi/L) (2020 results) and the beta emitting isotopes present are primarily strontium-90 (184 pCi/L) and technetium-99 (209 pCi/L). Uranium-233/234 and uranium-238 were not sampled in 2019 due to an administrative error. The concentrations listed above are from the 2Q2020 sample event. The results of isotopic speciation for FGW 005C (with the results from 2Q2020 for uranium-233/234 and uranium-238) are included in Appendix A.

At the West plume, the concentrations of gross alpha and nonvolatile beta attenuate rapidly with distance away from the F-Area facilities. As shown in Figure 7, the nonvolatile beta

plume terminates approximately half-way between the F-Area fence line and the wetlands of UTRC and poses no threat to surface water.

Since 2006, PCE, TCE and TCFM have been detected in GW near the seepline at piezometer UTR 18R; however, surface water samples collected at UTR-005-FOU have historically been non-detect for VOCs. In 2019, the maximum concentration in GW at the seepline was 4.64 µg/L for TCE and was below the MCL. PCE and TCFM were also below the MCL in 2019 at 3.22 µg/L and 1.87 µg/L, respectively. UTR 018R is located at the base of a slope in an area of localized GW seeps. At this area, the rate of GW discharge is so low that standing water is not present year-round. Also, the seepline sample point (UTR 18R) is ~182.9 meters (600 feet) from UTRC and GW discharged to the surface typically seeps back into the ground or evaporates before reaching the creek. Downgradient of the seep piezometer, the concentration of all constituents has historically been below the MCL at surface water location UTR 005. In 2019, a sample was unable to be collected at UTR 005 because it was dry.

Overall, 2019 data continue to indicate that the plumes remain stable with respect to extent and concentrations. Both the VOC and nonvolatile beta plumes terminate prior to discharging at seeps to UTRC. When surface water is present at UTR 005-FOU it is not expected to be impacted above MCLs in that concentrations at seepline piezometer UTR 18R upgradient of UTR 005-FOU are below MCLs. Continued monitoring is recommended for the West plume. Monitoring results for 2019 are provided in Appendix B.

South Plume

The South plume covers an area of ~22.3 ha (55 ac) on the south west corner of F Area. The plume is located within the UAZ and LAZ of the UTRA. GW flow in this portion of the OU is generally south west toward UTRC. During 2019, GW samples were collected from 13 wells. Analytical results are presented in Appendix B.

The South plume consists primarily of tritium and nonvolatile beta constituents. VOCs are not present at the South plume. Specific radionuclides that have been present above MCLs

include iodine-129, strontium-90, radium-226, technetium-99, and tritium. SRS believes these constituents are sourced from the RCRA permitted FIPSL. Potential sources of contamination include historic releases along sections of the FIPSL. A collapsed section of the vitrified clay FIPSL is known to exist down gradient of the Tank Farm. The collapsed section is shown in Figure 2. Potential sampling locations near the collapsed section of the FIPSL are not accessible at this time due to interferences with power lines and active steam lines.

In 2019, nonvolatile beta was the most widespread contaminant detected. It was present at levels exceeding 50 pCi/L in five of the thirteen wells with concentrations ranging from 65.1 pCi/L (BRR 6C) to 474 pCi/L (FTF 28). Historically, the elevated concentrations have been detected in the area of wells FTF 28 and FSL 5D near the FIPSL collapsed section, and also at down gradient well FGW 12C.

In addition to nonvolatile beta activity, a few wells near the FIPSL have exceeded the MCL for iodine-129, nitrate, strontium-90, radium-226, technetium-99, and tritium. In 2019, all of these analytes and gross alpha exceeded the MCL in at least one well with maximum concentrations as follows: iodine-129 (22.4 pCi/L), nitrate (15.1 mg/L), gross alpha (15.1 pCi/L), radium-226 (5.55 pCi/L), strontium-90 (53.4 pCi/L), technetium-99 (1250 pCi/L), and tritium (93.7 pCi/mL). The maximum concentrations occurred in wells along or near the FIPSL, except for nitrate and tritium which was highest at well FGW 12C. Historically, radium-228 has also exceeded in at least one well. However, concentrations of radium-228 were below the MCL at all sampled locations in the South plume.

Overall, the 2019 data indicate that the plume remains stable with respect to extent and concentrations. Monitoring results are provided in Appendix B.

During the August 2012 Core Team meeting, uncertainties associated with the extent of the South plume in the LAZ and the possibility of the South plume discharging to surface water were discussed. The Core Team recommended investigating a tributary to UTRC that is located down gradient of well FGW 012C for potential sampling locations. The potential locations investigated included one surface water sample station, one seepline

piezometer location, and a location for one new GW monitoring well, if needed. A field walk-down was held on April 16, 2013, with representatives from USEPA, SCDHEC, and SRS. Based on the walk-down, GW discharge to the tributary was determined to begin approximately half-way down its length with the tributary being discharged to the floodplain swamp of UTRC. The upper reaches of the tributary were dry.

In September 2014, SRS installed a surface water sample station (FGW 024) near the discharge point to the swamp and in August 2014, a shallow piezometer (FGW 023) to sample GW discharging to the surface. Nitrate-nitrite, radium-226, radium-228, nonvolatile beta, technetium-99 and tritium have all been detected, but all concentrations were very low and below MCLs. The 2019 sampling results continue to indicate the South plume is not impacting this tributary to UTRC. The results are presented in Appendix B.

F-Area Retention Basin

Previously, the Core Team decided to incorporate the monitoring and reporting for the FRB (281-3F) in this report. The GSA Western GW OU monitoring network includes sampling at four wells for the FRB (FRB 1 through FRB 4). The monitoring network is shown on Figure 2 and details are provided in Table 1. The wells are sampled semi-annually according to the FRB OU ROD. Samples were collected from all wells during the second and fourth quarter in 2019. All results were below MCLs at the FRB. The analytical data are presented in Appendix B.

4.1.1 Problem Warranting Action

- VOCs, nitrate, and radionuclides in the UTRA are present at levels that exceed the respective MCLs.
- VOCs and radionuclides have been present in GW at the seepline at levels above the MCLs.

4.1.2 Remedial Action Objectives

- Ensure that contaminants in GW do not impact surface water at levels that exceed MCLs.

- Prevent human exposure to contaminants in GW at levels that exceed MCLs.

4.1.3 Scope of Problem

- GW contaminants in the UTRA include VOCs, radionuclides, and nitrate. Tritium, TCE, and nonvolatile beta are recognized as the most widespread contaminants in the GW at the OU. Figures 3, 7, and 8 show the distribution of these contaminants in the UTRA during 2019.

4.1.4 Likely Response Actions

- Continued monitoring of GW in the UTRA and at the seepline on an annual frequency.

4.1.5 Uncertainties

- There is some uncertainty regarding the potential sources of shallow GW contamination due to the number of operating facilities and waste units within the boundaries of the GSA Western GW OU. Individually and collectively, these facilities and waste sites have contaminated the shallow aquifer that underlies this GW OU. The closure of the F-Area facilities will manage the uncertainties associated with residual sources. The uncertainty regarding source areas will ultimately be addressed by the F-Area OU remedial investigation (prior to Area Closure). Until then, the impact of the combined sources on GW will be tracked by continued GW monitoring in the GSA Western GW OU. The well network for each plume area, sampling frequency, and specific analyte lists are summarized in Table 1.

4.2 Surface Water

Shallow GW within the OU discharges to surface water at the seeplines of UTRC and Fourmile Branch. The Phase 1 Work Plan specified that if GW contamination was detected at the seeplines above the MCLs, then surface water quality in the stream(s) would be evaluated. Four surface water sample locations are used to monitor water quality in the GW monitoring plan (see Figure 2). In June 2010, the Core Team agreed to sample the surface water at the same frequency as the GW.

Characterization and monitoring well data show that GW contamination exists above MCLs beneath the seepline at a few locations within the OU. At the North and West plumes, GW at the seepline has exceeded MCLs for tritium, strontium-90, iodine-129, and VOCs in the past. However, 2019 sample results for surface water in the streams has demonstrated that contaminant levels are below MCLs in the tributaries to UTRC.

4.2.1 Problem Warranting Action

- No problems warranting action have been identified for surface water at the OU.

4.2.2 Remedial Action Objectives

- To date there were no MCL exceedances in surface water; therefore, remedial action objectives are not applicable at this time.

4.2.3 Surface Water Scope of Problem Warranting Action

The GSA Western GW OU contains three distinct areas of GW contamination. Since routine monitoring started in 2005, two of these plumes, the North plume and the West plume, have been above MCLs in GW near the discharge zone to the seeplines. However, GW at the seepline in the North plume and the West plume was below the MCLs for all constituents in 2019. Historically, confirmation sampling of the surface water has demonstrated that contaminant levels have been and continue to be below MCLs in the tributaries to UTRC.

4.2.4 Surface Water Likely Response Actions

- Monitoring of surface water per the schedule in Table 1.

4.2.5 Uncertainties

- It is uncertain if surface water of UTRC and tributaries will be impacted by GW discharging from the North and West plumes. Historically, at some of the seepline locations contaminants have been detected above the MCL in GW. However, the associated streams continue to remain below MCLs for all contaminants. As more data is obtained, trends will be developed as necessary. This uncertainty is managed by

monitoring surface water in the tributaries to UTRC. Sample locations and analytes are summarized in Table 1.

5.0 OPERABLE UNIT STRATEGY

- SRS will sample the monitoring network annually for contaminants of concern until there is a decision to modify the frequency. New monitoring locations (GW and surface water) added to the GSA Western Groundwater OU will be sampled semi-annually until a baseline is established. Evaluation will be based on data trends. This information is reported in an annual update to this Scoping Summary.
- SRS will convene the Core Team annually (or as necessary) to review data, re-evaluate the well network, sampling frequency, and analyte list, assess the effectiveness of the OU logic, and decide if the monitoring strategy is still appropriate or if changes are required (including the need for immediate action).
- SRS will notify the Core Team promptly if monitoring data indicate a problem that requires immediate attention.

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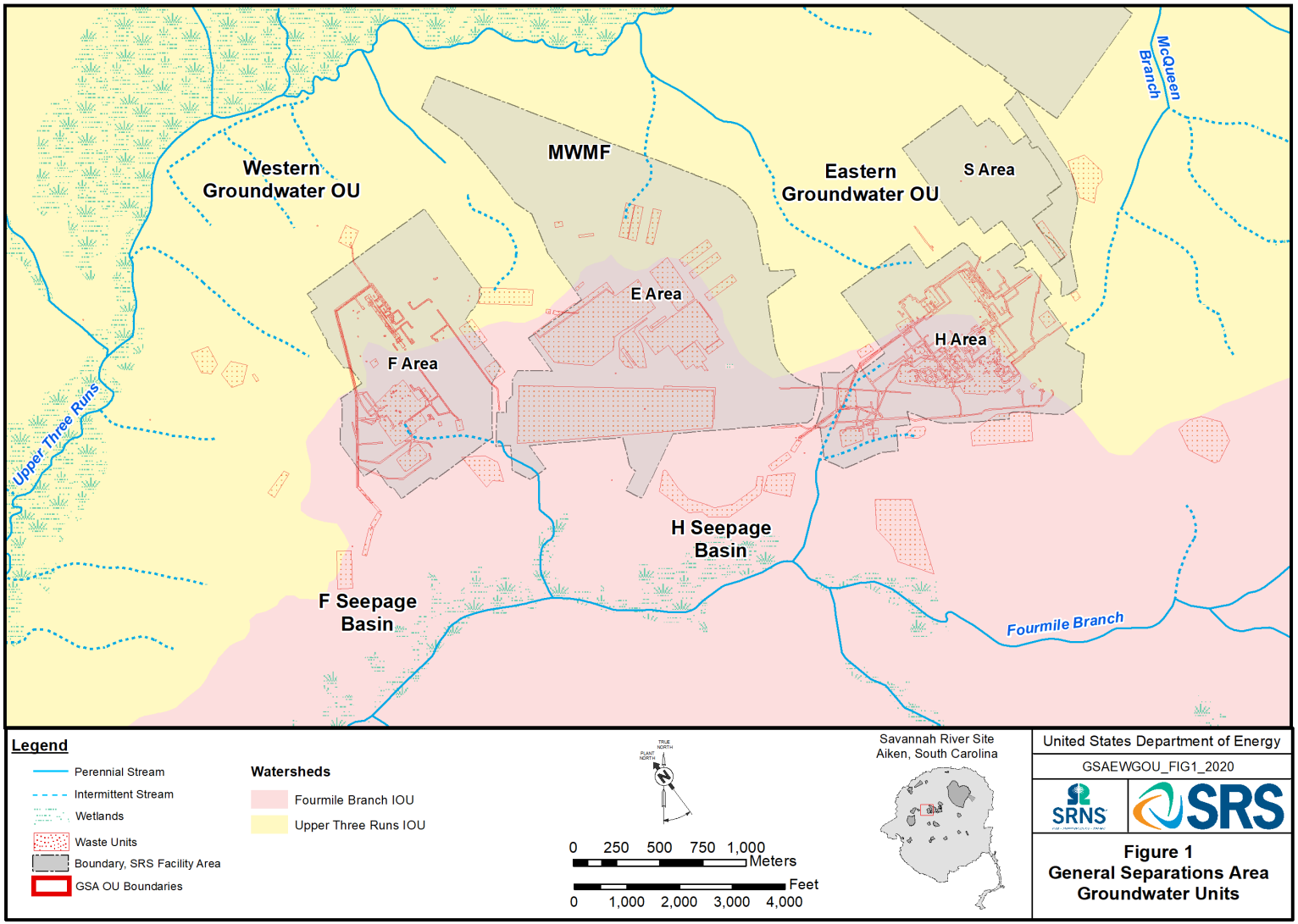

Figure 1. Groundwater Operable Units at the General Separations Area

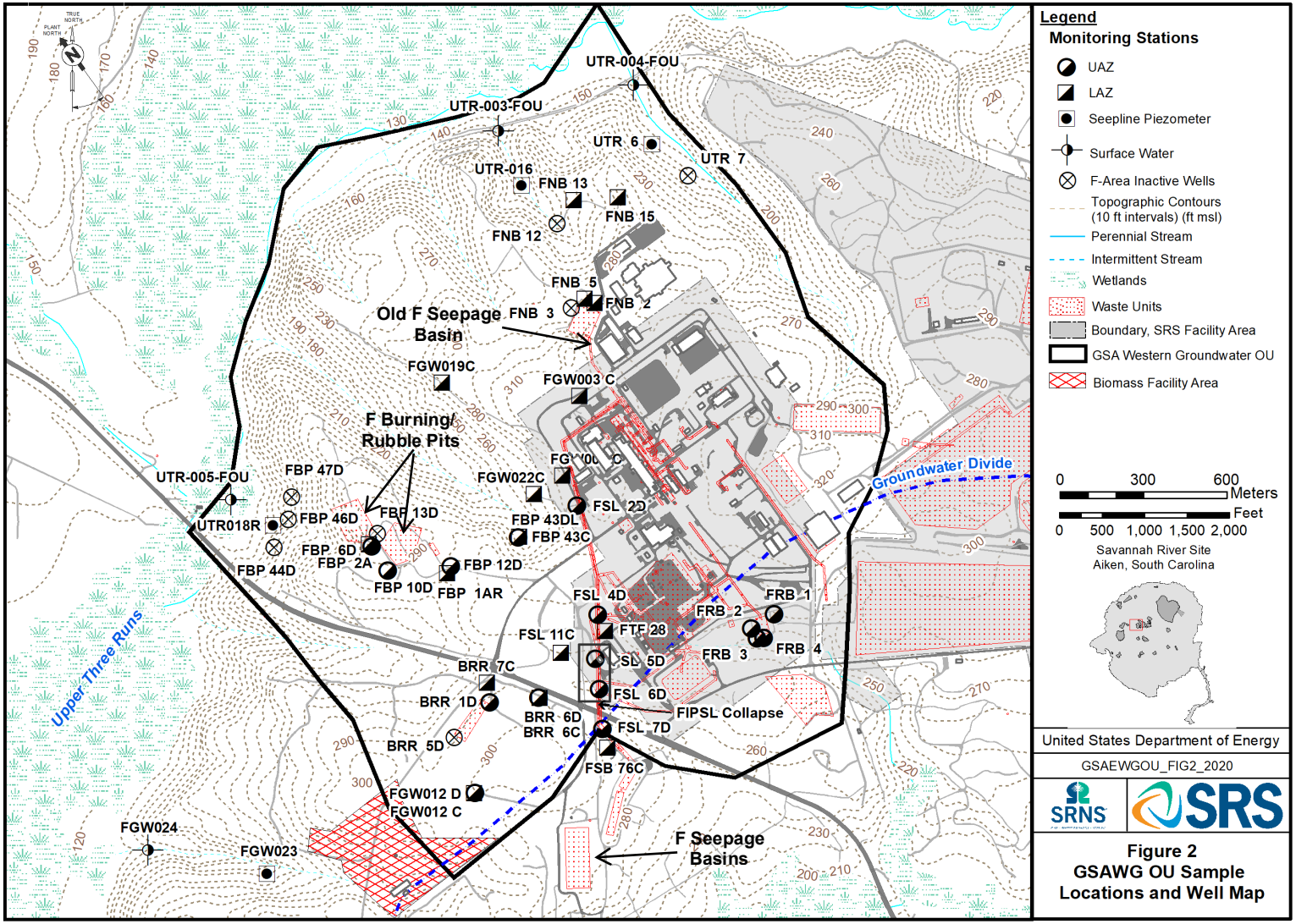

Figure 2. GSA Western Groundwater OU Sample Locations and Well Map

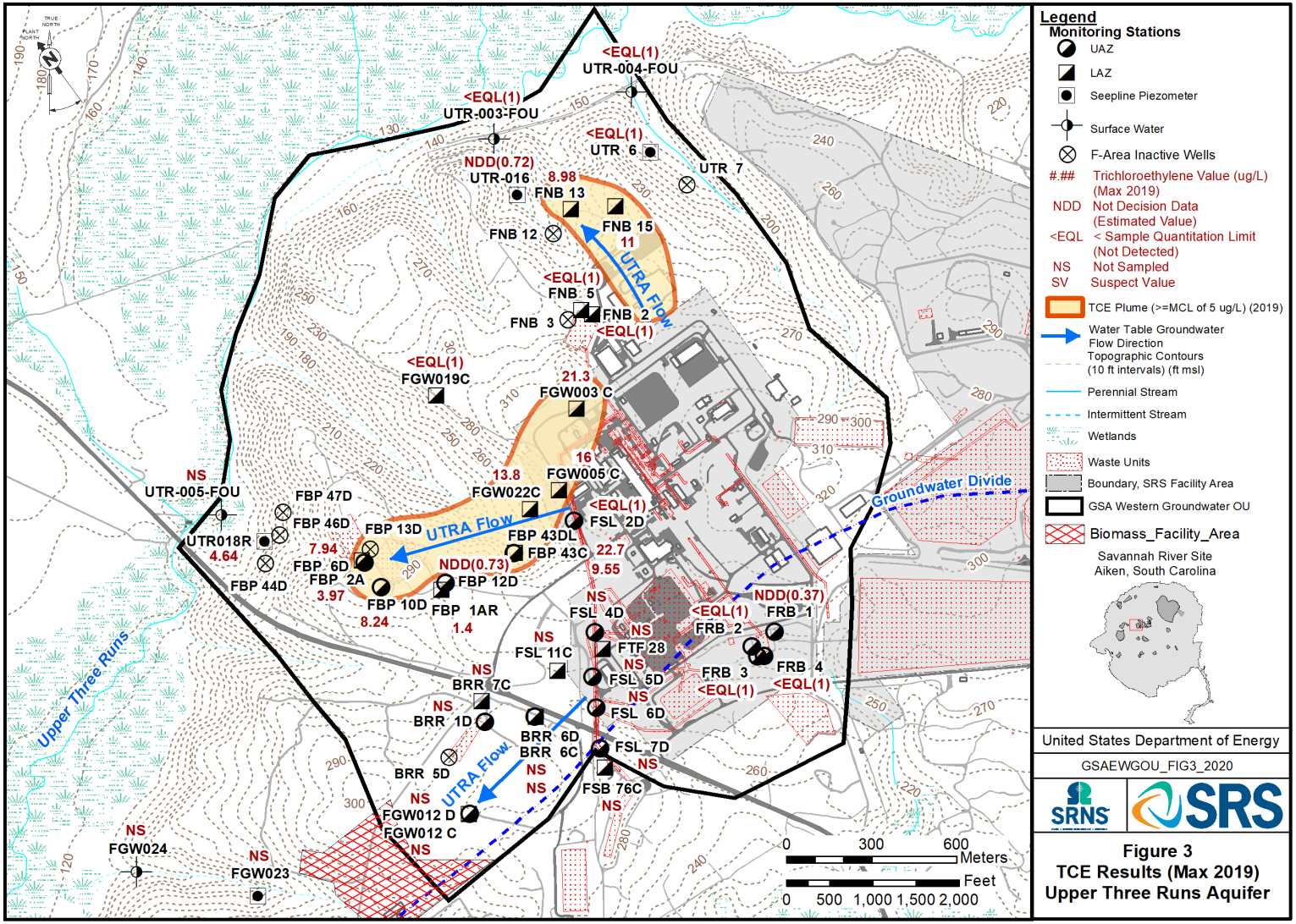

Figure 3. Trichloroethylene Results (Max 2019) Upper Three Runs Aquifer

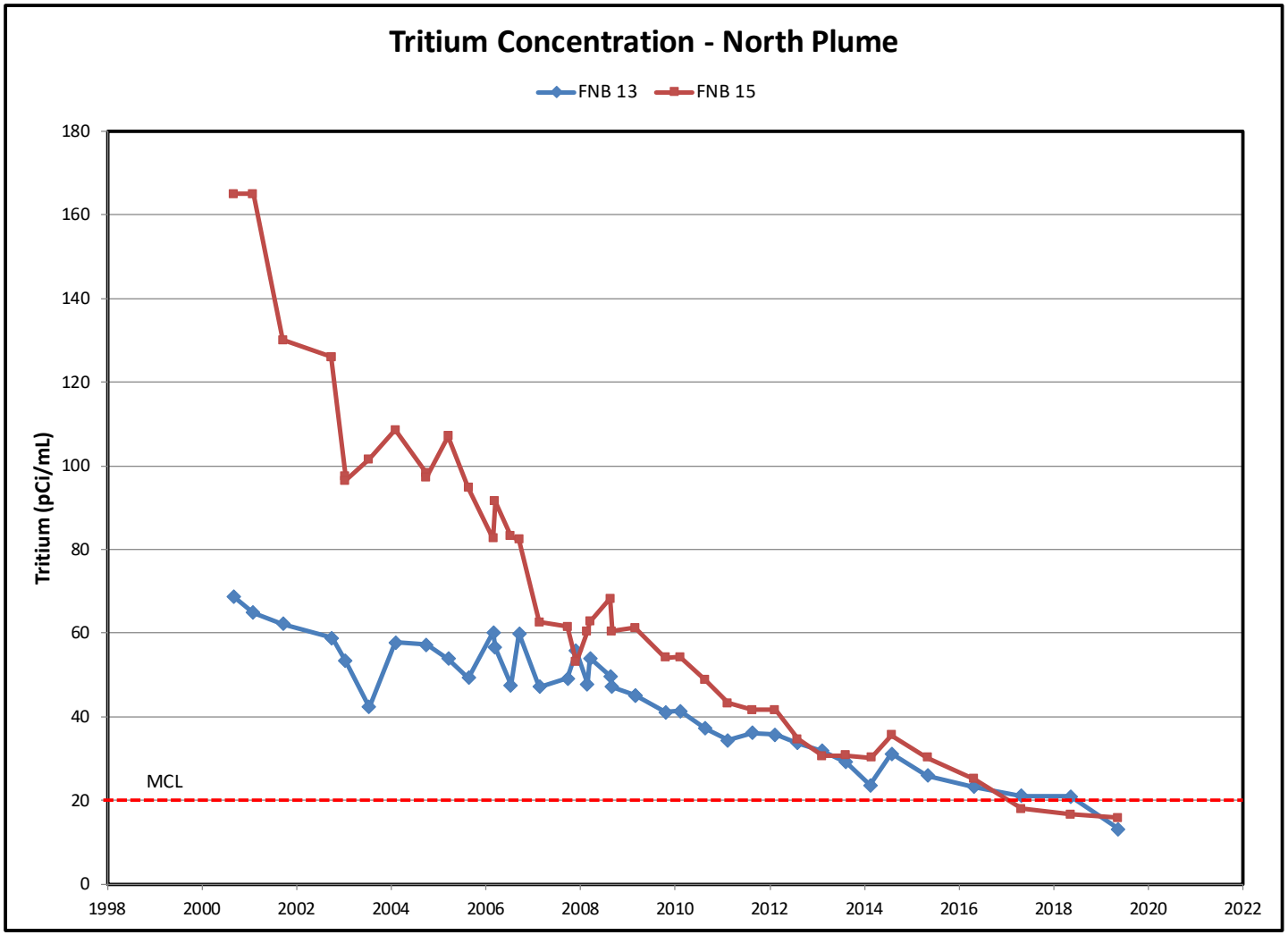

Figure 4. Tritium Concentration in the North Plume

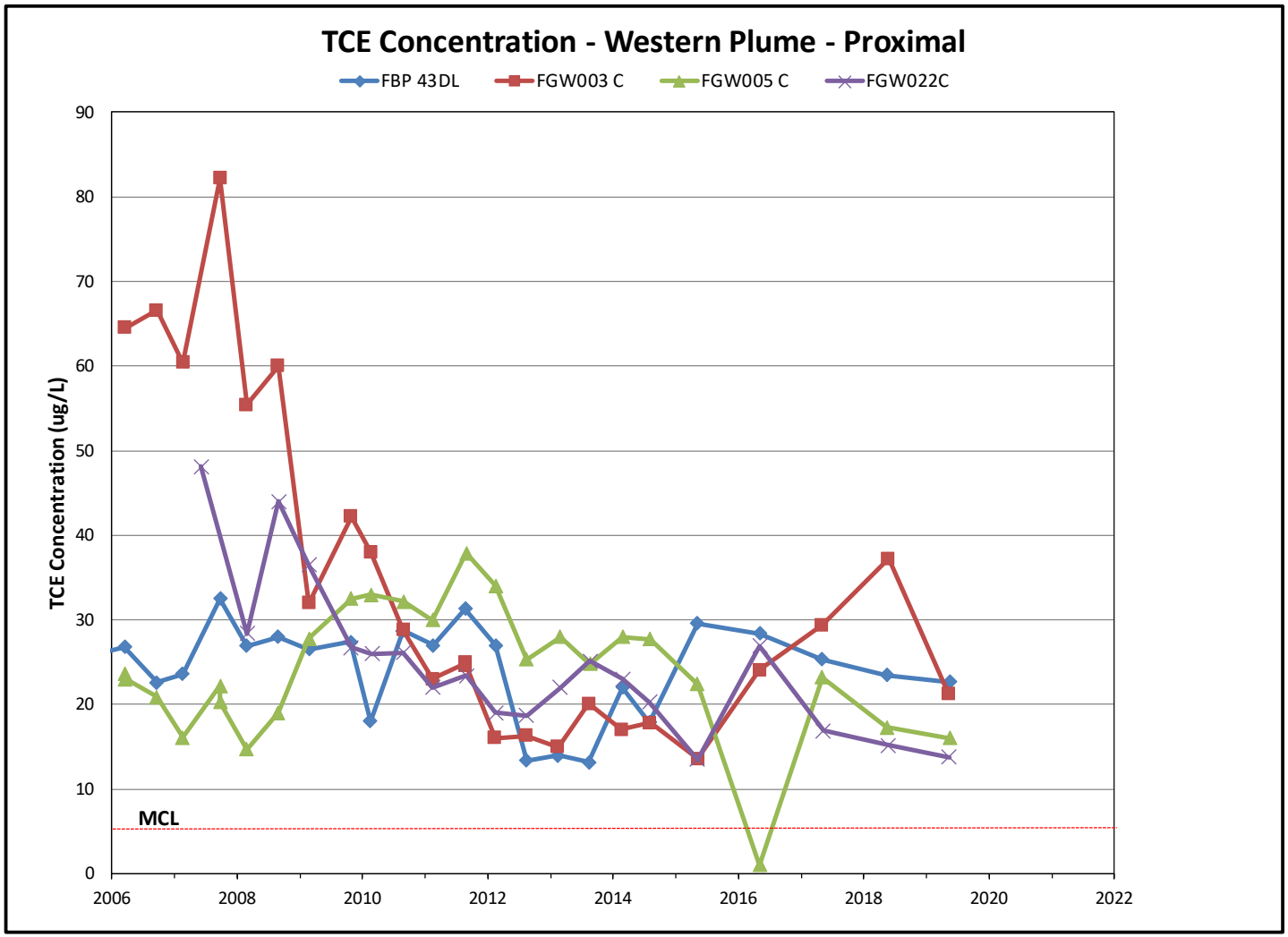

Figure 5. TCE Concentration Near the Source in the West Plume

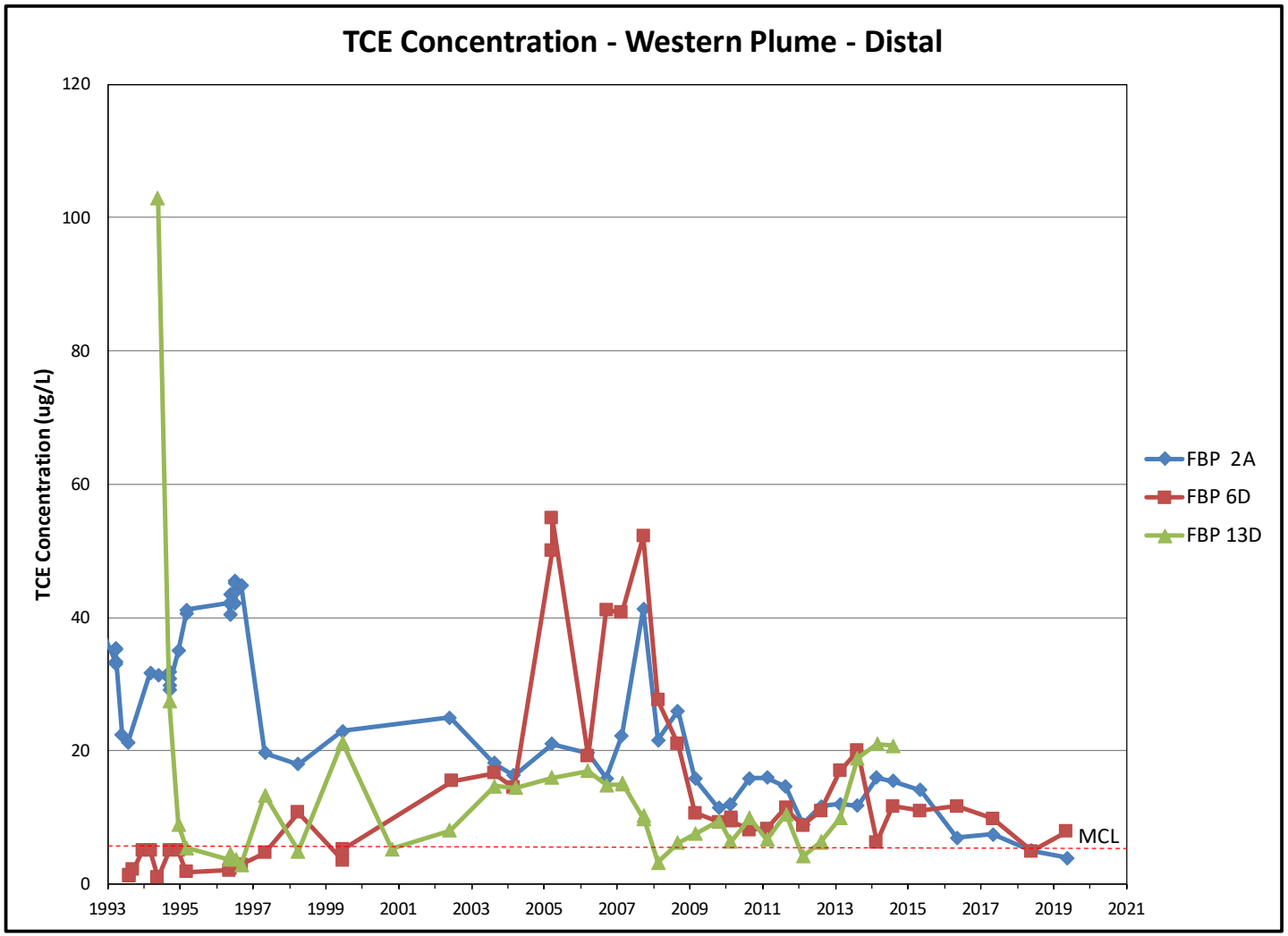

Figure 6. TCE Concentrations in the Distal Part of the West Plume

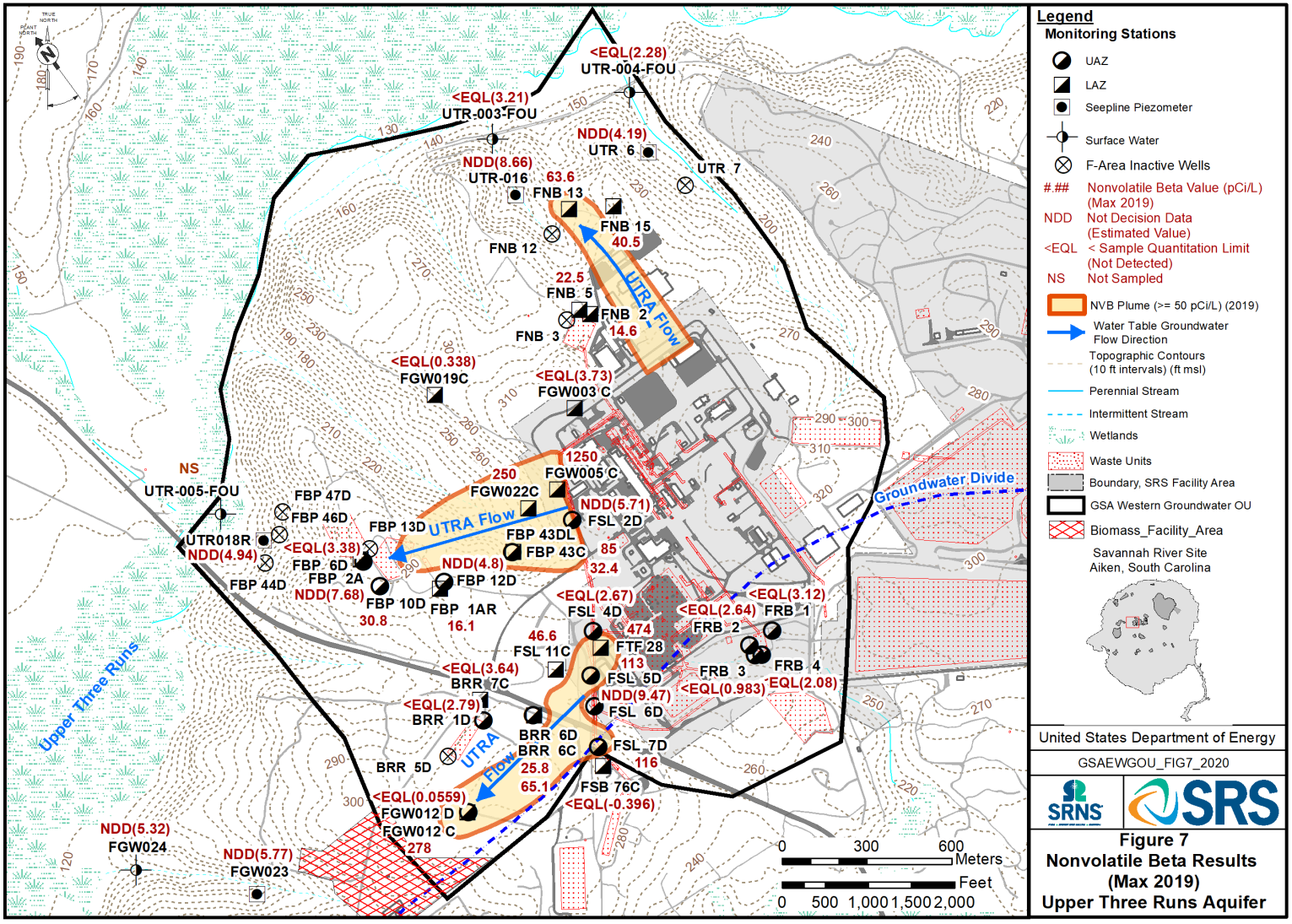

Figure 7. Nonvolatile Beta Results (Max 2019) Upper Three Runs Aquifer

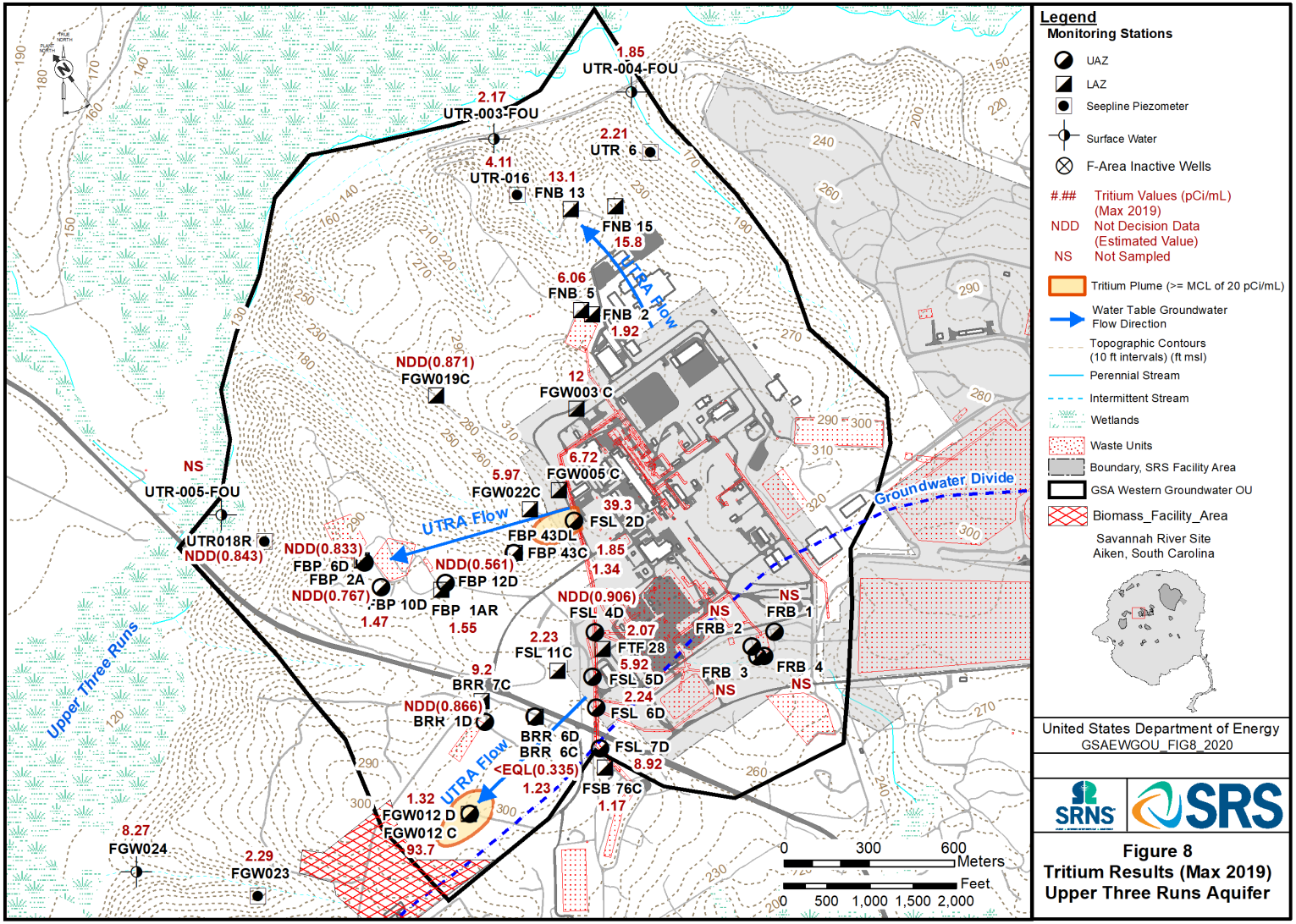

Figure 8. Tritium Results (Max 2019) Upper Three Runs Aquifer

Table 1. Monitoring Network

Plume Description	Aquifer Zone	Well ID	Analyte List
West Plume	UAZ of UTRA	FBP10D, FBP6D, FBP12D, FBP43DL, FSL2D	Nitrate, gross alpha, nonvolatile beta, tritium, and TCL VOCs
	LAZ of UTRA	FBP 1AR, FBP2A, FBP43C, FGW003C, FGW005C, FGW019C, FGW022C	Alpha and beta/gamma speciation for FGW005C
	Seepline/ Surface Water	UTR18R, UTR005	At surface water locations: field parameters for VOC degradation and degradation products
North Plume	LAZ of UTRA	FNB2, FNB5, FNB13, FNB15	Nitrate, gross alpha, nonvolatile beta, tritium, iodine-129, strontium-90, and TCL VOCs
	Seepline/ Surface Water	UTR16, UTR6, UTR003, UTR004	
South Plume	UAZ of UTRA	BRR1D, BRR6D, FSL4D, FSL5D, FSL6D, FSL7D, FSB76C, FGW012D	Nitrate, gross alpha, nonvolatile beta, tritium, iodine-129, radium-226, 228, strontium-90, technetium-99, uranium-233/234, 238
	LAZ of UTRA	BRR6C, BRR7C, FTF28, FSL11C, FGW012C	
	Seepline/ Surface Water	FGW024, FGW023	
F Area Retention Basin	UAZ of UTRA	FRB1, FRB2, FRB3, FRB4	Gross alpha, nonvolatile beta, cesium-137, strontium-90, radium-226, TCE

- Sampling of the monitoring network is performed annually for existing wells starting in 2014 except for the F-Area Retention Basin. The FRB wells are sampled semi-annually according to the ROD. New monitoring locations added to the OU will be sampled semi-annually until a baseline is established. The monitoring network was revised during the August 2013 scoping meeting based on the Monitoring Optimization White Paper, SRNS-RP-2012-00783, Rev. 1, January 2014.
- Sample locations are shown on Figure 2. FBP-45D was abandoned in 2009.

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APPENDIX A

Isotopic Speciation Results for FGW 005C

Well ID	Date	Analyte	Detection Limit	Quantitation Limit	Lab Qualifier	Review Qualifier	Result	Units
FGW005 C	5/16/2019	AMERICIUM-241	0.0638	0.0638	U	U	0	pCi/L
FGW005 C	5/16/2019	AMERICIUM-241	0.0521	0.0521	U	U	0	pCi/L
FGW005 C	5/16/2019	CARBON-14	12.4	27.3	U	U	1.71	pCi/L
FGW005 C	5/16/2019	CESIUM-137	9.67	21.7	U	U	-3.98	pCi/L
FGW005 C	5/16/2019	CURIUM-242	0.117	0.221	U	U	0.0189	pCi/L
FGW005 C	5/16/2019	CURIUM-242	0.0953	0.116	U	U	-0.00514	pCi/L
FGW005 C	5/16/2019	CURIUM-243/244	0.0628	0.156	U	U	0.0232	pCi/L
FGW005 C	5/16/2019	CURIUM-243/244	0.0513	0.0513	U	U	0	pCi/L
FGW005 C	5/16/2019	CURIUM-245/246	0.121	0.316	U	U	0.09	pCi/L
FGW005 C	5/16/2019	CURIUM-245/246	0.0531	0.164	U	U	0.0392	pCi/L
FGW005 C	5/16/2019	IODINE-129	1.12	3.93			4.77	pCi/L
FGW005 C	5/16/2019	IODINE-129	1.12	4.08			4.11	pCi/L
FGW005 C	5/16/2019	NEPTUNIUM-237	0.135	0.693	J	J	0.645	pCi/L
FGW005 C	5/16/2019	NEPTUNIUM-237	0.0652	0.729			0.746	pCi/L
FGW005 C	5/16/2019	PLUTONIUM-238	0.0536	0.0536	U	U	0	pCi/L
FGW005 C	5/16/2019	PLUTONIUM-238	0.0645	0.161	U	U	0.0238	pCi/L
FGW005 C	5/16/2019	PLUTONIUM-239/240	0.0997	0.215	U	U	0.0346	pCi/L
FGW005 C	5/16/2019	PLUTONIUM-239/240	0.12	0.218	U	U	0.0179	pCi/L
FGW005 C	5/16/2019	RADIUM-226	0.0565	1.75			16.5	pCi/L
FGW005 C	5/16/2019	RADIUM-228	0.504	1.9			5.76	pCi/L
FGW005 C	5/16/2019	STRONTIUM-90	3.33	44.1			180	pCi/L
FGW005 C	5/16/2019	STRONTIUM-90	3.3	45.2			184	pCi/L
FGW005 C	5/16/2019	TECHNETIUM-99	4.54	17.5			209	pCi/L
FGW005 C	5/16/2019	THORIUM-228	0.251	0.472	U	U	0.0364	pCi/L
FGW005 C	5/16/2019	THORIUM-228	0.266	0.479	U	U	0.0108	pCi/L
FGW005 C	5/16/2019	THORIUM-230	0.0553	0.137	U	U	0.0204	pCi/L
FGW005 C	5/16/2019	THORIUM-230	0.107	0.256	U	U	0.0582	pCi/L
FGW005 C	5/16/2019	THORIUM-232	0.103	0.123	U	U	-0.00509	pCi/L
FGW005 C	5/16/2019	THORIUM-232	0.0572	0.0572	U	U	0	pCi/L
FGW005 C	5/16/2019	TRITIUM	0.404	1.44			6.72	pCi/mL
FGW005 C	5/13/2020	URANIUM-233/234	7.3	90.5			395	pCi/L
FGW005 C	5/13/2020	URANIUM-235	7.62	33.82	J	J	30.6	pCi/L
FGW005 C	5/13/2020	URANIUM-238	8.58	156.18			1240	pCi/L

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APPENDIX B

2019 Monitoring Well Results
Data Matrix Table and Field Conditions Key Codes

Field Code	Explanation
A	Pump is surging excessively; aerated
B	Blank sample was collected
C	Well is continuously pumping
D	Well is dry-no sample or field data collected
E	Equipment blank was collected
I	Well went dry during sampling; field data collected but insufficient water to collect all samples
L	Well went dry before sampling began; only depth to water can be determined
N	Well was not stabilized before sampling began
P	Inaccessibility or mechanical failure prevented sample collection and field analysis of the water
S	No water in standpipe; for water level events only
T	Samples were collected, but some samples were not sent to the laboratory due to high turbidity
W	Unable to sample well because of stabilization or sampling equipment failure; water-level measurements were obtained
X	Well went dry during purging; samples collected after well recovered measurements obtained
0	OK
1	Pump Dry
2	Sampled after recovery
3	Gallons purged through sample port
4	DI water obtained from 772-7B
5	High turbidity
6	Flow meter leaking
7	Pump failure
8	Flow meter not operating
9	# gallons added
10	Well is inaccessible, well cannot be Sampled
11	Well abandoned
12	No water to surface
13	Field measurements only
14	Not all samples were collected
15	Equipment failure
16	No water in standpipe
17	Bailed well
18	Water level tape not long enough
19	Well not sampled, maintenance required
20	Well sampled, maintenance required
21	Measurement Exceeded Criteria

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Matrix Table GSAWOU 2019

GSA Western GW OU Monitoring Constituents

N/A

Station	Well Use	Aquifer Zone	Field Data: SAMPLE COLLECTION DATE	DEPTH TO WATER	PH	SAMPLING EVENT WATER ELEVATION	SPECIFIC CONDUCTANCE	TOTAL ALKALINITY (AS CACO3)	WATER TEMPERATURE	Constituent	GWPS Unit	FIELD CONDITIONS	Inorganics: NITRATE+NITRITE AS NITROGEN	Radionuclides: CESIUM-137	COMBINED RADIUM (226 AND 228)	GROSS ALPHA	IODINE-129	NEONVOLATILE BETA	RADIUM-226	RADIUM-228	STRONTIUM-90	TECHNETIUM-99	TRITIUM	URANIUM-233/234	URANIUM-238	VOC: 1,1,1-TRICHLOROETHANE	1,1,2,2-TETRACHLOROETHANE	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHANE	1,1-DICHLOROETHYLENE	1,2,3-TRICHLOROBENZENE	1,2,4-TRICHLOROBENZENE	1,2-DIBROMO-3-CHLOROPROPANE	1,2-DIBROMOETHANE	1,2-DICHLOROBENZENE	1,2-DICHLOROETHANE (EDC)	1,2-DICHLOROPROPANE	1,3-DICHLOROBENZENE	1,4-DICHLOROBENZENE	1,4-DIOXANE	2-HEXANONE	ACETONE	BENZENE	BROMOCHLOROMETHANE
			day-month-year	ft	pH	ft	uS/cm	mg/L	degC				mg/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/mL	pCi/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
													10	5	200	15	1	50	5	5	8	900	20	15	15																					
FRB 1	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	53.2	4.8	226.45	39	0	21.6	No Comments	NS	<EQL (21.4)	1.67	<EQL (6.65)	NS	<EQL (10.1)	[1.67]	NS	<EQL (6.57)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
			04-Nov-2019	53.9	4.6	225.75	44	0	24.4	No Comments	NS	<EQL (18.2)	2.25	[3.76]	NS	<EQL (9.6)	2.25	NS	<EQL (7.98)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																				<EQL (8)																									
FRB 2	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	49.5	4.7	224.86	60	0	21.9	No Comments	NS	<EQL (22.5)	1.22	<EQL (6.64)	NS	<EQL (9.9)	1.22	NS	<EQL (6.02)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
			04-Nov-2019	50.4	4.7	223.96	57	0	22.5	No Comments	NS	<EQL (23.9)	[1.38]	[3.02]	NS	<EQL (8.54)	[1.38]	NS	<EQL (7.86)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FRB 3	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	47.62	4.7	224.57	58	0	21.7	No Comments	NS	<EQL (20.1)	[0.802]	[2.39]	NS	<EQL (9.33)	[0.802]	NS	<EQL (6.18)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
			04-Nov-2019	48.7	4.9	223.49	54	0	22	No Comments	NS	<EQL (23.5)	[1.46]	<EQL (6.13)	NS	<EQL (8.7)	[1.46]	NS	<EQL (7.83)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FRB 4	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	46.34	4.8	224.72	46	0	21.7	No Comments	NS	<EQL (23.3)	<EQL (1.71)	[3.97]	NS	<EQL (9.78)	<EQL (0.519)	NS	<EQL (6.66)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																	<EQL (0.597)																												
			04-Nov-2019	47.4	4.8	223.66	47	0	22.6	No Comments	NS	<EQL (21.5)	[1.29]	[3.38]	NS	<EQL (9.18)	[1.29]	NS	<EQL (8.22)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
UTR 6	North Plume Seepline Piezometer	LAZ_UTRAU	05-Jun-2019	5.75	4.9	166.25	24	0	19.6	No Comments	0.0352	NS	NS	<EQL (5.4)	<EQL (2.41)	[4.19]	NS	NS	<EQL (5.91)			2.21	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
																				<EQL (6.38)																									
UTR-016	North Plume Seepline Piezometer	LAZ_UTRAU	20-May-2019	4.1	4.9	166.06	48	0	19.2	No Comments	2.46	NS	NS	<EQL (5.13)	<EQL (2.73)	[8.66]	NS	NS	[5.09]	NS		4.11	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
UTR-003-FOU	North Plume Surface Water	LAZ_UTRAU	20-May-2019	NS	6.6	NS		29	10	24	No Comments	0.115	NS	NS	<EQL (5.24)	<EQL (2.33)	<EQL (10)	NS	NS	<EQL (6.67)	NS		2.17	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
												0.149																																
UTR-004-FOU	North Plume Surface Water	LAZ_UTRAU	20-May-2019	NS		6.9	NS		45	7	22.6	No Comments	0.844	NS	NS	<EQL (4.82)	<EQL (2.56)	<EQL (9.71)	NS	NS	<EQL (6.24)	NS		1.85	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FNB 2	North Plume Well	LAZ_UTRAU	09-May-2019	82.45	4.6	206.23	44	0	20.8	No Comments	2.16	NS	NS	[8.26]		10.6	NS	14.6	NS	NS	[6.96]	NS		1.92	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
																				[6.28]																									
FNB 3	North Plume Well	LAZ_UTRAU	NS	NS	NS	NS	NS	NS	NS	NS	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FNB 5	North Plume Well	LAZ_UTRAU	14-May-2019	82.8	4.4	204.9	101	0	20	No Comments	8.44	NS	NS	[8.77]	[2.53]	NS	22.5	NS	NS	[6.12]	NS		6.06	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FNB 12	North Plume Well	LAZ_UTRAU	NS	NS	NS	NS	NS	NS	NS	NS	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FNB 13	North Plume Well	LAZ_UTRAU	20-May-2019	23.14	4.9	191.81	126	0	19.8	No Comments	12.1	NS	NS	[9.62]		3.49	63.8	NS	NS	14.3	NS		13.1	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FNB 15	North Plume Well	LAZ_UTRAU	13-May-2019	78	4.8	193.22	191	0	20.7	No Comments	10.2	NS	NS	[11.6]	[3.21]		40.5	NS	NS	<EQL (6.81)	NS		15.8	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
															[2.54]																													
FGW023	South Plume Seepline Piezometer	LAZ_UTRAU	13-May-2019	3	5	181.14	31	0	18.4	No Comments	0.785	NS	<EQL (0.332)	<EQL (6.01)	<EQL (2.2)	[5.77]	<EQL (0.24)	<EQL (1.09)	<EQL (5.8)	25.3		2.29	<EQL (0.209)	<EQL (0.0583)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FGW024	South Plume Surfacewater	LAZ_UTRAU	13-May-2019	NS	6.2	NS		35	3	21.1	No Comments	0.417	NS	NS	<EQL (5.69)	<EQL (2.35)	[5.32]	<EQL (0.265)	<EQL (0.941)	<EQL (5.76)	[7.43]		8.27	<EQL (0.254)	<EQL (0.283)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BRR 1D	South Plume Well	UAZ_UTRAU	09-May-2019	80.1	5	216.1	37	0	22.8	No Comments	1.24	NS	NS	[0.778]		<EQL (3.08)	<EQL (4.22)	<EQL (9.83)	[0.304]		<EQL (5.64)	<EQL (10.3)	[0.866]		<EQL (0.233)	<EQL (0.177)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																	<EQL (3.83)		[0.301]	<EQL (0.889)	<EQL (5.7)			<EQL (0.248)	<EQL (0.284)																				
BRR 6C	South Plume Well	UAZ_UTRAU	20-May-2019	85	5.7	211	45	7	21.7	No Comments	1.13	NS	NS	[0.285]		<EQL (6.53)	<EQL (2.27)	65.1	[0.295]	<EQL (1.08)	<EQL (6.23)	169		1.23	<EQL (0.293)	<EQL (0.26)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																						161																							
BRR 6D	South Plume Well	UAZ_UTRAU	09-May-2019	89.6	6	206.6	58	11	19.3	No Comments	0.557	NS	<EQL (0.179)	<EQL (4.21)	<EQL (4.03)		25.8	<EQL (0.207)	<EQL (0.924)	<EQL (5.04)		41.7	<EQL (1.04)	<EQL (0.325)	<EQL (0.29)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																			<EQL (0.998)																									
BRR 7C	South Plume Well	LAZ_UTRAU	09-May-2019	82.5	5	208.6	50	0	21.1	No Comments	3.43	NS	<EQL (0.299)	<EQL (6.04)	<EQL (1.97)	<EQL (10.2)	<EQL (0.271)	<EQL (0.969)	<EQL (5.55)	<EQL (10.4)		9.2	<EQL (0.331)	<EQL (0.328)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FGW012 C	South Plume Well	LAZ_UTRAU	16-May-2019	80.1	4.8	206.27	178	0	20.5	No Comments	15.2	NS	2.68	[6.99]	[2.11]	278	2.68	<EQL (1.31)	<EQL (6.19)	572		93	<EQL (0.361)	<EQL (0.27)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																			<EQL (6.7)			<EQL (0.367)	<EQL (0.346)																						
FGW012 D	South Plume Well	UAZ_UTRAU	13-May-2019	74.05	4.9	212.5	31	0	20.2	No Comments	1.26	NS	<EQL (1.09)	<EQL (6.31)	<EQL (2.38)	<EQL (8.95)	<EQL (0.45)	<EQL (1.05)	<EQL (5.64)	<EQL (10.4)		1.32	<EQL (0.266)	<EQL (0.296)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
														<EQL (6.34)		<EQL (8.94)																												
FSB 76C	South Plume Well	LAZ_UTRAU	13-May-2019	80.6	5.7	213.2	49	4	20.3	No Comments	1.3	NS	<EQL (0.34)	<EQL (5.98)	<EQL (4.15)	<EQL (8.74)	<EQL (0.273)	<EQL (0.991)	<EQL (5.77)	<EQL (10.4)		1.17	<EQL (0.291)	<EQL (0.306)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																					[1]																							
FSL 4D	South Plume Well	UAZ_UTRAU	13-May-2019	75.23	5.6	219.57	77	2	21.1	No Comments	2.04	NS	[0.612]		<EQL (6.48)	<EQL (4.05)	<EQL (9.92)	[0.612]		<EQL (0.88)	<EQL (5.38)	<EQL (10.4)	[0.906]		<EQL (0.281)	<EQL (0.202)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FSL 5D	South Plume Well	UAZ_UTRAU	14-May-2019	72.1	5.3	220.3	76	5	24.7	No Comments	1.87	NS	1.06	<EQL (7.12)	[1.63]		1.06	<EQL (0.933)	<EQL (6.26)	138		5.92	<EQL (0.286)	<EQL (0.185)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
																						5.78																							
FSL 6D	South Plume Well	UAZ_UTRAU	14-May-2019	67.2	5.1	219.6	153	3	24.7	No Comments	0.984	NS	[0.362]		<EQL (5.14)	2.32	[9.47]	[0.362]		<EQL (1.08)	<EQL (6.57)	13		2.24	<EQL (0.362)	<EQL (0.211)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FSL 7D	South Plume Well	UAZ_UTRAU	14-May-2019	69.6	4.5	218	105	0	22.7	No Comments	8.52	NS	NS	[2.12]		<EQL (2.3)	116	5.55		1.62		14.9		8.92	<EQL (0.239)	<EQL (0.213)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FSL 11C	South Plume Well	UAZ_UTRAU	09-May-2019	88	5.4	212.73	44	2	21.3	No Comments	1.82	NS	NS	<EQL (0.178)	<EQL (4.85)	<EQL (4.29)	46.6	<EQL (0.252)	<EQL (1.28)	<EQL (5.69)	196		2.23	<EQL (0.268)	<EQL (0.349)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FTF 28	South Plume Well	UAZ_UTRAU	20-May-2019	83.1	5.1	213.62	41	0	23.7	No Comments	2.06	NS	NS	<EQL (5.64)	<EQL (2.61)	[4.74]	[0.233]	<EQL (1.14)	<EQL (5.74)	176		2.07	<EQL (0.212)	<EQL (0.248)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
UTR018R	West Plume Seepline Piezometer	LAZ_UTRAU	21-May-2019	6.8	5.1	148.7	35	1	24.8	X	0.0139	NS	NS	<EQL (4.68)	NS	[4.94]	NS	NS	NS	NS	NS	[0.843]		NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
UTR-005-FOU	West Plume Surface Water	LAZ_UTRAU	20-May-2019	NS	NS	NS		NS	NS	NS	D	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
FBP 2A	West Plume Well	UAZ_UTRAU	20-May-2019	103	5	186.3	59	0	21.4	No Comments	2.19	NS	NS	<EQL (6.12)	NS	[7.68]	NS	NS	NS	NS	NS	[0.767]	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FBP 6D	West Plume Well	UAZ_UTRAU	09-May-2019	100.1	5.1	189.8	62	4	20.4	No Comments	1.4	NS	NS	<EQL (6.42)	NS	<EQL (10.1)	NS	NS	NS	NS	NS	[0.833]	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FBP 10D	West Plume Well	UAZ_UTRAU	09-May-2019	87.9	6.8	198.4	311	89	20.7	No Comments	1.1	NS	NS	<EQL (5.26)	NS	NS	30.8	NS	NS	NS	NS	1.47	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FBP 12D	West Plume Well	UAZ_UTRAU	09-May-2019	84.9	5.2	205.7	54	0	19.8	No Comments	2.79	NS	NS	<EQL (6.36)	NS	[4.8]	NS	NS	<EQL (6.39)	NS	NS	[0.561]	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
																			[4.56]																										
FBP 43C	West Plume Well	UAZ_UTRAU	09-May-2019	45.3	7.2	208.4	278	75	19.8	No Comments	2.1	NS	NS	<EQL (4.51)	NS		32.4	NS	NS	NS	NS	1.34	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FBP 43DL	West Plume Well	UAZ_UTRAU	16-May-2019	44.1	7.4	209.72	417	86	20.5	No Comments	2.1	NS	NS	<EQL (4.77)	NS		32.4	NS	NS	NS	NS	1.85	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FBP001AR	West Plume Well	UAZ_UTRAU	09-May-2019	81.8	4.9	206.74	56	2	20.3	No Comments	3.7	NS	NS	<EQL (6.67)	NS	<EQL (10.3)	NS	NS	NS	NS	NS	[0.932]	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FGW003 C	West Plume Well	LAZ_UTRAU	09-May-2019	99.6	5.1	212.04	103	6	21.5	No Comments	8.59	NS	NS	<EQL (4.23)	NS	<EQL (10.2)	NS	NS	NS	NS	NS	12	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FGW005 C	West Plume Well	LAZ_UTRAU	16-May-2019	94.9	3.7	214.56	431	0	22.5	No Comments	81.6	<EQL (21.7)	30.2	2380	4.77	2750	16.5	5.78	184	209	6.72	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
															1.11				192																										
FGW019C	West Plume Well	LAZ_UTRAU	13-May-2019	79.34	5.3	206.47	14	0	21.2	No Comments	0.0576	NS	NS	<EQL (5.56)	NS	<EQL (9.01)	NS	NS	NS	NS	NS	[0.871]	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
											0.0575																																	
FGW022C	West Plume Well	LAZ_UTRAU	14-May-2019	55.5	4.2	210.9	322	0	20	No Comments	8.1	NS	NS	NS		40	NS		2.98	NS	NS	NS	NS	5.97	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)
FSL 2D	West Plume Well	LAZ_UTRAU	13-May-2019	81.3	5.5	225.2	94	9	24.5	No Comments	6.34	NS	NS	[7.3]	NS	[5.71]	NS	NS	NS	NS	NS	22	NS	NS	<EQL (1)	<EQL (1)	<EQL (5)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (1)	<EQL (50)	<EQL (5)	<EQL (5)	<EQL (1)	<EQL (1)

N/A

Station	Well Use	Aquifer Zone	Field Data: SAMPLE COLLECTION DATE	DEPTH TO WATER	PH	SAMPLING EVENT WATER ELEVATION	SPECIFIC CONDUCTANCE	TOTAL ALKALINITY (AS CACO3)	WATER TEMPERATURE	Constituent	GWPS Unit	FIELD CONDITIONS	VOC: BROMODICHLOROMETHANE	BROMOFORM (TRIBROMOMETHANE)	BROMOMETHANE (METHYL BROMIDE)	CARBON DISULFIDE	CARBON TETRACHLORIDE	CHLOROBENZENE	CHLOROETHANE (ETHYL CHLORIDE)	CHLOROETHENE (VINYL CHLORIDE)	CHLOROFORM	CHLOROMETHANE (METHYL CHLORIDE)	CIS-1,2-DICHLOROETHYLENE	CIS-1,3-DICHLOROPROPENE	CUMENE (ISOPROPYLBENZENE)	CYCLOHEXANE	DIBROMOCHLOROMETHANE	DICHLORODIFLUOROMETHANE	DICHLOROMETHANE (METHYLENE CHLORIDE)	ETHYLBENZENE	M,P-XYLENE	METHYL ACETATE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	METHYL TERTIARY BUTYL ETHER (MTBE)	METHYLCYCLOHEXANE	O-XYLENE	STYRENE	TETRACHLOROETHYLENE (PCE)	TOLUENE	TRANS-1,2-DICHLOROETHYLENE	TRANS-1,3-DICHLOROPROPENE	TRICHLOROETHYLENE (TCE)	TRICHLOROFLUOROMETHANE
			day-month-year	ft	pH	ft	uS/cm	mg/L	degC				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
FRB 1	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	53.2	4.8	226.45	39	0	21.6	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<EQL (1)	NS
			04-Nov-2019	53.9	4.6	225.75	44	0	24.4	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	[0.37]	NS
FRB 2	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	49.5	4.7	224.86	60	0	21.9	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<EQL (1)	NS
			04-Nov-2019	50.4	4.7	223.96	57	0	22.5	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<EQL (1)	NS
FRB 3	F Area Retention Basin Plume	UAZ_UTRAU	09-May-2019	47.62	4.7	224.57	58	0	21.7	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<EQL (1)	NS
			04-Nov-2019	48.7	4.9	223.49	54	0	22	No Comments	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	N