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Savannah River Operations Office
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JUN 29 2021

Ms. Susan B. Fulmer, P. G., Manager
Federal Facility Agreement Section
Division of Site Assessment, Remediation and Revitalization
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Jon Richards
Savannah River Site Remedial Project Manager
Superfund Division
U. S. Environmental Protection Agency, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303

Dear Ms. Fulmer and Mr. Richards:

SUBJECT: 2020 K-Area Burning/Rubble Pit and Rubble Pile (131-K and 631-20G) (KBRP) and P-Area Burning/Rubble Pit (131-P) (PBRP) Operable Units Combined Groundwater Monitoring Report (Sampling Summary), SEMS Numbers: 40 and 59

Reference: *Submittal of the Proposal to Standardize Sampling and Reporting Requirements of Groundwater Data for P, L, and K Area Burning/Rubble Pit Operable Units, CERCLIS Numbers 59, 56, 40* (ACP-08-133, dated January 15, 2008)

In accordance with the terms of the Federal Facility Agreement, the U. S. Department of Energy (DOE) is submitting the combined groundwater monitoring report (sampling summary) for your review. Per the referenced letter, combined sampling summaries are submitted annually via letter, with detailed groundwater reports submitted every five (5) years. The combined sampling summary reporting began in June 2008 and the first detailed groundwater report was submitted in June 2012. The next detailed groundwater report will be submitted in June 2022. This letter is transmitting the 2020 annual sampling summary, *2020 K-Area and P-Area Burning/Rubble Pits Annual Groundwater Data Summary Report*.

The combined groundwater monitoring report (sampling summary) formerly included the L-Area Burning/Rubble Pit and Rubble Pile (131-L, 131-3L, and 131-2L) (LBRP) Operable Unit (OU). In October 2017, the South Carolina Department of Health and Environmental Control (SCDHEC) and the U. S. Environmental Protection Agency (EPA) agreed to discontinue groundwater monitoring and reporting for the LBRP OU. Therefore, LBRP OU is not included in this report.

Please review the information and provide any comments that you may have within one hundred twenty (120) days of receipt. The effort and time that the SCDHEC and the EPA have given on the subject operable units are greatly appreciated.

2020 K-AREA AND P-AREA BURNING/RUBBLE PITS ANNUAL GROUNDWATER DATA SUMMARY REPORT

K-Area Burning/Rubble Pit (KBRP) Operable Unit (OU)

Sampling optimizations that were developed and approved by U. S. Environmental Protection Agency (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC) as presented in the *K-Area Burning/Rubble Pit and Rubble Pile (131-K and 631-20G) (KBRP), L-Area Burning/Rubble Pit and Rubble Pile (131-L, 131-3L, and 131-2L) (LBRP), and P-Area Burning/Rubble Pit (131-P) (PBRP) Operable Units (OUs) Detailed Combined Groundwater Monitoring Report (U)* (SRNS-RP-2012-00200, Revision 1, December 2012) continued at KBRP in 2020. Due to the limited plume distribution, sampling wells in the AA aquifer (portion of the upper aquifer zone) and a subset of wells in the transmissive zone (TZ) on an annual basis is sufficient to monitor the groundwater contaminants at the KBRP OU. In 2020, samples were collected from six AA aquifer wells (i.e., KRP 4 through KRP 9) and two TZ aquifer wells (i.e., KRP 10D and KRP 11D) in accordance with the optimized sampling schedule. Water elevation measurements were collected from all eleven wells within both the AA and TZ aquifers.

The eight wells at KBRP OU were sampled during the fourth quarter of calendar year 2020 (4Q2020). All eight wells were below their respective trigger levels [mixing zone concentration limit (MZCL) or maximum contaminant level (MCL)] as shown in Table 1. Trichloroethylene (TCE) and tetrachloroethylene (PCE) concentrations at well KRP 9 remained below their respective MCL of 5 µg/L after an increase above the MCL was recorded in 4Q2018. Associated degradation products were not detected or were well below their respective MCLs at the remaining KBRP OU monitoring wells in 2020. Figures 1 and 2 display the time-series plots for PCE and TCE concentrations at plume wells KRP 8 and KRP 9, respectively. Wells that are currently not being sampled consistent with the optimized sampling schedule are noted as SS (Suspended Sampling) in Table 1 and on Figure 3.

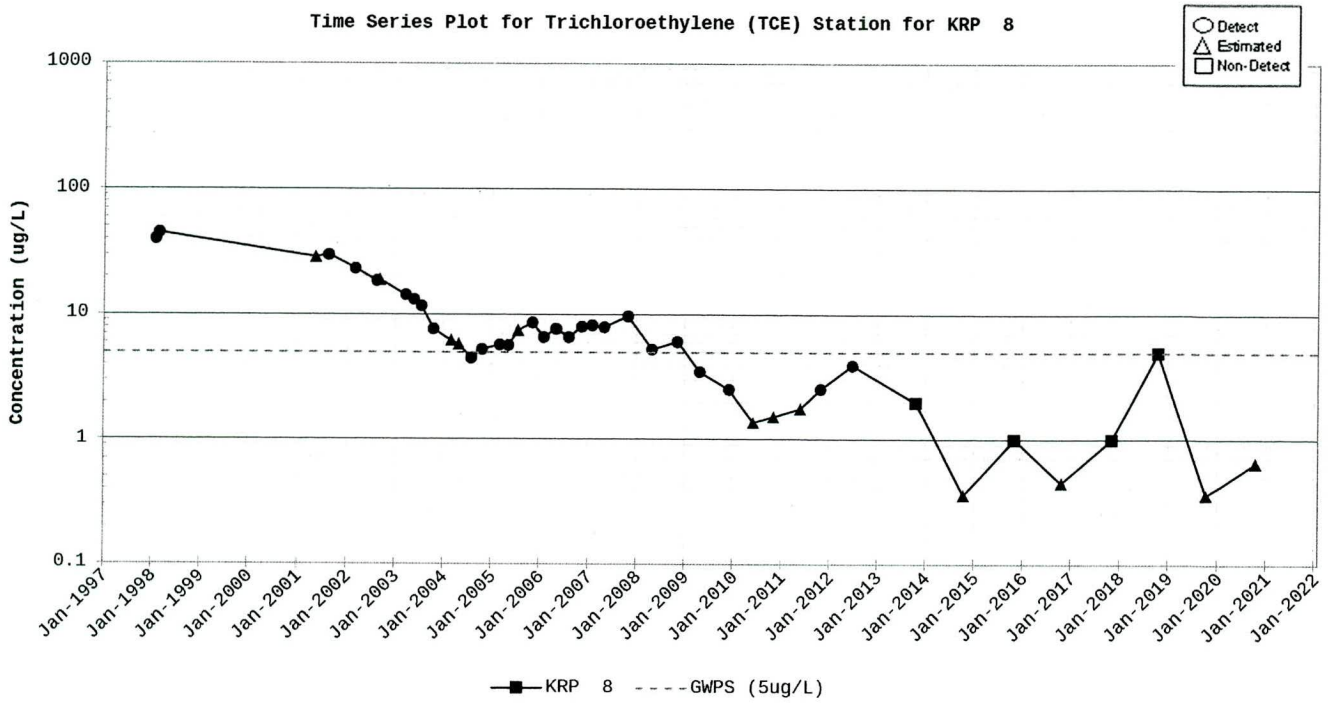
Figure 3 shows the monitoring well network, the PCE concentrations, and water elevation measurements for 4Q2020. Water table elevations increased from 2019 values by an average of 2.49 feet (ft) (0.76 meters [m]) in the AA aquifer and 2.10 ft (0.64 m) in the TZ aquifer. All wells yielded adequate sampling volumes. Groundwater flow in all aquifers is to the southwest (Figure 3).

No additional sampling was triggered based on the 2020 results (Table 1). However, based on exceeding the MCLs for PCE and TCE in 2018 the project team has initiated an increase in sampling frequency to semi-annually at well KRP 9 to facilitate our understandings as to the need for continued monitoring at this unit. Sampling results confirm that the approved groundwater mixing zone remedy is performing as intended and remains effective for the KBRP unit.

Table 1. KBRP OU PCE and TCE Monitoring Well Data for 2020

Well	Aquifer	Well Type	PCE Trigger Level (µg/L)	PCE (µg/L) 4Q2020	TCE Trigger Level (µg/L)	TCE (µg/L) 4Q2020
KRP 4	AA	Plume	43[a]	1.1	61[a]	ND
KRP 5	AA	Plume	43[a]	ND	61[a]	ND
KRP 6	AA	Plume	43[a]	ND	61[a]	ND
KRP 7	AA	Compliance	5[b]	0.51 J	5[b]	ND
KRP 8	AA	Plume	43[a]	1.9	61[a]	0.65 J
KRP 9	AA	Auxiliary Plume	43[a]	4.8	61[a]	3.0
KRP 10D	TZ	Intermediate	5[b]	ND	5[b]	ND
KRP 11D	TZ	Intermediate	5[b]	ND	5[b]	ND
KRP 12D	TZ	Compliance	5[b]	SS	5[b]	SS
KRP 13D	TZ	Compliance	5[b]	SS	5[b]	SS
KRP 15D	TZ	Compliance	5[b]	SS	5[b]	SS
KRP 10C	LAZ	Intermediate	5[b]	SS	5[b]	SS
KRP 11C	LAZ	Intermediate	5[b]	SS	5[b]	SS
KRP 12C	LAZ	Compliance	5[b]	SS	5[b]	SS
KRP 15C	LAZ	Compliance	5[b]	SS	5[b]	SS

AA= Portion of Upper Aquifer Zone
J = Estimated Value
ND = Not Detected
SS = Suspended Sampling
LAZ = Lower Aquifer Zone
TZ = Transmissive Zone
[a] = MZCL
[b] = MCL



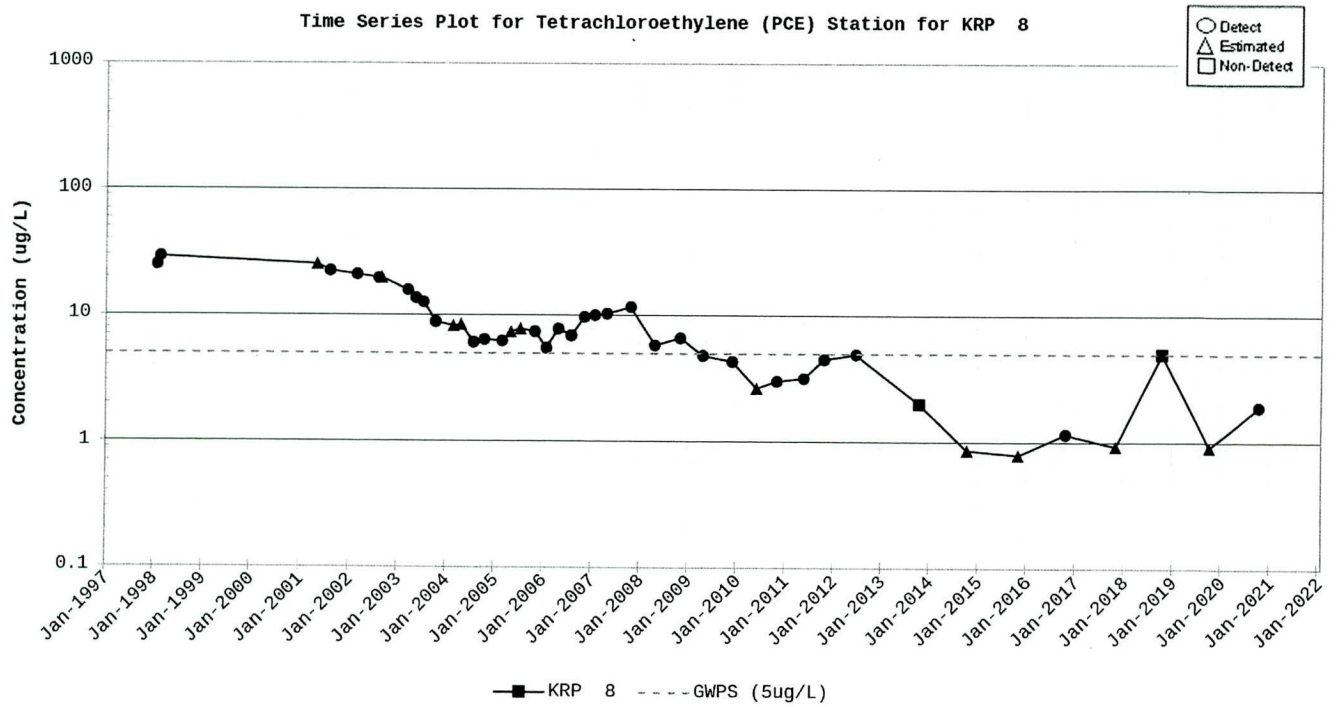
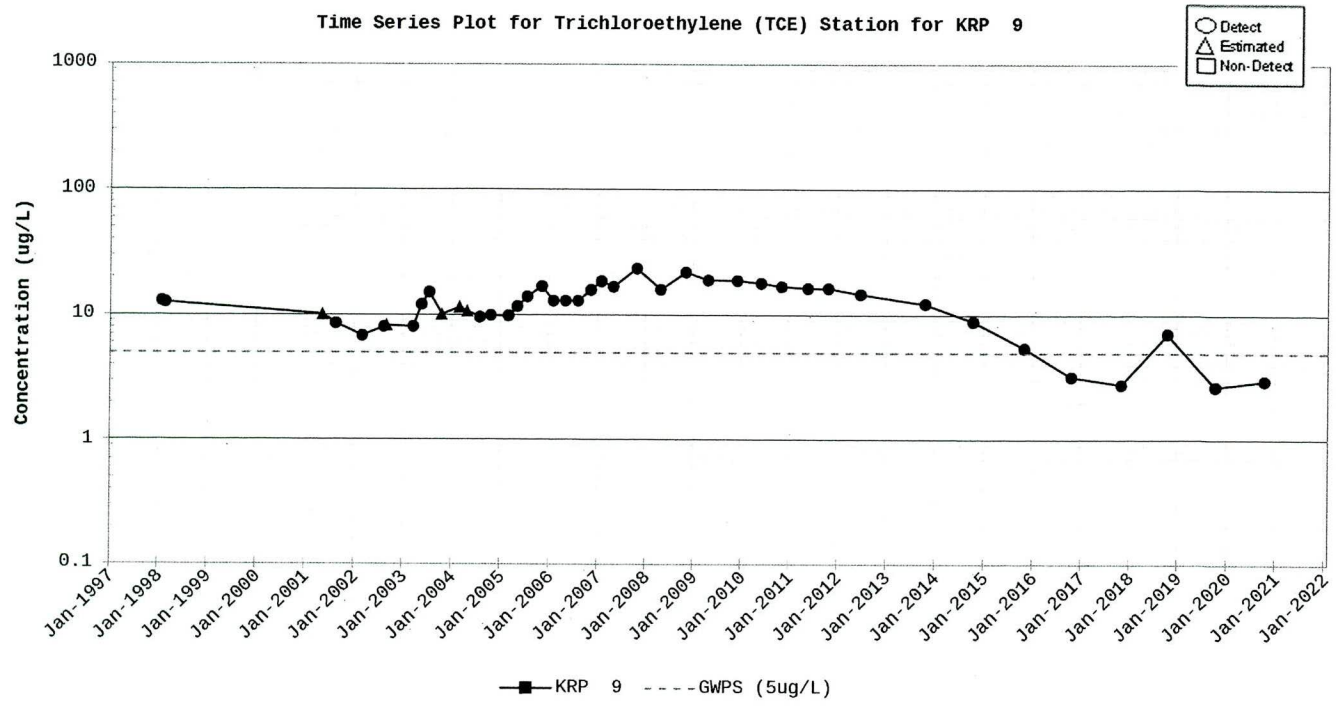


Figure 1. Time-Series Plots of PCE and TCE for KRP 8



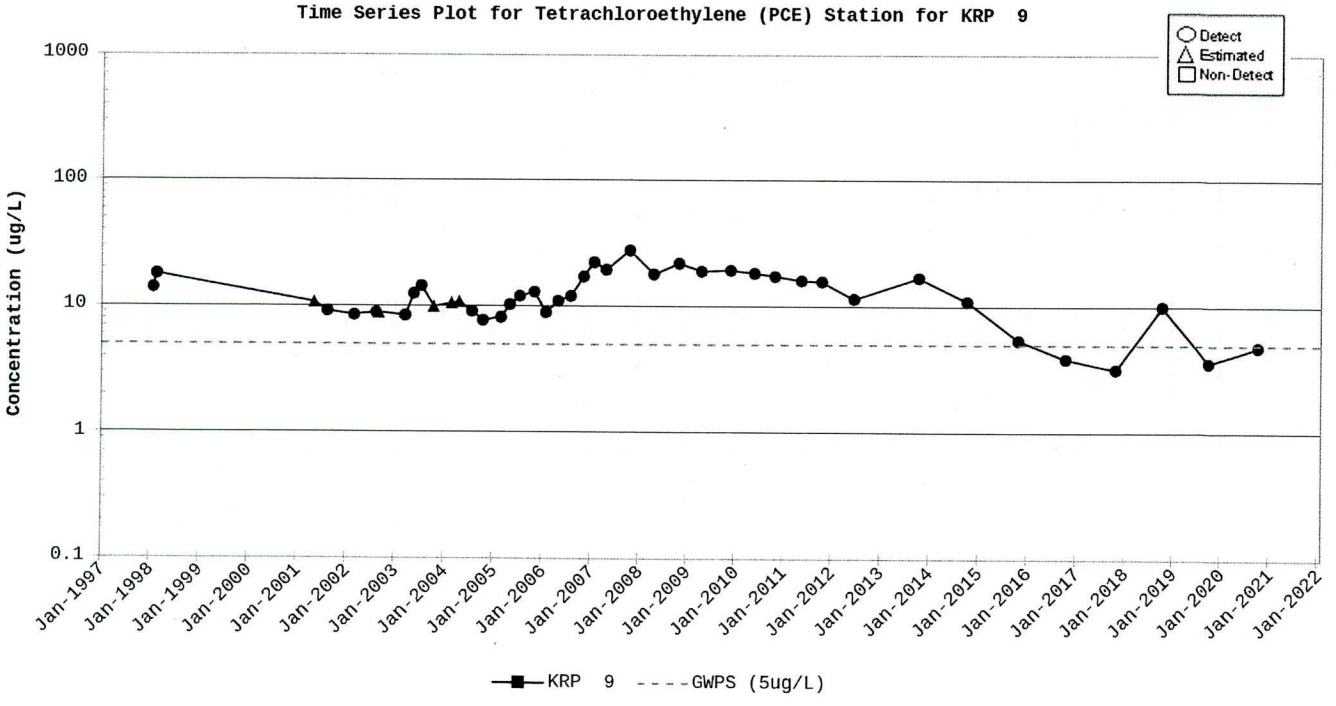


Figure 2. Time-Series Plots of PCE and TCE for KRP 9

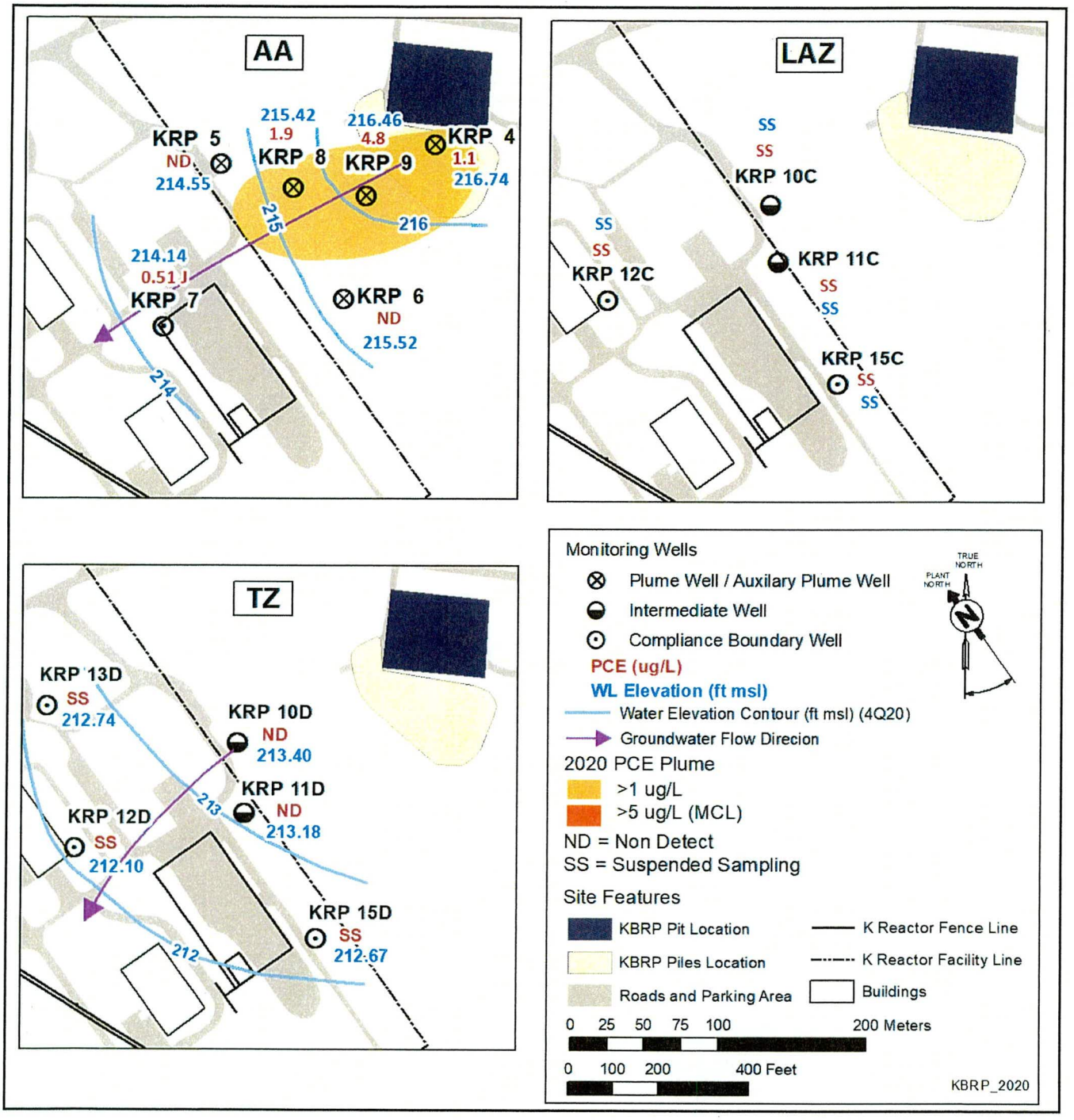


Figure 3. KBRP OU Monitoring Well Network, PCE Concentrations, and Water Elevation Measurements during 4Q2020

P-Area Burning/Rubble Pit (PBRP) OU

Sampling optimizations that were developed and approved by EPA and SCDHEC as presented in the *Standardizing Sampling and Reporting Requirements P, L and K Area Burning Rubble Pits* (see ACP-08-133, dated January 15, 2008) continued at PBRP in 2020. 1,4-dioxane was added to the list of monitored constituents at the PBRP based on a recommendation in the Fourth Five-Year Remedy Review Report for the Savannah River Site (SRS) (SRNS-RP-2012-00011, Revision 1.1, November 2013). On February 11, 2020, the EPA documented that the remedial action is complete (monitoring systems are installed and operational) for the selected Monitored Natural Attenuation remedy at the PBRP and noted the progress of the remedy towards meeting the remedial goals as documented in the *K-Area Burning/Rubble Pit and Rubble Pile (131-K and 631-20G) (KBRP), L-Area Burning/Rubble Pit and Rubble Pile (131-L, 131-3L, and 131-2L) (LBRP), and P-Area Burning/Rubble Pit (131-P) (PBRP) Operable Units (OUs) Detailed Combined Groundwater Monitoring Report (U)* (SRNS-RP-2017-00356, Revision 0, June 2017) (Letter, H. G. Adams (EPA) to B. Hennessey (DOE), dated February 11, 2020 [SRNS-OS-2020-00105]).

The three PBRP wells (PRP 5, PRP 6, and PRP 7) were sampled during 4Q2020. The 2020 sampling results for wells PRP 5, PRP 6, and PRP 7 are presented in Table 2. 1,1-dichloroethylene (1,1-DCE) was detected above the MCL (7 µg/L) in well PRP 6 at a concentration of 19 µg/L, a significant increase from the 4Q2019 concentration of 3.6 µg/L. The last exceedance of 1,1-DCE in well PRP 6 was in 2015. In well PRP 7, the 1,1-DCE concentration slightly decreased from 2019 and remained below the MCL. TCE was detected above the MCL (5 µg/L) in well PRP 6 at a concentration of 44 µg/L. This represents the highest historical detection of TCE in this well and is a substantial increase in concentration from the 4Q2019 value of 3.3 µg/L. The last MCL exceedance of TCE in PRP 6 was recorded in 2007. The TCE concentration in well PRP 7 slightly increased from 2019 but remained below the MCL. The increase in 1,1-DCE and TCE concentrations may be associated with an increase in water elevations, which SRS plans to evaluate as discussed below. 1,4-Dioxane was detected in wells PRP 6 and PRP 7 during the 4Q2020 sampling event at a concentration of 3.5 µg/L and 3.2 µg/L, respectively. All other analytical concentrations at wells PRP 6 and PRP 7 continue to be non-detect or below MCLs. Well PRP 5 remains non-detect for all constituents.

1,4-Dioxane does not have an MCL; therefore, the EPA tap water regional screening level (RSL) has been applied. However, the Practical Quantitation Limits (PQLs) are currently unable to meet the RSL. The PQL for 1,4-dioxane was established at 1.4 µg/L; all other PQLs remain below the established MCL for all analytes. Time series plots of 1,1-DCE, TCE and 1,4-dioxane at wells PRP 6 and PRP 7 are provided in Figures 4, 5 and 6, respectively.

Figure 7 shows the monitoring network, contaminant distribution, and water elevation measurements for 4Q2020. Water table elevations increased from the previous year with an average increase of 1.09 ft (0.33 m). Groundwater flow is to the southwest.

SRS will continue to monitor groundwater annually for the constituents of concern identified in Table 2 to determine if the elevated results observed in 4Q2020 are reproduced. Correlation of contaminant trend results with water levels will be conducted as part of the interpretation of these results in the detailed report to be submitted next year. Monitoring will continue until it is agreed that the remedial goals have been met and monitoring is no longer necessary.

Table 2. PBRP OU Groundwater Data for 2020

Analyte	MCL (µg/L)	4Q2020 (µg/L)		
		PRP 5	PRP 6	PRP 7
1,1,1-Trichloroethane (1,1,1- TCA)	200	ND	6.3	ND
1,1-Dichloroethylene (1,1-DCE)	7	ND	**19**	1.1
Cis-1,2-Dichloroethylene (c-DCE)	70	ND	3.8	1.1
Tetrachloroethylene (PCE)	5	ND	0.9 J	1.3
Trichloroethylene (TCE)	5	ND	**44**	1.8
Chloroethene (Vinyl Chloride) (VC)	2	ND	ND	ND
1,4-Dioxane	0.46*	ND	**3.5**	**3.2**

ND = Not Detected
J = Estimated Value
Bold values exceed the respective MCL/RSL
*1,4-Dioxane does not have an MCL. The current groundwater protection standard used is the EPA RSL, which is 0.46 µg/L; however, detection limits are not able to accurately meet the RSL.

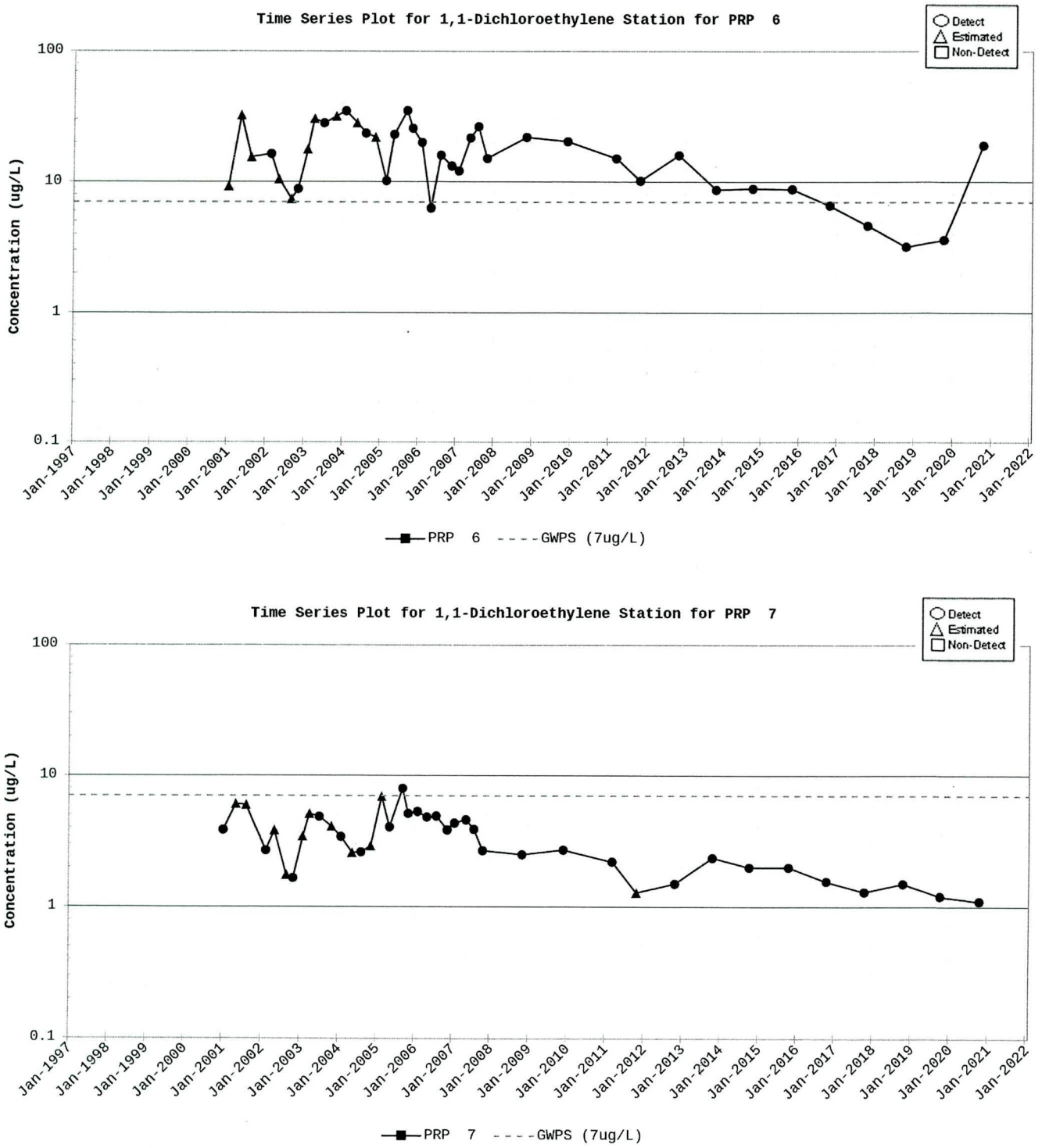
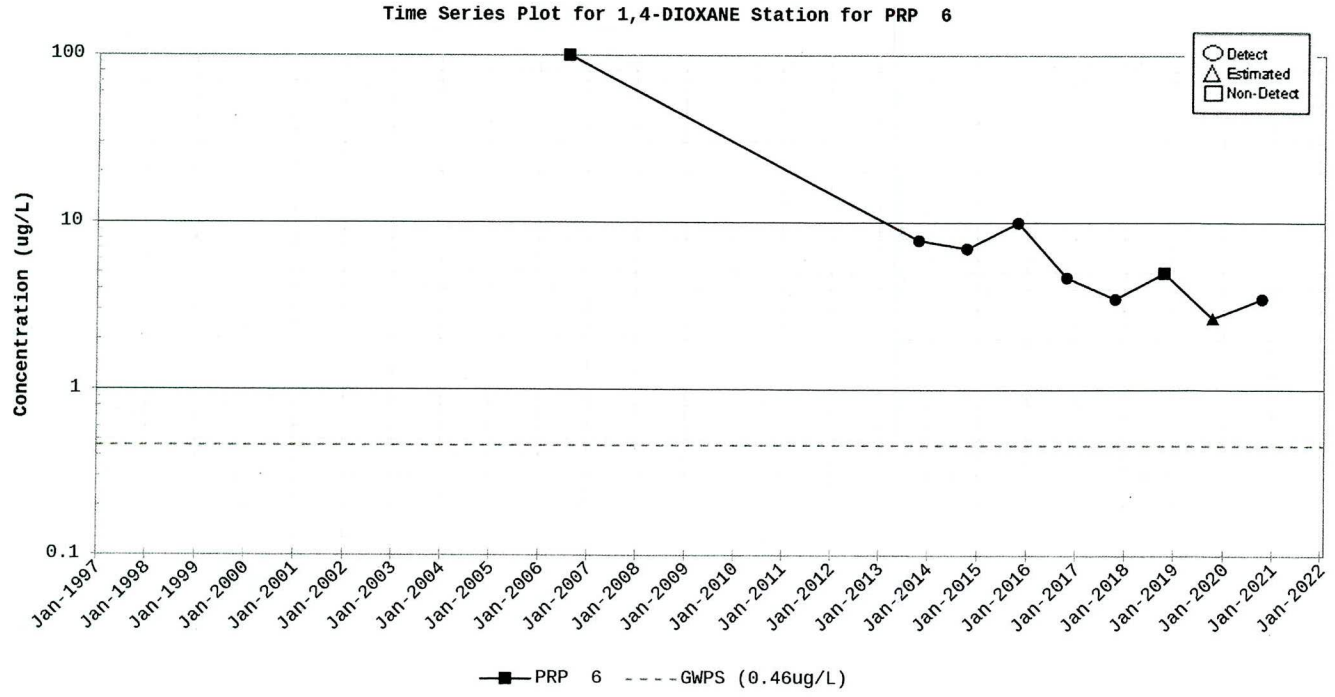


Figure 4. Time-Series Plots of 1,1-DCE at Wells PRP 6 and PRP 7



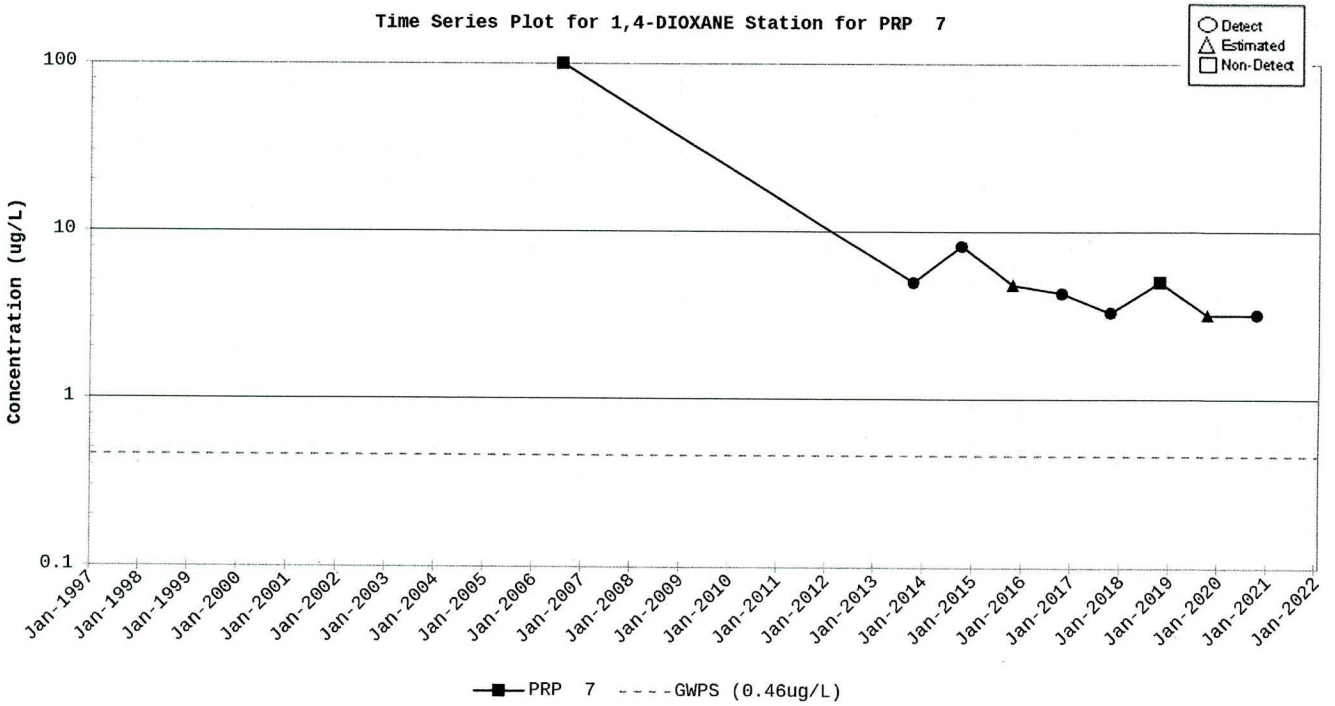
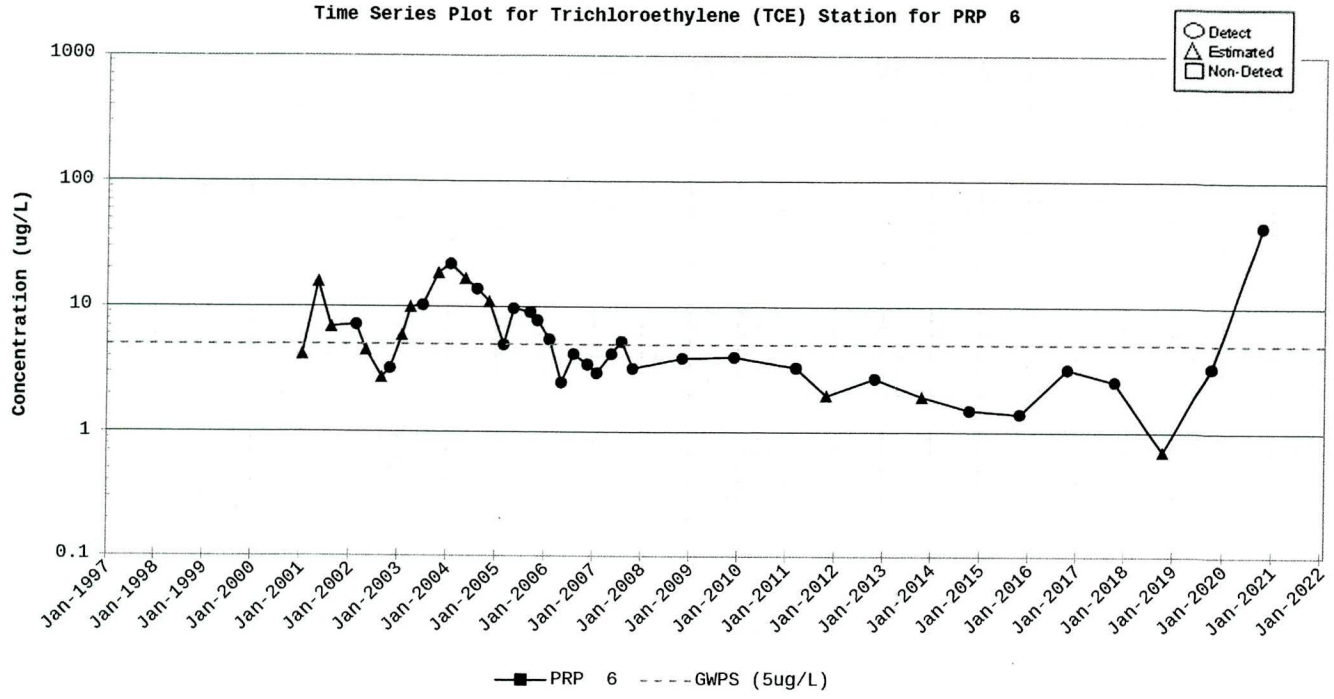


Figure 5. Time-Series Plots of 1,4-Dioxane at Wells PRP 6 and PRP 7



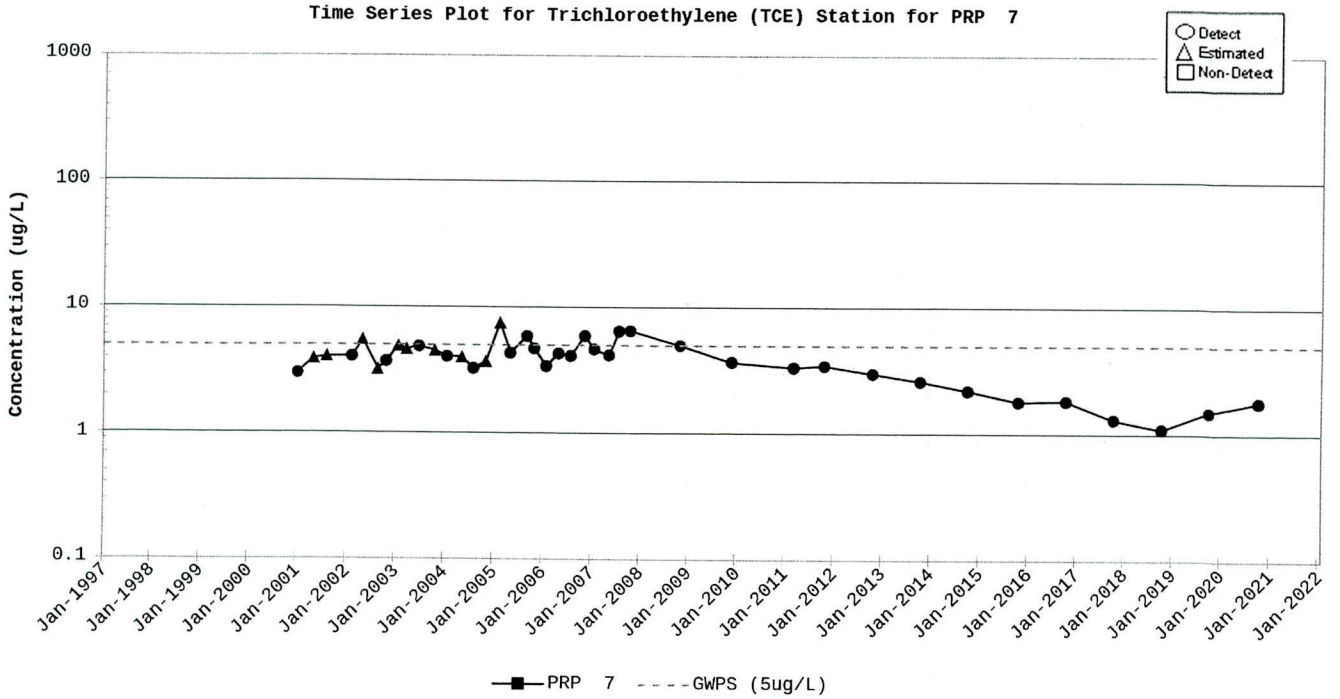


Figure 6. Time-Series Plots of TCE at Wells PRP 6 and PRP 7

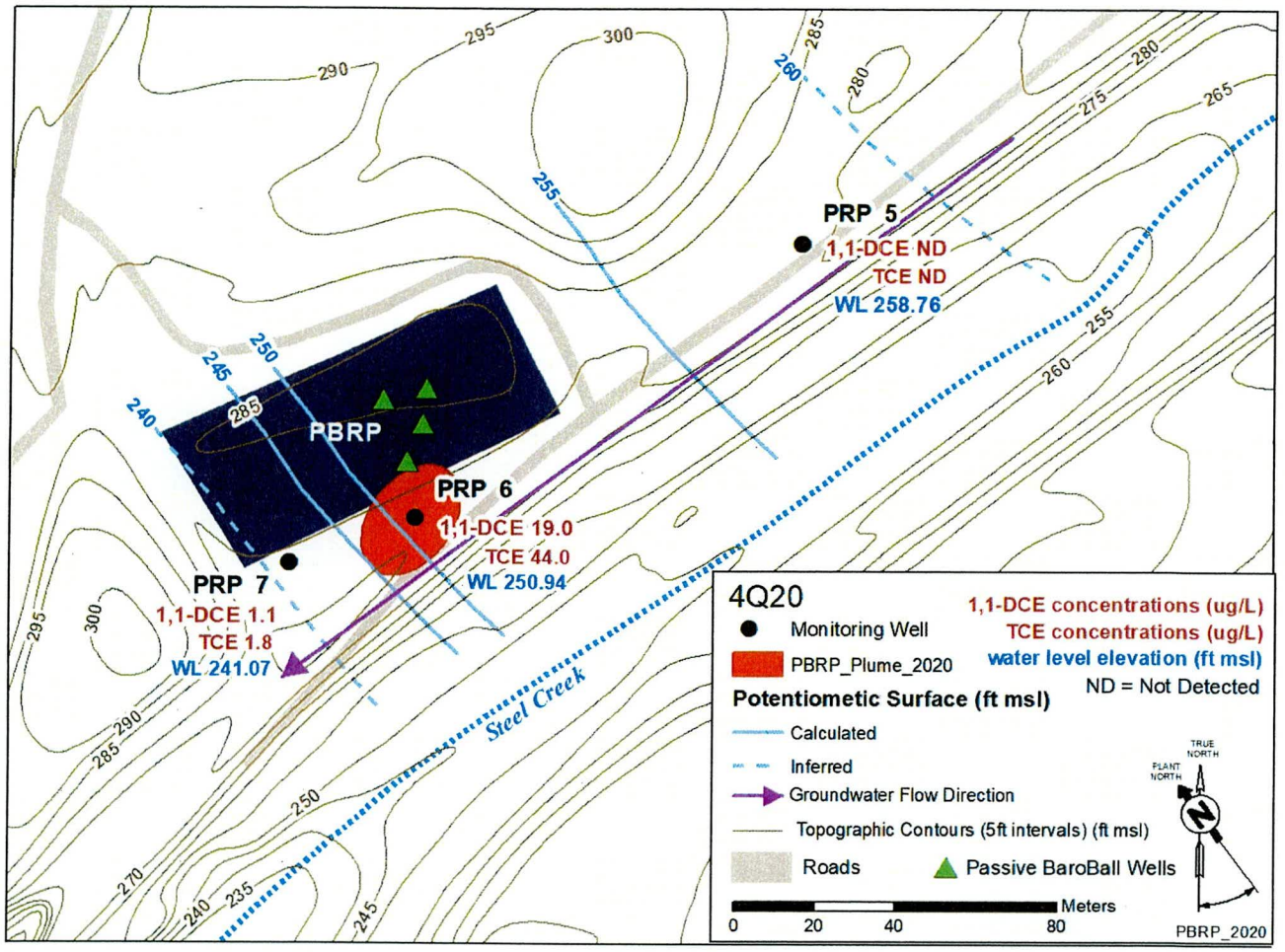


Figure 7. PBRP Monitoring Well Network, 1,1-DCE Values, and Water Elevation Measurements During 4Q2020

Questions from you or your staff may be directed to me at (803) 952-8365, or DOE Program Manager, Mr. Philip Prater, at (803) 952-9333.

Sincerely,

Brian T. Hennessey

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Date: 2021.06.28 15:09:11 -04'00'

Brian T. Hennessey
SRS Remedial Project Manager
Infrastructure and Area Completion Division

IACD-21-146

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