



PANTEX QUARTERLY PROGRESS REPORT

Remedial Action Progress

Third Quarter 2024

In support of Hazardous Waste Permit #50284 and
Pantex Plant Interagency Agreement
December 2024

Pantex Plant
FM 2373 and U.S. Highway 60
P.O. Box 30030
Amarillo, TX 79120

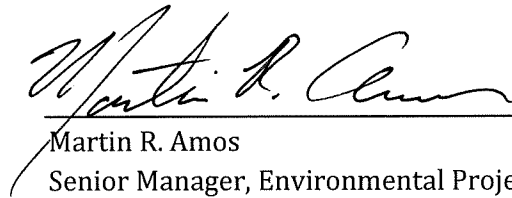


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CERTIFICATION STATEMENT

Third Quarter 2024 Remedial Action Progress Report
Pantex Plant, December 2024

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



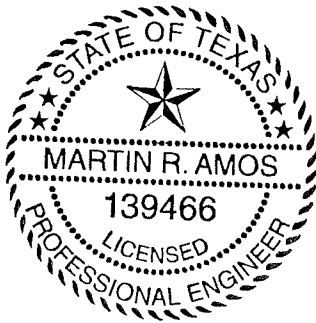
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12/18/2024
Date

**Remedial Action Progress Report
Third Quarter 2024
in Support of Hazardous Waste Permit #50284
and Pantex Plant Interagency Agreement
for the Pantex Plant, Amarillo, Texas
December 2024**

Prepared by
PanTeXas Deterrence, LLC
Management and Operating Contractor
for the
Pantex Plant
with the
U.S. Department of Energy
National Nuclear Security Administration

In accordance with 30 TAC §335.553 (g), this report has been prepared and sealed by an appropriately qualified licensed professional engineer or licensed professional geoscientist.





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12/18/2024
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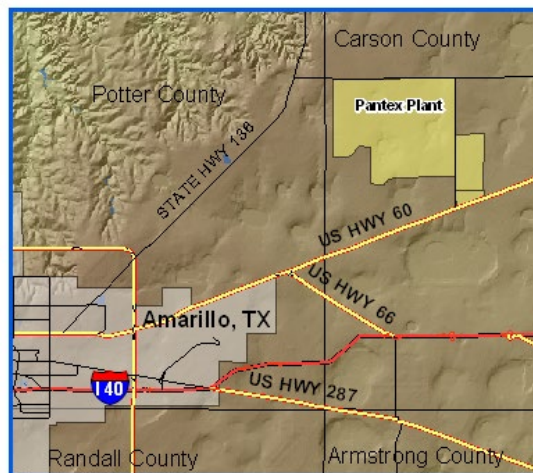
LIST OF ACRONYMS

6:2FTSA	1h,1h,2h,2h-Perfluorooctane Sulfonic Acid
µg/L	micrograms per liter
COC	contaminant of concern
CP	Compliance Plan
Cr(VI)	hexavalent chromium
CR8	County Road 8
DCE	dichloroethene
DNT2A	2-amino-4,6-dinitrotoluene
DNT4A	4-amino-2,6-dinitrotoluene
EPA	United States Environmental Protection Agency
ETA	Eurofins Test America
FGZ	fine-grained zone
GEL	General Engineering Laboratory
GWPS	groundwater protection standard
HE	high explosive
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
ISB	<i>in situ</i> bioremediation
ISPM	<i>in situ</i> performance monitoring
lbs	pounds
MCL	Maximum Contaminant Level
MEW	mobile extraction well
Mgal	million gallons
MXN	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine
mV	millivolts
ND	not detected
ORP	oxidation-reduction potential
P1PTS	Playa 1 Pump and Treat System
PCL	Protective Concentration Level
PCR	Perchlorate/Chromium
PFAS	per- and polyfluoroalkyl substances
PQL	practical quantitation limit
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
REC	recirculation well
SAP	Sampling and Analysis Plan
SCADA	Supervisory Control and Data Acquisition
SE ISB	Southeast <i>In Situ</i> Bioremediation
SE ISB EXT	Southeast <i>In Situ</i> Bioremediation Extension
SEPTS	Southeast Pump and Treat System
SVE	soil vapor extraction
TAC	Texas Administrative Code
TCE	trichloroethene

TCEQ	Texas Commission on Environmental Quality
TNX	hexahydro-1,3,5-trinitroso-1,3,5-triazine
TZM	treatment zone monitoring
VOC	volatile organic compound
WWTF	wastewater treatment facility
Z11 ISB	Zone 11 <i>In Situ</i> Bioremediation

INTRODUCTION

The Pantex Plant, located in the Texas Panhandle 17 miles northeast of Amarillo, has implemented a response action to remediate perched groundwater and soils. Two types of systems have been installed for the groundwater response action: pump and treat systems in two areas and *in situ* bioremediation (ISB) systems in four areas. A soil vapor extraction (SVE) system was used to remediate volatile organic compounds (VOCs) in soils at the Burning Ground area. The SVE system is closed, but groundwater monitoring will continue in the area to evaluate the long-term effectiveness of the SVE. This quarterly report addresses progress achieved through implementation of the remedial actions for third quarter of 2024.



This report provides an intermediate data summary for response action systems throughout the year. More intensive data reporting is included in the annual progress reports. The quarterly progress reports address three of the five evaluations included in the annual progress reports: response action effectiveness, uncertainty management, and early detection. The reports provide information required by Hazardous Waste Permit #50284 CP Table VII and the Pantex Interagency Agreement.

Maps of the plumes, remedial action systems, sampling locations, and system wells are provided in Appendix A. Graphs of operation and flow rates for the pump and treat systems are provided in Appendix B. Graphs of important parameters for the ISB treatment zone and downgradient wells are provided in Appendix C.

RESPONSE ACTION EFFECTIVENESS

This quarterly progress report focuses on specific criteria for the pump and treat systems and ISB systems. System operation, mass removal, and evaluation of effluent in reference to established operational goals are reported for the pump and treat systems. For the ISB systems, this report evaluates geochemical conditions and availability of food source in the treatment zone and reduction of concentrations of contaminants of concern (COCs) in downgradient performance monitoring wells to evaluate whether the treatment zone is working effectively.

PUMP AND TREAT SYSTEMS

The groundwater remedial action at the Pantex Plant includes two pump and treat systems: Southeast Pump and Treat System (SEPTS) and Playa 1 Pump and Treat System (P1PTS). The pump and treat systems are designed to extract water and remove contaminant mass from the water before the effluent is beneficially used for irrigation, general Plant needs, and/or for amendment injections at the ISB systems. The systems were also designed to remove water from the perched aquifer to reduce saturated thickness. This reduction in saturated thickness reduces migration of contaminants both vertically and horizontally so that natural breakdown processes can occur over time. Reducing migration provides protection for the underlying High Plains Aquifer (also known as and referred to herein as the Ogallala Aquifer). In addition to release of water to all beneficial use outlets, SEPTS has the capability to inject the treated water back into the perched aquifer when beneficial use is not possible. P1PTS can release water to the pivot irrigation system directly or to the wastewater treatment facility (WWTF) storage lagoons, which can discharge to Playa 1 or a subsurface drip irrigation system. Operational priorities for the pump and treat systems emphasize beneficial use of water. Operational goals were redeveloped in 2023 to also emphasize the operation of the SEPTS and reduce or shut down operation of P1PTS when water outlets are limited. Those goals were approved by the Texas Commission on Environmental Quality (TCEQ) and the Environmental Protection Agency (EPA) in 2023.

The subsurface drip irrigation system was not utilized during the third quarter of 2024. Operation of the subsurface system is, and will continue to be, hindered by limited storage capacity due to ongoing construction of repairs to the Plant’s WWTF storage lagoons. During periods the drip irrigation system is unavailable, Pantex continues to release WWTF water to Playa 1 as approved in the TCEQ wastewater permit (WQ0002296000). However, the permit restricts the amount of water that can be released to the playa, so pump and treat throughput is reduced if other outlets are not available for use. An irrigation alternative on the property east of FM 2373 provides additional long-term and beneficial use of the treatment system water. This system was utilized as an outlet for both systems during the third quarter.

During the third quarter, the SEPTS operated at a higher capacity using ISB injection, release to the Pivot Lagoon, and injection into the Playa 2 injection well field. The throughput for SEPTS was at

Pump and Treat System Third Quarter 2024 Operation	
<i>Playa 1 Pump and Treat System (P1PTS)</i>	
Days Operated	64
% Operation Time	65%
Volume Water Treated (Mgal)	18
HE Mass Removal (lbs)	4.7
Beneficial Use of Water	88%
<i>Southeast Pump and Treat System (SEPTS)</i>	
Days Operated	90
% Operation Time	98%
Volume Water Treated (Mgal)	33.6
HE Mass Removal (lbs)	92.1
Chromium Mass Removal (lbs)	14.2
Perchlorate Mass Removal (lbs)	12.1
Beneficial Use of Water	24.0%
<i>*Value below operational goals</i>	

98% of design, exceeding the goal of 90% during the third quarter. SEPTS was shut down during a small period of time for a scheduled granular activated carbon exchange in late August. The ability to efficiently run the SEPTS resulted in a large amount of treated water that required an outlet. A majority of the treated water was sent to the Playa 2 injection well field due to limited capacity at the Pivot and WWTF lagoons. Some treated water was used beneficially for ISB injection and irrigation which resulted in 24% beneficial reuse of treated outflow. P1PTS operated for 65% of the quarter in accordance to the redesigned operational goals that prioritize the operation of SEPTS when treated water outlets are limited. The system was shut down completely during the month of July due to the limited capacity at the Pivot System and WWTF lagoons that was caused by

continuing WWTF lagoon repairs and heavy rains that occurred in late July. P1PTS was able to fully operate in August and September and was only interrupted by one scheduled granular activated carbon exchange in mid-August.

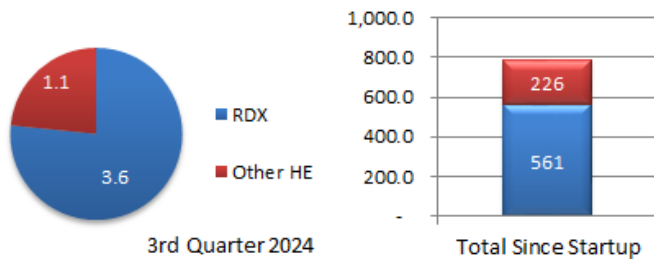


Figure 1. P1PTS Mass Removal

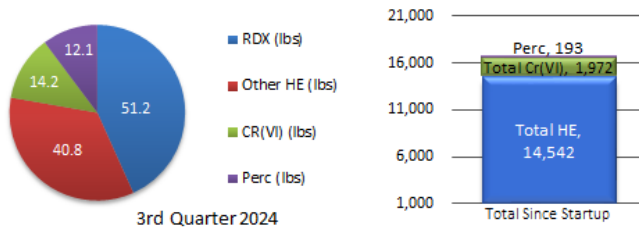


Figure 2. SEPTS Mass Removal

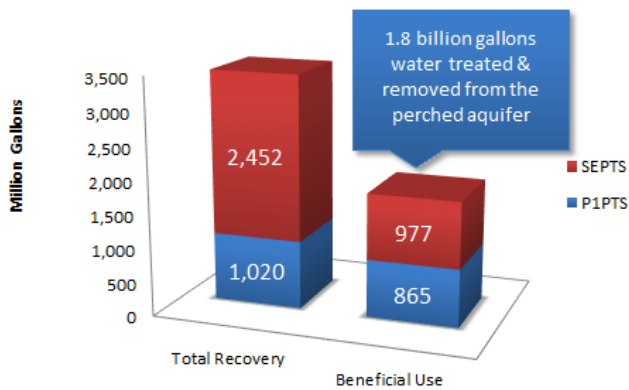


Figure 3. System Recovery and Use

Graphs of monthly operation and throughput are included in Appendix B. The SEPTS wellfield had two wells that were repaired in July and five wells that were repaired in September. Two other wells were locked out in September to perform repair. An additional six wells experienced communication failures during the third quarter. Repairs are expected to be complete before the end of fourth quarter. P1PTS had two wells that were repaired in the month of September resulting in the operation or operational readiness of all wells at that system.

Together the systems treated about 51.6 million gallons (Mgal) during the third quarter. P1PTS primarily treats RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) and other high explosives (HEs), and SEPTS primarily treats RDX and other HEs, hexavalent chromium [Cr(VI)], and perchlorate. Figures 1 and 2 provide mass removal information for RDX and HEs, Cr(VI), and perchlorate for the third quarter, as well as totals since system startup. Concentrations near Playa 1 are much lower due to declining source

concentrations resulting in reduced mass removal at P1PTS. Overall, the systems have removed over 17,494 pounds (lbs) of HEs, chromium, and perchlorate contaminants from perched groundwater since operations began.

As discussed in the *2023 Annual Progress Report* (June 2024), Pantex began investigating the presence of per- and polyfluoroalkyl substances (PFAS) in the perched groundwater pump and treat systems. Due to very low concentrations of PFAS at both systems, mass removal is only calculated to be approximately one pound per year at each system; therefore, PFAS is not tracked in the mass removal totals.

The total recovery and treatment from both systems since startup has been calculated at about 3.5 billion gallons. Because SEPTS was originally designed to inject treated water, all of the treated water prior to 2005 was injected. However, a significant volume of treated water has been used beneficially since 2005, with a total of over 1.8 billion gallons of treated water beneficially used since startup of the subsurface irrigation system. The recovery and beneficial use totals are presented in Figure 3. Portions of the SEPTS effluent was sent to the pivot irrigation lagoon and the Zone 11 ISB for beneficial reuse. The majority of P1PTS flow was sent to the center pivot irrigation system in the third quarter and those totals were included in the beneficial use numbers. Evaluation of effluent data from SEPTS and P1PTS indicates that all COCs were treated to levels below the groundwater protection standard (GWPS). Detected PFAS are treated below current Texas Risk Reduction Protective Concentration Levels (PCLs) or newly promulgated drinking water Maximum Contaminant Levels (MCLs). One detected PFAS, 1h,1h,2h,2h-perfluorooctane sulfonic acid (6:2FTSA), has no PCL or MCL available.

ISB SYSTEMS

Four ISB systems (Zone 11 ISB, Southeast ISB, Southeast ISB Extension, and Offsite ISB) were operating at Pantex during the third quarter of 2024. The systems are designed with closely spaced wells to set up a treatment zone in areas of the perched groundwater where pump and treat may not be as effective, or where the area is sensitive to vertical migration of COCs to the Ogallala Aquifer. Amendment is injected into these systems to establish treatment zones where COCs are degraded. Monitoring wells are installed downgradient of the treatment zone to monitor whether the system is effectively degrading the COCs (see maps in Appendix A). The primary COCs at the Zone 11 ISB are trichloroethene (TCE) and perchlorate. The primary COCs at the Southeast ISB are RDX and Cr(VI). The primary COC at the Southeast ISB Extension and the Offsite ISB is RDX.

The following section provides an understanding of the expected conditions at the ISB systems and downgradient concentrations of COCs. For the treatment zone wells, this report evaluates whether the conditions are present, including oxidation-reduction (i.e. redox) potential (ORP) and the reduction of electron acceptors (i.e. dissolved oxygen and nitrate), to degrade the COCs in each area. The presence of gases, such as methane, can also be an indication of deeper reducing conditions. The presence of a continued food source (total organic carbon) for the microbial reduction of COCs is also evaluated. Strong reducing conditions (ORP below -50 millivolts (mV) to reduce RDX and TCE and near 0 mV to reduce hexavalent chromium and perchlorate) are required to adequately reduce COCs. Figure 4 presents the redox ranges for the reduction of various COCs. Dissolved gases,

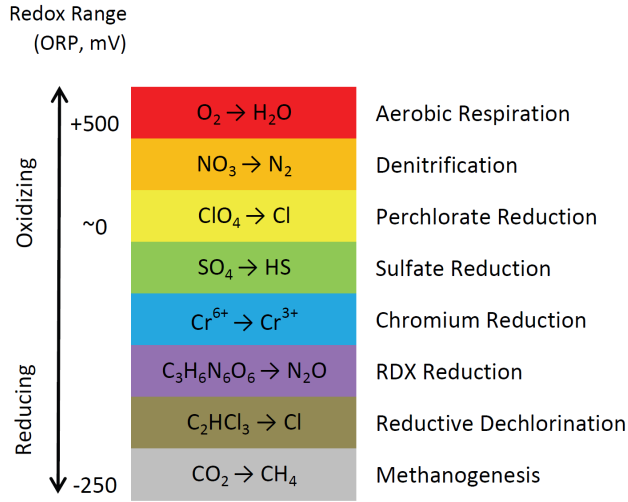


Figure 4. Redox Range for COCs

redox potential, nitrate, and TOC are evaluated in the ISB treatment zone performance wells to determine if the treatment zone is rebounding to baseline conditions, thus requiring amendment injection.

Downgradient monitoring wells are evaluated to determine if the ISB systems are effective in degrading the COCs and any breakdown products of the COCs. Graphs of data from sampled treatment zone wells and downgradient *in situ* performance monitoring (ISPM) wells are included in Appendix C.

ISB INJECTION ACTIVITIES

Sampling of the ISB systems has been reduced to a semi-annual frequency. As system data are not always available for quarterly evaluation, only new and complete data sets for each system will be assessed during the current quarter. During the third quarter, only the Southeast ISB was sampled completely, so data will be reported for only that system in this report. Table 1 summarizes the injection activities for 2024. Injection activities were continued at the Zone 11 ISB and the Offsite ISB in the third quarter, while well maintenance activities and injections were completed at the Southeast ISB Extension.

Table 1. ISB Systems Activities

Month (2024)	SE ISB EXT	SE ISB	Z11 ISB	Offsite ISB ¹
January				
February				
March				Injection/Sample
April	Sample	Sample	Rehab/Sample	Injection/Sample
May	Sample	Sample	Rehab/Sample	Injection
June			Injection	
July	Rehab/Injection		Injection	
August	Injection	Sample	Injection	Injection
September		Sample	Injection	Injection/Sample
October	Sample		Injection/Sample	Injection/Sample
November	Sample		Injection/Sample	Injection
December	Sample		Injection/Sample	Injection/Sample

¹All sampled wells in the Offsite ISB are extraction wells (REC) and (MEW) and are not injected; therefore, injection will not affect the sampling of the REC and MEW wells.

SE ISB EXT = Southeast ISB Extension

SE ISB = Southeast ISB

Z11 ISB = Zone 11 ISB

SOUTHEAST ISB REMEDIAL EFFECTIVENESS

The Southeast ISB was installed in 2007. Eight injection events have been completed at this system at the time of this report. The Southeast ISB continues to demonstrate declining water levels at the system; as a result, only 60% of the system was injected during the 2022 injection event. The inability to sample or inject into these wells is expected to persist with continued upgradient removal of water by the SEPTS. Pantex injected the system in early 2022 with molasses, as recommended in the *Fourth Quarter 2018 Progress Report*, but further injections may be limited or unnecessary.

Three injection wells and four downgradient ISPM wells were sampled at Southeast ISB during the third quarter. Two ISPM wells (PTX06-1118 and PTX06-1123) have gone dry or did not have sufficient water to be sampled. Analytical data indicate that reducing conditions continue at the treatment zone in all sampled ISB wells. All three wells have total organic carbon to allow continued treatment, although one well demonstrates a larger decline in carbon. Downgradient wells indicate that complete treatment is occurring at all but one well, PTX06-1153. PTX06-1153 indicates partial treatment, as the breakdown products of RDX are present. The concentration of RDX in this well is currently lower than the peak concentration in 2019, but concentrations are variable and average around 337 µg/L indicating that full RDX treatment may be stalled at this location. Pantex has requested removal of PTX06-1153 from permit HW-50284 so the monitor well can be used for injection. Pantex has also applied for use of this well under the underground injection control permit. Further recommendations will be made as injection occurs and more data are collected. This system is planned for injection in 2025.

BURNING GROUND SVE

The Burning Ground SVE system began operation in 2002 to clean up soil gas and residual nonaqueous phase liquids in soils for protection of groundwater resources. In August 2023, Pantex submitted a closure report for the Burning Ground SVE system since cleanup objectives were achieved. The closure report was approved by the EPA and TCEQ by the end of 2023, and the Burning Ground SVE operations were terminated. Pantex will continue to evaluate perched and Ogallala monitor wells in and near the Burning Ground for a period of time to ensure VOC concentrations do not rebound above the GWPS. Evaluation of those well data are included in the uncertainty management and early detection analysis in this report.

UNCERTAINTY MANAGEMENT AND EARLY DETECTION

Uncertainty management and early detection wells are evaluated to determine if there are unexpected conditions in areas where previous groundwater contamination has not been detected or confirmed (Ogallala and perched aquifers), or in previous plume locations where concentrations have fallen below GWPS, background, and the practical quantitation limit (PQL) (e.g., perched wells at the Burning Ground and Old Sewage Treatment Plant areas). Indicator COCs are evaluated at the uncertainty management/early detection wells in the quarterly report. A map depicting the wells evaluated is included in Appendix A.

Review of the uncertainty management/early detection data collected during the third quarter indicates unexpected conditions at two Ogallala Aquifer wells: PTX06-1056 and PTX01-1010. Detections at PTX06-1056 exceeded the respective PQLs, with one analyte exceeding the GWPS. There were no unexpected conditions at perched uncertainty management wells in the third quarter.

PTX06-1056 continues to demonstrate detections of 4-amino-2,6-dinitrotoluene (DNT4A) above the GWPS. RDX continues to be detected above the practical quantitation limit (PQL), but below the GWPS.

Summary of Unexpected Ogallala Detections at PTX06-1056, Third Quarter 2024

Well ID	Sample Date	Analyte	Measured Value (µg/L)	PQL (µg/L)	GWPS (µg/L)
PTX06-1056	7/29/2024	DNT4A	2.2	0.103	1.2
		RDX	0.628	0.103	2

In response to the detections of HEs in Ogallala Aquifer well PTX06-1056, Pantex installed three new Ogallala monitoring wells (PTX06-1223, PTX06-1224, and PTX06-1229) in 2023 to investigate nature and extent of the contamination (see Appendix A for well locations). The new wells were installed in areas identified in earlier plume modeling for being at risk of vertical contaminant migration from the perched to the Ogallala Aquifer and within the Ogallala flow path. Two wells (PTX06-1223 and PTX06-1229) also confirmed the presence of HEs, with PTX06-1229 indicating much higher concentrations. These wells were initially sampled in 2023 and early 2024 and will continue to be sampled semi-annually. PTX06-1224 was the only new 2023 Ogallala well that was sampled during the third quarter, and no unexpected conditions were observed.

PTX01-1010 is an Ogallala monitoring well that is located in the Burning Ground SVE area. Third quarter sampling results demonstrate that TCE was detected at 0.67 µg/L, below the GWPS (5 µg/L) and the PQL (1 µg/L). As a precaution, Pantex initiated a resampling event to validate this detection, though the contingency plan does not require resampling when the detection is less than the PQL. Resampling results will be discussed in the next progress report.

OTHER UNEXPECTED CONDITIONS

Pantex routinely evaluates data received from the laboratory to determine if it presents off-trend, all-time high or new detection conclusions that may require further sampling or evaluation. Through the well maintenance program, Pantex also inspects wells at least every five years to

ensure they are not silting in and to evaluate whether the well remains in contact with the formation. No unexpected conditions were noted in the third quarter.

SCHEDULE UPDATE

Pantex provided a detailed schedule of upcoming work in the *2023 Annual Progress Report*. An update of the activities scheduled to be started or completed before the publication date of this report is provided below.

Items that were completed are included below.

- ISB rehabilitation and injection at the Southeast ISB Extension was completed in September 2024.
- Pantex contracted for repair of Landfill 3. That work was completed in September 2024.
- PFAS sampling continues in accordance with the *Preliminary Per- and Polyfluoroalkyl Substances Sampling Plan* for the Pantex Plant. All planned groundwater well sampling was completed in July.
- Pantex contracted support for an evaluation of HE mass observed at PTX06-1229 and Plume Seeker fate and transport modeling to determine optimal placement of future Ogallala wells to improve understanding of the plume. This work was completed in September 2024.
- The *Sampling and Analysis Plan (SAP)* update started in late June. The SAP and LTM Design was delivered to TCEQ and EPA November 13, 2024.
- Pantex completed a design for the supervisory control and data acquisition (SCADA) replacement at the SEPTS during the third quarter.
- Pantex finished installing the new well infrastructure for the Perchlorate/Chromium (PCR) ISB.

Items that are in progress are included below.

- ISB rehabilitation and/or injection at the Offsite ISB and Zone 11 continued through the third quarter and is scheduled to be completed in December.
- Pantex contracted for installation of additional Ogallala wells to evaluate nature and extent of HE detections in PTX06-1229, new perched ISB and monitor wells, and for replacement of PTX06-1076. Drilling commenced in July and is scheduled for completion in December.
- Pantex contracted for installation of the County Road 8 (CR8) ISB wells. Well completion is anticipated in December.
- Pantex contracted for the plugging and abandonment of PTX06-1064. Pantex provided a letter, dated November 20, to TCEQ regarding the replacement of this well with PTX06-1062A. A copy was also provided to EPA.
- Pantex is currently requesting contractor proposals for the construction of pads, roads, and required conveyance for operation of the Northeast and CR8 ISBs.
- Pantex is currently requesting contractor proposals for the construction of Phase 1 and 2 of the SCADA replacement at SEPTS.
- Pantex is currently preparing sampling plans for the 2025 sampling of PFAS in perched groundwater to improve the understanding of PFAS in the uppermost groundwater.

CONCLUSIONS AND RECOMMENDATIONS FOR CHANGE

The remedial actions continue to operate and meet short-term expectations for cleanup of the perched groundwater in areas under the influence of the remediation systems. Perched water levels are declining, mass is being removed or reduced, and institutional controls provide protection from use of impacted groundwater, while the remedial actions continue to operate to meet long-term goals. Pantex is working to extend treatment systems to areas that are not currently under the influence of existing remediation systems. Pantex has completed projects to provide new injection and irrigation capabilities for treated water injection and beneficial use to ensure consistent operation of the pump and treat systems.

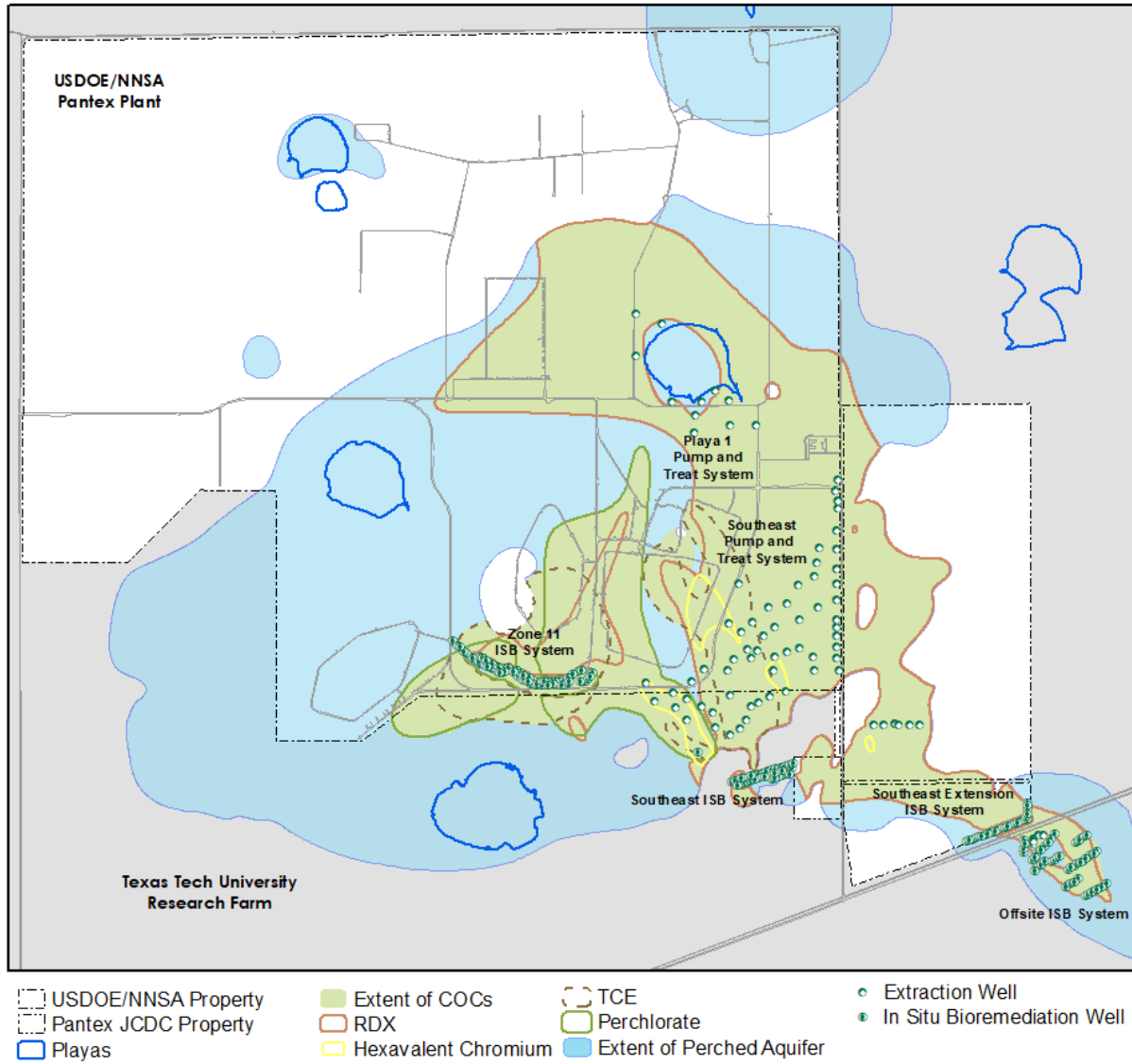
The SEPTS continued to remove COC mass and water from critical areas in the perched aquifer; thus, decreasing head that drives vertical and lateral movement of perched groundwater. P1PTS ran approximately 65% of the third quarter providing water to the pivot irrigation system and WWTF.

Monitoring results for areas downgradient of the established ISB systems continue to demonstrate that treatment has been generally effective. COC concentrations meet the GWPS at the Southeast ISB at two downgradient wells, with a third dry well having previously met GWPS. One downgradient well (PTX06-1153) for the Southeast ISB is not responding to treatment as well as the others. Pantex has recommended removing PTX06-1153 from HW-50284 so the monitor well can be used for injection. Pantex has also requested to add this well to the underground injection control permit so the well can be used for injection. Limited injection at the Southeast ISB is planned for spring 2025. Further recommendations will be made based on evaluation of data over time.

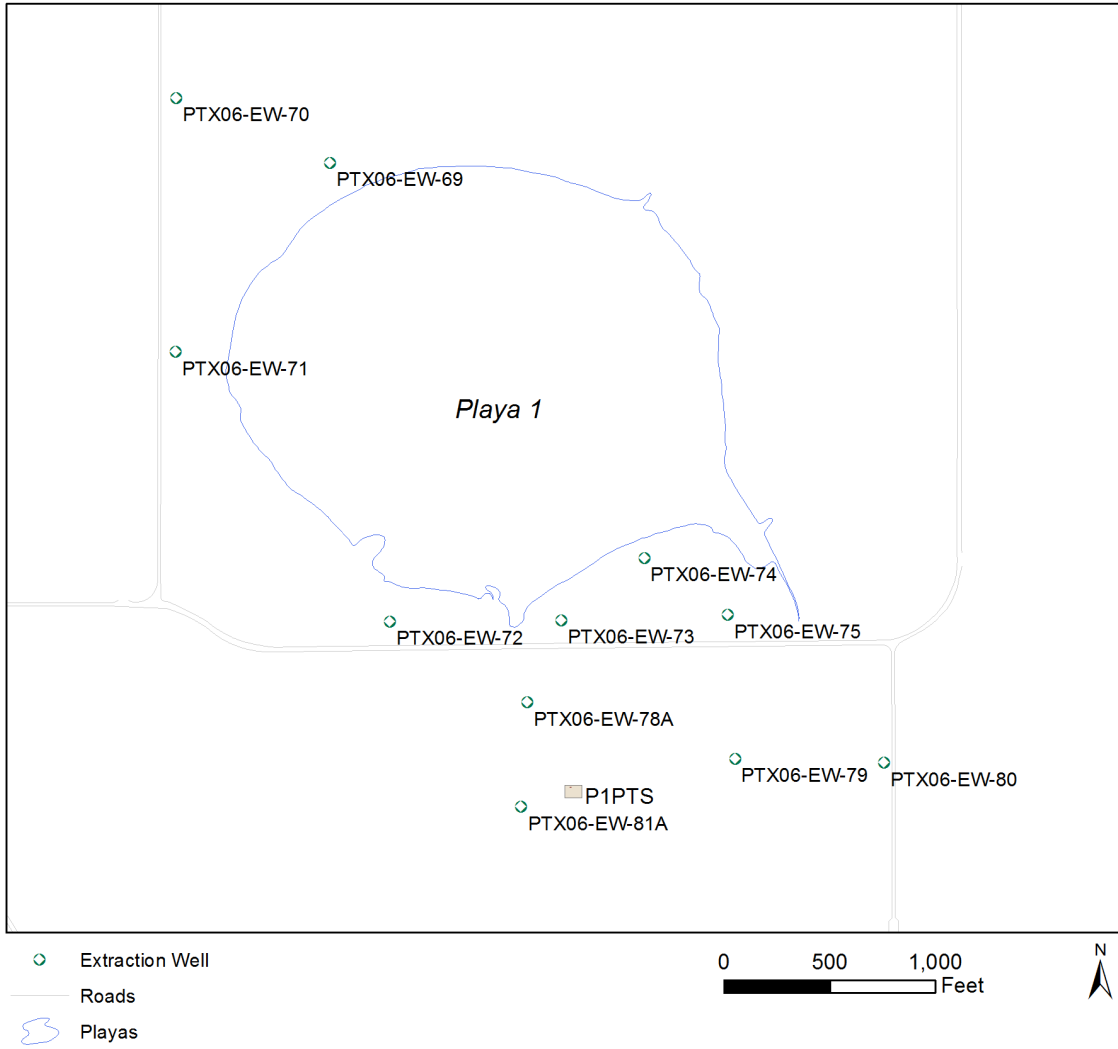
The groundwater remedies are considered protective for the short-term, as untreated perched groundwater usage is controlled to prevent human contact and monitoring data continue to indicate that the remedial actions remain generally protective of the Ogallala Aquifer. Based on review of construction logs, Pantex has plugged and abandoned PTX06-1076 and replaced it with a new well downgradient of the original location. Additional investigation of the area of the Ogallala Aquifer near PTX06-1056 began in 2023 with installation of three new monitoring wells. The *Second Quarter 2024 Progress Report* showed that initial detections at one of the new wells, PTX06-1229, indicate the presence of HEs above the GWPS. Pantex continues to evaluate the detections at this well and is currently installing additional wells to further evaluate nature and extent of the detections at PTX06-1229. The wells affected by HEs are distant from Pantex or neighboring water sources. Samples collected at other Ogallala wells near the boundary of Pantex do not indicate the presence of HEs indicating there is no endangerment of Pantex or neighboring water resources. Further actions at PTX06-1056 and PTX06-1229 will be determined based on future sampling results and in accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*.

Appendix A

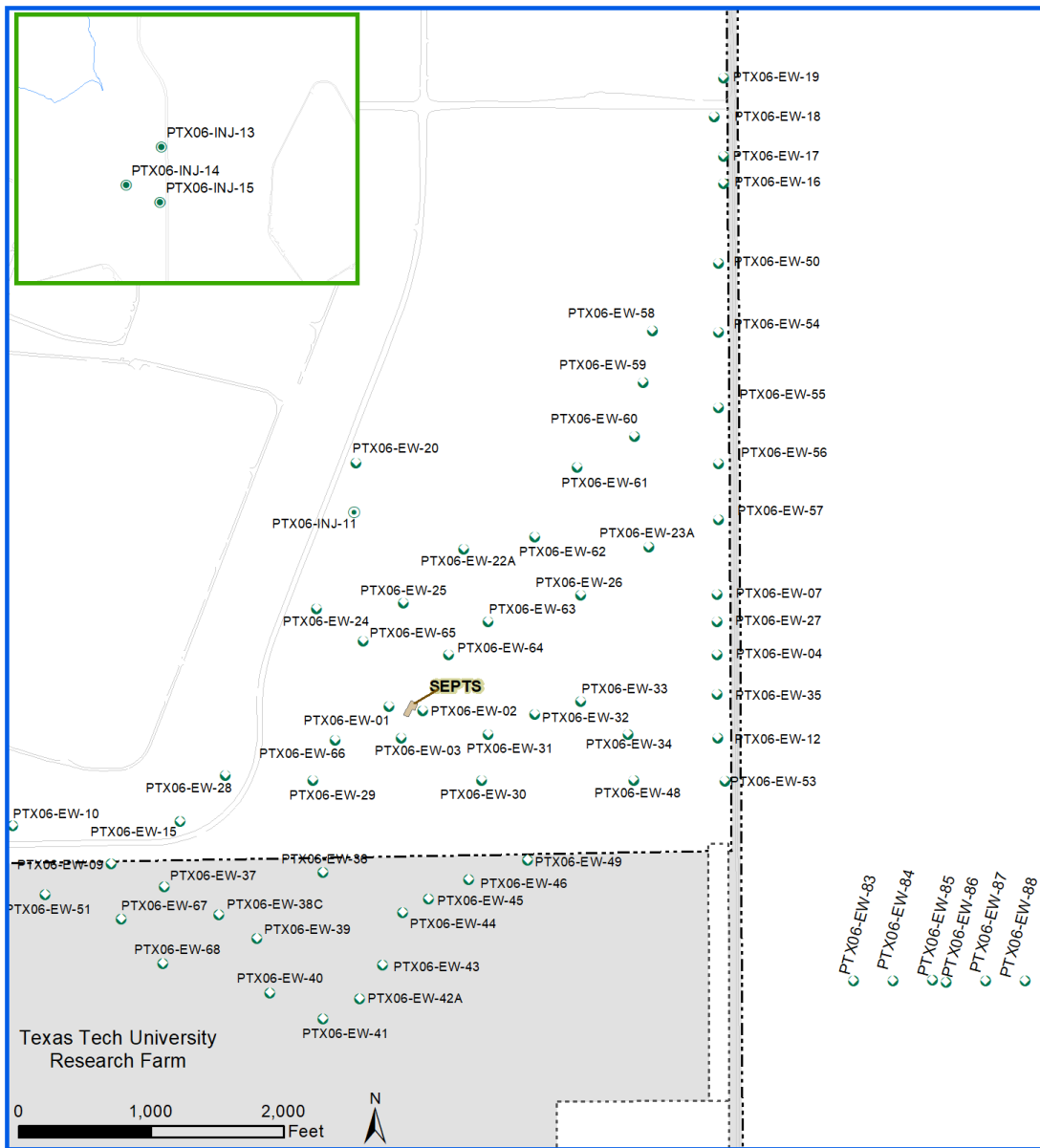
Maps



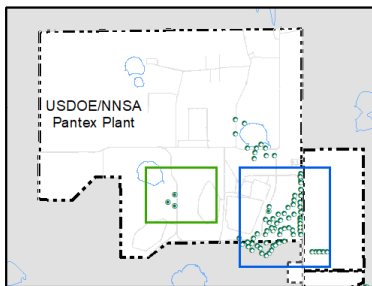
Extent of Perched Groundwater and Contaminant Plumes



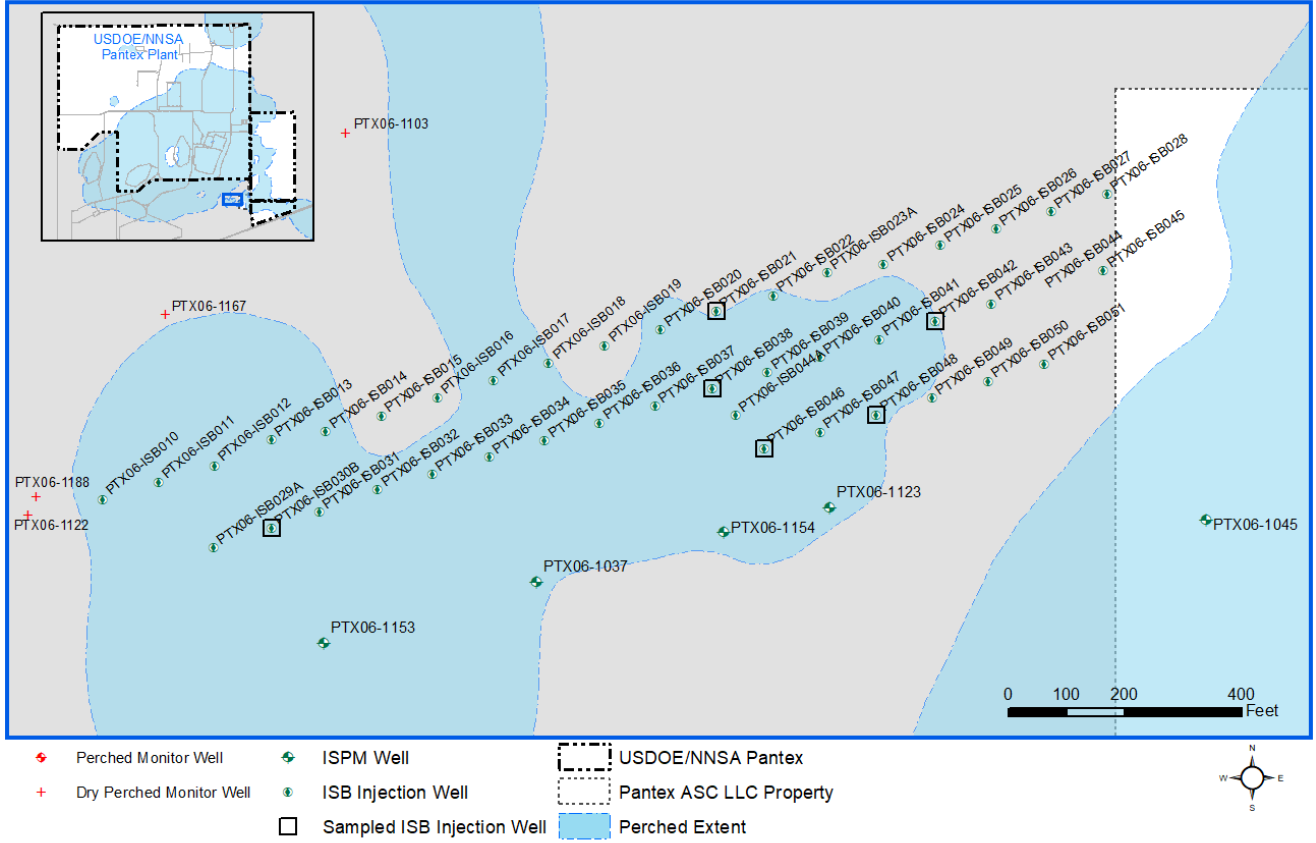
Playa 1 Pump and Treat System Wells



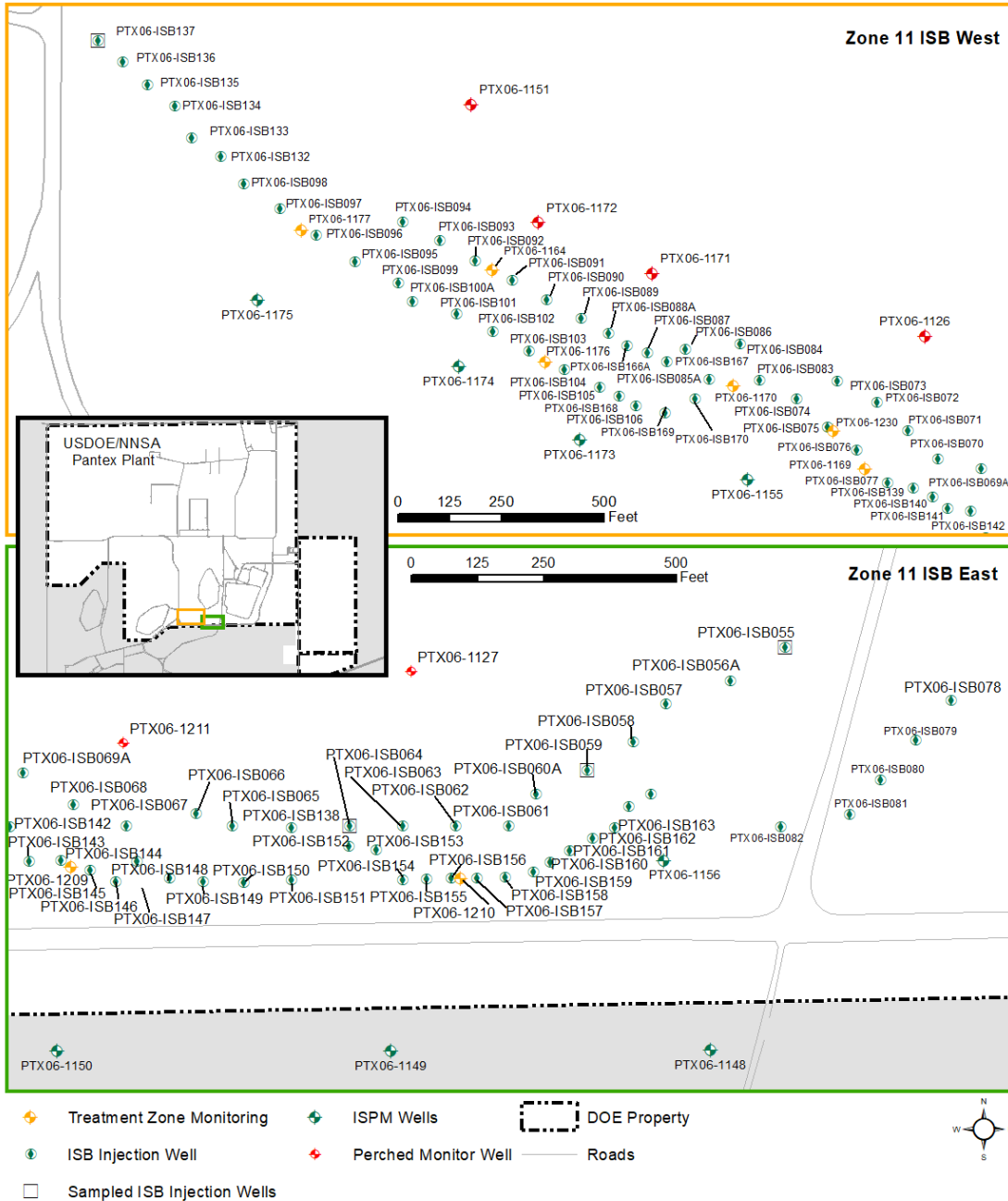
- Extraction Well
- Injection Well
- Roads
- ⋯ DOE Property
- ⋯ Pantex ASC LLC Property



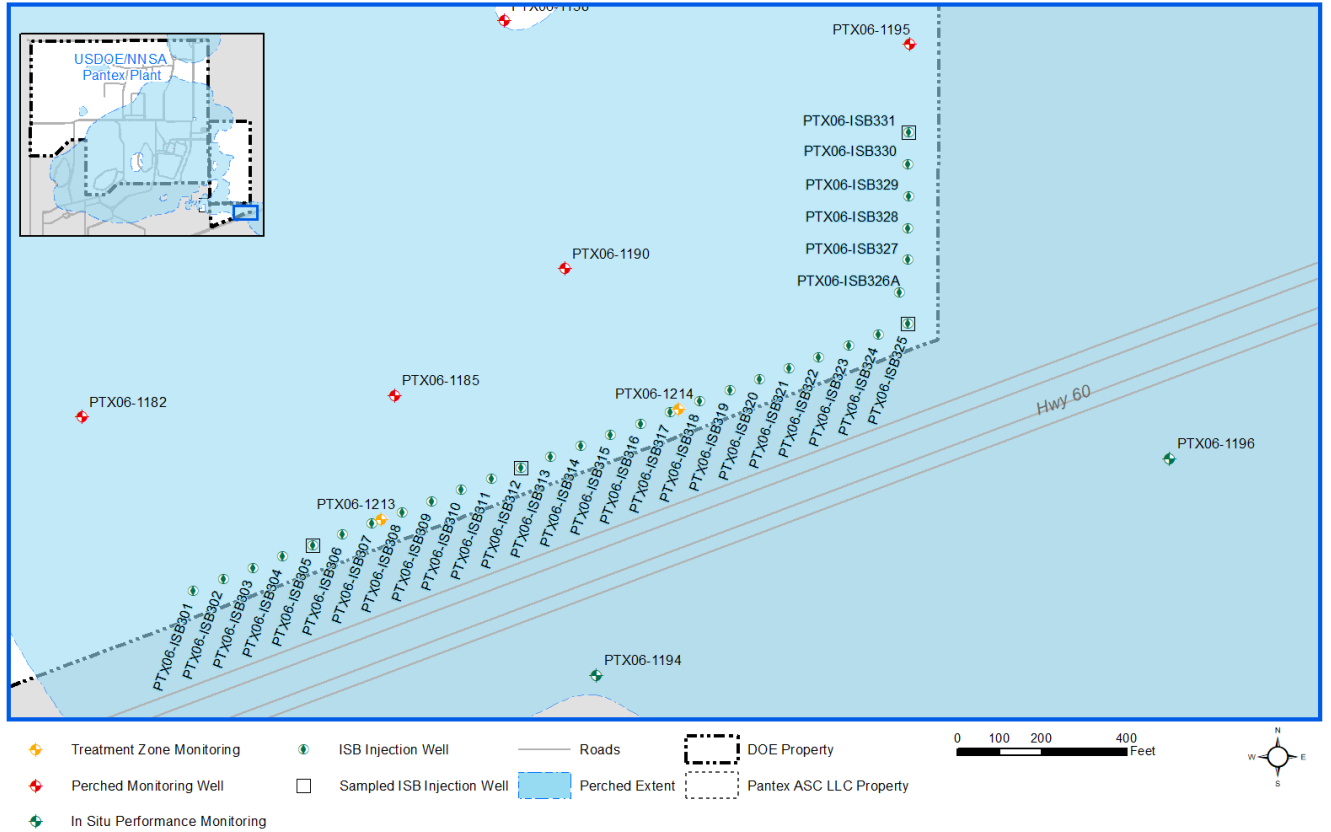
Southeast Pump and Treat System Wells



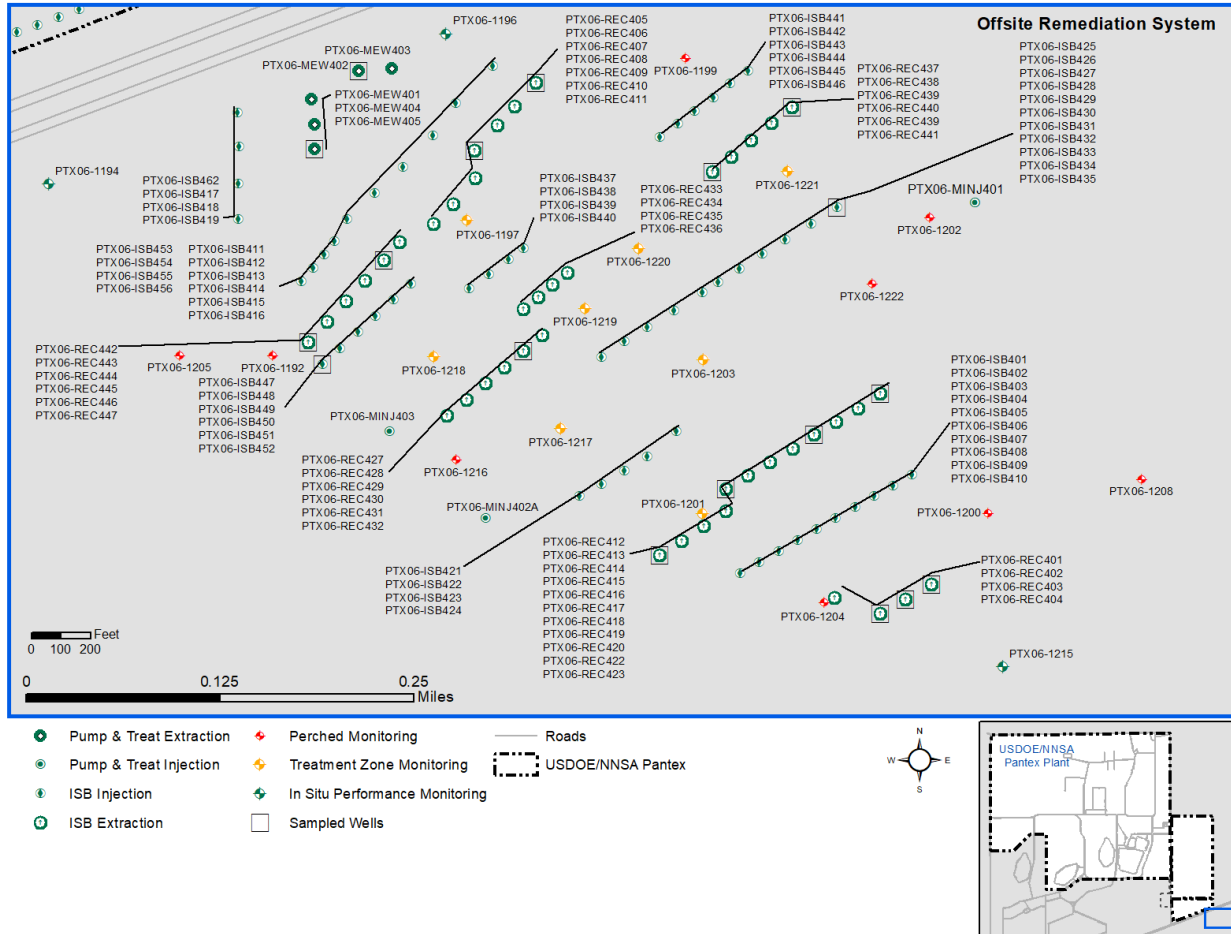
Southeast ISB Wells and Sampling Locations



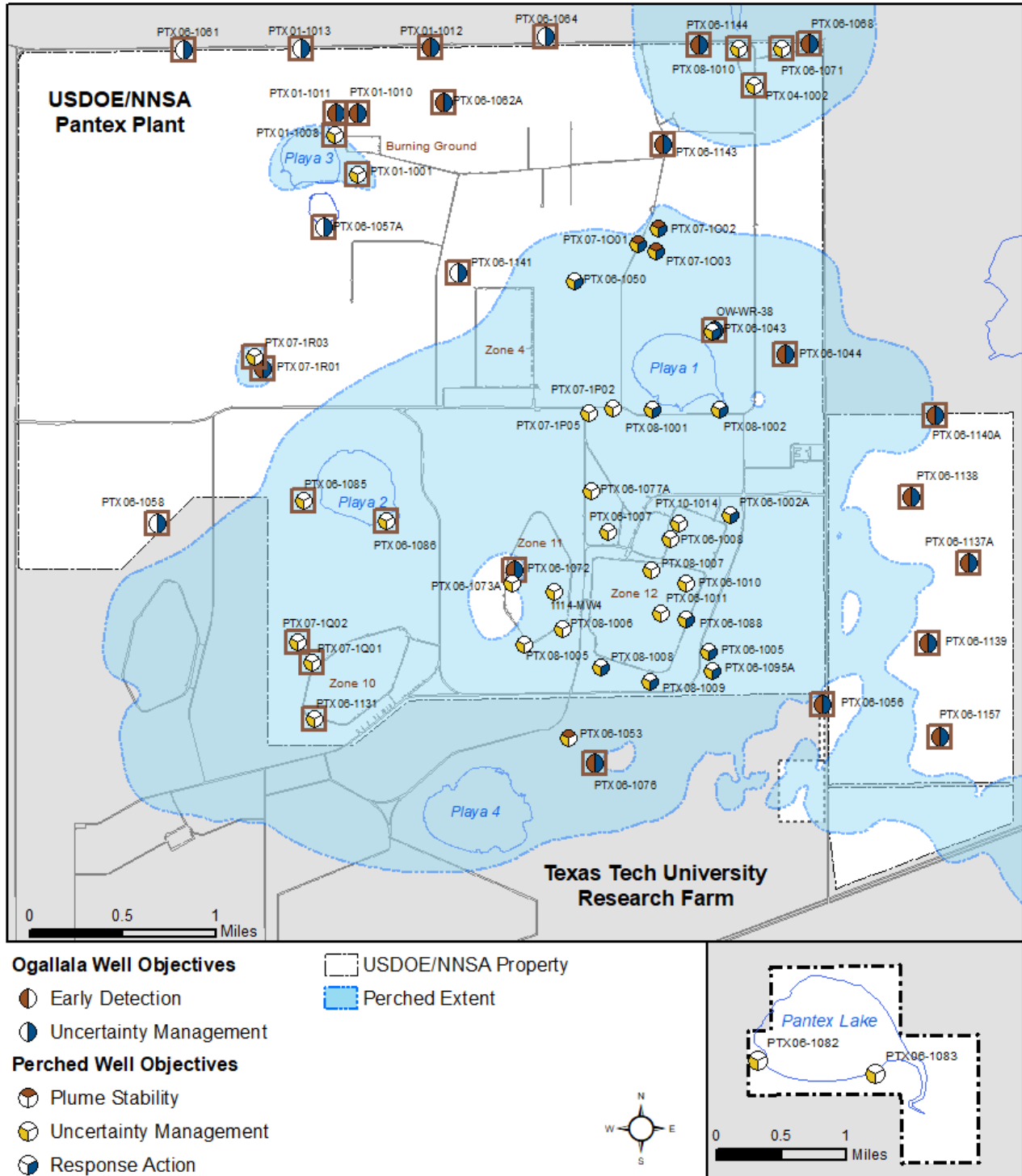
Zone 11 ISB Wells and Sampling Locations



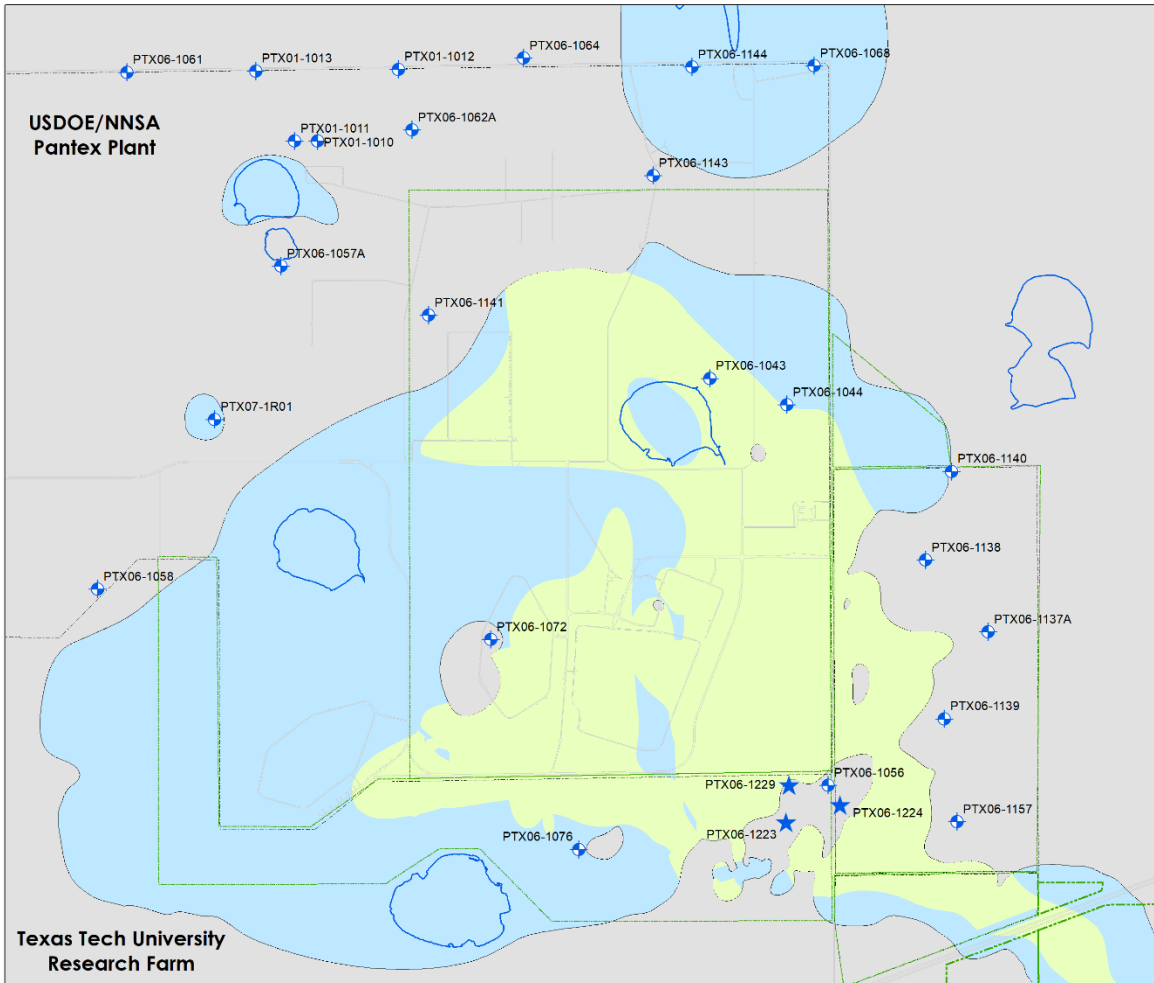
Southeast ISB Extension Wells and Sampling Locations



Offsite ISB Wells and Sampling Locations



Uncertainty Management and Early Detection Wells Evaluated in the Quarterly Progress Report



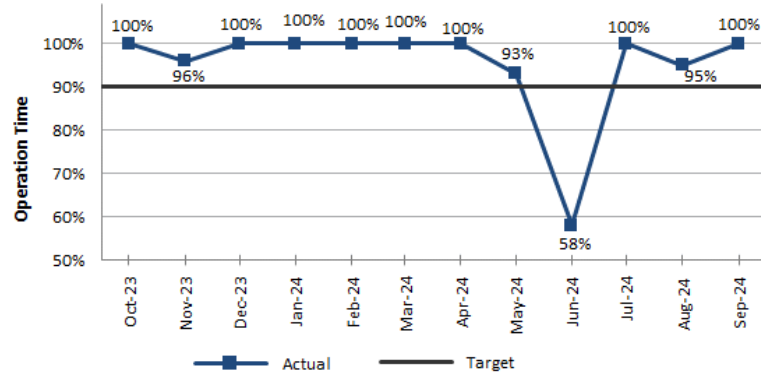
- USDOE/NNSA Property
- Extent of Perched Contamination
- Extent of Perched Aquifer
- Playas
- GW Deed Restriction Areas
- Ogallala Monitor Well
- New 2023 Ogallala Wells

Location of Ogallala Wells Installed in 2023

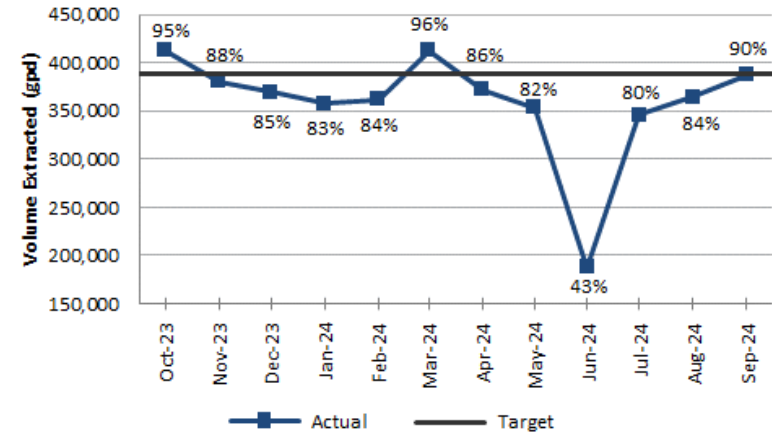
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Appendix B
Pump and Treat System Graphs

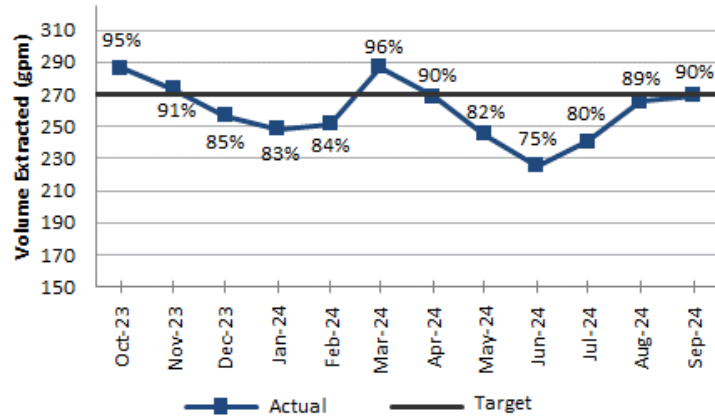
Southeast Pump and Treat System Graphs



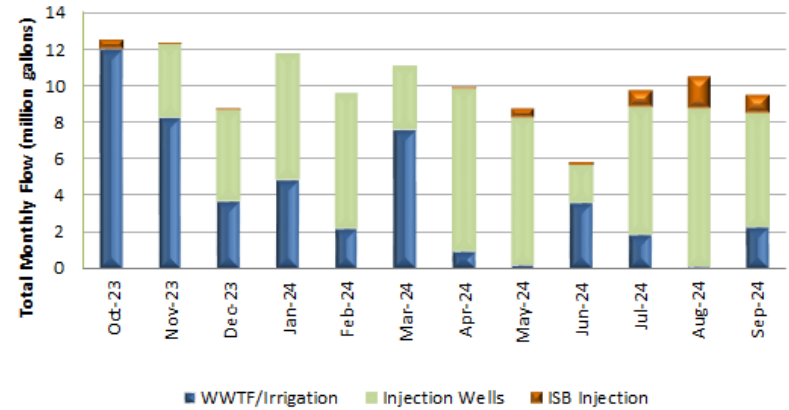
SEPTS Operation Time vs Target



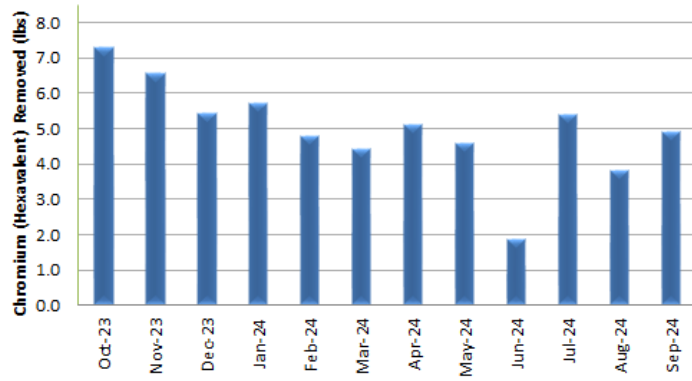
SEPTS GPD and % Capacity



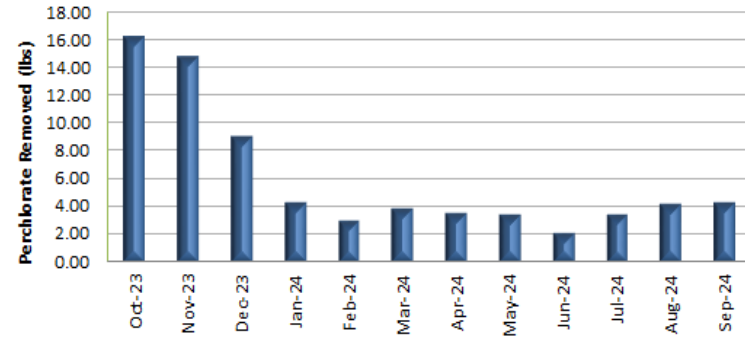
SEPTS Average GPM and % Capacity



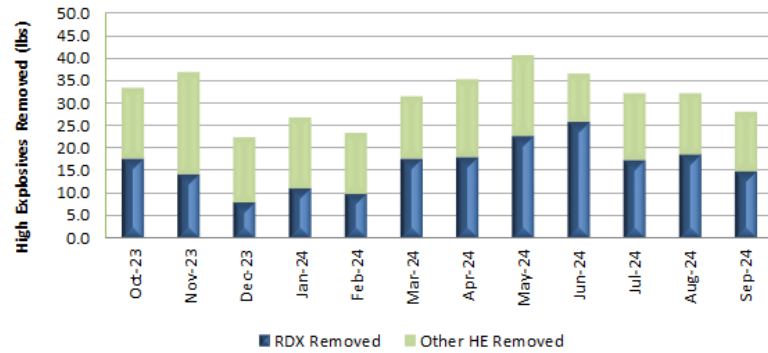
SEPTS Monthly Total Flow



SEPTS Chromium Removal by Month

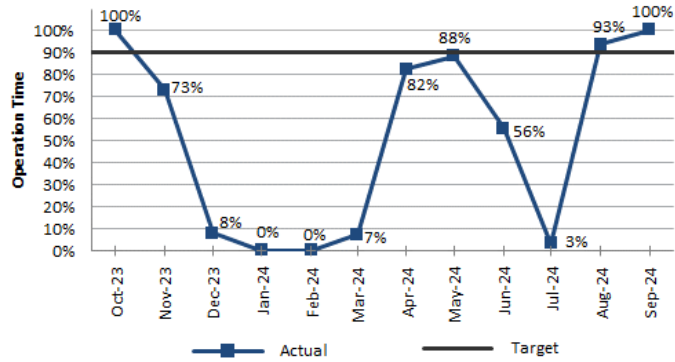


SEPTS Perchlorate Removal by Month

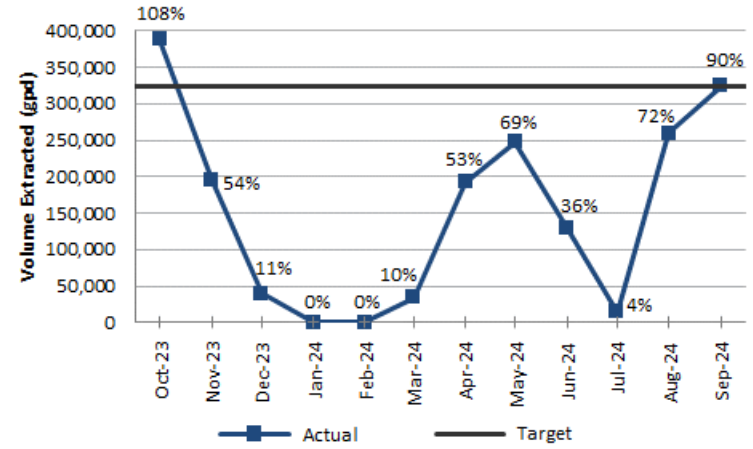


SEPTS HE Removal by Month

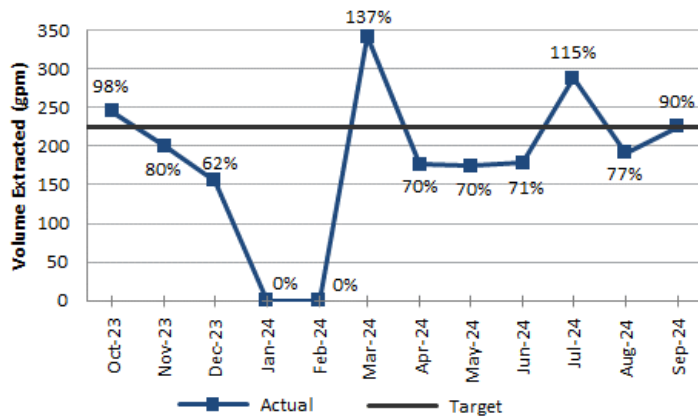
Playa 1 Pump and Treat System Graphs



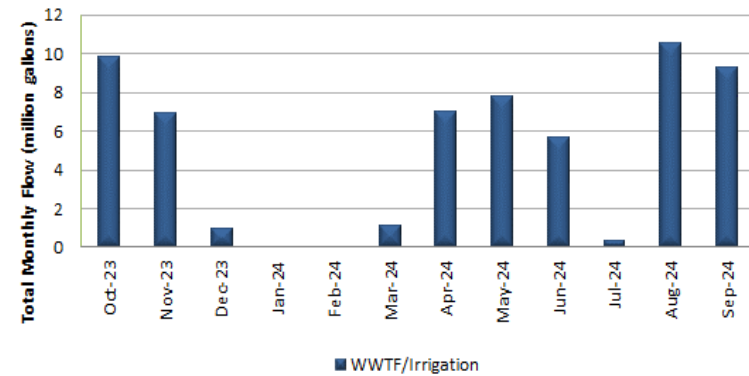
P1PTS Operational Time Vs Target



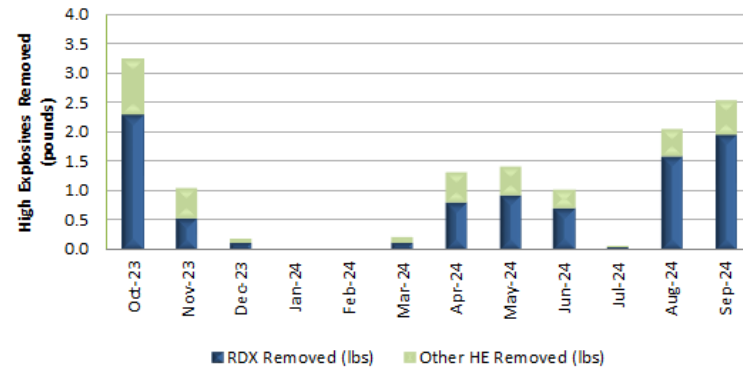
P1PTS Average GPD and % Capacity



P1PTS Average GPM and % Capacity



P1PTS Monthly System Total Flow



P1PTS HE Mass Removal by Month

Appendix B Glossary

Operation Time	Operation time represents the percentage of the total number of hours the system was actually operated vs. the total possible hours the system could have operated on a monthly basis.
GPM Extraction	The gallons per minute (GPM) extraction rate represents the extraction rate from the well field while the system was operating. This is a measurement of the well field's capability to support the overall system throughput goals. Low well field rates can occur due to inoperable wells or decline in saturated thickness that makes extraction difficult.
GPD Extraction	The gallons per day (GPD) extraction rate represents the system's ability to meet overall throughput goals, considering the well field extraction rate and the system's operational rate. This rate is affected by the ability to extract water from the well field and the system downtime.
Total Monthly Flow	Total monthly flow is the total volume of extracted water measured at the influent point of the pump and treat system. Individual well measurements and flow rates are provided in the annual progress report.

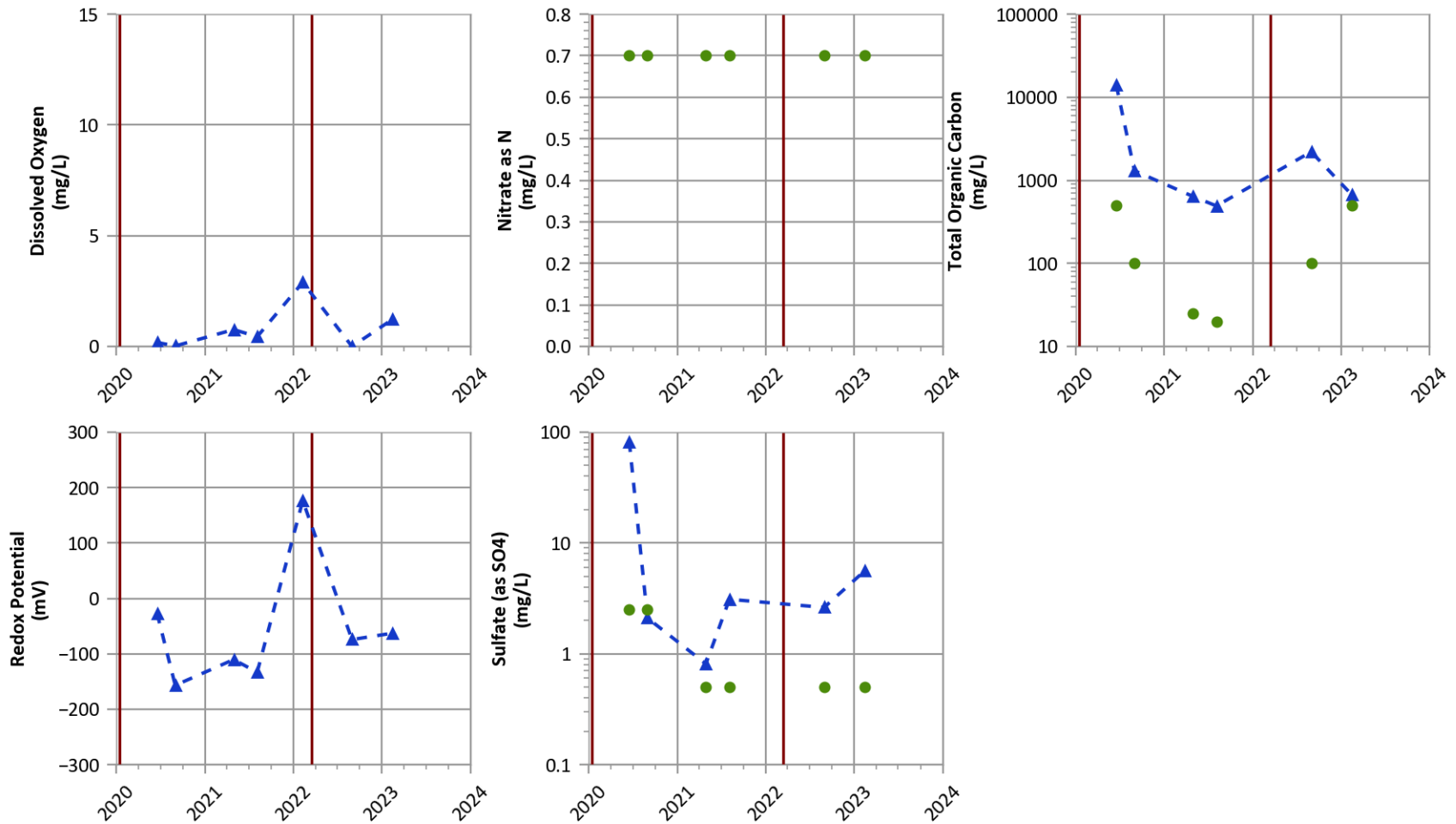
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Appendix C

ISB Graphs

Southeast ISB Graphs

**PTX06-ISB021 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



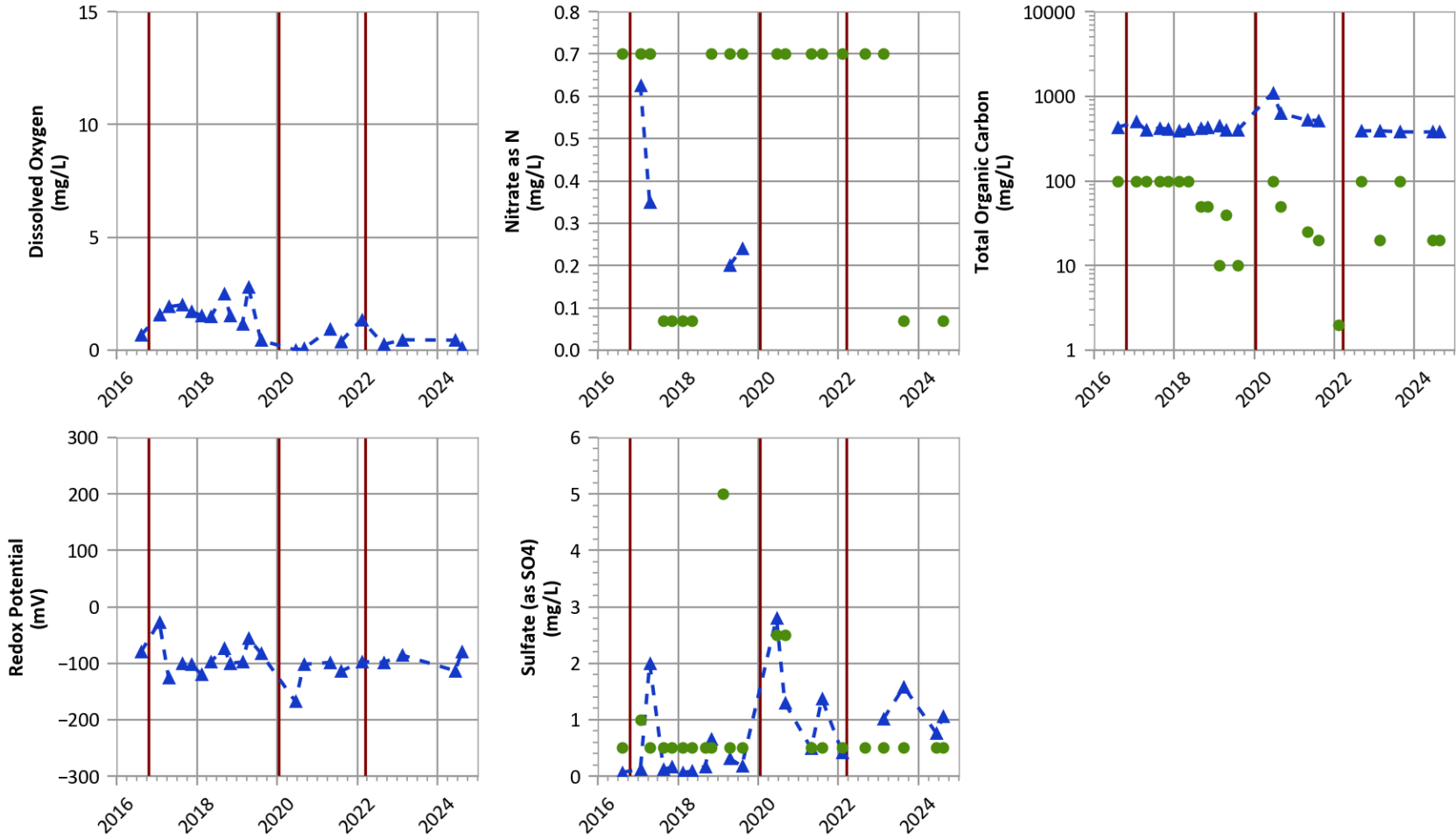
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



PTX06-ISB030B Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



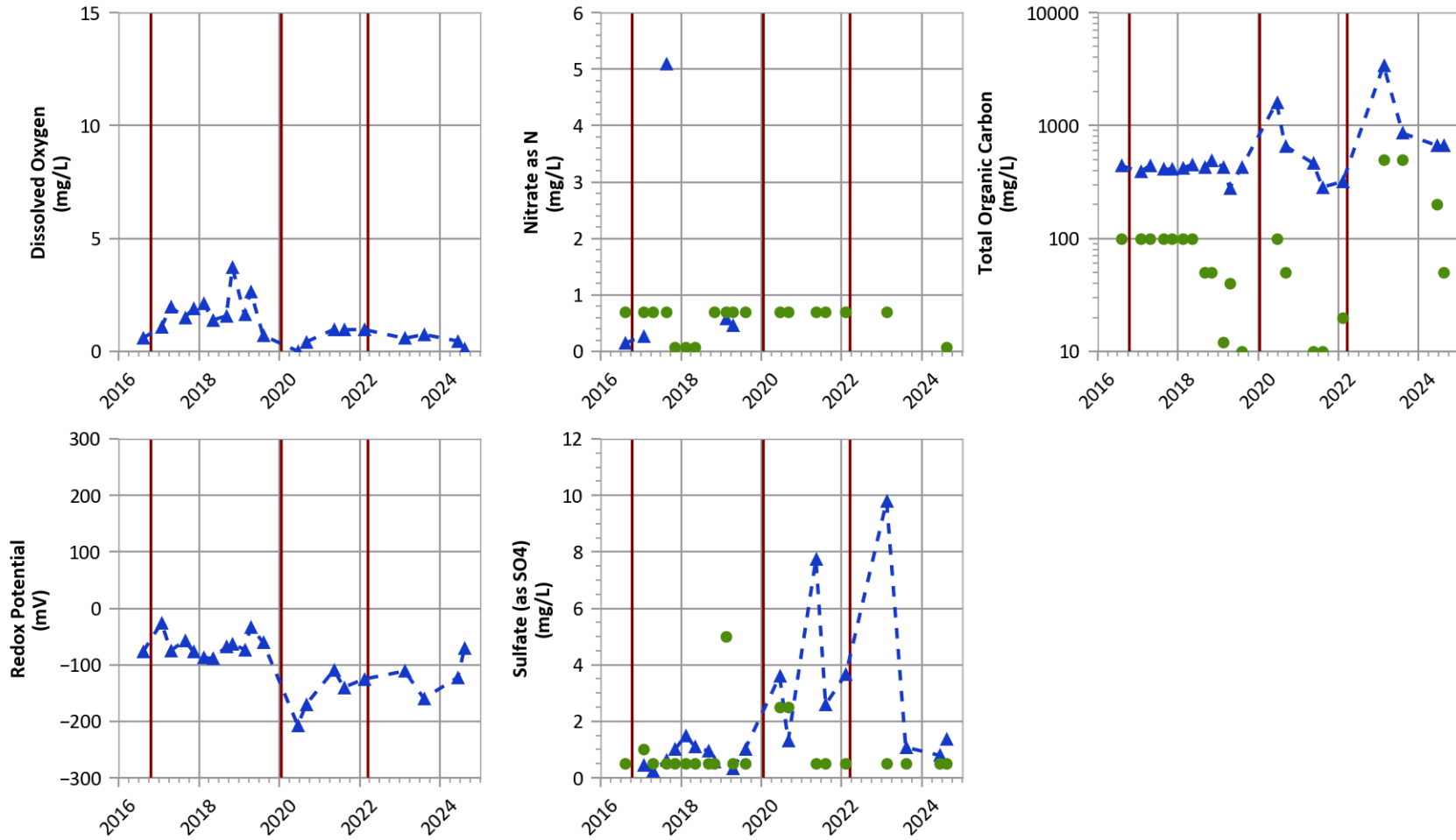
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



PTX06-ISB038 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

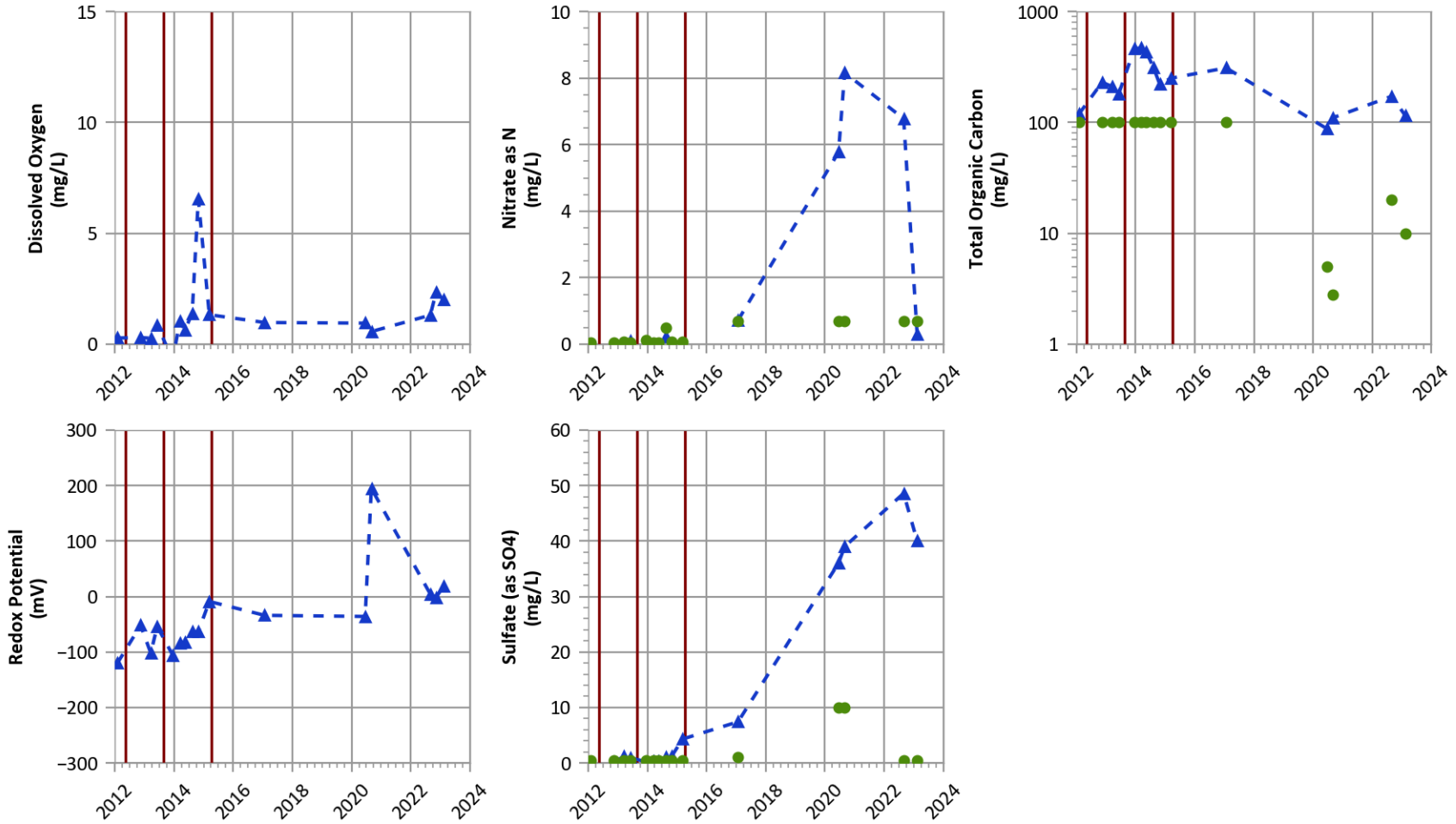


Typical Baseline Concentrations in Perched Groundwater
 Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



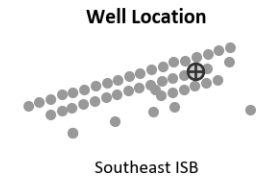
PTX06-ISB042 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



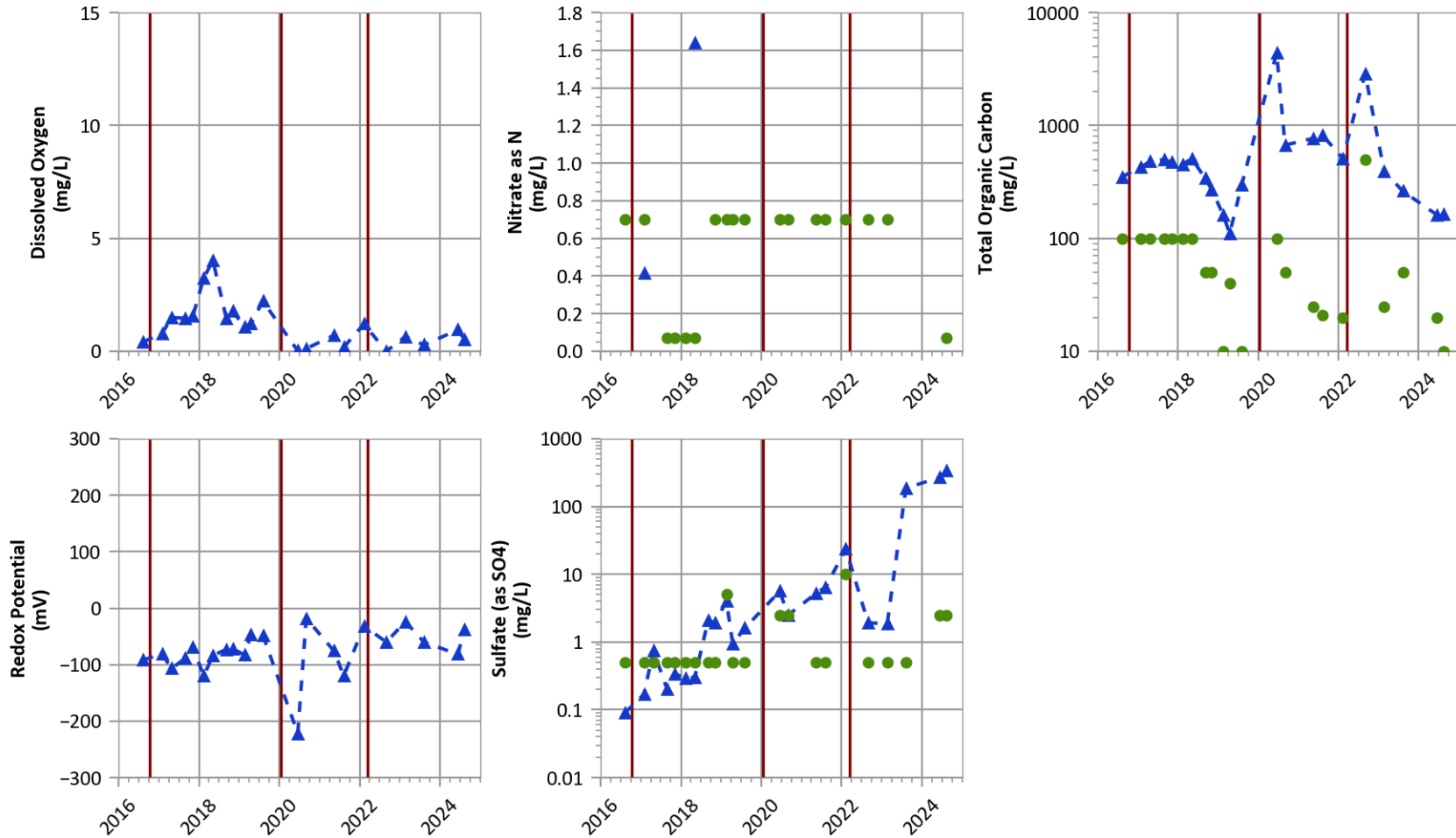
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



PTX06-ISB046 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



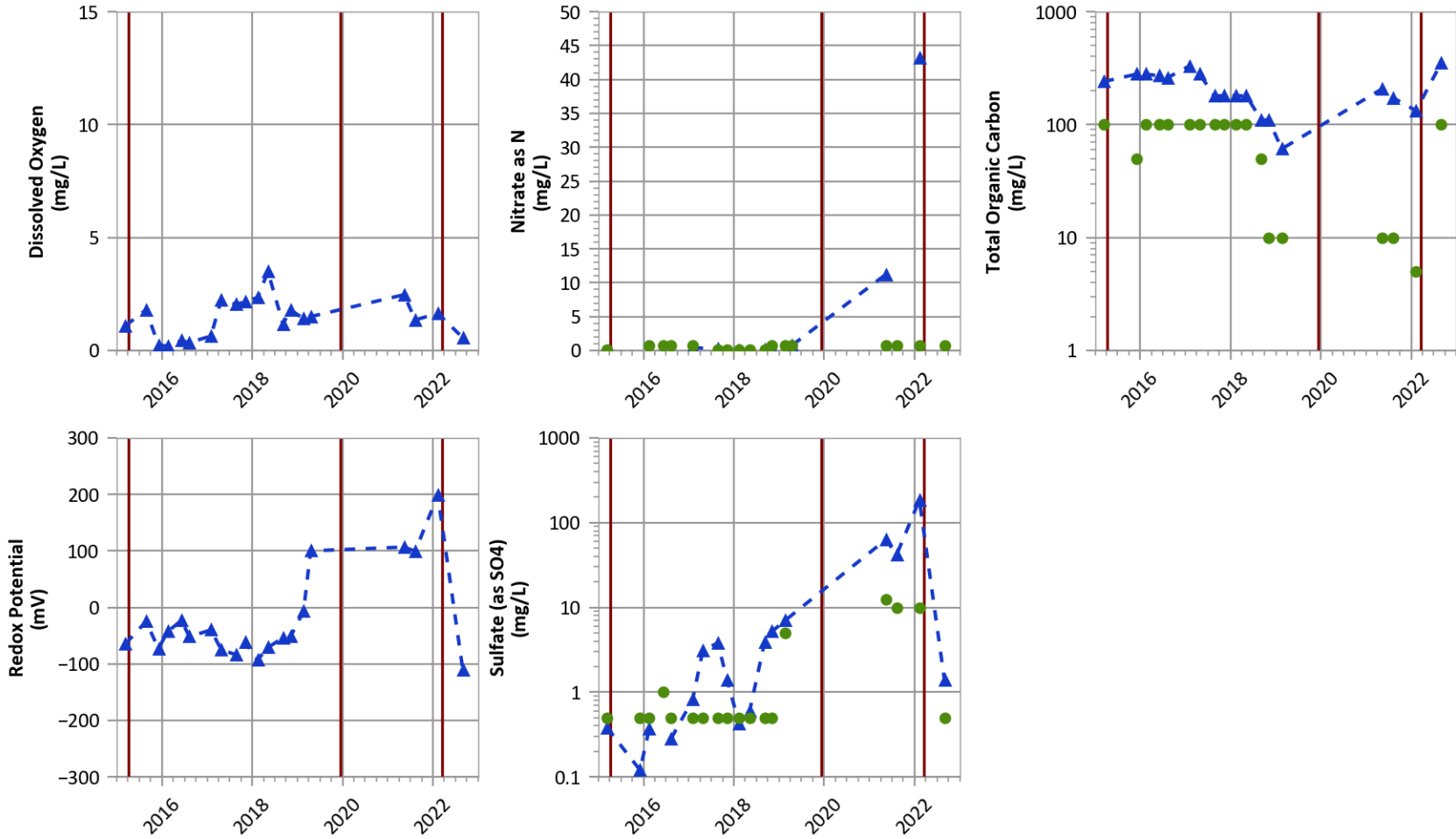
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



PTX06-ISB048 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



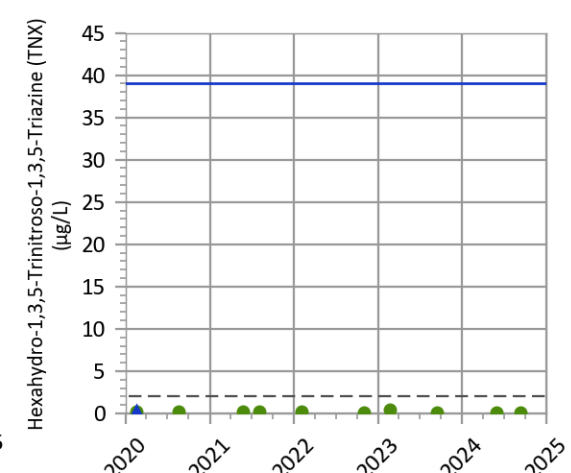
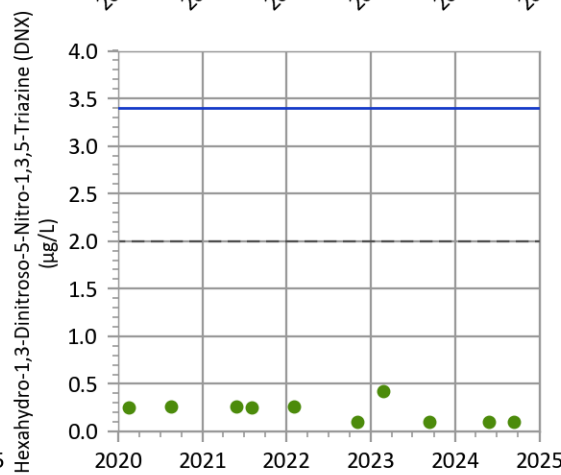
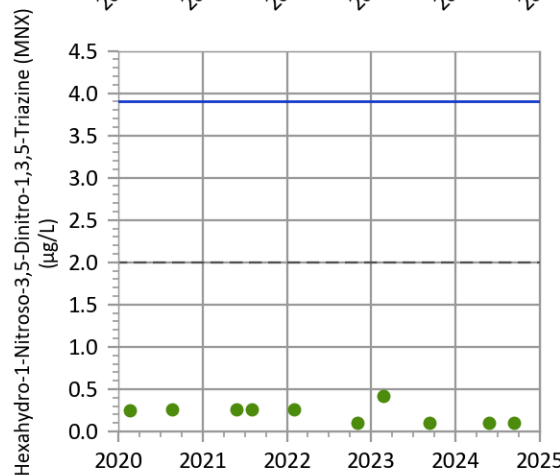
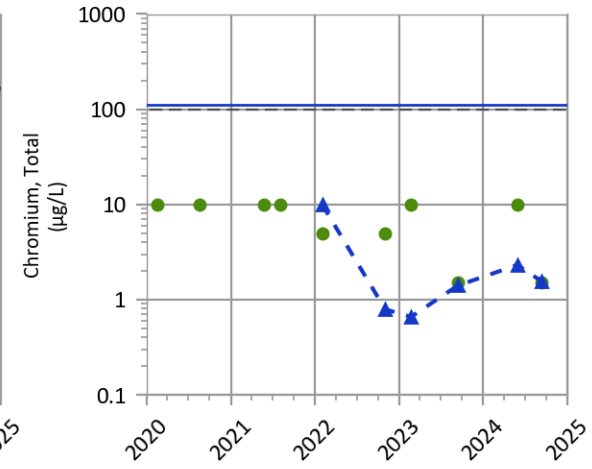
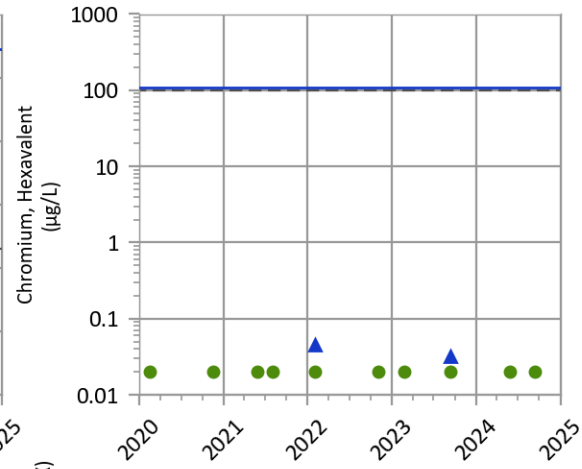
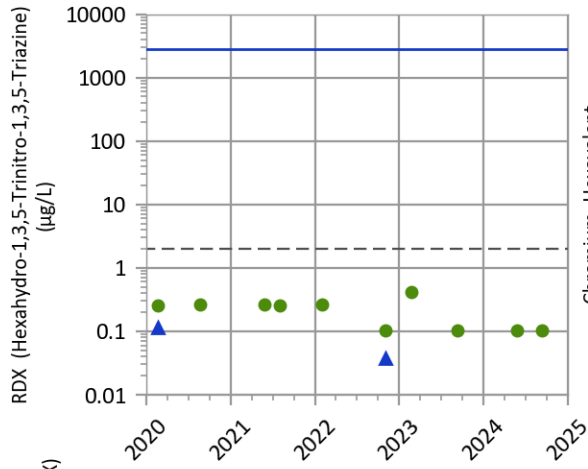
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



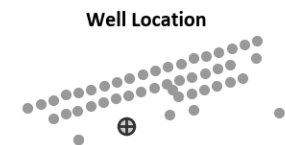
**PTX06-1037 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



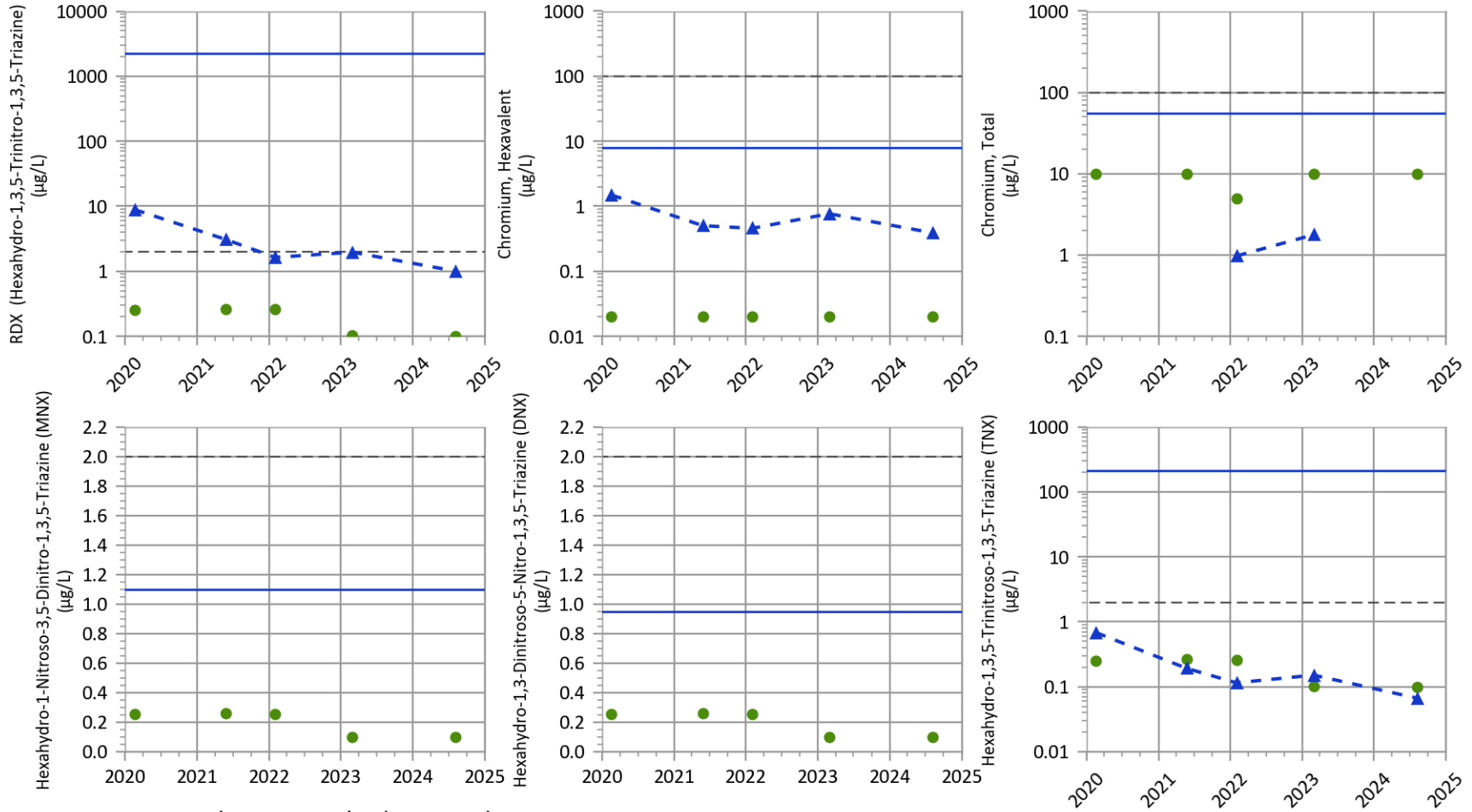
Most Recent Measured COC Concentrations (Feb 18, 2020)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
CR-6	Non-Detect	100.0
DNX	Non-Detect	2.0
CR	1.55	100.0
TNX	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



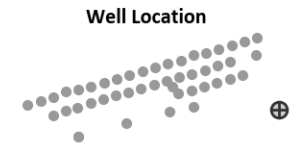
**PTX06-1045 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



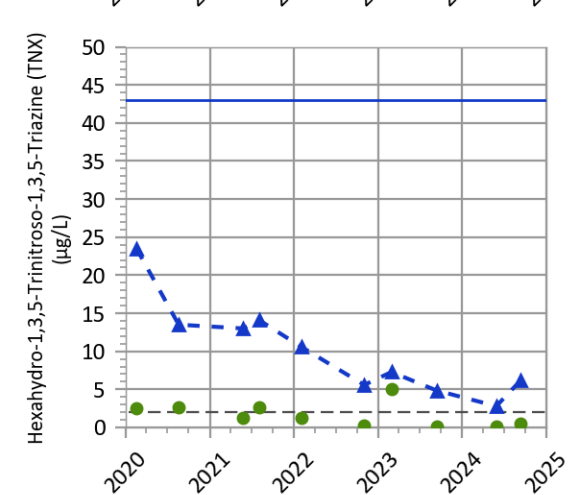
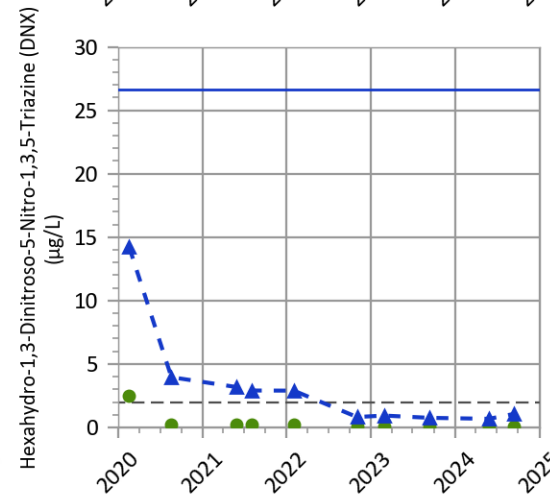
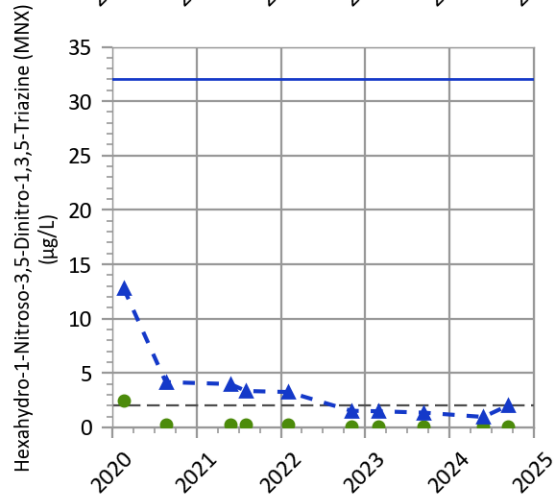
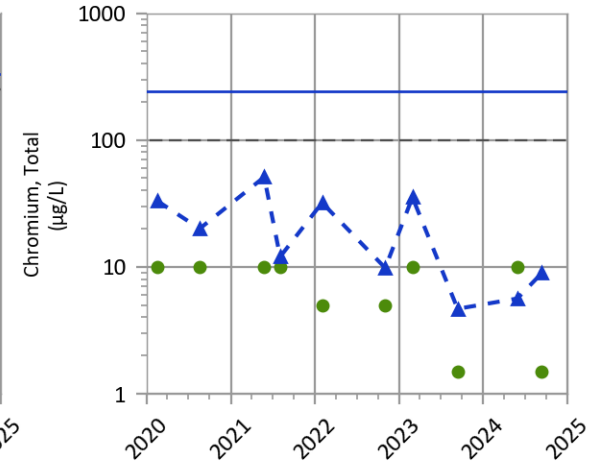
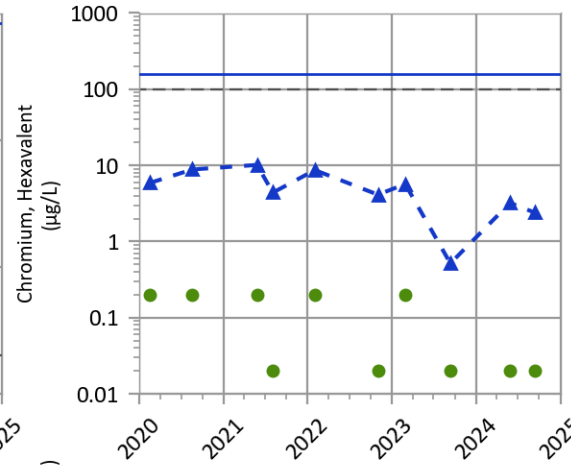
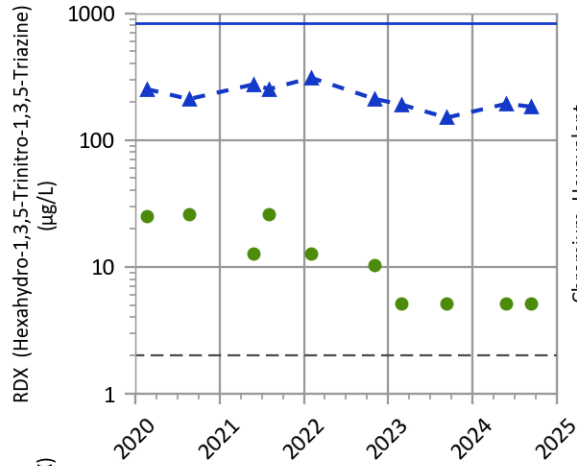
Most Recent Measured COC Concentrations (Aug 07, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	1.0	2.0
MNX	Non-Detect	2.0
CR-6	0.388	100.0
DNX	Non-Detect	2.0
CR	Non-Detect	100.0
TNX	0.0668	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



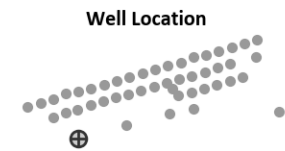
**PTX06-1153 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



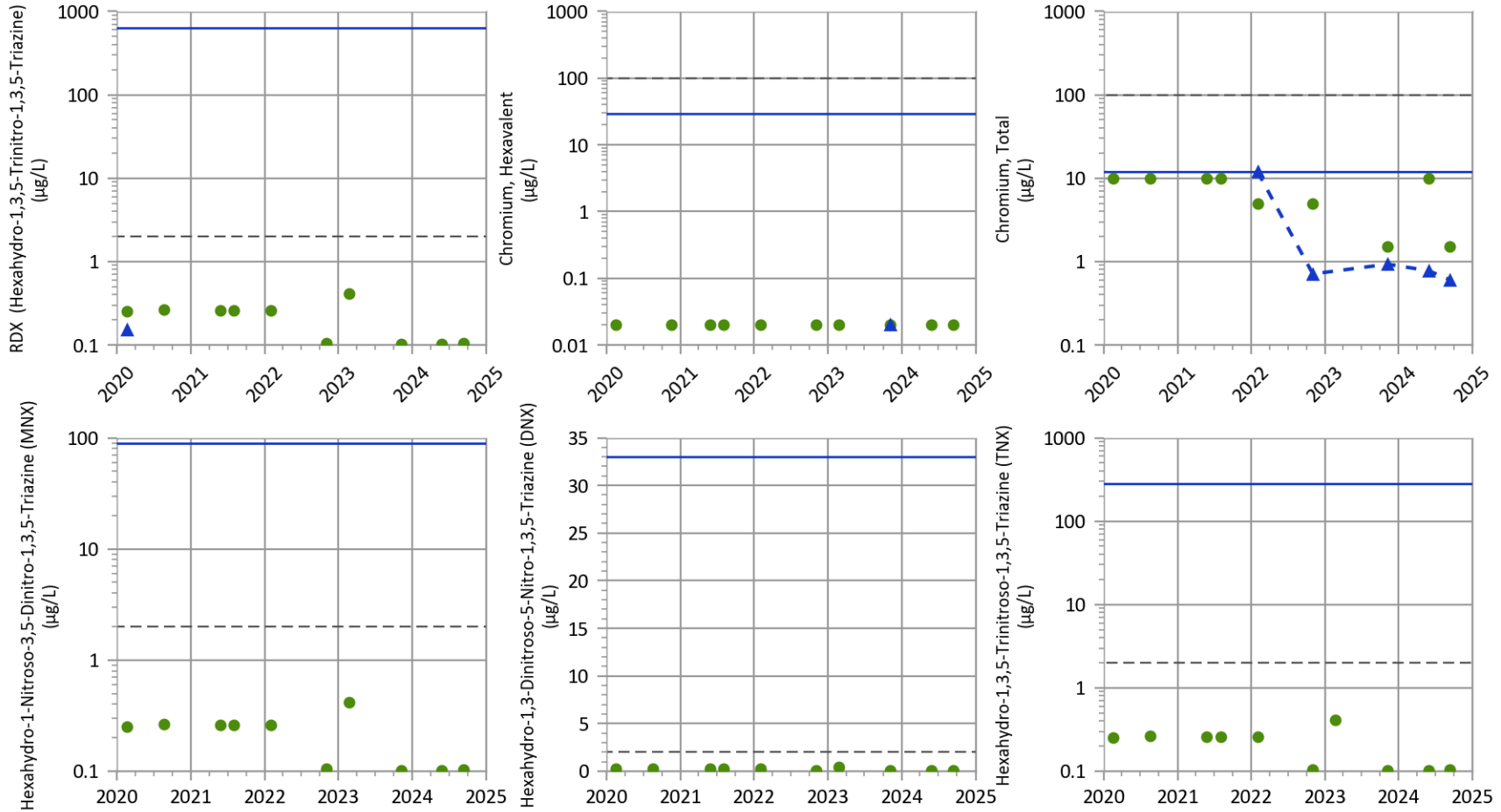
Most Recent Measured COC Concentrations (Sep 11, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	183.0	2.0
MNX	2.01	2.0
CR-6	2.401	100.0
DNX	1.06	2.0
CR	8.92	100.0
TNX	6.19	2.0

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend
- Maximum Concentration
- Groundwater Protection Standard



**PTX06-1154 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



Most Recent Measured COC Concentrations (Sep 11, 2024)

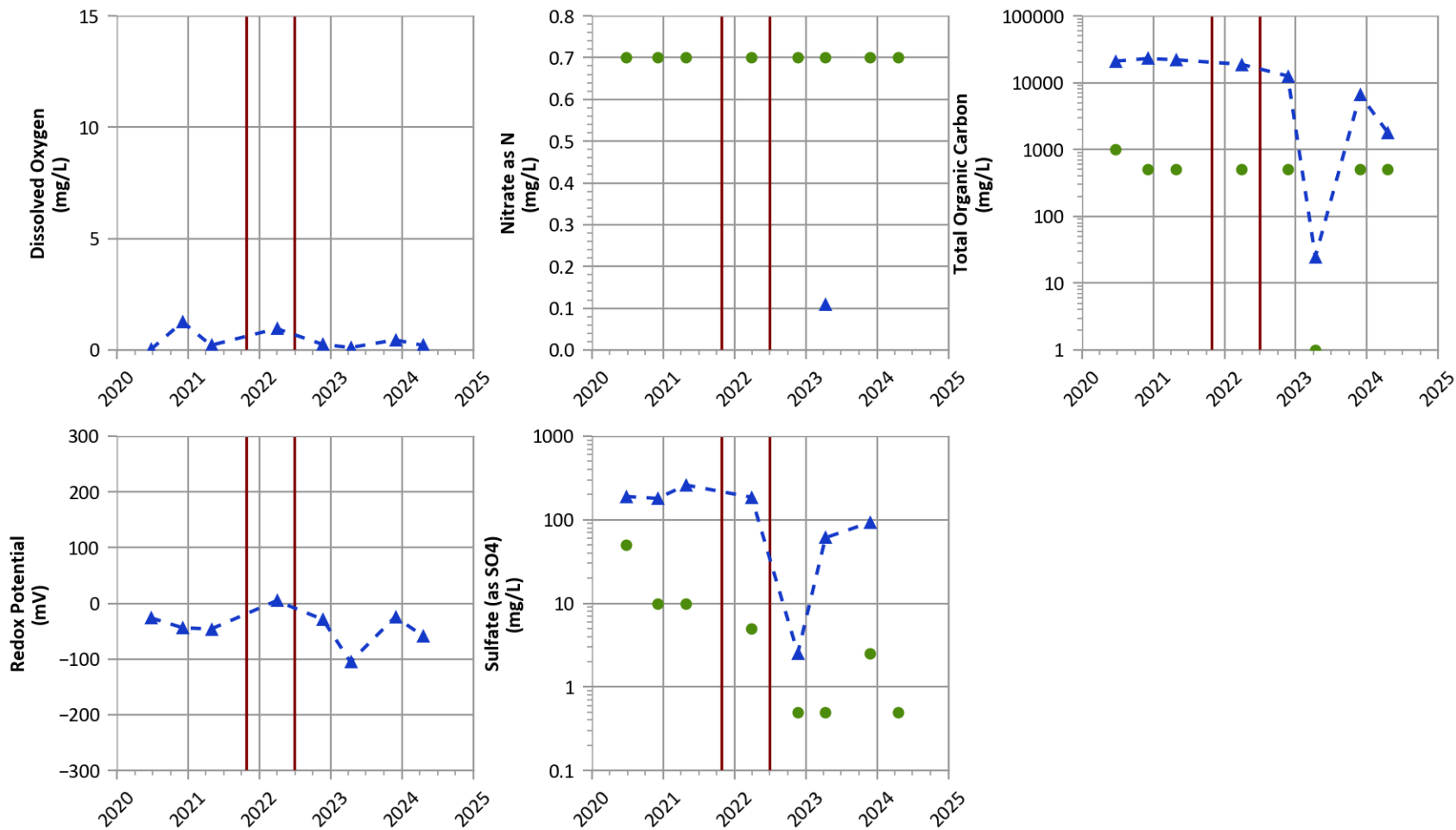
COC	Concentration ($\mu\text{g/L}$)	GWPS ($\mu\text{g/L}$)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
CR-6	Non-Detect	100.0
DNX	Non-Detect	2.0
CR	0.603	100.0
TNX	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend
- Maximum Concentration
- Groundwater Protection Standard



Zone 11 ISB Graphs

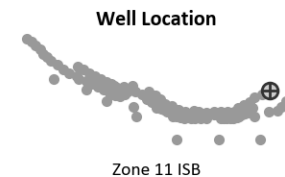
PTX06-ISB055 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



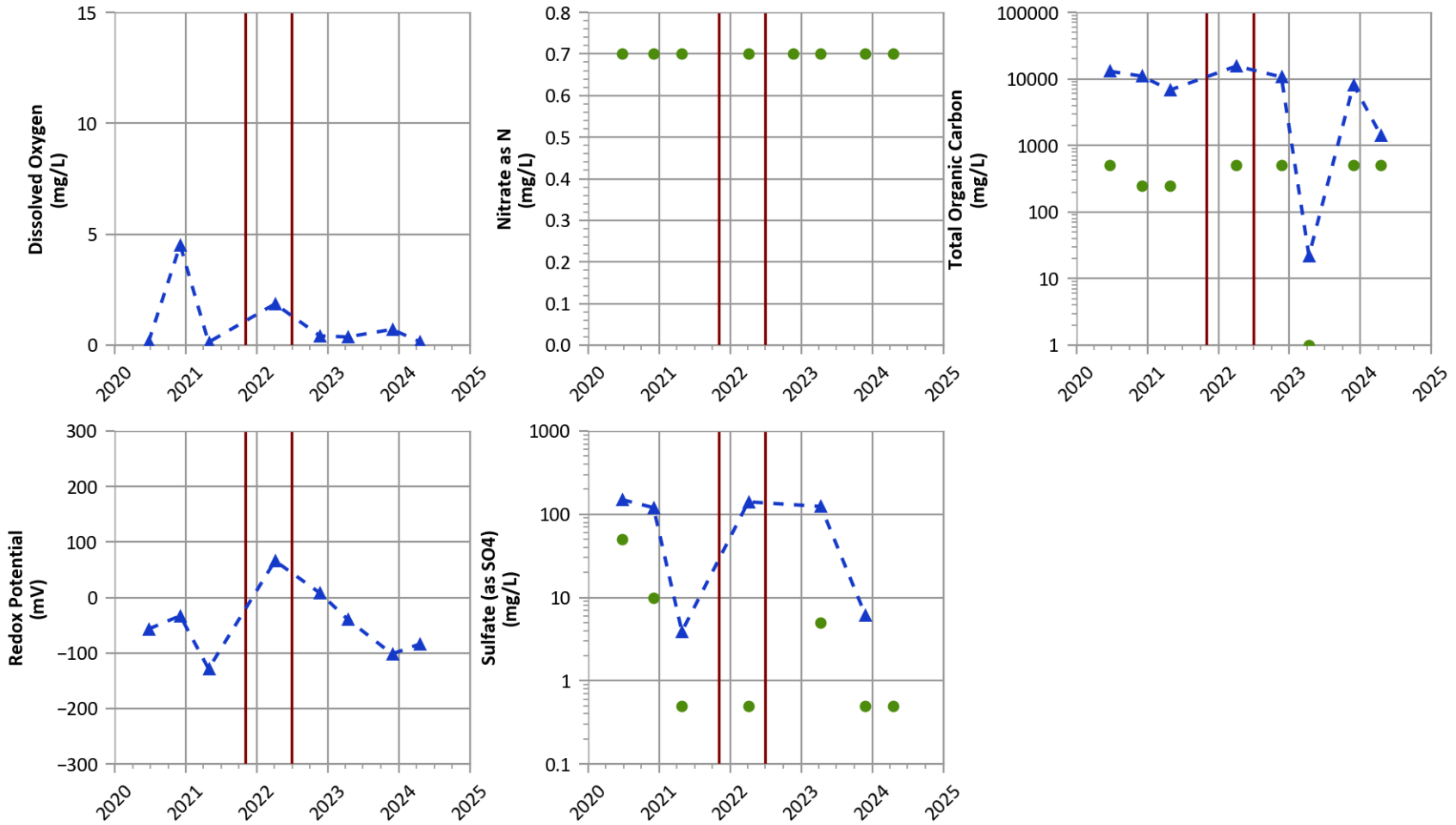
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



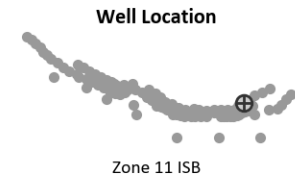
PTX06-ISB059 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



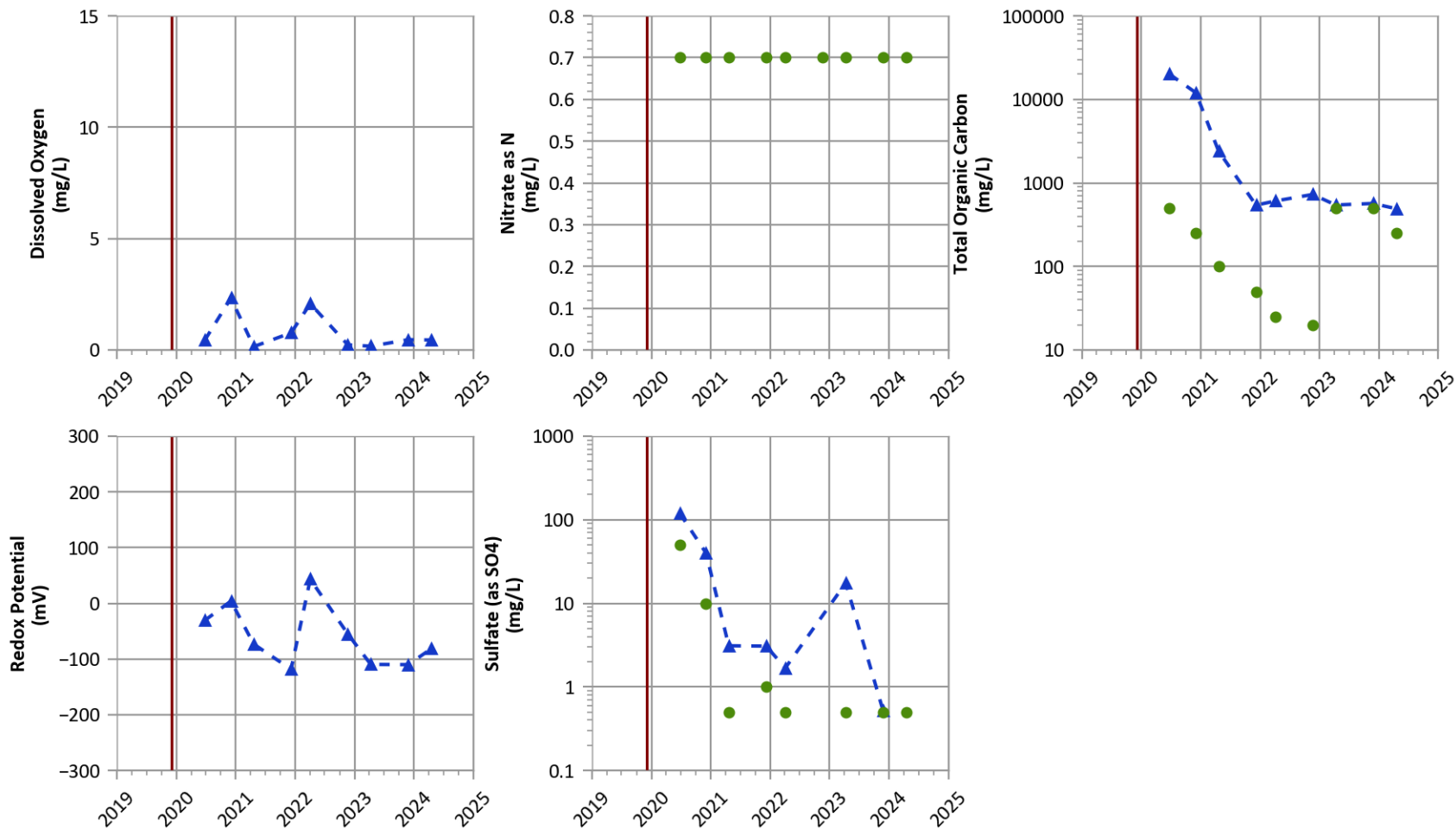
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



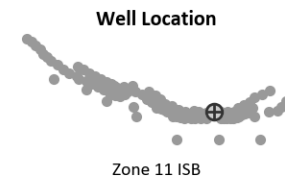
PTX06-ISB064 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



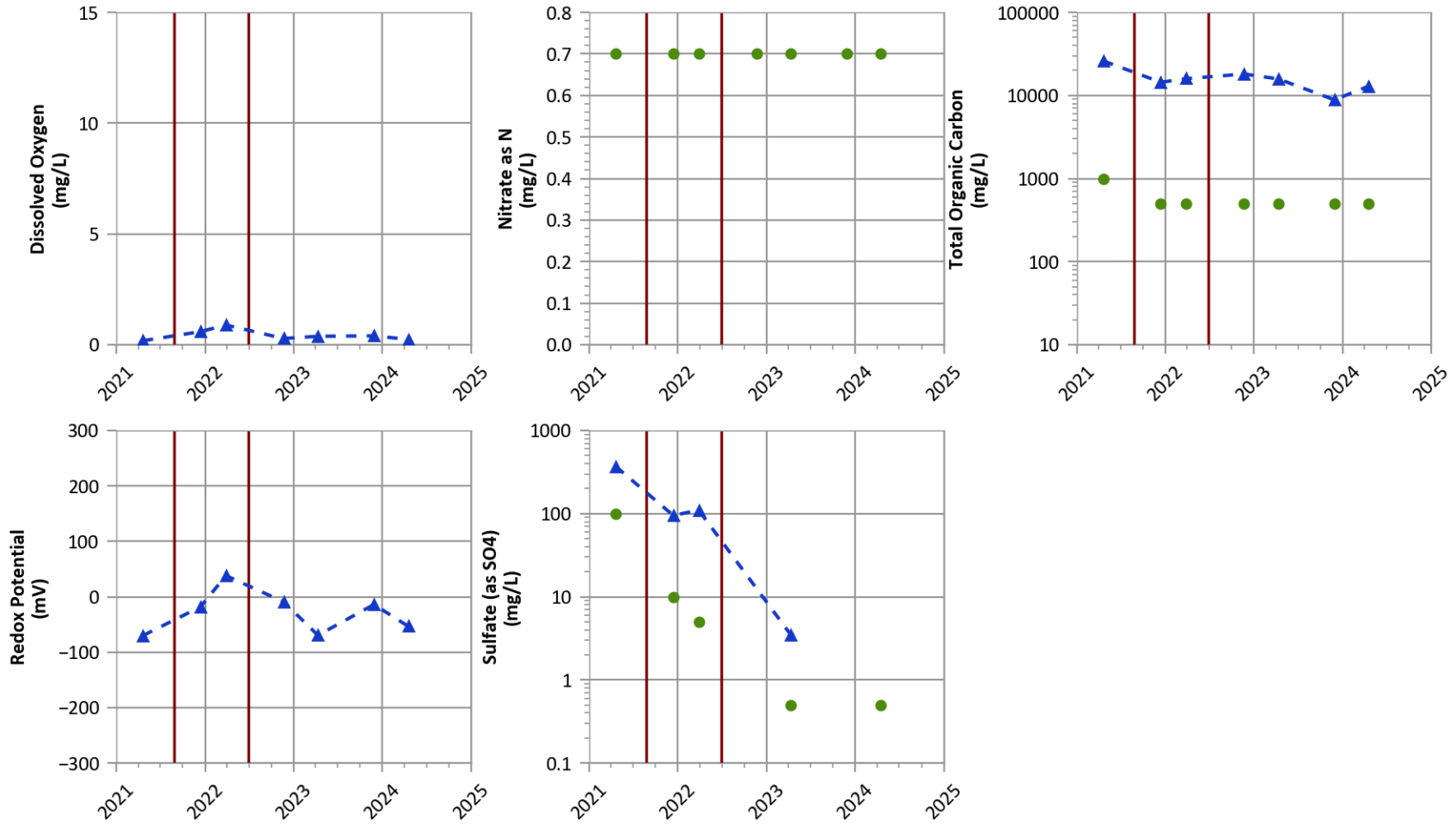
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



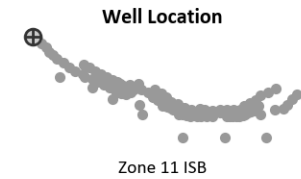
PTX06-ISB137 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



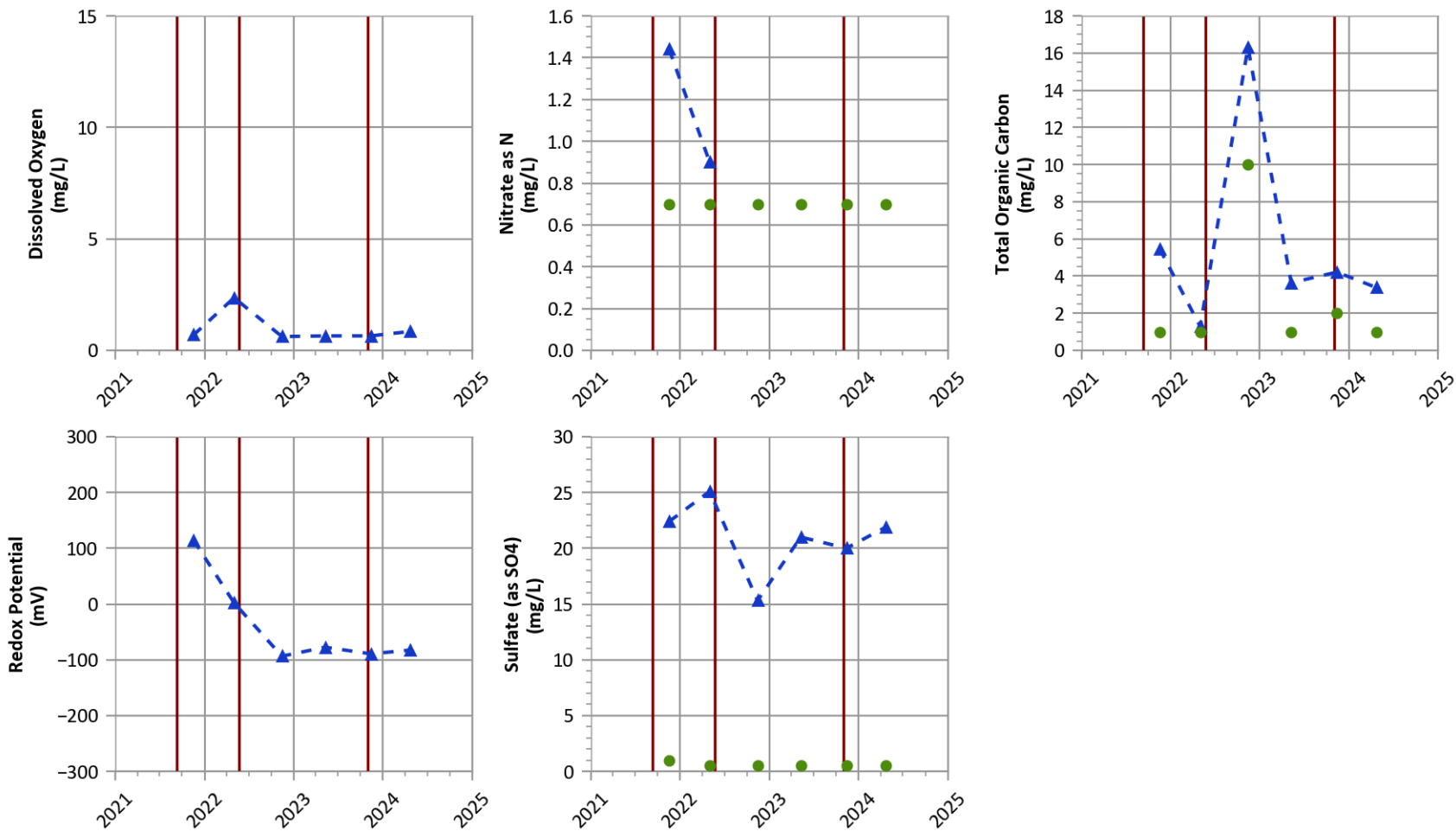
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



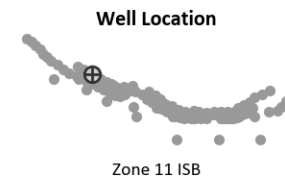
PTX06-1164 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



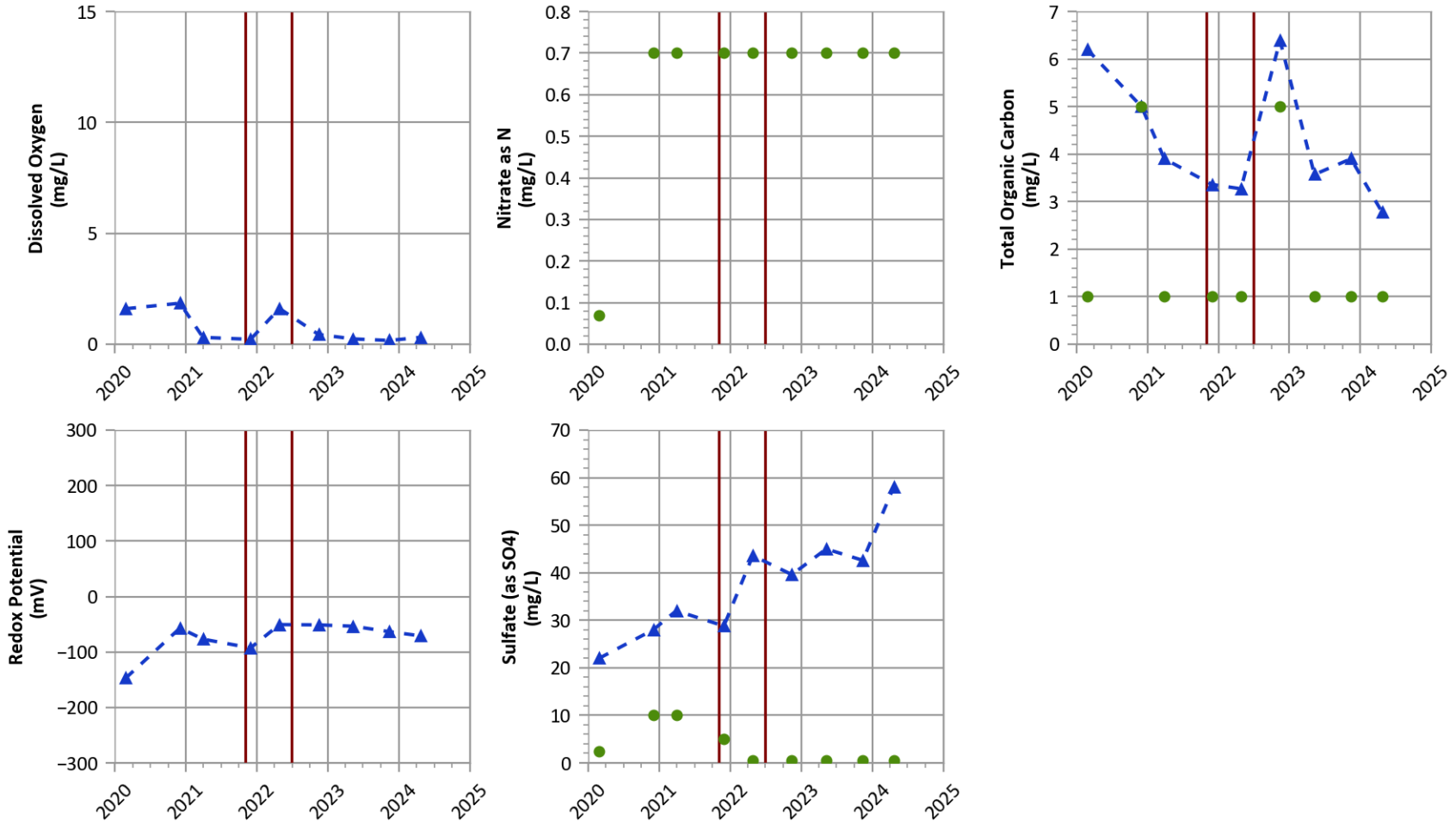
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates

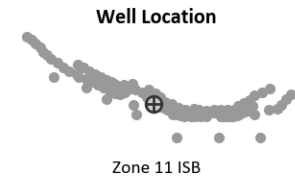


**PTX06-1169 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**

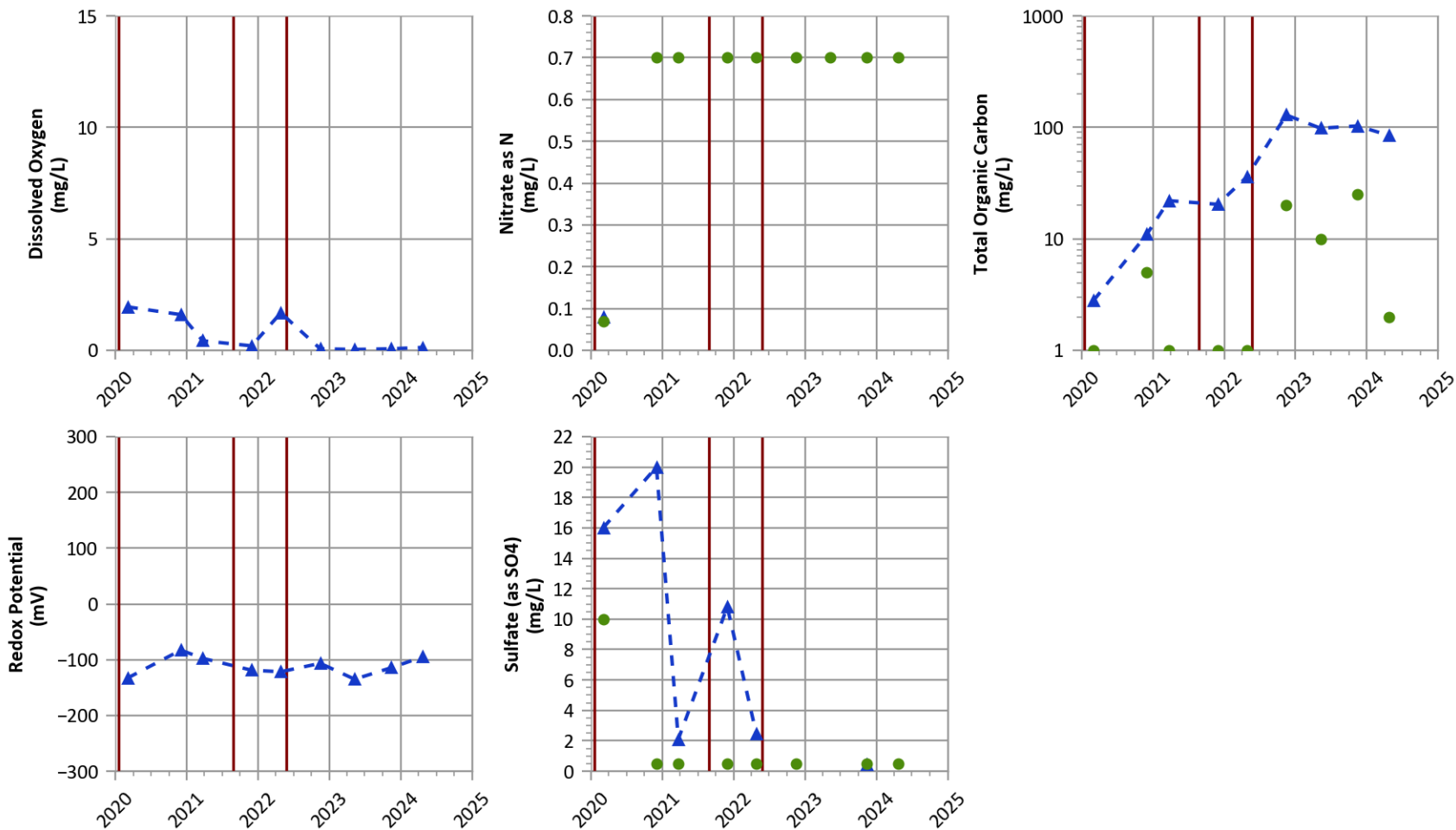


Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected



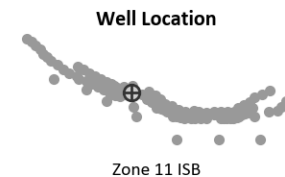
PTX06-1170 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



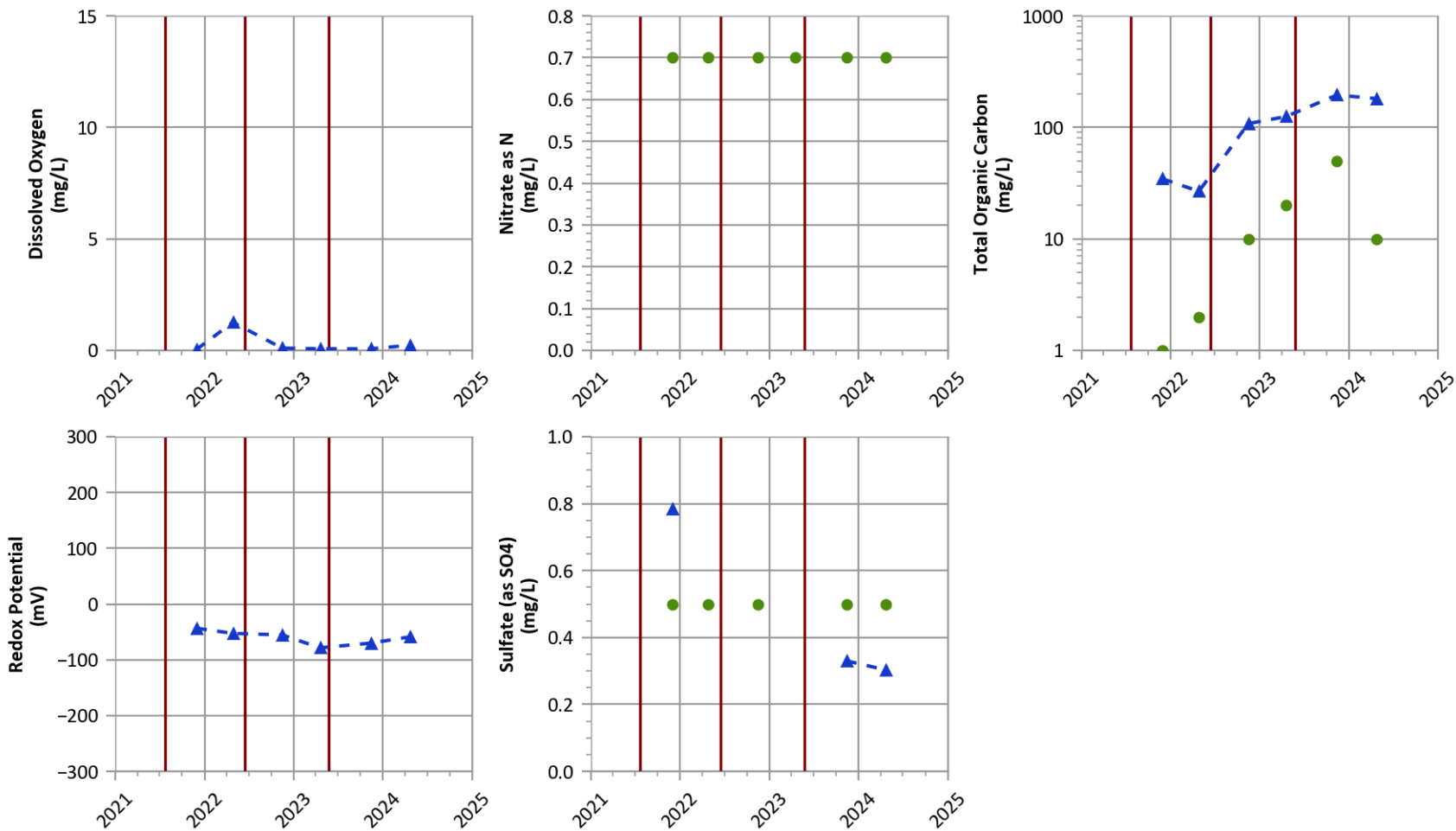
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



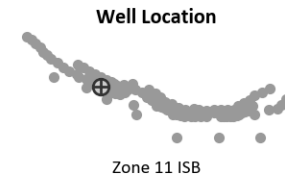
**PTX06-1176 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



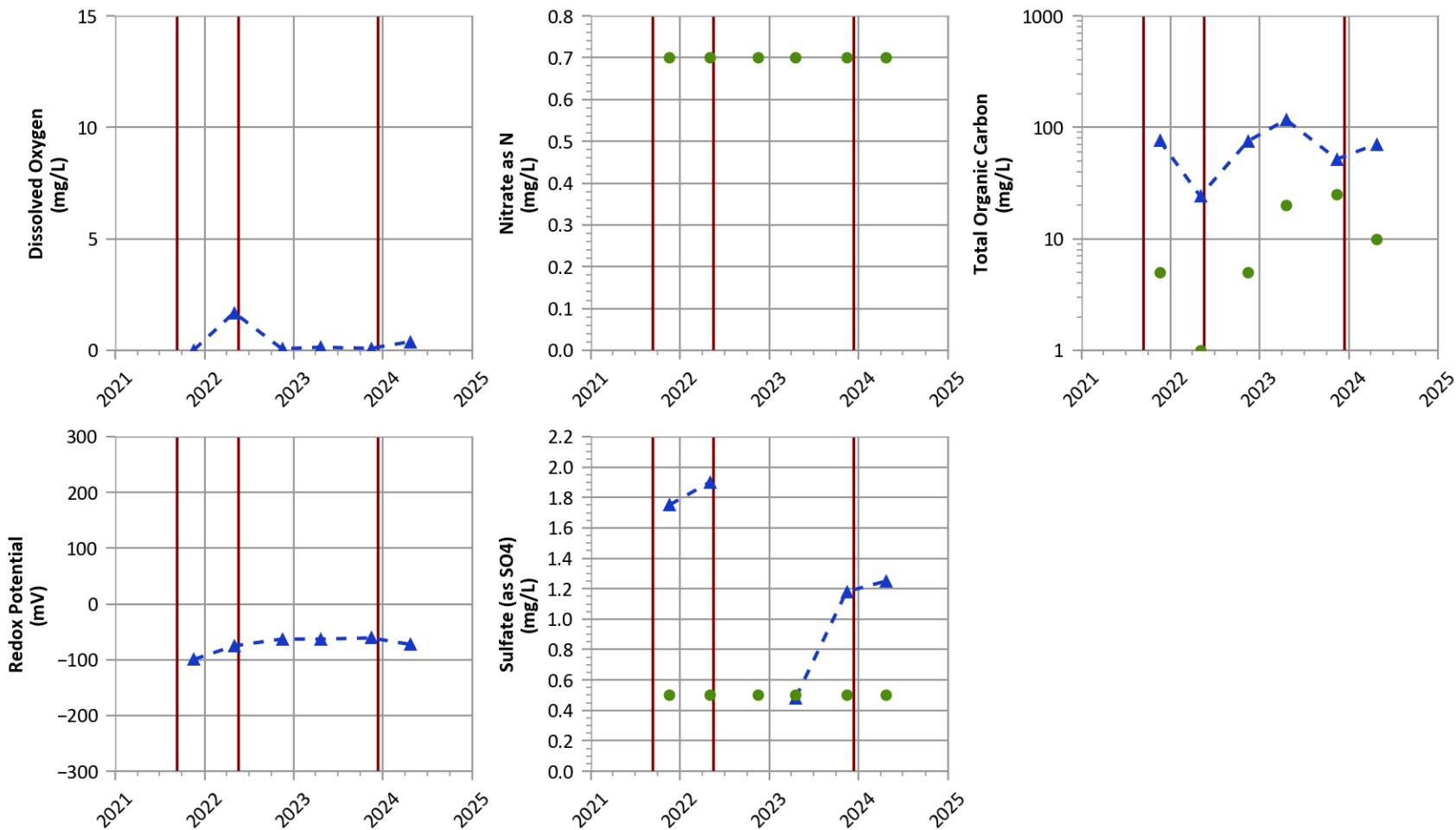
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend
- | Injection Dates



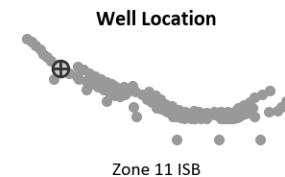
**PTX06-1177 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



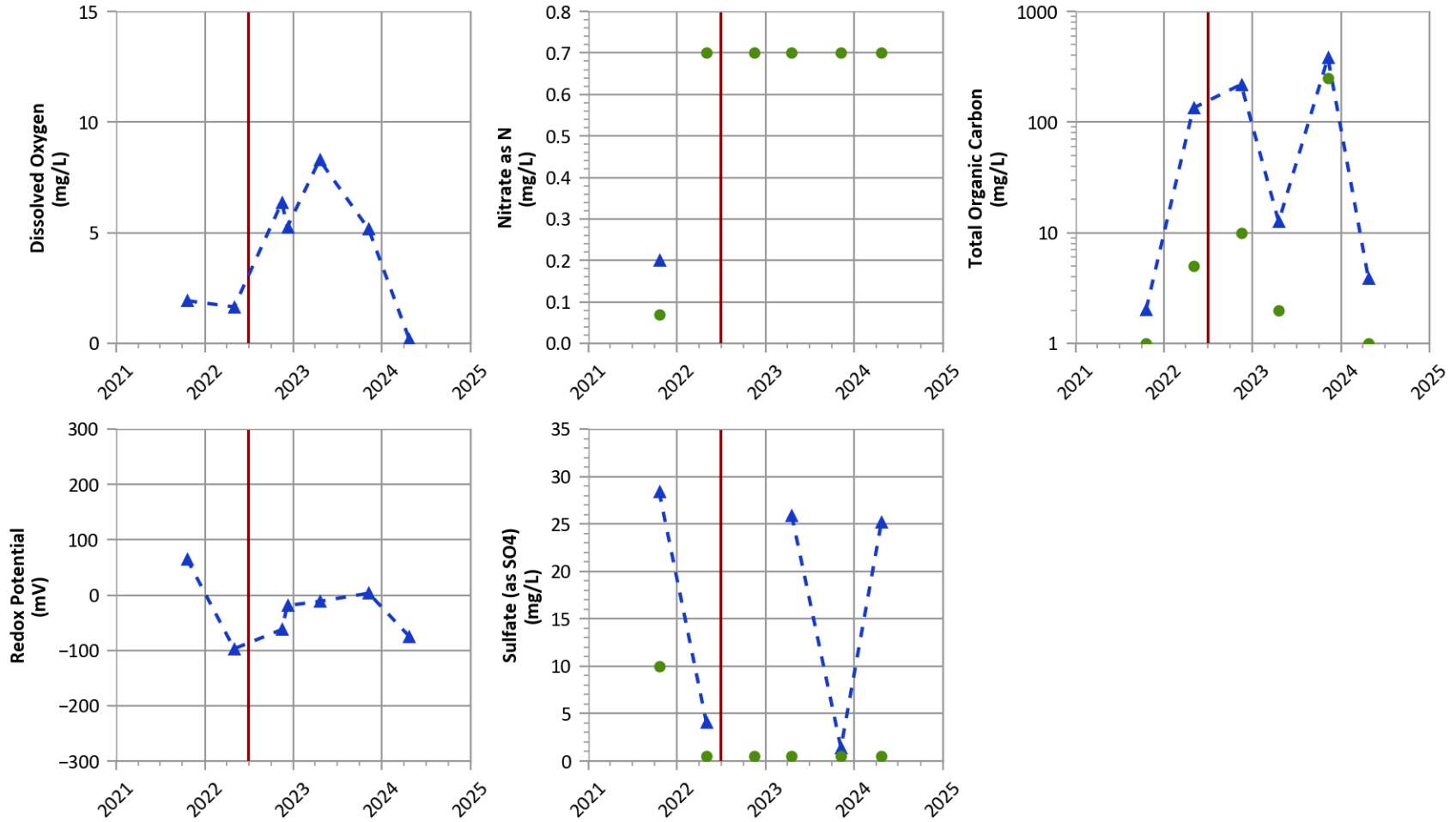
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



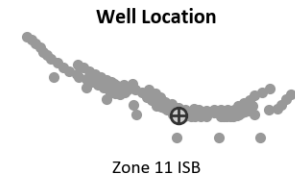
**PTX06-1209 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



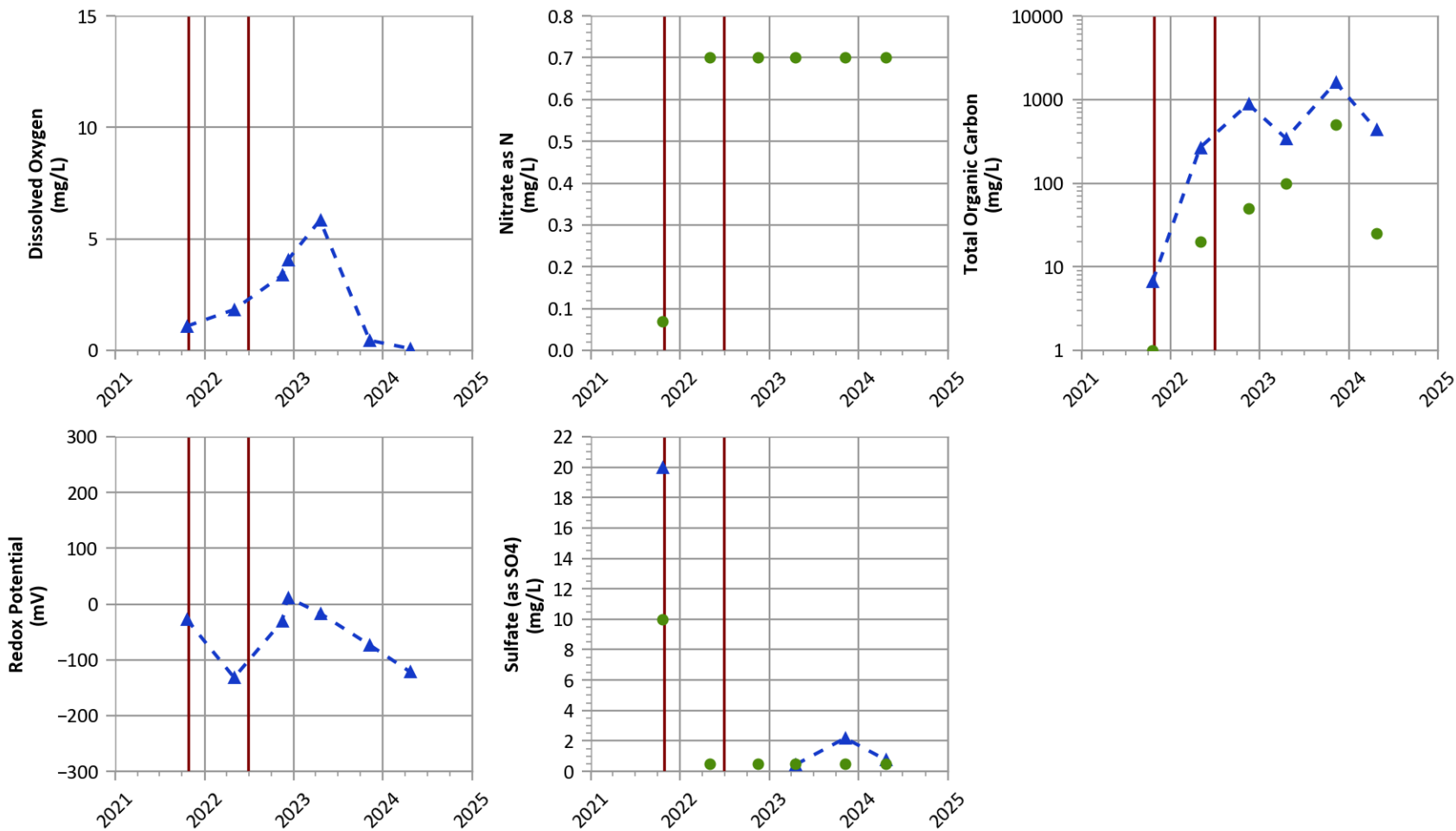
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



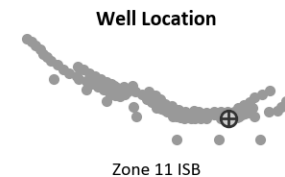
**PTX06-1210 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



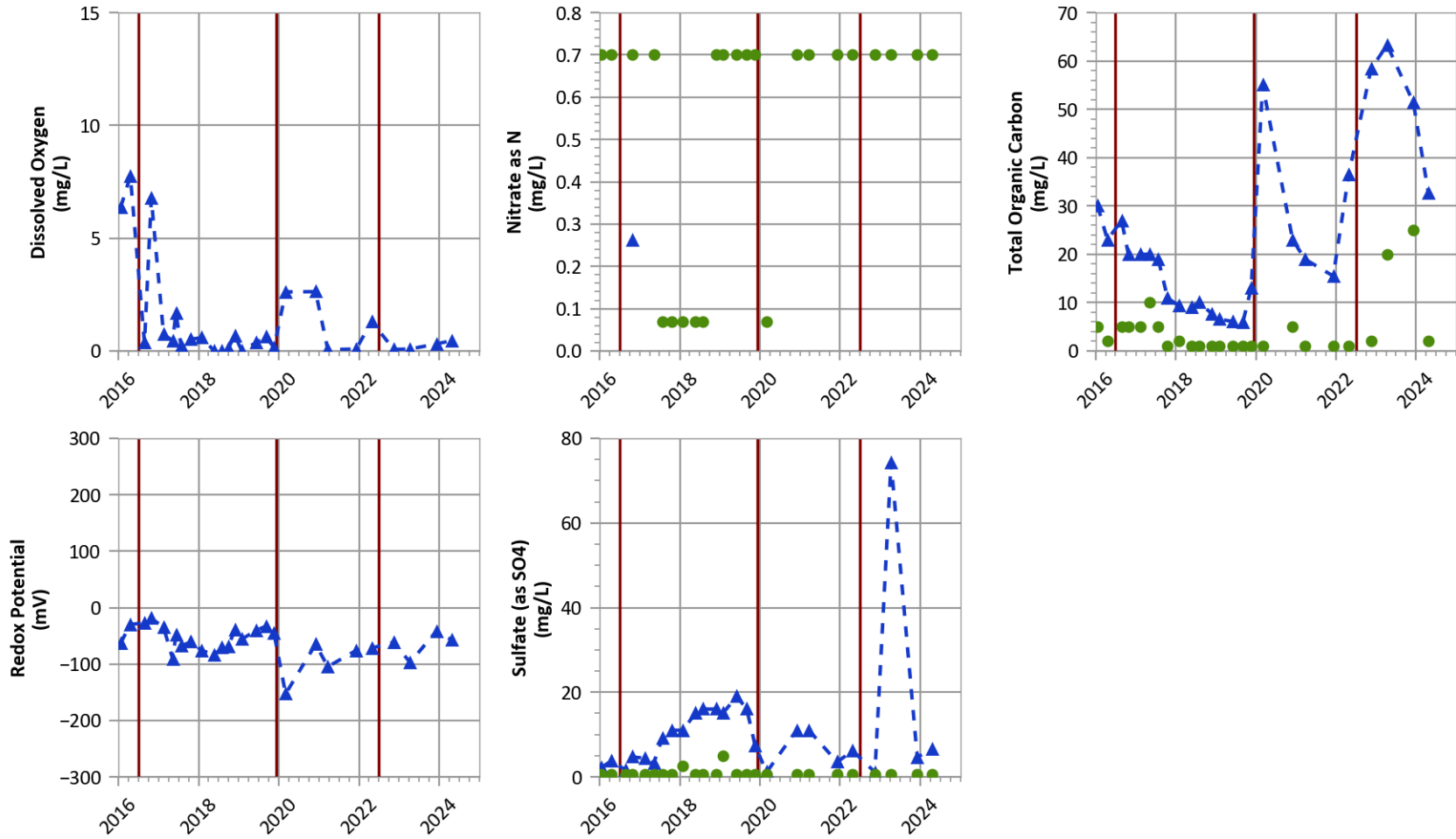
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend
- | Injection Dates



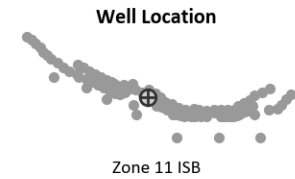
**PTX06-1230 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



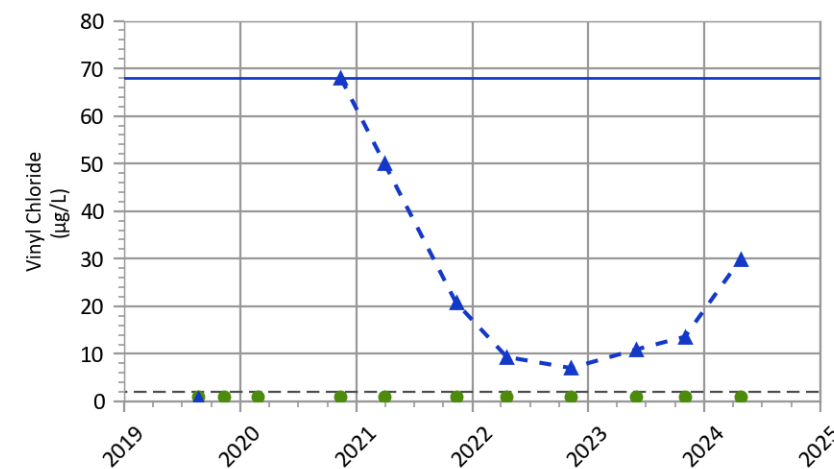
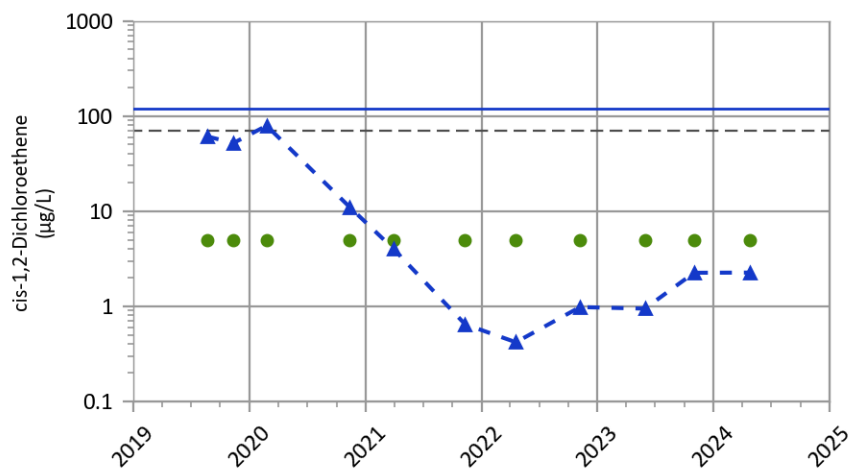
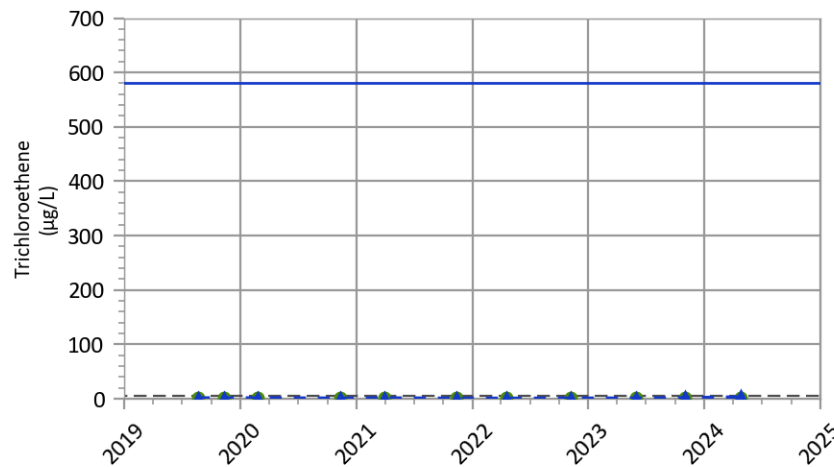
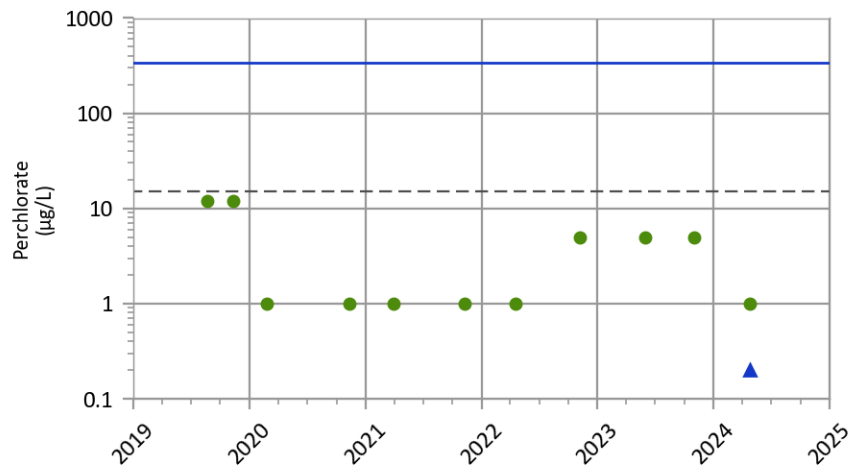
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



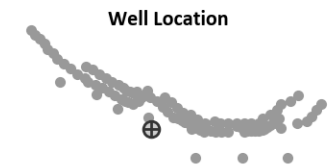
**PTX06-1012 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



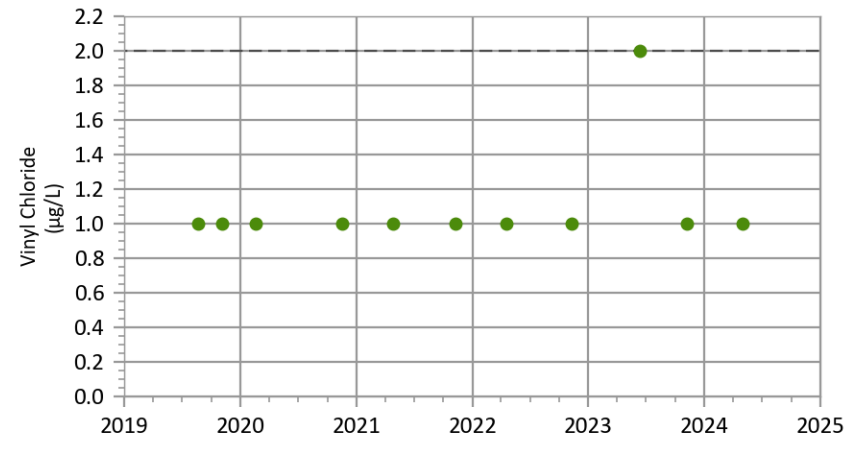
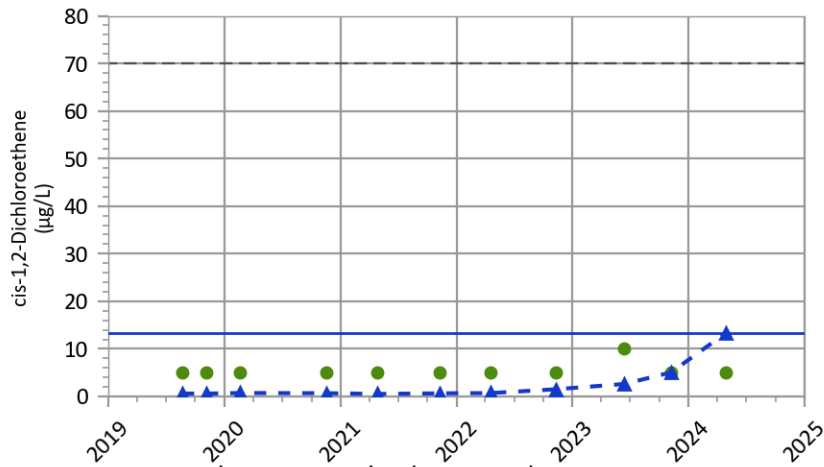
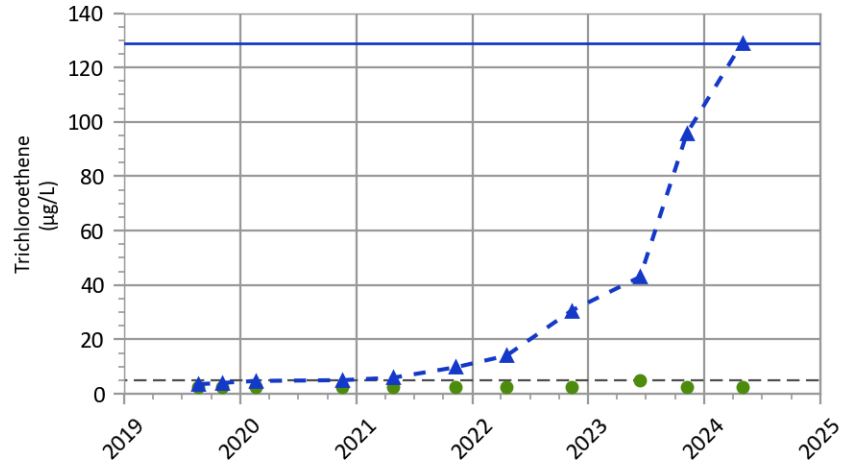
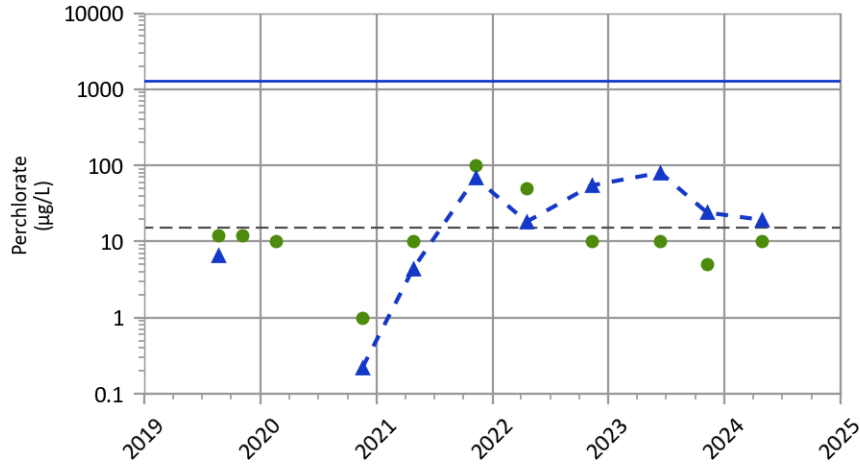
Most Recent Measured COC Concentrations (Apr 24, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	0.203	15.0
DCE12C	2.26	70.0
TCE	2.65	5.0
VC	29.9	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



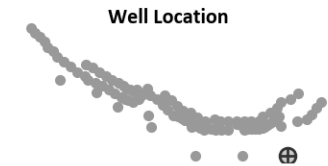
**PTX06-1148 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



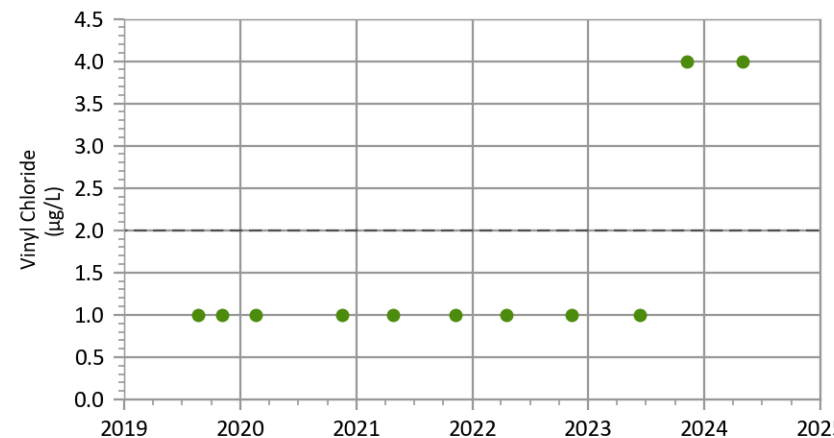
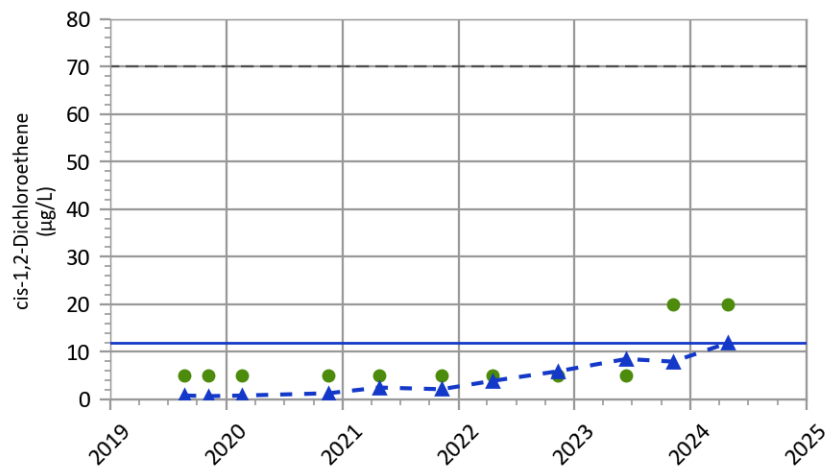
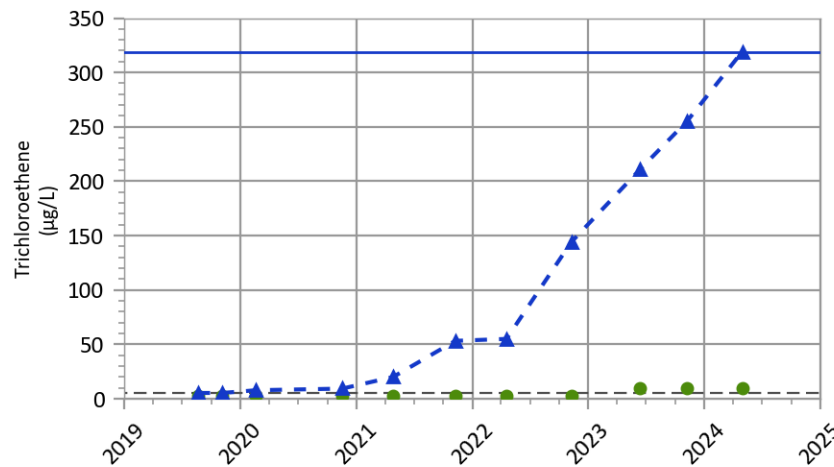
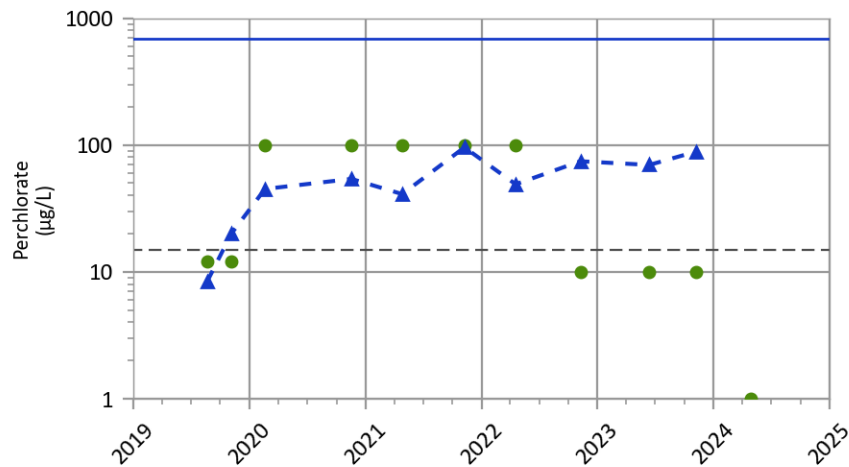
Most Recent Measured COC Concentrations (Apr 29, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	19.2	15.0
DCE12C	13.4	70.0
TCE	129.0	5.0
VC	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



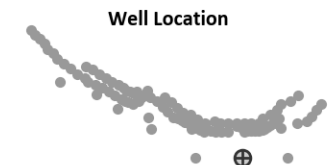
**PTX06-1149 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



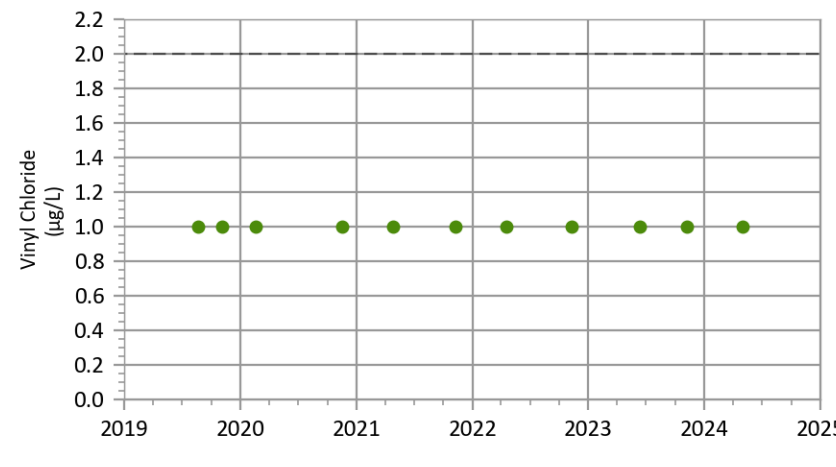
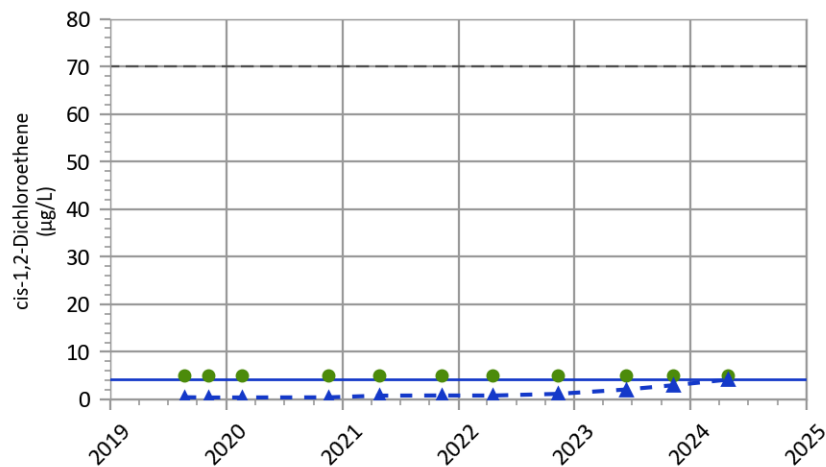
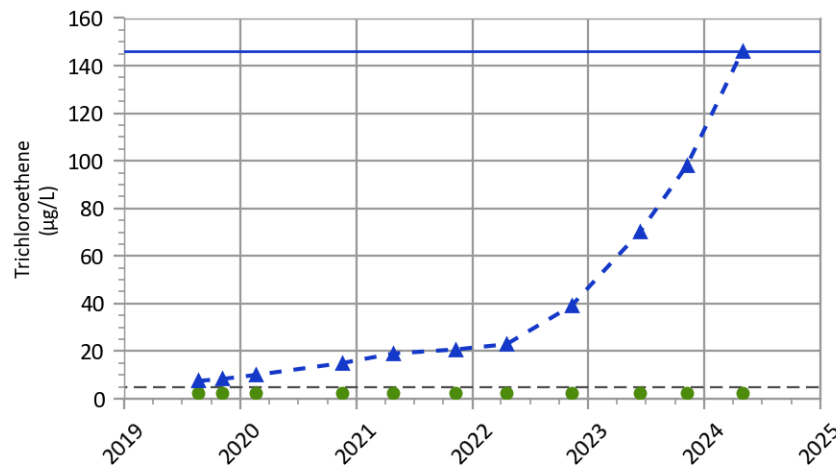
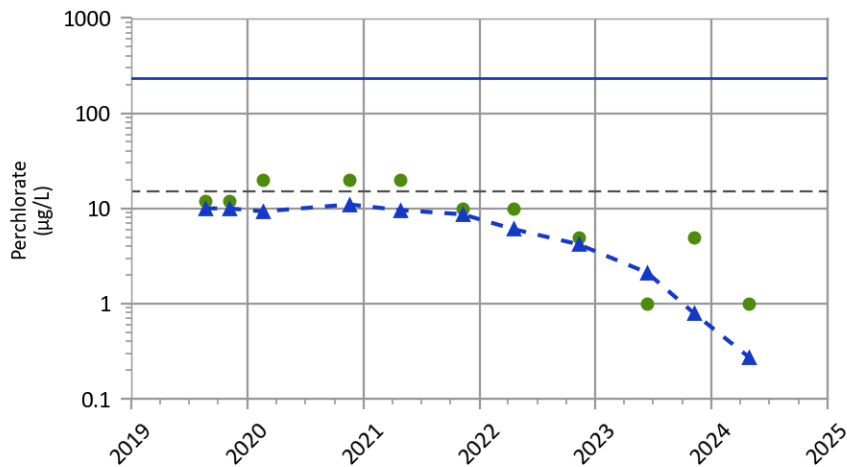
Most Recent Measured COC Concentrations (Apr 29, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	11.9	70.0
TCE	319.0	5.0
VC	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



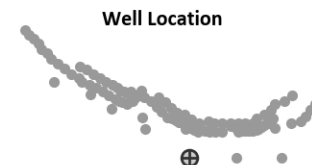
**PTX06-1150 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



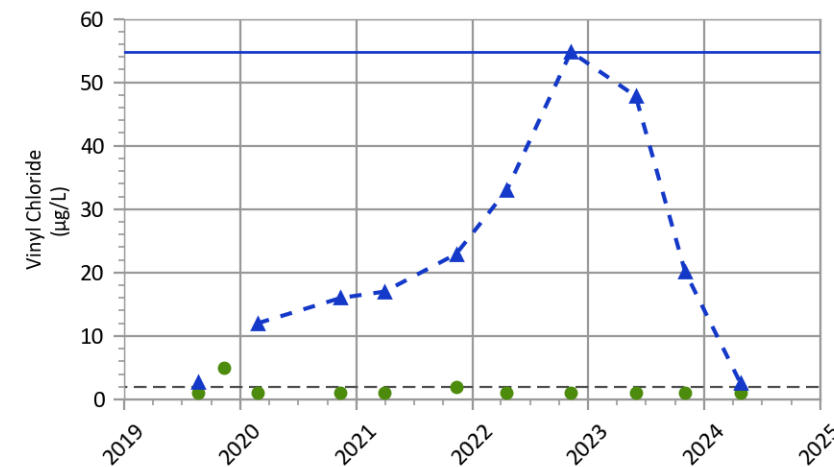
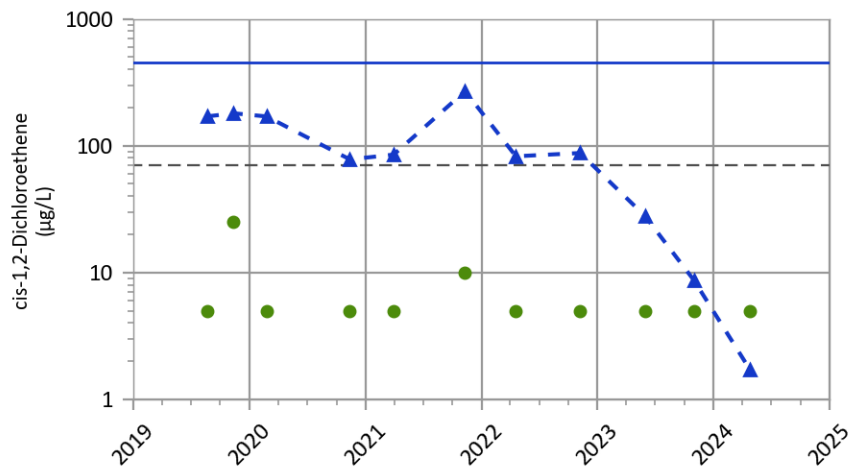
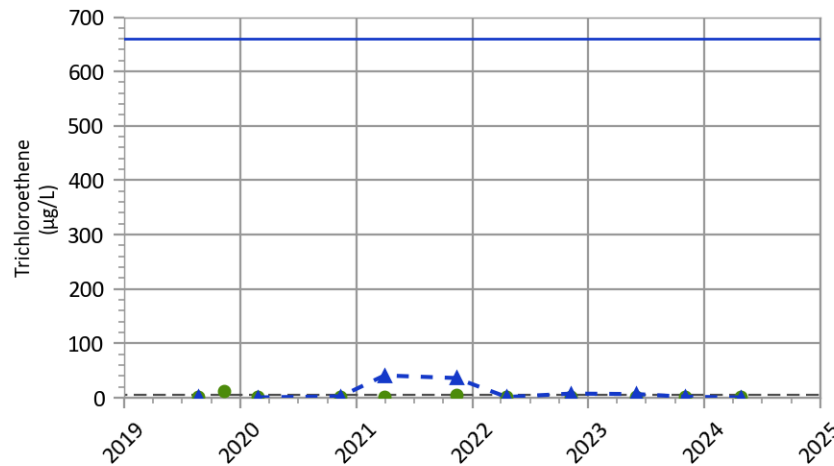
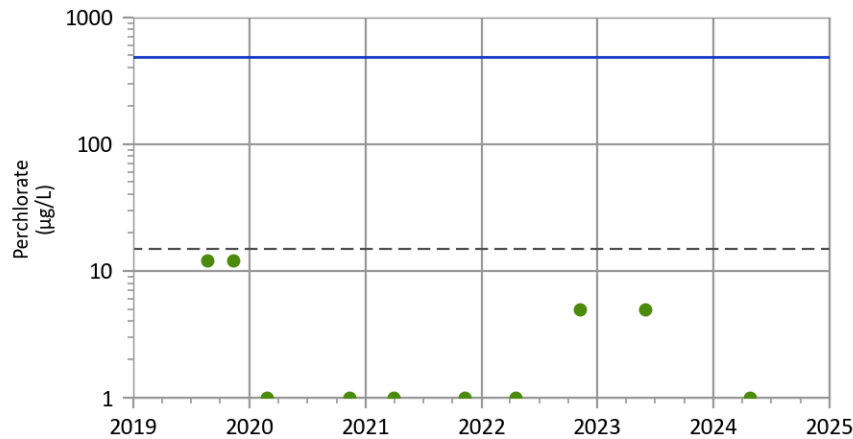
Most Recent Measured COC Concentrations (Apr 29, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	0.272	15.0
DCE12C	4.17	70.0
TCE	146.0	5.0
VC	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



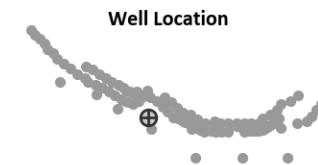
**PTX06-1155 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



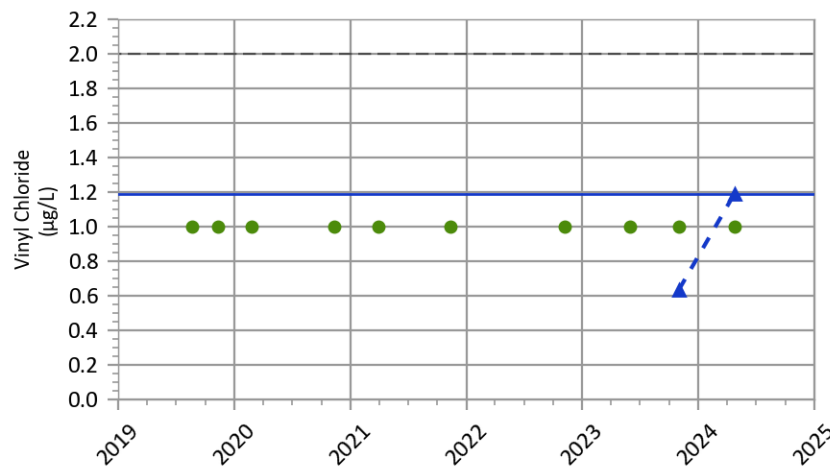
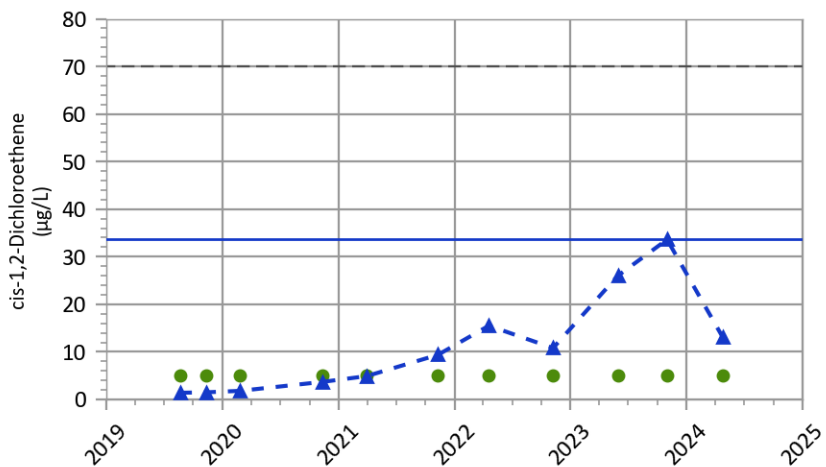
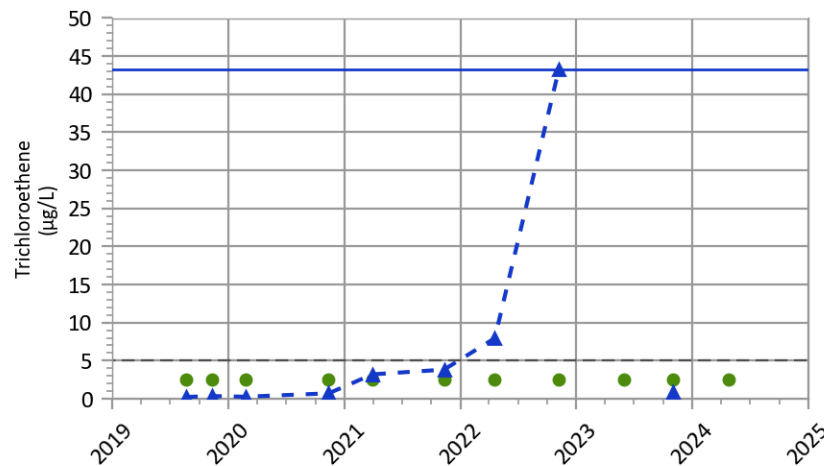
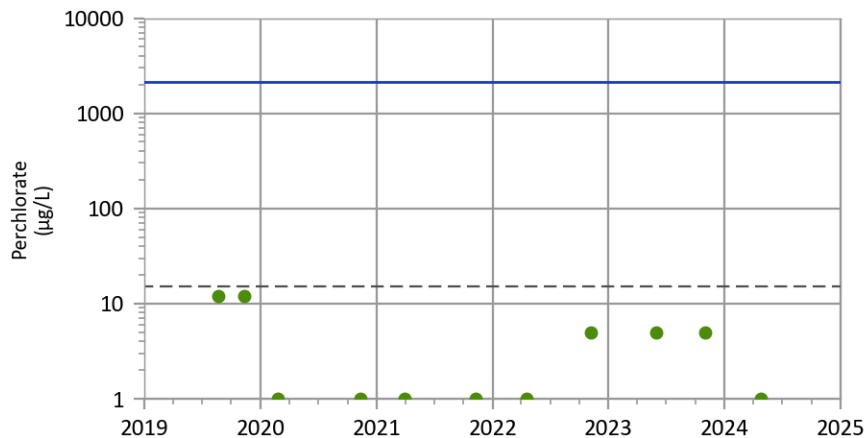
Most Recent Measured COC Concentrations (Apr 24, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	1.73	70.0
TCE	0.465	5.0
VC	2.55	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



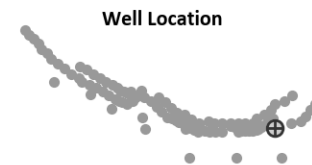
**PTX06-1156 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



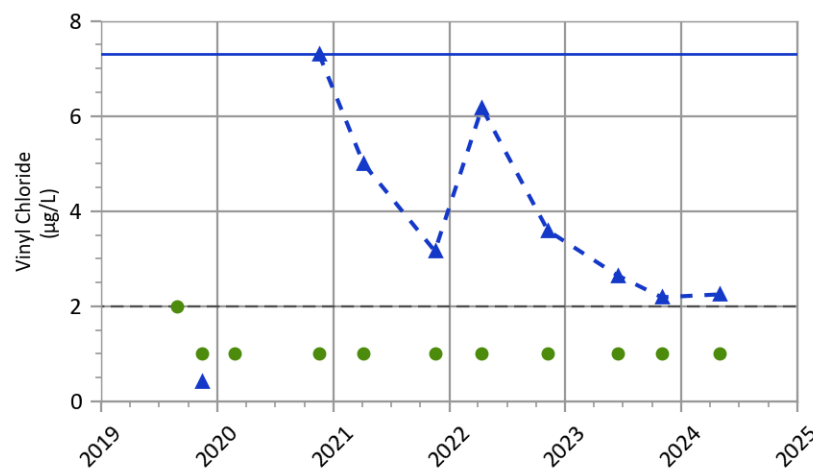
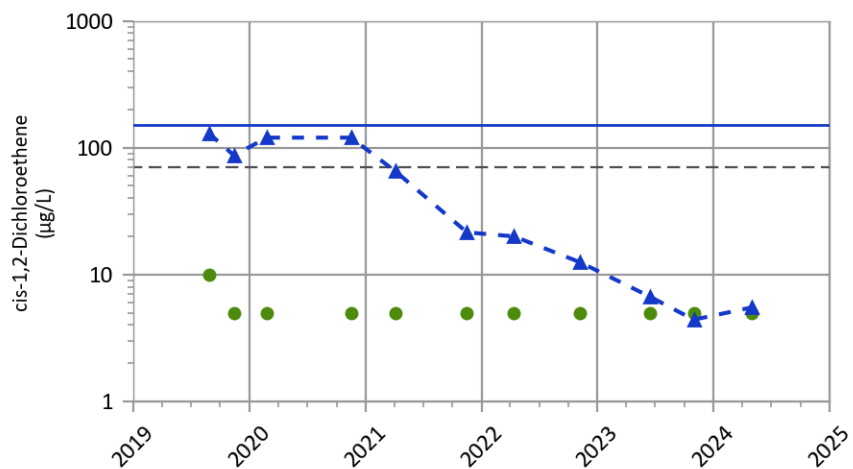
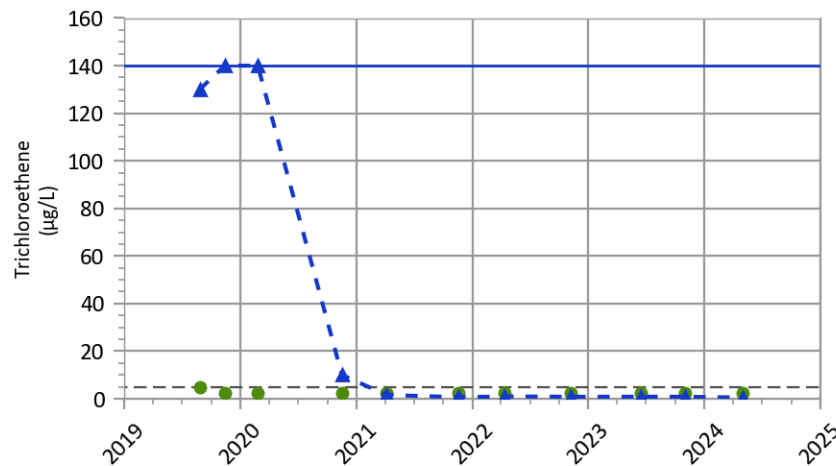
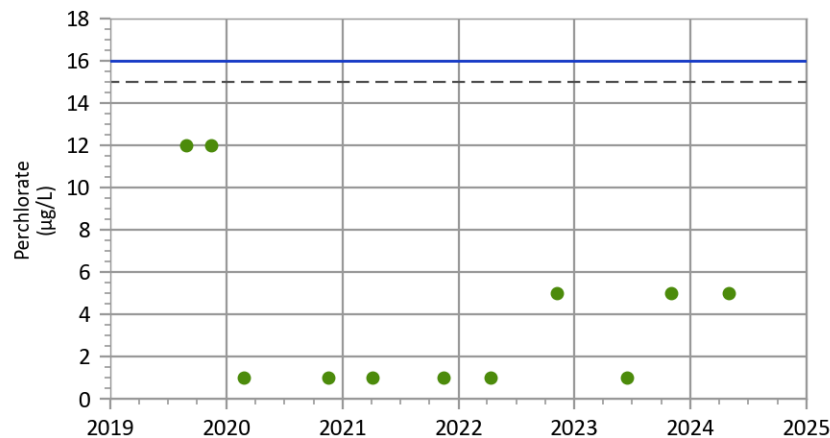
Most Recent Measured COC Concentrations (Apr 24, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	13.1	70.0
TCE	Non-Detect	5.0
VC	1.19	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



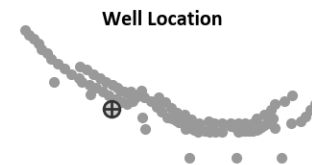
**PTX06-1173 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



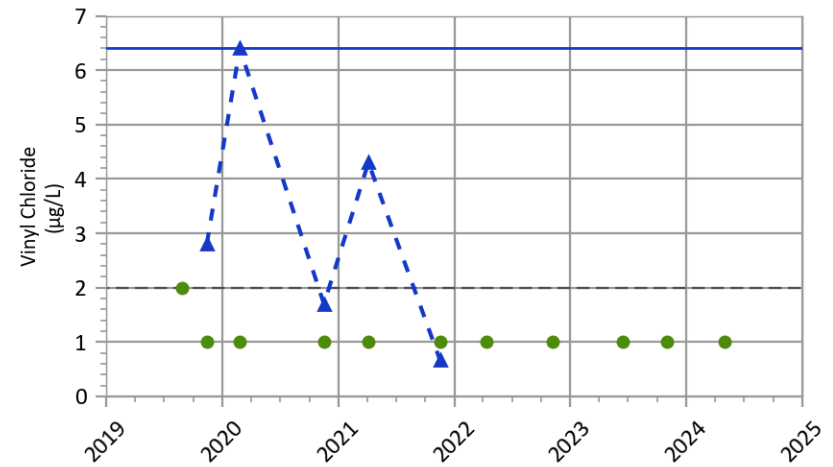
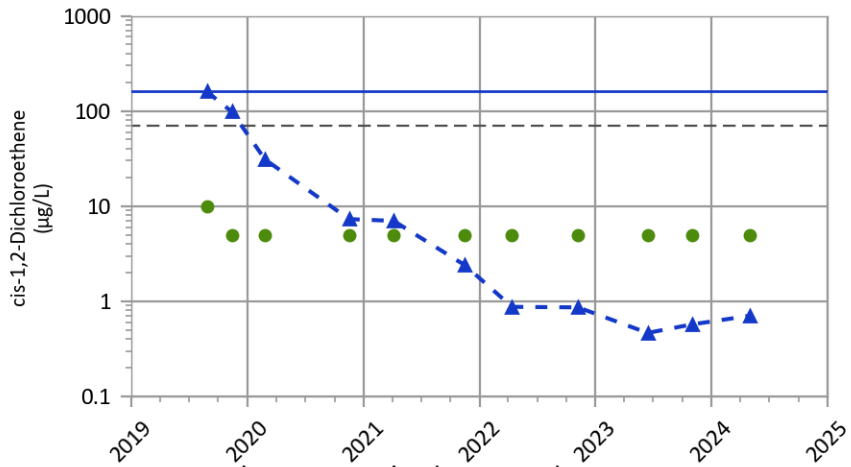
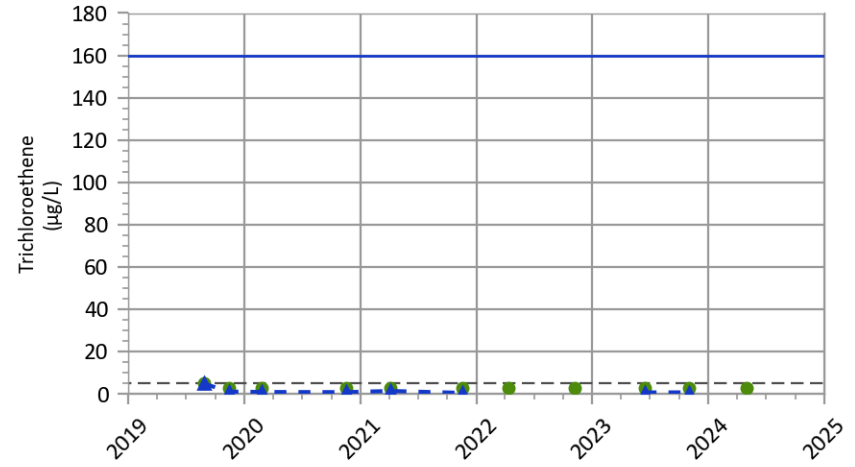
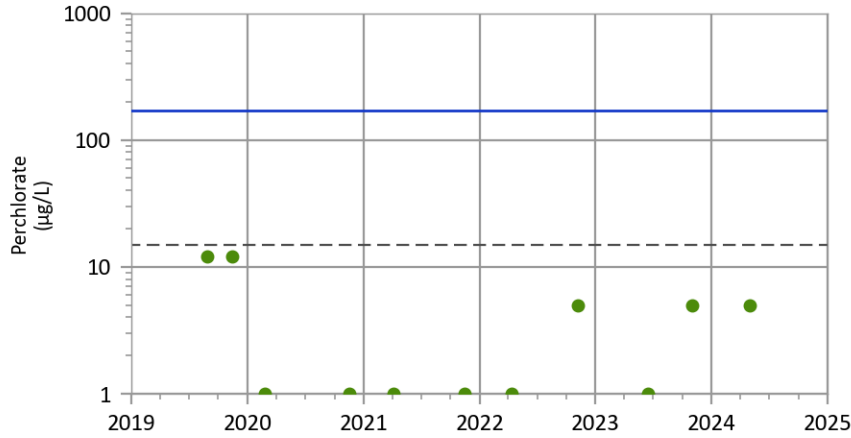
Most Recent Measured COC Concentrations (Apr 30, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	5.5	70.0
TCE	0.494	5.0
VC	2.25	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



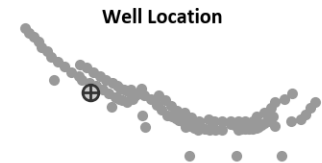
**PTX06-1174 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



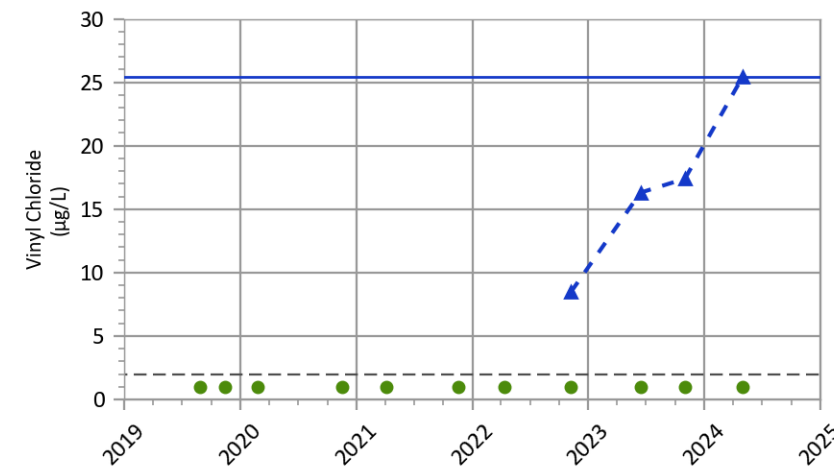
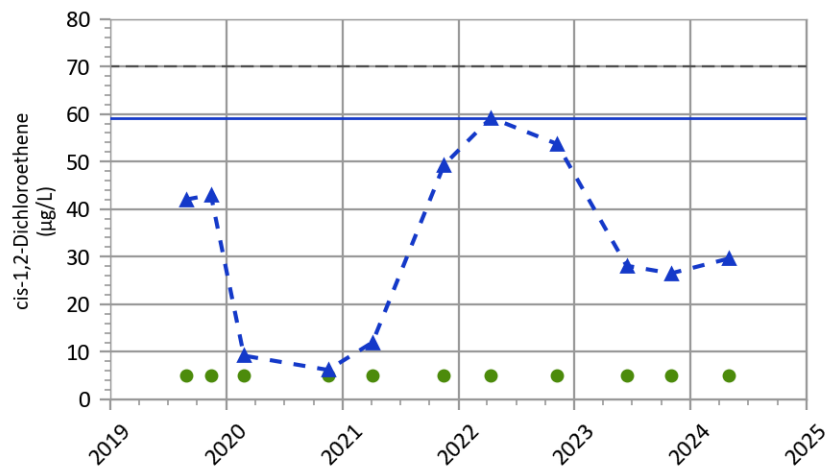
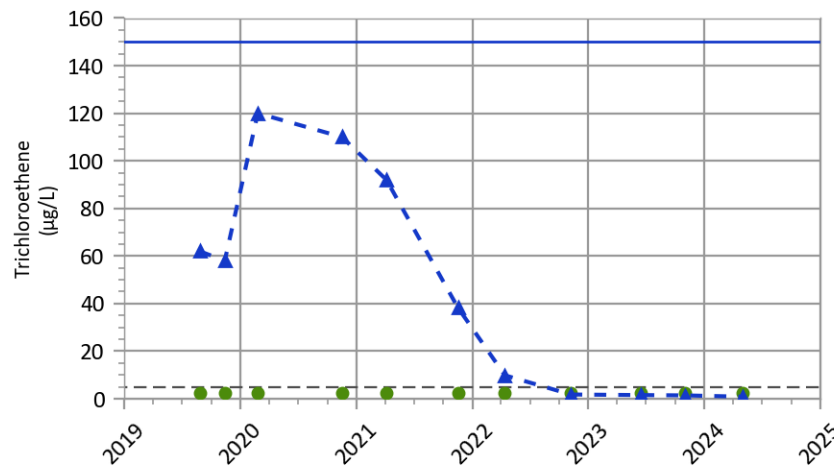
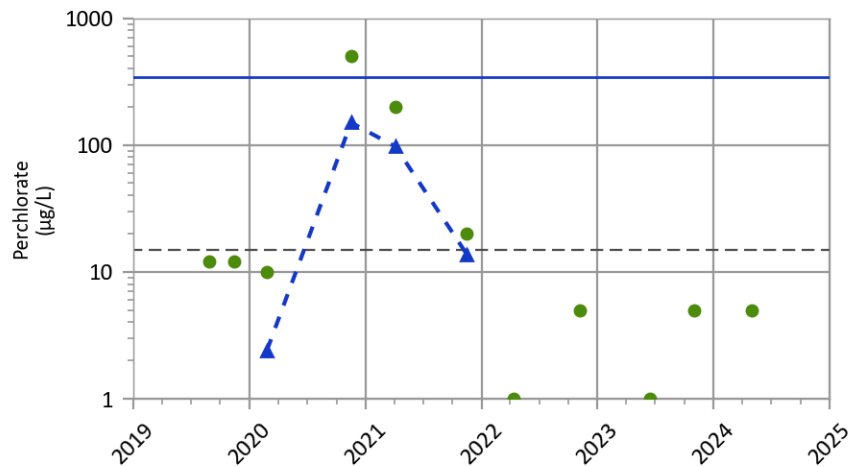
Most Recent Measured COC Concentrations (Nov 16, 2021)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	0.704	70.0
TCE	Non-Detect	5.0
VC	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



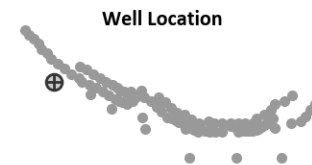
**PTX06-1175 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



Most Recent Measured COC Concentrations (Apr 30, 2024)

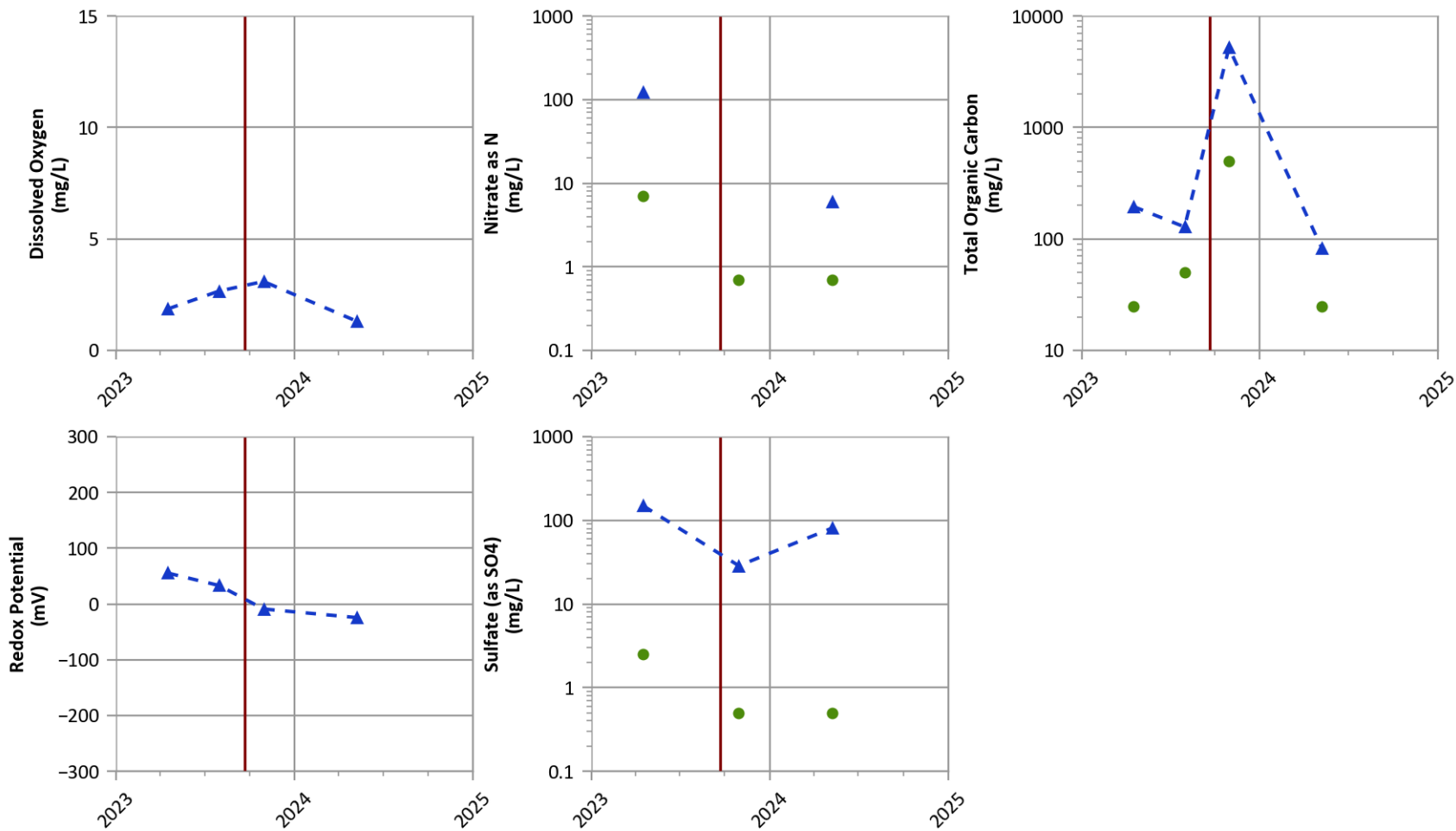
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	29.6	70.0
TCE	0.859	5.0
VC	25.4	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



Southeast ISB Extension

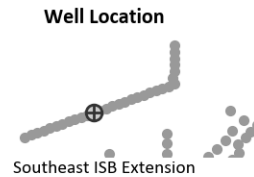
**PTX06-ISB312 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



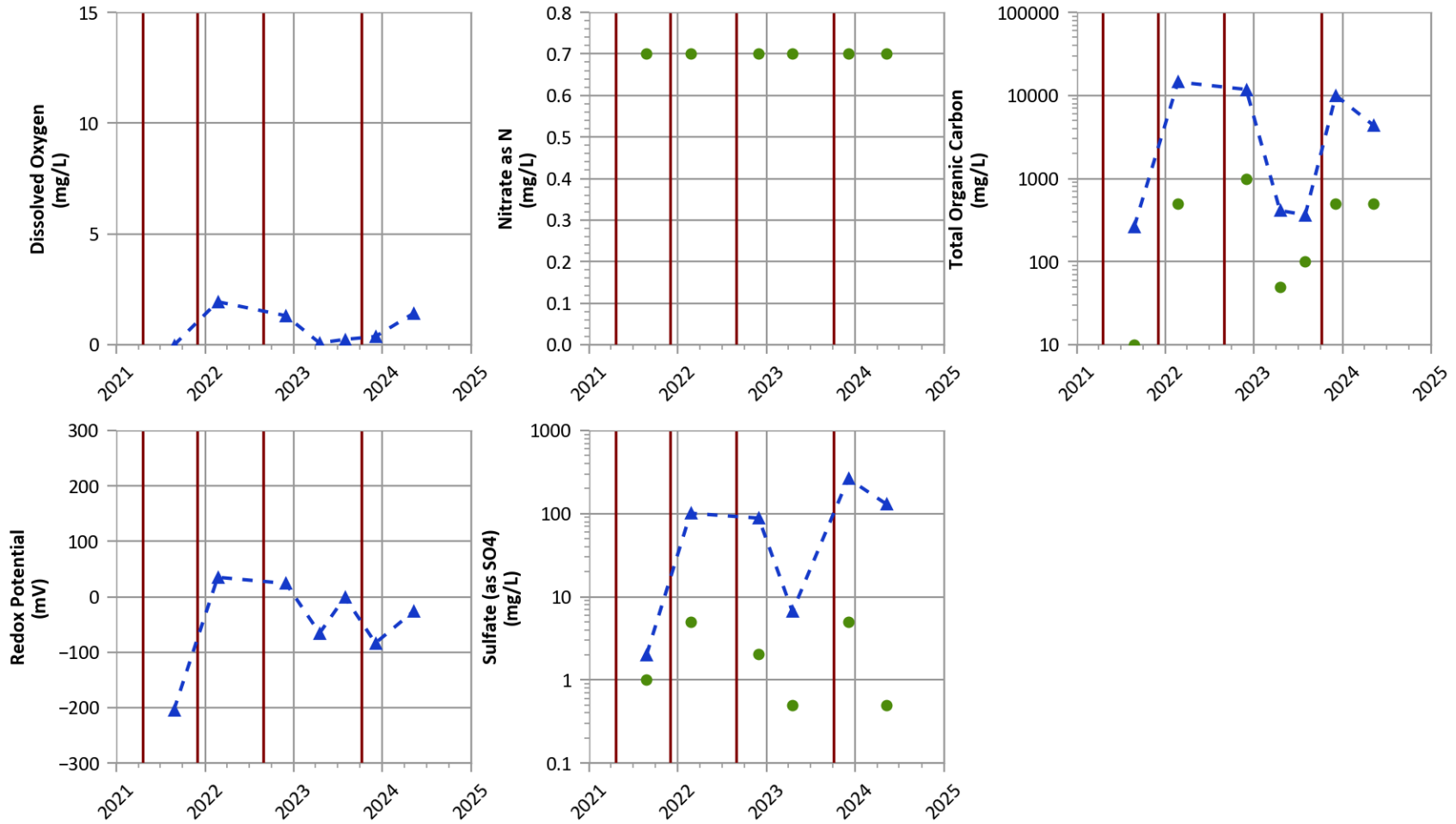
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend
- Injection Dates



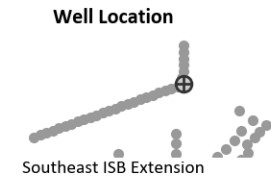
PTX06-ISB325 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



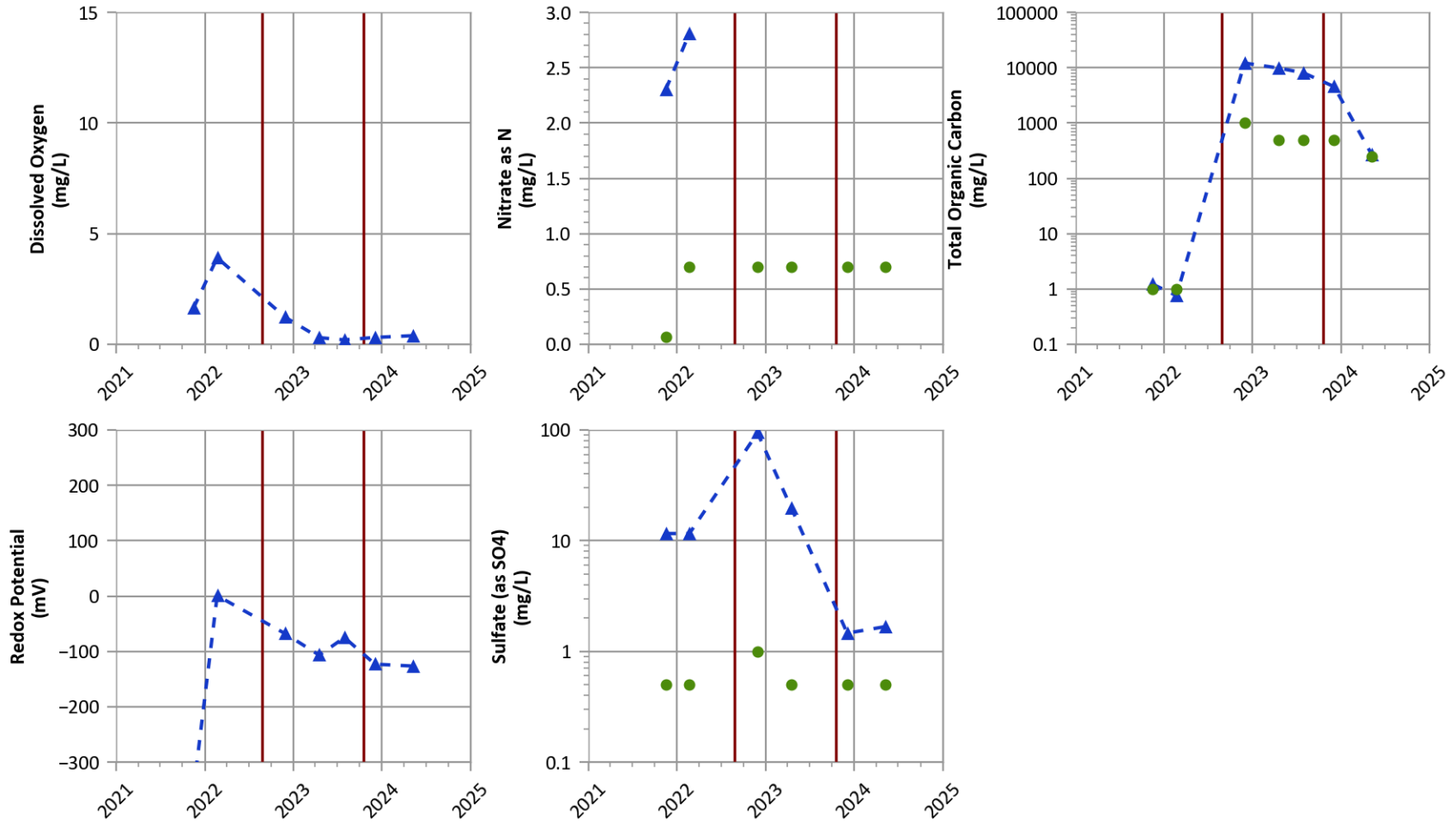
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



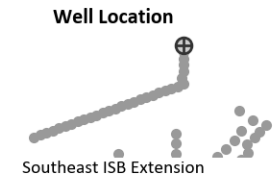
PTX06-ISB331 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



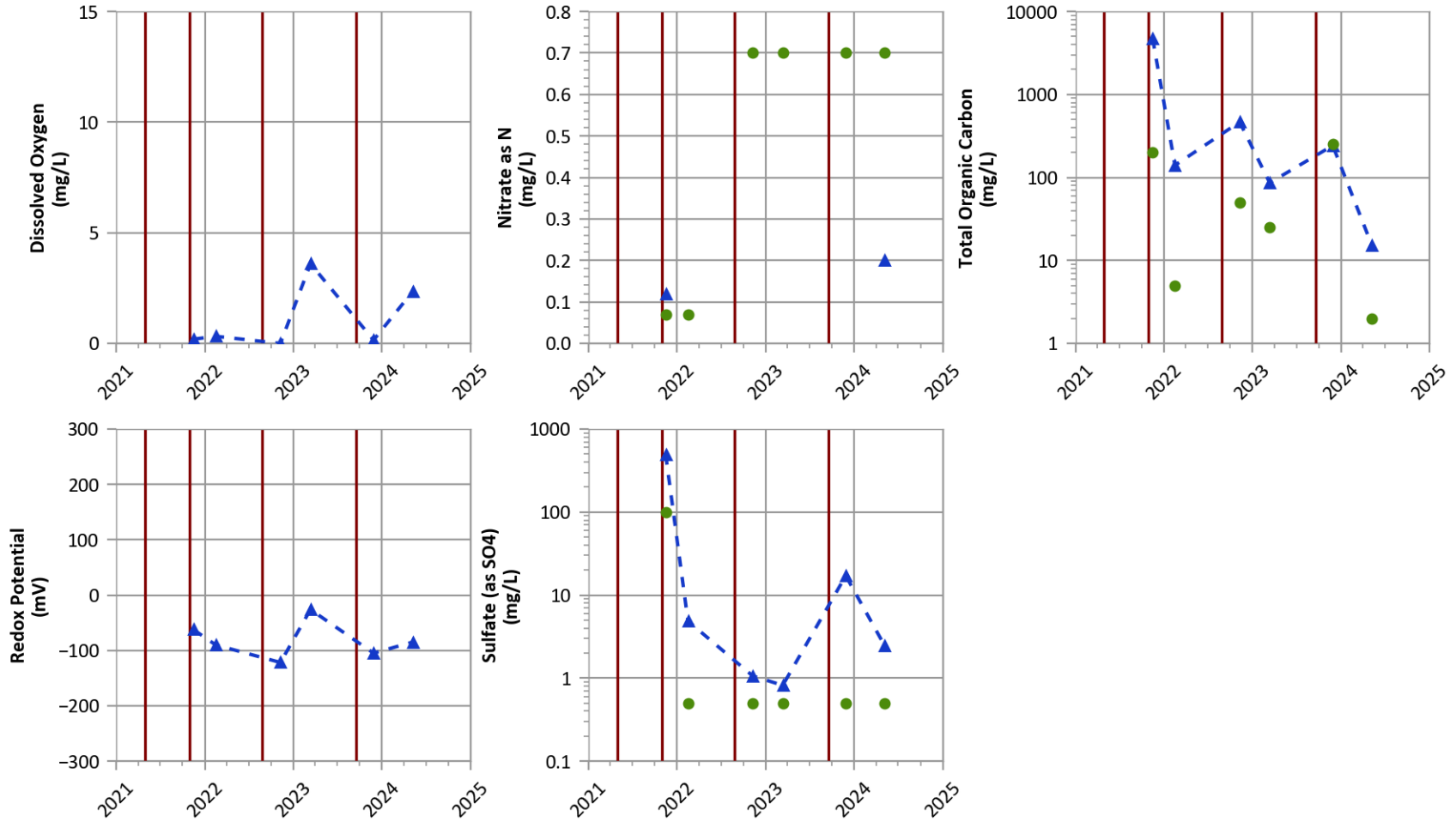
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates

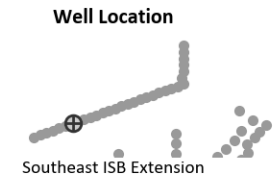


PTX06-1213 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

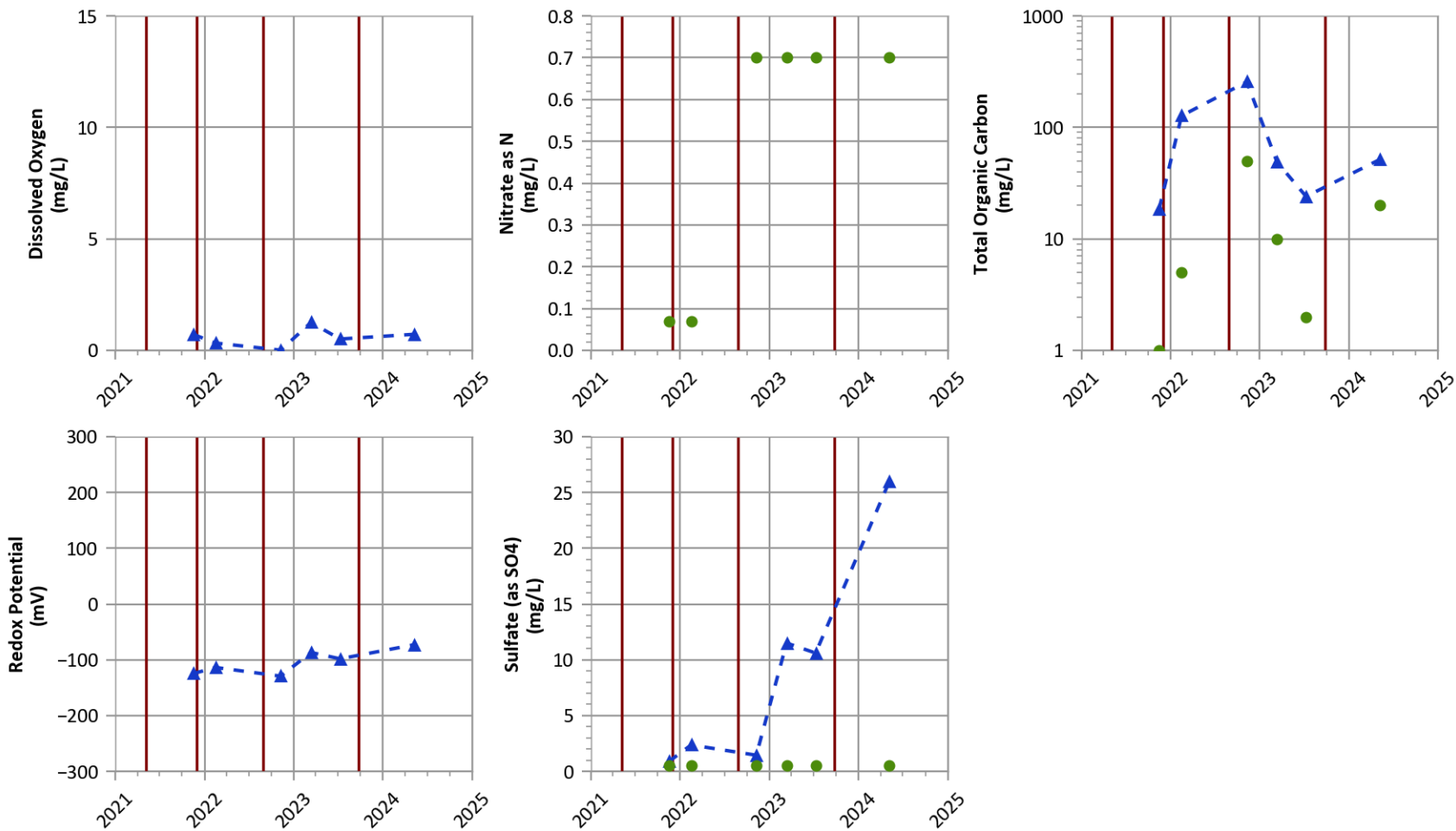


Typical Baseline Concentrations in Perched Groundwater
 Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



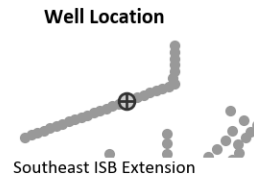
**PTX06-1214 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



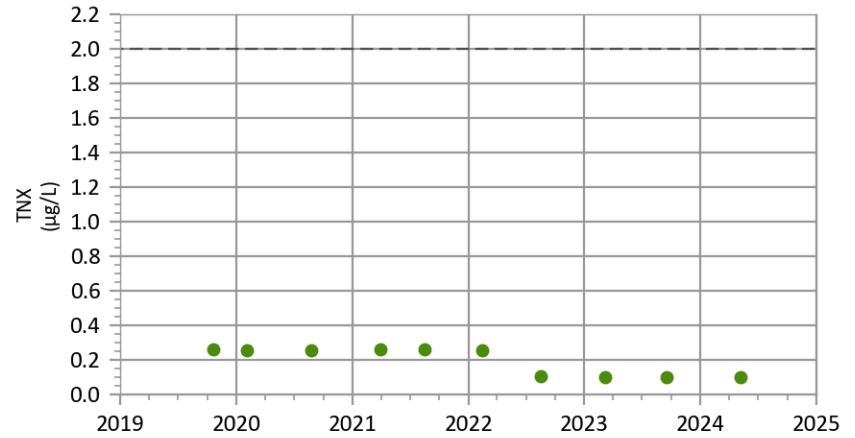
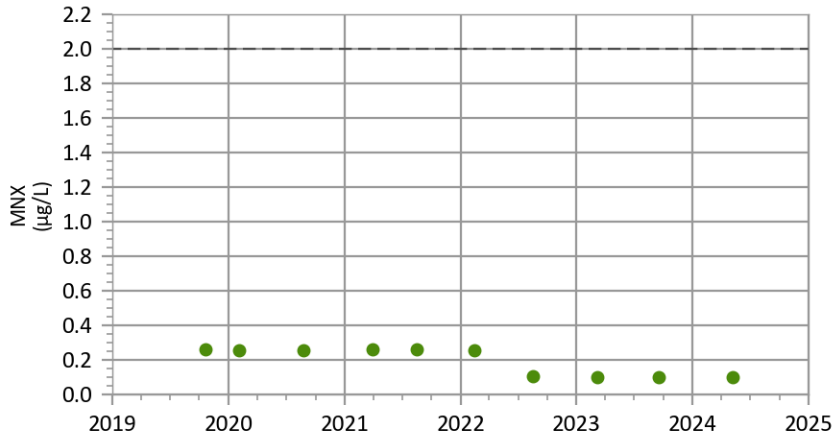
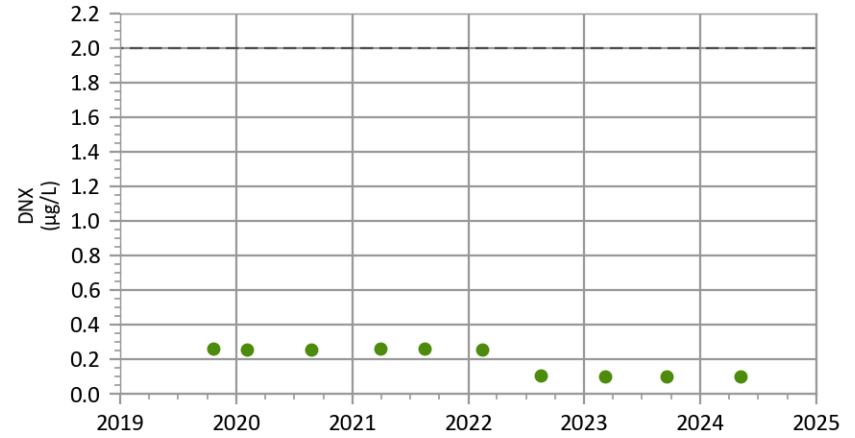
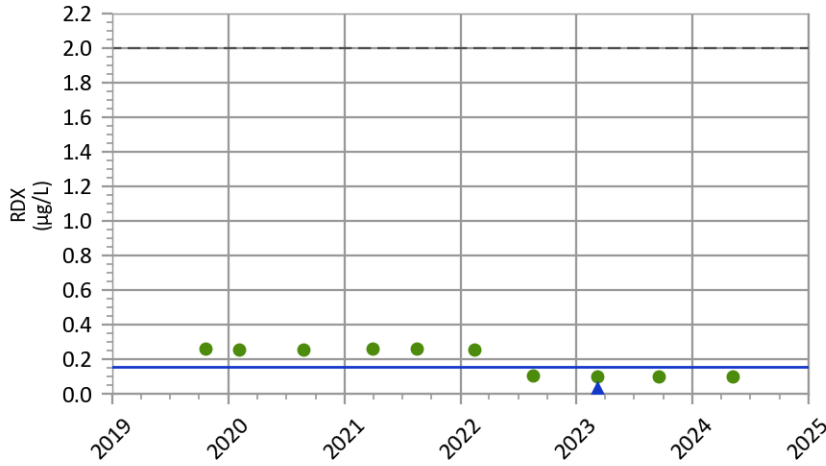
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



**PTX06-1194 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



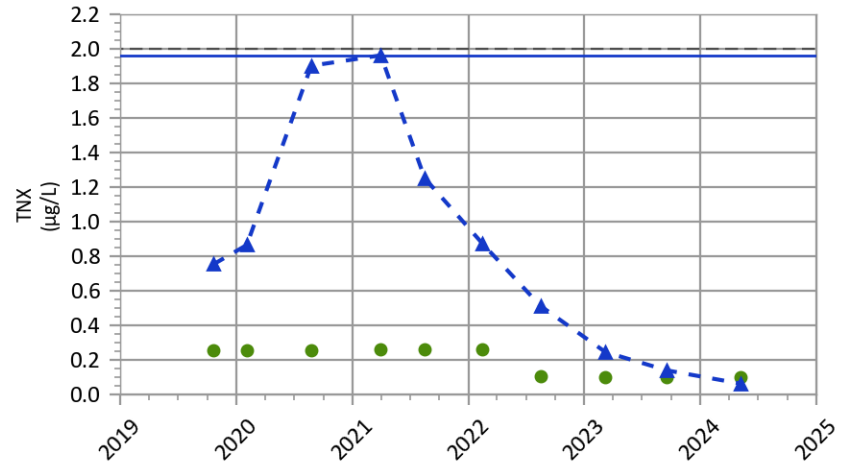
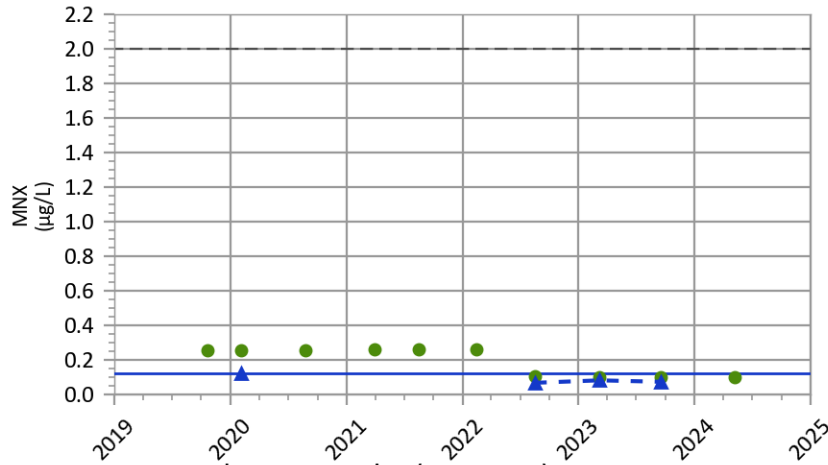
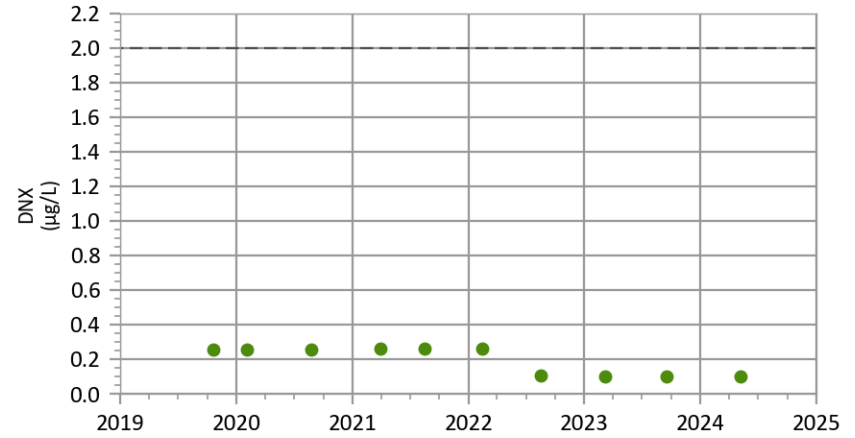
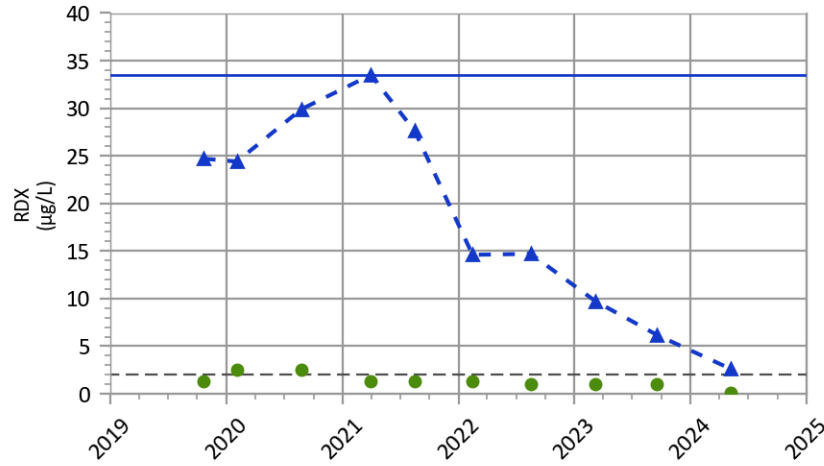
Most Recent Measured COC Concentrations (May 06, 2024)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
DNX	Non-Detect	2.0
TNX	Non-Detect	2.0

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend
- Maximum Concentration
- Groundwater Protection Standard



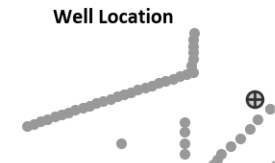
**PTX06-1196 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant**



Most Recent Measured COC Concentrations (May 06, 2024)

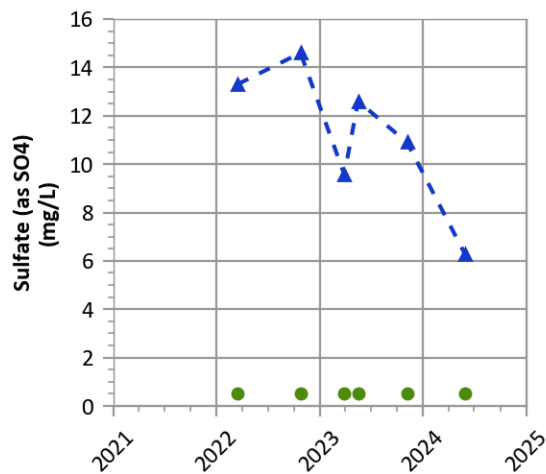
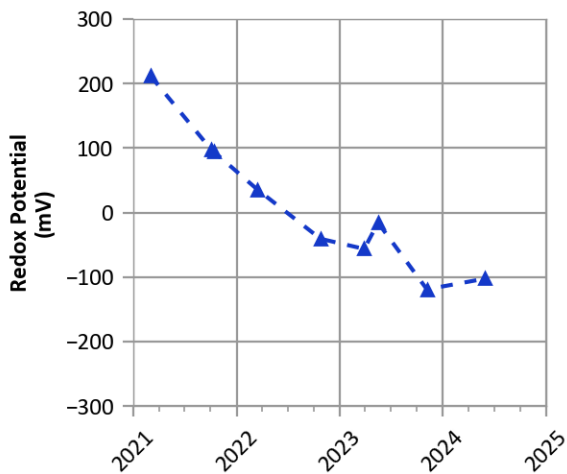
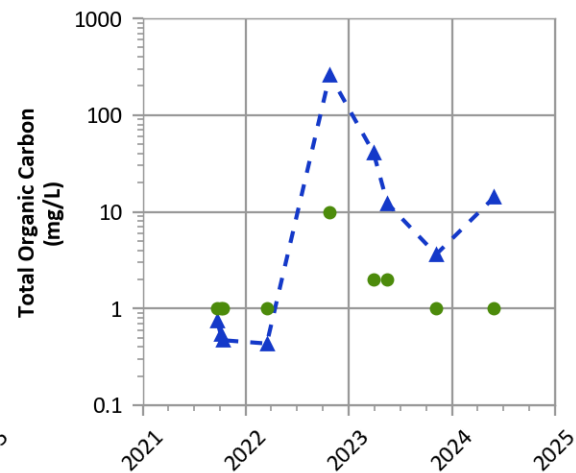
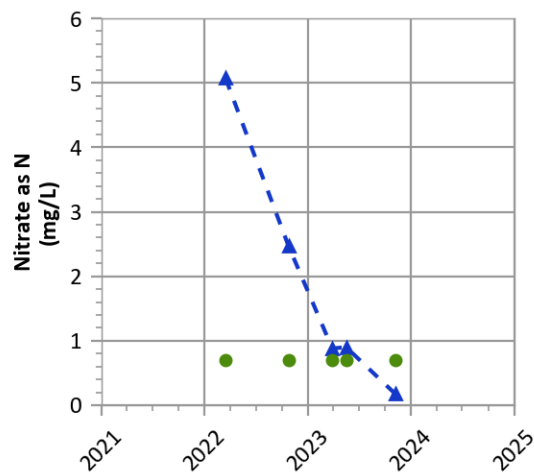
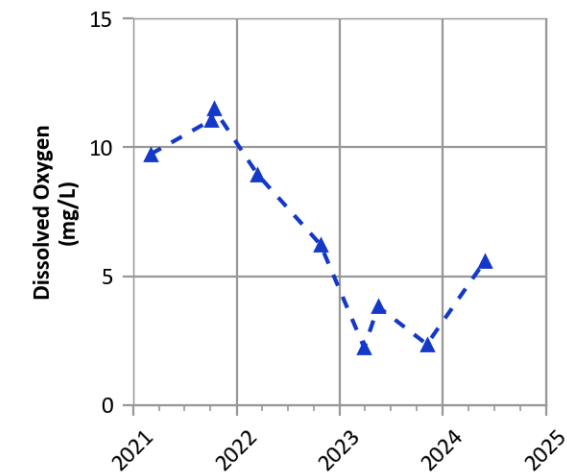
COC	Concentration (µg/L)	GWPS (µg/L)
RDX	2.62	2.0
MNX	Non-Detect	2.0
DNX	Non-Detect	2.0
TNX	0.0629	2.0

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Maximum Concentration
- - - Groundwater Protection Standard



Offsite ISB

PTX06-REC402 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



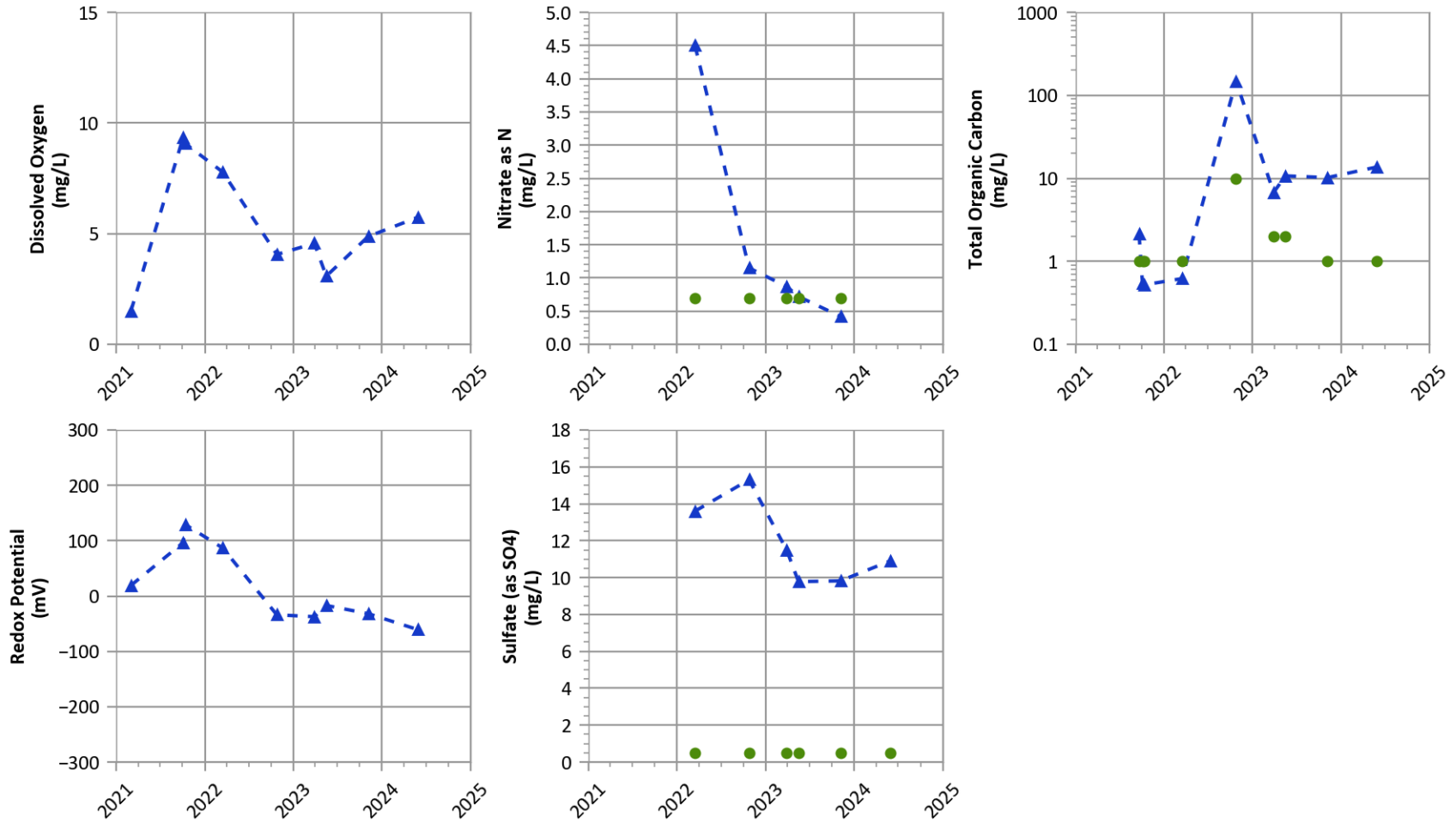
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-REC403 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



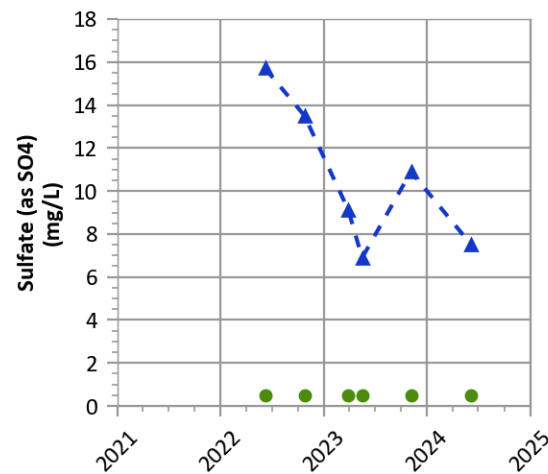
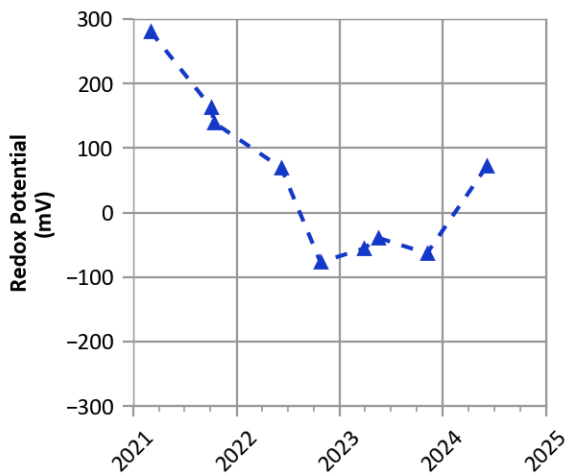
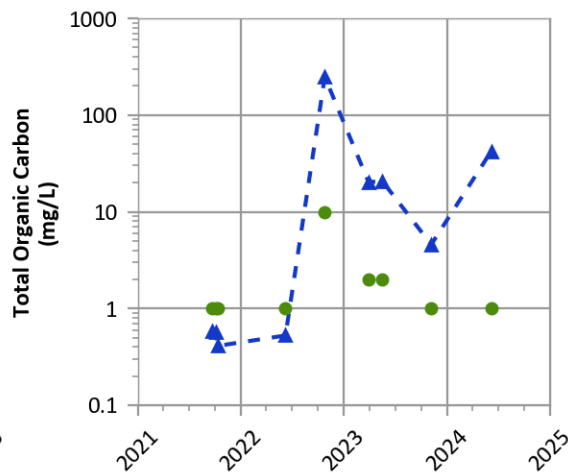
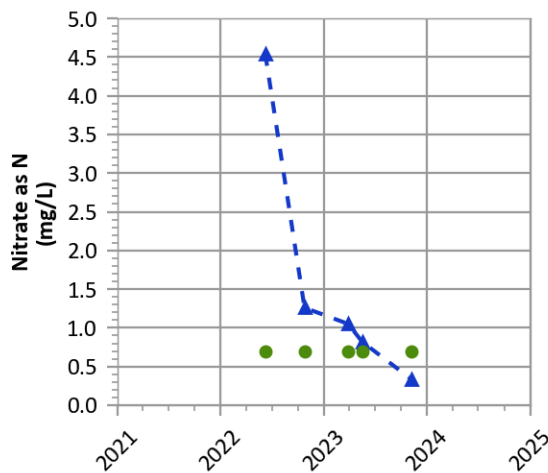
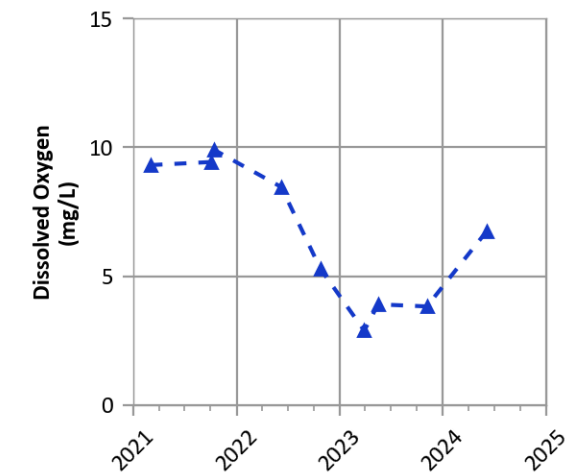
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend



PTX06-REC404 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



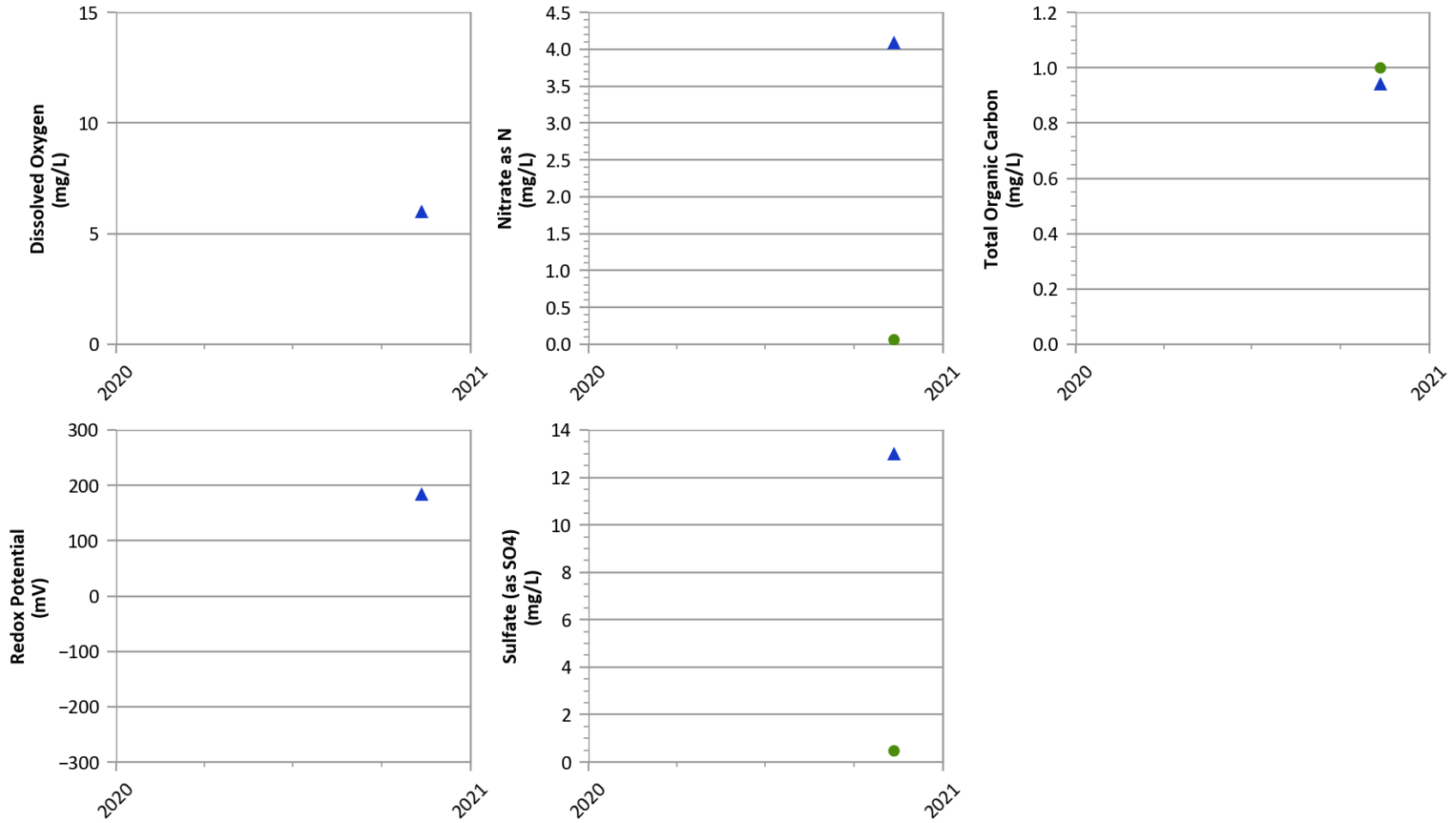
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-REC411 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



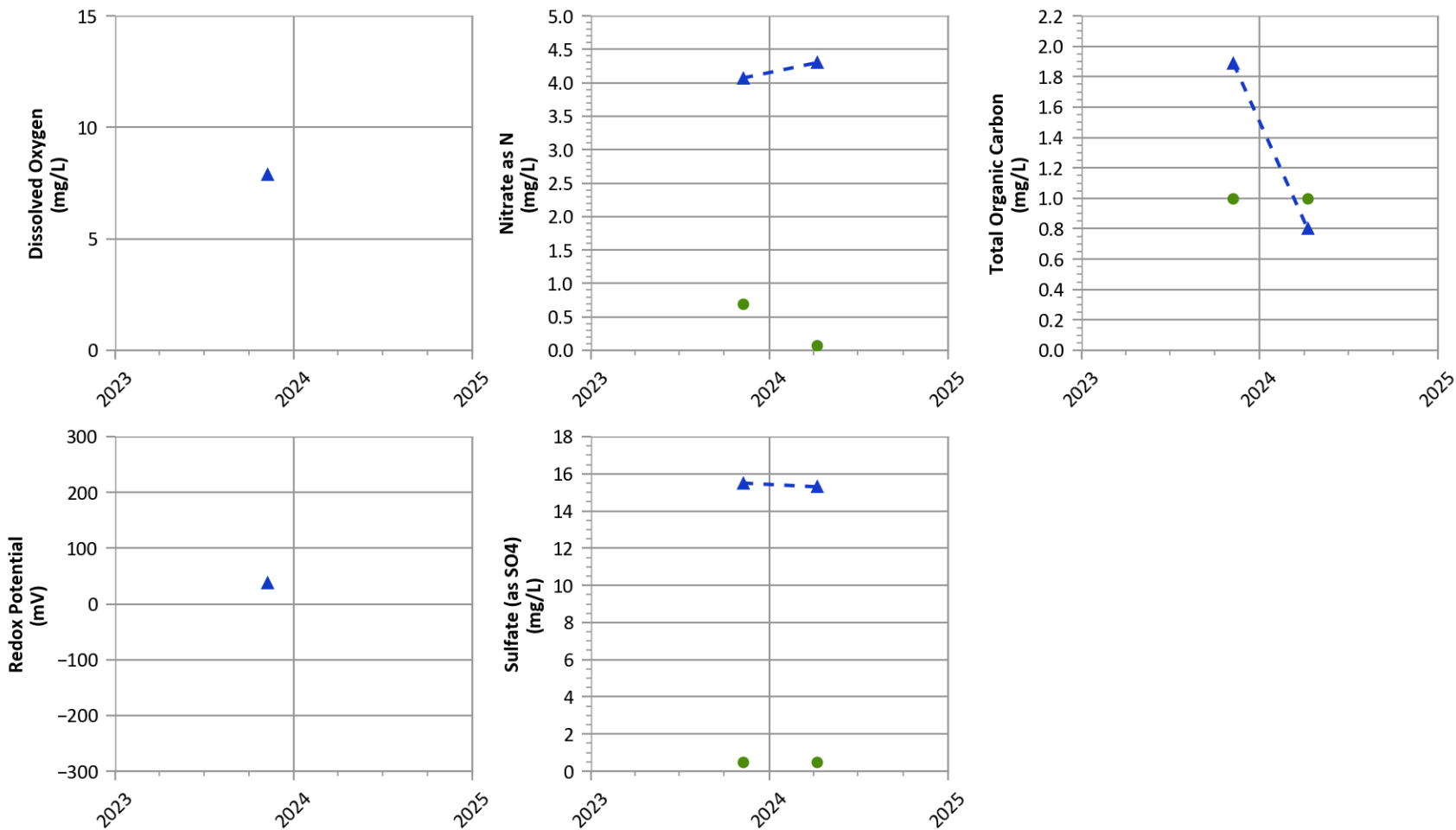
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend



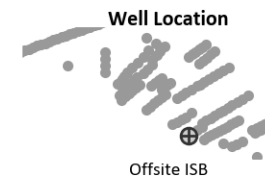
PTX06-REC412 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



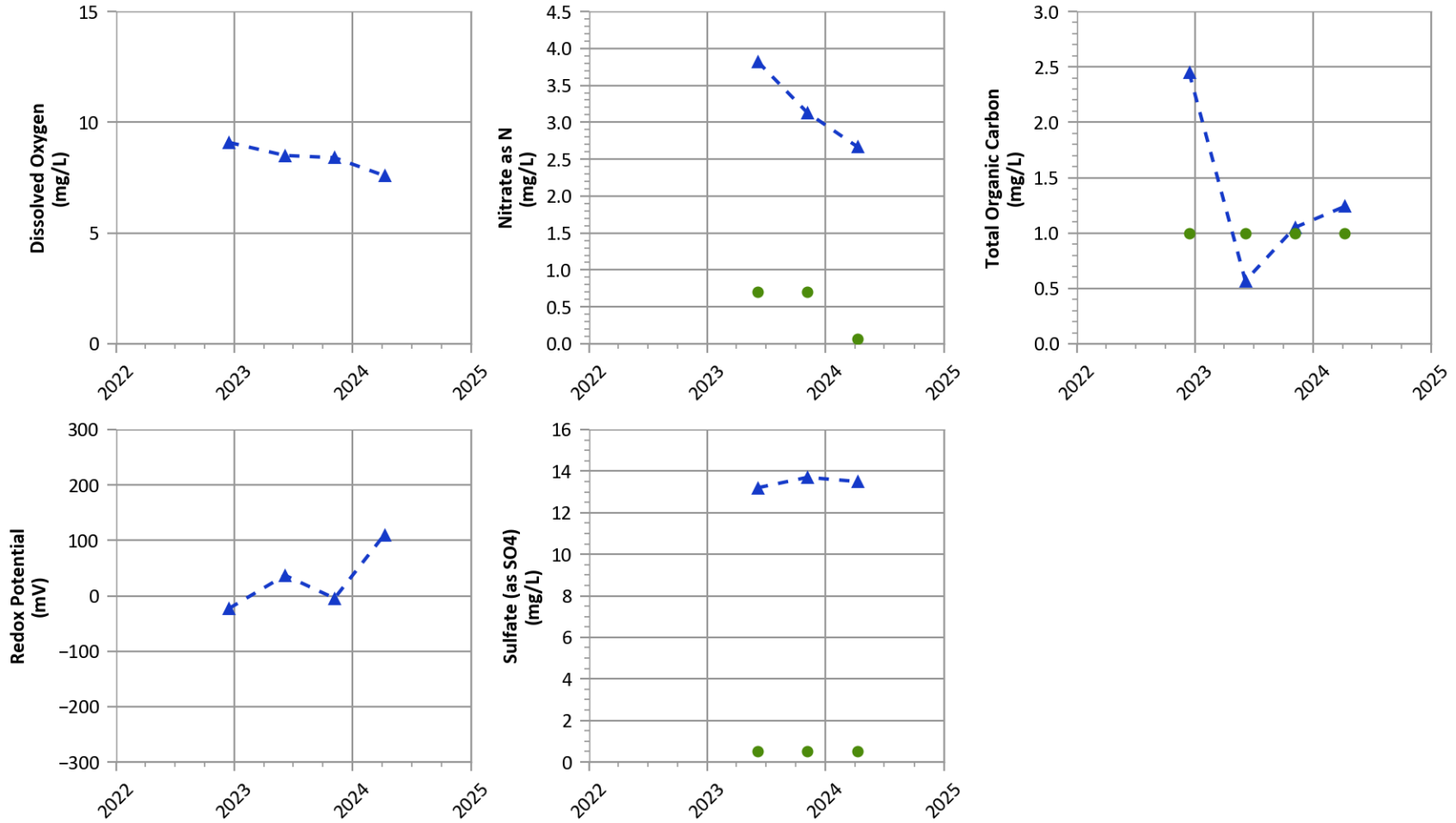
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-REC416 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



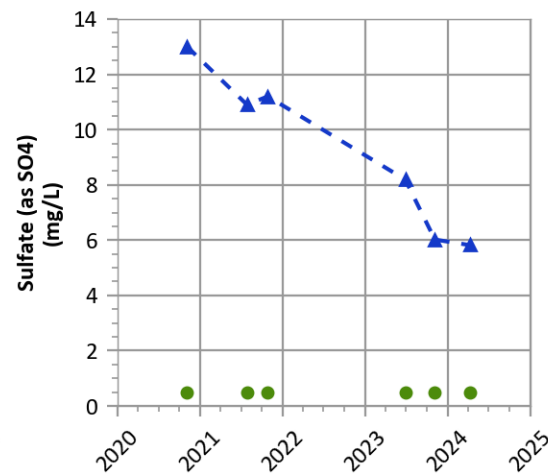
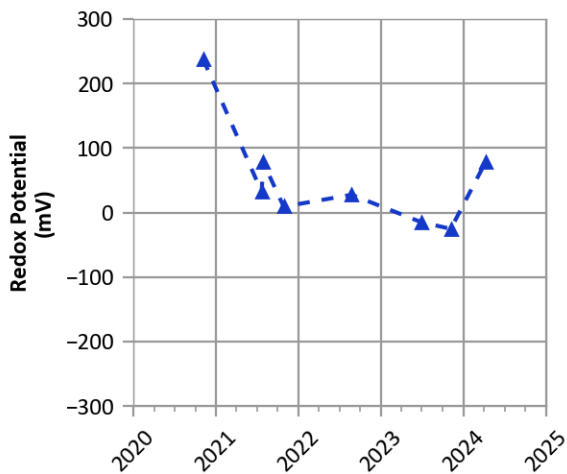
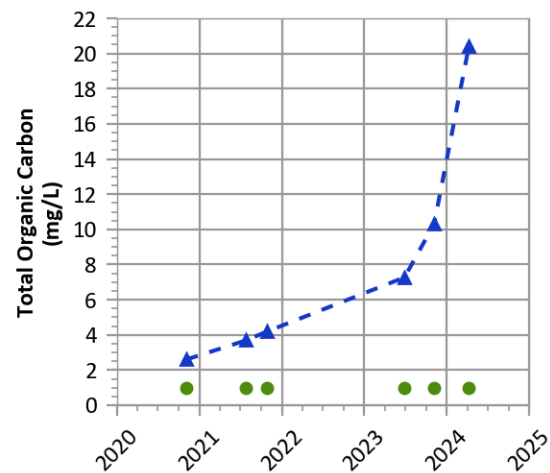
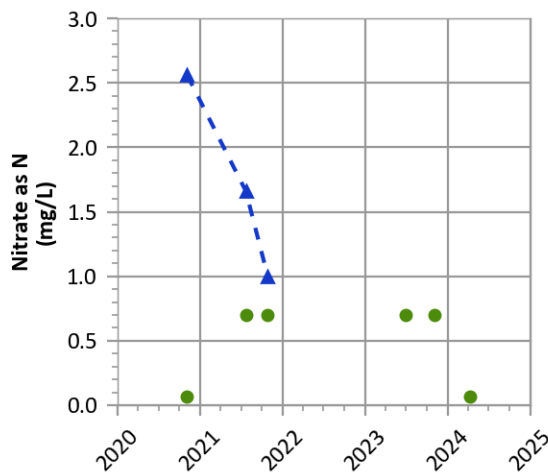
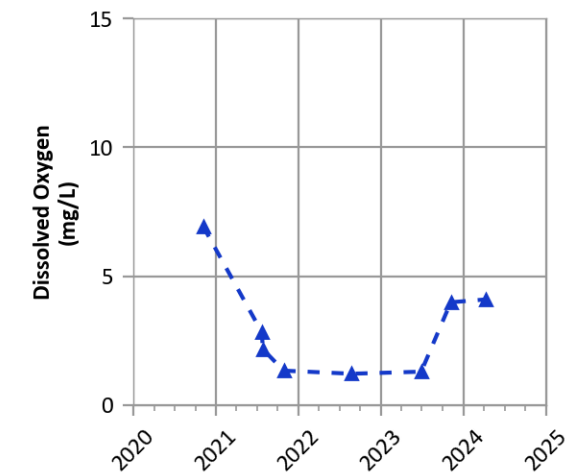
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



PTX06-MEW402 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



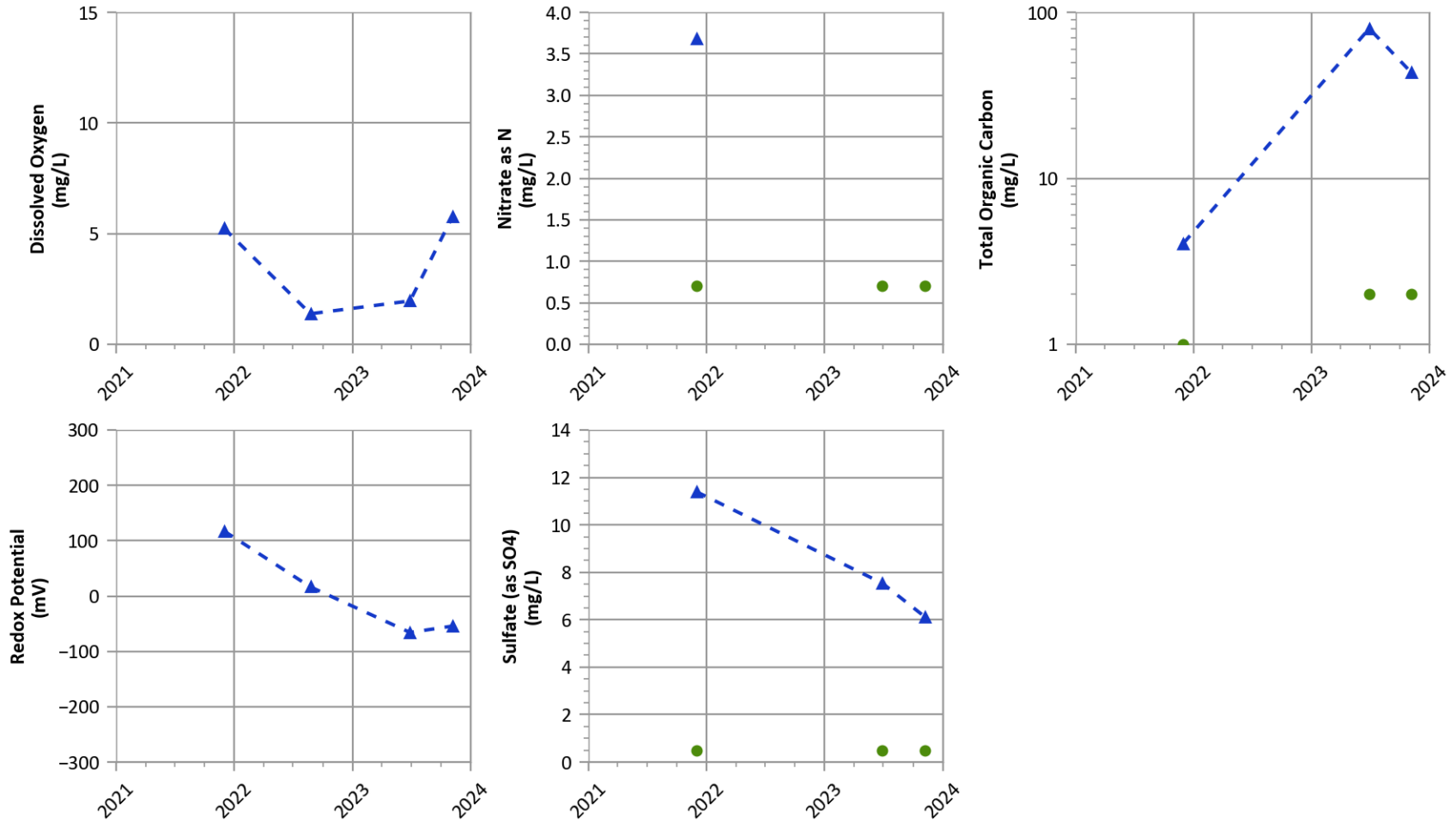
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-MEW405 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



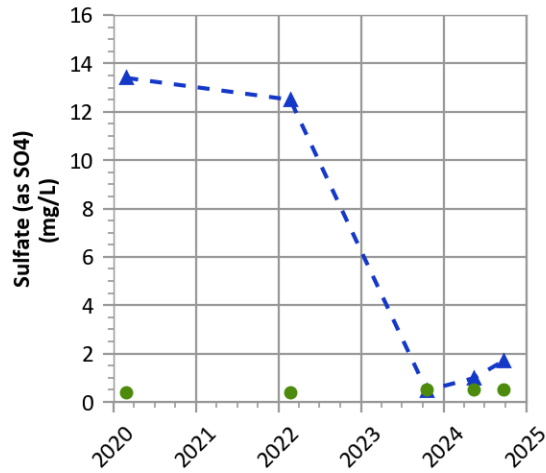
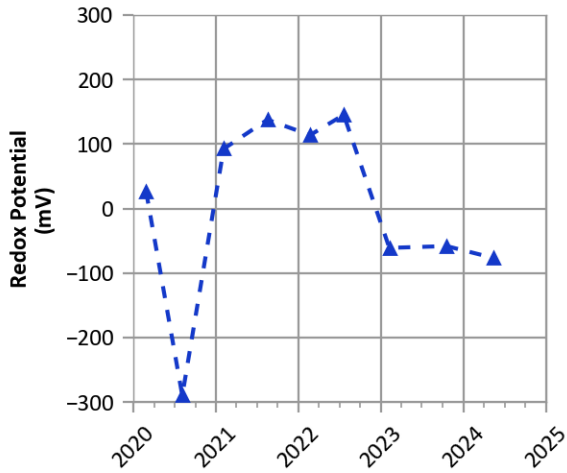
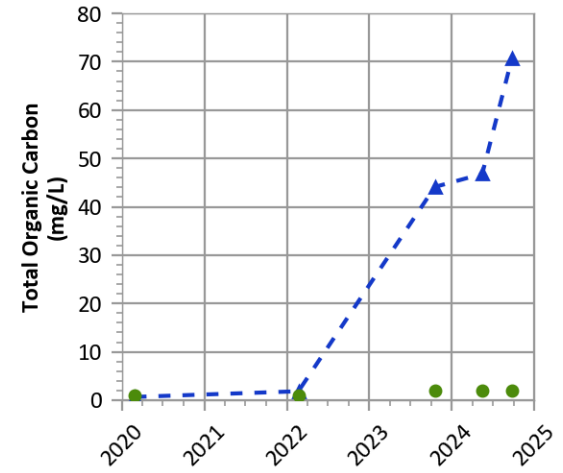
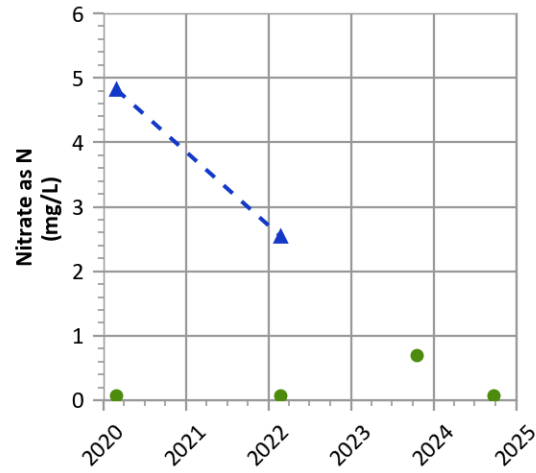
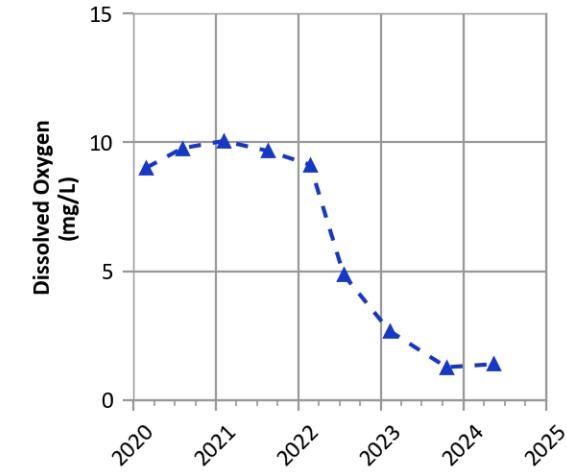
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



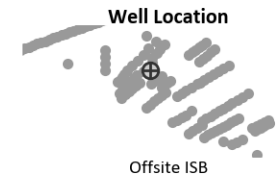
**PTX06-1197 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



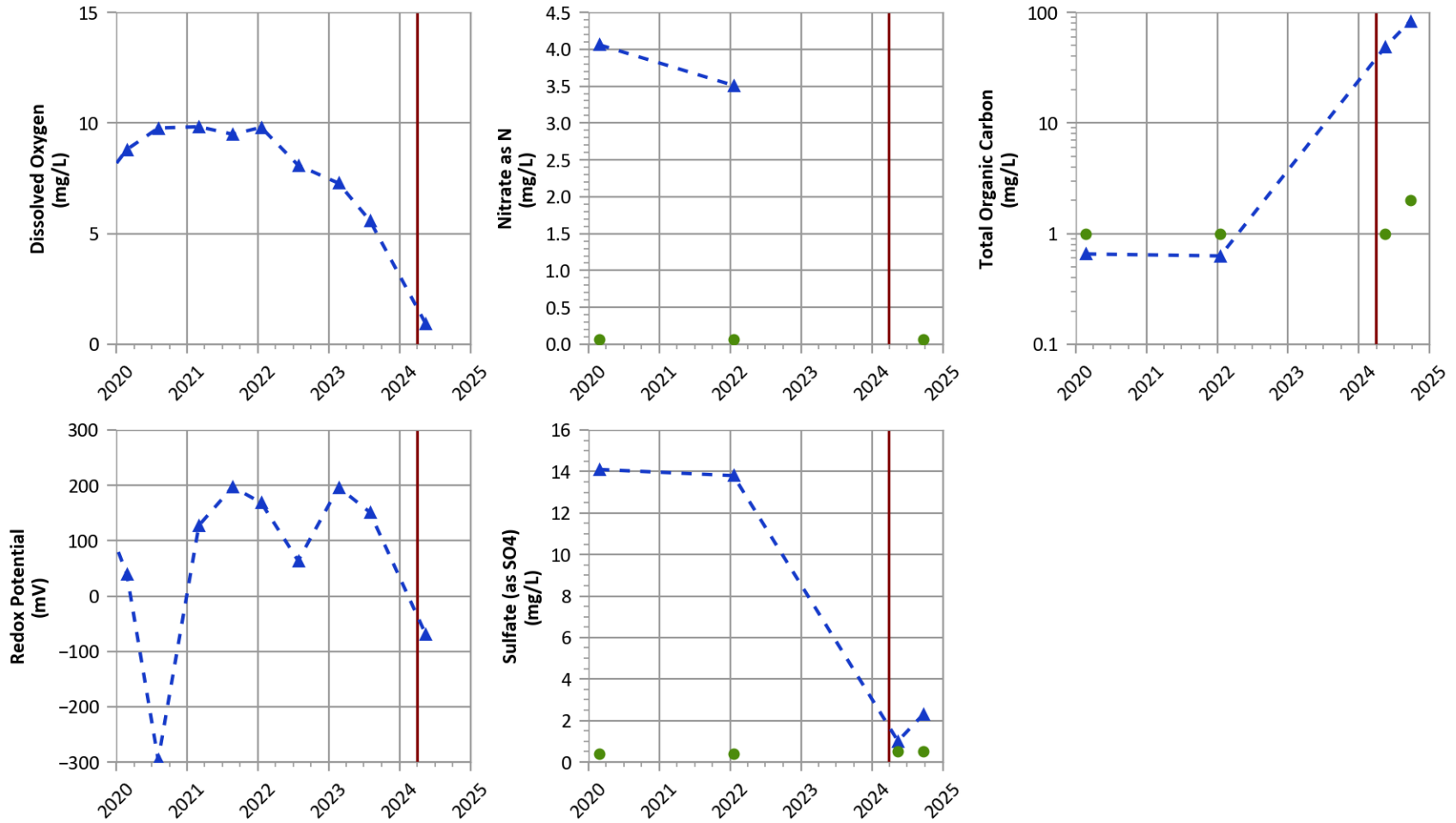
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-1203 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



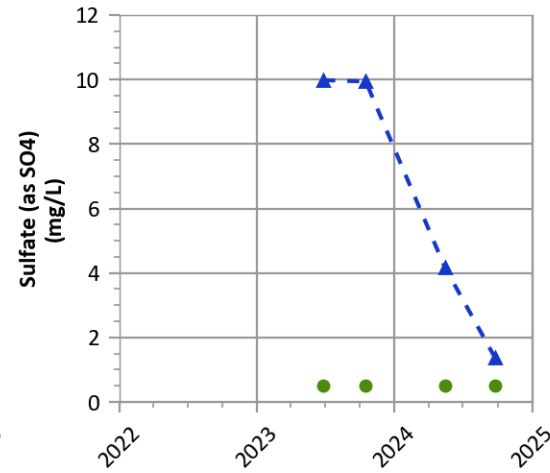
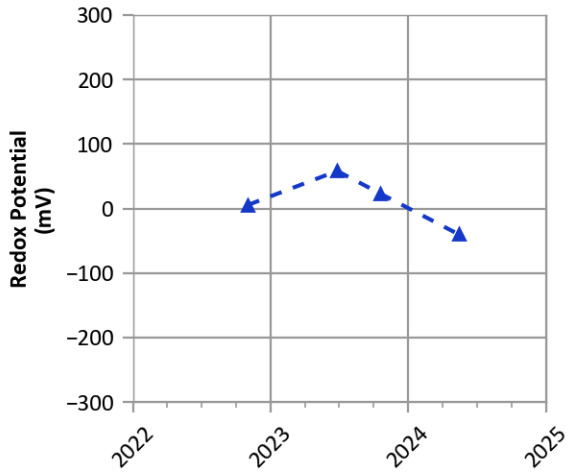
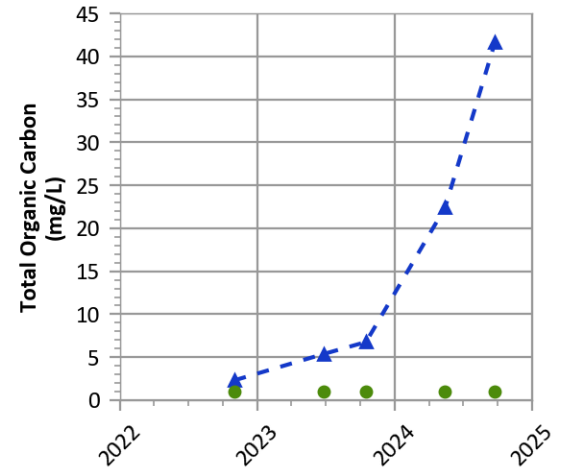
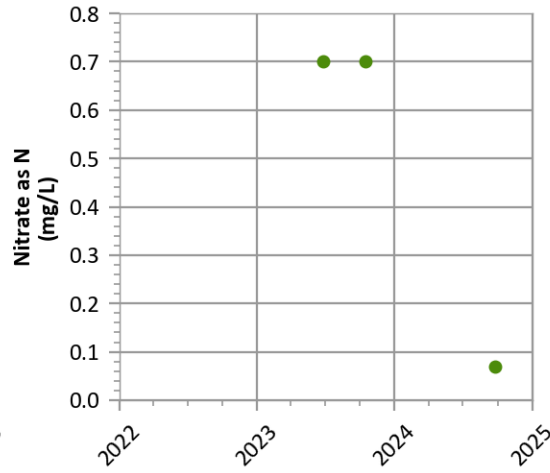
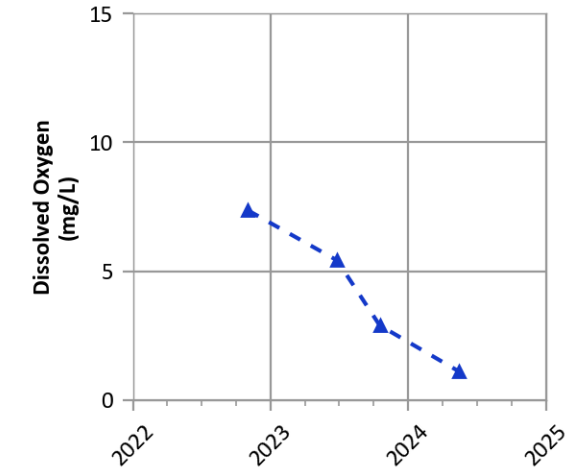
Typical Baseline Concentrations in Perched Groundwater

Dissolved Oxygen: 5-10 mg/L
 Redox Potential: > 100 mV
 Nitrate: > 1 mg/L
 Sulfate: > 10 mg/L
 Total Organic Carbon: < 5 mg/L
 Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend
- Injection Dates



**PTX06-1218 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



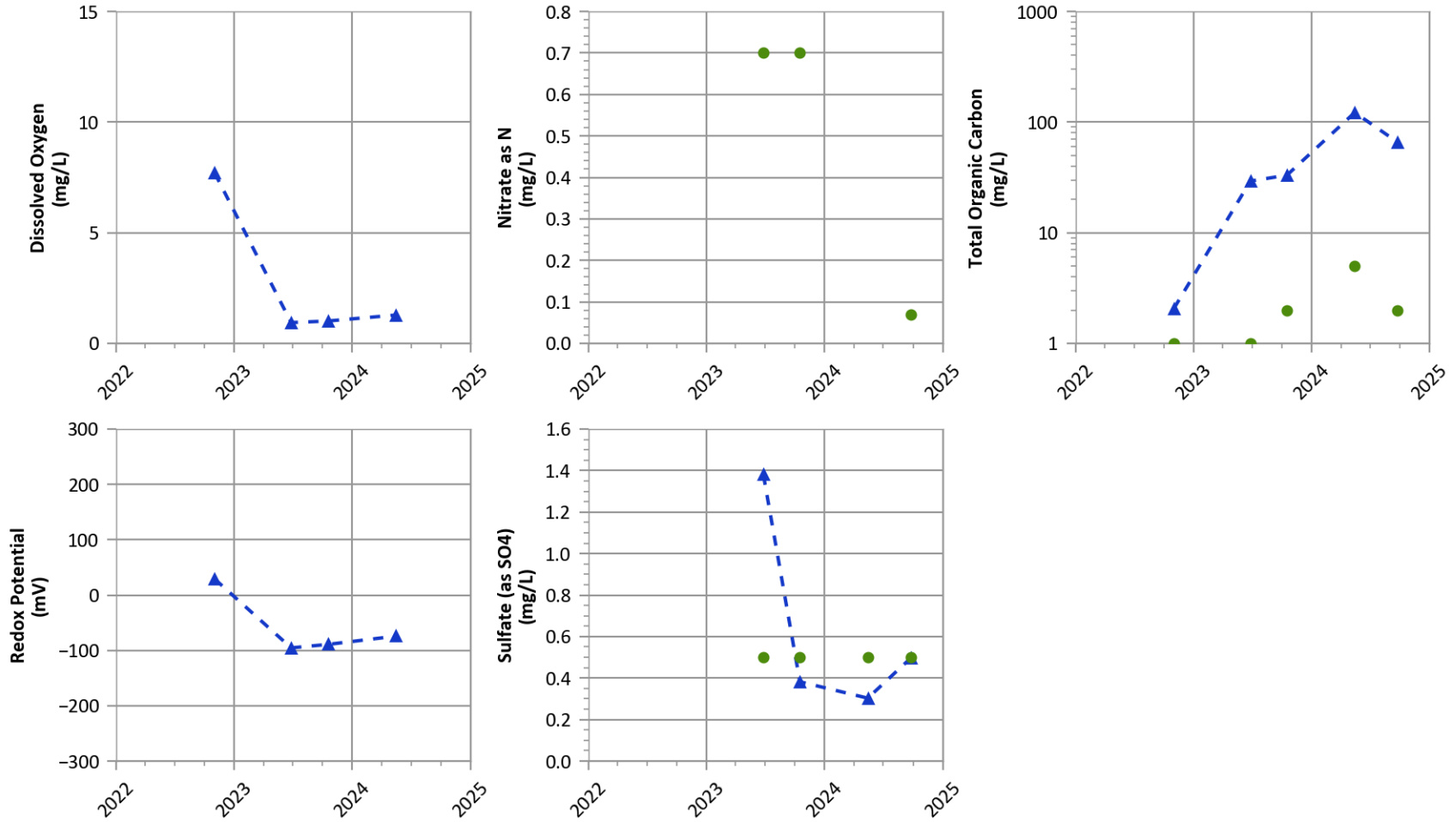
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-1219 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



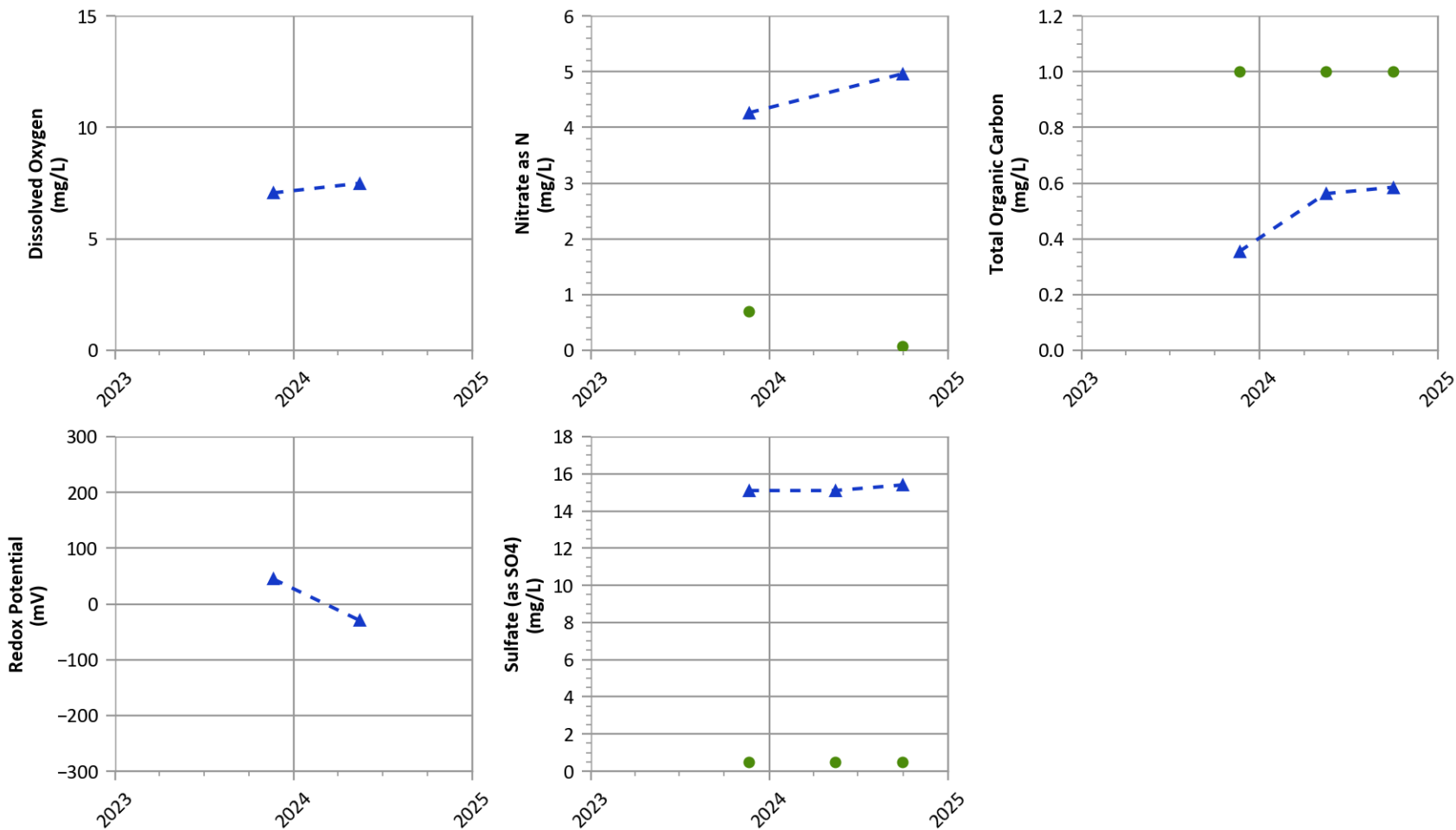
Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- - - Concentration Trend



**PTX06-1221 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant**



Typical Baseline Concentrations in Perched Groundwater

- Dissolved Oxygen: 5-10 mg/L
- Redox Potential: > 100 mV
- Nitrate: > 1 mg/L
- Sulfate: > 10 mg/L
- Total Organic Carbon: < 5 mg/L
- Total Volatile Fatty Acids: Not Detected

- ▲ Measured Value
- Sample Detection Limit
- Concentration Trend

