PANTEX QUARTERLY PROGRESS REPORT

Remedial Action Progress

Third Quarter 2023

In support of Hazardous Waste Permit #50284 and

Pantex Plant Interagency Agreement

December 2023

Pantex Plant

FM 2373 and U.S. Highway 60

P.O. Box 30030

Amarillo, TX 79120

NNSA PRODUCTION OFFICE — UNITED BY A COMMON GOAL

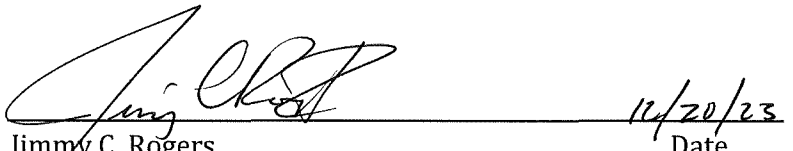
CNS consolidated nuclear security, llc

PANTEX PLANT | Y-12 NATIONAL SECURITY COMPLEX

CERTIFICATION STATEMENT

Third Quarter 2023 Remedial Action Progress Report
Pantex Plant, December 2023

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.



12/20/23

Jimmy C. Rogers
Senior Director, Environment, Safety and Health
Consolidated Nuclear Security, LLC

Date

Remedial Action Progress Report
Third Quarter 2023
in Support of Hazardous Waste Permit #50284
and Pantex Plant Interagency Agreement
for the Pantex Plant, Amarillo, Texas
December 2023

Prepared by
Consolidated Nuclear Security, LLC
Management and Operating Contractor
for the
Pantex Plant and Y-12 National Security Complex
under Contract No. DE-NA0001942
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.

Tony Biggs
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12/18/23
Date

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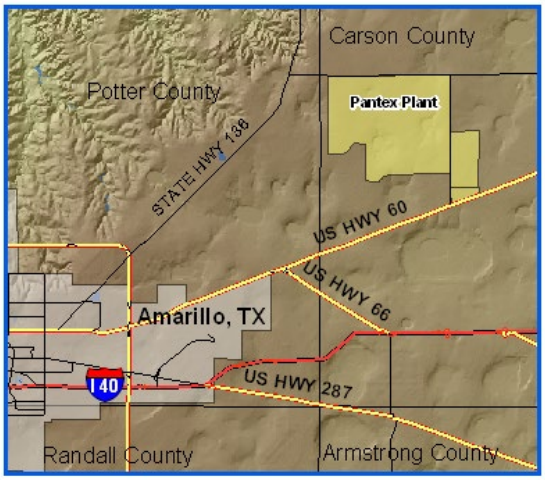
List of Acronyms

µg/L	micrograms per liter
CatOx	catalytic oxidation
COC	contaminant of concern
CP	Compliance Plan
Cr(VI)	hexavalent chromium
DCE	dichloroethene
DNT4A	4-amino-2,6-dinitrotoluene
EVO	emulsified vegetable oil
FGZ	fine-grained zone
GWPS	groundwater protection standard
HE	high explosive
ISB	*in situ* bioremediation
ISPM	*in situ* performance monitoring
Lbs	pounds
MEW	mobile extraction well
Mgal	million gallons
mV	millivolts
NAPL	non-aqueous phase liquid
ORP	oxidation-reduction potential
P1PTS	Playa 1 Pump and Treat System
ppmv	parts per million by volume
PQL	practical quantitation limit
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
REC	recirculation extraction well
SAP	Sampling and Analysis Plan
scfm	standard cubic feet per minute
SE ISB	Southeast *In Situ* Bioremediation
SE ISB EXT	Southeast *In Situ* Bioremediation Extension
SEPTS	Southeast Pump and Treat System
SVE	soil vapor extraction
TAC	Texas Administrative Code
TCE	trichloroethene
TZM	treatment zone monitoring
VOC	volatile organic compound
WWTF	wastewater treatment facility
Z11 ISB	Zone 11 *In Situ* 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 has been installed to remediate volatile organic compounds (VOCs) in soils at the Burning Ground area. This quarterly report addresses progress achieved through implementation of the remedial actions for third quarter of 2023.



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, ISB systems, and a small-scale SVE system. 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. System operation, mass removal, and effluent photoionization detector readings are evaluated for the SVE system.

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). SEPTS has the capability to inject the treated water back into the perched aquifer when beneficial use is not possible. Both systems now have the capability to release water to the new surface center pivot irrigation system. Other than the surface irrigation system, P1PTS can only release water to the WWTF storage lagoons. Operational priorities for the pump and treat systems emphasize beneficial use of water.

Pump and Treat System
Third Quarter 2023 Operation

Playa 1 Pump and Treat System (P1PTS)	
Days Operated	42
% Operation Time	22%
Volume Water Treated (Mgal)	9.2
HE Mass Removal (lbs)	2
Beneficial Use of Water	100%
Southeast Pump and Treat System (SEPTS)	
Days Operated	92
% Operation Time	98%
Volume Water Treated (Mgal)	33.9
HE Mass Removal (lbs)	107.1
Chromium Mass Removal (lbs)	17.6
Perchlorate Mass Removal (lbs)	44.8
Beneficial Use of Water	11%

*Value below operational goals

The subsurface drip irrigation system, a primary release location for treated water, was not utilized during the third quarter of 2023. Operation of the subsurface system is, and will continue to be, hindered by lowered lagoon 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 Texas Commission on Environmental Quality 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. At the end of the third quarter, Pantex finished installation of an irrigation alternative on the property east of FM 2373 in August 2023 to provide additional long-term use of the treatment system water. Installation of five pivot center irrigation pivots helps increase throughput for the pump and treat systems. The pivot system will be able to fully operate during warmer months (primarily March – November), decreasing water released to Playa 1. Operation of the pivot system will be limited during winter due to freezing temperatures.

During the third quarter, the SEPTS system operated at a higher capacity using injection, release to Playa 1, shutdown of P1PTS and operation of the new pivot irrigation system. P1PTS was shut

down at the end of April 2022 to construct the connection to the new center pivot irrigation system east of FM 2373. The system remained down during a majority of the third quarter, but became operational at the end of July 2023. P1PTS was operated intermittently during July, August, and September to allow for automation and testing of the new pivot irrigation system.

Graphs of monthly operation and throughput are included in Appendix B. The SEPTS wellfield had nine wells that required repair during the third quarter due to electrical and equipment issues, while P1PTS had two wells in need of repair. Pantex has issued a contract to address these problems, and most wells will be operational by the end of 2023.

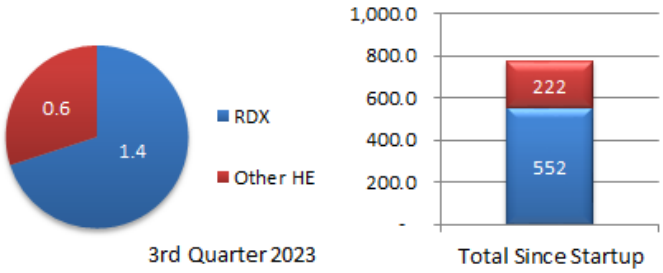


Figure 1. P1PTS Mass Removal

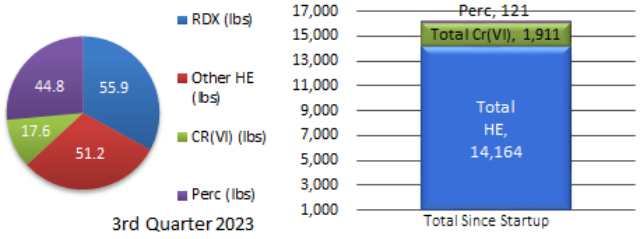


Figure 2. SEPTS Mass Removal

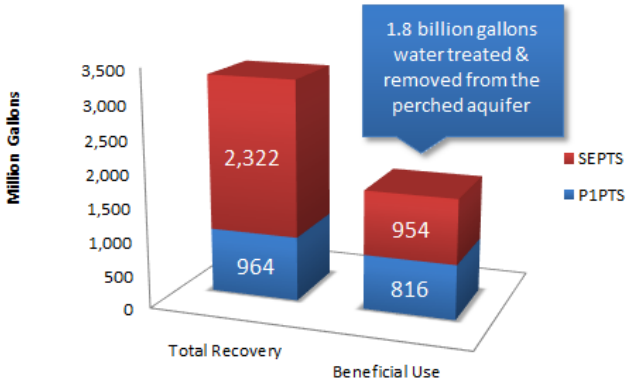


Figure 3. System Recovery and Use

Both systems treated about 43 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 reduction of mass removal at P1PTS. Overall, the systems have removed over 16,800 pounds (lbs) of HEs, chromium, and perchlorate contaminants from perched groundwater since operations began.

The total recovery and treatment from both systems since startup has been calculated at about 3.3 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 irrigation system. The recovery and beneficial use totals are presented in Figure 3. All of P1PTS flow was used for irrigation purposes

(including testing) in the third quarter and 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).

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 2023. 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.

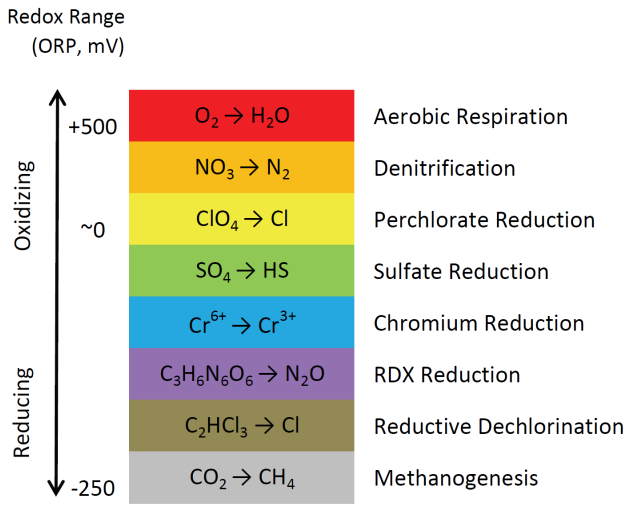


Figure 3. Redox Range for COCs

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 3 presents the redox ranges for the reduction of various COCs. Dissolved gases, 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 a system's data is not always available for quarterly evaluation, only new and complete data sets for each system will be assessed during the current quarter. In the third quarter, no system was sampled completely. Table 1 summarizes the injection activities for 2023. 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 (2023)	SE ISB EXT	SE ISB	Z11 ISB	Offsite ISB[1]
January				
February		**Sample**		*Maintenance*
March	**Sample**	**Sample**	*Maintenance*	*Injection*
April	**Sample**		**Sample**	*Injection*
May			**Sample/***Injection*	**Sample/***Injection*
June			*Injection*	**Sample/***Injection*
July	***Sample****/Maintenance*		*Injection*	*Injection*
August	*Injection*	**Sample**	*Injection*	*Injection*
September	*Injection*	**Sample**	*Injection*	*Injection*
October			*Injection*	***Sample/****Injection*
November	**Sample**	**Sample**	**Sample**	***Sample/****Injection*
December			**Sample**	

[1]All sampled wells in the Offsite ISB are extraction wells (REC) and (MEW) and 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

Burning Ground SVE

The Burning Ground SVE system began operation in 2002 as a large-scale catalytic oxidizer (CatOX) system. Due to a large reduction in VOC concentrations, a small CatOX system has been operating at the Burning Ground SVE system since April 2012. This small-scale system focused on treating residual non-aqueous phase liquid (NAPL) and soil gas at a single extraction well (SVE-S-20) near the source area.

Overall, the system operated 28% of the quarter (~ 606 hours of operation). The system had been shutdown due to repairs, but became operational again in August 2023. The system ran until the end of October 2023 when a failure of the catalytic oxidizer shutdown the system. Figure 4 shows mass removal calculated for the third quarter and since startup for VOCs that historically contribute to the total VOC concentration.

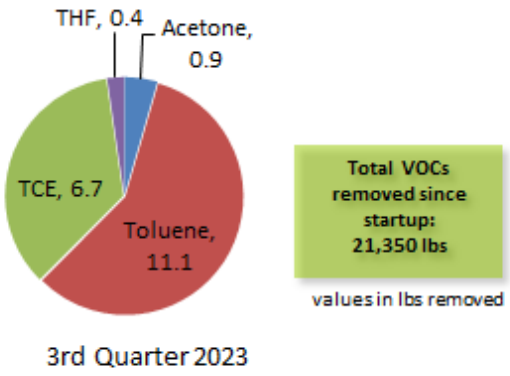


Figure 4. SVE Mass Removal

The system removed ~ 19 lbs of total VOCs during the third quarter, but has removed about 21,350 lbs of VOCs since startup. Based on PID data collected at the system effluent port, the overall average system destruction efficiency was 96%. Analytical data collected at startup indicate that the NAPL source is almost depleted, as reflected in the current mass removal values. Pantex submitted a closure report in August and will request closure of the system with the renewal of the Hazardous Waste Permit.

The system operated at a higher flow due to the modifications to the system, with the flow increased from 32 standard cubic feet per minute (scfm) in early 2017 to the current level of 44 scfm. The hourly VOC removal rates increased with the increased flow until Fourth Quarter 2018. The removal rate declined during 2018, but began to improve over the first two quarters of 2019. In the tdhird and fourth quarter of 2019, removal rates decreased and continued to remain low in the third quarter of 2023. As total VOC concentrations continue to remain below 100 ppmv, Pantex has been pulsing the system to determine current recovery efforts and feasibility of system closure. The SVE closure report was approved by EPA in October 2023 and TCEQ in December 2023.

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 three Ogallala Aquifer wells: PTX06-1056, PTX06-1076 and PTX07-1R01. Detections in PTX06-1056 and PTX06-1076 exceeded the respective PQLs. There were no unexpected conditions at perched uncertainty management wells in the third quarter.

4-amino-2,6-dinitrotoluene (DNT4A), a breakdown product of 2,4,6-trinitrotoluene (TNT), has been detected at PTX06-1076, with the initial detection occurring in June 2020. Sample results collected since that time have been variable, with values from May 2023 exceeding the PQL for the first time. As a result, a verification sample was completed at PTX06-1076 in August 2023. Results from the verification sample confirmed detections of DNT4A above the PQL. In accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*, sampling will be increased from semi-annual to monthly sampling for a three-month duration starting in October 2023. Notification to regulators were sent in advance of sampling actions. Further actions will be determined based on future sampling results and in continued accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*.

Summary of Unexpected Ogallala Detections at PTX06-1076, Third Quarter 2023

Well ID	Sample Date	Analyte	Measured Value (µg/L)	PQL (µg/L)	GWPS (µg/L)
PTX06-1076	5/1/2023	DNT4A	0.14	0.102	1.2
	8/1/2023	DNT4A	0.11	0.102	1.2

DNT4A has been detected at PTX06-1056, with the initial detection occurring in April 2014. Sample results collected since that time have been variable, with values exceeding the PQL since late 2016. A trend of DNT4A (performed using Mann-Kendall statistics) continues to indicate an increasing trend across all data. PTX06-1056 also continues to demonstrate detections of 1,2-dichloroethane (DCA12). DCA12 has been variably detected since August 2015, with the most recent detection below the PQL. Additionally, 2,6-Dinitrotoluene (DNT26), another breakdown product of TNT, was also detected but was below the PQL.

Summary of Unexpected Ogallala Detections at PTX06-1056, Third Quarter 2023

Well ID	Sample Date	Analyte	Measured Value (µg/L)	PQL (µg/L)	GWPS (µg/L)
PTX06-1056	8/1/2023	RDX	0.26	0.104	2
	8/1/2023	DNT4A	1.78	0.104	1.2
	8/1/2023	DCA12	0.79	1	5
	8/1/2023	DNT26	0.04	0.104	1

The third quarter result detected DNT4A above the GWPS at 1.78 ug/L and RDX above the PQL (0.104 ug/L) at 0.26 ug/L. DCA12 was also detected, but was below the PQL. Pantex responded by installing three additional Ogallala monitoring wells to help understand extent. Installation of these wells was complete in September 2023 and routine sampling will be complete by the end of 2023. Further actions will be determined based on future sampling results and in accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*.

TNT was measured at 0.04 ug/L, below the PQL (0.103 µg/L), at PTX07-1R01. Since the detection was below the PQL, sampling will continue as approved in the *Sampling and Analysis Plan* (SAP) and in accordance with the *Pantex Plant Ogallala Aquifer and Perched Groundwater Contingency Plan*. No further action will be taken at this time.

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 *2022 Annual Progress Report*. An update of the activities scheduled to be started or completed by the publication date of this report is provided below.

Pantex completed the following:

- Pantex awarded a new well drilling contract in January 2023 with scope including installation of two new Ogallala monitoring wells in response to detections at PTX06-1056. Additional scope was added later to the contract to drill an additional Ogallala monitoring well. Completion of the third well was completed at the end of September 2023. In the Fiscal Year 2023 well drilling contract, scope was also included for all Phase 4 wells for the Offsite ISB. Drilling on these wells commenced in April 2023 and completed in September 2023.
- The initial 2023 injection event was completed at the northern and southern Offsite ISB wells in August 2023.
- Injections were completed at the Southeast ISB Extension at the end of September.
- The center pivot system construction was completed in August, with testing and commissioning of the system continuing into September. The system was fully commission in September. Crops were planted in October 2023 allowing full operation on two pivot areas.
- An SVE closure report was submitted to TCEQ and EPA in August 2023. The report was approved by EPA in October 2023 and TCEQ in December 2023.
- The Third Five-Year Review Report was approved in September 2023.
- Infrastructure for the last phase of the Offsite ISB System was completed in November 2023.

Pantex continues progress toward completion of the following items:

- Pantex submitted a Request for Proposal for the design of the upgrade to the SCADA system for SEPTS and P1PTS. The contract was awarded in September 2022 and the 60% design was submitted and approved in March. Due to funding expectations in the upcoming fiscal years, a phased design approach is being added. The final phased design is expected to be completed by the end of 2023.
- The second 2023 injection event was started at the northern and southern Offsite ISB wells in October 2023. The system will be injected until late December when freezing conditions make it impractical to continue. Operation and maintenance activities will resume in Spring 2024.
- Injections were started at the Zone 11 ISB in July and will be completed in December.
- Pantex continued development of the Hazardous Waste Permit Application and the permit application was delivered to TCEQ in November 2023.
- Pantex continued development of an Underground Injection Control permit application to expand the current injection capacity for three new ISB systems and to expand capability for the current systems in use. The permit application was submitted to TCEQ in December 2023.

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. Both pump and treat systems were operating at the end of the third quarter.

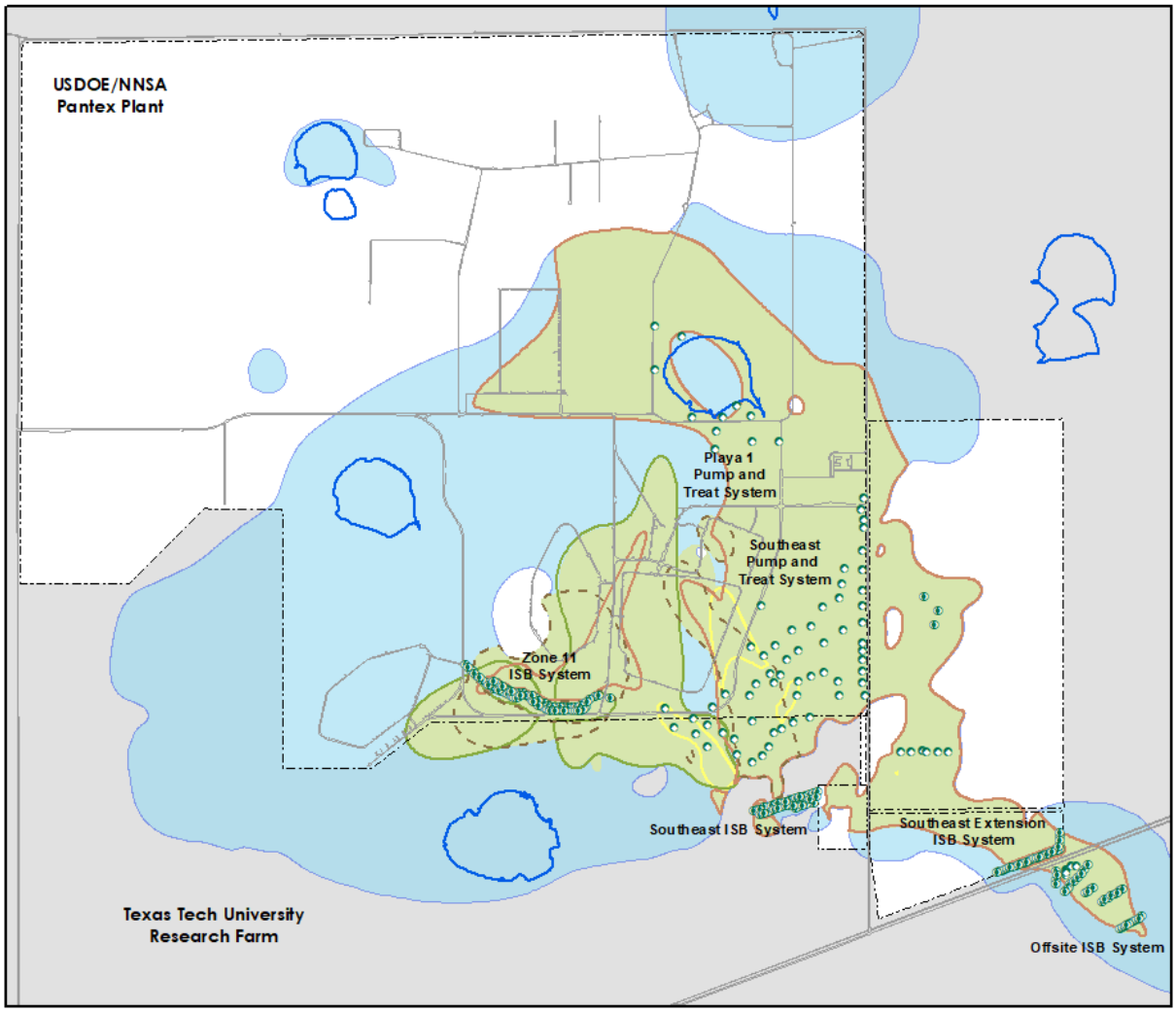
In the third quarter, no ISB system was sampled completely. However, injection activities were ongoing at the Zone 11 ISB and the Offsite ISB in the third quarter, while well maintenance activities and injections were completed at the Southeast ISB Extension. ISB system results will be included in the fourth quarter reporting.

Since 2002, the SVE system has treated soil gas and residual NAPL in the solvent evaporation pit/chemical burn pit area of the Burning Ground, mitigating vertical movement of VOCs to groundwater. Pantex was unable to complete rebound tests successfully, and was unable to prepare a path to closure as recommended in the first Five-Year Review. Therefore, Pantex has evaluated other paths to closure for this system. In May 2017, Pantex completed a modification to six inactive SVE extraction wells surrounding the active extraction well SVE-S-20 to open the wells to ambient air. This modification enhances airflow through the formation while the system is operating. The airflow increased from 32 scfm to about 44 scfm over time. Evaluation of hourly VOC removal indicates that the mass removal rate initially increased with the increase in influent airflow; however, influent concentrations and mass removal have greatly decreased since the

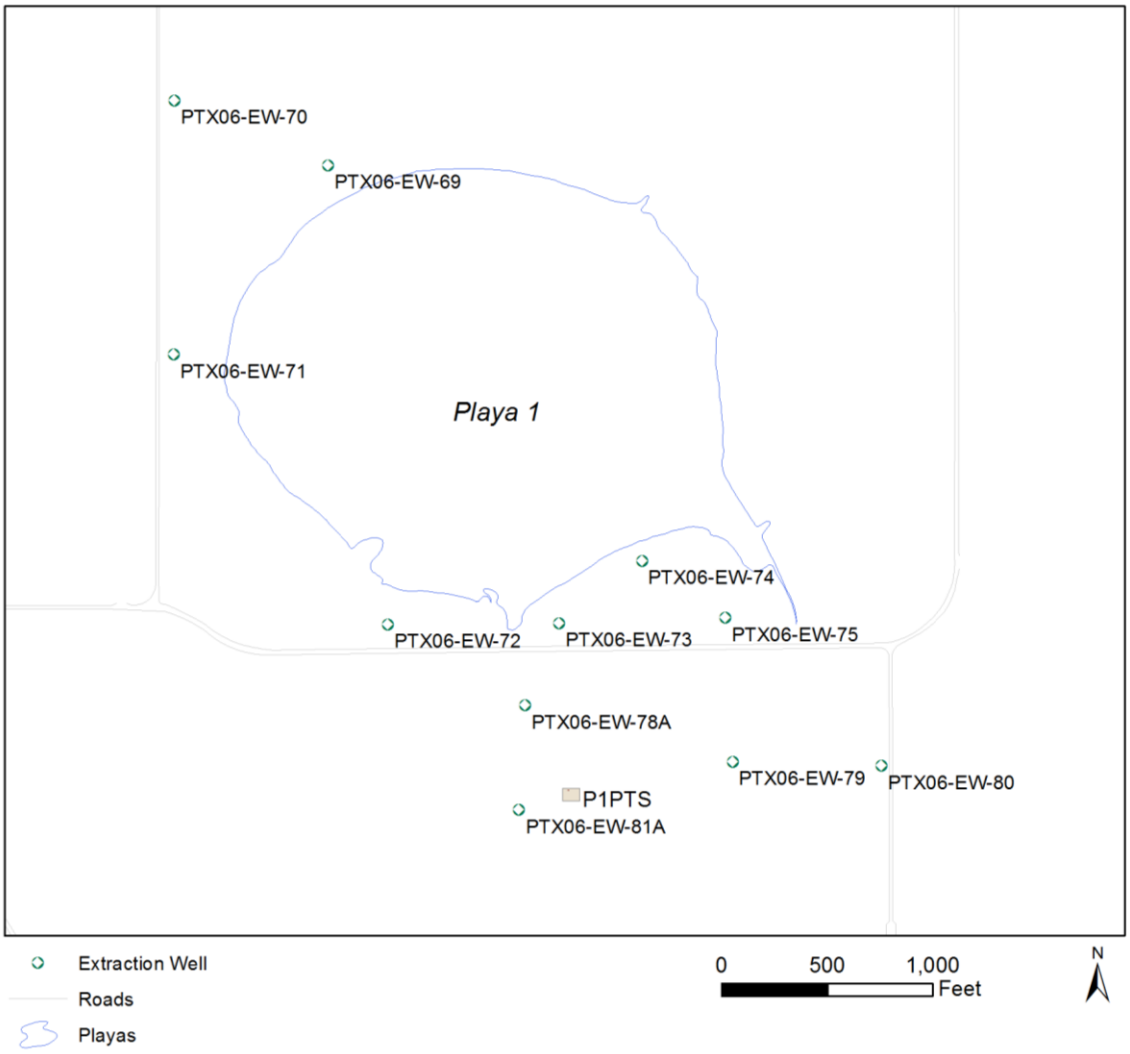
system was modified. Pantex is pulsing the system to evaluate final closure of the system. Based on data collected since 2020, Pantex has recommend closure of the system by submitting a closure report to TCEQ and EPA and requested removal of the system in the recently submitted application for renewal of the Hazardous Waste Permit. EPA approved the closure report in October 2023 and TCEQ followed with approval in December 2023.

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. Additional investigation of the area of the Ogallala Aquifer near PTX06-1056 began in early 2023 with installation of two new monitoring wells. Installation of a third well was also completed September 2023. These new wells were recently sampled and results will be available in the fourth quarter report.

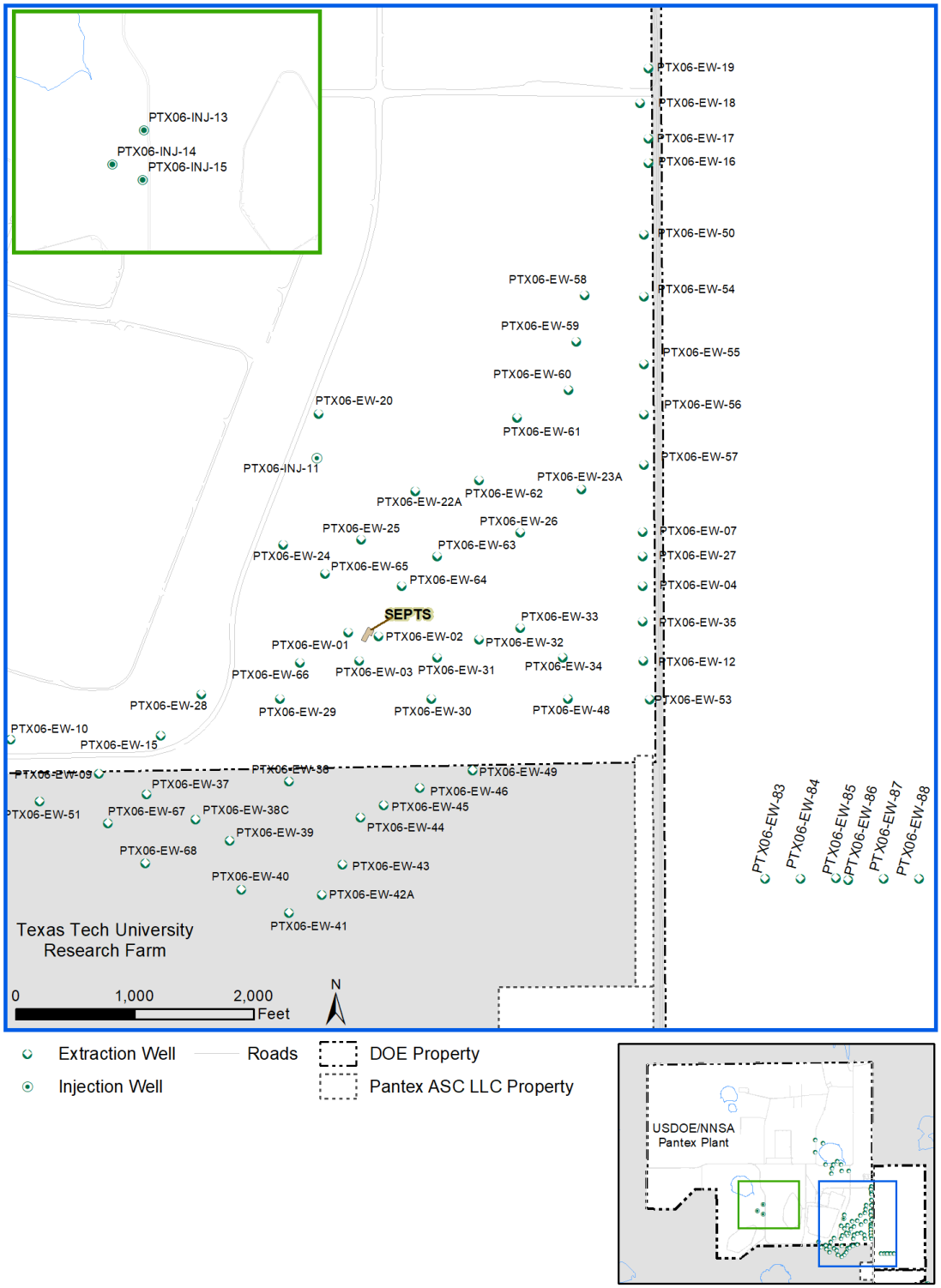
Appendix A
Maps



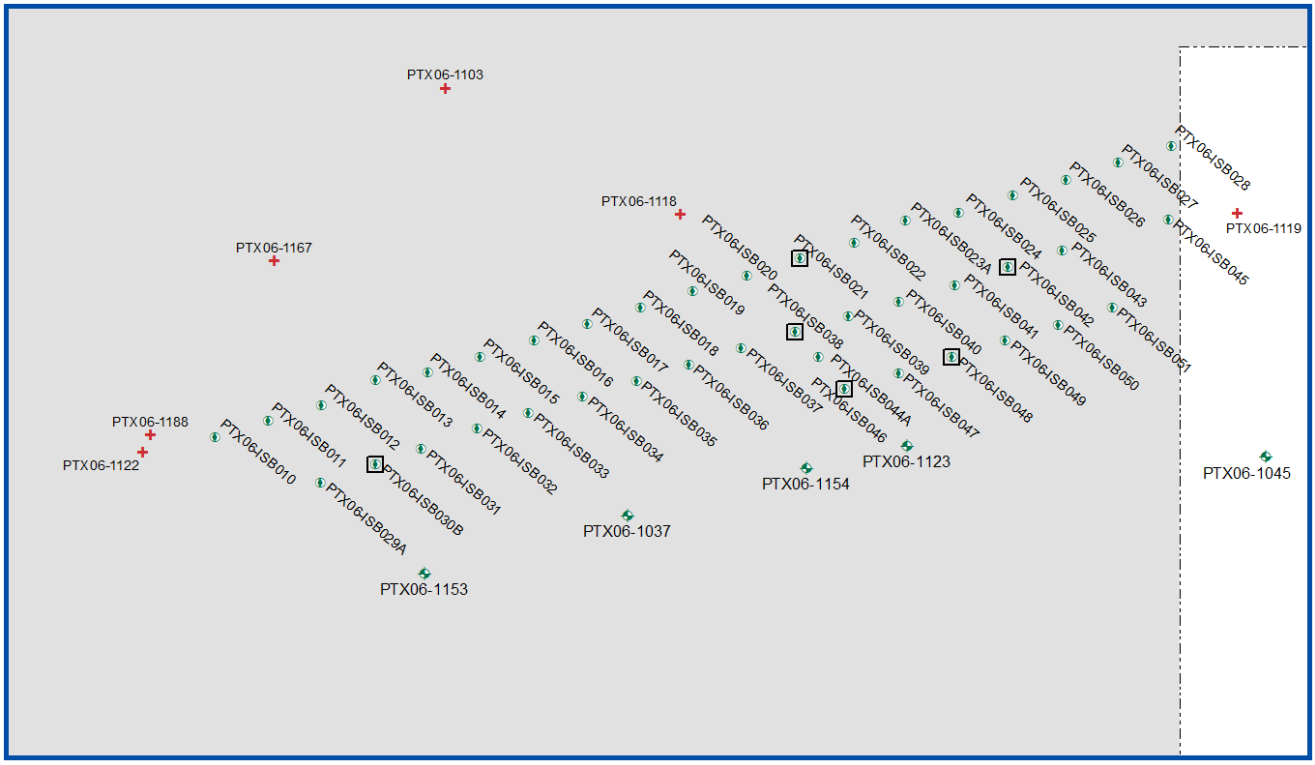
Extent of Perched Groundwater and Contaminant Plumes



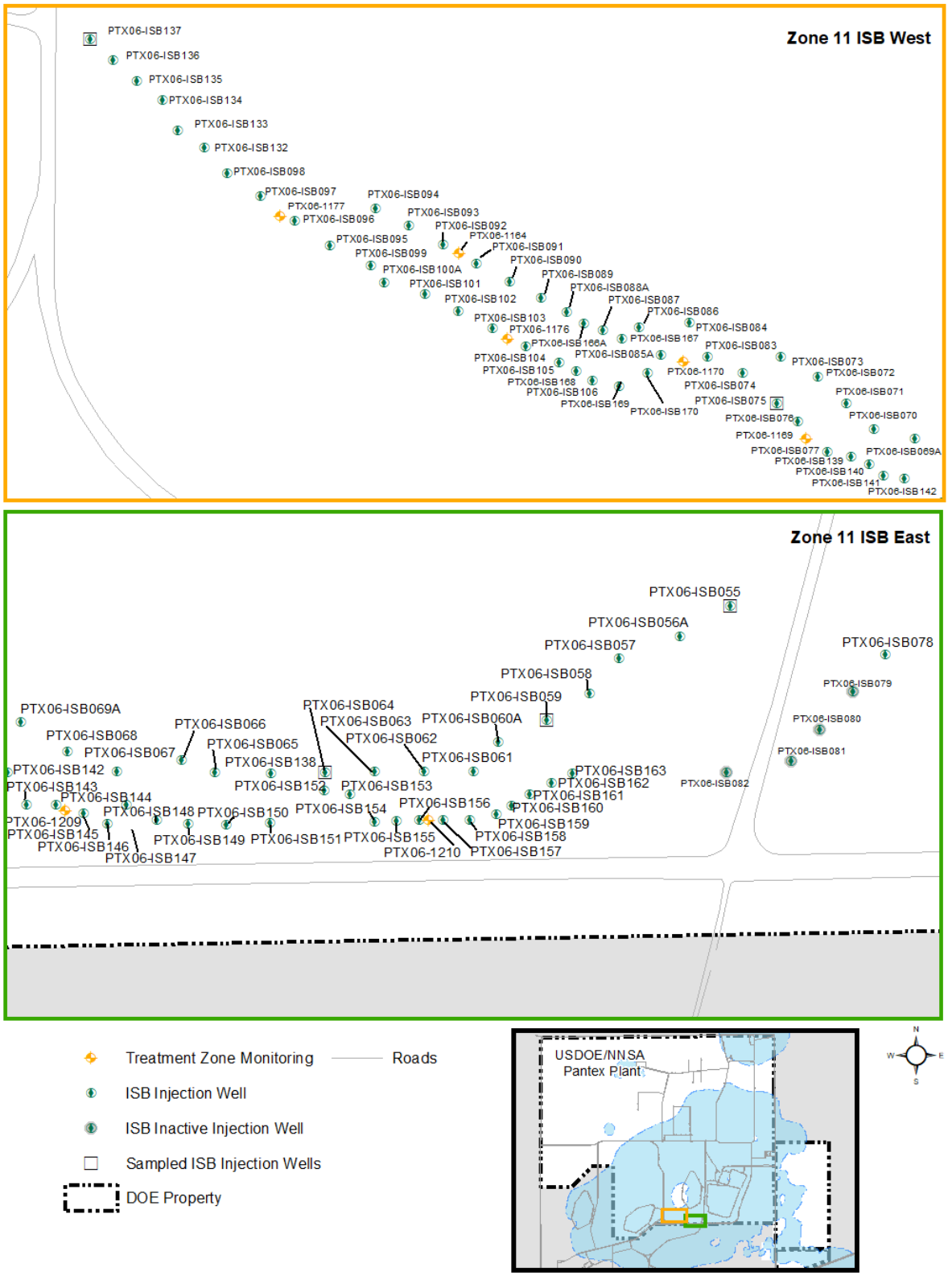
Playa 1 Pump and Treat System Wells



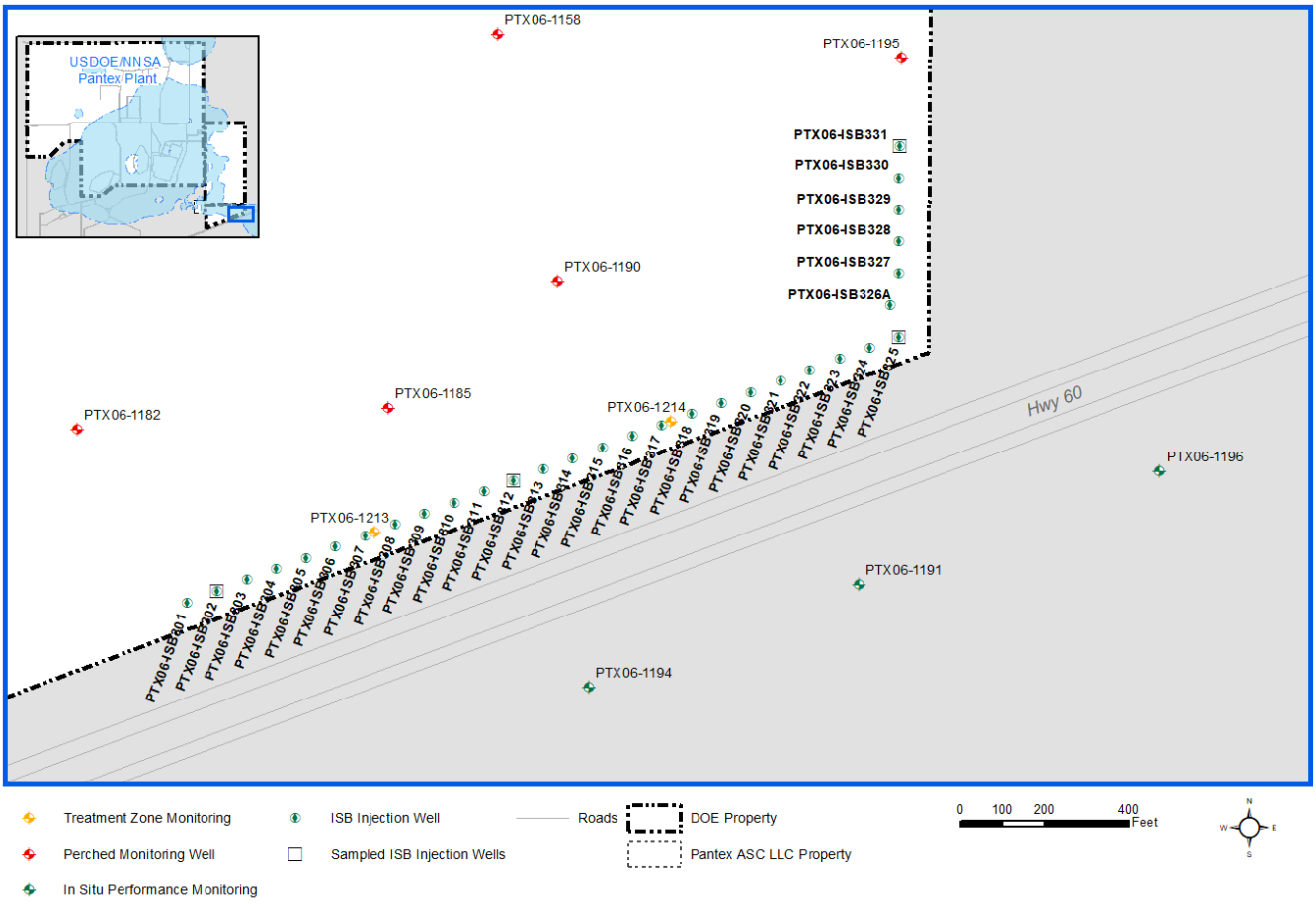
Southeast Pump and Treat System Wells



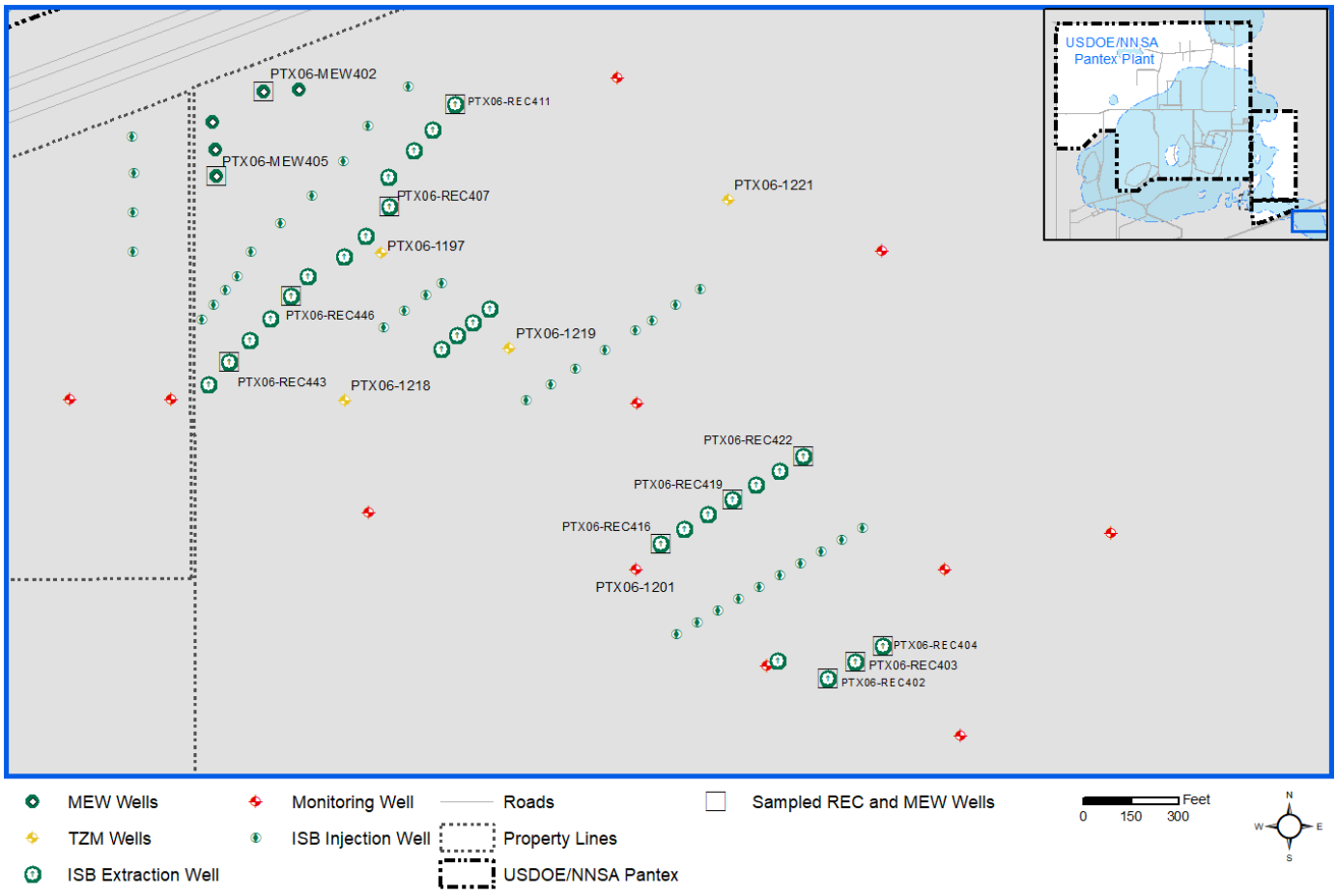
Southeast ISB Wells and Sampling Locations



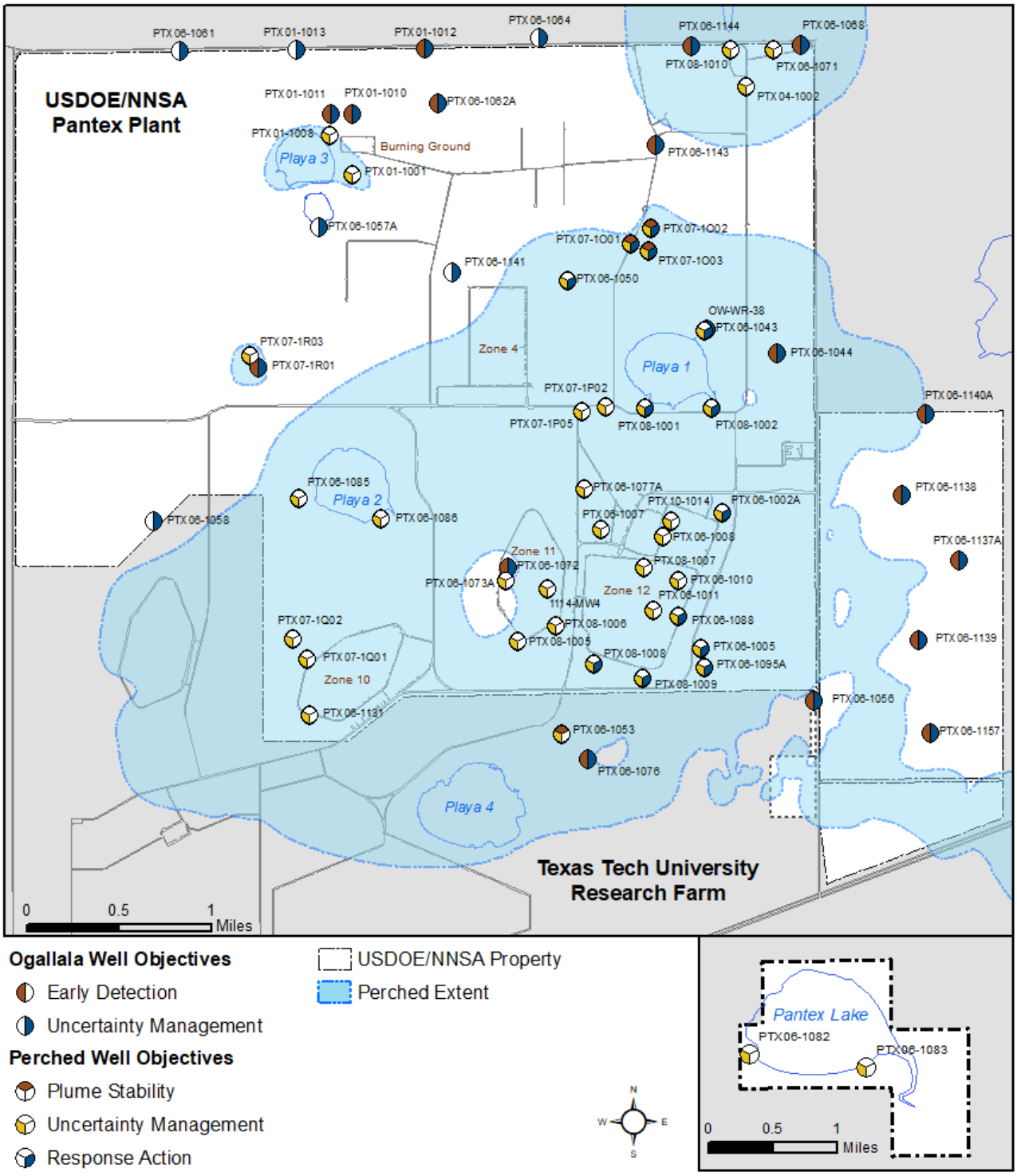
Zone 11 ISB Wells and Sampling Locations



Southeast ISB Extension Wells and Sampling Locations



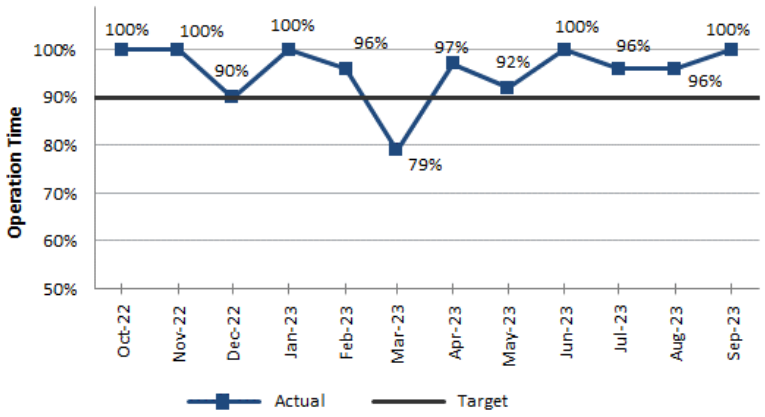
Offsite ISB Wells and Sampling Locations



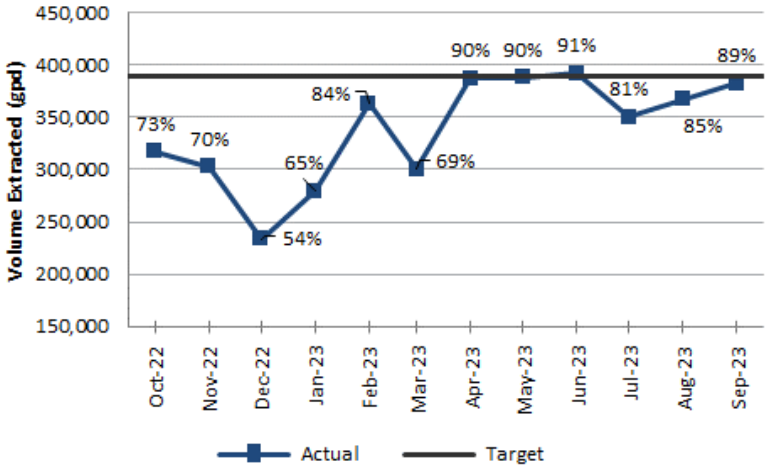
Uncertainty Management and Early Detection Wells Evaluated in the Quarterly Progress Report

Appendix B
Pump and Treat System Graphs

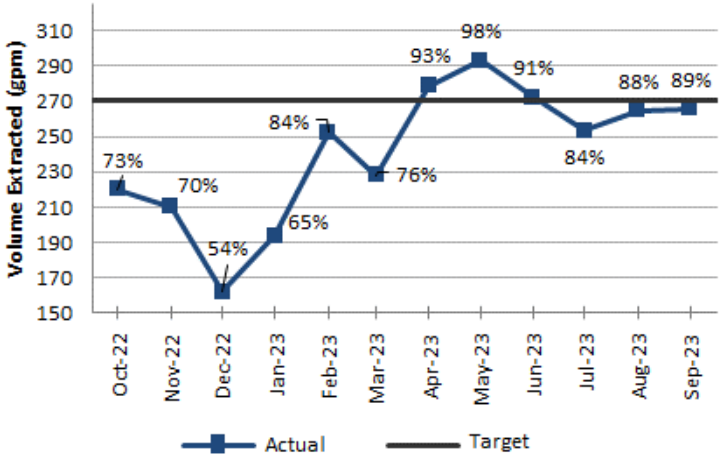
Southeast Pump and Treat System Graphs



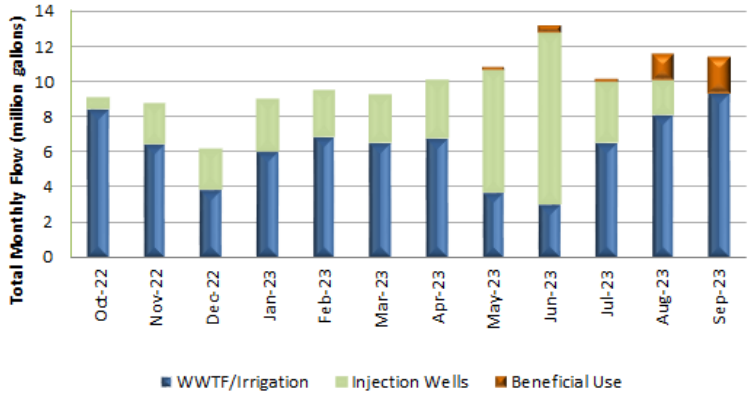
SEPTS Operation Time vs Target



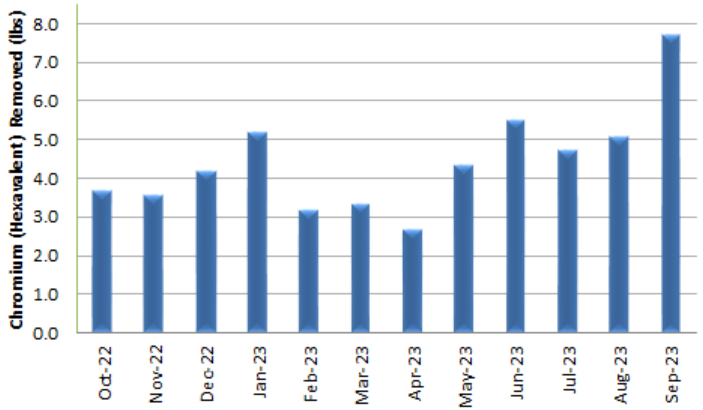
SEPTS GPD and % Capacity



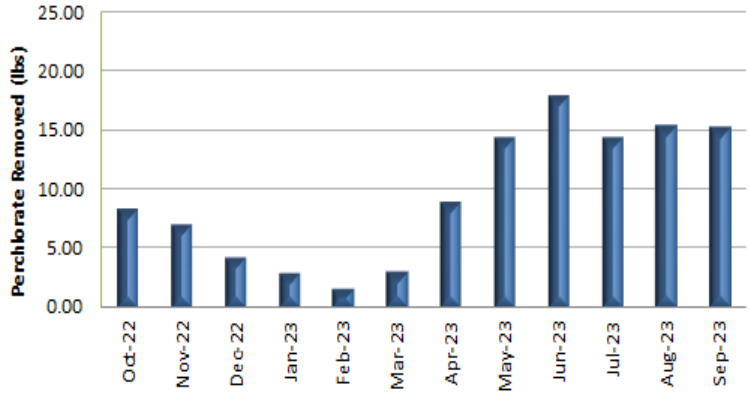
SEPTS Average GPM and % Capacity



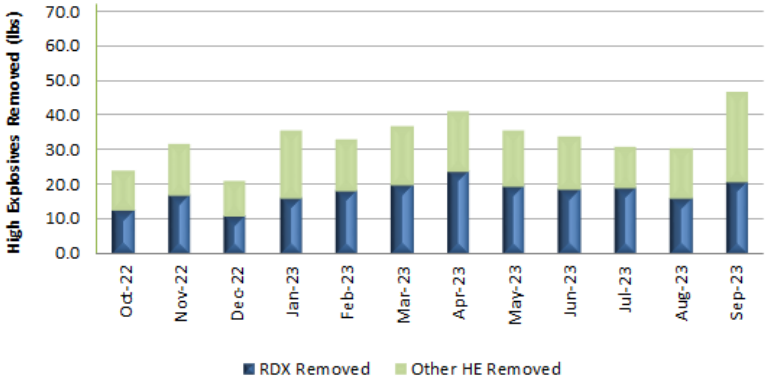
SEPTS Monthly Total Flow



SEPTS Chromium Removal by Month

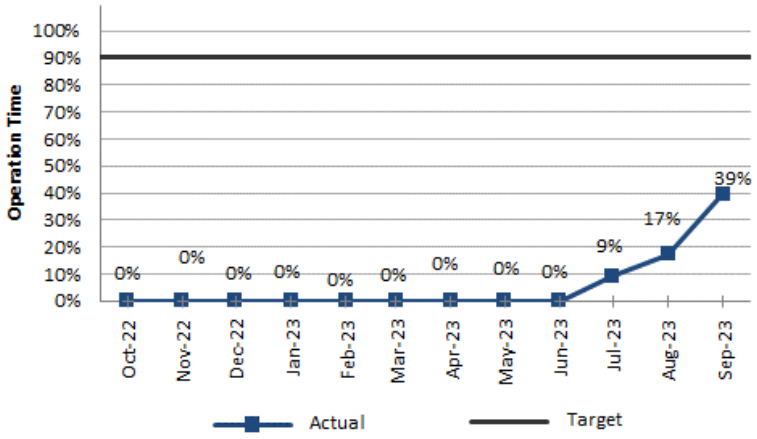


SEPTS Perchlorate Removal by Month

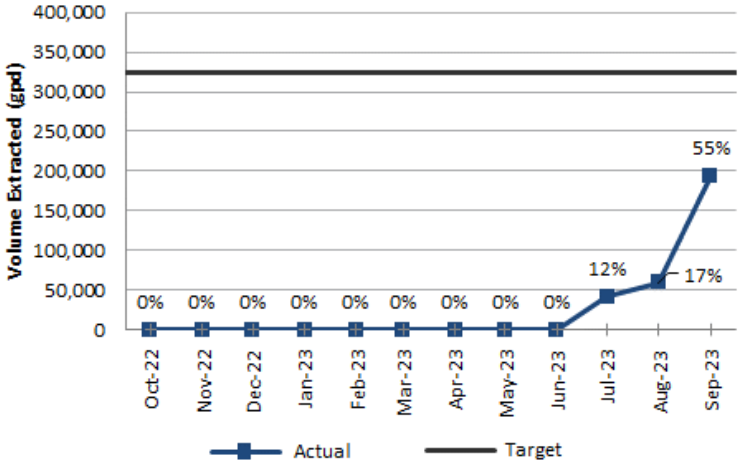


SEPTS HE Removal by Month

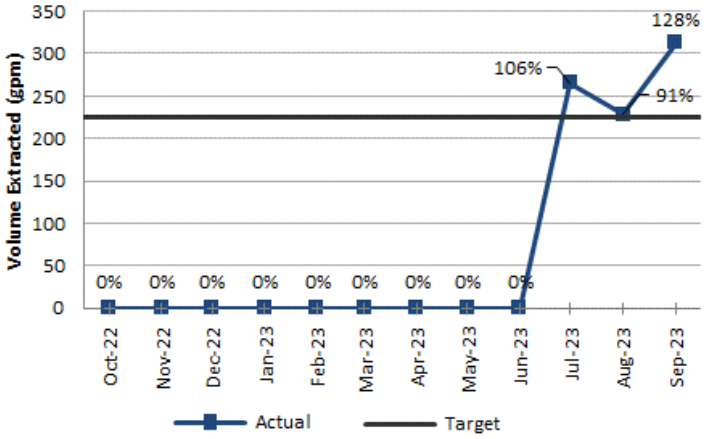
Playa 1 Pump and Treat System Graphs



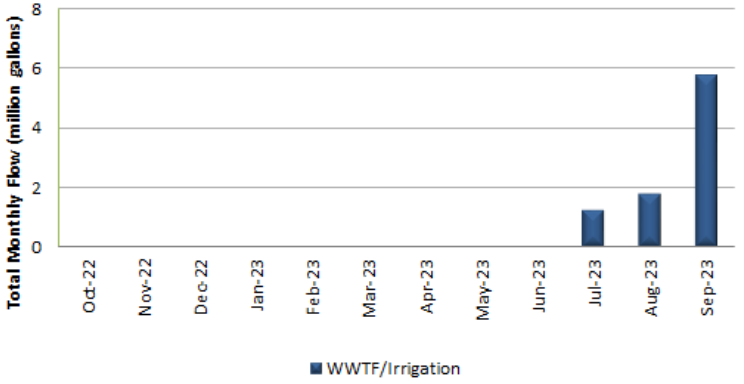
P1PTS Operational Time Vs Target



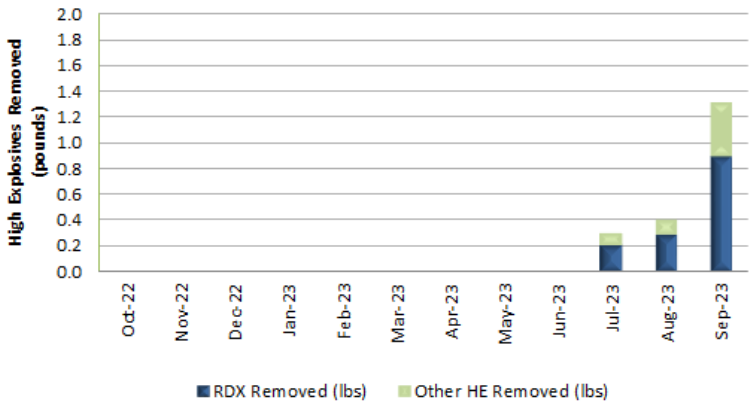
P1PTS Average GPD and % Capacity



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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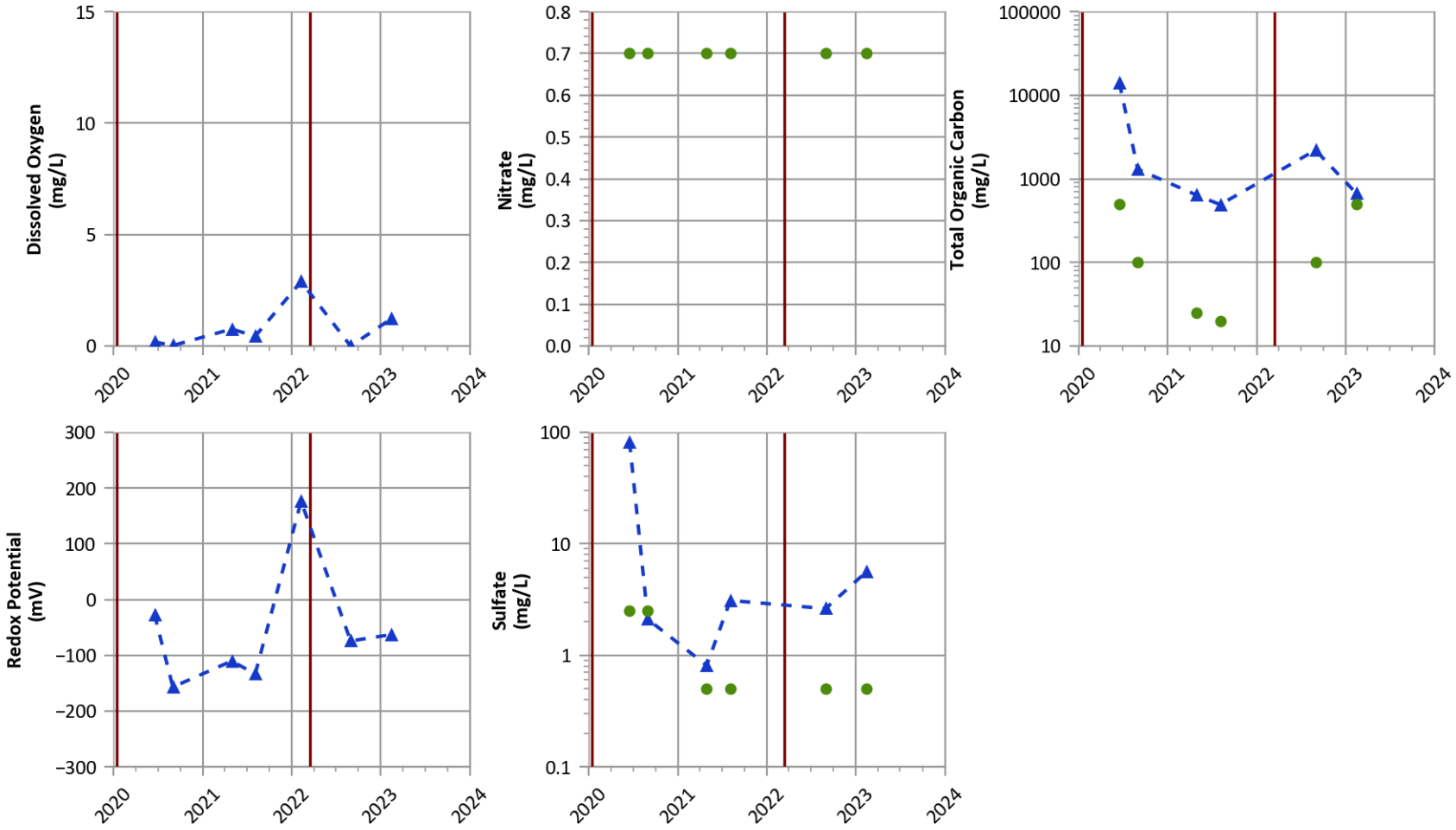
Appendix C
ISB Graphs

Southeast ISB Graphs

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

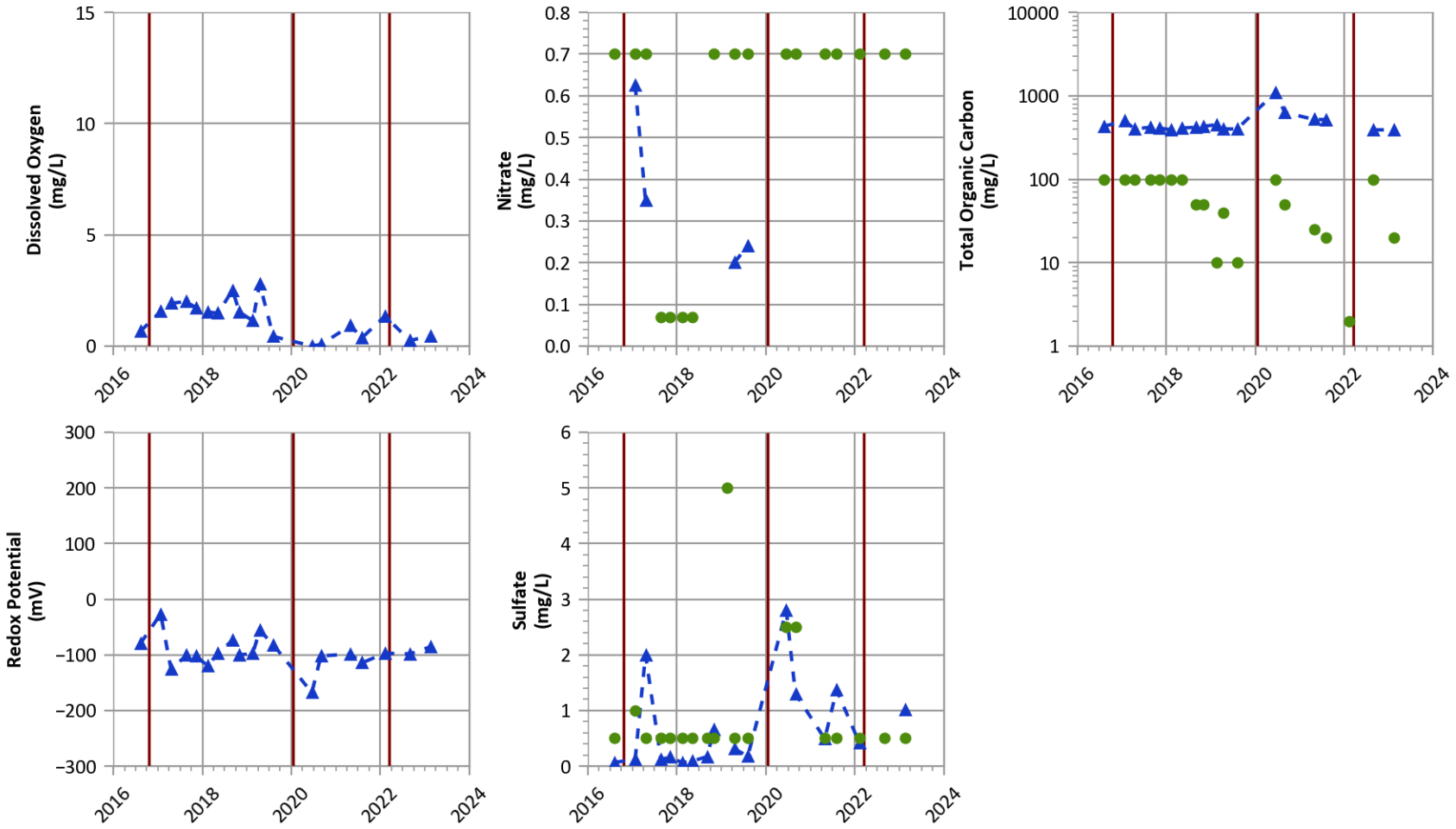


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

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

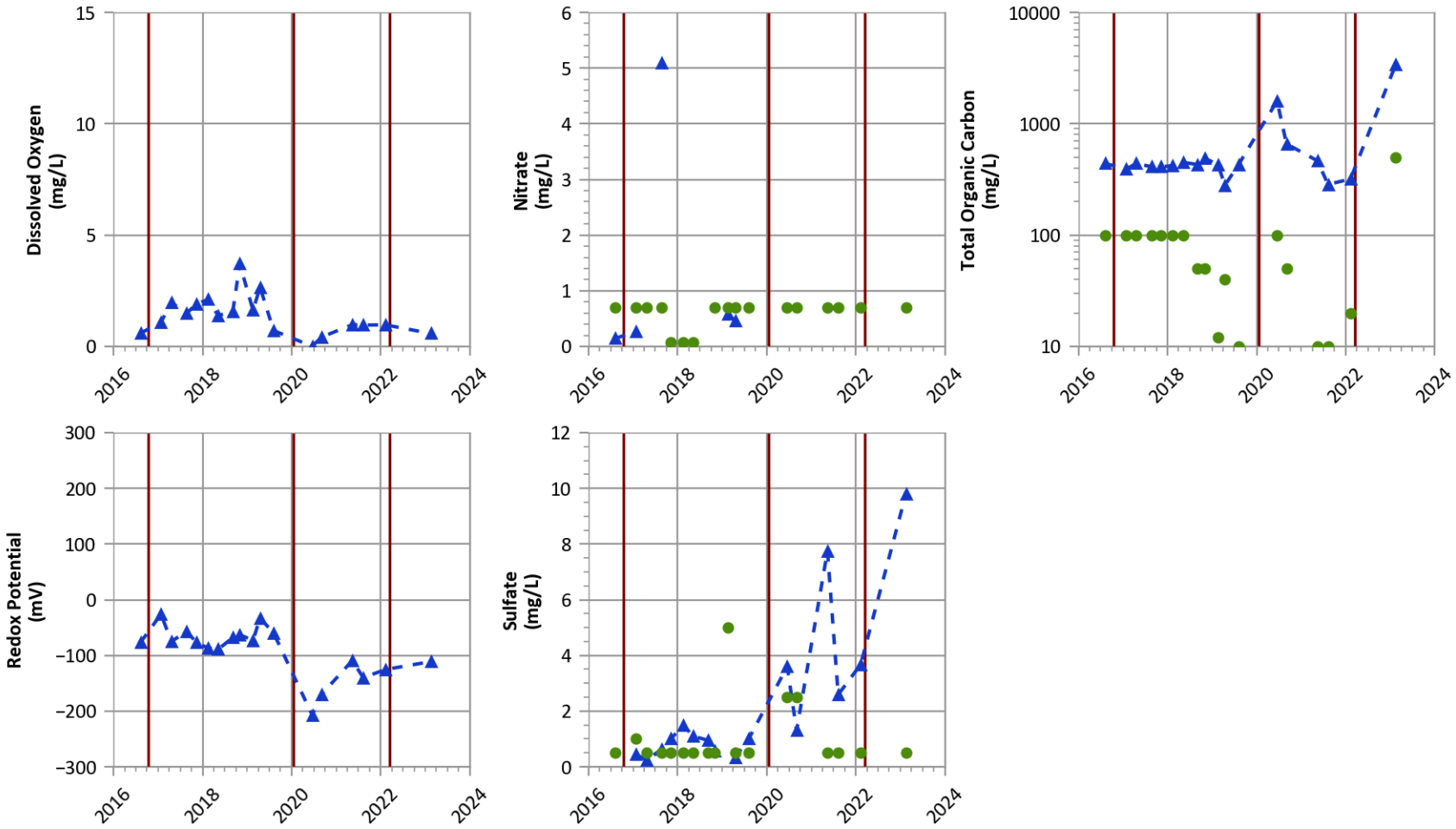


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

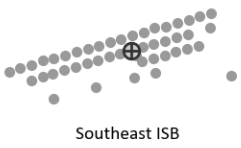
Well Location

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

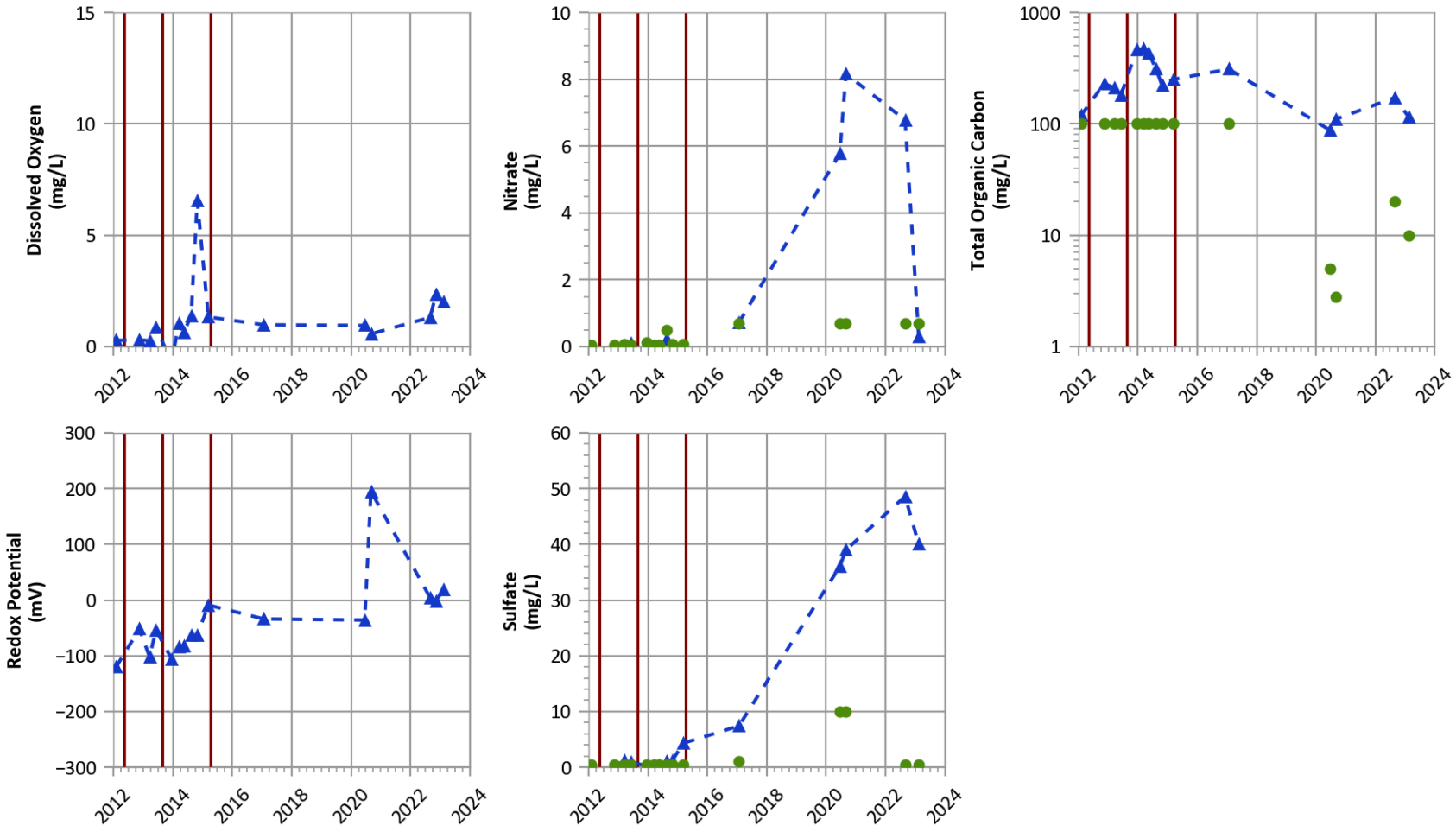


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



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

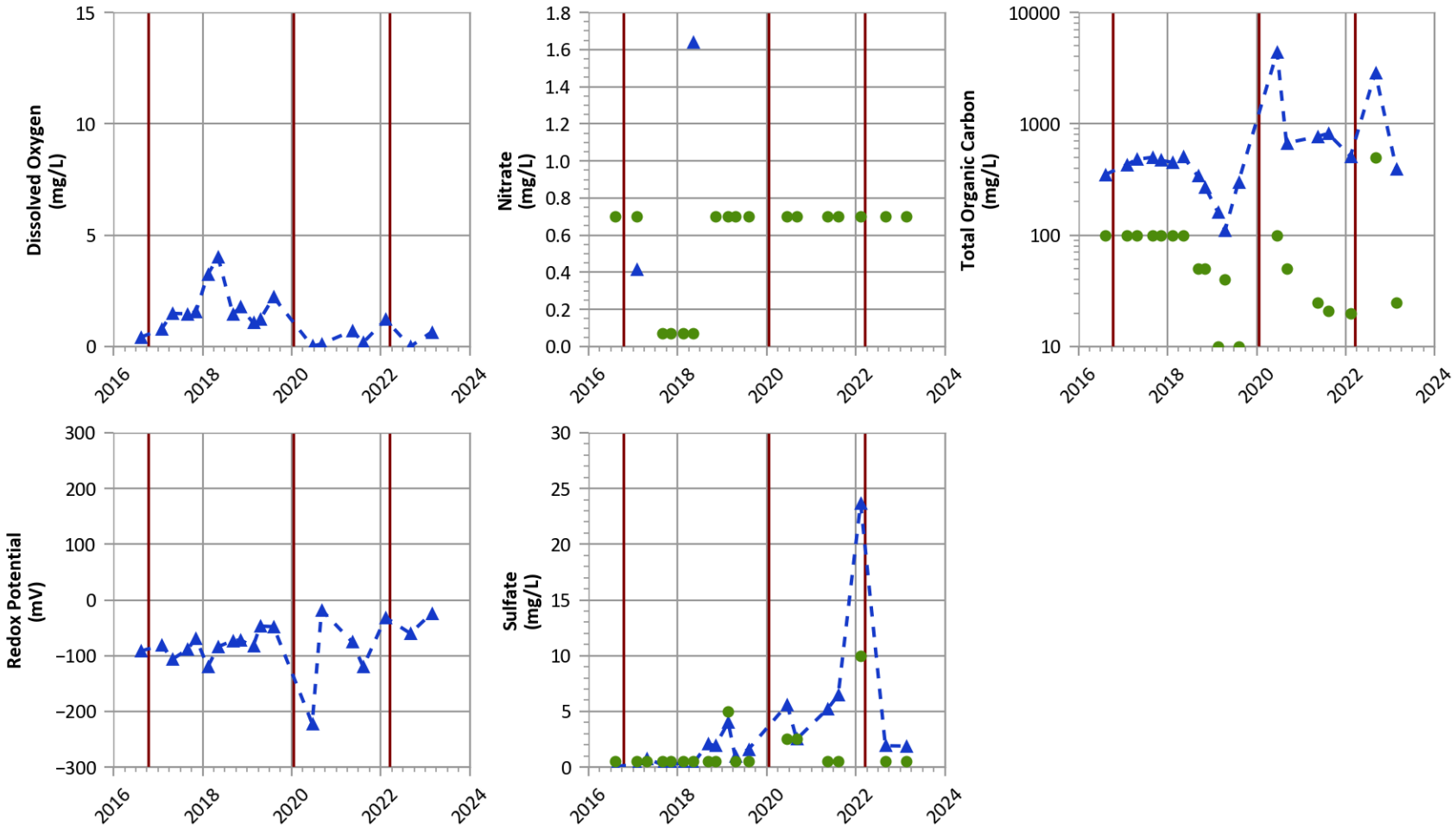


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

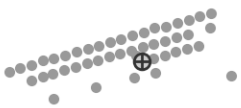
Southeast ISB

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



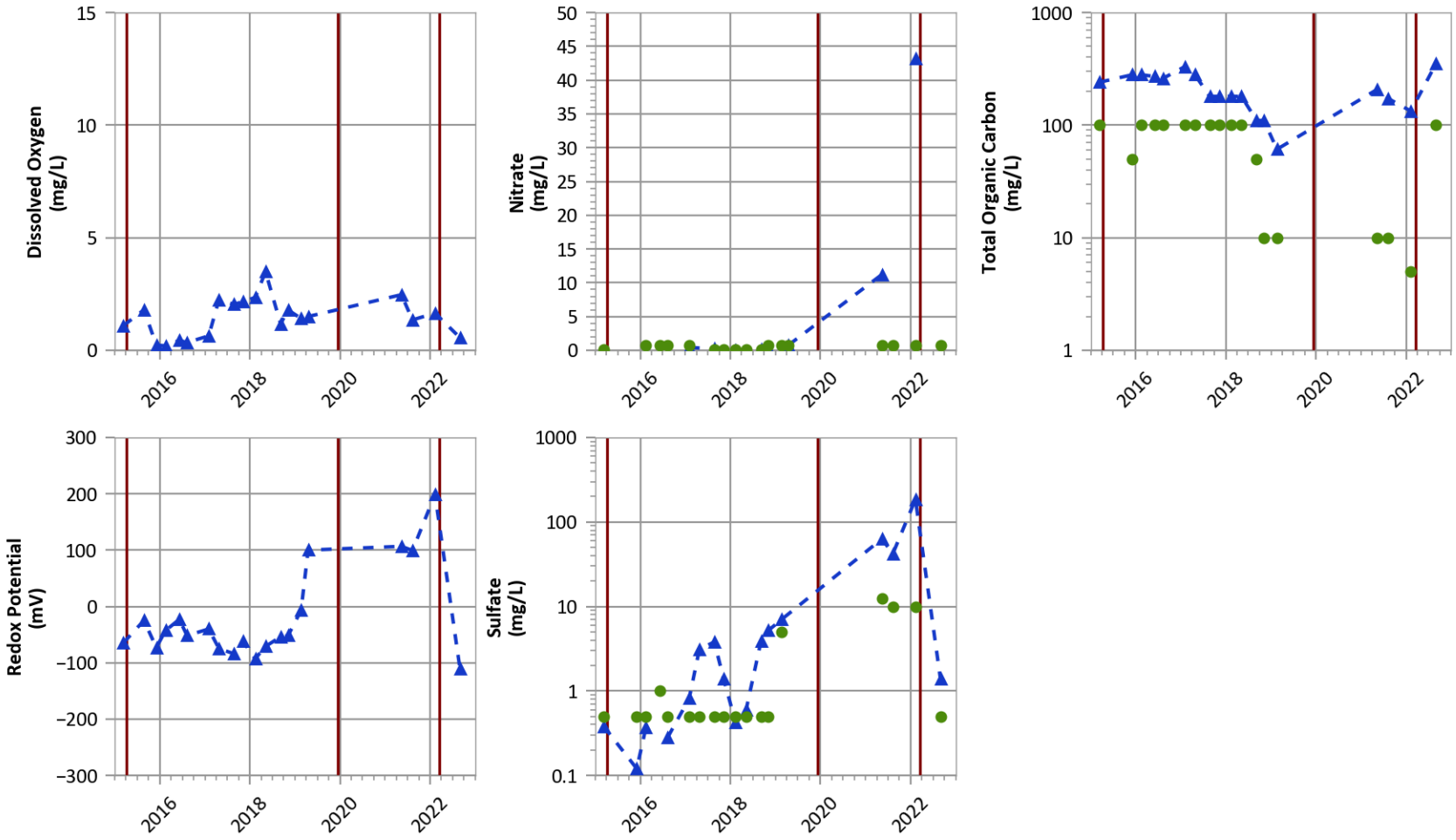
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



Southeast ISB

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

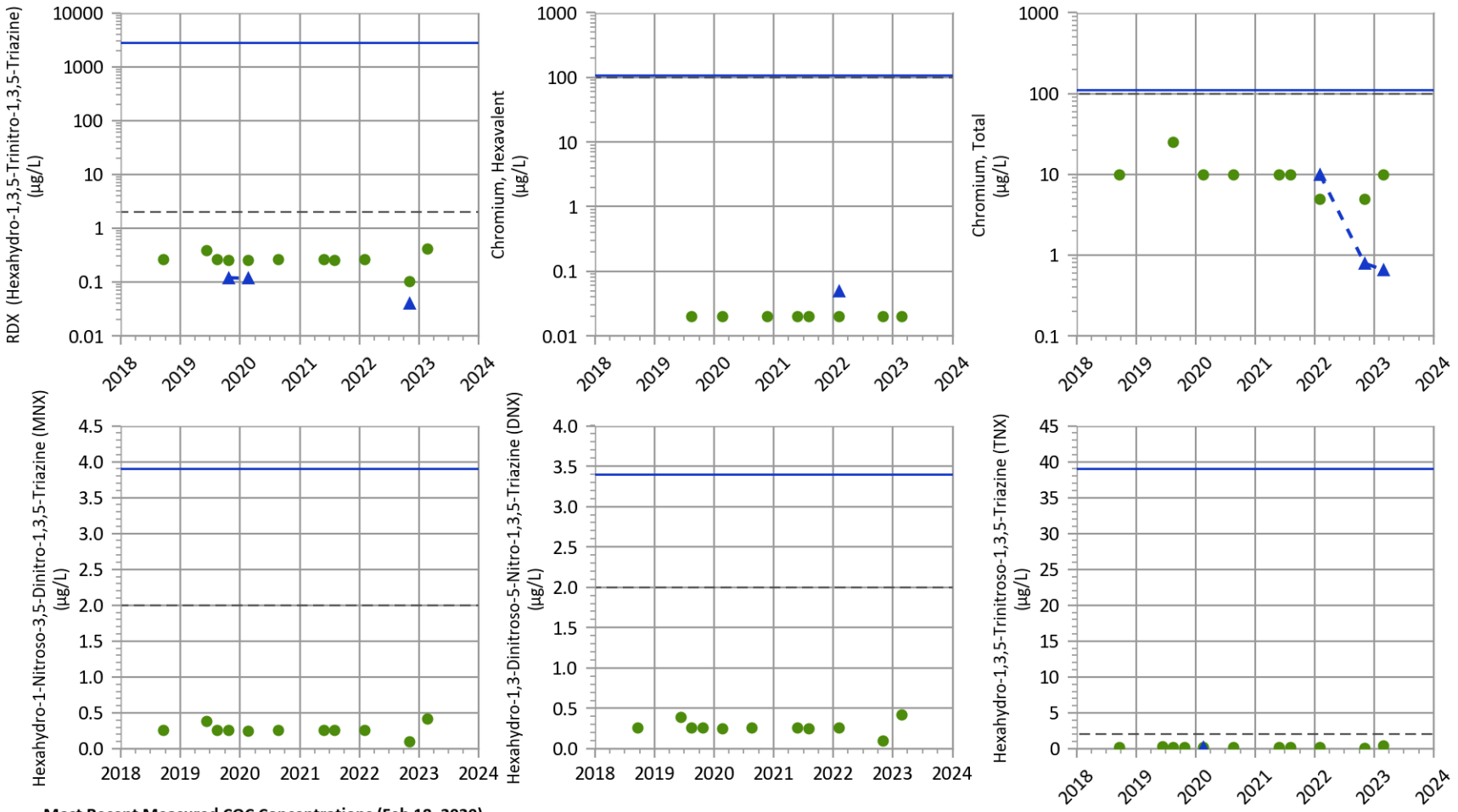


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

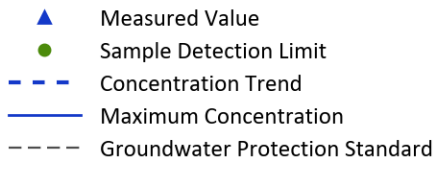
Well Location

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



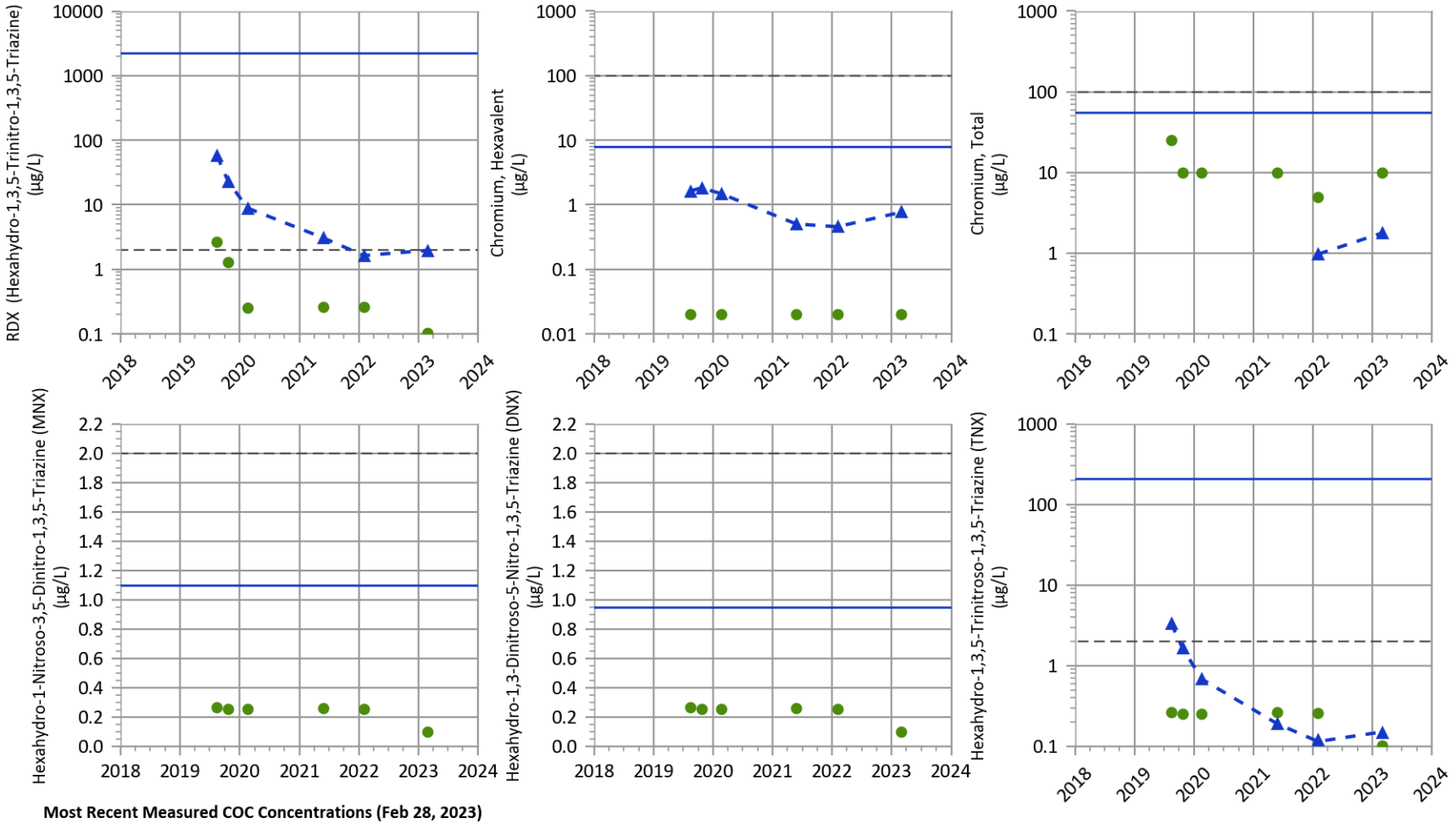
Most Recent Measured COC Concentrations (Feb 18, 2020)

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	0.66	100.0
TNX	Non-Detect	2.0



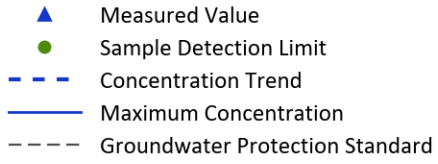
Well Location

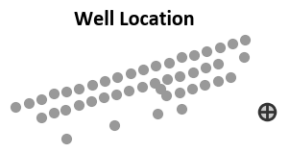
PTX06-1045 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



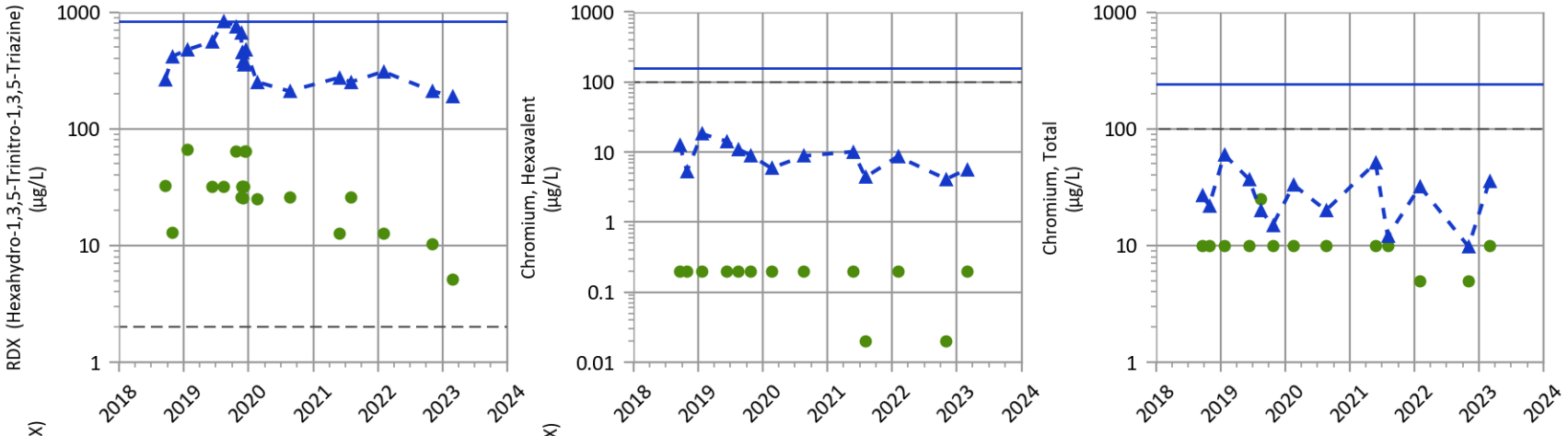
Most Recent Measured COC Concentrations (Feb 28, 2023)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	1.96	2.0
MNX	Non-Detect	2.0
CR-6	0.77	100.0
DNX	Non-Detect	2.0
CR	1.77	100.0
TNX	0.15	2.0



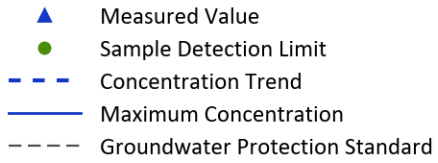


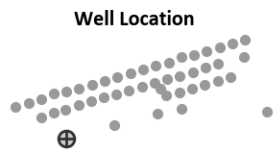
PTX06-1153 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



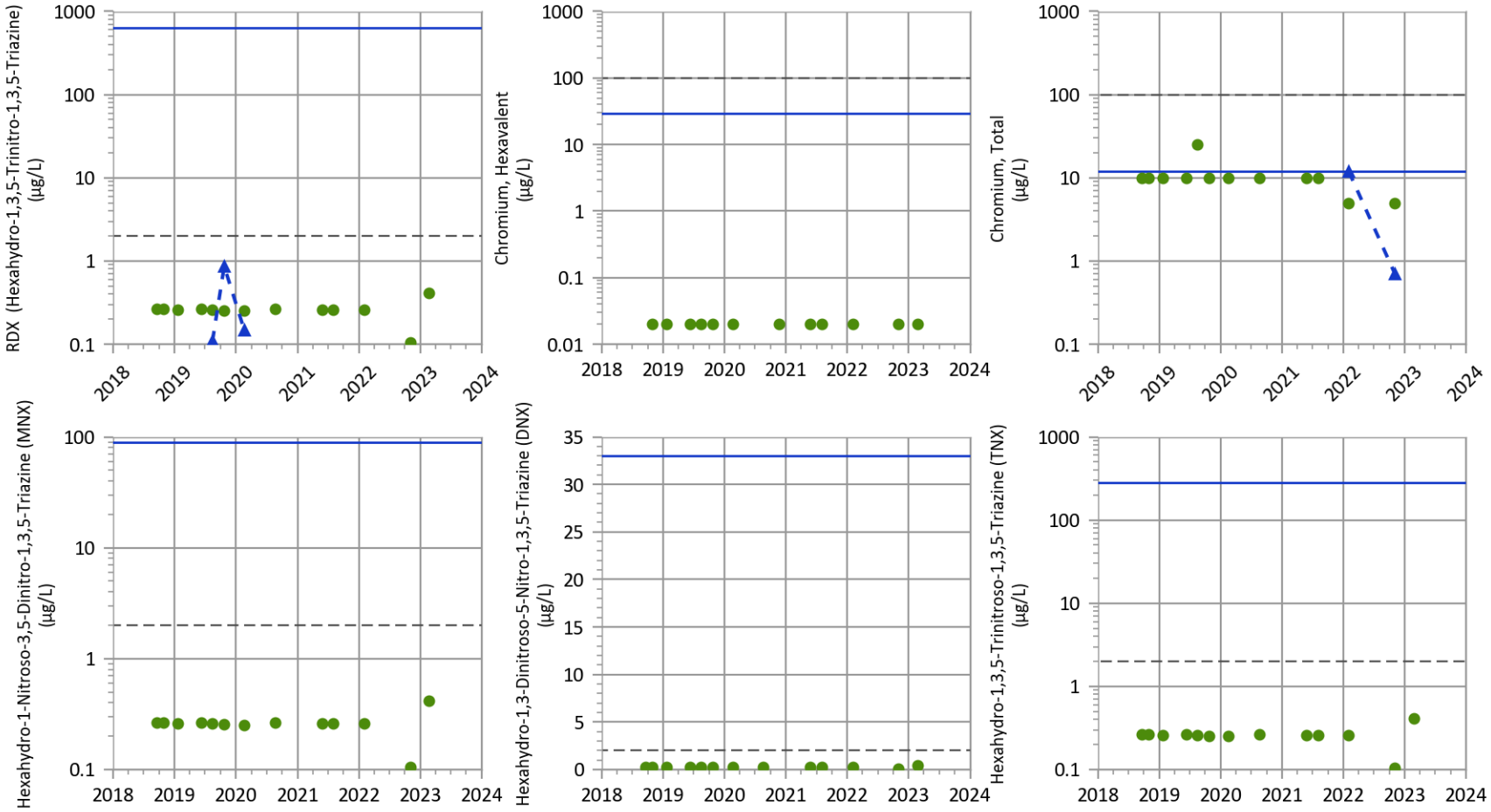
Most Recent Measured COC Concentrations (Feb 28, 2023)

COC	Concentration (µg/L)	GWPS (µg/L)
RDX	190.0	2.0
MNX	1.49	2.0
CR-6	5.68	100.0
DNX	0.94	2.0
CR	35.3	100.0
TNX	7.28	2.0



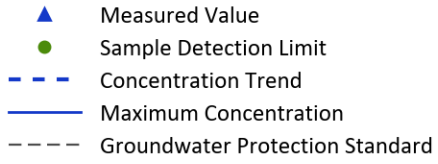


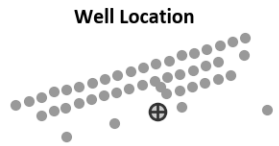
PTX06-1154 Downgradient Performance Indicators
Southeast In Situ Bioremediation System
USDOE/NNSA Pantex Plant



Most Recent Measured COC Concentrations (Feb 22, 2023)

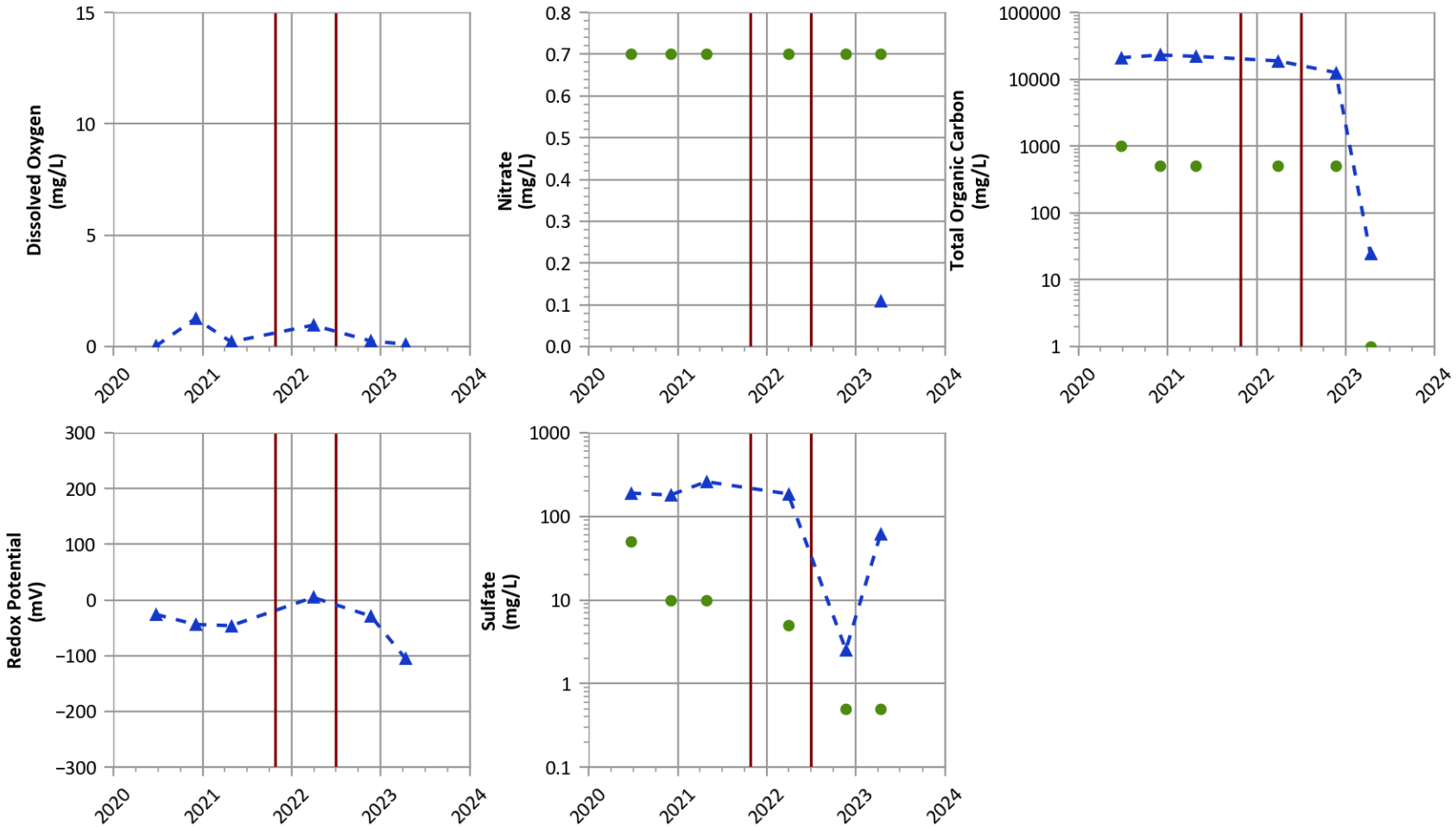
COC	Concentration (µg/L)	GWPS (µg/L)
RDX	Non-Detect	2.0
MNX	Non-Detect	2.0
CR-6	Non-Detect	100.0
DNX	Non-Detect	2.0
CR	0.71	100.0
TNX	Non-Detect	2.0





Zone 11 ISB Graphs

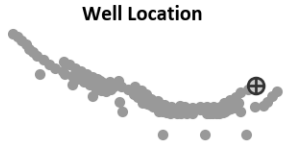
PTX06-ISB055 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

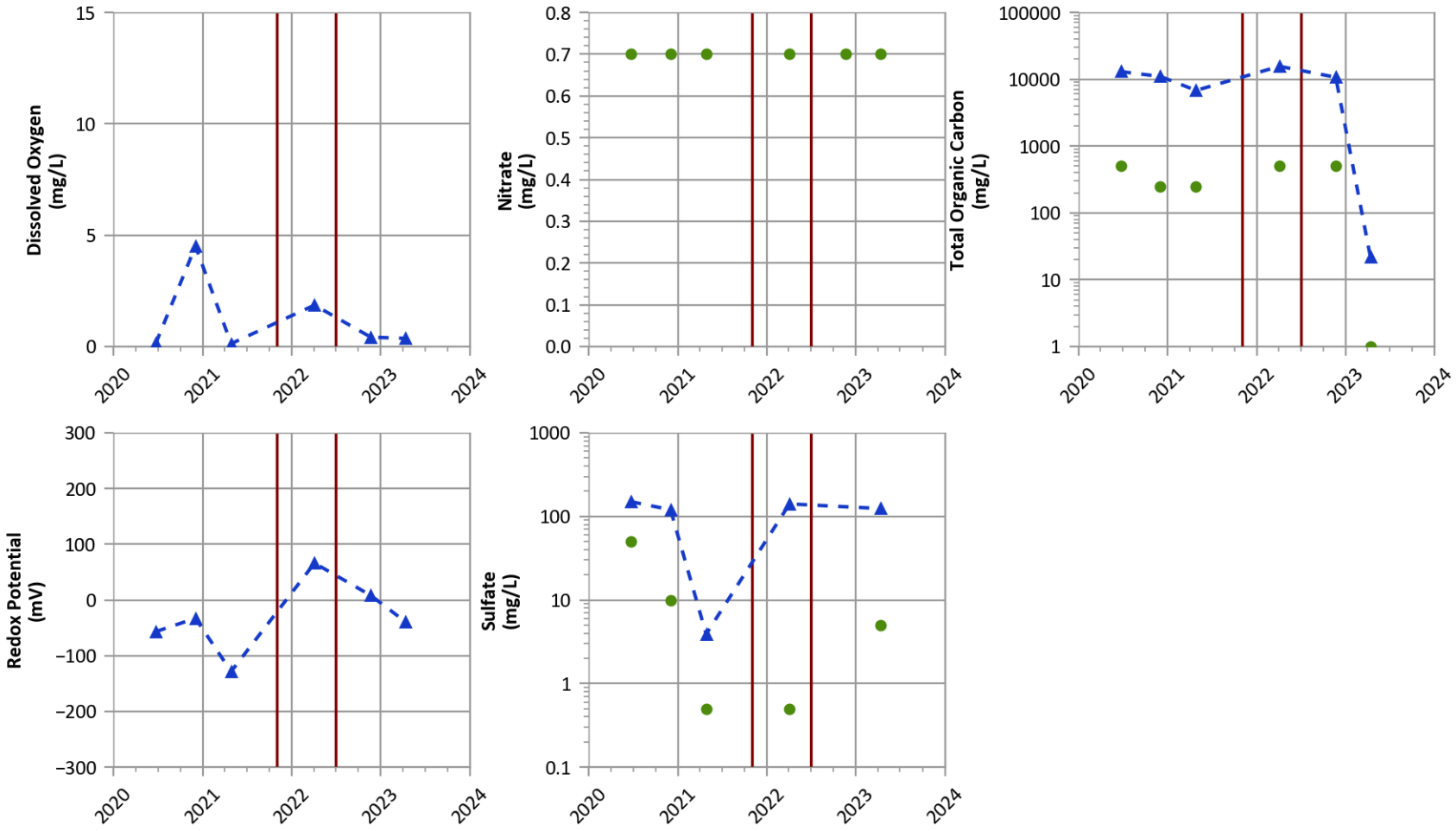
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



Zone 11 ISB

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



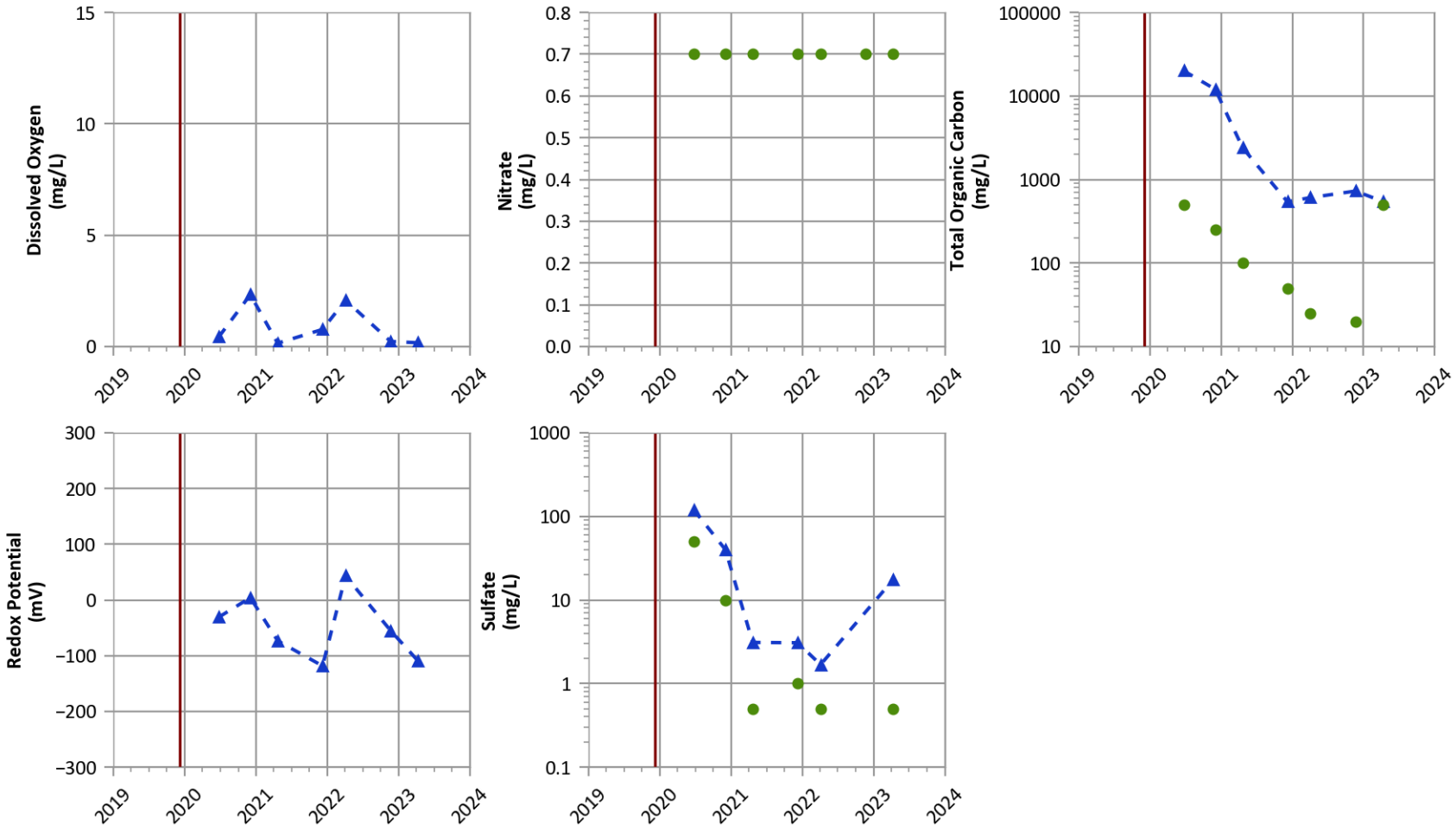
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

Zone 11 ISB

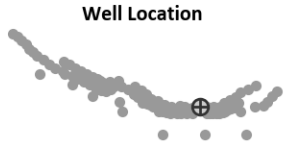
PTX06-ISB064 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

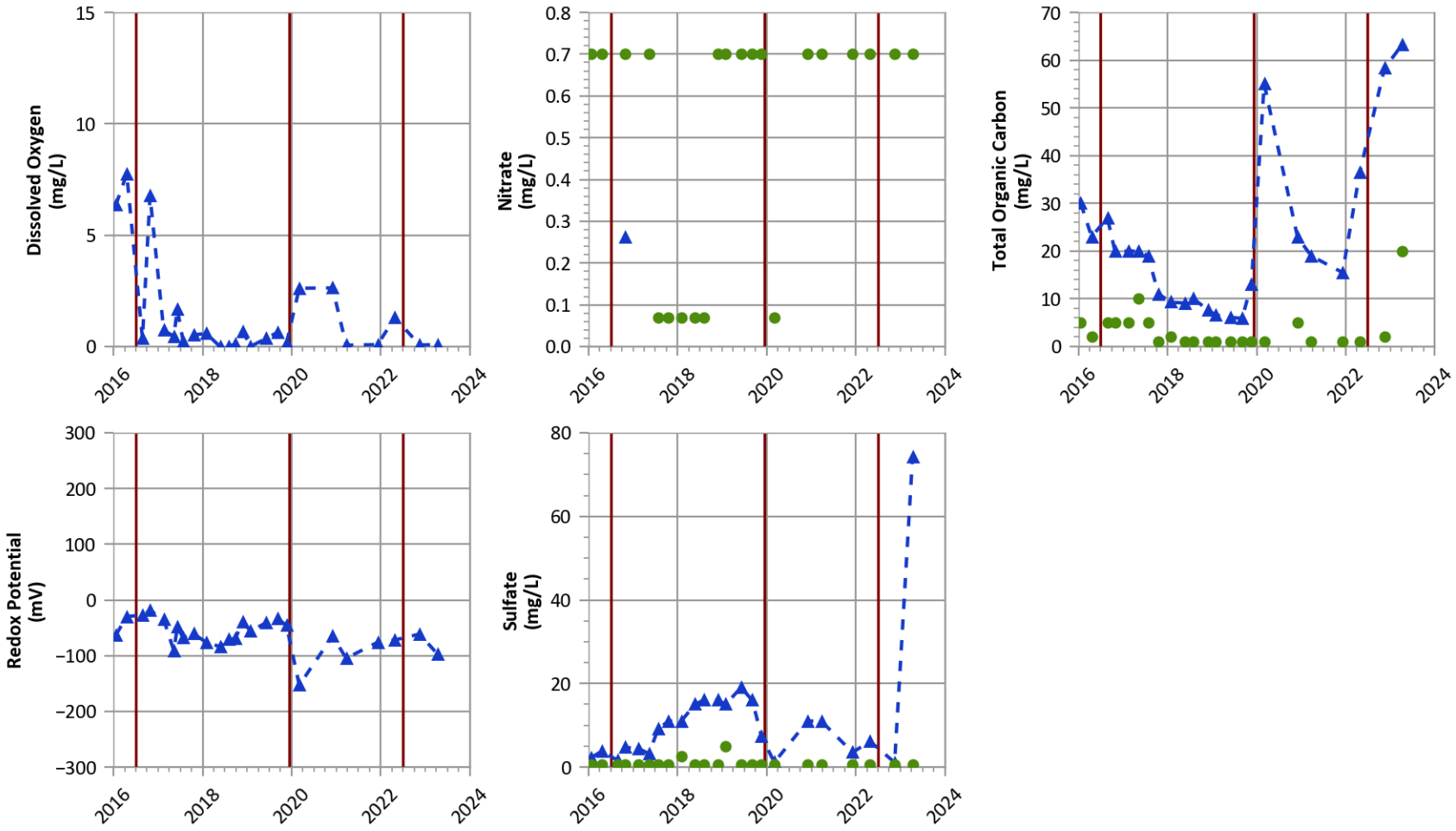
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



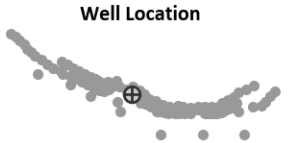
Zone 11 ISB

PTX06-ISB075 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



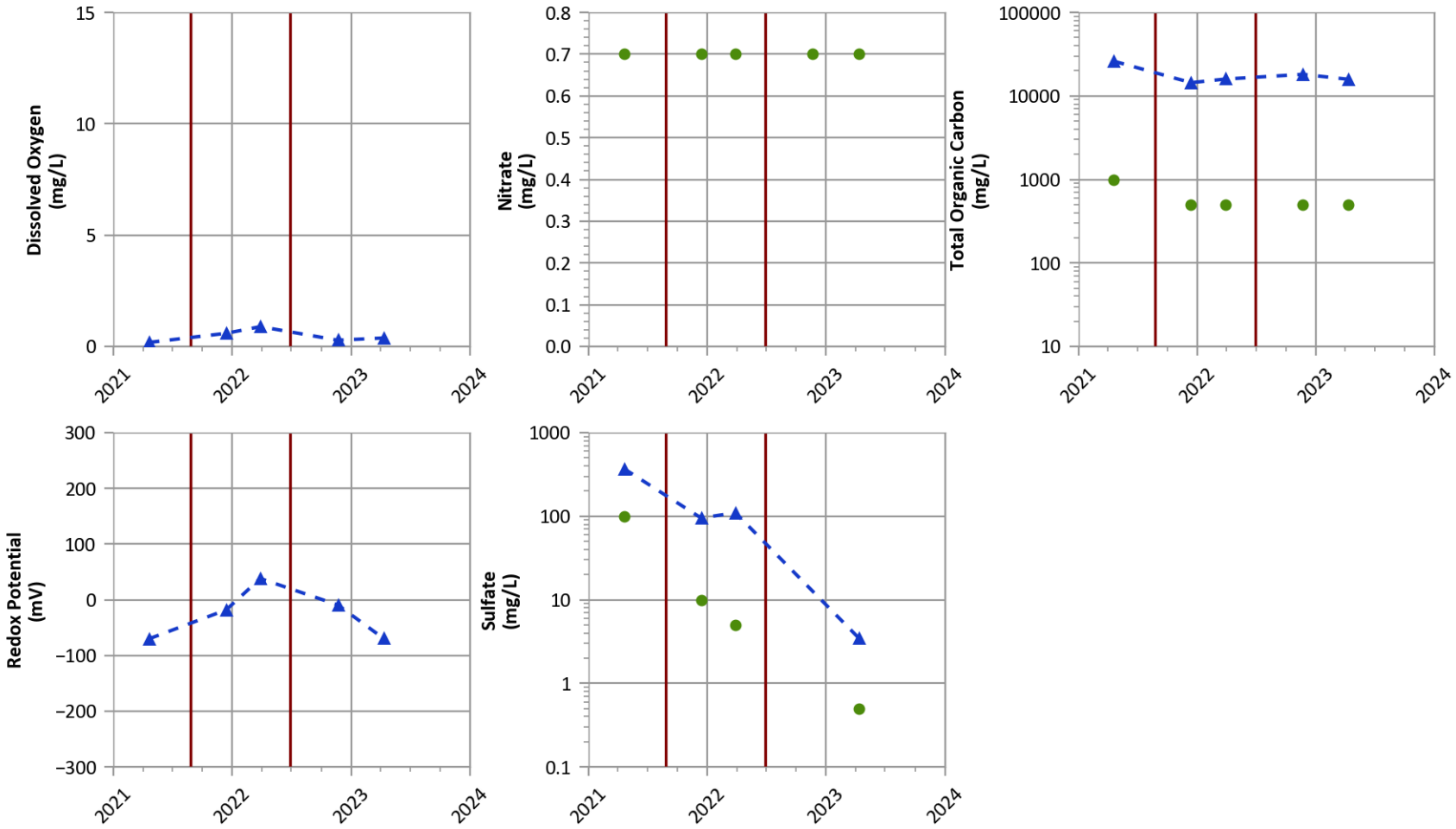
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

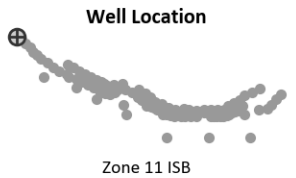


Zone 11 ISB

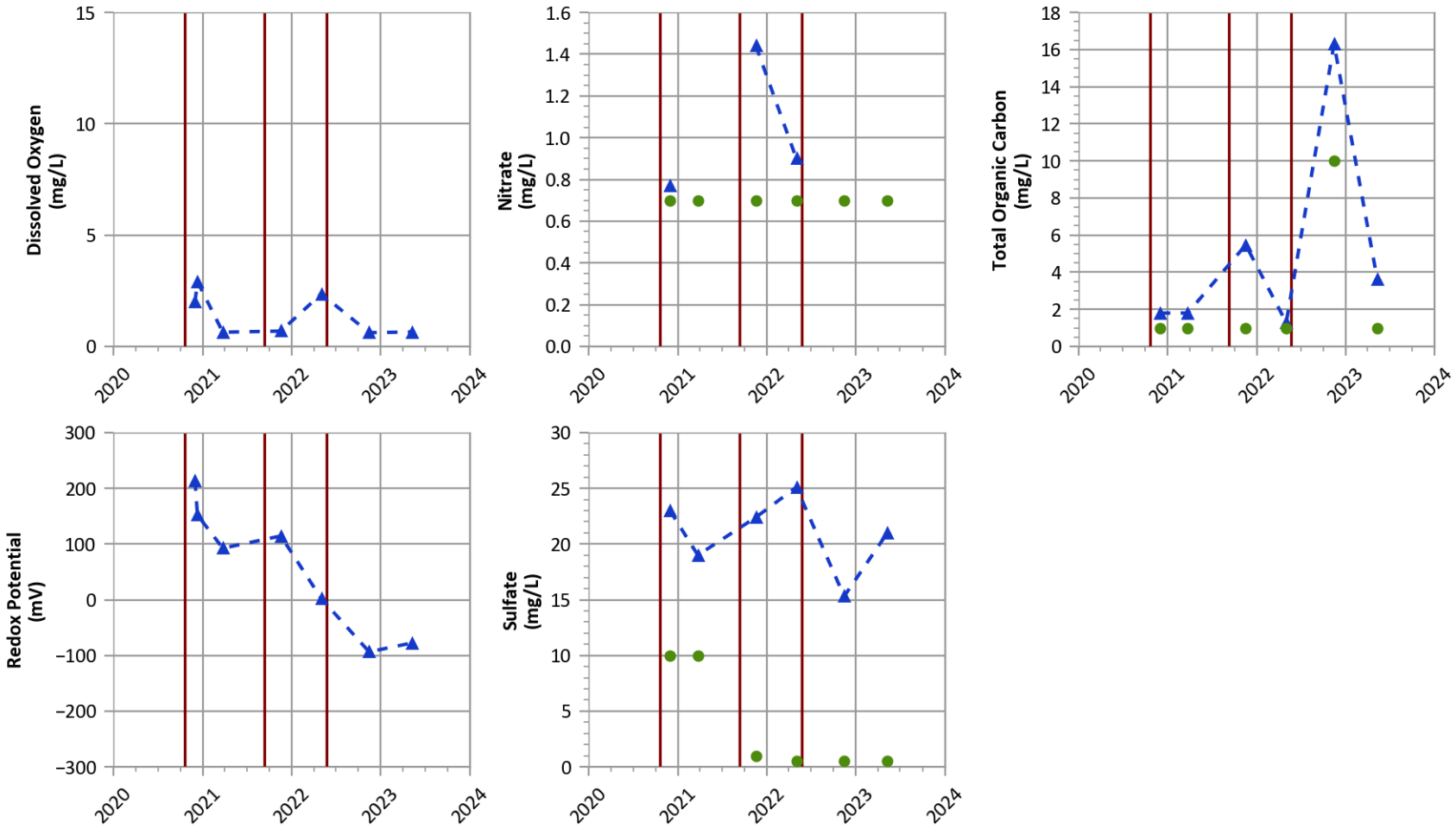
PTX06-ISB137 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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



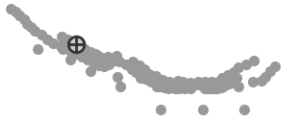
PTX06-1164 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

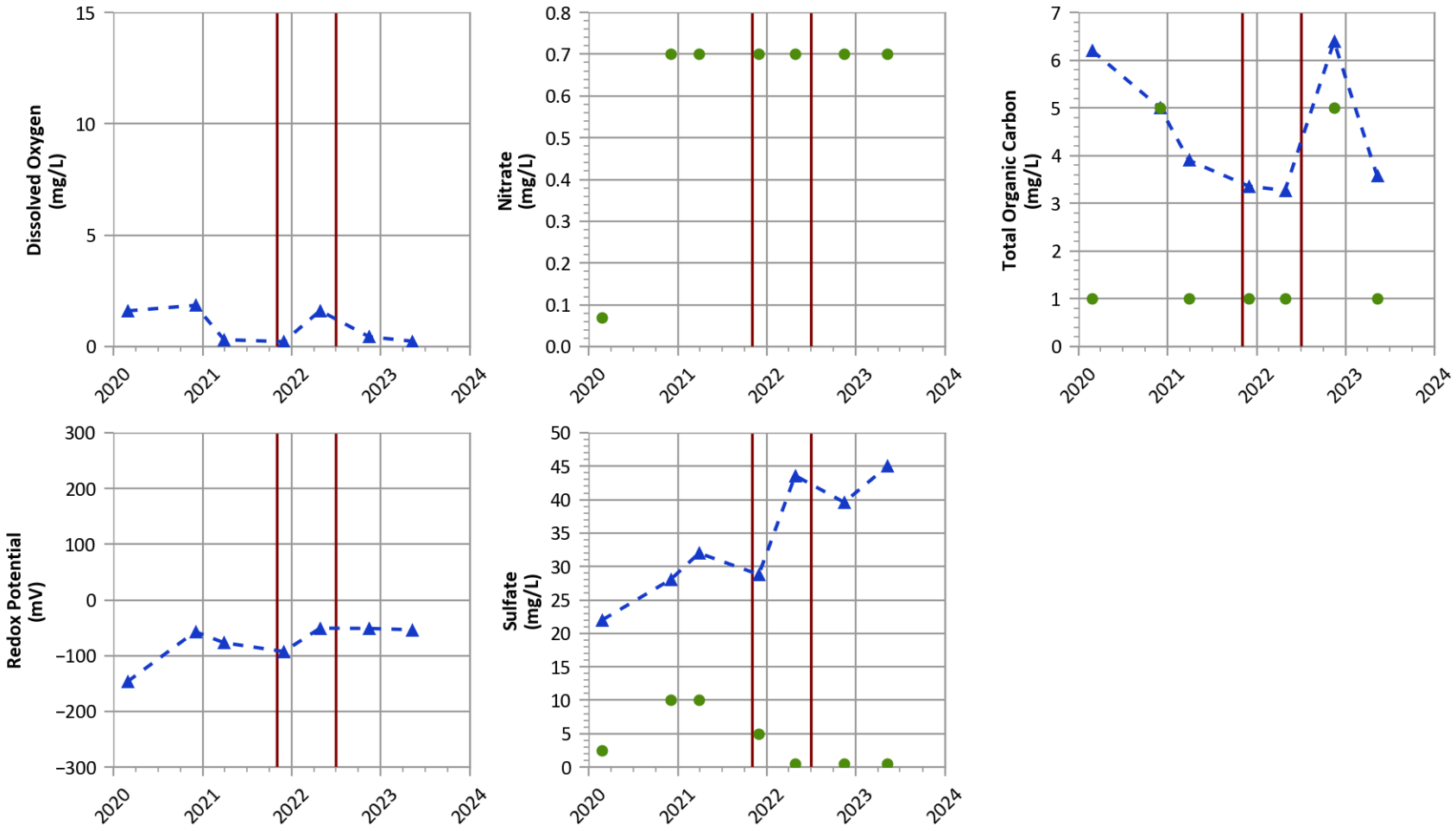
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



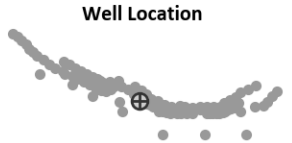
Zone 11 ISB

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



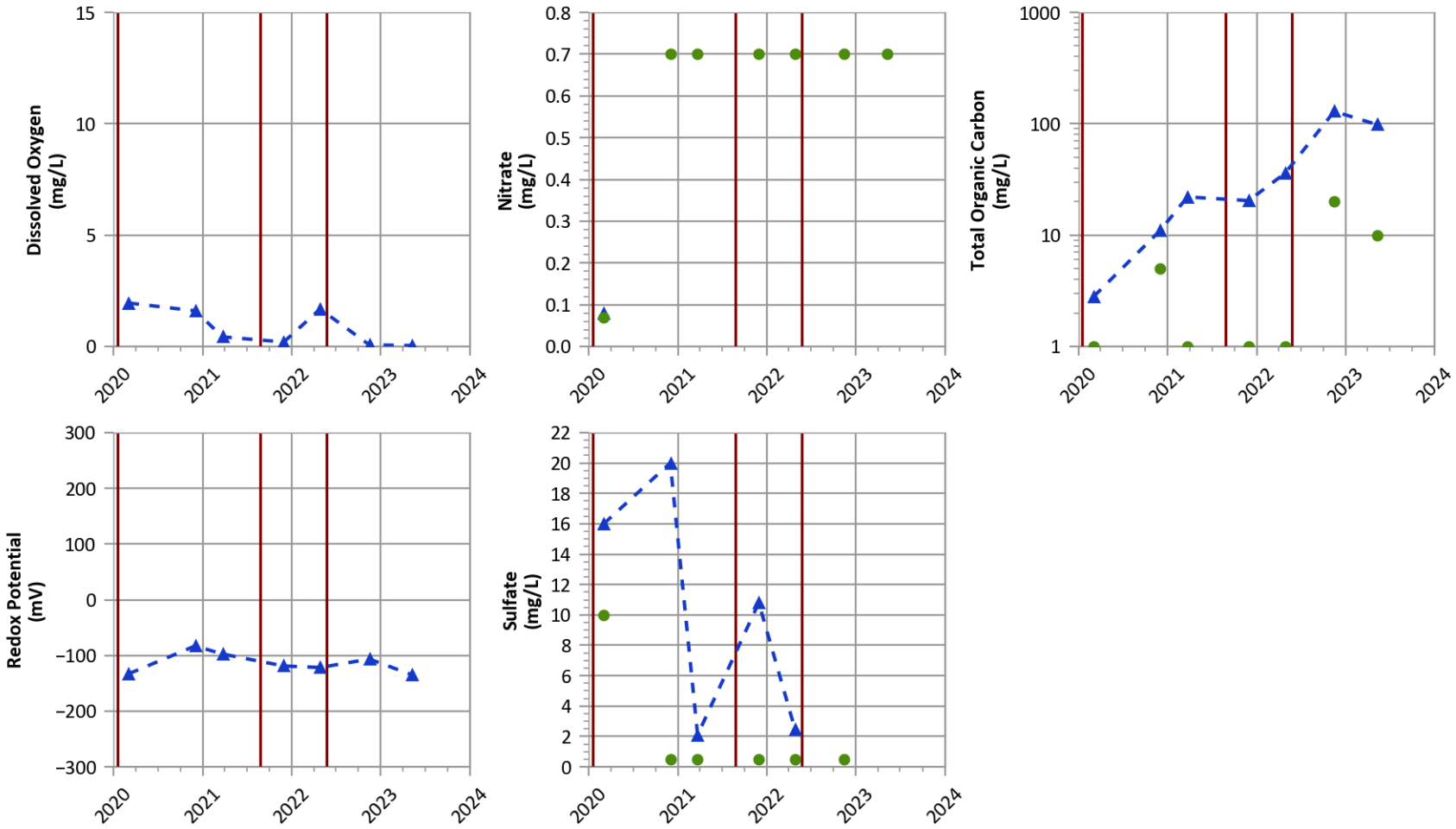
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



Zone 11 ISB

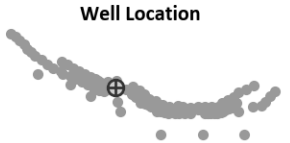
PTX06-1170 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

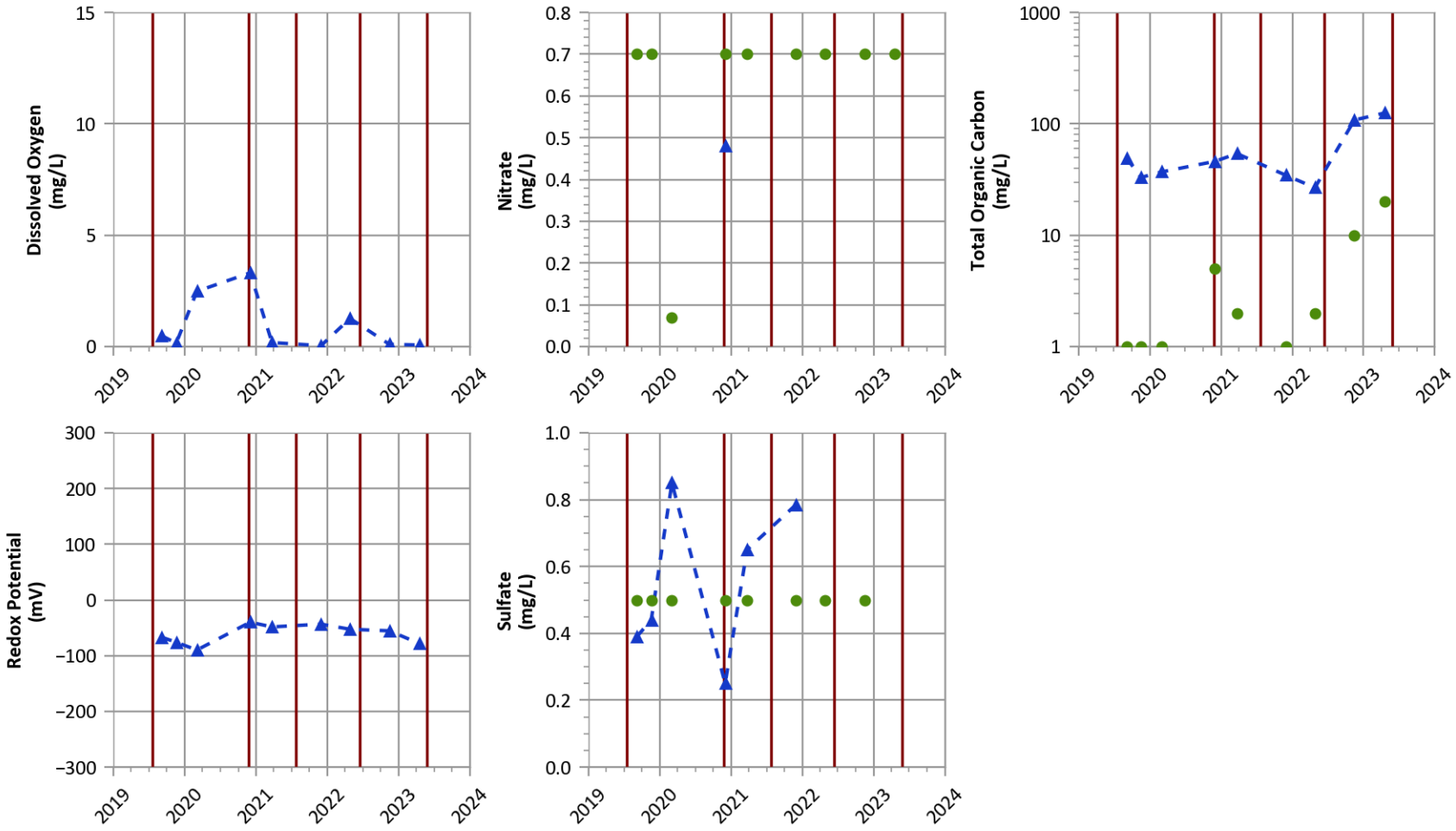
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



Zone 11 ISB

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



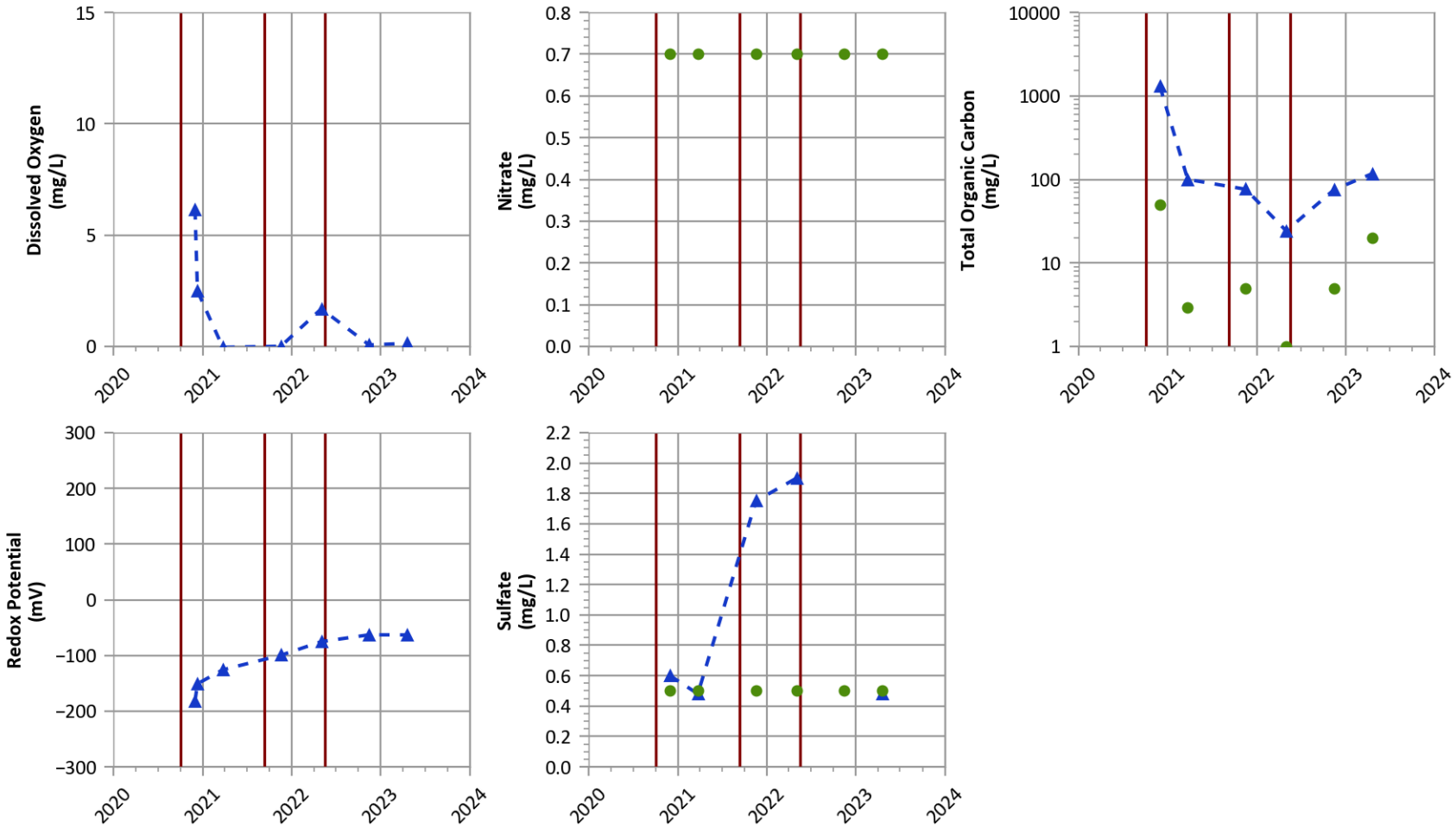
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

Zone 11 ISB

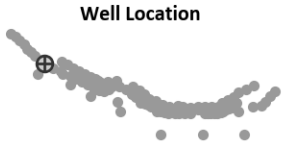
PTX06-1177 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

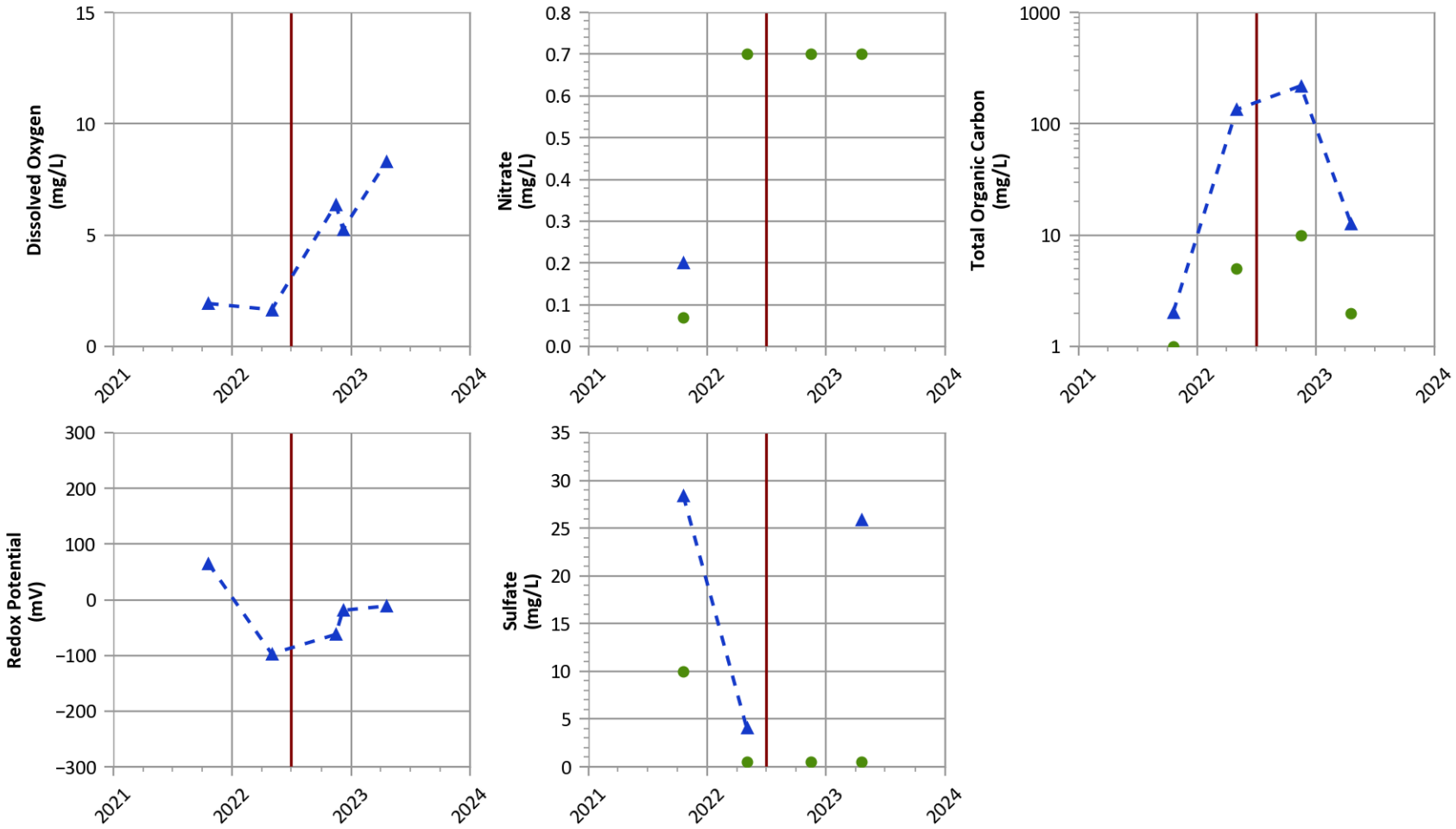
Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



Zone 11 ISB

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

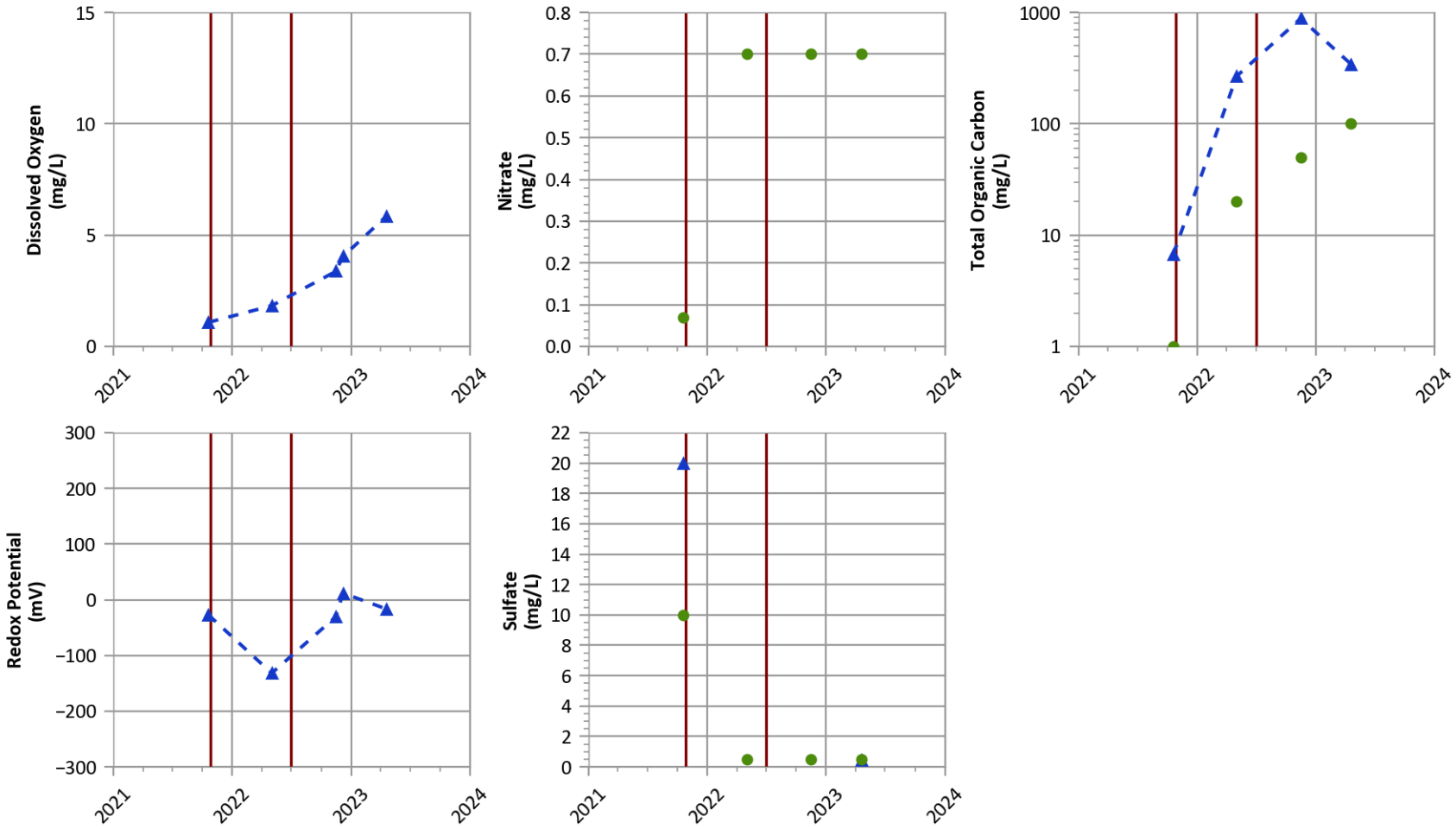


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location

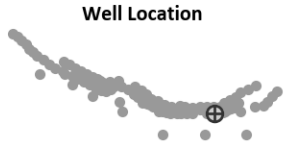
Zone 11 ISB

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



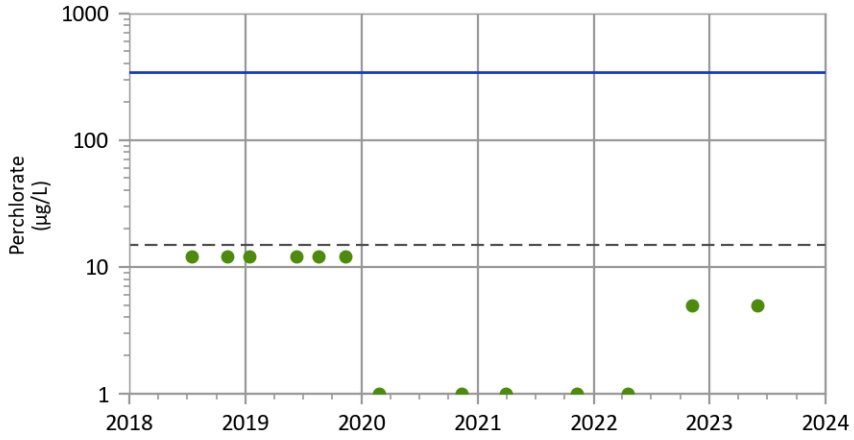
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

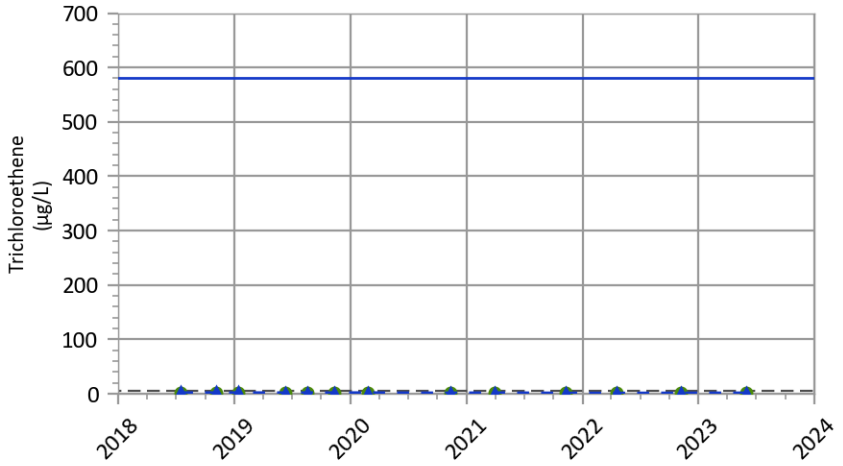
Well Location

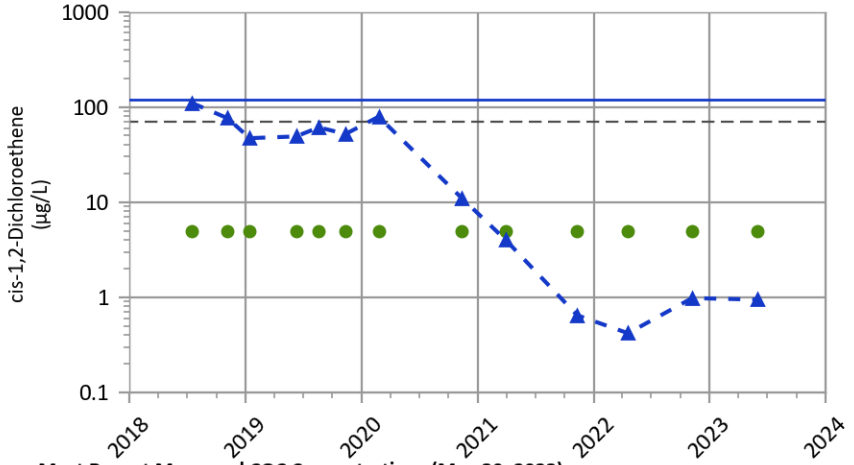


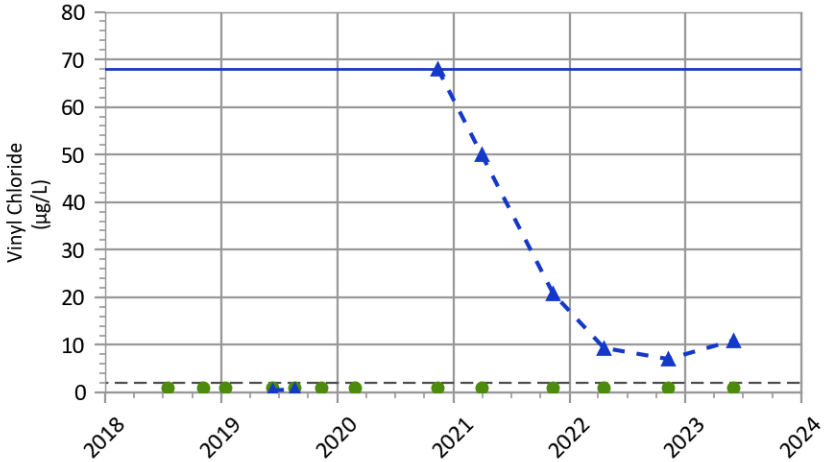
Zone 11 ISB

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



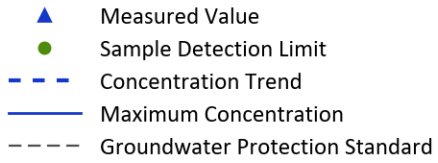




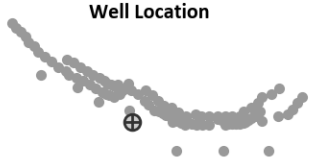


Most Recent Measured COC Concentrations (May 30, 2023)

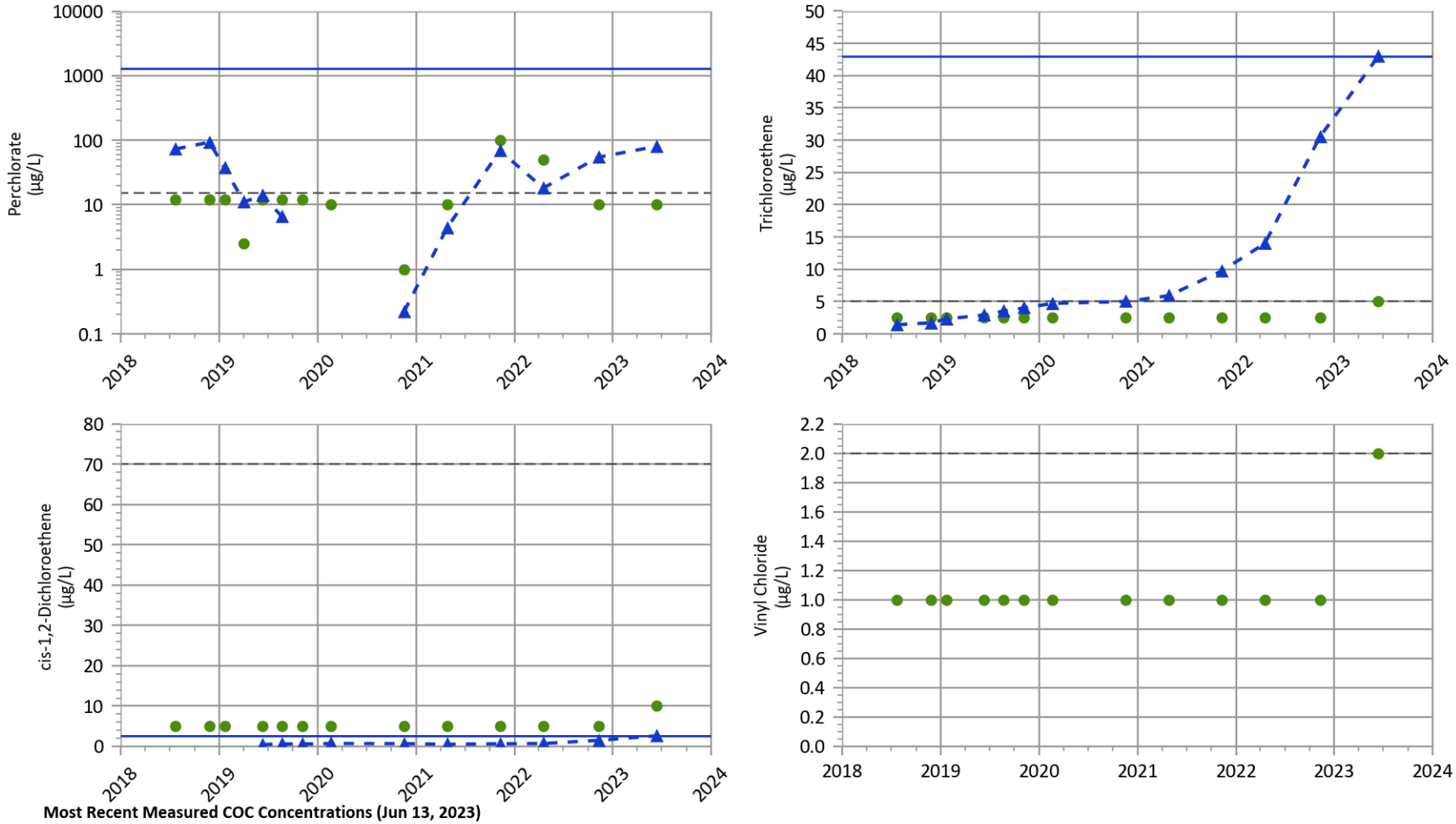
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	0.945	70.0
TCE	0.52	5.0
VC	10.9	2.0



Well Location

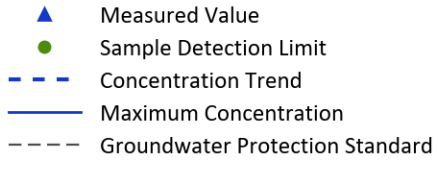


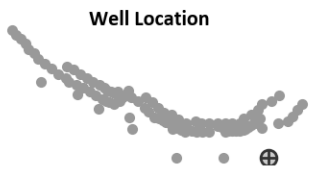
PTX06-1148 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



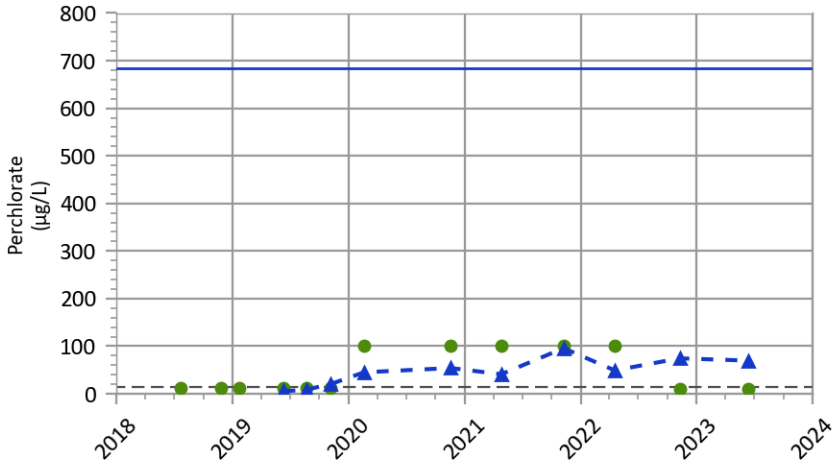
Most Recent Measured COC Concentrations (Jun 13, 2023)

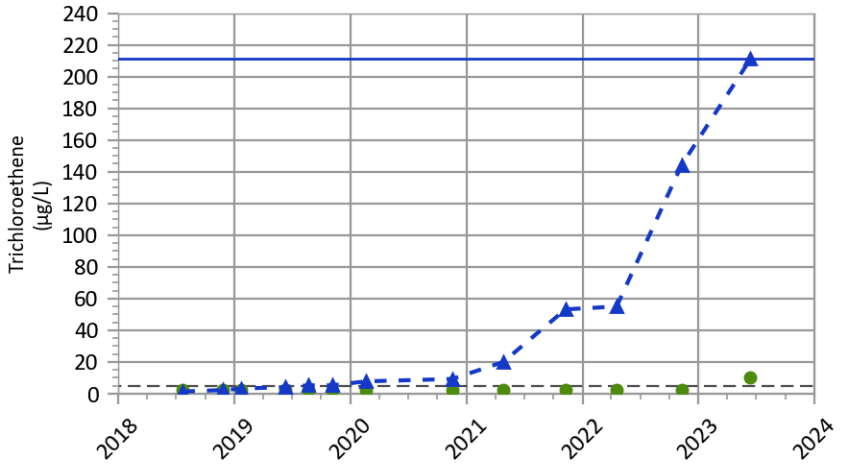
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	80.2	15.0
DCE12C	2.62	70.0
TCE	43.0	5.0
VC	Non-Detect	2.0

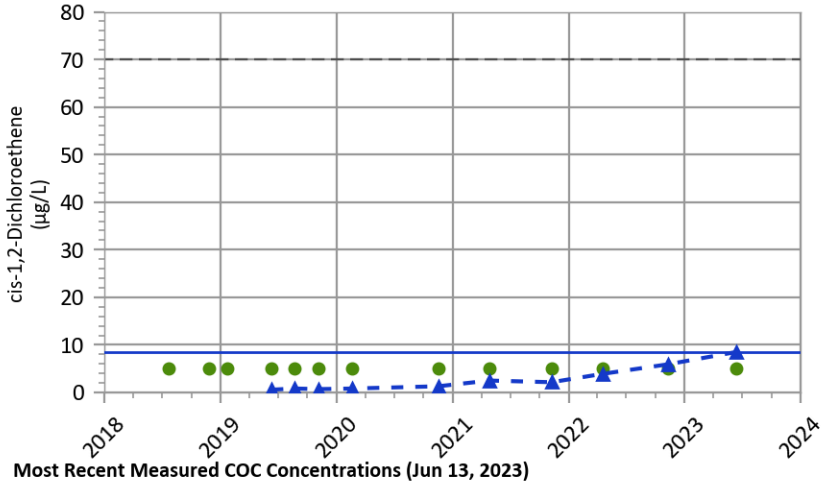


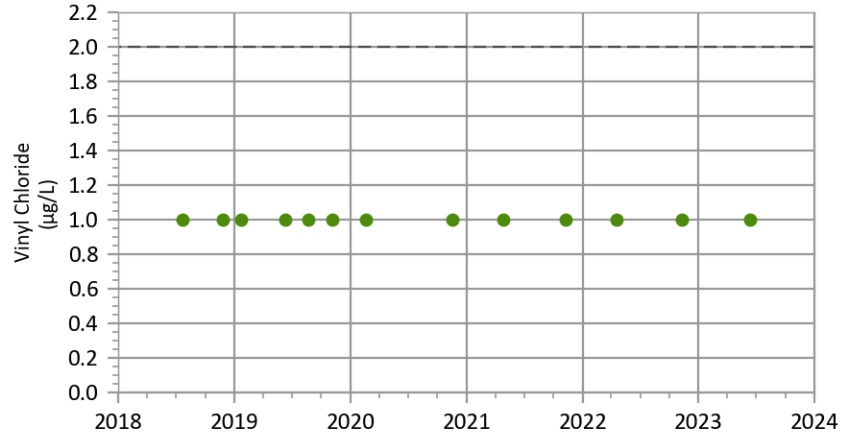


PTX06-1149 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



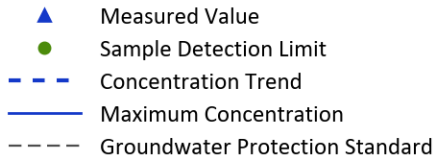


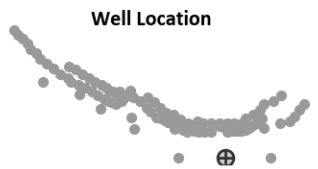




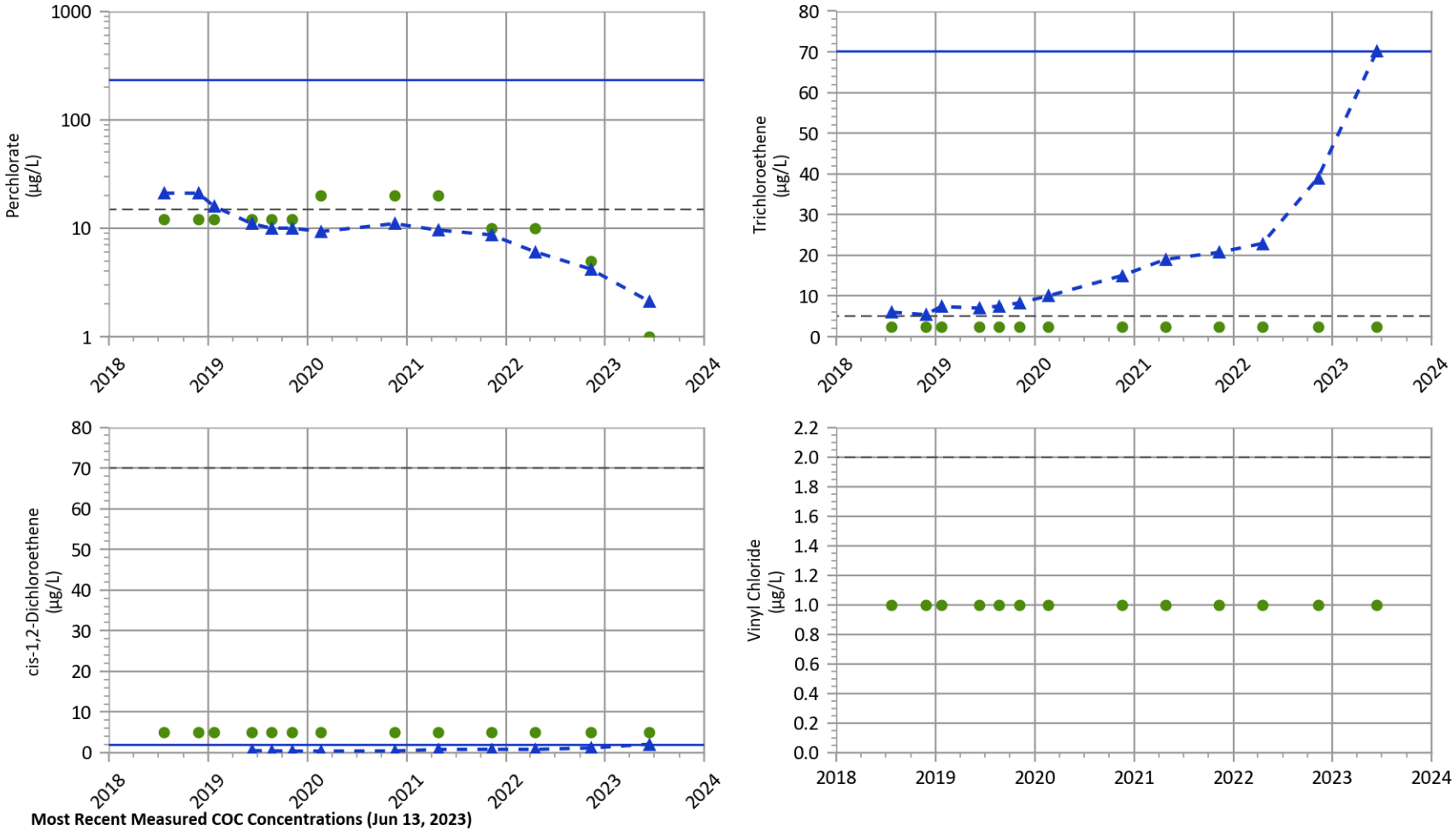
Most Recent Measured COC Concentrations (Jun 13, 2023)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	69.6	15.0
DCE12C	8.51	70.0
TCE	211.0	5.0
VC	Non-Detect	2.0





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

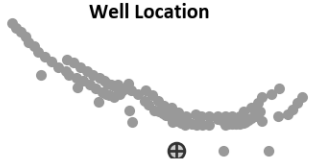


Most Recent Measured COC Concentrations (Jun 13, 2023)

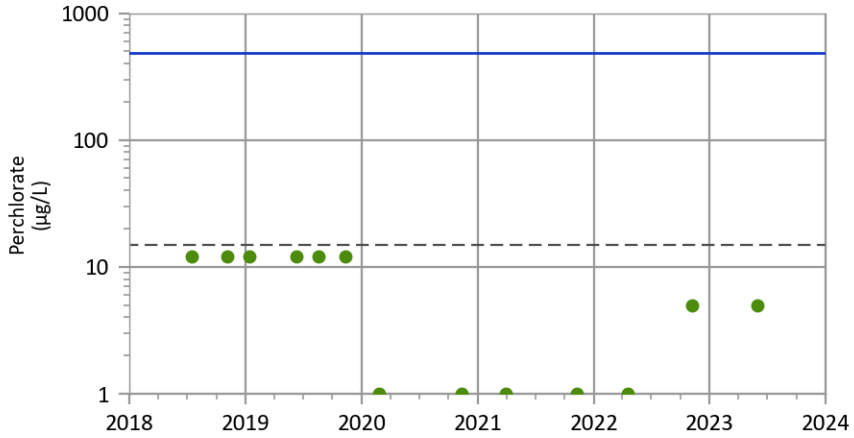
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	2.11	15.0
DCE12C	2.09	70.0
TCE	70.2	5.0
VC	Non-Detect	2.0

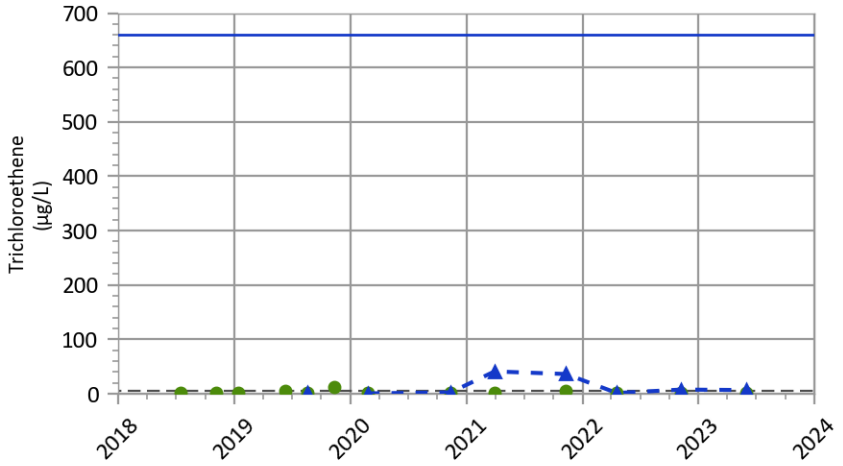
- Measured Value
- Sample Detection Limit
- Concentration Trend
- Maximum Concentration
- Groundwater Protection Standard

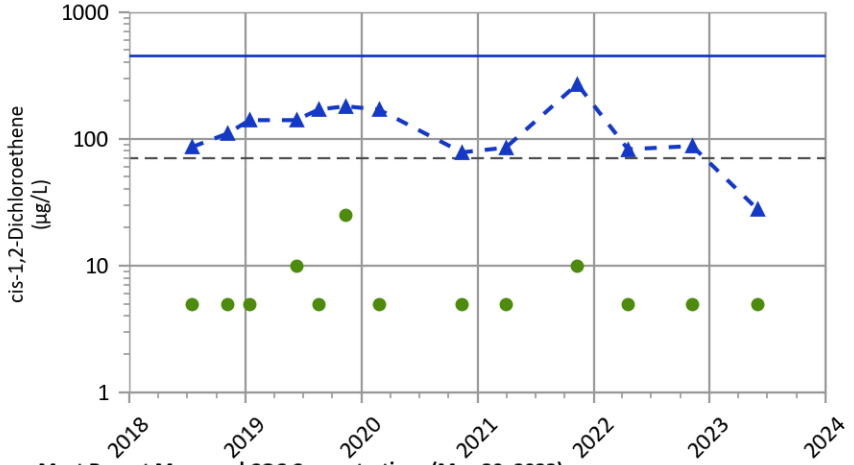
Well Location

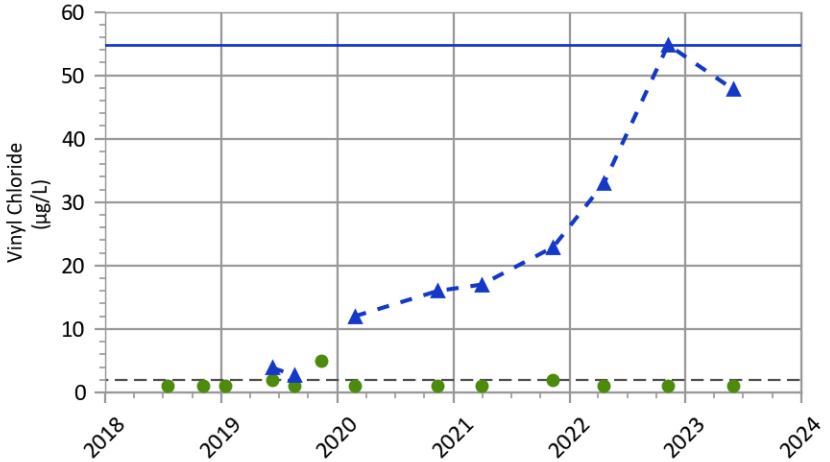


PTX06-1155 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



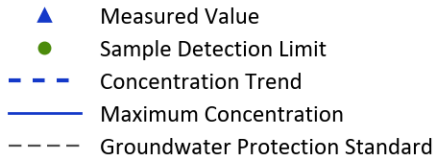


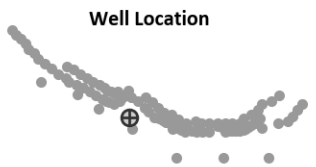




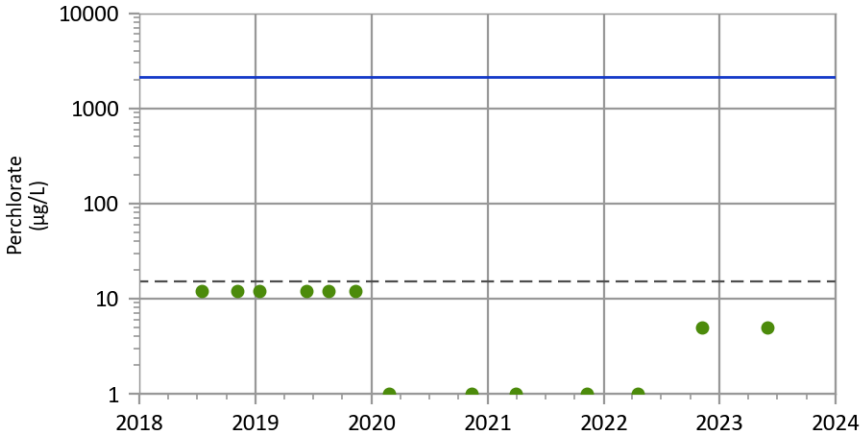
Most Recent Measured COC Concentrations (May 30, 2023)

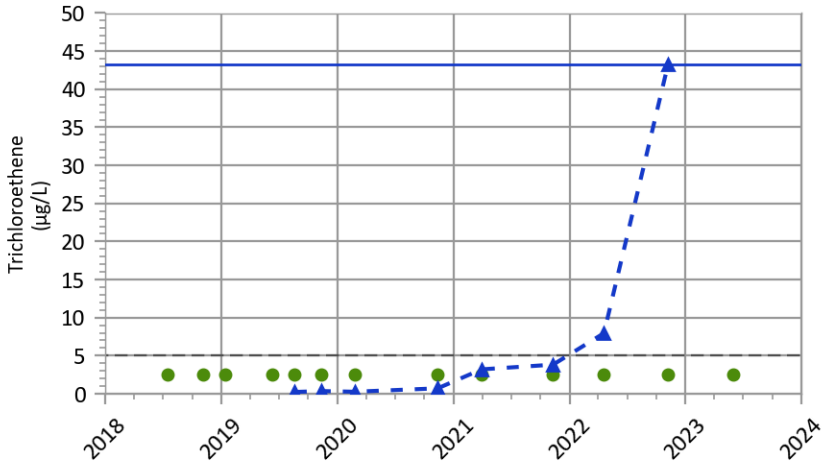
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	28.0	70.0
TCE	6.73	5.0
VC	47.8	2.0

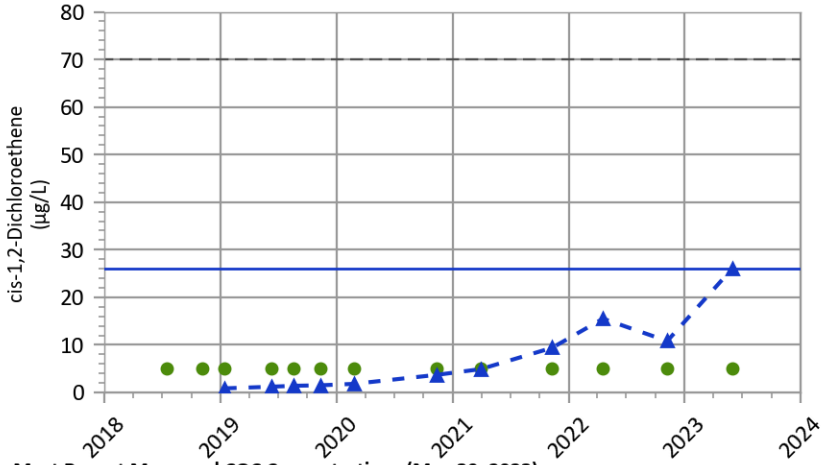


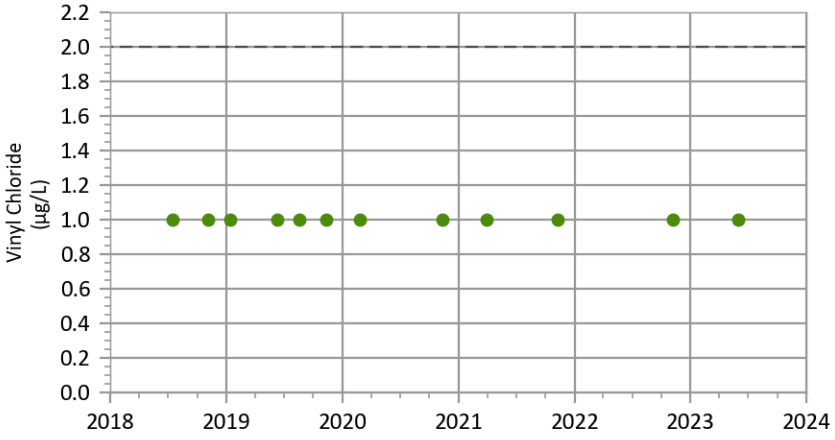


PTX06-1156 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



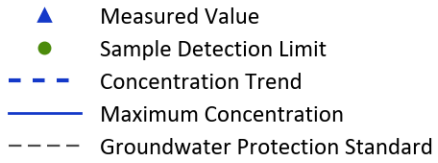


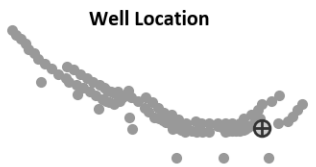




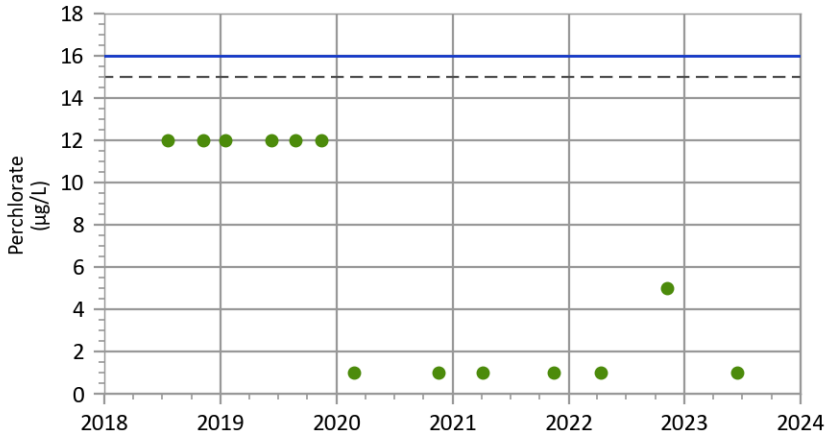
Most Recent Measured COC Concentrations (May 30, 2023)

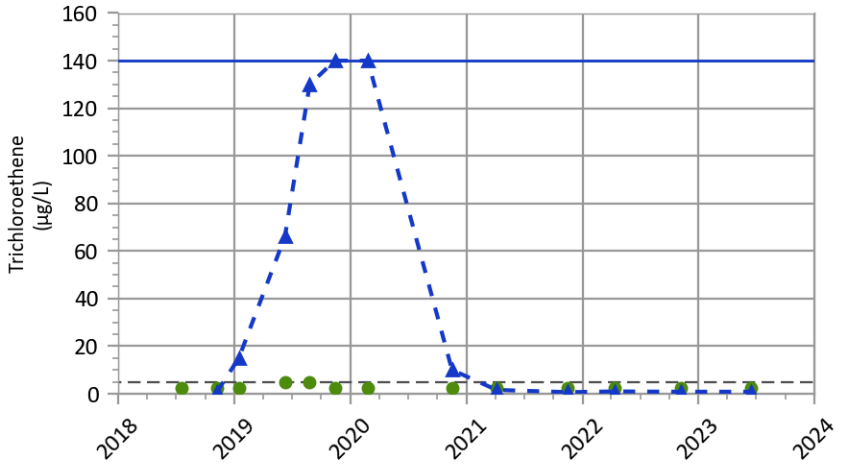
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	26.0	70.0
TCE	Non-Detect	5.0
VC	Non-Detect	2.0

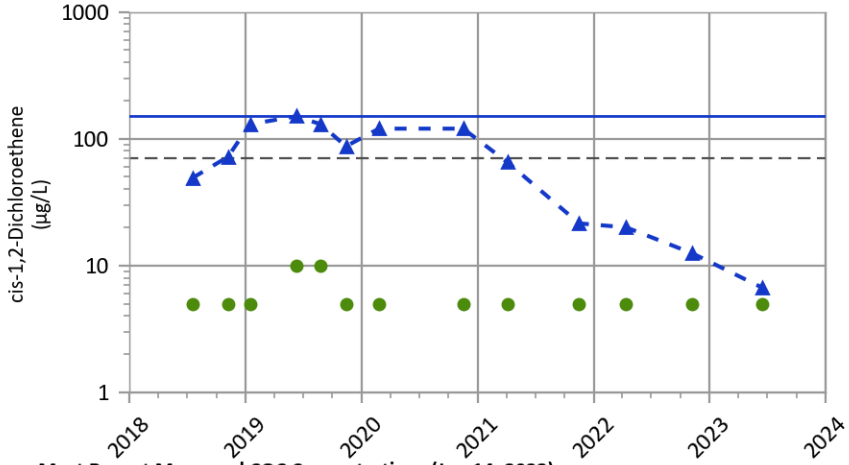


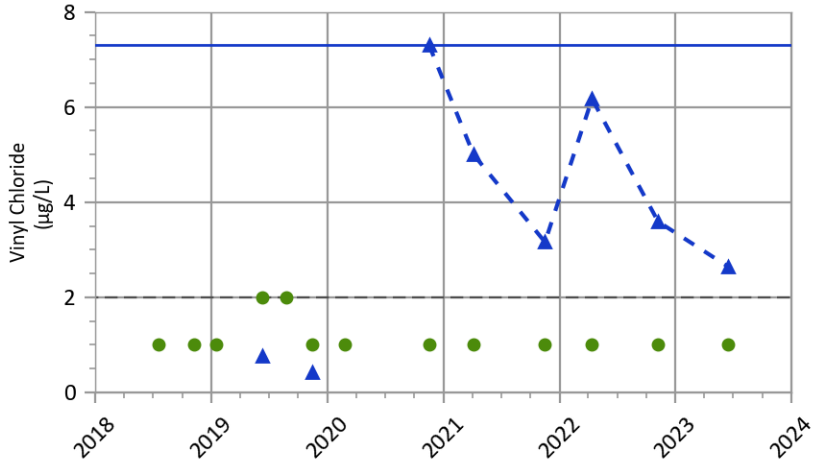


PTX06-1173 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



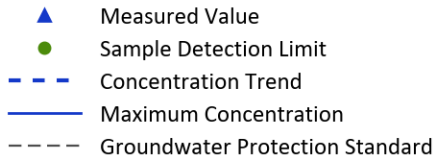


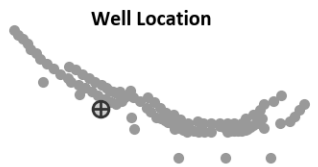




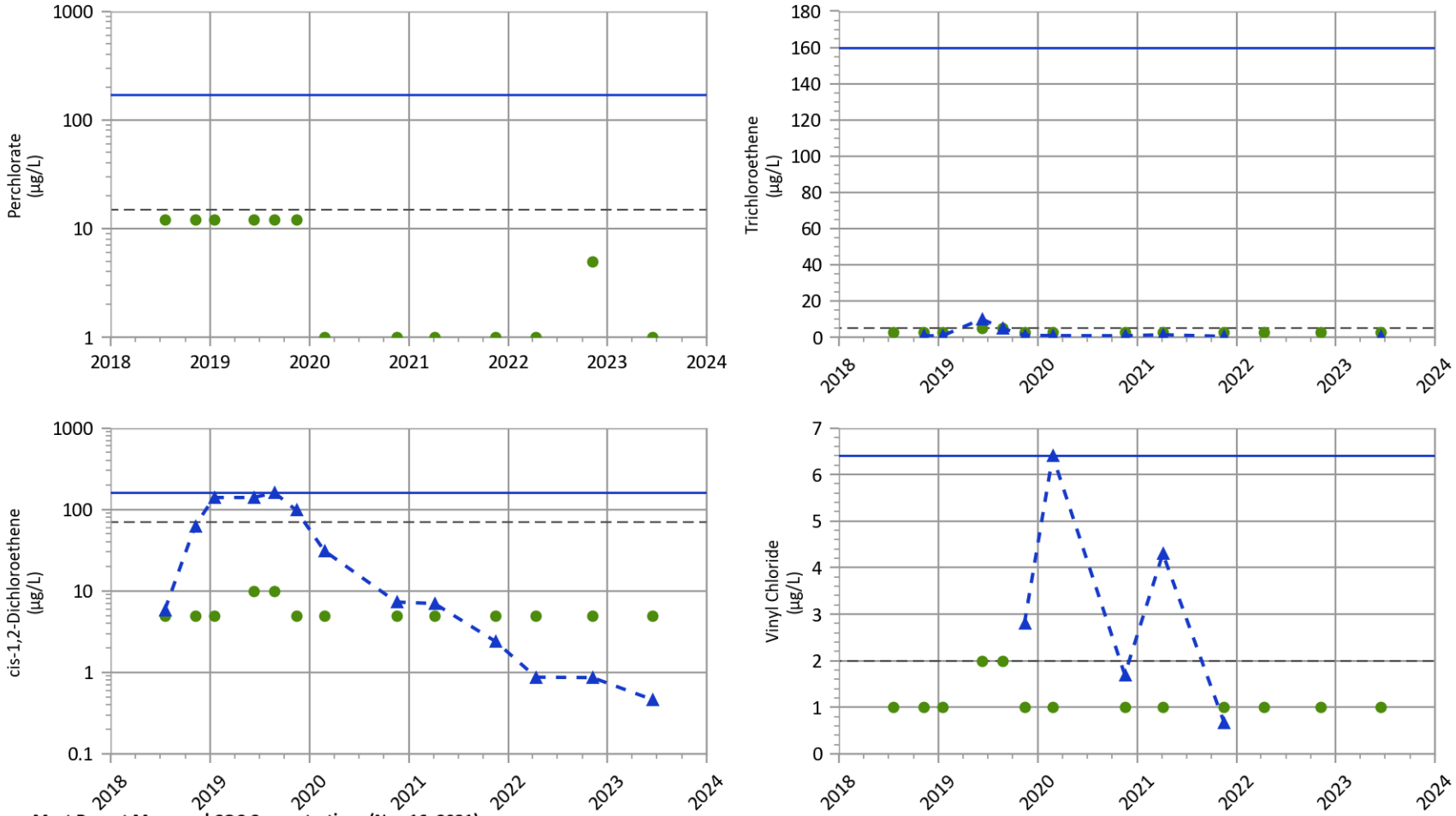
Most Recent Measured COC Concentrations (Jun 14, 2023)

COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	6.72	70.0
TCE	0.848	5.0
VC	2.65	2.0



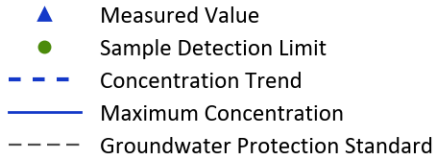


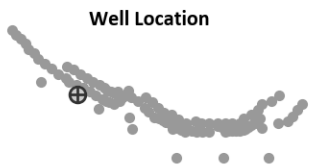
PTX06-1174 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



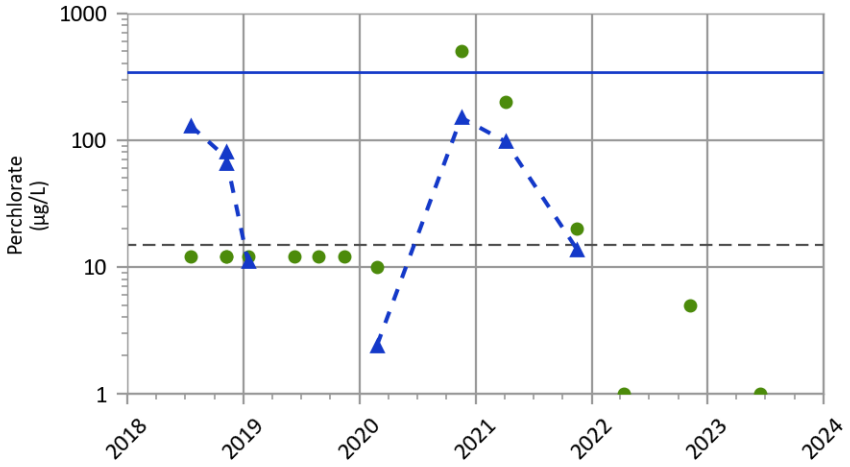
Most Recent Measured COC Concentrations (Nov 16, 2021)

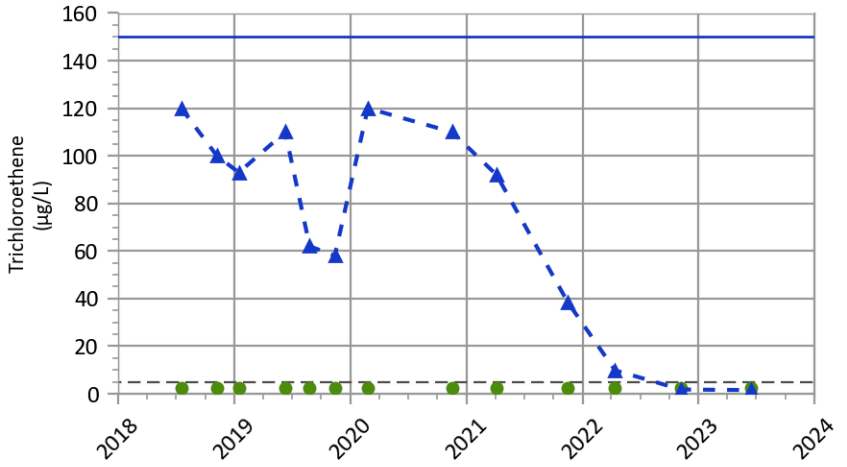
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	0.465	70.0
TCE	0.624	5.0
VC	Non-Detect	2.0

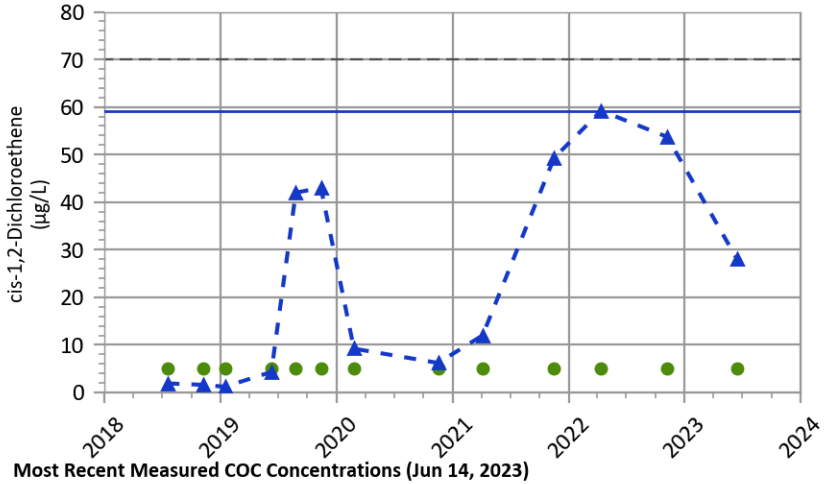


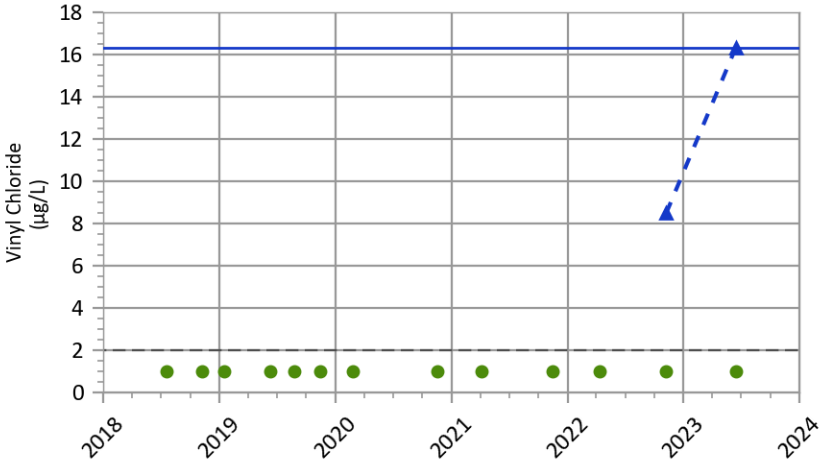


PTX06-1175 Downgradient Performance Indicators
Zone 11 In Situ Bioremediation System
USDOE/NNSA Pantex Plant



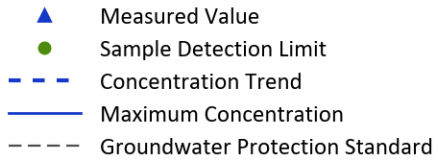


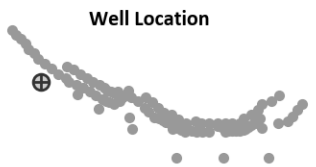




Most Recent Measured COC Concentrations (Jun 14, 2023)

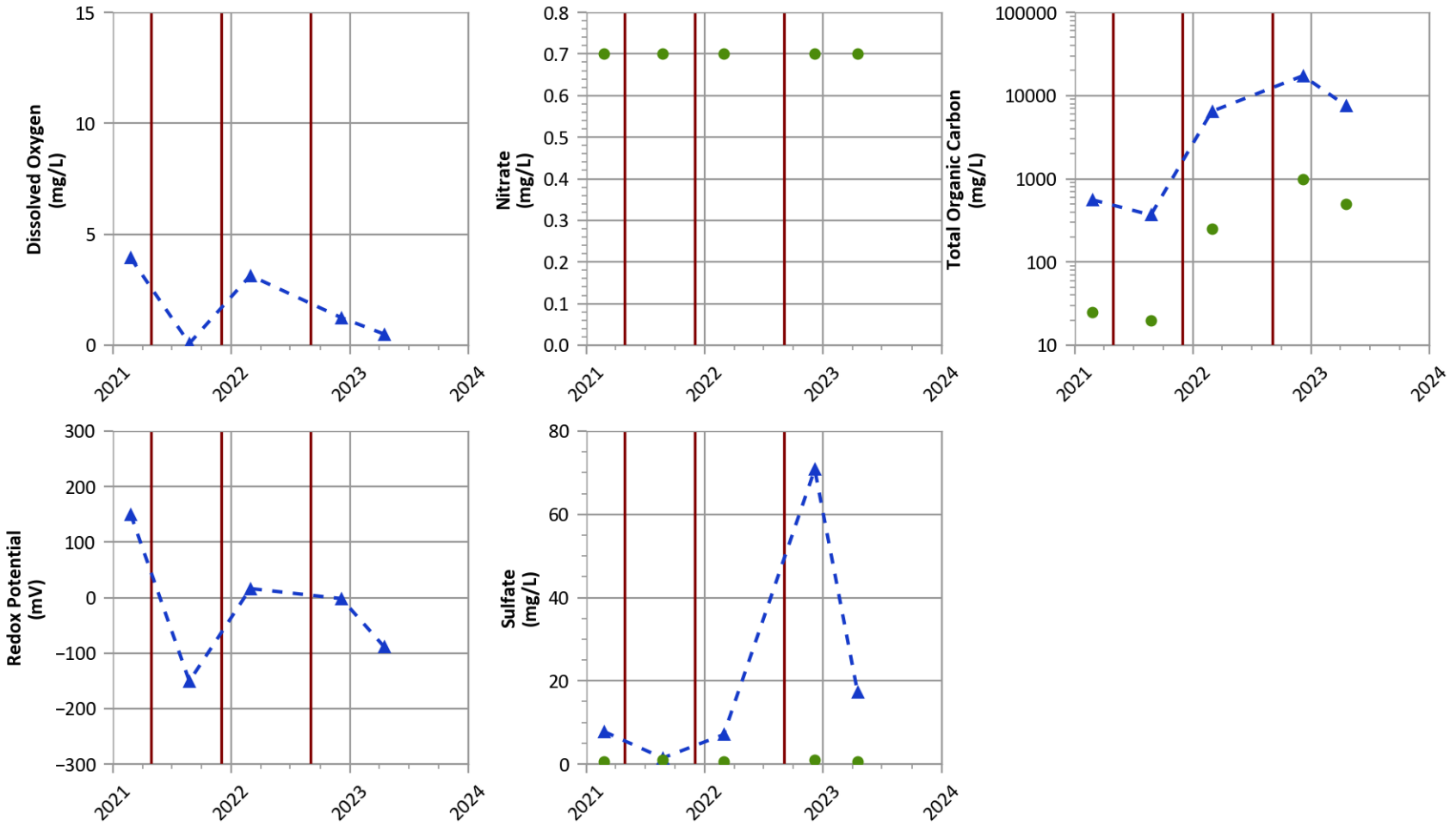
COC	Concentration (µg/L)	GWPS (µg/L)
PERC	Non-Detect	15.0
DCE12C	28.1	70.0
TCE	1.53	5.0
VC	16.3	2.0





Southeast ISB Extension

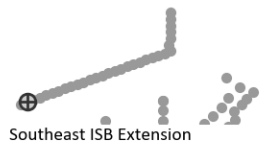
PTX06-ISB302 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



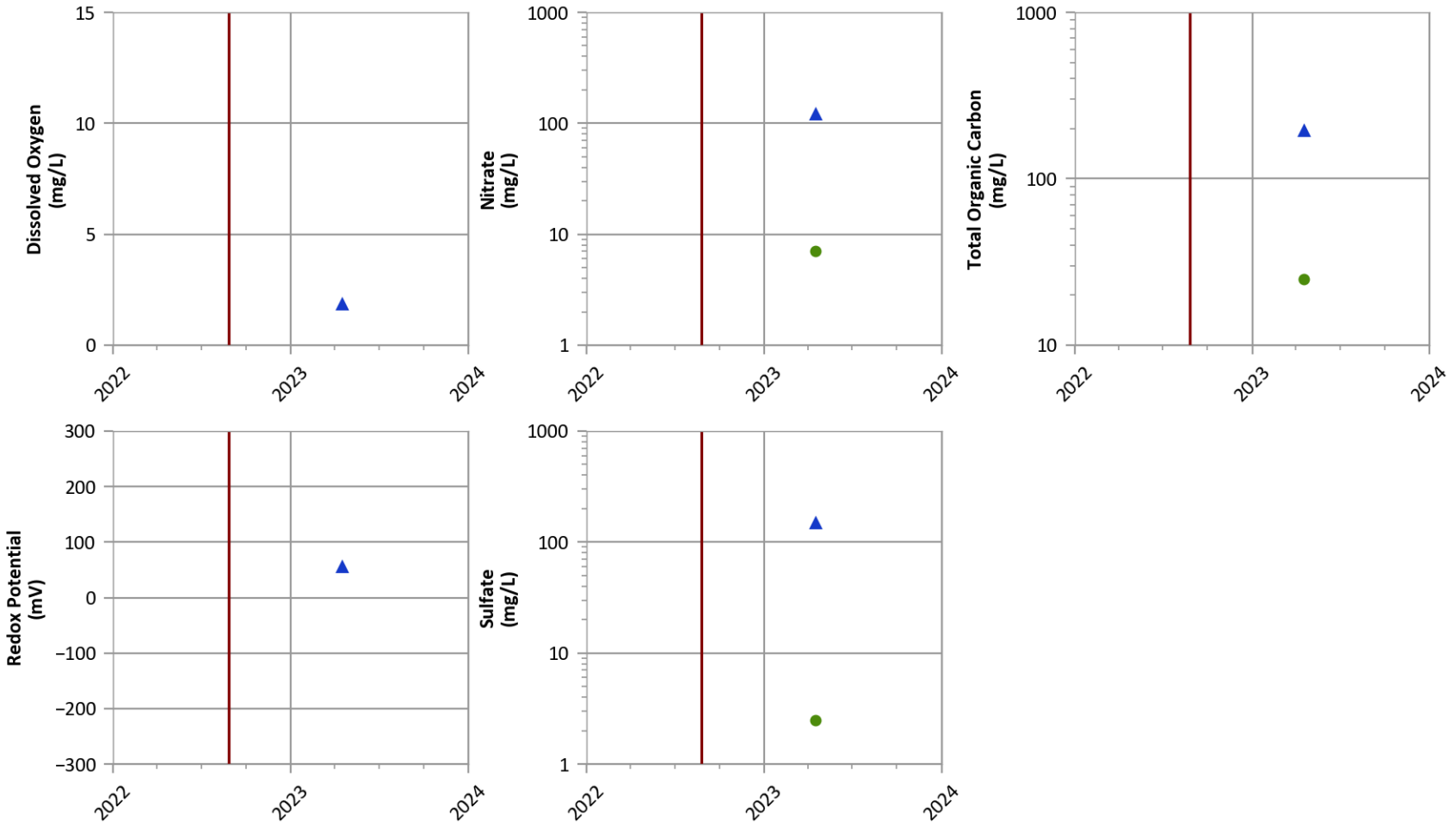
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



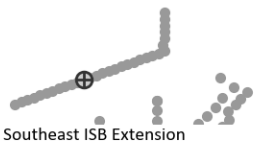
PTX06-ISB312 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



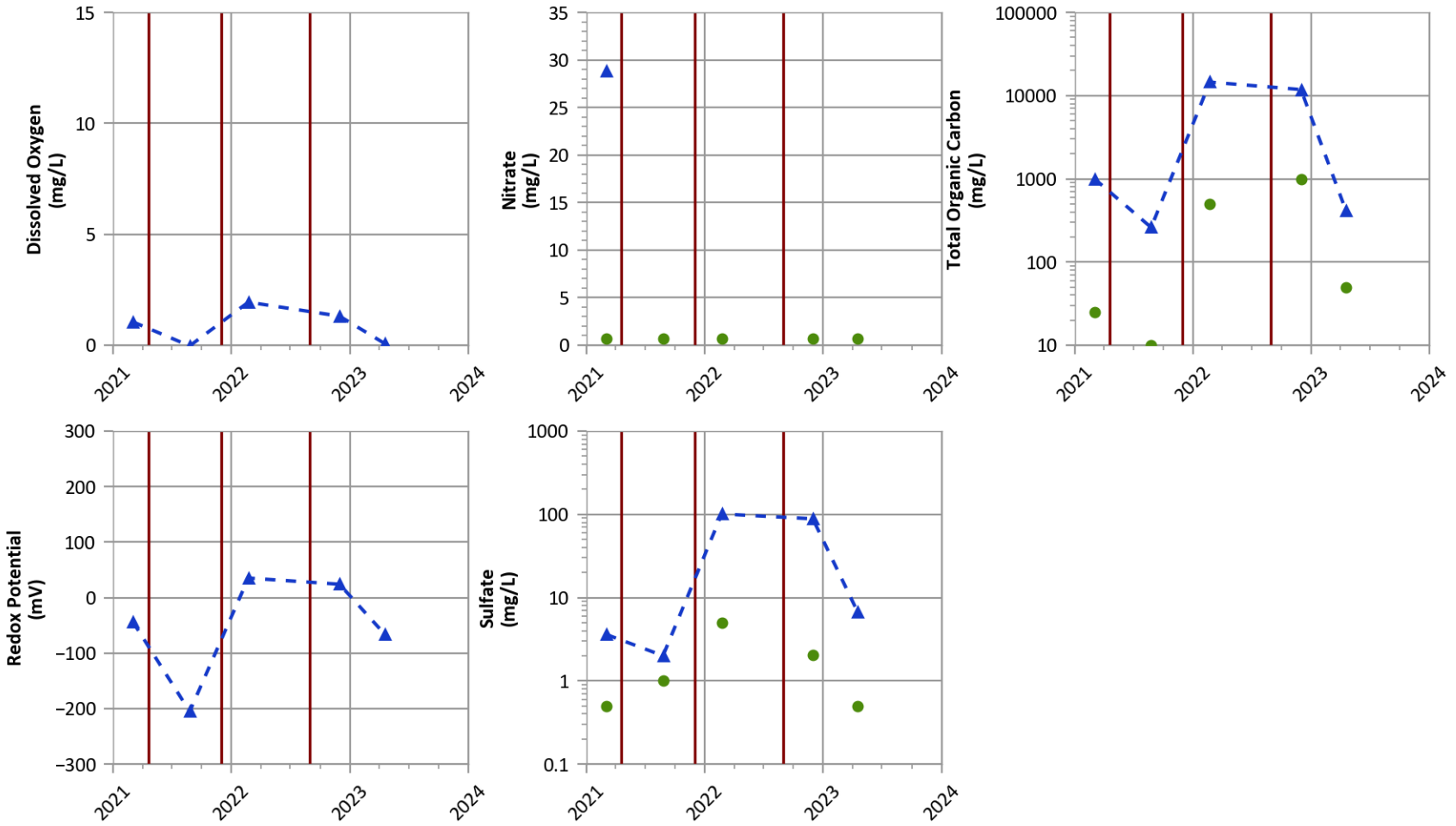
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

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

Well Location



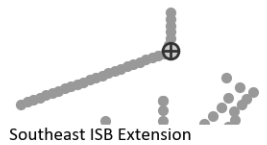
PTX06-ISB325 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



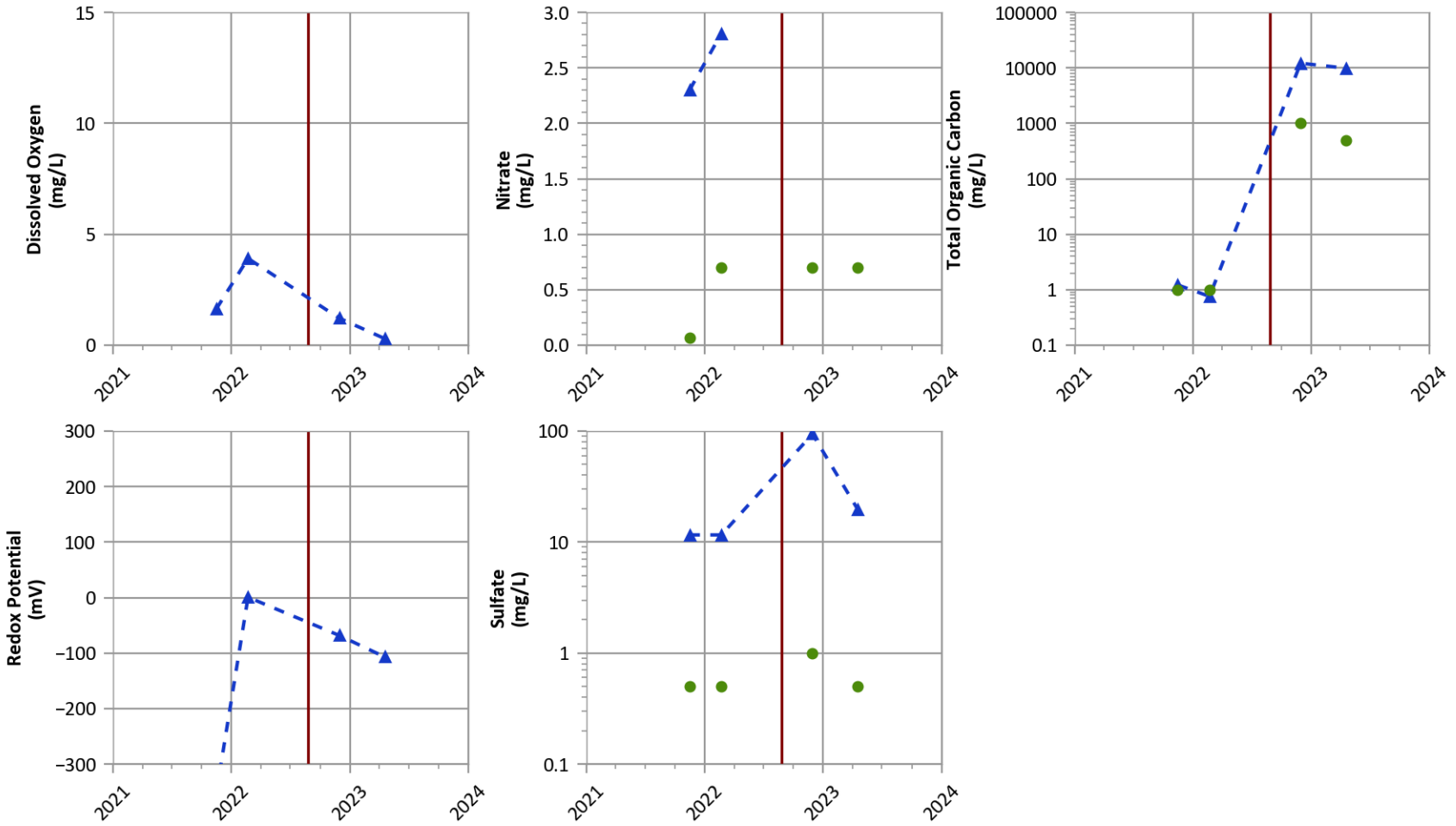
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location



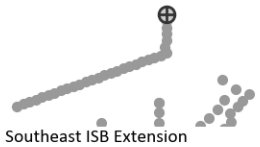
PTX06-ISB331 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



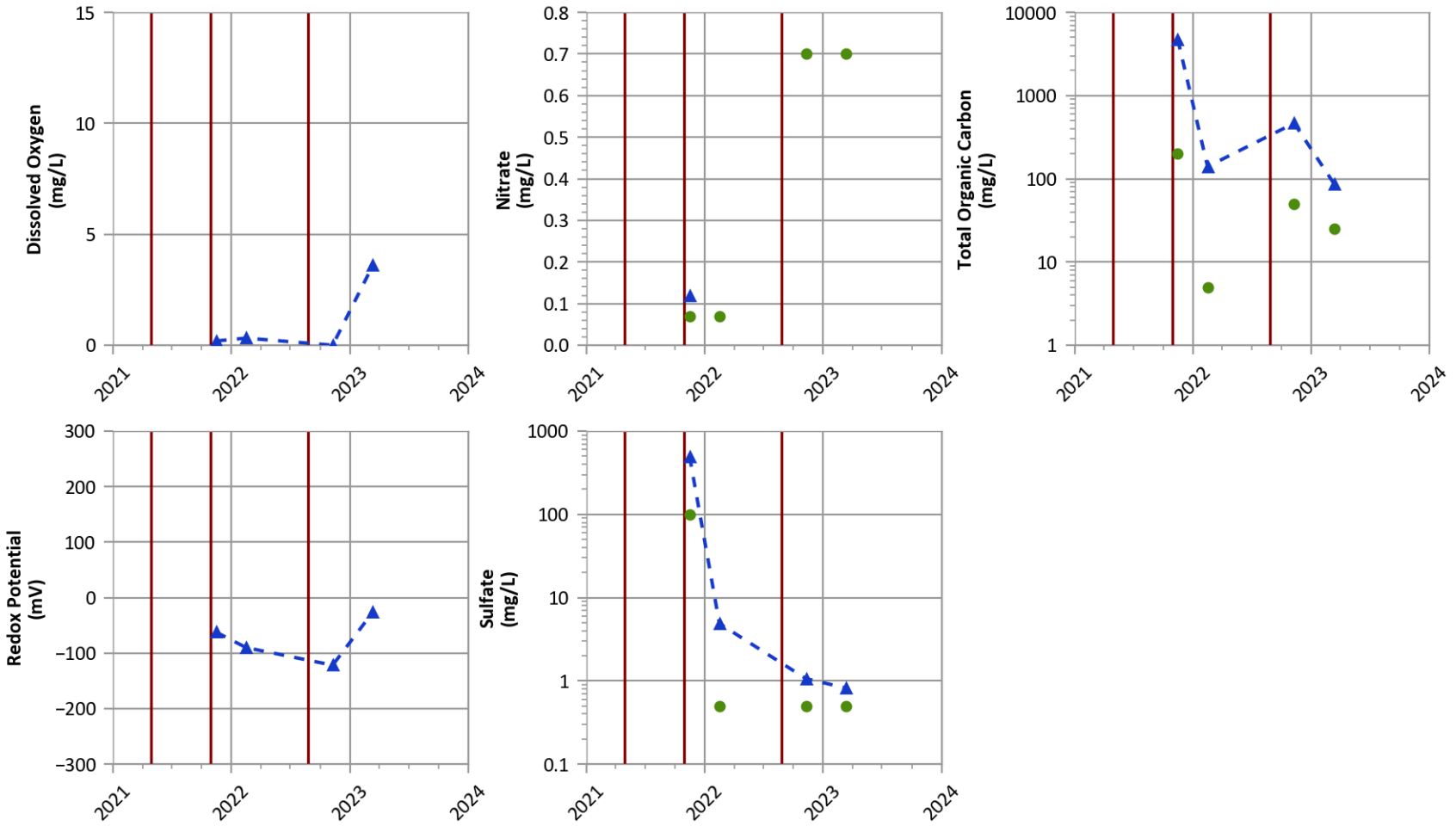
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

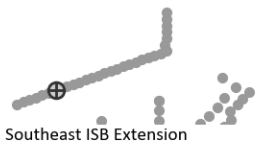


PTX06-1213 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant

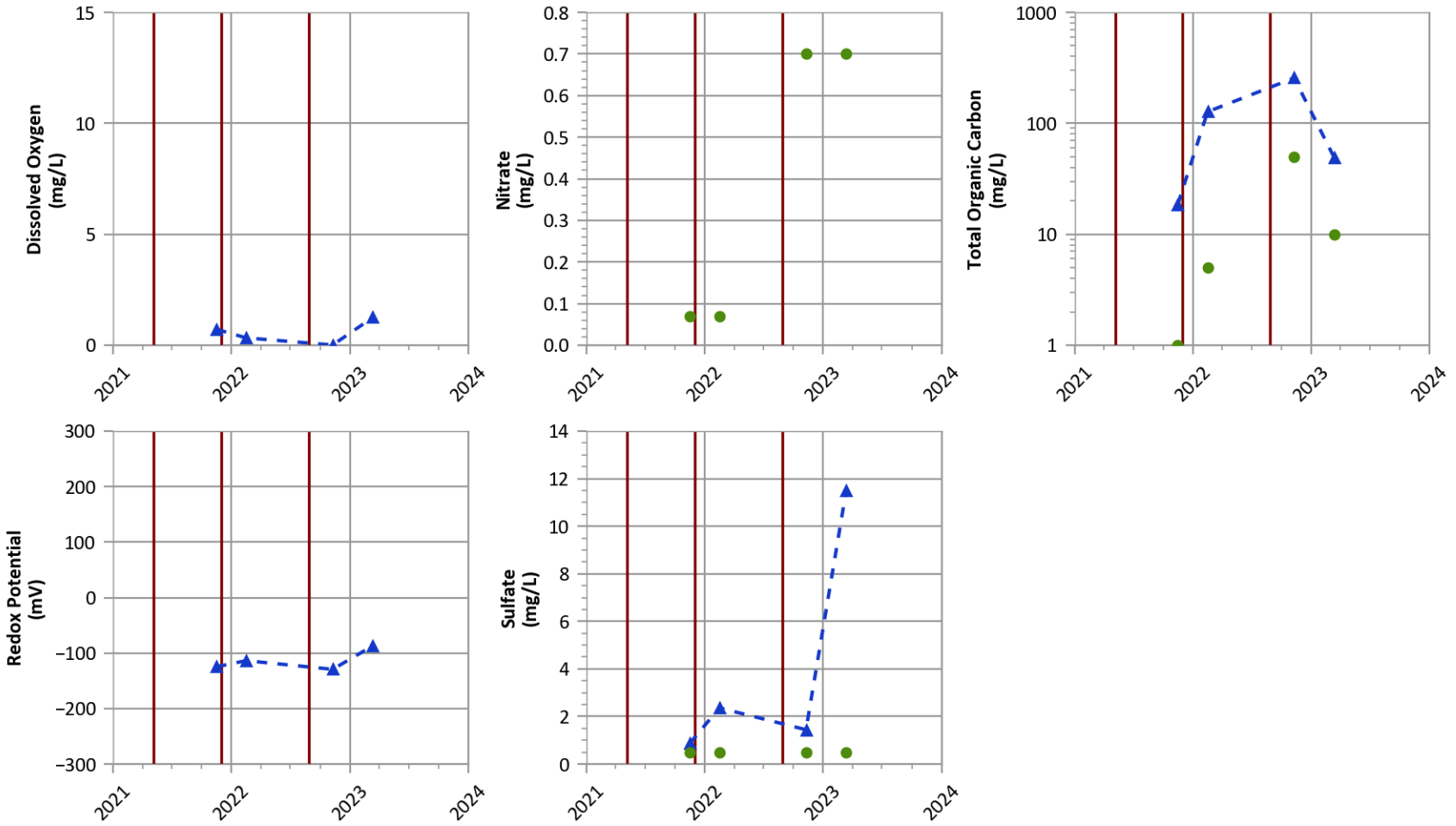


Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Well Location



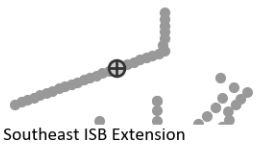
PTX06-1214 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



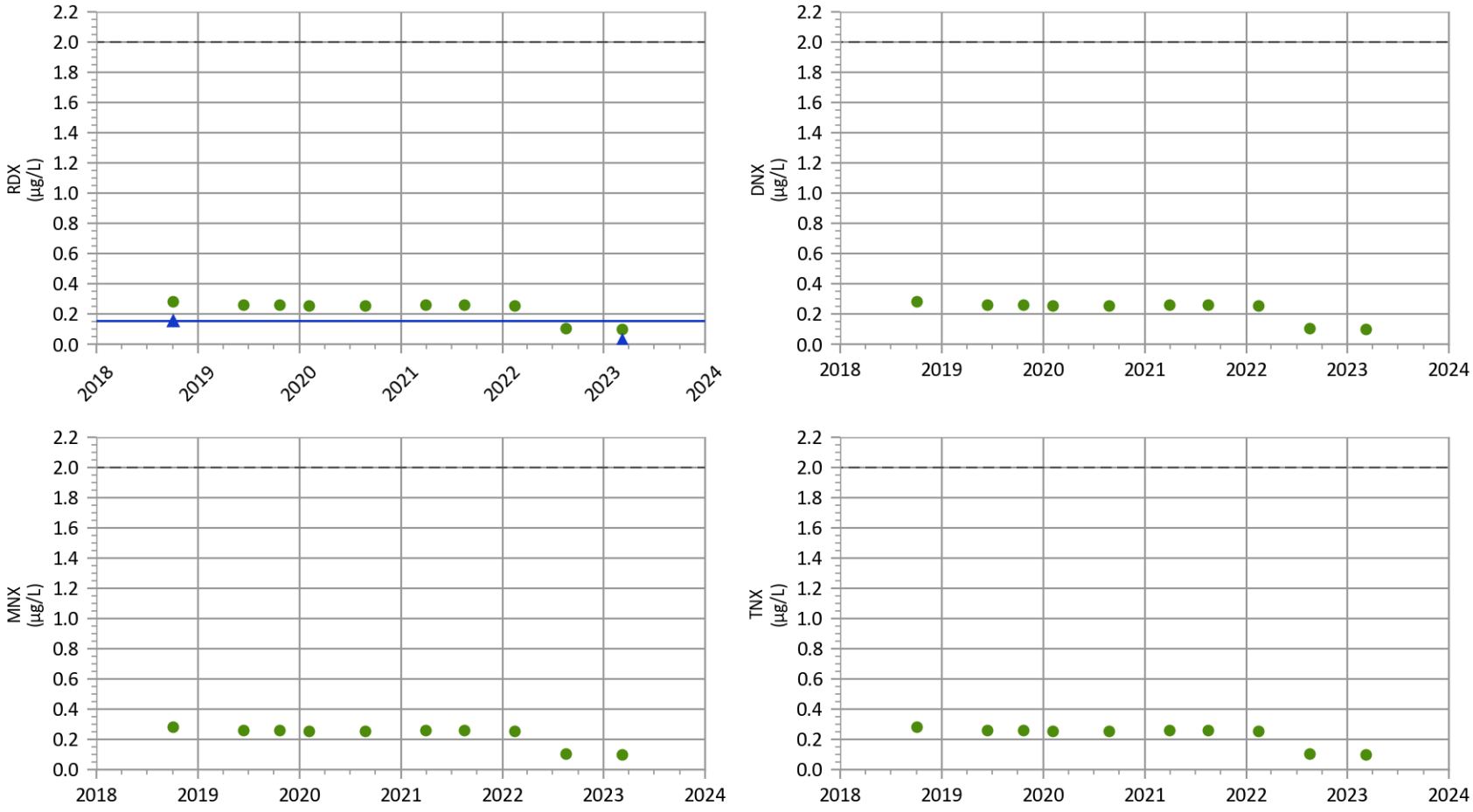
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

Measured Value
Sample Detection Limit
Concentration Trend
Injection Dates

Well Location

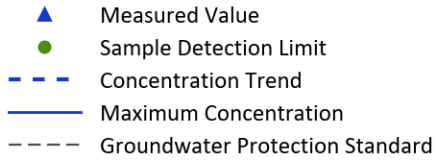


PTX06-1194 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant

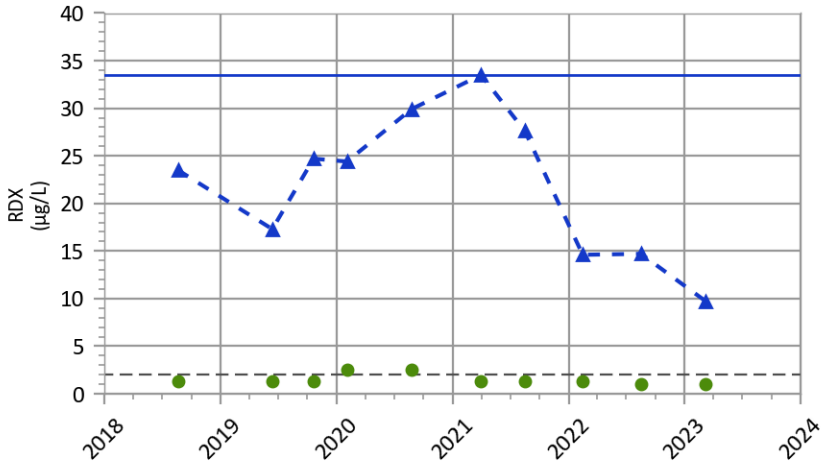


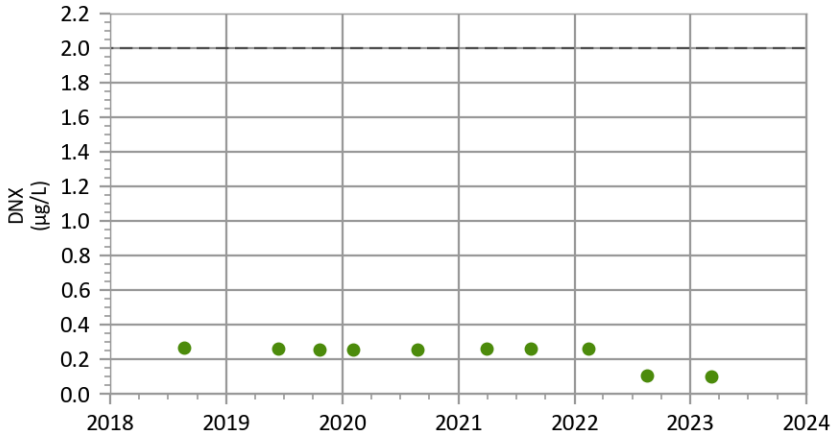
Most Recent Measured COC Concentrations (Mar 08, 2023)

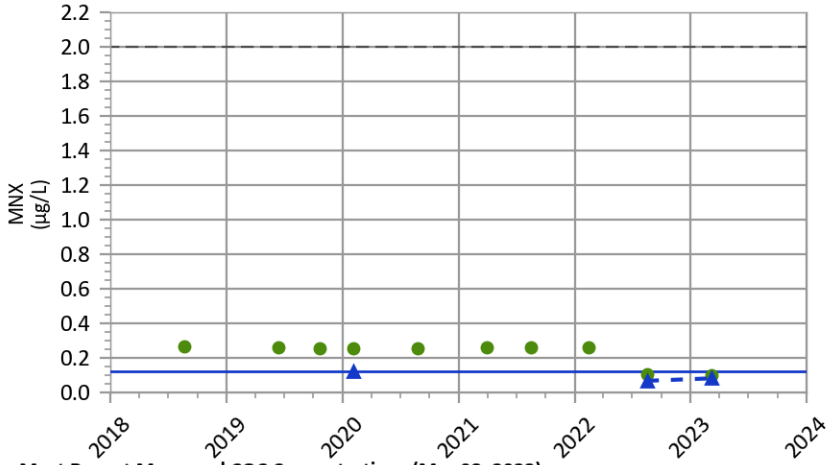
COC	Concentration (µg/L)	GWPS (µg/L)
RDX	0.0285	2.0
MNX	Non-Detect	2.0
DNX	Non-Detect	2.0
TNX	Non-Detect	2.0

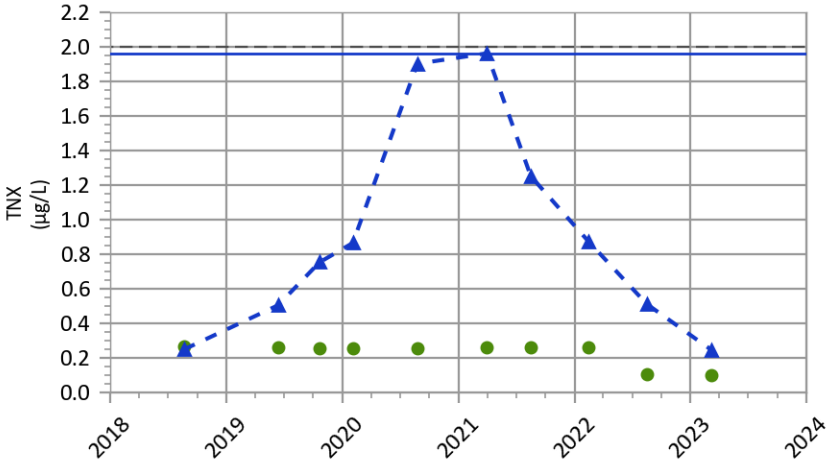


PTX06-1196 Downgradient Performance Indicators
Southeast Ext In Situ Bioremediation System
USDOE/NNSA Pantex Plant



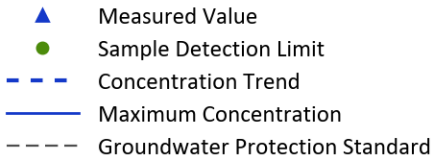


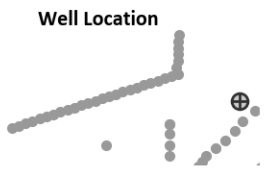




Most Recent Measured COC Concentrations (Mar 08, 2023)

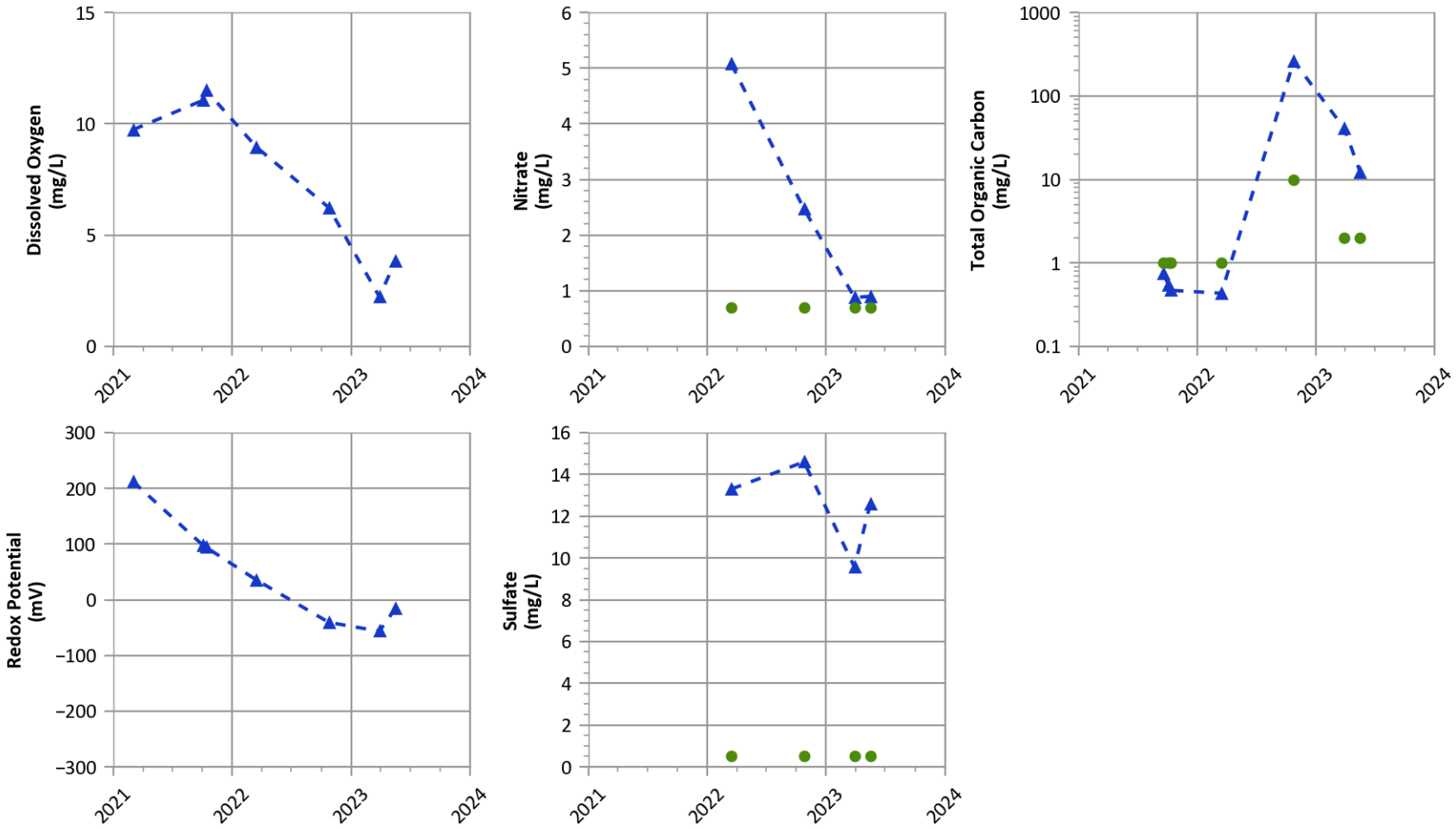
COC	Concentration (µg/L)	GWPS (µg/L)
RDX	9.72	2.0
MNX	0.0815	2.0
DNX	Non-Detect	2.0
TNX	0.245	2.0





Offsite ISB

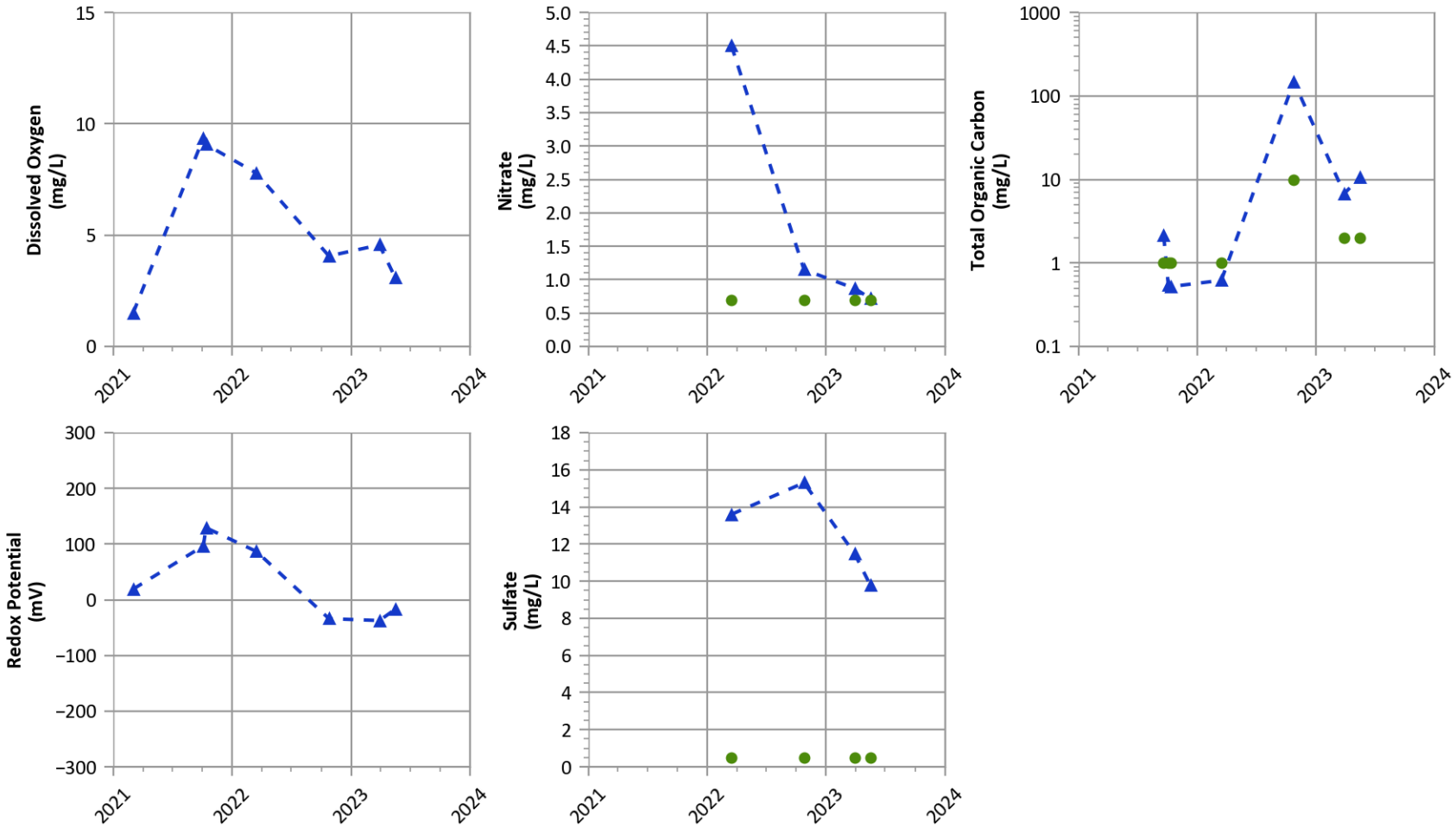
PTX06-REC402 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

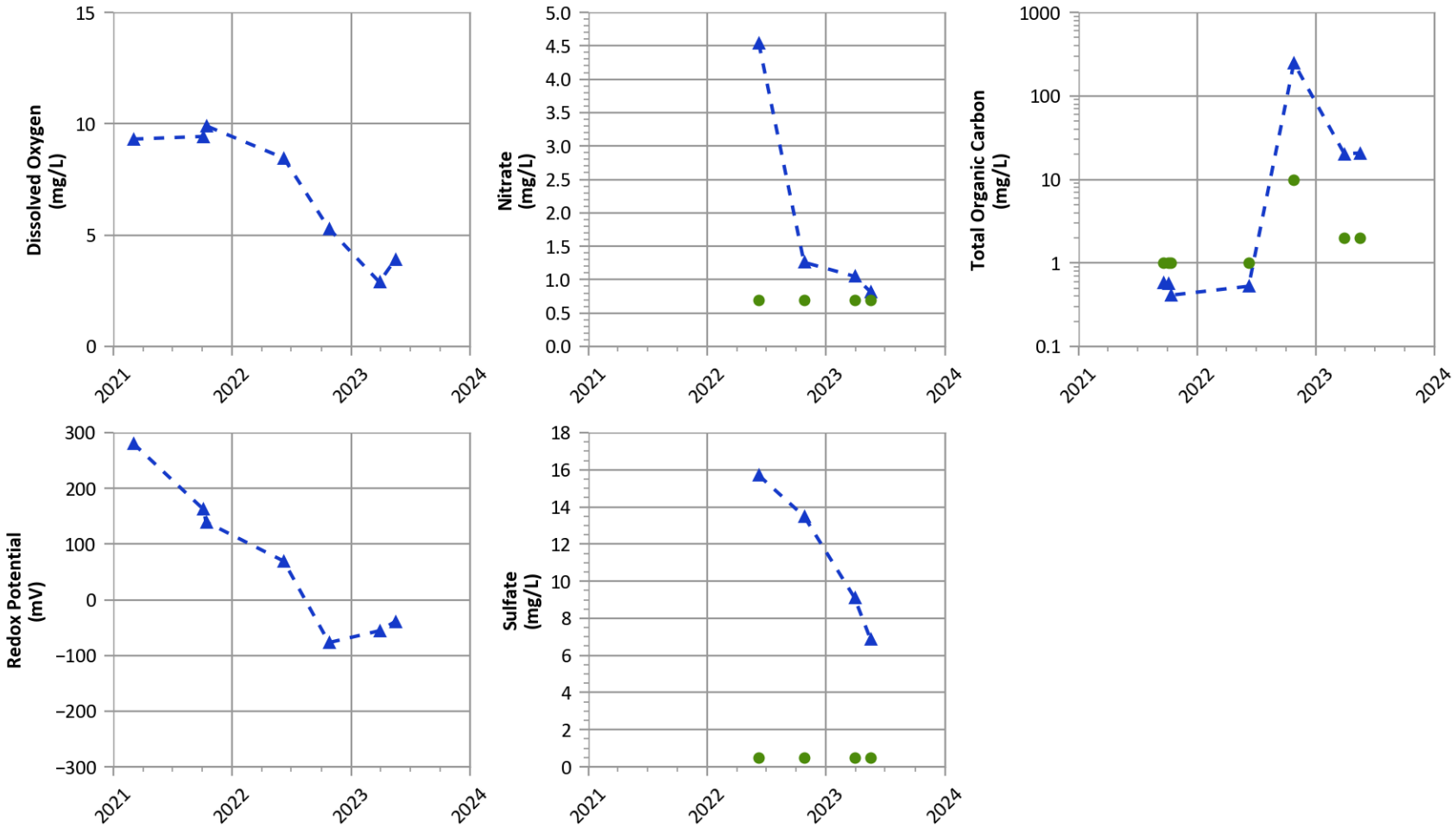
▲ Measured Value
● Sample Detection Limit
– – – Concentration Trend

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

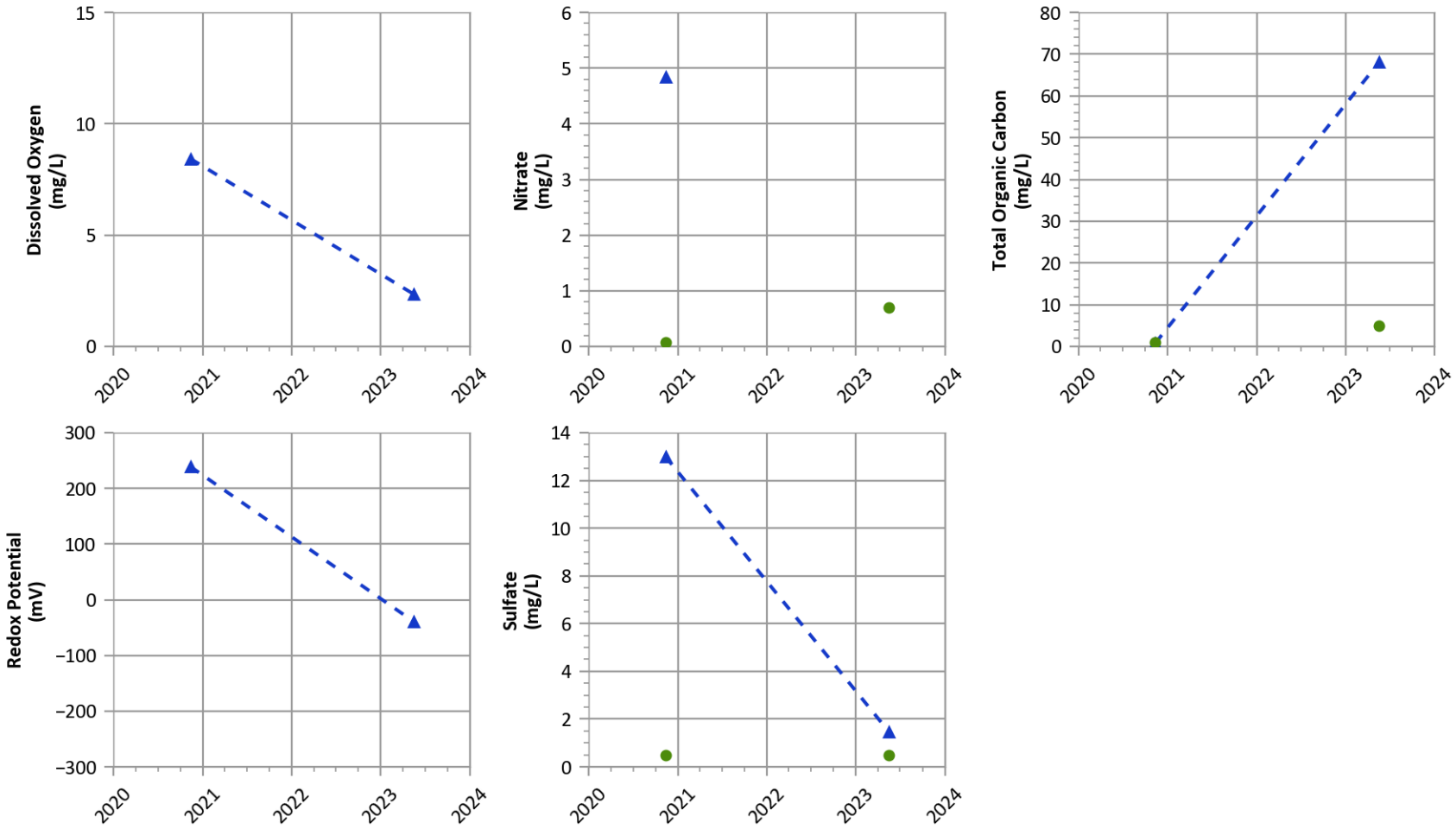
PTX06-REC404 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

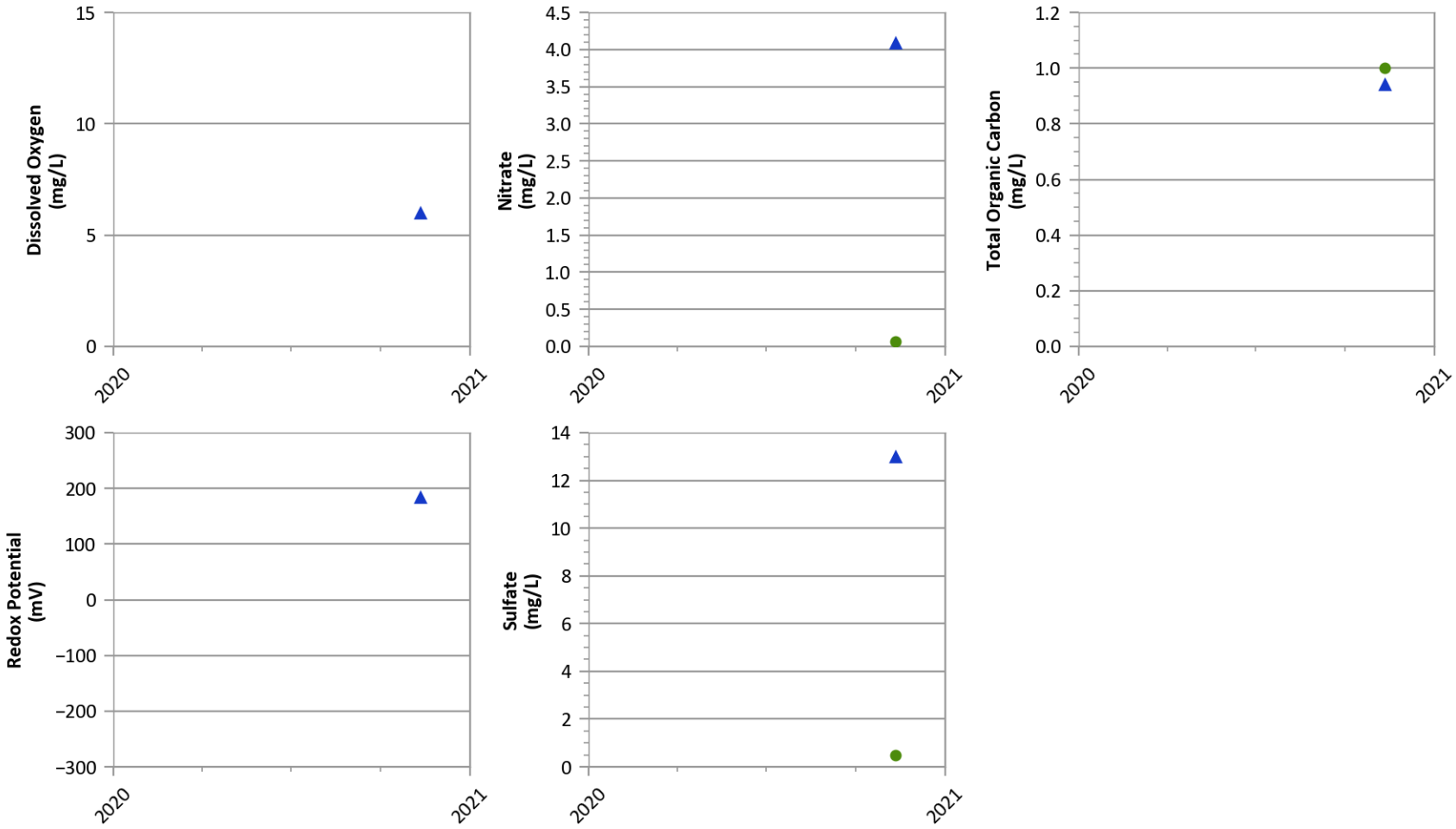
▲ Measured Value
● Sample Detection Limit
– – – Concentration Trend

PTX06-REC407 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

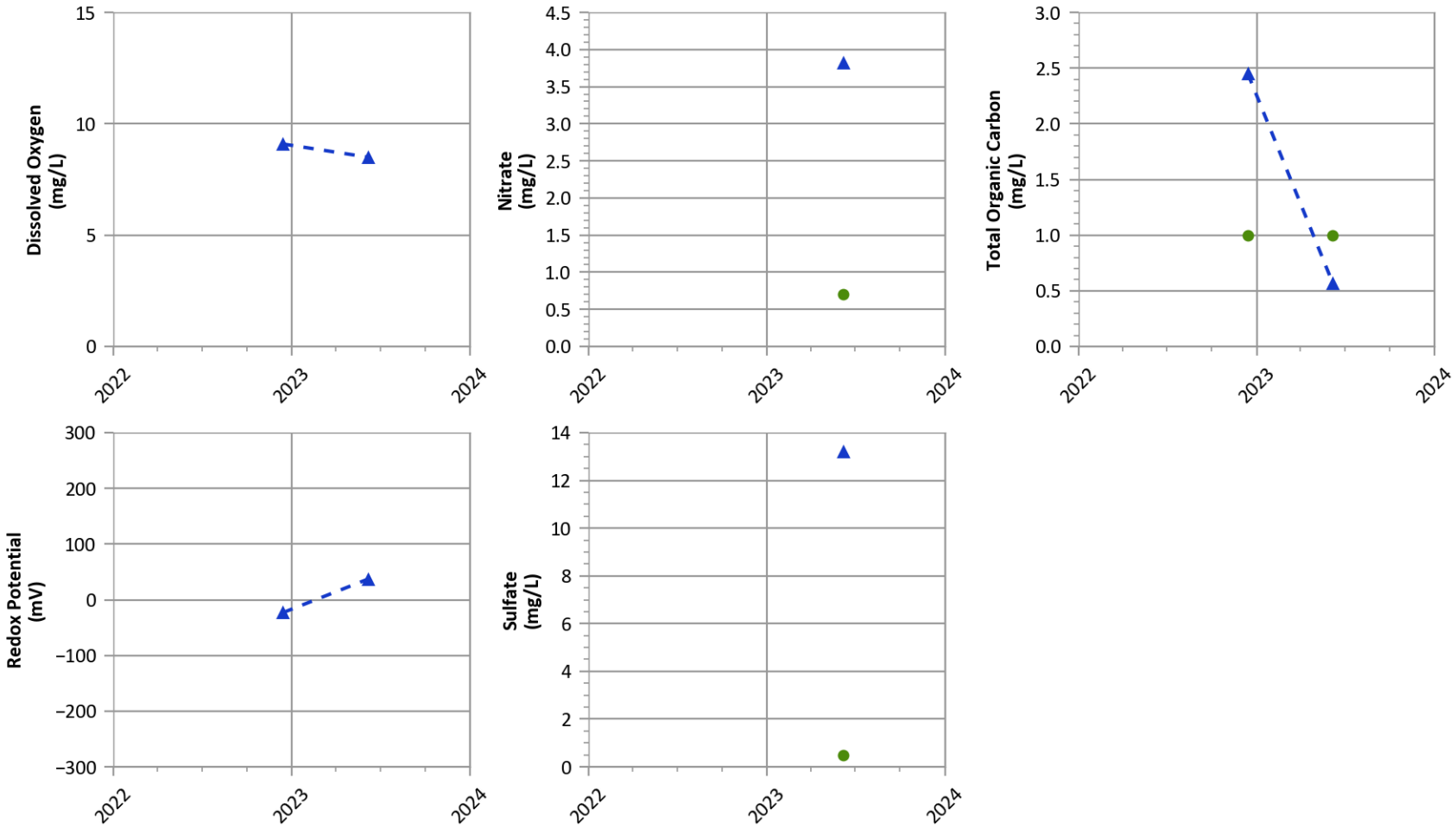
PTX06-REC411 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



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

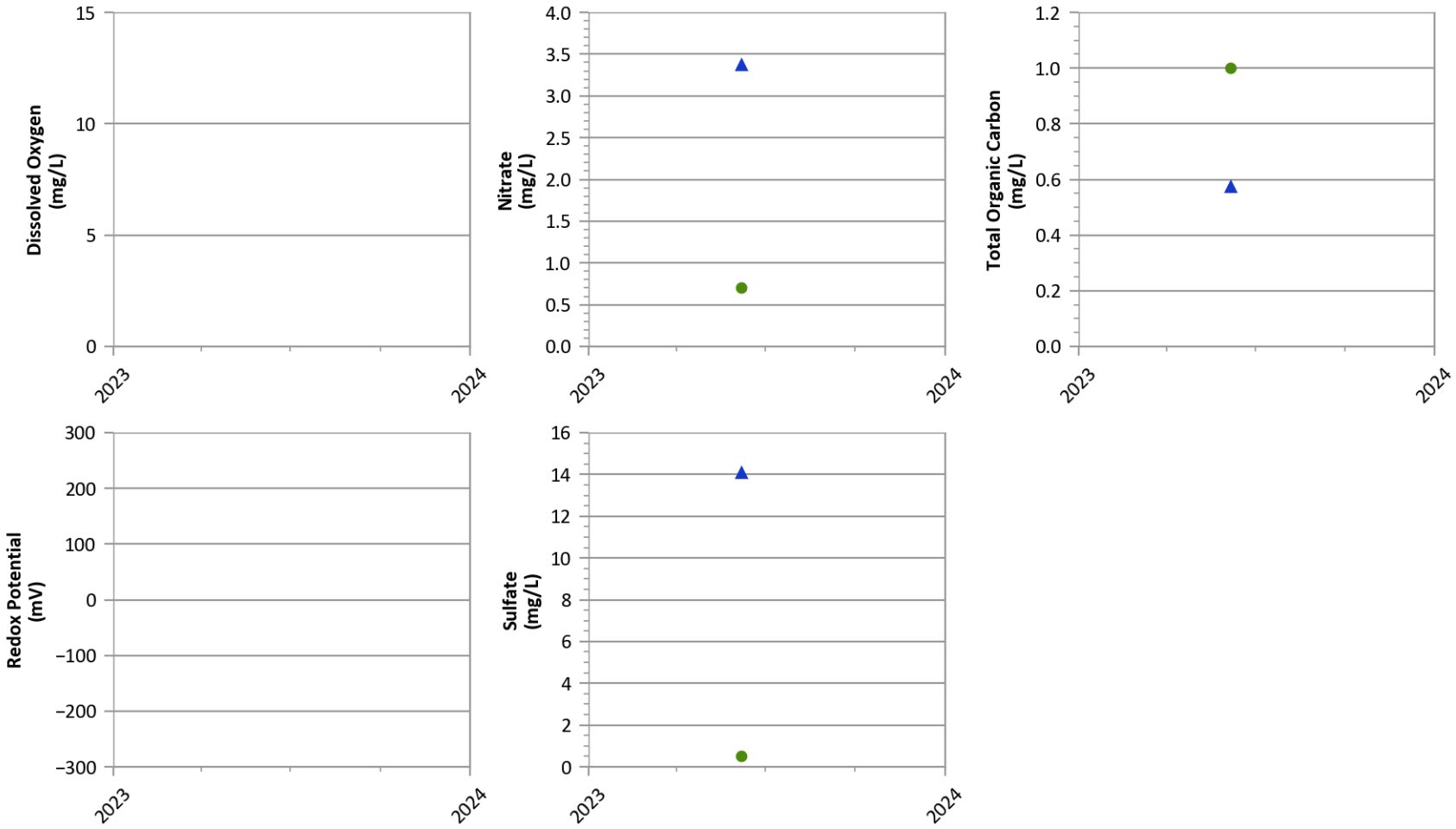
▲ Measured Value
● Sample Detection Limit
– – – Concentration Trend

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



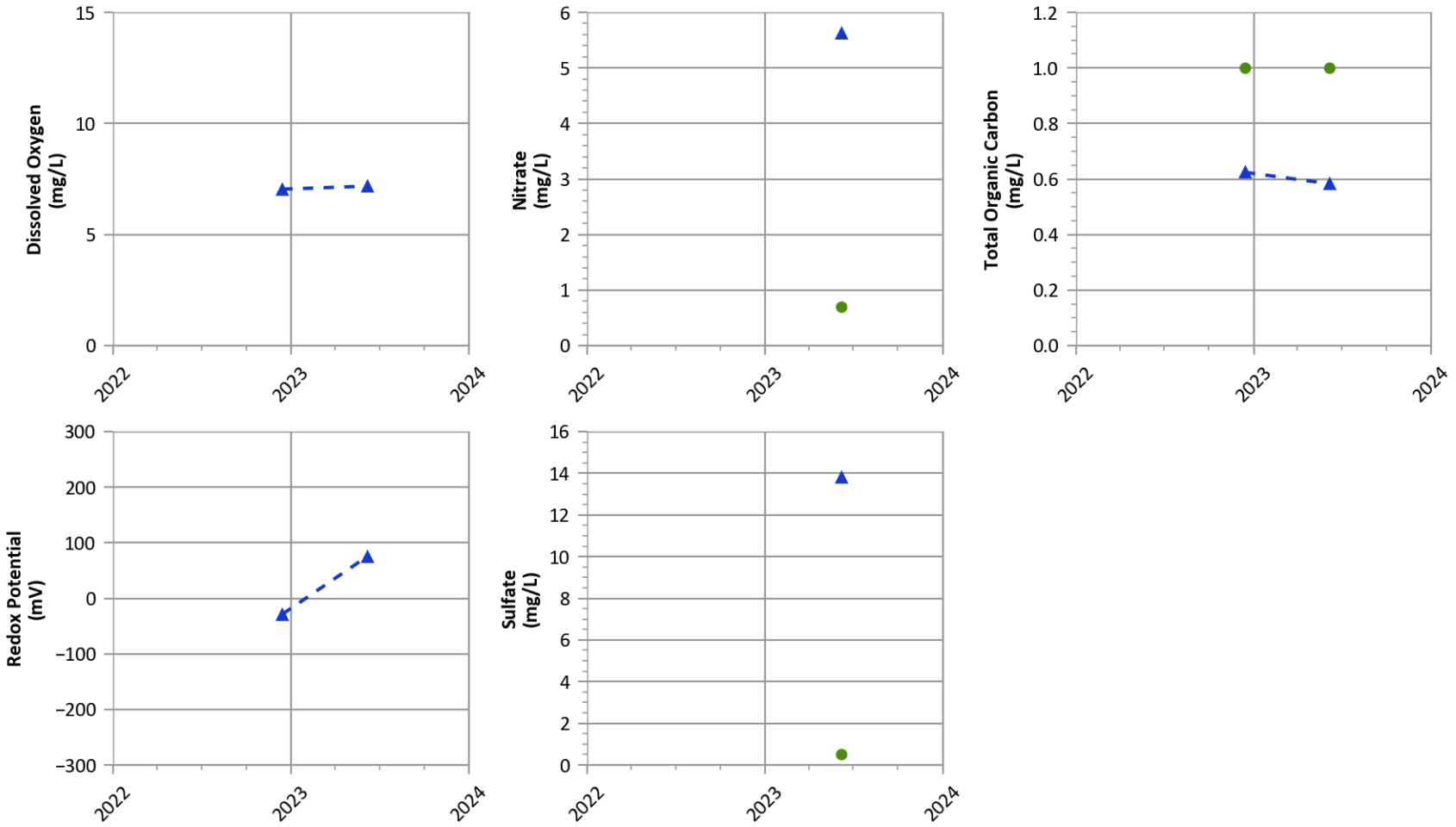
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

PTX06-REC419 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



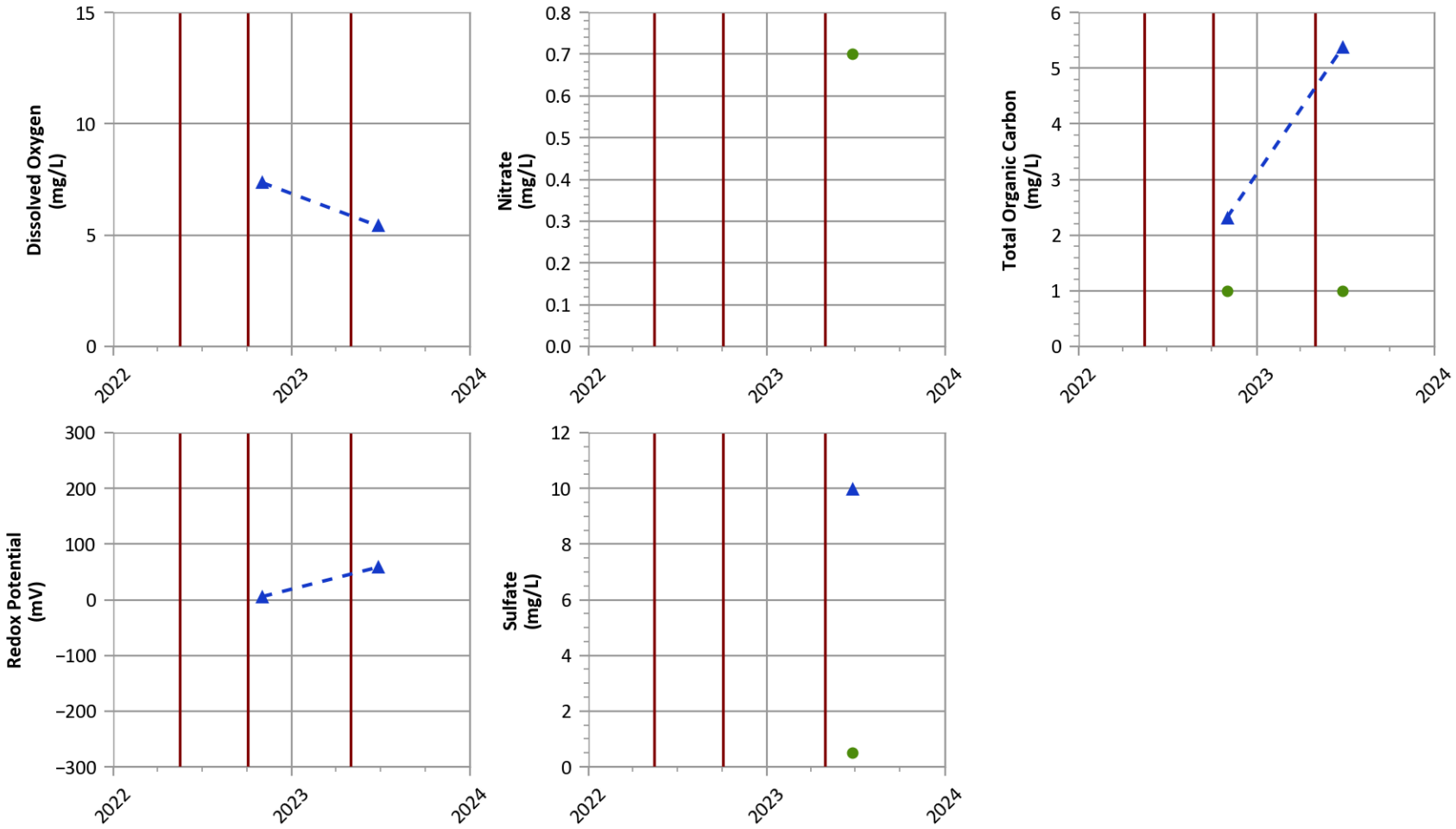
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

PTX06-REC422 Treatment Zone Performance Indicators
USDOE/NNSA Pantex Plant



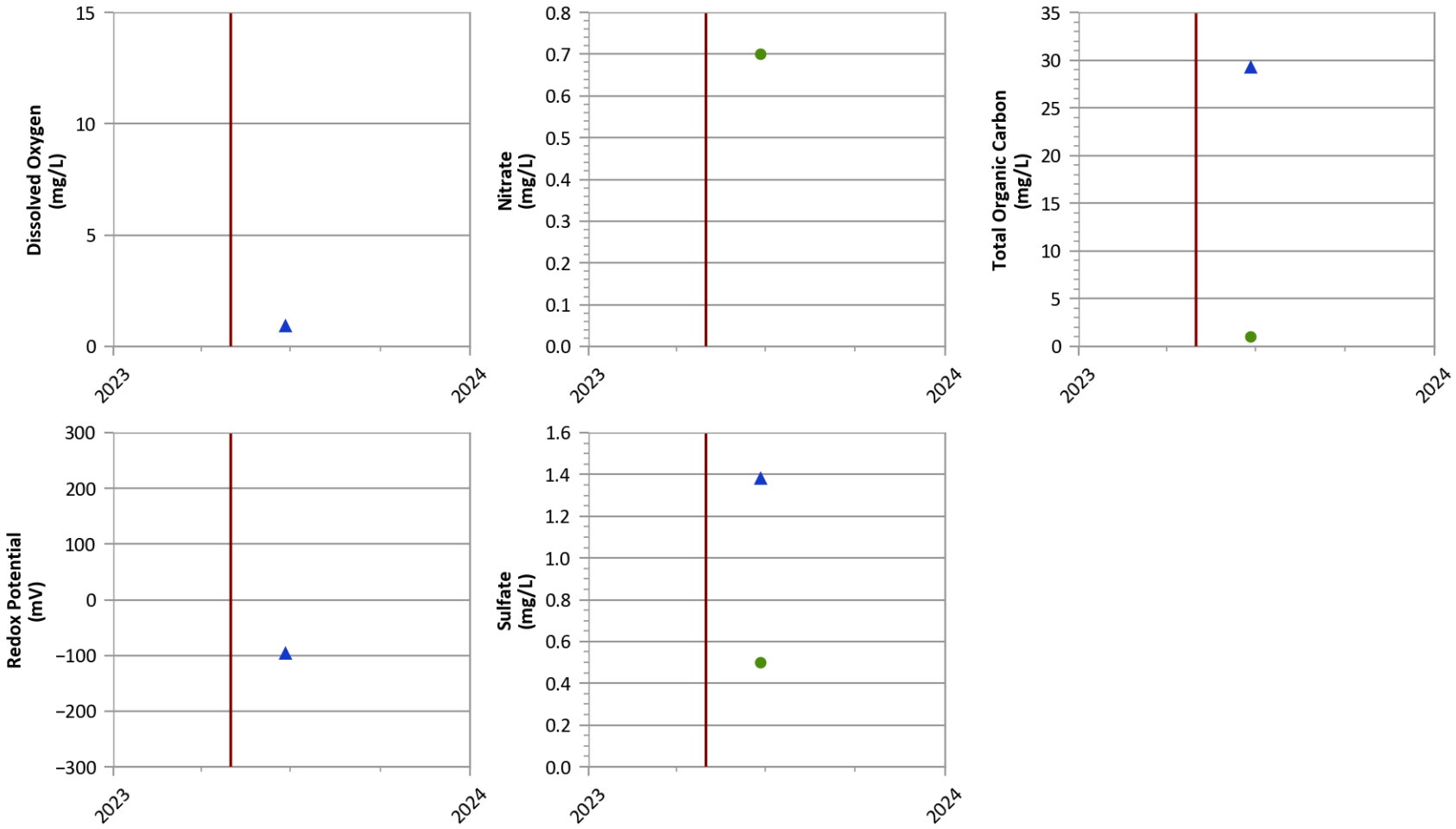
Typical Baseline Concentrations in Perched Groundwater
Dissolved Oxygen: 5-10 mg/L
Redox Potential: > 100 mV
Nitrate: > 1 mg/L
Sulfate: > 10 mg/L
Total Organic Carbon: < 5 mg/L
Total Volatile Fatty Acids: Not Detected

PTX06-1218 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

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