Savannah River NUCLEAR SOLUTIONS℠
FLUOR • NEWPORT NEWS NUCLEAR • HONEYWELL

2021 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (U)

SEMS NUMBERS: 21, 29

SRNS-RP-2022-00627

Revision 0

August 2022

SAVANNAH RIVER SITE • AIKEN, SOUTH CAROLINA

DISCLAIMER

This document was prepared in conjunction with work accomplished under Contract No. DE-AC09-08SR22470 with the U.S. Department of Energy.

This work was prepared under an agreement with and funded by the U.S. Government. Neither the U.S. Government or its employees, nor any of its contractors, subcontractors or their employees, makes any express or implied: 1. warranty or assumes any legal liability for the accuracy, completeness, or for the use or results of such use of any information, product, or process disclosed; or 2. representation that such use or results of such use would not infringe privately owned rights; or 3. endorsement or recommendation of any specifically identified commercial product, process, or service. Any views and opinions of authors expressed in this work do not necessarily state or reflect those of the United States Government, or its contractors, or subcontractors.

Printed in the United States of America
Prepared for
U.S. Department of Energy
And
Savannah River Nuclear Solutions, LLC
Aiken, South Carolina

EXECUTIVE SUMMARY

The *2020 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report* has been prepared to support the regulatory reporting requirements for the TNX Area Groundwater (TNX) Operable Unit (OU) at the Savannah River Site. The reporting requirements are specified in the *TNX Effectiveness Monitoring Strategy Addendum to the TNX Groundwater Operable Unit Remedial Design Report/Remedial Action Work Plan* (U) (WSRC 1995, Revision 1.5, Attachment 17). In accordance with the Effectiveness Monitoring Strategy, an annual report must be submitted on or before August 31, 2022, to document groundwater conditions and evaluate remedial action effectiveness based on data collected during the second and fourth quarter, calendar year 2021.

Past operation processes within the TNX Area resulted in contamination of the vadose zone and groundwater. All potential sources of groundwater contamination were assessed and remediated as part of the TNX Area OU Record of Decision (WSRC 2003a) or the T-Area OU Record of Decision (WSRC 2005a).

Current Remedial Action

Remedial actions are currently implemented to address the chlorinated volatile organic compound contamination in the vadose zone with a soil vapor extraction system which started up in 2002, and edible oil treatment to target the groundwater which started as a treatability study in 2008.

The edible oil treatability study demonstrated the ability to decrease the contaminant mass and areal extent of the trichloroethylene plume in less time and at lower cost than the remedy selected in the TNX Area OU Record of Decision, and still be protective of the groundwater. The effectiveness of edible oil warranted a change in the remedy for TNX groundwater. An Explanation of Significant Difference was issued on June 12, 2013 (SRNS 2012a), with the following modifications to the remedy selected in the Record of Decision for the TNX Area OU groundwater component:

- Injection of additional edible oil treatment as needed using the existing well network if a sustained rebound lasting over one (1) year in excess of 75 µg/L of trichloroethylene, tetrachloroethylene, or carbon tetrachloride occurs in any well. If the rebound occurs, then additional edible oil will be determined appropriate by the United States Department of

Energy, South Carolina Department of Health and Environmental Control, and the United States Environmental Protection Agency.

- Permanent removal of the T-1 Air Stripper from service. The T-1 Air Stripper was closed in accordance with a state approved closure plan.

In 2015, although the rebound conditions to trigger additional oil injections had not been exceeded, additional edible oil was injected at ten monitoring wells to prevent future rebound of trichloroethylene concentrations. Emulsified Oil Substrate® was reinjected into the original treatment zone and both neat oil and Emulsified Oil Substrate® were injected outside of the original treatment zone to target monitoring wells with elevated trichloroethylene concentrations.

Results collected since the 2015 edible oil injections indicate that injection fluids were placed into the aquifer successfully. Trichloroethylene concentrations are less than the maximum contamination level at most wells in the treatment area, and reductive conditions are present in the treatment area. During the second quarter 2021, trichloroethylene concentrations exceeding the maximum concentration level at two monitoring wells (i.e., TRW 2 and TVM 1M). During the fourth quarter 2021, trichloroethylene concentrations exceeded the maximum concentration level at TNX 28D, TRW 2, and TVM 1M.

Soil vapor extraction continues to remove mass from the vadose zone near the TNX Burying Ground. However, the total annual pounds of solvent removed from the MicroBlowers™ have decreased with time with approximately one pound of solvent removed per year during the last five years. The five MicroBlowers™ removed less than one pound of solvent during 2021.

The remedial actions (i.e., edible oil and soil vapor extraction) continue to provide effective treatment and source reduction of the groundwater at TNX Area OU. Trichloroethylene, tetrachloroethylene, or carbon tetrachloride concentrations did not exceed the rebound conditions to trigger additional oil injections during 2021. Future sampling events will continue to determine the longevity of the edible oil treatment and resulting volatile organic compound concentrations.

Groundwater Monitoring

The TNX groundwater monitoring program includes sampling a network of 43 monitoring wells (Figure ES-1) during the second and fourth quarters of each calendar year.

Six parameters (i.e., 1,4-dioxane, cis-1,2-dichloroethylene, trichloroethylene, uranium [total recoverable], combined radium, and adjusted gross alpha) exceeded maximum contaminant levels during 2021. The primary trichloroethylene groundwater plume is located downgradient of the TNX Burial Ground source area (Figure ES-2). The trichloroethylene plume and source has been significantly reduced in the treatment area in response to the injection of edible oil (Figure ES-3). 1,4-Dioxane was analyzed at all monitoring wells during the second and fourth quarter 2021 using two analytical methods (i.e., EPA 8260BSIM and EPA 522). 1,4-Dioxane was detected above the regional screening level for tap water (0.46 µg/L) in two monitoring wells (i.e., TBG 3 and TBG 5) in 2021. Cis-1,2-dichloroethylene concentrations exceeded the maximum contaminant level (70 µg/L) at TBG 5 and was elevated at TRW 4R and TVM 1M which is an indication that degradation of TCE is occurring. The distribution of uranium (total recoverable) was observed in the vicinity of the wetlands downgradient of the Old TNX Seepage Basin (i.e., TCM 5). Combined radium was observed at activities that exceeded the maximum contaminant level (5 ρCi/L) four monitoring wells (i.e., TIR 1M, TIR 1U, TNX 5D, and TNX 8D). Adjusted gross alpha was detected at TNX 72D with an activity that exceeded the maximum contaminant level (15 ρCi/L). There is not a discernible and consistent groundwater plume with respect to cis-1,2-dichloroethylene, combined radium, adjusted gross alpha, and uranium at TNX.

Recommendation

South Carolina Department of Health and Environmental Control recommended adding a new monitoring well between TNX 28D and the TNX 72 well cluster, based on the recent history of trichloroethylene concentrations exceeding the maximum concentration level at TNX 28D since 2016. The Savannah River Site agreed to evaluate the trichloroethylene concentrations at TNX 28D for three consecutive years (i.e., until 2019). Based on that evaluation, the Savannah River Site recommended the period of evaluation be extended to reporting year 2022 based on a series of trichloroethylene results that were less than the maximum contaminant level (5 µg/L) in 2018 and 2019. A meeting to discuss the need for and timing for the possible installation of a new monitoring well will be scheduled after the submittal of the *2022 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report*.

The Savannah River Site recommends performing an evaluation of the twenty SVE wells to determine the future operational status of the five MicroBlowers™. Details of the evaluation were

presented on May 26, 2022 during a meeting with the United States Department of Energy, South Carolina Department of Health and Environmental Control, and the United States Environmental Protection Agency. A detailed summary of the proposal is provided in Appendix F of this report.

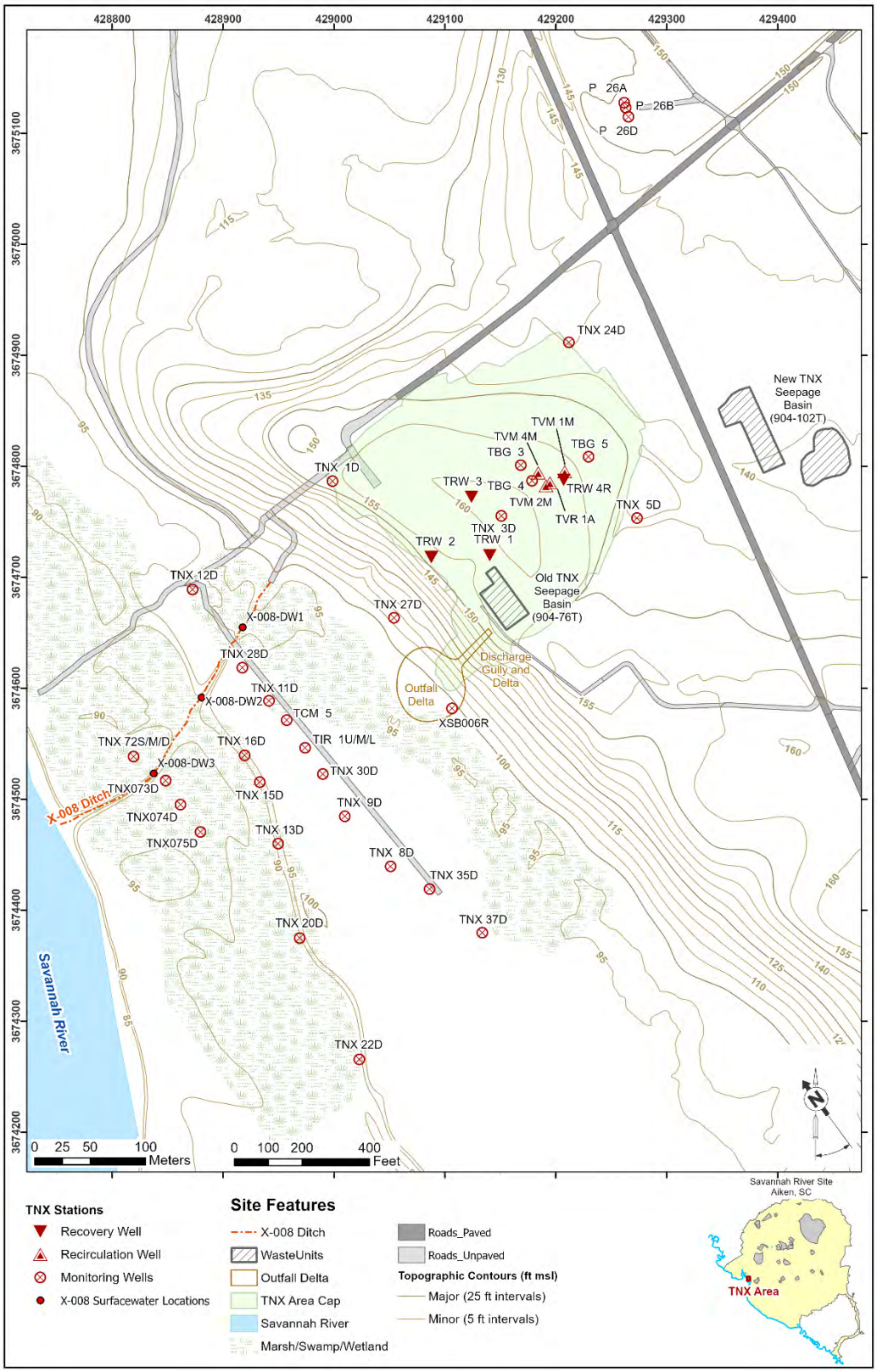


Figure ES-1. TNX Area Well Locations

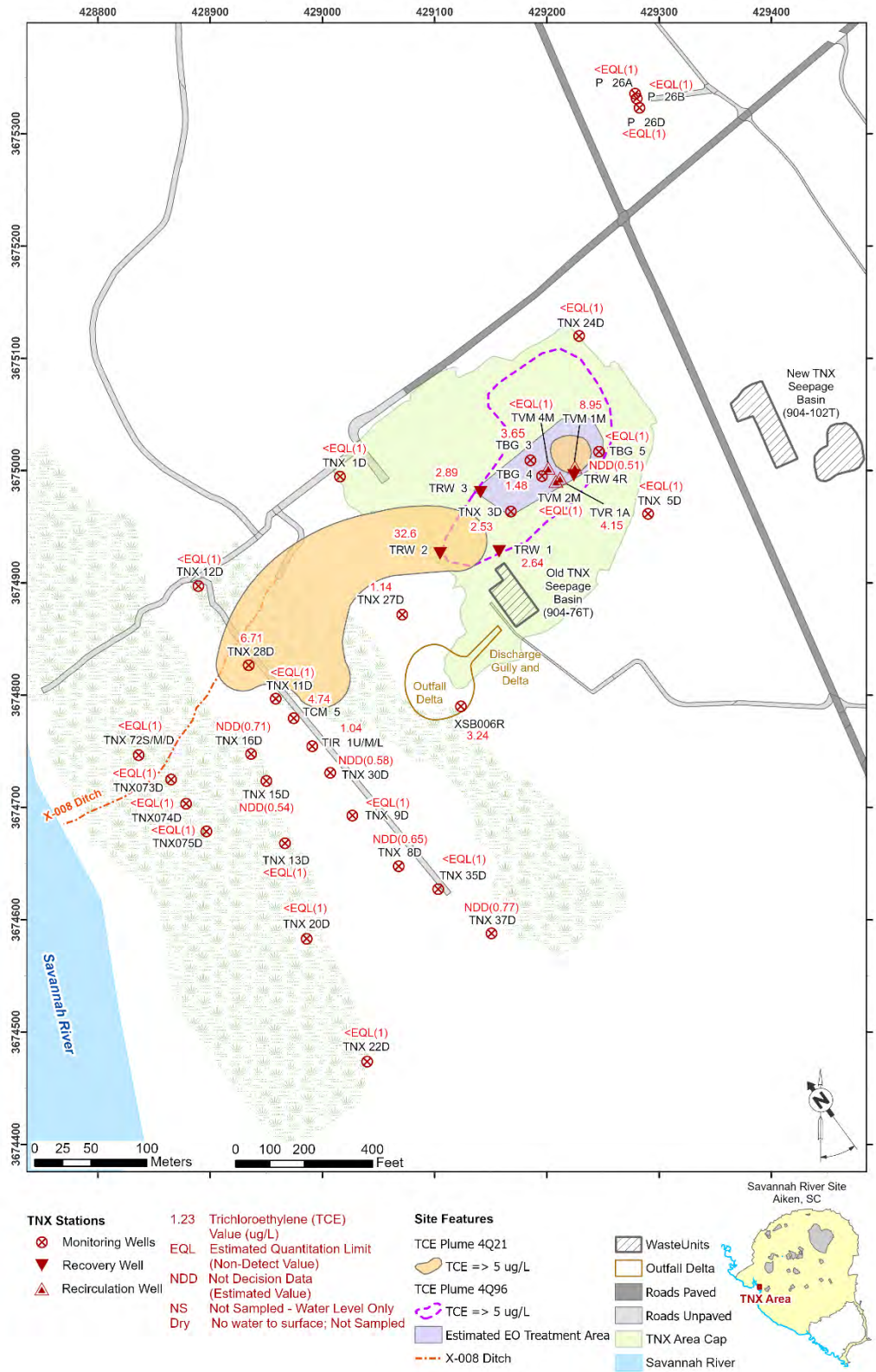


Figure ES-2. TNX Area Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021 with >500 µg/L TCE Plume from 4Q1996 Superimposed

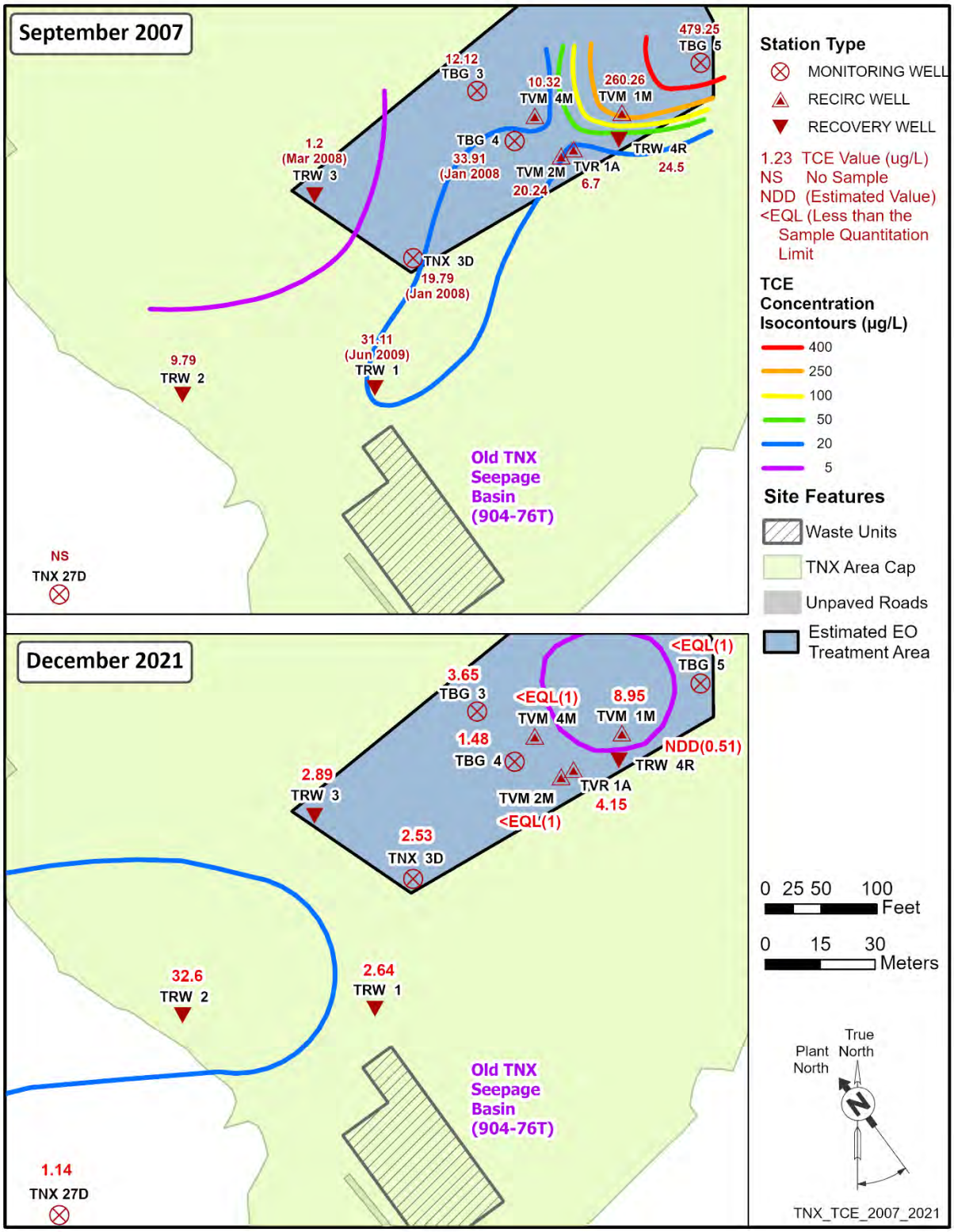


Figure ES-3. Comparison of Trichloroethylene Concentration in the Treatment Zone in 2007 and 2021

This page intentionally left blank.

TABLE OF CONTENTS

Section **Page No.**

EXECUTIVE SUMMARY ES-1
LIST OF FIGURES ii
LIST OF TABLES iii
LIST OF APPENDICES iv
LIST OF ABBREVIATIONS AND ACRONYMS v
1.0 Introduction 1
1.1 Purpose 1
1.2 Unit History/Description 1
1.3 Regulatory and Operational History 3
2.0 Site Hydrogeology 6
3.0 Remedial Action 8
3.1 Objectives 9
3.2 Soil Vapor Extraction 9
3.3 Edible Oil Treatment 10
3.4 Recovery Well/Air Stripper System 12
3.5 Radiologically Contaminated Groundwater 12
4.0 Monitoring Network 17
4.1 Sampling Events 18
5.0 Field and Analytical Results 23
5.1 Precipitation Measurements 23
5.2 Water-Level Measurements 23
5.3 pH 24
5.4 Analytical Results 24
6.0 Evaluation of Field and Analytical Results 36
6.1 Potentiometric Surface 36
6.2 pH 37
6.3 VOC Constituents (i.e., PCE, TCE, Cis-1,2-DCE, VC, Ethylene, and CCl_4) 38
6.4 Edible Oil Parameters 41
6.5 Uranium, Combined Radium, and Adjusted Gross Alpha 44
6.6 NO_3/NO_2 as N and Mercury 47
6.7 1,4-Dioxane 48
7.0 System Performance 50
7.1 Soil Vapor Extraction (SVE) Operations 50
7.2 Edible Oil Injections 50
8.0 Summary/Recommendations 59

8.1 Summary 59
8.2 Recommendations 60
9.0 References 61

LIST OF FIGURES

Figure **Page No.**
Figure ES-1. TNX Area Well Locations ES-5
Figure ES-2. TNX Area Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021 with >500 µg/L TCE Plume from 4Q1996 Superimposed ES-6
Figure ES-3. Comparison of Trichloroethylene Concentration in the Treatment Zone in 2007 and 2021 ..... ES-7
Figure A-1. Location of the TNX Area at the Savannah River A-3
Figure A-2. Location of TNX Area Interim Remedial Action / Effectiveness Monitoring Strategy Well System during Startup and Initial Operations A-5
Figure A-3. TNX Area Cross Section Location Plan A-7
Figure A-4. TNX Area Cross Section A-A' A-9
Figure A-5. TNX Area Cross Section B-B' A-10
Figure A-6. Plan View of the TNX Area OU Showing Particle Starting Locations and Path Lines Towards the X-008 Ditch and the Savannah River A-11
Figure A-7. Cross-sectional View along Section A-A' Showing the Vertical Locations and Particle Path Lines A-12
Figure A-8. Schematic Cross Section of TNX Operable Units and Remedial Actions A-143
Figure A-9. Location of TNX Area SVE Monitoring Well System A-14
Figure A-10. Location of Edible Oil Injection Wells (2008 and 2010 Injections) A-145
Figure A-11. Location of Edible Oil Injection Wells (2015 Injection) A-1616
Figure A-12. TNX Area Well Locations A-17
Figure A-13. TNX Area Water Table Elevation 4Q2021 ..... A-18
Figure A-14. TNX Area Field pH of Groundwater, 4Q2021 ..... A-19
Figure A-15. TNX Area Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021 with >500 µg/L TCE Plume from 4Q1996 Superimposed A-20
Figure A-16. TNX Area Cross Section A-A' Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021 ..... A-21
Figure A-17. TNX Area Cross Section B-B' Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021 ..... A-22
Figure A-18. TNX Area Cis-1,2-Dichloroethylene Concentration in Groundwater, 4Q2021 ..... A-23
Figure A-19. TNX Area Adjusted Gross Alpha Activity in Groundwater, 4Q2021 ..... A-24
Figure A-20. TNX Area Uranium, Total Recoverable Concentration in Groundwater, 4Q2021 ..... A-25
Figure A-21. TNX Area Combined Ra-226/228 Activity in Groundwater, 4Q2021 ..... A-26
Figure A-22. TNX Area Mercury, Total Recoverable Concentration in Groundwater, 4Q2021 ..... A-27

Figure A-23. **TNX Area Nitrate-Nitrite as Nitrogen Concentration in Groundwater 4Q2021** **A-28**
Figure A-24. **TNX Area 1,4-Dioxane Concentration in Groundwater, 4Q2021** **A-29**
Figure A-25. **Comparison of TCE Concentration and Water Elevation at TBG 3** **A-31**
Figure A-27. **Average TCE Concentrations of Monitoring Wells in the Treatment Zone and the Distal Plume** **A-32**
Figure A-28. **Graphical Relationship of pH and Water Elevation at TBG 3** **A-33**
Figure A-29. **Graphical Relationship of Nitrate/Nitrite as Nitrogen Concentration and Water Elevation at TBG 3** **A-34**
Figure A-30. **Uranium Isotope Mass compared to Total Uranium Mass** **A-35**
Figure A-31. **Estimate of TCE Mass Reduction since Edible Oil Injections** **A-36**
Figure A-32. **Comparison of Dissolved Oxygen Concentration in the Treatment Zone in 2007 and 2021** **A-37**
Figure A-33. **Comparison of Total Organic Carbon Concentration in the Treatment Zone in 2008 and 2021** **A-38**
Figure A-34. **Comparison of Oxidation Reduction Potential Concentration in the Treatment Zone in 2007 and 2021** **A-39**
Figure A-35. **Comparison of Sulfate Concentration in the Treatment Zone in 2007 and 2021** **A-40**
Figure A-36. **Comparison of Methane Concentration in the Treatment Zone in 2008 and 2021** **A-41**
Figure A-37. **Comparison of Nitrate Concentration in the Treatment Zone in 2007 and 2021** **A-42**
Figure A-38. **Comparison of Trichloroethylene Concentration in the Treatment Zone in 2007 and 2021** **A-43**
Figure A-39. **Comparison of Cis-1,2-Dichloroethylene Concentration in the Treatment Zone in 2007 and 2021** **A-44**
Figure A-40. **Comparison of Vinyl Chloride Concentration in the Treatment Zone in 2010 and 2021** **A-45**
Figure A-41. **Comparison of Ethylene Concentration in the Treatment Zone in 2008 and 2021** **A-46**
Figure F-1. **TNX SVE Well Network** A-13
Figure F-2. **Annual SVE Mass Removal History at the TNX Area OU.** A-14
Figure F-3. **Location of the High Frequency Sampling Well Groups.** A-15

LIST OF TABLES

Table **Page No.**
Table 3–1. **Injection Well Elevations and Injection Volumes** **15**
Table 4–1. **TNX Monitoring Well Network** **21**
Table 4–2. **Summary of the Groundwater Sampling and Analyses Plan at TNX (2nd and 4th Quarters)** **22**
Table 5–1. **Rainfall (inches) at 400-D, 1973 to 2021** **33**
Table 5–1. **Rainfall (inches) at 400-D, 1973 to 2021 (*Continued/Ended*)** **34**
Table 5–2. **Constituents Exceeding USEPA NPDWS MCLs in T-Area Wells During 2021** **35**

Table 7–1. Well Construction and Operation for TNX SVE Wells 53
Table 7–2. Monthly SVE Well VOC Mass Removal (2021).....55
Table 7–3. VOC Mass Removed by SVE (2021) 57
Table F–1. List of VOCs Analyzed during the SVE Evaluation.....F-10
Table F–2. High Frequency Sampling Well Groups.....F-11
Table F–3. Proposed Schedule of SVE Evaluation Activities F-12

LIST OF APPENDICES

Appendix **Page No.**
Appendix A Figures..... A-1
Appendix B Groundwater Monitoring Results (Matrix Tables) B-1
Appendix C Data Review Key C-1
Appendix D Hydrographs..... D-1
Appendix E Time-Series Plots.....E-1
Appendix F Proposal to Evaluate the Soil Vapor Extraction Wells at the TNX Operable Unit.....F-1

LIST OF ABBREVIATIONS AND ACRONYMS

amsl	above mean sea level
CCl_4	carbon tetrachloride
CERCLA	Comprehensive Environmental Response, Compensation And Liability Act
cfm	cubic feet per minute
cm	centimeter
DG	Discharge Gully
DO	dissolved oxygen
DWPF	Defense Waste Processing Facility
EO	edible oil
EOS®	Emulsified Oil Substrate®
EQL	estimated quantitation limit
ESD	Explanation of Significant Difference
ft	feet
gal	gallon
GAU	Gordon aquifer unit
GCU	Gordon confining unit
gpm	gallons per minute
HGCA	Hybrid Groundwater Corrective Action
in	inch
IROD	Interim Record of Decision
km	kilometer
LAZ	Lower Aquifer Zone
lb	pound
MCL	maximum contaminant level
µg/L	micrograms per liter
m	meter
m^3	cubic meter
mV	millivolt
NTSB	New TNX Seepage Basin
ORP	oxidation reduction potential
OTSB	Old TNX Seepage Basin

LIST OF ABBREVIATIONS AND ACRONYMS *(Continued/End)*

OU	Operable Unit
PCE	tetrachloroethylene
pCi/g	picocuries per gram
pCi/L	picocuries per liter
ppb	parts per billion
Q	quarter
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSL	regional screening level
SCDHEC	South Carolina Department of Health and Environmental Control
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SVE	Soil Vapor Extraction
TAOU	T-Area Operable Unit
TBG	TNX Burying Ground
TCE	trichloroethylene
TNX OD	TNX Outfall Delta
TOC	total organic carbon
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
UTRAU	Upper Three Runs aquifer unit
VC	vinyl chloride
VFA	volatile fatty acid
VOC	volatile organic compound
WSRC	Westinghouse Savannah River Company (prior to 2005)
WSRC	Washington Savannah River Company, LLC (post 2005)

1.0 INTRODUCTION

1.1 Purpose

This 2021 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report[i] was prepared to support the regulatory reporting requirements for the TNX Area Operable Unit (OU) at the Savannah River Site (SRS), and provide interim results from the edible oil (EO) remedial action deployed in 2015. The reporting requirements are specified in the *TNX Effectiveness Monitoring Strategy Addendum to the TNX Groundwater Operable Unit Remedial Design Report/Remedial Action Work Plan (U)* (WSRC 1999a). In accordance with the TNX Area Effectiveness Monitoring Strategy, an annual report is required to be submitted each year (i.e., current agreement by August 31st) to document groundwater conditions and to evaluate the remedial action effectiveness based on data collected during the second and fourth quarters of the previous calendar year.

1.2 Unit History/Description

The TNX Area is in the southwest portion of the SRS, approximately 0.4 km (0.25 mi) east of the Savannah River (Figure A-1). The TNX Area was a pilot-scale testing and evaluation facility that supported nuclear fuel, target manufacturing chemical process, and the Defense Waste Processing Facility (DWPF). Past operations processes within the TNX Area resulted in contamination of the vadose zone and groundwater. Sources of groundwater contamination included seepage from unlined basins (Old TNX Seepage Basin [OTSB] and New TNX Seepage Basin [NTSB]), the TNX Burying Ground (TBG), leakage from the process sewers, and leachate from other sources at TNX (e.g., temporary storage facility drums and an equipment staging area).

The TNX Area OU consists of four subunits: the TBG, the OTSB, the NTSB, and the TNX Groundwater beneath the surface units (Figure A-2).

[i] This report was formerly known as the Comprehensive TNX Area Annual Groundwater and Effectiveness Monitoring Strategy Report. The title was modified at a June 10, 2015 scoping meeting between the USDOE, USEPA, and SCDHEC to more accurately represent the contents of the report.

1.2.1 TNX Burying Ground (TBG)

The TBG was created in 1953 to dispose of debris that resulted from the explosion of an experimental separation process (Purex) in the TNX Area earlier that year. The separation process used nitric acid, organic solvents, and an evaporator to concentrate uranium. The debris included conduit, drums, tin, and structural steel contaminated with uranyl nitrate and depleted uranium. Between 1980 and 1984, most of the waste buried at the TBG was excavated and sent to the Radioactive Waste Burial Ground (643-7E). The remaining waste remains beneath the asphalt, building, and transformer pads. An estimated 27 kg (60 lbs) of uranyl nitrate are thought to remain buried at the TBG.

1.2.2 Old TNX Seepage Basin (OTSB)

The OTSB was an unlined excavation designed to contain wastewater until it could seep into the underlying sediments that were believed to act as a natural ion-exchange media. The OTSB received process wastewater between 1956 and 1980 from pilot-scale tests conducted in the TNX Area for the DWPF and the General Separations Area. The waste discharged to the basin included a number of chemicals ranging from inorganic salts and low-level radionuclides to organic solvents. Waste stream components of particular interest include natural thorium, uranyl nitrate, mercuric nitrate, several aluminum and ammonium compounds, and tributyl phosphate. During periods of high flow, the OTSB periodically overflowed downhill into the Savannah River floodplain adjacent to the TNX facility. In 1980, area wastewater was re-routed from the OTSB to the NTSB. During closure of the OTSB in 1981, the remaining liquid was drained to the nearby floodplain. As result of draining the remaining liquid and overflow events, erosion occurred in the hillside forming a Discharge Gully (DG).

1.2.3 New TNX Seepage Basin (NTSB)

The NTSB was an unlined excavation (constructed to replace the OTSB) that operated between 1980 and 1988. While in operation, the basin received waste from pilot-scale chemical processing tests for DWPF and chemical separation. The waste discharged to the basin included simulated, non-radioactive DWPF sludge; simulated, non-radioactive salt

supernate; glass frit; other processing chemicals; and laboratory sink wastewater. No hazardous waste was discharged to the basin. During periods of unusually high discharge, the seepage section of the basin overflowed to Outfall X-013A, located on the southeast corner of the NTSB, which in turn discharged to a local surface depression.

1.2.4 TNX Groundwater

Shallow groundwater beneath the TNX Area has been contaminated with chlorinated volatile organic compounds (VOCs), such as trichloroethylene (TCE), tetrachloroethylene (PCE), and carbon tetrachloride (CCl_4). All sources of groundwater contamination were assessed and remediated as part of the TNX Area OU Record of Decision (ROD) (WSRC 2003) or the T-Area OU (TAOU) ROD (WSRC 2005a). Specific remedial actions are listed in Section 1.3 of this document.

The TNX Groundwater consists of the groundwater beneath the TNX Area subunits described above and extending to the Savannah River. Groundwater at TNX is divided into two main aquifer systems, the Lower Aquifer Zone (LAZ) of the Upper Three Runs Aquifer Unit (UTRAU) and the underlying Gordon Aquifer Unit (GAU) system. The LAZ of the UTRA is an unconfined water table aquifer present at the northeastern portion of TNX Area that pinches out as water elevations decline to the southwest. The GAU is a semi-confined aquifer approximately 6 to 12 m (20 to 40 ft) thick. Groundwater flows progressively from deep to shallow aquifers (i.e., upward hydraulic gradient) and to the Savannah River (WSRC 1998).

1.3 Regulatory and Operational History

In November 1994, an Interim ROD (IROD) was approved by the United States Department of Energy (USDOE), United States Environmental Protection Agency (USEPA), and South Carolina Department of Health and Environmental Control (SCDHEC) (WSRC 1994). The IROD required installation of a hybrid groundwater corrective action (HGCA) for the VOC groundwater plume. The HGCA consisted of 1) a pump and treat system (recovery well network and low-profile air stripper) to treat and inhibit further migration of the 500 μg/L TCE plume; and 2) an airlift recirculation well

located at the heart of the plume to expedite remediation. Figure A-2 shows the location of the TNX well system for the interim remedial action during startup and initial operations. The recirculation well system was determined to be ineffective at the TNX Area, due to both geological factors and the nature of the contamination. Consequently, an Explanation of Significant Difference (ESD) (WSRC 1997b) to the IROD was issued in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations to remove the recirculation well from the HGCA. In 2002, a multi-well soil vapor extraction (SVE) system was added to the interim remedial action as part of a vadose zone source term remedy, via an ESD to the IROD (WSRC 2001).

In 2003, the TNX Area OU ROD was issued and outlined the selected remedy for the vadose zone and groundwater (WSRC 2003). The selected remedy was extraction in the high chlorinated VOC areas with monitoring/mixing zone and institutional controls. This remedy entailed SVE at high VOC concentration areas and operation of the existing T-1 pump and treat system until monitoring determined that passive remediation (mixing zone) and continued monitoring and institutional controls (i.e., land use controls) would be appropriate.

Between 2004 and 2006, the final remedial and removal action for the TNX Area OU and T-Area OU was completed. In 2005, the *Explanation of Significant Differences to the Record of Decision for the TNX Area Operable Unit* (WSRC 2005c) was issued to address principal threat source material in the soil associated with the OTSB/Inactive Process Sewer Line/Discharge Gully subunit and selected sumps and a small area of contamination on the western exterior of Building 678-T. This change to the remedy increased the volume of material to be excavated for offsite disposal. The remedial action for the OTSB and the NTSB subunits is detailed in the *Post-Construction Report (PCR) for the TNX Area Operable Unit (U)* (WRSC 2005b). The remedial action for the T-Area OU, including the TNX Outfall Delta (TNX OD), is detailed in the *Post-Construction Report (PCR) for T Area Operable Unit (TAOU) (U)* (WSRC 2006). The removal action for the TNX OD, Lower DG, and Swamp is detailed in the *Removal Site Evaluation Report/Engineering Evaluation and Cost Analysis for the TNX Outfall Delta, Lower Discharge Gully, and*

Swamp Operable Unit (U) (WSRC 2004c). A summary of the remedial actions and removal action is provided below.

- Remedial action for the OTSB started in April 2005 and was completed in February 2006. Remedial action included excavation of contaminated soil, confirmation sampling, backfilling the basin and backfilling the DG.

- Remedial action for the NTSB started in August 2004 and was completed in December 2004. Remedial action included drainage of the basin, backfilling the basin, and grouting the process sewer line.

- Removal action to excavate soil from the TNX OD, Lower DG, and Inner Swamp was started in December 2004 and completed in September 2005. This removal action excavated radiologically contaminated soil from three areas within the Inner Swamp.

- Remedial action for the TAOU included a low permeability, geosynthetic cover system (i.e., TAOU cap) and a soil amendment. Construction of the TAOU cap was started in January 2006 and completed in November 2006. The soil amendment included application of apatite to the Inner Swamp and the TNX OD to attenuate the leachability of the radiological contaminants in the soil. The soil amendment application was completed in March 2006.

During 2005, the TNX Area OU was incorporated into an area-based remedial strategy for the TAOU, as documented in the TAOU ROD (WSRC 2005a). The TAOU is an area-based OU that incorporates most of the T-Area footprint and the TNX OD.

After completion of the TAOU cap, the T-1 Air Stripper operated from January to December 2007. In December 2007, the T-1 Air Stripper was placed in standby mode to accommodate a pilot treatability study for the deployment of EO onto the water table surface and into the water table aquifer to reduce VOC concentrations. The SVE system remained operational. The treatability study was initiated in February 2008 and completed in May 2010 (SRNS 2009). Per agreement with USEPA and SCDHEC, the pump and treat

system and T-1 Air Stripper were not returned to service during the subsequent groundwater sampling period to evaluate the overall effectiveness of the EO injections.

In 2013, the second ESD to the TNX Area OU ROD was approved which modified the groundwater remedy to add EO treatments as needed and remove the air stripper from service (SRNS 2012a). Modifications to the remedy via the ESD did not impact any other components of the selected remedy as described in the TNX Area OU ROD including operations of the passive SVE system, groundwater monitoring, and institutional controls (i.e., land use controls).

Although the rebound conditions to trigger the additional EO injections did not occur, SRS observed TCE increases in some monitoring wells that correlated with an increase in water elevation due to increased precipitation and associated recharge (SRNS 2015a). To prevent future rebound, additional EO treatment was applied to the VOC source area as detailed in the *Second Corrective Measures Implementation/Remedial Action Implementation Plan (CMI/RAIP) for the TNX Area Operable Unit (U)* (SRNS 2015b). The additional EO injections were completed in 2015.

2.0 SITE HYDROGEOLOGY

The Floridan aquifer system is the aquifer system of concern within the TNX Area between Upper Three Runs Creek and the southern boundary of SRS. The Floridan aquifer system is divided into two aquifer units separated by a confining unit. From top to bottom, they are known as the LAZ of the UTRAU, the Gordon confining unit (GCU), and the GAU (Figures A-3, A-4, and A-5). The GAU is separated into an upper and lower aquifer unit. The lower GAU is not depicted on Figures A-4 or Figure A-5. The unsaturated zone within the TNX Area includes fluvial terrace sediments and the sediments of the LAZ of the UTRAU, which lie atop the water bearing units of the Floridan aquifer system.

The LAZ of the UTRAU is barely represented in the hydrostratigraphic section beneath the TNX Area. From east to west, the water table elevation drops from approximately 33 m (108 ft) above mean sea level (amsl) near TNX 24D to less than 26 m (85 ft) amsl in the TNX Swamp. Beneath the TNX Area, the clayey silt to silty clay beds of the GCU are

sporadic, and the confining unit does not represent an effective aquitard. However, clayey silt to silty clay beds that occur in the GAU locally retard vertical groundwater movement within the aquifer. These beds represent a semi-confining zone that divides the upper and lower GAU. The water table aquifer includes the unconfined portion of the LAZ of the UTRA in the northeast and the upper GAU southwest of TNX 24D.

The water table receives recharge from infiltrating precipitation and from the lower GAU through the semi-confining zone of the GAU. The lower GAU is at a higher pressure than the overlying upper GAU. This is evident by looking at average values for water level data collected between first quarter 1995 and fourth quarter 2021 from wells P 26A, P 26B, and P 26D (Appendix D, page D-3). The average hydraulic head measured in the lower GAU at P 26A is 35.4 m (116.3 ft) amsl which is approximately 3.1 m (10.1 ft) greater than the average hydraulic head measured in the upper GAU at P 26B (32.4 m [106.2 ft] amsl). The average hydraulic head measured in the LAZ of the UTRAU at P 26D is 35.1 m (115.2 ft) amsl which is 2.7 m (8.9 ft) more than the average hydraulic head measured in the upper GAU. Water level data collected since the first quarter 1995 from wells P 26A, P 26B, and P 26D indicate that the hydraulic gradient is consistently upward from the lower GAU and downward from the LAZ of the UTRAU (Appendix D, page D-3).

The hydraulic conductivity of the water table varies from 6 to 18 m/day (20 to 60 ft/day) (WSRC 1997c), which is consistent with groundwater modeling analyses showing calibrated horizontal hydraulic conductivities in the range of 1.8 to 22.5 m/day (6 to 75 ft/day) (WSRC 2000).

The Savannah River is the major discharge point for the Floridan aquifer system and thus exerts control on the direction and rate of horizontal and vertical groundwater movement. Particle tracking from the groundwater model (WSRC 2000) illustrates westerly flow from TNX source areas to the Savannah River with some water discharging to the X-008 Ditch and wetlands (Figures A-6 and A-7). Particle tracking from the groundwater model was based on potentiometric data from 1990 to 1996 and figures from that model are provided in this report to support the current interpretation of the hydrogeologic conceptual model for the TNX OU.

The X-008 Ditch received process wastewater from the TNX facilities and effluent from the T-1 Air Stripper. There are no active sources of process wastewater being discharged to the X-008 Ditch, only surface water runoff. Therefore, during periods of low precipitation and low river stage, water flowing in the X-008 Ditch would be attributed from groundwater. In spring of 2022, a walkdown of the X-008 Ditch was conducted to observe flow in the ditch during a period of low precipitation and low river stage. The walkdown concluded that water was actively flowing in the X-008 ditch and its most likely source was groundwater. This confirms the model results that a portion of groundwater flow is outcropping into the X-008 Ditch. The last samples from the X-008 Ditch were collected in 1999. The United States Geological Survey (USGS) was contracted to assess the potential for natural attenuation processes in the TNX flood plain (USGS 1999). Results from the 1999 sampling event verified that VOC concentrations were elevated in the upper reaches of the X-008 Ditch but decreased to below detection limits downstream before the surface water discharged to the Savannah River. The decrease in VOC concentration was attributed to volatilization. Another round of surface water samples was collected in the second quarter 2022 at the headwaters of the ditch (X-008-DW1), at a midpoint (X-008-DW2), and at a downstream location (X-008-DW3). The samples were analyzed for the same constituents as the monitoring wells in the wetlands (i.e., VOCs, metals, inorganics, and radionuclides). The three new surface water sample locations will be sampled again in the fourth quarter 2022. Results from these sampling events will be reported in the 2022 annual report with recommendations on future sampling.

The X-008 ditch has had numerous designations throughout historical documentation including X8, X-8, X08, X-08, X008, and X-008. Figures and figure captions referencing the X-008 Ditch will be revised where applicable to reflect the “X-008” nomenclature. Figure A-2 and Figure A-6 are not easily reproduced and will not be revised.

3.0 REMEDIAL ACTION

The groundwater remedy selected in the 2003 TNX Area OU ROD (WSRC 2003) entailed SVE in high VOC concentration areas, operation of the existing T-1 pump and treat system, and continued monitoring and land use controls. In 2013, an ESD to the TNX Area OU

ROD was issued which modified the groundwater remedy to permanently remove the T-1 Air Stripper system from service and add EO treatments as needed. Figure A-8 is a schematic of the TNX Area OU and the current remedial actions.

3.1 Objectives

The overall objectives of the groundwater remedial action are as follows:

- Protect future industrial workers from exposure to contaminated groundwater;
- Return groundwater to beneficial use;
- Prevent, minimize, or eliminate discharge of contaminated groundwater to surface water that would result in unacceptable risk to human or ecological receptors; and
- Minimize adverse impact to the wetland ecosystem of the TNX Area floodplain.

The EO remedial action has altered the natural state of the aquifer to allow for the reductive dichlorination and biological degradation of the TCE groundwater plume. Beneficial reuse of the groundwater will not be achieved until active remediation of the groundwater is complete.

3.2 Soil Vapor Extraction

Two SVE treatability studies were performed in the vadose zone near the TBG, Phase I in 1997 (WSRC 1997d) and Phase II in 1999 (WSRC 1999b). Phase I and II utilized the recirculation well (i.e., TVR 1A) and associated monitoring wells (i.e., TVM series, 'V' and 'U' horizons). Based on the results from these treatability studies, SVE was shown to be an effective and cost-efficient approach at reducing the mass of VOCs at TNX (i.e., removing vadose zone secondary source VOCs near the plume core) and minimizing future VOC groundwater concentrations in the TNX floodplain.

In October 2001, an ESD to the IROD (WSRC 2001) was approved to add SVE to the HGCA system. In 2002, a portable SVE unit and twelve additional SVE wells (i.e., TVX series) were installed at the TNX Area OU. In 2006, the SVE wells were shut down to accommodate the placement of the TAOU cap. After completion of the TAOU cap, the conventional active SVE unit was replaced with five 24-volt passive (MicroBlower™)

SVE systems. The five Microblowers™ are rotated between any of the SVE wells to optimize VOC vapor removal. Location of the current SVE well network is presented in Figure A-9. The SVE wells not equipped with a MicroBlower™ have been equipped with BaroBalls™ which allow for venting of subsurface vapors based on changes in the barometric pressure of the atmosphere.

There are twenty SVE wells associated with the TNX OU SVE well network (Figure A-9). The TVM series have 'V' and 'U' screen horizons in the unsaturated zone and are viable SVE wells. TVM 2L and TVM 4L are no longer used as viable wells but will remain on Table 7-1 because these wells were connected to the MicroBlowers™ between 2010 to 2014.

An evaluation of the SVE system was proposed to the Core Team (DOE, USEPA, and SCDHEC) on May 26, 2022 to determine the future operational status of the five MicroBlowers™. The evaluation of the SVE well network is needed to identify the location of the residual mass in the vadose zone, determine if the placement of MicroBlowers™ can be limited to an optimized well network, and establish criteria for the eventual shutdown of the MicroBlowers™. Details of the proposed SVE evaluation and Core Team recommendations are included in Appendix F of this annual report. The proposal will not be implemented until Core Team approval is provided.

3.3 Edible Oil Treatment

In December 2007, the T-1 Air Stripper was temporarily placed in standby mode to accommodate an EO treatability study (SRNL 2012). Most of the SVE system remained operational during the treatability study, except three SVE wells (i.e., TVX 3L, TVX 5L and TVX 6L) with screens near the top of the water table that were used to deploy neat (pure) vegetable oil.

The EO treatability study (February to April 2008 and May 2010) was conducted to determine how effective EO deployment was on treating VOCs and reducing the cost and the time associated with treatment. The EO treatment consisted of 1) deployment of neat (pure) vegetable oil at the top of the water table in the residual source area (vicinity of the

smear zone); and 2) deployment of emulsified oil substrate (EOS®) in the core of the groundwater VOC plume (Figure A-8). Table 3-1 lists the construction details of the injection wells as well as the volumes of the neat and emulsified oil injected at each location. Figure A-10 provides the location of the injection wells associated with the 2008 and 2010 injects.

The EO treatments have significantly reduced VOC concentrations in the groundwater (Figures A-27, A-31, and A-38). In 2013, an ESD to the TNX Area OU ROD was approved which modified the remedial action to add EO treatments as needed and remove the pump and treat system from service. A trigger to inject additional EO was defined in the *Second Explanation of Significant Differences (ESD) for the Revision 1 TNX Area Operable Unit Record of Decision (U)* (SRNS 2012a). This document states that additional EO treatment will be applied if a sustained rebound lasting over one (1) year in excess of 75 µg/L (ppb) of TCE, PCE, or CCl_4 in any well if determined appropriate by the USDOE, USEPA, and SCDHEC.

In 2015, a third amendment of EO was applied to a larger area outside of the originally targeted treatment zone. This injection was initiated based on TCE results at TBG 3 and TVM 1M that came close to exceeding the trigger criteria identified in the ESD to the TNX Area OU ROD (i.e., >75 ppb increase sustained for one year). The rebound in TCE concentration at TBG 3 was correlated to an increase in water table elevation (Figure A-25). The elevated water table likely encountered residual VOC mass present in the capillary fringe. Although the trigger criteria were not exceeded, SRS proceeded with the injections to take advantage of the high-water table and to prevent future rebounds. On April 28, 2015, the SRS met with the USDOE, USEPA and SCDHEC and an agreement was reached to inject neat and emulsified oils at 10 existing monitoring wells during the third quarter 2015. These events are documented in an Underground Injection Control Application (SRNS 2015a) and a CMI/RAIP for the TNX Area OU (SRNS 2015b). Table 3-1 lists the construction details of the 2015 injection wells and the volumes of the neat and/or emulsified oil injected at each location.

3.4 Recovery Well/Air Stripper System

The recovery well system was designed to capture the migration of contaminated groundwater containing >500 μg/L TCE and to remove TCE from the groundwater. The recovery wells were positioned at the downgradient edge of the initial >500 μg/L TCE plume, and groundwater was pumped to the T-1 Air Stripper for removal of VOCs. Recovery wells TRW 1, 2, 3 and 4 were installed to pump contaminated water from the unconfined portion of the UTRA/GAU (WSRC 1997a) (Figure A-4). The recovery well network and T-1 Air Stripper began operation on September 16, 1996. During 2005 the T-1 Air Stripper was temporarily shut down to accommodate the remedial action activities occurring at the TNX Area OU and the T-Area OU. During the shutdown, recovery well TRW 4 was abandoned and replaced by TRW 4R. The T-1 Air Stripper was restarted in January 2007 and operated until December 2007.

The system proved to be effective in capturing and treating VOCs, resulting in depletion of the VOCs in the groundwater near the source area. SRS determined that the recovery well/air stripper system would have to be operated for an extended period of time to manage the secondary source term in the groundwater near the source area (in the capillary fringe of the water table and within the water table). In December 2007, the T-1 Air Stripper and associated recovery wells were placed in stand-by to allow for the deployment of EO in the source area. After a successful EO demonstration, a removal action removed the T-1 Air Stripper from service as documented in an ESD to the ROD issued on June 12, 2013. The T-1 Air Stripper was permanently removed from service in 2013.

3.5 Radiologically Contaminated Groundwater

The radiologically contaminated source areas were excavated during previous remedial actions associated with both the TAOU and TNX Area OU. Excavation activities occurred at the TBG, OTSB, and in the wetlands (WSRC 2005b and WSRC 2006). Institutional controls (i.e., land use controls) are the agreed to remedial action for the radionuclide contaminated groundwater for the TNX OU. There are two localized areas where the groundwater monitoring wells exceed the MCLs for the respective radionuclide constituents. The two areas are downgradient of the TBG and in the wetlands

downgradient of the OTSB, near the TNX OD. Based on the monitoring data and historical trends, the exceedances are sporadic or one-time occurrences. TCM 5 is the only well with persistent uranium concentrations that exceed the MCL. There are no discernible and consistent groundwater plumes present and therefore no remedial action is needed to address radiological contamination in groundwater.

This page intentionally left blank.

Table 3–1. Injection Well Elevations and Injection Volumes

Well ID	Injection Date	Type of Oil	Volume of Oil (gal)	Top Screen Elevation (ft msl)	Bottom Screen Elevation (ft msl)	Ground Elevation (ft msl)	Well Diameter (in)
TBG 3	August 2015	EOS®	550	49.77	69.77	158.67	4
TBG 4	August 2015	EOS®	550	50.66	70.66	159.96	4
TBG 5	August 2015	EOS®	550	42.65	62.65	155.05	4
TRW 3	August 2015	EOS®	1100	49.88	84.78	162.18	6
TRW 4R	August 2015	EOS®	2200	50	80	157.61	6
TVM 1M	August 2015	EOS®	550	71.08	72.08	157.28	2
TVX002L	August 2015	EOS®	550	44.38	64.38	156.64	2
TVX002L	August 2015	Neat Oil	550	44.38	64.38	156.64	2
TVX003L	August 2015	Neat Oil	550	41.8	56.8	154.1	2
TVX004L	August 2015	EOS®	550	43.85	55.85	152.95	2
TVX004L	August 2015	Neat Oil	550	43.85	55.85	152.95	2
TVX005L	July 2015	Neat Oil	550	46.92	56.92	155.16	2
TBG 4	May 2010	EOS®	55	109.30	89.30	159.96	4
TBG 5	Feb 2008	EOS®	960	112.40	92.40	155.05	4
TNX 3D	March 2008	EOS®	1,250	104.90	84.90	162.97	4
TRW 4R	March 2008	EOS®	1,250	107.45	77.45	157.45	6
TVX003 L	April 2008	Neat Oil	300	112.30	97.30	154.1	2
TVX005 L	April 2008	Neat Oil	900	108.24	98.24	155.16	2
TVX006 L	April 2008	Neat Oil	1,500	107.49	92.49	155.18	2

This page intentionally left blank.

4.0 MONITORING NETWORK

Figure A-2 shows the T-Area monitoring well network and locations that were in place during the start-up and initial operation of the remedial action system. Monitoring wells were abandoned between 2004 and 2006, due to their location on and outside of the final TAOU cap (WSRC 2005b and WSRC 2006). The TNX Area monitoring well network currently consists of 43 wells (Table 4-1 and Figure A-12). Table 4-2 provides a summary of the sampling analysis plan for the monitoring well network at the TNX Area OU. The monitoring wells associated with the EO remedial action receive additional analysis to monitor the effects of the EO (Table 4-2).

A new monitoring well was installed in response to the need to fill a potential data gap downgradient of the OTSB identified by the USEPA during a field walkdown in 2015. A white paper documenting historic monitoring results near the OTSB was submitted to the USEPA and SCDHEC in 2015, revised based on comments, and resubmitted in 2016 (SRNS 2015c). The USEPA also mentioned a potential data gap near the OTSB in comments on the 2014 annual report. In April 2017, the USDOE, USEPA, and SCDHEC conducted a walkdown of the area near the OTSB and agreed on the location for a new monitoring well with the objective to define the eastern edge of the TCE plume and determine if any radiological sources are emanating from the OTSB. The new monitoring well, XSB006R, was installed on April 22, 2019, downgradient of the OTSB. Well construction details are provided in Table 4-1.

1,4-Dixoane analysis was initiated at all monitoring wells in the fourth quarter 2013 in response to comments provided by the USEPA and SCDHEC during review of the *Fourth Five-Year Remedy Review Report for the Savannah River Site* (SRNS 2012b). Monitoring for 1,4-dioxane has continued in all monitoring wells since 2013.

In the fourth quarter 2015, volatile fatty acids (VFA) were added to the list of constituents monitored for at the EO monitoring well network (Table 4-2) in accordance with the sampling requirements identified in the *Second Corrective Measures Implementation /Remedial Action Implementation Plan (CMI/RAIP) for the TNX Operable Unit (U)* (SRNS

2015b). EO, (i.e., soybean oil), is composed almost entirely of fatty acids (saturated, mono-unsaturated, poly-unsaturated, and oleic). VFAs are theorized to be produced as microbes consume the EO or fatty acids. VFAs can be used to indicate the general presence and longevity of EO in the subsurface. The change in VFA composition might be an indicator of microbial de-polymerization of the EO.

The VFA analytical method measures the concentration of up to five individual VFAs. The individual concentrations are presented in Appendix B along with the total VFA, which is the sum of VFA analyzed. Time series graphs of total VFA are presented in Appendix E.

Three surface water sample locations were sampled along the X-008 Ditch in the second quarter of 2022. The sample locations are provided on Figure A-2. Results from these locations will be reported in the 2022 annual report.

4.1 Sampling Events

The 2021 TNX groundwater sampling program included a 43-monitoring well network to be sampled in the second and fourth quarters of the calendar year (Table 4-1 and Figure A-12). In addition, water levels were to be recorded during the sampling events. During the 2Q2021 and 4Q2021, samples from 42 of the 43 wells were collected.

4.1.1 Sampling Issues

During the 2Q2021 sampling event, the following sampling issues occurred:

- TNX 72S was dry and no water level or sample was collected. TNX 72S has a history of being dry due to a shallow screen depth (i.e., 3.4 to 5.9 ft below ground surface [bgs]) and fluvial sediments.

- 1,4-Dioxane results analyzed using noncertified method EPA522 for TBG 4, TVM 1M, and TVM 4M were qualified as rejected due to hold time exceedances at the laboratory. 1,4-Dioxane results analyzed using the certified method EPA8260BSIM were valid with no issues for these three wells.

During the 4Q2021 sampling event, the following sampling issues occurred:

- TNX 72S was dry and no water level or sample could be collected. TNX 72S has a history of being dry due to a shallow screen depth (i.e., 3.4 to 5.9 ft below ground surface [bgs]) and fluvial sediments

This page intentionally left blank.

Table 4–1. TNX Monitoring Well Network

Well Name	Screen Zone	Well Category	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Total Well Depth (ft bgs)	Well Diameter (in)	Ground Elevation (ft msl)
P 26A	Semi-confined GAU	Background/EO Monitoring Well	119.8	129.8	132	4	151.8
P 26B	Unconfined UTRAU/GAU	Background/EO Monitoring Well	69.5	80	82.2	4	151.9
P 26D	Unconfined UTRAU/GAU	Background/EO Monitoring Well	29.9	50	52.1	4	151.8
TBG 3	Unconfined UTRAU/GAU	Primary/EO Monitoring Well	49.77	69.77	79.77	4	158.67
TBG 4	Unconfined UTRAU/GAU	Primary/EO Monitoring Well	50.66	70.66	80.66	4	159.96
TBG 5	Unconfined UTRAU/GAU	Primary/EO Monitoring Well	42.65	62.65	77.65	4	155.05
TCM 5	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	2.25	17.25	20	2	97.11
TIR 1L	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	32	34.01	40	2	99.72
TIR 1M	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	13	14.97	22.65	2	99.56
TIR 1U	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	7.5	9.47	13	2	99.48
TNX 1D	Unconfined UTRAU/GAU	Secondary	54.5	74.5	76.9	4	154.1
TNX 3D	Unconfined UTRAU/GAU	Primary/EO Monitoring Well	58.07	78.07	89.07	4	162.97
TNX 5D	Unconfined UTRAU/GAU	Secondary	38.5	58.5	60.8	4	147
TNX 8D	Unconfined UTRAU/GAU	Primary	4	24	26.3	4	98
TNX 9D	Unconfined UTRAU/GAU	Secondary	4	24	26.3	4	99.4
TNX 11D	Unconfined UTRAU/GAU	Primary	4.5	24.5	26.6	4	97.7
TNX 12D	Unconfined UTRAU/GAU	Secondary	4	24	26.1	4	97.1
TNX 13D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	3.5	5.5	6	2	93.4
TNX 15D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	4.6	6.6	7.08	2	92.5
TNX 16D	Unconfined UTRAU/GAU	Primary	4.6	6.6	7.08	2	92.7
TNX 20D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	3.2	5.2	5.7	2	91.4
TNX 22D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	2.7	4.7	5.2	2	90.5
TNX 24D	Unconfined UTRAU/GAU	Secondary	26	40.96	45	2	139.7
TNX 27D	Unconfined UTRAU/GAU	Primary/EO Monitoring Well	7	27	35	2	108.27
TNX 28D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	4.8	14.8	15.1	2	97.4
TNX 30D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	4.7	14.7	15	2	100.3
TNX 35D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	4.9	14.9	15.2	2	97.4
TNX 37D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	4.7	14.7	15	2	98.2
TNX 72D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	12.3	14.8	15.58	2	92.8
TNX 72M	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	6.4	8.9	2.57	2	92.8
TNX 72S	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	3.4	5.9	2.62	2	92.8
TNX073D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	12.08	17	18	2	95.4
TNX074D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	12.75	17.78	18	2	93.3
TNX075D	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	12.71	17.7	18	2	92
TRW 1	Unconfined UTRAU/GAU	Recovery/EO Monitoring Well	53.5	78.5	84	6	159.9
TRW 2	Unconfined UTRAU/GAU	Recovery/EO Monitoring Well	40.3	75.3	82.3	6	152.56
TRW 3	Unconfined UTRAU/GAU	Recovery/EO Monitoring Well	49.88	84.78	90.28	6	162.18
TRW 4R	Unconfined UTRAU/GAU	Recovery/EO Monitoring Well	50	80	83	6	156.6
TVM 1M	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells/EO Monitoring Well	71.08	72.08	73.68	2	157.28
TVM 2M	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells/EO Monitoring Well	71.29	72.29	73.79	2	159.39
TVM 4M	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells/EO Monitoring Well	71.75	73.75	76.47	2	158.87
TVR 1A	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells/EO Monitoring Well	15	40	80.6	8	148.2
TVR 1A	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells/EO Monitoring Well	65	75	80.6	8	148.2
XSB006R	Unconfined UTRAU/GAU	Auxiliary TNX Area Wells	9.5	19.5	19.5	2	99.1

Table 4–2. Summary of the Groundwater Sampling and Analyses Plan at TNX (2nd and 4th Quarters)

Requested Analyses	Hydrocarbons	Organic Compounds	Mercury	Nitrate	Nitrate-Nitrite as Nitrogen	Sulfate	Total Organic Carbon	Uranium, Total	Gross Alpha	Nonvolatile Beta	Radium-226 & Radium 228	Total Volatile Fatty Acids	Field Parameters
Background Wells													
P 26A (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
P 26B (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
P 26D (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
Primary Wells													
TBG 3 (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TBG 4 (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TBG 5 (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TNX 3D (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TNX 8D		1	x		x			x	x	x	x		3
TNX 11D		1	x		x			x	x	x	x		3
TNX 16D		1	x		x			x	x	x	x		3
TNX 27D (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
Recovery Wells													
TRW 1 (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TRW 2 (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TRW 3 (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
TRW 4R (EO)	2	1	x	x	x	x	x	x	x	x	x	x	3
Secondary Wells													
TNX 1D		1	x		x			x	x	x	x		3
TNX 5D		1	x		x			x	x	x	x		3
TNX 9D		1	x		x			x	x	x	x		3
TNX 12D		1	x		x			x	x	x	x		3
TNX 24D		1	x		x			x	x	x	x		3
Auxiliary Wells													
TCM 5		1	x		x			x	x	x	x		3
TIR 1L		1	x		x			x	x	x	x		3
Auxiliary Wells (continued)													
TIR 1M		1	x		x			x	x	x	x		3
TIR 1U		1	x		x			x	x	x	x		3
TNX 13D		1	x		x			x	x	x	x		3
TNX 15D		1	x		x			x	x	x	x		3
TNX 20D		1	x		x			x	x	x	x		3
TNX 22D		1	x		x			x	x	x	x		3
TNX 28D		1	x		x			x	x	x	x		3
TNX 30D		1	x		x			x	x	x	x		3
TNX 35D		1	x		x			x	x	x	x		3
TNX 37D		1	x		x			x	x	x	x		3
TNX 72D		1	x		x			x	x	x	x		3
TNX 72M		1	x		x			x	x	x	x		3
TNX 72S		1	x		x			x	x	x	x		3
TNX073D		1	x		x			x	x	x	x		3
TNX074D		1	x		x			x	x	x	x		3
TNX075D		1	x		x			x	x	x	x		3
TVM 1M (EO)	2	1		x		x	x					x	3
TVM 2M (EO)	2	1		x		x	x					x	3
TVM 4M (EO)	2	1		x		x	x					x	3
TVR 1A (EO)	2	1		x		x	x					x	3
XSB006R		1	x		x			x	x	x	x		3

NOTES:
1 Organic compounds include; trichloroethylene, cis-1,2-dichloroethylene, vinyl chloride, carbon tetrachloride, tetrachloroethylene, and 1,4-dioxane
2 Hydrocarbons include; methane, ethylene, nitrogen, and carbon dioxide
3 Field parameters include; pH, specific conductivity, dissolved oxygen, oxidation reduction potential, turbidity, total alkalinity, water elevation, and water temperature
x Sample to be obtained
(EO) Edible oil monitoring well network

5.0 FIELD AND ANALYTICAL RESULTS

The following sections summarize the results of the field and analytical data. Field and analytical data are shown in Appendix B, Tables B-1, and B-2. Historic data trends are presented as hydrographs in Appendix D and analytical time series graphs in Appendix E. Table 5-2 summarizes the constituents that exceeded an MCL during 2021. Appendix C includes the Data Review Key.

5.1 Precipitation Measurements

Precipitation measurements are collected at a meteorological station located approximately 4.0 km (2.5 mi) southeast of TNX Area at D Area (Figure A-1). Precipitation data is collected at regular intervals (24-hr period) at the D-Area meteorological station and provided as monthly totals from 1973 to 2021 in Table 5-1. Precipitation in D-Area totaled 119.1 cm (46.89 in) in 2021 which is approximately 1.5 cm (0.61 in) above the historic average.

5.2 Water-Level Measurements

The water table map showing current conditions (Figure A-13) was constructed from water-level measurements collected during the 4Q2021. Appendix D includes the hydrographs showing water elevations for the period of record.

The horizontal groundwater flow in the TNX Area is to the southwest toward the Savannah River Swamp. Horizontal flow rate calculations provide estimates of the transport rate of constituents originating from the TNX Area. Flow rates are estimated using the following equation:

$$Flow\ \left(\frac{ft}{day}\right) = \frac{Hydraulic\ Conductivity\ Kh\ \left(\frac{ft}{day}\right)}{Effective\ Porosity\ (unitless)} x \frac{dh\ (ft)}{dl\ (ft)}$$

Where the hydraulic conductivity (*Kh*) constant is 10 ft/day, the effective porosity value is 20 percent, the change in head is *dh*, and the horizontal distance along each flow direction arrow is *dl*. Flow path length is calculated to the nearest five feet. Flow rate per day is

calculated to two significant figures, then multiplied by 365 and rounded to two significant figures for the flow rate per year. Flow rate estimates vary depending upon the vertical gradient between wells, the size of the area under consideration, the number of data points, and the length and location of the flow path. Because these are inferred or estimated parameters, flow rate estimates should be considered accurate to an order of magnitude only.

In the 4Q2021, horizontal flow rates in the LAZ of the UTRAU and the upper GAU ranged from approximately 460 m per year (1,500 ft/yr) in the northeast beneath the TAOU cap (Flow path A-A', Figure A-13) to approximately 73 m per year (240 ft/yr) near the OTSB and in the swamp (Flow path B-B', Figure A-13). As shown on Figure A-13, the gradient flattens on the southern end of the TAOU cap and into the wetlands.

5.3 pH

Field pH values measured during 2021 ranged from 4.3 to 6.8 with the average being 5.6 during this sample period. During 2Q2021, three monitoring wells (i.e., TBG 3, TIR 1M, and TIR 1U) had a pH less than 5. During the 4Q2021, two monitoring wells (i.e., TBG 3, and TNX 15D) had a pH less than 5 (Figure A-14).

5.4 Analytical Results

Analytical results for 2021 are included on Tables B-1 and B-2. Appendix E includes time series plots for selected constituents and monitoring wells. Interpretations for the analytical results reported in this section are provided in the Evaluation of Field and Analytical Results section (i.e., Section 6.0).

Tetrachloroethylene (PCE). During 2021, PCE was not detected in 2Q2021. PCE concentrations were detect in four wells in 4Q2021, but did not exceed the MCL (5 µg/L) at any of the monitoring wells.

Trichloroethylene (TCE). TCE was detected in 18 wells in 2Q2021. Concentrations of TCE exceeded the MCL (5 µg/L) in two monitoring wells (i.e., TRW 2 and TVM 1M). TCE concentrations at TRW 2 have fluctuated above and below the MCL with time. The

most recent fluctuations at TRW 2 started in 4Q2018 with a sharp decline in TCE concentrations to less than the MCL followed by a decline to less than the MCL again in 4Q2019. Since 4Q2019, the TCE concentration at TRW 2 has been greater than the MCL. TCE concentrations at TVM 1M declined to non-detect levels after the 2015 EO injections, In 2Q2021, the TCE concentration was 8.33 µg/L which exceeded the MCL for the first time since 2016.

TCE was detected in 20 wells during 4Q2021. Concentrations of TCE exceeded the MCL (5 µg/L) in three monitoring wells (i.e., TNX 28D, TRW 2, and TVM 1M). The TCE concentration at TNX 28D was 6.71 µg/L during the 4Q2021. TCE concentrations at TNX 28D have been above and below the MCL since 2010. At TRW 2, the TCE concentration was 32.6 µg/L during the 4Q2021. As mentioned before, TCE concentrations at TRW 2 have fluctuated above and below the MCL, since 4Q2018, with the most recent concentrations exceeding the MCL. At TVM 1M, TCE results exceeded the MCL with a concentration of 8.95 µg/L.

Cis-1,2-Dichloroethylene (cis-1,2 DCE). Cis-1,2-DCE was detected in six wells during 2Q2021. The cis-1,2-DCE concentration did not exceed the MCL (70 µg/L) during the 2Q2021.

During the 4Q2021, cis-1,2-DCE was detected in ten wells. The cis-1,2-DCE concentrations at TGB 5 did exceed the MCL (70 µg/L) with a concentration of 73.9 µg/L during the 4Q2021. This is the second exceedance of cis-1,2-DCE at TBG 5 since the 2015 EO injections.

Vinyl Chloride (VC). During 2021, VC was detected at one monitoring wells (TBG 5) during 2Q2021 and three monitoring wells (TBG 4, TBG 5, and TRW 4R) during 4Q2021. Concentrations of VC did not exceed the MCL (2 µg/L) during 2021.

Ethylene. Ethylene was detected in seven monitoring wells during 2Q2021. The detections ranged from 0.2 to 2.5 µg/L.

Ethylene was detected in one monitoring well during 4Q2021. The detection was at TBG 4 with a concentration of 3.3 µg/L.

Carbon Tetrachloride (CCl_4). During 2021, CCl_4 was not detected at any of the monitoring wells.

Uranium. During the 2Q2021, total recoverable uranium was detected in 18 wells and all detections were less than the MCL (30 µg/L). .

During the 4Q2021, total recoverable uranium was detected in 21 wells. The uranium concentrations exceeded the MCL (30 µg/L) at TCM 5 with a concentration of 36.1 µg/L during 4Q2021.

Adjusted Gross Alpha. Adjusted gross alpha is the difference when uranium activity is subtracted from the gross alpha activity. Uranium activity is calculated from the uranium metals concentrations by multiplying a constant conversion factor of 0.67 ρCi/µg. The MCL for adjusted gross alpha is 15 ρCi/L. See Appendix C for a detailed explanation of the adjusted gross alpha calculation.

During the 2Q2021, the adjusted gross alpha activity did not exceed the MCL (15 ρCi/L).

During 4Q2021, the adjusted gross alpha activity exceeded the MCL at TNX 72D. This is the first time adjusted gross alpha activity has been elevated at this monitoring well.

Combined Radium. Combined radium is the sum of radium-226 and radium-228 and has an MCL of 5 ρCi/L. See Appendix C for a detailed explanation of the combined radium calculation.

During the 2Q2020, the combined radium activity did not exceed the MCL (5 ρCi/L).

During the 4Q2021, the combined radium activity exceeded the MCL at four monitoring wells (i.e., TIR 1M, TIR 1U, TNX 5D, and TNX 8D). The 4Q2021 exceedance at TIR 1M was the first to exceed at this monitoring well. At TIR 1U, combined radium activity has exceeded sporadically in 2002, 2014, and 2021. Combined radium activity at TNX 5D has

exceeded the MCL in 2018 and in 2021. TNX 8D has exceeded the MCL for combined radium twice during its sampling history, in 2002 and 2021.

Mercury. During the 2Q2021, mercury was detected in three monitoring wells and all the detections were below the MCL (2 µg/L).

During the 4Q2021, mercury was detected in four monitoring wells. Mercury concentrations did not exceed the MCL (2 µg/L) during 4Q2021.

Nitrate-Nitrite as Nitrogen (NO_3/NO_2 as N). During the 2Q2021, NO_3/NO_2 as N was detected in 30 wells and in 23 wells in the 4Q2021, and all the results were below the MCL (10 mg/L).

1,4-Dioxane. During the 2Q2021, 1,4-dioxane was detected at two wells. The 1,4-dioxane concentration exceeded the regional screening level (RSL) for tap water (0.46 µg/L) at TBG 3 and TBG 5. TBG 3 had a 1,4-dioxane concentration of 27 µg/L and has now exceeded the RSL three times during its history, 2013, 2020, and 2021. TBG 5 had a concentration of 5.4 µg/L and has a history of exceeding the RSL.

During the 4Q2021, 1,4-dioxane was detected at two wells. The 1,4-dioxane concentration exceeded the RSL for tap water (0.46 µg/L) at TBG 5 (6.2 µg/L).

1,4-Dioxane samples were analyzed using SCDHEC certified method EPA 8260BSIM and noncertified method EPA 522. Method EPA 8260BSIM cannot achieve detection limits less than the RSL for tap water (0.46 µg/L) while method EPA 522 can. Both analytical results are present on Tables B-1 and B-2 while the maximum result is presented on Figure A-24 and the time series graphs (Appendix E).

Edible Oil Parameters. The EO parameters are analyzed near the treatment zone to identify the reductive conditions created after injection of the EO in the groundwater. These parameters include DO, total organic carbon (TOC), oxidation/reduction potential (ORP), sulfate, methane, nitrate, and VFA, and are compared to concentrations measured prior to or during the EO injections (Appendix A, Figures A-32 through A-41). These

parameters are also presented in Appendix E on time series graphs. It should be noted that the results for DO, ORP, sulfate, nitrate, and TOC from 2008 to 2014 are not present in the database; therefore, the program used to create the time series graphs could not be used. The graphs for these constituents were created manually. Although the data is presented accurately, the graph formatting looks different than the other time series graphs.

DO decreased at most injection wells in the treatment zone after the 2008, 2010, and 2015 EO injections. DO concentrations at TBG 3, TRW 3, and TVM 1M have been variable since the 2015 EO injection.

- The DO concentration at TBG 3 decreased after the 2015 EO injections and averaged 1.8 mg/L from 4Q2015 to 4Q2017. DO concentrations at TBG 3 were elevated from 2018 to 2019, ranging from 2.63 to 6.22 mg/L with a suspect DO concentration of 12.13 mg/L in 4Q2018 (DO concentration greater than 9 mg/L). Although DO concentration declined briefly in 2020, they increased to 2.63 mg/L and 3.43 mg/L in 2Q2021 and 4Q2021, respectively.

- At TRW 3, the DO concentrations have been variable since the 2015 EO injections, ranging between approximately 1 mg/L and 4 mg/L. In 2021, DO concentrations at TRW 3 were 3.9 mg/L in both the 2Q2021 and 4Q2021.

- At TVM 1M, DO concentrations have fluctuated in a decreasing trend since the 2015 EO injections until 2019. DO concentrations increased during 2019 and 2020 with concentrations ranging between 4 and 6 mg/L with a suspect concentration of 14.38 mg/L in 4Q2019. In 2021, DO concentrations were 1.14 mg/L in 2Q2021 and 2.46 mg/L in 4Q2021 which continue the general decreasing trend since 2015.

At the original EO injection wells (i.e., TBG 4, TBG 5, TNX 3D and TRW 4R), DO concentrations continue to return to background concentrations (i.e., 6-8 mg/L).

- The general trend of DO concentrations at TBG 4 has increased from 1.2 mg/L in the 4Q2015 to approximately 6 mg/L in 2018. In 2019 and 2020, DO concentrations were variable, but generally lower than 2018 DO concentrations. In

2021, DO concentrations were increasing back to 2018 concentrations with concentrations of 2.9 mg/L and 6.1 mg/L in the 2Q2021 and 4Q2021, respectively.

- The DO concentration at TBG 5 gradually increased from 2014 to 2019. In 2020, DO concentrations declined. In 2021, DO concentrations increased to 2.43 mg/L and 6.34 mg/L in the 2Q2021 and 4Q2021, respectively.

- The DO concentration at TNX 3D was 7.8 mg/L in the first quarter 2008 and decreased to less than 1.0 mg/L from 2009 to 2014. After the 2015 EO injections, DO concentrations at TNX 3D increased through 2019 and then declined in 2020. In 2020, DO concentrations remained low with concentrations of 1.22 mg/L and 0.92 mg/L in 2Q2021 and 4Q2021, respectively.

- The DO concentration at TRW 4R decreased to less than 1.0 mg/L after the initial EO injection in 2008 and started increasing in 2013. In 2021, DO concentrations continue a general increasing trend with a concentration of 4.8 mg/L in 2Q2021 and 4.9 mg/L in 4Q2021.

There were no suspect DO measurements observed during 2021. All DO measurements that are greater than 9 mg/L are considered suspect.

The TOC concentrations increased at injection wells immediately after each EO injection occurred. After the 2015 injections, TOC concentrations increased at the injection wells (i.e., TBG 3, TGB 4, TBG 5, TRW 3, TRW 4R, and TVM 1M) and one monitoring well (i.e., TVR 1A). Since the 2015 injections, TOC concentrations at most of these wells have steadily decreased through 2021, except at TBG 3. At TBG 3, TOC concentrations increased from 2Q2019 (88,900 µg/L) to 4Q2019 (2.18×10^6 µg/L). Since 2019, TOC concentrations have slowly declined and were 1.69 million µg/L and 0.96 million µg/L in the 2Q2021 and 4Q2021, respectively.

The ORP results have decreased at most of the injection wells after the EO injections. Injection wells TBG 4, TBG 5, and TNX 3D have sustained low ORP results since EO was injected in 2008 and 2010. This trend continued during 2021.

- Since the 2015 injection, the ORP result at TBG 4 decreased until 4Q2016. Since the 4Q2016, ORP results have hovered and remained stable around -100 millivolts (mV). In 2021, ORP results increased above -100 mV with concentrations of -15 mV in the 2Q2021 and -6 mV in the 4Q2021.

- The ORP result at TBG 5 were -121 mV in 2Q2021 and 23 mV in 4Q2021.

- The ORP result at TNX 3D were 57 mV in 2Q2021 and -20 mV during the 4Q2021. Although the ORP results continue to be less than background, the ORP results at TNX 3D have steadily increased since 2009.

At other wells within the treatment zone, ORP results have been variable with time. The most variability has been observed at TRW 4R. ORP at TBG 3 was decreasing after the 2015 EO injections but rebounded during 2019.

- In 2021, the ORP results at TRW 4R continue to be variable with an ORP result of 9 mV in 2Q2020 and 29 mV in 4Q2020.

- The ORP results at TBG 3 steadily declined from 4Q2015 to 4Q2018 and sharply increased in 2019. In 2021, ORP results continued to be elevated with results of 245 and 102 mV in 2Q2021 and 4Q2021, respectively.

- ORP results initially declined at some monitoring wells (i.e., TVM 2M, TVM 4M, and TVR 1A) after the 2008 injections and have steadily increased since. ORP results continue to have increasing trends at TVM 2M and TVR 1A into 2021. The ORP results at TVM 4M increased to a max ORP result of 302 mV in 4Q2019. Since 2019, ORP results at TRV 1A have declined to 205 mV in 4Q2021.

ORP results at monitoring wells (i.e., TNX 27D and TRW 2) located downgradient of the treatment zone have been declining since the 2015 EO injections.

- The ORP results at TNX 27D have declined from 205 mV in 4Q2015 to 66 mV in 4Q2021.

- The ORP results at TRW 2 have declined from 263 mV in the 2Q2014 to 22 mV in the 2Q2018. From 2018 to 2021, ORP results have been variable ranging from 170 to -5 mV.

Sulfate concentrations were variable after the 2008 and 2010 EO injections. After the 2015 EO injections, sulfate concentrations decreased at some of the injection wells (i.e., TBG 3, TBG 5, TRW 4R, and TVM 1M). TRW 4R had the most extreme decline in sulfate concentrations averaging 7.7 mg/L between 2008 and 2014 and decreasing to an average of 0.92 mg/L from 2015 to 2019. The sulfate concentration at TRW 4R has increased since 2019 with a concentration of 3.57 mg/L during the 4Q2021. The sulfate concentrations at TBG 3, TBG 5, and TVM 1M declined gradually from 2015 to 2017. TBG 3 had sulfate concentrations increased in 2019 and has decreased into 2021 with a concentration of 1.02 mg/L in 4Q2021. Sulfate concentrations at TBG 5 and TVM 1M have remained low through 2020. The sulfate concentration at TVM 1M increased in 2021 with a concentration of 1.98 mg/L in 4Q2021. Sulfate concentrations at TVR 1A have been steadily increasing since 2015.

Methane concentrations at injection and monitoring wells near the treatment zone increased to greater than 1,000 µg/L after the 2008 and 2010 injections. Methane concentrations at TBG 3 and TRW 3 increased to greater than 1,000 µg/L after the 2015 injections. The methane concentration at TBG 3 was 7,500 µg/L during the 4Q2021, while the methane concentration at TRW 3 was 10,000 µg/L during the 4Q2021. Previous injections wells (i.e., TBG 4, TBG 5, TNX 3D, and TRW 4R) continue to have elevated methane concentrations. The methane concentrations during the 4Q2021 at TBG 4, TBG 5, TNX 3D, and TRW 4R were 13,000, 12,000, 14,000, and 14,000 µg/L, respectively. Monitoring wells (i.e., TVM 2M and TVM 4M) inside the treatment zone have experienced decreasing methane concentrations since the 2015 EO injections. Outside of the treatment zone, TRW 2 experienced increased methane concentrations (> 1,000 µg/L) starting in 2014. The methane concentration at TRW 2 has decreased since 2014 to 82 µg/L during the 4Q2021.

Nitrate concentrations decreased in the treatment zone at injection wells (i.e., TBG 4, TBG 5, and TNX 3D) after the 2008 and 2010 injections and continue to be low during 2021.

After the 2015 injections, nitrate concentrations decreased at injection wells, TBG 3, TRW 3, and TVM 1M. The nitrate concentrations throughout the treatment zone continue to remain low during 2021.

Total Volatile Fatty Acids. The total VFA concentrations were elevated immediately after the 2015 EO injection in the injection wells. Most of the injection wells had total VFA concentrations greater than 100,000 µg/L while TBG 4 and TBG 5 had total VFA concentrations of greater than one million µg/L. Since 2015, a decrease in total VFA concentrations has been observed at TBG 4, TBG 5, TRW 3, TRW 4R, and TVM 1M. The total VFA concentrations at TBG 4 have only slightly decreased between 2015 and 2021 with concentrations averaging 4.2 million µg/L. The total VFA concentration at TRW 3 has sharply declined since 2020. At the monitoring wells (i.e., TRW 1, TRW 2, TVM 2M and TVR 1A), total VFA concentrations have been detected at concentrations less than 100,000 µg/L, but detections have not been consistent with time.

Table 5–1. Rainfall (inches) at 400-D, 1973 to 2021

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
1973	5.19	4.52	6.54	5.03	3.05	7.7	4.3	2.74	4.07	0.87	0.32	3.99	48.32
1974	2.15	6.78	2.28	1.69	4.82	3.31	2.43	6.06	2.92	0	1.9	4.09	38.43
1975	3.42	6.04	6.05	4.38	6.46	4.72	10.91	1.37	7.06	0.74	3.15	4.03	58.33
1976	3.89	1.07	3.52	2.3	10.23	6.95	1.81	1.46	6.41	5.02	3.44	4.7	50.8
1977	3.33	3.25	7.6	1.3	1.23	2.91	1.47	7.1	3.06	4	2.46	4.15	41.86
1978	8.41	1.5	3.12	3.75	3.96	1.77	1.99	5.08	4.96	0.75	3.37	1.72	40.38
1979	3.48	9.49	3.06	4.54	7.45	1.37	5.57	7.14	6.13	0.82	6.38	2.35	57.78
1980	4.23	3.05	11.1	2.45	4.15	4.5	0.97	1.65	7.51	2.05	1.73	2.71	46.1
1981	0.72	3.8	4.16	2.64	3.7	4.96	4.56	6.18	0.06	3.04	0.66	8.86	43.34
1982	4.48	4.89	3.17	4.98	3.64	5.82	3.36	3.12	3.2	3.71	1.68	6.08	48.13
1983	4.09	7.12	5.36	5.43	2.4	3.44	1.63	5.32	2.54	2.42	4.35	4.03	48.13
1984	3.22	5.65	5.3	4.91	5.39	6.07	8.81	1.97	0.73	0.38	1.15	1.34	44.92
1985	2.64	5.71	1.01	1.53	1.79	6.25	8.9	4.15	0.2	5.53	7.16	2.7	47.57
1986	1.14	2.8	3.07	0.48	2.48	5.01	1.66	8.13	0.52	2.52	4.7	3.96	36.47
1987	6.49	6.65	3.85	0.28	1.39	4.69	2.45	1.73	4.64	0.19	2.34	1.27	35.97
1988	3.55	5.3	2.04	6.18	1.56	6.94	1.76	5.04	5.06	2.45	1.81	1.15	42.84
1989	1.78	3.17	4.56	4.72	2.42	5.73	7.39	0.23	5.11	4.57	2.61	2.37	44.66
1990	2.05	3.51	3.19	0.29	1.1	1.22	4.8	5.23	0.44	17.12	1.26	1.67	41.88
1991	7.49	2	7.15	4.9	3.09	2.58	9.11	8.59	1.52	0.53	1.01	3.34	51.31
1992	3.59	4.86	3.27	2.48	2.15	7.55	7.29	6.27	3.58	3.91	6.64	1.95	53.54
1993	7.92	2.55	9.7	1.3	2.24	8.65	1.85	3.06	6.42	0.87	1.84	2.25	48.65
1994	4.71	4.49	6.72	1.29	1.66	7.33	6.08	3.62	2.33	8.98	2.86	4.71	54.78
1995	5.28	6.06	2.47	0.17	2.28	7.24	4.2	6.86	3.95	2.11	2.49	4.47	47.58
1996	2.6	2.05	6.26	1.69	1.6	3.65	4.89	7.93	3.72	1.98	1.5	2.74	40.61
1997	4.14	5.1	1.98	3.42	1.69	6.82	6.54	1.37	5.41	4.74	4.29	7.93	53.43
1998	7.76	6.26	7.86	7.14	4.2	2.86	7.53	2.98	6.33	0.65	0.57	1.89	56.03
1999	6.9	2.26	2.98	2.12	2.59	7.37	6.36	5.46	3.45	2.18	0.65	0.91	43.23
2000	5.11	0.77	4.26	1.62	0.21	5.85	3.86	4.15	9.11	0.06	3.33	1.61	39.94
2001	2.69	3.05	7.28	1.43	3.24	6.54	2.19	3.14	3.31	0.18	1.12	0.57	34.74
2002	2.04	2.23	4	1.59	1.63	3.9	4.41	4.55	3.72	4.57	3.94	3.86	40.44
2003	2.07	5.31	8.07	8.64	6.81	9.18	10.14	3.96	2.63	3.39	1.19	2.26	63.65
2004	2.7	7.11	0.86	1.28	2.79	7.83	2.91	1.96	7.05	0.59	2.74	2.54	40.36
2005	2.35	4.43	6.07	1.26	4.12	9.57	5.19	4.64	2.07	2.95	2.53	6.4	51.58
2006	3.19	2.61	1.35	2.29	2.34	6	5.26	1.59	2.81	1.77	3.76	4.4	37.37
2007	3.18	2.87	1.7	2.48	1.23	5.42	4.97	3.04	0.91	1.47	0.14	9.67	37.08
2008	4	5.89	4.66	2.35	2.42	0.27	6.82	6.86	0.57	4.47	2.93	5.13	46.37
2009	2.03	0.8	4.25	5.86	8.21	1.72	4.47	7.67	5.74	2.89	4.56	9.75	57.95

Table 5–1. Rainfall (inches) at 400-D, 1973 to 2021 (*Continued/Ended*)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
2010	4.9	2.62	2.5	1.71	1.34	7.29	2.39	7.04	2.51	0.48	1.45	1.41	35.64
2011	2.2	4.95	5.67	3.53	1.17	2.81	2.5	2.54	2.38	1.86	2.68	1.91	34.2
2012	1.91	1.59	3.07	1.43	6.96	3	5.27	9.85	1.55	0.54			35.17
2013*			1.75	1.05		5.64	4.99			0.08	1.64	4.64	19.79
2013**	0.68	13.5	4.44	4.09	2.6	7.15	13.29	6.69	0.6	2.45	0.83	4.84	61.16
2014	2.77	5.22	3.15	3.69	4.08	5.2	6.1	3.8	4.46	1.13	3.88	5.17	48.65
2015	3.47	5.09	4.12	7.08	0.35	6.03	4.33	2.81	4.64	4.99	7.25	5.36	55.52
2016	2.8	4.8	3.45	3.51	5.58	6.87	4.06	5	6	4.8	0.26	5.54	52.67
2017	4.5	1.43	1.57	7.23	3.41	6.53	3.26	3.27	6.12	1.27	1.58	4.9	45.07
2018	2.4	1.96	4.04	4.08	8.39	5.25	5.32	1.77	3.45	3.92	7.58	7.24	55.40
2019	4.96	1.09	2.67	4.12	1.78	7.75	1.21	1.93	1.79	4.42	4.39	8.69	44.80
2020	5.51	10.3	4.76	5.65	2.77	4.13	3.52	4.84	6.53	0.48	2.15	2.26	52.94
2021	4.17	8.01	2.99	1.69	2.23	4.26	6.21	5.81	3.51	2.6	0.28	5.13	46.89
Average	3.83	4.21	4.33	3.21	3.33	5.27	4.65	4.38	3.80	2.73	2.77	3.94	**46.28**
Max	8.41	10.34	11.1	8.64	10.23	9.57	10.91	9.85	9.11	17.12	7.58	9.75	**63.65**
Min	0.72	0.77	0.86	0.17	0.21	0.27	0.97	0.23	0.06	0	0.14	0.57	**34.2**

*Incomplete 2013 precipitation data from the D-Area meteorological station (400-D).
**Precipitation data from the K-Area meteorological station.

Table 5–2. Constituents Exceeding USEPA NPDWS MCLs in T-Area Wells During 2021

Aquifer	Monitoring Category	TAOU Groundwater Monitoring Constituents					
		Trichloroethylene (TCE)	Cis-1,2-Dichloroethylene	Uranium (total recoverable)	1,4-Dioxane*	Combined Radium (226 and 228)	Adjusted Gross Alpha
Unconfined UTRAU/GAU	Background						
	Primary		X	X	X	X	
	Secondary						
	Auxiliary	X		X		X	X
	Recovery	X					

NOTES:
X = Constituents Exceeding USEPA NPDWS MCLs or RSL*
UTRAU/upper GAU = Upper Three Runs Aquifer Unit/ Gordon Aquifer Unit
USEPA NPDWS MCLs = USEPA National Primary Drinking Water Standards MCLs (USEPA 2001)
*USEPA RSL for drinking water

6.0 EVALUATION OF FIELD AND ANALYTICAL RESULTS

Analytical results and field parameters for the 2Q2021 and 4Q2021 are included in Tables B-1 and B-2. Two dimensional planar and cross section maps displaying 4Q2021 results, for selected constituents, are shown in Figures A-13 through A-24. Figures A-32 through A-41 provide a comparison of pre-EO injection parameters with 4Q2021 results. Hydrographs and time series plots of selected constituents are provided in Appendix D and Appendix E, respectively.

6.1 Potentiometric Surface

The water table was initially drawn down during the operation of the four extraction wells between 1996 and 2007. The termination of extraction in 2007 allowed the water table to rebound. In response to the rebound, the water table elevation increased significantly in TRW 1, TRW 2, TRW 3, and TRW 4R, and to a lesser extent in most of the other wells. The EO injections are thought to have only temporarily affected the water table elevation during injection, and there is no evidence of long-term impacts.

Between 2012 and 2013, above average precipitation totals caused most wells to experience a 2 to 5 ft increase in water elevation. The increased water elevations were sustained at most monitoring wells until 2017 when water elevations decreased into 2018. Above average precipitation in 2018 was first observed as an increase in water elevation during the second half of 2018 at monitoring wells located in the wetlands and during the first half of 2019 in monitoring wells on the TAOU cap. In 2021, the total annual precipitation was 46.9 inches, which is higher than the 40-year average of 46.28 inches. The water elevation at most monitoring wells near the TAOU cap decreased in 2021 from the previous increase during the first half of 2020. Most of the wetland wells experienced only a slight decrease in water elevation in 2021. The changes in water elevation did not have a significant effect on groundwater flow directions with the predominant flow direction continuing to be in the southwest toward the Savannah River.

6.2 pH

Low pH conditions at TNX are defined as a pH less than 5. Background pH conditions in groundwater are approximately 5.5. Low pH conditions have previously been observed in the groundwater at discrete locations in the TNX Area OU. The low pH conditions beneath the TAOU cap are likely the result of groundwater in contact with nitric acid and the uranyl nitrate that was associated with the TBG. Low pH conditions observed in the wetlands may be a combination of naturally occurring low pH conditions as wells as disposal of nitrates at the OTSB and TNX OD. The low pH conditions have been correlated to elevated radium activity, uranium concentration, and nitrate/nitrite as nitrogen concentration, see Section 6.5 and 6.6 for more detailed discussion.

During the 4Q2021, there were two wells (i.e., TBG 3 and TNX 15D) with a pH of less than 5 (Figure A-14). TBG 3 had the lowest pH results during 2021 and has had a history of pH fluctuating above and below 5. At TBG 3, water elevations greater than 98 ft msl generally correlate to a lower pH (< 5) (Figure A-28). On a similar note, elevated nitrate/nitrite as nitrogen concentrations at TBG 3 also correlate to elevated water elevation (Figure A-29). This could indicate that there is source material (i.e. nitrates) in the capillary fringe near TBG 3 and as the water table rises and contacts source material the pH decreases.

A low pH (< 5) plume has been previously depicted between XSB006R and the TIR 1 well cluster but in 4Q2021 the pH at these wells was greater than 5. The TIR 1 well cluster has a history of pH being less than 5 at all three screens (i.e., -1U, -1M, and -1L). The pH at XSB006R has been less than 5 twice since it was initially sampled in 2019. The low pH at XSB006R, may be an indication that there is a low pH source associated with either the OTSB or the OD. This relationship will continue to be monitored and reported on in subsequent annual reports.

The EO injections added a basic solution to buffer the lower pH of the groundwater to a pH of between 6 to 8 to promote bacterial activity. After the 2008 and 2010 injections, elevated pH (> 6) was observed in three of the injection wells, TBG 4, TBG 5, and TNX

3D. A basic solution was also added during the 2015 EO injections; however, the aquifer was not buffered as much as during the 2008 and 2010 injections. In 2021, the maximum pH results at TBG 4, TBG 5, TNX 3D were 6.6, 6.8, and 6, respectively, which are on the low end of the desired range to promote biological activity.

6.3 VOC Constituents (i.e., PCE, TCE, Cis-1,2-DCE, VC, Ethylene, and CCl_4)

The T-1 Air Stripper and associated recovery wells removed a significant amount of VOC mass from the groundwater at TNX Area OU. Monitoring wells located in the source area (i.e., TBG 3, TBG 4, and TBG 5) as well as the downgradient monitoring wells (i.e., TNX 3D, TNX 11D, and TNX 27D) experienced decreasing TCE and PCE concentrations during operation of the T-1 Air Stripper (i.e., 1996 to 2007). When the T-1 Air Stripper was temporarily shut down (i.e., 2005 to 2007) during the installation of the TAOU cap, TCE and PCE concentrations rebounded revealing a residual source was still present in the source area. The EO treatability study was designed to target the residual source and further reduce VOC mass in the groundwater. Since the 2015 EO injections, the TCE concentrations within the treatment zone have steadily declined, depleting source concentrations and has had a direct effect on the TCE concentrations observed in the wetland wells. As source TCE concentrations have declined, distal TCE concentrations have concurrently declined (Figure A-27). Figure A-27 provides a comparison of the average fourth quarter TCE concentrations for eight monitoring wells (i.e., TBG 3, TBG 4, TBG 5, TNX 3D, TRW 1, TRW 2, TRW 3, and TRW 4R) located on the TAOU cap in the source plume and seven wells (i.e., TCM 5, TIR 1U, TNX 15D, TNX 16D, TNX 27D, TNX 28D, and TNX 30D) located in the wetlands or distal plume. From 2018 to 2020, both of the average TCE concentrations were less than the MCL (5 µg/L). In 2021, the source plume average was greater than the MCL (5 µg/L) with a concentration of 5.5 µg/L and the distal plume average continued to be less than the MCL (5 µg/L). The average source plume TCE concentration was greater than the MCL because of elevated TCE concentrations at TRW 2 and TVM 1M.

The general decreasing TCE concentrations at most monitoring wells on the TAOU cap and in the wetlands is a good indicator that the EO injections have been successful at

removing TCE mass from the source area. However, there were a few monitoring wells (i.e., TRW 2, TNX 28D, and TVM 1M) in 2021 that exceeded the MCL for TCE. TRW 2 is located on the TAOU cap and has had a variable TCE trend since EO injections began in 2008. This well is located downgradient of the EO injection wells and the variable TCE concentrations are likely caused by treated groundwater flowing from the upgradient injection wells. Treated groundwater flowing toward TRW 2 is also evident by the changing EO parameters (i.e., decreasing DO, decreasing ORP, increasing methane, and denitrification). After the 2015 EO injections, TCE concentration at TRW 2 have generally been greater than the MCL. This could be an indication that the 2015 EO injections at TRW 3 displaced the TCE plume toward TRW 2. TRW 2 exceeded the MCL for TCE in both 2Q2021 and 4Q2021. TNX 28D is in the wetlands and has experienced TCE concentrations that have been above and below the MCL. A slug of elevated TCE concentrations were observed at TNX 28D from 2016 to 2018. Since 2019, TCE concentrations at TNX 28D have fluctuated above and below the MCL. In 2021 that trend continued with a 2Q2021 TCE concentration of 3.32 µg/L and a 4Q2021 TCE concentration of 6.71 µg/L. The TCE concentrations at TRW 2 and TNX 28D are located downgradient of the EO treatment zone and represent a groundwater plume that is detached from the source. TVM 1M is also located on the TAOU cap but within the EO treatment area. It was used as an injection well during the 2015 EO injection campaign. After the 2015 injections, TCE concentrations decreased to less than the MCL from 2017 to 2020. In 2021, TCE concentrations at TVM 1M were 8.33 µg/L and 8.95 µg/L for 2Q2021 and 4Q2021, respectively. The increase in TCE concentration at TVM 1M could be an indication that the effects of EO are deteriorating and the TCE groundwater plume is rebounding in concentration.

Cis-1,2-DCE was observed at the monitoring wells in the source area (i.e., TBG 3, TBG 4, TGB 5, TNX 3D, and TRW 1) prior to the injection of EO. Like TCE and PCE, cis-1,2-DCE concentrations decreased as VOC mass was removed by the operation of the recovery wells and T-1 Air Stripper. After the 2008 and 2010 EO injections, cis-1,2-DCE concentrations began to increase at wells near the treatment area indicating TCE degradation is likely occurring. This is evident at TBG 5 where cis-1,2-DCE

concentrations have had an increasing trend since 2008, exceeding the MCL (70 µg/L) in 2014 and 2015. After the 2015 EO injections, cis-1,2-DCE concentrations decreased slightly before resuming an increasing trend into 2021. The increasing cis-1,2-DCE trend could indicate that the degradation pathway at TBG 5 is slowing at cis-1,2-DCE but not stalling as VC and ethylene are also present at TBG 5. In 4Q2021, the cis-1,2-DCE concentration exceeded the MCL with a concentration of 73.9 µg/L and was less than the MCL in 2Q2021 with a concentration of 53.6 µg/L. TRW 4R and TVM 1M are other monitoring wells in the treatment zone that have had increasing cis-1,2-DCE concentrations approaching the MCL since the 2015 EO injections. In the wetlands, cis-1,2-DCE concentrations have been below the detection limit since the 2015 EO injections and continue to be below detection limits in 2021.

There were no VC concentrations that exceeded the MCL (2 µg/L) during 2021. Detections of VC have been localized to the EO treatment zone. Since the 2015 EO injections, VC concentrations have been detected in monitoring wells TBG 5 and TRW 4R. The presence of VC at TBG 5 and TRW 4R is an indication that the degradation process is progressing. Although cis-1,2-DCE concentrations are increasing at these two wells, the presence of VC is an indication that the degradation process is ongoing.

Elevated ethylene concentrations were observed immediately after the 2008 and 2010 EO injections at injection wells TBG 4, TBG 5, and TNX 3D. After the 2015 EO injections, ethylene concentrations increased at TBG 3, TBG 4, TBG 5, TRW 3, and TVM 1M. Since the increase in ethylene concentrations in 2015, ethylene concentrations have steadily decreased but remain at detectable concentrations into 2021 at TBG 3, TBG 4, and TBG 5. The presence of ethylene is another indicator that the process is completely degrading TCE and daughters.

CCl_4 concentrations declined to below the detection limit at TBG 3 after the 2015 EO injections and continue to be less than the detection limit in 2021. It is uncertain what process is causing the decline in CCl_4 concentrations at TBG 3, but it is likely the same processes degrading the TCE are also degrading the CCl_4.

6.4 Edible Oil Parameters

The injection of EO into the groundwater during 2008, 2010, and 2015 converted the aerobic aquifer to a reducing environment. The EO parameters monitor for methane, DO, ORP, TOC, sulfate, and nitrate to identify areas that have become anaerobic and potentially where reductive dechlorination is occurring. The reductive environment created in the EO treatment area is illustrated in Figures A-32 through A-37 which compares pre-injection groundwater parameters to post-injection parameters collected during the 4Q2020. Time series trends for these parameters are presented in Appendix E. Evidence of a reductive environment in the treatment area includes:

- DO has decreased in the treatment area.
- TOC is elevated in the treatment area.
- ORP results indicate more reductive conditions in the treatment area.
- Sulfate concentrations indicate a sulfate reduction in the treatment area.
- Methane concentrations increased at injection wells.
- Denitrification (decreasing nitrate concentrations) occurred in the treatment area.

The DO at all the injection wells decreased immediately after the injection of EO indicating that the aquifer turned anaerobic. As the oxygen in the aquifer was consumed, reductive conditions became more prevalent and eventually lead to conditions favorable for reductive dechlorination. After the 2008 EO injections, DO concentrations were less than 1 mg/L at most of the injection wells. DO concentrations were starting to increase before the 2015 EO injections and declined to concentrations between 1 mg/L and 4 mg/L immediately after the 2015 EO injections. Since the 2015 EO injections, DO concentrations have become more variable with a general increasing trend at most injection and monitoring wells. In 2021, DO concentrations continue to increase at injection and monitoring wells within the treatment area (Figure A-32). The increase in DO concentrations could be the result of clean upgradient water migrating under the TAOU cap and into the treatment zone. The upgradient water would have background DO concentrations (i.e., 6-8 mg/L) causing the lower EO induced DO concentrations to increase. The rising DO

measurements could also be an indication that the anaerobic conditions created by the EO are diminishing as EO is consumed and becoming limited in the aquifer.

After the EO injections, TOC concentrations increased in the injection wells from approximately 1,000 µg/L to greater than 100,000 µg/L. This is evident at all the injection wells including 2015 injection wells, TBG 3 and TRW 3. An increase in TOC reflects the introduction of carbon associated with the EO injections. After each of the injections, TOC concentrations spiked and generally began to decline at the injection wells. The decrease in TOC is an indication that some of the carbon introduced into the aquifer has been dispersed into the aquifer or utilized by microbial activity. In 2021, TOC concentrations continue to be elevated at the 2015 injection wells. TBG 3 experienced an increase in TOC during the 4Q2019 and have slowly declined through 2021. The increased TOC at TBG 3 might be the result of an elevated water table (2Q2019 and 2Q2020) coming in contact with neat oil deployed in the deep vadose zone and capillary fringe at upgradient SVE wells (i.e., TVX002L, TVX003L, TVX004L, and TVX005L). Injection wells TNX 3D, TRW 3, and TVM 1M are three injection wells that have declining trends approach background concentrations of approximately 1,000 µg/L.

The ORP results are generally lower within the EO treatment zone and provide evidence that the EO has created reductive conditions within the aquifer. ORP results at injection wells (i.e., TBG 4, TBG 5, TNX 3D, TRW 3, TRW 4R, and TVM 1M) decreased to values of < -100 mV after each injection of EO. The low ORP results at these wells are an indication that there is still a large portion of the EO treatment area that is experiencing reductive conditions (Figure A-34). Through 2021, ORP results are slowly increasing to less negative values providing another indication that conditions in the aquifer are become less anaerobic. Monitoring wells (i.e., TNX 27D and TRW 2) located on the downgradient side of the treatment zone have also experienced decreasing ORP results after the 2015 EO injections. This was evidence that reductive conditions created by the EO migrated downgradient of the treatment area with groundwater flow. Exceptions to the low ORP results in the treatment area occur at TBG 3, TVM 2M, TVM 4M, and TVR 1A. The ORP results at TBG 3 steadily decreased from 2015 to 2018 but increased sharply during 2019. In 2021, the ORP results continue to be elevated. Other monitoring wells TVM 2M, TVM

4M, and TVR 1A also experienced a decrease in ORP results after EO injections but currently have increasing ORP trends in 2021. The increasing ORP results at these four wells could be an indication that background conditions (i.e., more oxygenated groundwater) are being restored at these monitoring wells.

Decreased sulfate, increased methane, and denitrification are further indicators for the presence of a reducing environment and suggest reductive dechlorination could be occurring. In comparison to 2007 sulfate concentrations, 2021 sulfate concentrations have been reduced in the treatment area (Figure A-35). Evidence of sulfate reduction is the most apparent at injections wells (i.e., TBG 5, TRW 4R and TVM 1M) with decreasing sulfate concentrations occurring after the 2015 EO injections. Methane concentrations increased immediately after each injection at the injection wells and are also elevated at some of the monitoring wells. Methane concentrations have remained elevated within the treatment zone through 2021. The exception are two monitoring wells (i.e., TVM 2M and TVM 4M). The presence of methane is an indication that highly reductive conditions are present in the aquifer and that reductive dechlorination of VOCs is likely occurring. Decreasing nitrate concentrations is evidence that reductive conditions have progressed enough to allow dechlorination of VOCs. Denitrification is apparent throughout the treatment zone but is most noticeable at injection wells (i.e., TBG 3, TBG 4, TRW 3, and TVM 1M) and monitoring wells (i.e., TRW 1, and TRW 2).

VFAs indicate the general presence and longevity of EO in the subsurface. EO is composed of long chain fatty acids, and as these fatty acids are consumed, they are broken into short chain fatty acids or VFA. After the 2015 injections, total VFA concentrations were detected at injection wells and monitoring wells. Since 2015, the concentration of VFA have decreased sharply at some of the injection wells (i.e., TBG 5, TRW 3, TRW 4R, and TVM 1M) while only decreasing slightly at other injection wells (i.e., TBG 3 and TBG 4). VFA concentrations were also detected in the monitoring wells (i.e., TRW 1, TRW 2, TVM 2M, and TVR 1A) between 2016 and 2017 suggesting that EO was distributed out into the aquifer. The concentration of VFAs observed at these four monitoring wells have not been sustained after 2017 and were an order of magnitude lower than those concentrations observed at the injection wells.

6.5 Uranium, Combined Radium, and Adjusted Gross Alpha

The adjusted gross alpha activity is calculated to exclude naturally occurring uranium-234, uranium-235, and uranium-238 activity from the gross alpha activity. A description of the calculation is provided in Appendix C. In previous reports, the gross alpha activity was incorrectly compared to the adjusted gross alpha MCL (15 ρCi/L). To correct this inaccuracy, the 2020 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report (SRNS 2021) included a detailed discussion of the historical exceedances of the MCL for adjusted gross alpha activity and which monitoring wells those exceedances occurred at. It was determined that detections of adjusted gross alpha tend to be co-located with combined radium detections and low pH conditions near the TBG and this correlation is less prominent in the wetlands. In the wetlands, naturally occurring uranium is the dominant radionuclide affecting the adjusted gross alpha activity.

Although radium-226 is the potential contaminant of concern, the MCL is measured for the sum of radium-226 (uranium decay series) and radium-228 (thorium decay series) or combined radium. Detections of combined radium are sparse, do not define a discernible groundwater plume, and are associated mainly with the TBG and occasionally in the fluvial sediments of the wetlands.

Detections of uranium are sparse, do not define a discernible groundwater plume, and are associated with the TBG, OTSB, DG, OD, and naturally occurring uranium in the fluvial sediments of the wetlands. Uranium isotope data collected between 1998 and 2004 was evaluated in the *Addendum to the CERCLA Facility Investigation/Remedial Investigation/Baseline Risk Assessment (RFI/RI/BRA) Report for the TNX Area Operable Unit, Groundwater Radiological Characterization* (WSRC-RP-2001-4180). Figure A-30 graphs the mass of the three uranium isotopes (i.e. uranium-238, -235, and -233/234) with the total uranium mass. In Figure A-30, the percent mass of the uranium isotopes is comparable to naturally occurring uranium (i.e., uranium-238 [99%], uranium-235 [0.7%], and uranium -234 [0.005%]). It has also been observed that a combination of increasing

water elevation, oxidizing and reducing environments, and high and low pH influences the solubility of uranium in a particular groundwater sample.

Groundwater in the TNX Area OU monitoring wells exceed the MCLs for the respective radionuclide near the TBG (area under the TAOU cap) and in the wetlands near the OTSB and TNX OD. The area under the TAOU cap has been further altered by the EO injections. In the wetlands, in addition to being sourced by the OTSB, naturally occurring radionuclides are present in the organic rich fluvial sediments which are entrained within the aquifer sediments.

TBG (Area under the TAOU Cap). Uranium has been the recent radiological constituent to exceed the MCL (30 µg/L) under the TAOU cap. In 2021, uranium concentrations did not exceed the MCL under the TAOU cap. The elevated uranium concentrations observed between 2019 and 2020 at TBG 3 are likely related to the lower than average pH that ranged from 3.2 to 4.2 between the same time frame (Appendix E, page E-334). In 2021, uranium concentrations at TBG 3 continue to slowly decline as pH slowly increases. The uranium concentration at TBG 4 did not exceed the MCL during 2021. Uranium concentrations at TBG 4 have been decreasing since concentrations peaked in 2014. The previous exceedances at TBG 4 may have been associated with the increased solubility of uranium caused by high pH and a reductive environment (Appendix E, page E-335). The reductive environment and elevated pH conditions (i.e., sodium bicarbonate buffer added during EO injections) at TBG 4 were initiated after the EO injections in 2008 and 2010. After the 2015 injection, pH at TBG 4 decreased to approximately 6 and subsequently uranium concentrations have also decreased. Elevated uranium concentration during low pH conditions (< 5) at TBG 3 and elevated uranium concentrations during high pH conditions (8-10) at TBG 4 are indications of the complex geochemistry that is occurring in the groundwater under the TAOU cap. The complex geochemistry is a result of the previous EO injections. The relationship between uranium and pH is presented on time series graphs in Appendix E.

Combined radium has historically exceeded the MCL (5 ρCi/L) at monitoring wells TBG 3 and TBG 4. The exceedances at these monitoring wells appear to be associated with lower

pH created from nitric acid releases from the TBG. The solubility of radium increases with decreasing pH. This relationship between combined radium and pH is presented on time series graphs in Appendix E (Pages E-122 and E-123). Combined radium activities at TBG 3 and TBG 4 exceeded the MCL before the TAOU cap was constructed 2006. After the TAUO cap was constructed 2006, there is less of a correlation between combined radium and pH indicating that limited infiltration under the cap may have broken the migration pathway of the nitric acid source resulting in reduced impacts to groundwater. After 2006, combined radium activities declined at TBG 3 and TBG 4. The declining combined radium activities at TBG 3 correlates to an increase in pH at the end of 2006. The pH at TBG 3 was not directly impacted by the 2015 EO injections. In 2019 to 2021, lower than average pH (3-4) was experienced at TBG 3 but the combined radium activity was not directly affected. The combined radium activity at TBG 4 steadily declined from 2006 to 2010. During that time, the pH at TBG 4 increased slightly between 2006 and 2008 but increased sharply the 2010 EO injection. Although the combined radium activity was already declining leading into 2010, combined radium activity has not exceeded the MCL since 2010. There were no exceedances for combined radium at TBG 3 and TBG 4 during 2021. The combined radium activity did exceed the MCL at TNX 5D during 4Q2021. TNX 5D is located just outside of the TAOU cap and is outside of the TBG source area. TNX 5D has a sporadic history of exceeding the MCL for combined radium.

Adjusted gross alpha historical exceedances under the TAOU cap are most associated with TBG 3 and TBG 4. The adjusted gross alpha exceedances at TBG 3 and TBG 4 that occurred between 2000 and 2007 correlate to elevated combined radium activities and low pH (i.e., refer to time series graphs in Appendix E, pages 41 through 46). TBG 5, TIR 1U, and TNX 3D also had adjusted gross alpha results exceed the MCL (15 ρCi/L) but these exceedances are sporadic and cannot be directly correlated to combined radium activity or pH. In 2021, there were no exceedances of the MCL for adjusted gross alpha activity at monitoring wells under the TAOU cap.

Wetlands. The OTSB and fluvial sediments are two potential sources of radiological constituents in the wetlands. The exceedances of radiological constituents in the wetlands

are mostly sporadic and there is not a discernible groundwater plume for any radiological constituent in the wetlands.

Uranium concentrations are mostly sporadic in the wetland monitoring wells with one exception (i.e., TCM 5). Uranium concentrations have regularly exceeded the MCL at TCM 5 since 2005 with a couple of concentrations between 2014 and 2016 that were less than the MCL. In 2021, uranium concentrations at TCM 5 were less than the MCL in 2Q2021 with a concentration of 13.9 µg/L and exceeded the MCL in 4Q2021 with a concentration of 36.1 µg/L. It is not clear if the uranium observed at TCM 5 is sourced from TNX processes or is naturally occurring. TCM 5 is located downgradient of the OD which received overflow from the OTSB. The monitoring wells downgradient of TCM 5 (i.e., TNX 16D, TNX 15D, TNX073D, TNX074D, and TNX075D) typically have uranium concentrations that are below detection limits which is an indication that the uranium observed at TCM 5 is localized and not migrating with groundwater.

Most of the occurrences of combined radium in the wetland are sporadic or one-time occurrences. The sporadic nature of the combined radium exceedances is likely due to naturally occurring radium in the fluvial sediments beneath the wetlands. In 2021, there were three wetland monitoring wells (i.e., TIR 1M, TIR 1U, and TNX 8D) that exceeded the MCL (5 ρCi/L) for combined radium activity.

Adjusted gross alpha exceedances in the wetlands are sporadic. Two monitoring wells, TCM 5 and TIR 1U, have experienced historic adjusted gross alpha activity exceedances. In 2021, TCM 5 and TIR 1U did not exceed the MCL (15 ρCi/L). The MCL for adjusted gross alpha activity was exceeded at TNX 72D in 4Q2021. This is the first time the MCL for adjusted gross alpha has been exceeded at TNX 72D. The sporadic nature of the adjusted gross alpha exceedances in the wetlands is an indication that most of the detections are associated with uranium as is indicated by the uranium concentrations at TCM 5.

6.6 NO_3/NO_2 as N and Mercury

The NO_3/NO_2 as N graph is presented with pH to show the relationship that decreases in pH correspond with increases in NO_3/NO_2 as N concentrations. Uranyl nitrate was

disposed of at the TBG, and as water infiltrated the burial ground, nitric acid was produced causing low pH (< 5) in the groundwater. Low pH and NO_3/NO_2 as N concentrations above the MCL were observed at TBG 3 and TBG 4 between 2001 and 2005. After the TAOU cap was completed in 2006, the amount of infiltrating water contacting the source of NO_3/NO_2 as N was reduced decreasing the concentration observed at TBG 3 and TBG 4. After 2006, the NO_3/NO_2 as N concentrations decreased to less than the MCL (10 mg/L) as pH increased (Appendix E). At TBG 4, NO_3/NO_2 as N concentrations decreased steadily after 2006 and became less than the MCL in 2010. The pH at TBG 4 was less than 5 until 2010 when the EO injections increased pH to approximately 10. Since the 2008 and 2010 EO injections, NO_3/NO_2 as N concentrations have been less than the MCL at TBG 3 and TBG 4. NO_3/NO_2 as N concentrations has also exceeded the MCL at other wells located on the TAOU cap, but most of those exceedances were sporadic. NO_3/NO_2 as N concentrations at TNX 27D exceeded the MCL from 2006 to 2008 and have not exceeded the MCL since 2008. There were no wells that exceeded the MCL in 2021.

Mercury is graphed only for TBG 4 since it is the only well that has had a trend of mercury concentrations above the MCL (2 µg/L). Mercury concentrations declined from 2007 to 2010 after the TAOU cap was completed in 2006. After 2010, mercury concentrations have been less than the MCL. Mercury concentrations did not exceed the MCL at TBG 4 during 2021. The new monitoring well XSB006R had a mercury concentration that exceeded the MCL in 4Q2019 but were less than the detection limit in 2021. Mercury at monitoring well XSB006R will continue to be monitored and evaluated.

6.7 1,4-Dioxane

1,4-Dioxane sampling was initiated at all monitoring wells in 2013. In 2019, 1,4-dioxane was analyzed for using two methods, EPA 8260BSIM and EPA 522. Method EPA 8260BSIM is certified by the SCDHEC. Method EPA 522 is not certified by SCDHEC but is the only method that can achieve detection limits lower than the RSL (0.46 µg/L). TBG 3 and TBG 5 exceeded the RSL for 1,4-dioxane during 2021. TBG 5 has a history of exceeding the RSL, and TBG 3 exceeded the RSL for the first time in 4Q2021. 1,4-Dioxane is a common stabilizer added to chlorinated solvents to reduce volatilization. The

1,4-dioxane contamination at TNX was likely associated with the solvents that were included in the debris buried at the TBG source area. Using the low detection analytical method, EPA 522, indicates that there is not an extensive 1,4-dioxane plume associated with TNX OU groundwater. The 1,4-dioxane plume is localized to the TBG source area.

There were three wells (i.e., TBG 4, TVM 1M, and TVM 4M) with results analyzed using the noncertified method EPA522 that were rejected by the laboratory for exceeding hold times during 2Q21. It is unfortunate that these results were rejected, but these wells had corresponding non-detect results from the certified method EPA8260BSIM during the 2Q21 sampling event. The 4Q21 1,4-dioxane results had no issues for either of the analytical methods.

7.0 SYSTEM PERFORMANCE

7.1 Soil Vapor Extraction (SVE) Operations

During 2021, the MicroBlowers™ were connected to TVM 1V, TVM 3V, TVM 4U, TVX 4U, and TVX 7U.

Table 7-1 provides details of construction, history, and duration each SVE well has been connected to a MicroBlower™. Vapor concentrations, flow rates, and the estimated time of operation for each SVE well are presented in Table 7-2. The data presented in Table 7-2 was used to determine the contaminant mass removed by each MicroBlower™. The contaminant mass removed at the MicroBlower™ is determined using vapor concentrations and the volume of air (ft^3) that passes through the MicroBlower™. The vapor concentration is multiplied by the volume of air that passes through the MicroBlower™ during a given month. Unit conversions are integrated into these calculations. The product provides the total mass removed from the MicroBlower™ for a given month. The MicroBlowers™ are sampled quarterly, so vapor concentrations and flow rates are assumed to be constant during the quarter. Table 7-3 summarizes the total VOCs removal per month, during 2021.

In 2021, approximately 0.2 kg (0.47 lb) of VOCs (i.e., 0.12 kg [0.27 lb] of TCE, 0.09 kg [0.2 lb] of PCE, and 0.0 kg [0.0 lb] of CCl_4) were removed from the TNX vadose zone.

With diminishing mass removal rates at TNX, an evaluation of the TNX SVE wells was proposed to the Core Team on May 26, 2022. It was determined at that meeting that a summary of the proposed evaluation be included as an appendix in this report. Details of the proposal are presented in Appendix F.

7.2 Edible Oil Injections

EO treatment was selected as the remedial action for the remaining TCE groundwater plume in 2013. EO amendments were injected into the aquifer during 2008, 2010, and 2015. After the 2008 injections, aquifer conditions within the treatment area were changed to a reductive environment capable of degrading TCE and its daughter products. The 2010

and 2015 injections added additional EO expanding the treatment area or replenishing the original treatment area. TCE concentrations in the treatment area have continued to decrease and are currently less than the MCL (5 µg/L) at most monitoring wells. The reduced TCE concentrations in the source area have also corresponded to decreasing TCE concentrations at most of the wetland wells. Some monitoring wells (i.e., TCM 5, TRW 2, and TNX 28D) have experienced elevated TCE concentrations. These three wells define a TCE groundwater plume that is outside of the EO treatment area. The TCE groundwater plume is considered detached from the source area based on TCE concentrations from upgradient monitoring wells. TCE concentrations greater than the MCL have recently been observed at TVM 1M which is located within the EO treatment area. This well is an indication that TCE is still present at low concentrations within the treatment area.

To assess the effectiveness of the EO injections, the change in mass of the TCE groundwater plume was quantified and plotted with time from 2007 to 2021 (Figure A-31). Figure A-31 shows the exponential decline of the estimated VOC mass with time. The estimated annual mass of TCE in the plume is calculated based on the area of the TCE plume during the fourth quarter for a given year, the average concentration of the plume during that year, assuming a plume thickness of 20 ft, and a porosity of 0.3. The following equation was used to calculate the mass of TCE in the plume for each year between 2007 and 2021.

Average TCE Concentration x Plume Volume x Porosity = TCE Mass

Table 7-4 provides all the values used in the mass calculations. From 2007 to 2021 it is estimated that the mass of TCE in the plume has been reduced by 96%. In 2021, the mass of TCE rebounded as TNX 28D, TRW 2, and TVM 1M exceeded the MCL (Figure A-15). The 2021 TCE plume depicts a plume that is detached from the source with some residual mass returning elevated TCE concentrations to the source area. The detached TCE plume will continue to experience TCE concentrations above or near the MCL but without a connection to the source concentrations, concentrations are expected to decrease with time. The small plume depicted around TVM 1M represents a rebound of TCE concentrations in the source area. This rebound likely represents residual mass that is present within the

aquifer is not effectively treated by the EO injections. The concentrations observed at TVM 1M do not trigger the criteria established in the 2013 ESD to the ROD for additional EO injections. Some of the EO parameters within the treatment area indicate the anaerobic conditions created by the injections have been returning to more aerobic, background conditions. The lower TCE concentrations at TVM 1M could be the first indication that dichlorination is no longer occurring at that well. If this issue becomes more abundant at other monitoring wells within the treatment zone, then the desire to add additional EO will be discussed with the Core Team.

Table 7–1. Well Construction and Operation for TNX SVE Wells

STATION ID	Date Installed	Ground Elevation (ft msl)	Total Depth (ft)	Screen Length (ft)	MicroBlower™ Operation (yr)
TVM 1U	10/6/1995	157.7	51.8	10	2011, 2013, 2014, 2015, 2016, 2017
TVM 1V	10/18/1995	157.3	63	2	2009, 2010, 2018, 2019, 2020, 2021
TVM 2L*	10/17/1995	159.5	91.5	1	2013, 2014
TVM 2U	10/17/1995	159.5	60.7	10	2011, 2015, 2016, 2017
TVM 2V	10/19/1995	159.4	46.8	2	
TVM 3U	10/13/1995	158.9	67.6	10	2009, 2010, 2011, 2012
TVM 3V	10/20/1995	159	46	2	2009, 2010, 2018, 2019, 2020, 2021
TVM 4L*	11/22/1995	158.9	92.4	2	2010
TVM 4U	11/22/1995	158.9	63.4	10	2009, 2011, 2015, 2016, 2017, 2018, 2019, 2020, 2021
TVM 4V	11/22/1995	158.9	46.9	1	2011, 2013, 2014, 2015, 2016, 2017
TVX 1L	7/2/2002	153.2	58.4	15	2009, 2012
TVX002 L	6/27/2002	156.6	67.4	20	2011
TVX002 U	6/27/2002	156.5	42.5	10	2013, 2014
TVX003 L	7/3/2002	154.1	59.3	15	2012
TVX004 L	7/8/2002	153	56	12	2010, 2011
TVX004 U	7/8/2002	153.1	42.1	15	2009, 2010, 2018, 2019, 2020, 2021
TVX005 L	7/9/2002	155.2	57.5	10	2013, 2014
TVX005 U	7/9/2002	155.2	48.4	15	2010, 2011
TVX006 L	7/2/2002	155.2	68.3	15	2011, 2012, 2015, 2016, 2017
TVX006 U	6/27/2002	155.2	58.4	15	
TVX007 L	6/27/2002	159	64.1	15	2009, 2010
TVX007 U	6/27/2002	158.9	44.6	10	2009, 2010, 2012, 2018, 2019, 2020, 2021

* TVM 2L and TVM 4L are screened in the saturated zone and are no longer used as viable SVE wells.

This page intentionally left blank.

Table 7–2. Monthly SVE Well VOC Mass Removal (2021)

TVM-1V	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
Operating Time (hours)	372	324	372	360	372	360	360	372	360	372	360	348	4332	361
Downtime (hours)	372	372	300	360	372	360	384	372	360	372	360	396	4380	365
Total Solvent Removed (lbs)	0.000	0.000	0.000	0.009	0.009	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.002
Average Vapor Flow Rate (scfm)	11.2	11.2	11.2	10.2	10.2	10.2	7.7	7.7	7.7	12	12	12	NA	7.65
Average Concentration Influent (ppmv)	0.000	0.000	0.000	0.094	0.094	0.094	0.000	0.000	0.000	0.000	0.000	0.000	NA	0.023

TVM-3V	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
Operating Time (hours)	372	336	372	360	372	360	372	372	360	372	360	372	4380	365
Downtime (hours)	372	360	372	360	372	360	372	372	360	372	360	372	4404	367
Total Solvent Removed (lbs)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.009	0.09	0.01
Average Vapor Flow Rate (scfm)	18.92	18.92	18.92	19.7	19.7	19.7	18.4	18.4	18.4	14.8	14.8	14.8	NA	30.45
Average Concentration Influent (ppmv)	0.054	0.054	0.054	0.050	0.050	0.050	0.048	0.048	0.048	0.071	0.071	0.000	NA	0.050

TVM-4U	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
Operating Time (hours)	372	336	372	360	372	312	372	372	360	372	360	372	4332	361
Downtime (hours)	372	360	372	360	372	408	372	372	360	372	360	372	4452	371
Total Solvent Removed (lbs)	0.01	0.01	0.01	0.03	0.03	0.03	0.02	0.02	0.02	0.00	0.00	0.001	0.19	0.02
Average Vapor Flow Rate (scfm)	11.65	11.65	11.65	16.6	16.6	16.6	12.2	12.2	12.2	0.52	0.52	0.52	NA	18.275
Average Concentration Influent (ppmv)	0.146	0.146	0.146	0.247	0.247	0.247	0.198	0.198	0.198	0.197	0.197	0.197	NA	0.197

TVX-4U	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
Operating Time (hours)	372	336	372	360	372	360	372	348	348	372	360	372	4344	362
Downtime (hours)	372	360	372	360	372	360	372	396	372	372	360	372	4440	370
Total Solvent Removed (lbs)	0.000	0.000	0.000	0.008	0.009	0.008	0.000	0.000	0.000	0.000	0.000	0.027	0.052	0.004
Average Vapor Flow Rate (scfm)	6.6	6.6	6.6	10.9	10.9	10.9	6.7	6.7	6.7	12	12	12	NA	5.4
Average Concentration Influent (ppmv)	0.000	0.000	0.000	0.088	0.088	0.088	0.000	0.000	0.000	0.000	0.000	0.000	NA	0.022

TVX-7U	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
Operating Time (hours)	372	288	336	360	372	360	372	372	360	372	360	372	4296	358
Downtime (hours)	372	408	408	360	372	360	372	372	360	372	360	372	4488	374
Total Solvent Removed (lbs)	0.01	0.01	0.01	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.007	0.15	0.01
Average Vapor Flow Rate (scfm)	10.62	10.62	10.62	12	12	12	12.0	12.0	12.0	8.7	8.7	8.7	NA	12.25
Average Concentration Influent (ppmv)	0.093	0.093	0.093	0.233	0.233	0.233	0.092	0.092	0.092	0.099	0.099	0.099	NA	0.129

This page intentionally left blank.

Table 7–3. VOC Mass Removed by SVE (2021)

Month	TCE (lbs)	PCE (lbs)	CC14 (lbs)
January	0.0223	0.0069	0.0000
February	0.0197	0.0055	0.0000
March	0.0220	0.0064	0.0000
April	0.0349	0.0452	0.0000
May	0.0361	0.0467	0.0000
June	0.0318	0.0442	0.0000
July	0.0268	0.0076	0.0000
August	0.0268	0.0076	0.0000
September	0.0259	0.0074	0.0000
October	0.0077	0.0093	0.0000
November	0.0075	0.0090	0.0000
December	0.0077	0.0093	0.0000
Average Monthly Removed in 2021	0.0224	0.0171	0.0000
Totals	**0.2691**	**0.2053**	**0.0000**

Table 7–4. Estimated TCE Plume Mass

Year	Plume Area (ft^2)	Aquifer thickness (ft)	Plume Volume (ft^3)	Average concentration of >5ppb TCE Plume (ug/L)	Number of wells used in the average	Porosity	TCE Mass (kg)
2007	441,695	20	8,833,899	71.15	13	0.3	5.34
2008	326,697	20	6,533,949	37.20	9	0.3	2.06
2009	318,857	20	6,377,134	46.75	11	0.3	2.53
2010	292,721	20	5,854,418	14.08	9	0.3	0.70
2011	277,039	20	5,540,789	27.78	8	0.3	1.31
2012	301,433	20	6,028,657	22.15	11	0.3	1.13
2013	226,946	20	4,538,917	34.08	7	0.3	1.31
2014	309,274	20	6,185,472	12.92	9	0.3	0.68
2015	155,508	20	3,110,160	13.20	4	0.3	0.35
2016	141,569	20	2,831,378	12.07	2	0.3	0.29
2017	192,098	20	3,841,962	13.8	3	0.3	0.45
2018	0	20	0	1.47***	13	0.3	0
2019	182,951	20	3,659,011	5.95	1	0.3	0.18
2020	222,154	20	4,443,085	5.95	2	0.3	0.22
2021	232,609	20	4,652,172	16.1	3	0.3	0.64

***Fourth quarter data was utilized when determining the plume area and average TCE concentrations.**
****Unit conversions used in the TCE mass calculation: 28.32 L/ft^3; 1x10^9 µg/kg**
*****This average was created using all detect and estimated (J) TCE concentrations, since all TCE results were < 5 µg/L**

8.0 SUMMARY/RECOMMENDATIONS

8.1 Summary

The TNX Area OU monitoring well network is sampled semi-annually and consists of 43 monitoring wells. Constituents exceeding MCLs during 2021 include adjusted gross alpha, combined radium, cis-1,2-DCE, 1,4-dioxane, TCE, and uranium.

Monitoring data indicate that EO injection fluids were placed into the aquifer successfully, TCE concentrations are less than the MCL at most wells in the treatment area, and reductive conditions are present in the EO treatment area. Reduced TCE concentrations were already established at injection wells used during the 2008 and 2010 injections (TBG 4, TBG 5, TNX 3D, and TRW 4R) and continued after the 2015 injections. TCE concentrations were less than the MCL at some of the new 2015 injection wells (i.e., TBG 3, and TRW 3). TVM 1M exceeded the MCL for TCE in 2021. During 2021, reductive conditions (i.e., DO, ORP, etc.) are trending back towards natural aerobic conditions. The effects of diminishing reductive conditions may be evident at TVM 1M but are not widespread which is an indication that the EO injections have significantly reduced the TCE plume. TCE concentrations exceeding the MCL at other monitoring wells (i.e., TNX 28D, and TRW 2) are located downgradient of the EO treatment area. The remedial actions (i.e., EO and SVE) continue to provide effective treatment and source reduction of the groundwater at TNX Area OU. Future sampling events will be used to determine the longevity of the EO treatment and resulting TCE concentrations.

There is not a discernible and consistent groundwater plume with respect to adjusted gross alpha, combined radium, cis-1,2-DCE and uranium at TNX. Adjusted gross alpha and combined radium detections were sporadic and likely represent naturally occurring radionuclides. Cis-1,2-DCE detections were isolated to TBG 5. The uranium detection exceeding the MCL was associated with a monitoring well in the wetland (i.e., TCM 5).

There appears to be a localized 1,4-dioxane plume near TBG 3 and TBG 5 with sporadic detections at the other monitoring wells.

8.2 Recommendations

SRS recommends continued monitoring of the existing well network with the current sampling and analysis schedule (Table 4-2).

SCDHEC recommended adding a new monitoring well between TNX 28D and the TNX 72 well cluster, based on the history of TCE concentrations exceeding the MCL (5 µg/L) at TNX 28D since 4Q2016. This recommendation was provided to SRS as a comment on the *2017 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report*. SRS agreed to evaluate the TCE concentrations at TNX 28D for three consecutive years (i.e., 2019). The period of evaluation was extended to reporting year 2022 based on a series of TCE results that were less than the MCL in 2018 and 2019. A meeting with the USDOE, USEPA, and SCDHEC to discuss the need for and timing of the possible installation of a new monitoring well will be scheduled after the submittal of the *2022 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report* or prior to that if deemed necessary.

The five MicroBlowers™ at TNX have been operating since 2007 and have removed a total of 23.5 pounds of solvent. During their operation, the MicroBlowers™ have been rotated between 20 SVE wells and two monitoring wells (Table 7-1). While not connected to a MicroBlower™, the SVE wells are connected to BaroBalls™ to allow for continued venting of the unsaturated zone. The total annual pounds of solvent removed from the MicroBlowers™ have decreased with time with approximately one pound of solvent removed per year during the last five years. SRS is planning in fiscal year 2024 or 2025 to conduct an evaluation of the SVE wells to determine the future operational status of the MicroBlowers™. A meeting conducted on May 26, 2022 with the USDOE, USEPA, and SCDHEC proposed an evaluation of the SVE well network. A summary of that proposal is included in this report (Appendix F) for review.

9.0 REFERENCES

DOE, 2013. Letter, Brian T. Hennessey (DOE) to Van Keisler (SCDHEC) and Robert H. Pope (EPA), Submittal of the 2012 Comprehensive TNX Area Annual Groundwater and Effectiveness Monitoring Strategy Report (SRNS-RP-2013-00286, Revision 0, June 2013) and Savannah River Site Responses to the U. S. Environmental Protection Agency's Request for Additional Data (EPA Letter Dated February 27, 2013), CERCLIS Numbers: 21, 29, ACP-13-179, dated June 26, 2013, United States Department of Energy, Savannah River Operations Office, Aiken, SC

SRNL, 2012. *Treatability Study for Edible Oil Deployment for Enhanced cVOC Attenuation for T-Area, Savannah River Site*, SRNL-STI-2012-00290, May 2012, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2009. *2008 Comprehensive TNX Area Annual Groundwater and Effectiveness Monitoring Strategy Report*, SRNS-RP-2009-00593, June 2009, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2012a. *Second Explanation of Significant Differences (ESD) for the Revision 1 TNX Area Operable Unit Record of Decision (U)*, SRNS-RP-2012-00205, February 2013, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2012b. *Fourth Five-Year Remedy Review Report for the Savannah River Site*, SRNS-RP-2012-00011, Revision 1 (Redline), August 2013, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS 2015a. Underground Injection Control Permit Application for the Continued Edible Oil Deployment for Enhanced CVOC Attenuation at the SRS TNX Operable Unit (U), SRNS-RP-2015-00180, Revision 0, June 2015, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS 2015b. *Second Corrective Measures Implementation/Remedial Action Implementation Plan (CMI/RAIP) for the TNX Area Operable Unit (U)*, SRNS-RP-2015-

00266, Revision 0, June 2015, CERCLIS Number 21, 29, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS 2015c. *TNX Groundwater Monitoring near the Old TNX Seepage Basin*, SRNS-RP-2015-00658, Rev. 1, August 2016, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS 2021. *2020 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report*, Rev. 0, June 2021, Savannah River Nuclear Solution, LLC, Savannah River Site, Aiken, SC

USEPA (U.S. Environmental Protection Agency, Office of Water), 2001. National Primary Drinking Water Regulations – EPA's Drinking Water Standards; http://www.epa.gov/safewater/mcl.html. This web page was updated Thursday, May 31, 2001. For copies of the complete regulations regarding these contaminants, follow the links to the National Primary Drinking Water Regulations

USGS, 1999. D. Vroblesky, et. al, *Natural Attenuation Potential of Chlorinated Volatile Organic Compounds in Ground Water, TNX Flood Plain, Savannah River Site, South Carolina*, Water-Resources Investigations Report, 99-4071, United States Geological Survey

WSRC, 1994. *Interim Action Record of Decision, Remedial Alternative Selection - TNX Area Groundwater Operable Unit (U)*, WSRC-TR-94-0375, Rev. 1, October 1994, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1997a. *Post-Construction Report for the TNX Groundwater Operable Unit Interim Remedial Action (U)*, WSRC-RP-96-0826, Rev. 1, January 1997, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1997b. *Explanation of Significant Differences for the TNX Area Groundwater Operable Unit (U)*, WSRC-RP-97-169, Rev. 1, September 1997, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1997c. *Addendum to the TNX Shallow Groundwater Characterization Report (U)*, WSRC-TR-97-0337, Rev. 0, October 1997, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1997d. *TNX Area Soil Vapor Extraction Test Treatability Study Report (U)*, WSRC-TR-97-336, Rev. 0, October 1997, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1998. *TNX Geosiphon Cell (TGSC-1) Phase I Treatability Study Report*, WSRC-TR-98-00048, Rev. 0, February 1998, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999a. TNX Groundwater Operable Unit Remedial Design Report/Remedial Action Work Plan (U), Addendum: TNX Effectiveness Monitoring Strategy, WSRC-TR-95-0284, Rev. 1.5, May 1999, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 1999b. *TNX Area Phase II Soil Vapor Extraction Test Treatability Study Report*, WSRC-TR-99-00051, Rev. 0, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2000. *Fate & Transport Modeling in Support of TNX Operable Unit Groundwater Remediation Alternatives (U)*, WSRC-TR-99-00186, Rev. 0, September 2000, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2001. Explanation of Significant Differences (ESD) to the Revision 1 Interim Record of Decision (IROD) for the TNX Area Operable Unit Groundwater (U), WSRC-RP-2001-00764, Rev. 0, October 2001, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC 2001. *TNX Vadose Zone Characterization for the Installation of Soil Vapor Extraction Wells*, WSRC-TR-2001-00596, December 2001, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2003a. *Record of Decision Remedial Alternative Selection for the TNX Area Operable Unit (U)*, WSRC-RP-2003-4017, Rev. 1, August 2003, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC.

WSRC, 2004a. *2003 Comprehensive TNX Area Annual Groundwater and Effectiveness Monitoring Strategy Report (U)*, WSRC-RP-2004-00335, June 2004, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2004b. *Recommended SVE System for the TNX Operable Unit (U)*, WSRC-TR-2004-00452, Rev. 0, August 2004, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC.

WSRC 2004c. Removal Site Evaluation Report/Engineering Evaluation and Cost Analysis for the TNX Outfall Delta, Lower Discharge Gully, and Swamp Operable Unit (U), WSRC-RP-2004-4055, Revision 1, August 2004, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2005a. *Record of Decision Remedial Alternative Selection for the T-Area Operable Unit*, WSRC-RP-2004-4070, Rev. 1., September 2005, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2005b. *Post-Construction Report (PCR) for the TNX Area Operable Unit (U)*, WSRC-RP-2005-4007, Rev. 1, April 2007, Washington Savannah River Company, LLC, Savannah River Site, Aiken, SC

WSRC, 2005c. *The Explanation of Significant Differences to the Record of Decision for the TNX Area Operable Unit*, WSRC-RP-2005-4030, Revision 1, June 2005, Washington Savannah River Company, LLC, Savannah River Site, Aiken, SC

WSRC, 2006. *Post-Construction Report (PCR) for T Area Operable Unit (TAOU) (U)*, WSRC-RP-2006-4005, Rev 1, November 2006, Washington Savannah River Company, LLC, Savannah River Site, Aiken, SC

APPENDIX A

FIGURES

This page intentionally left blank.

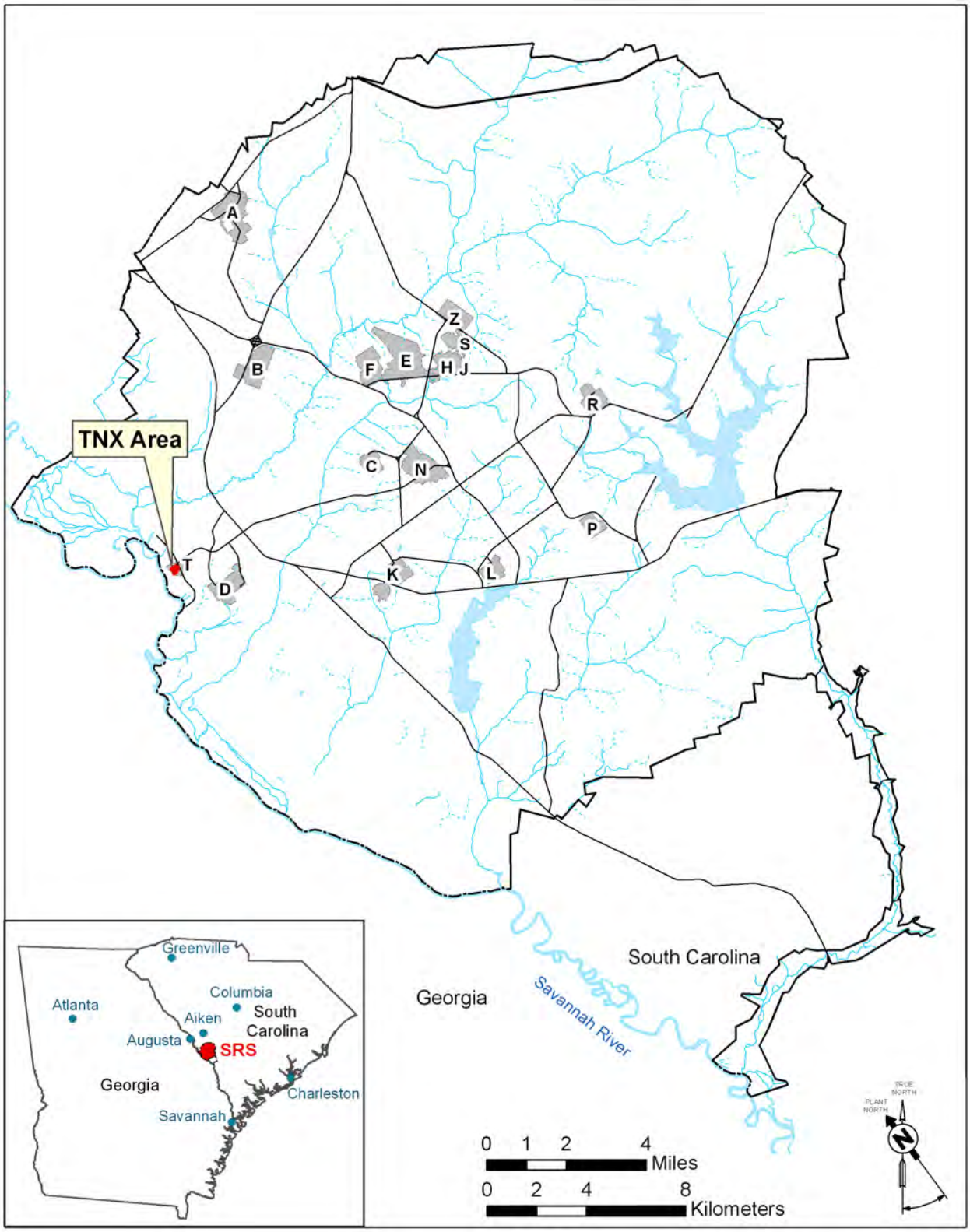


Figure A-1. Location of the TNX Area at the Savannah River

This page intentionally left blank.

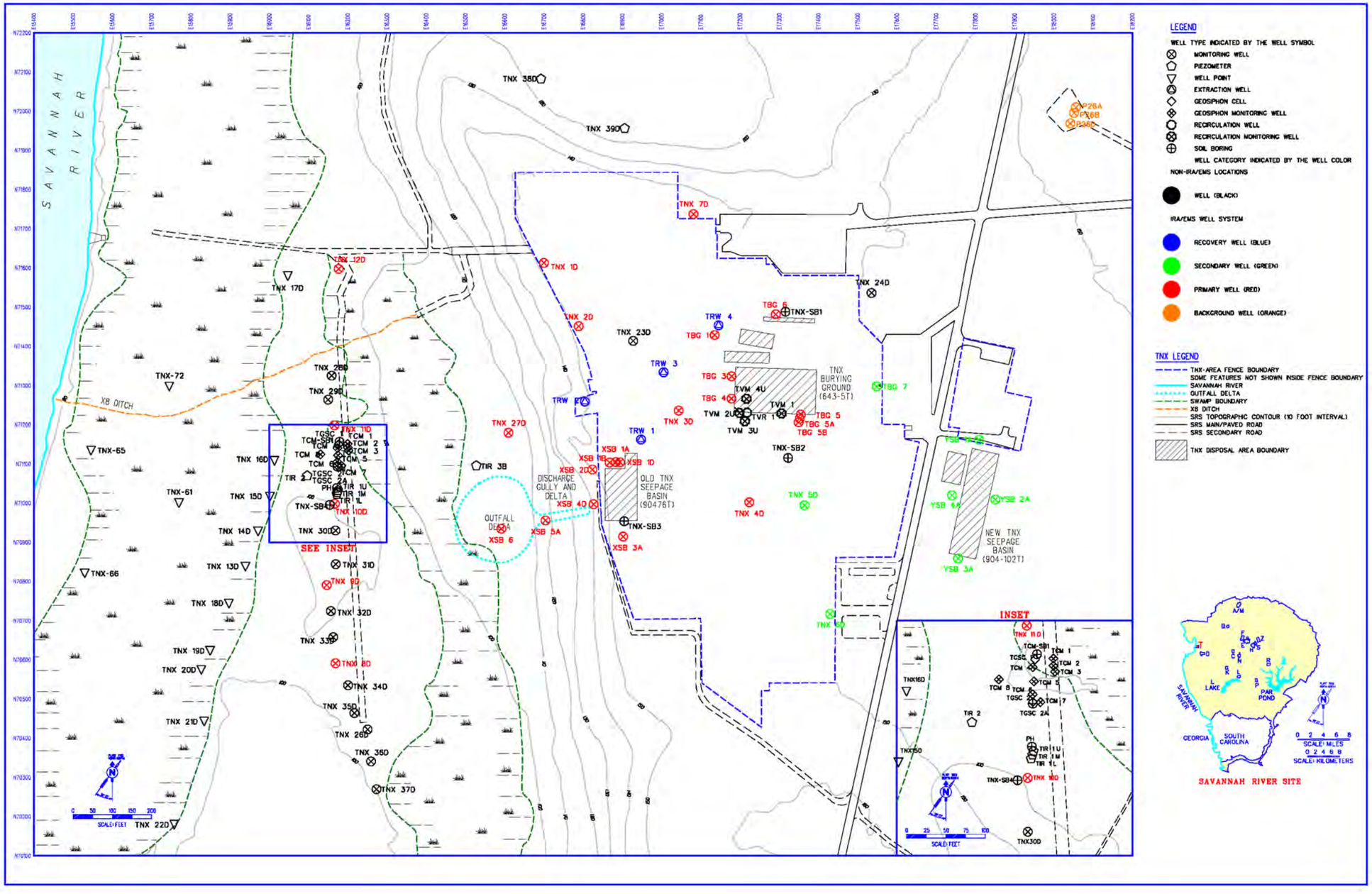


Figure A-2. Location of TNX Area Interim Remedial Action / Effectiveness Monitoring Strategy Well System during Startup and Initial Operations

This page intentionally left blank.

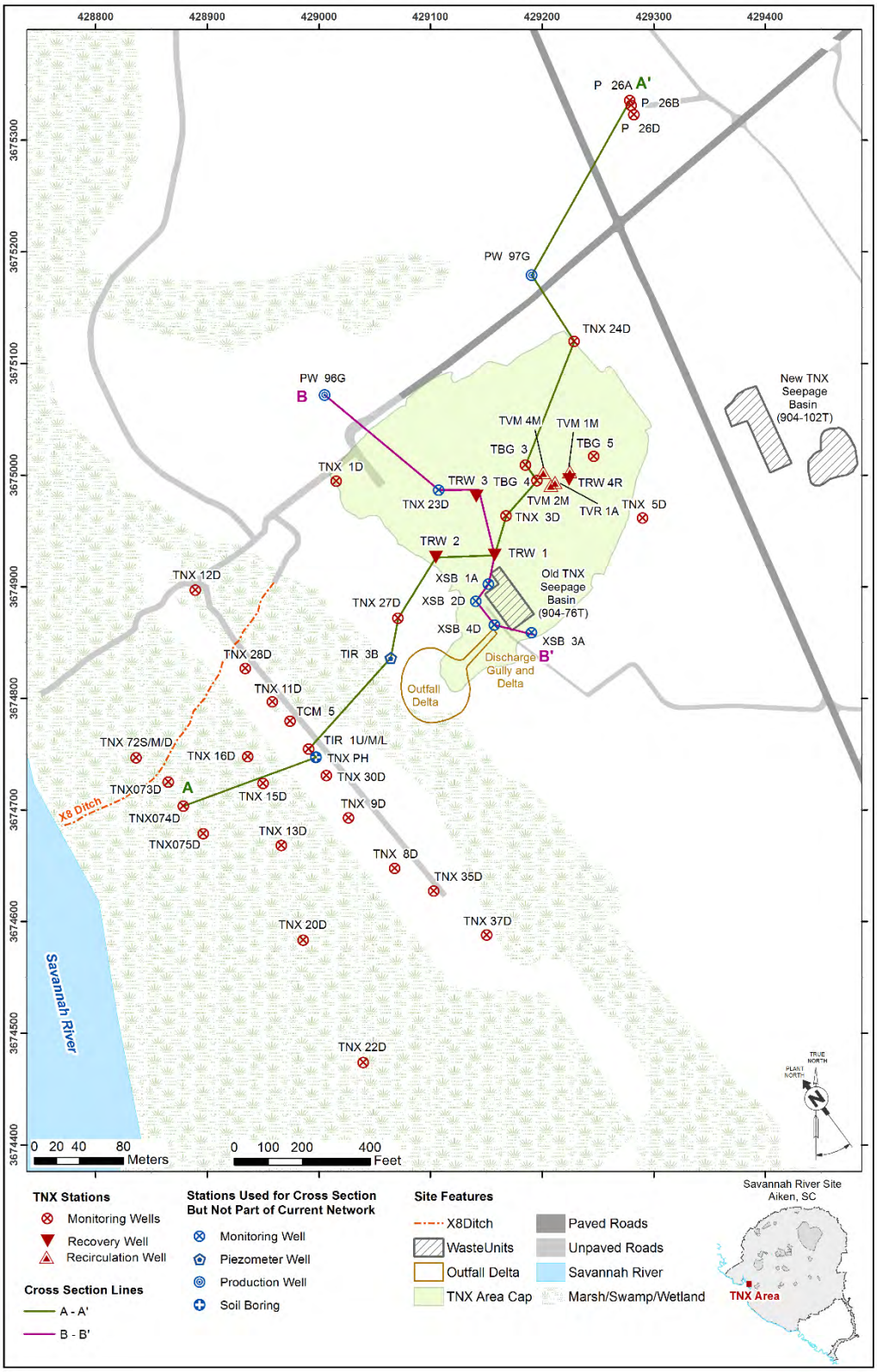


Figure A-3. TNX Area Cross Section Location Plan

This page intentionally left blank.

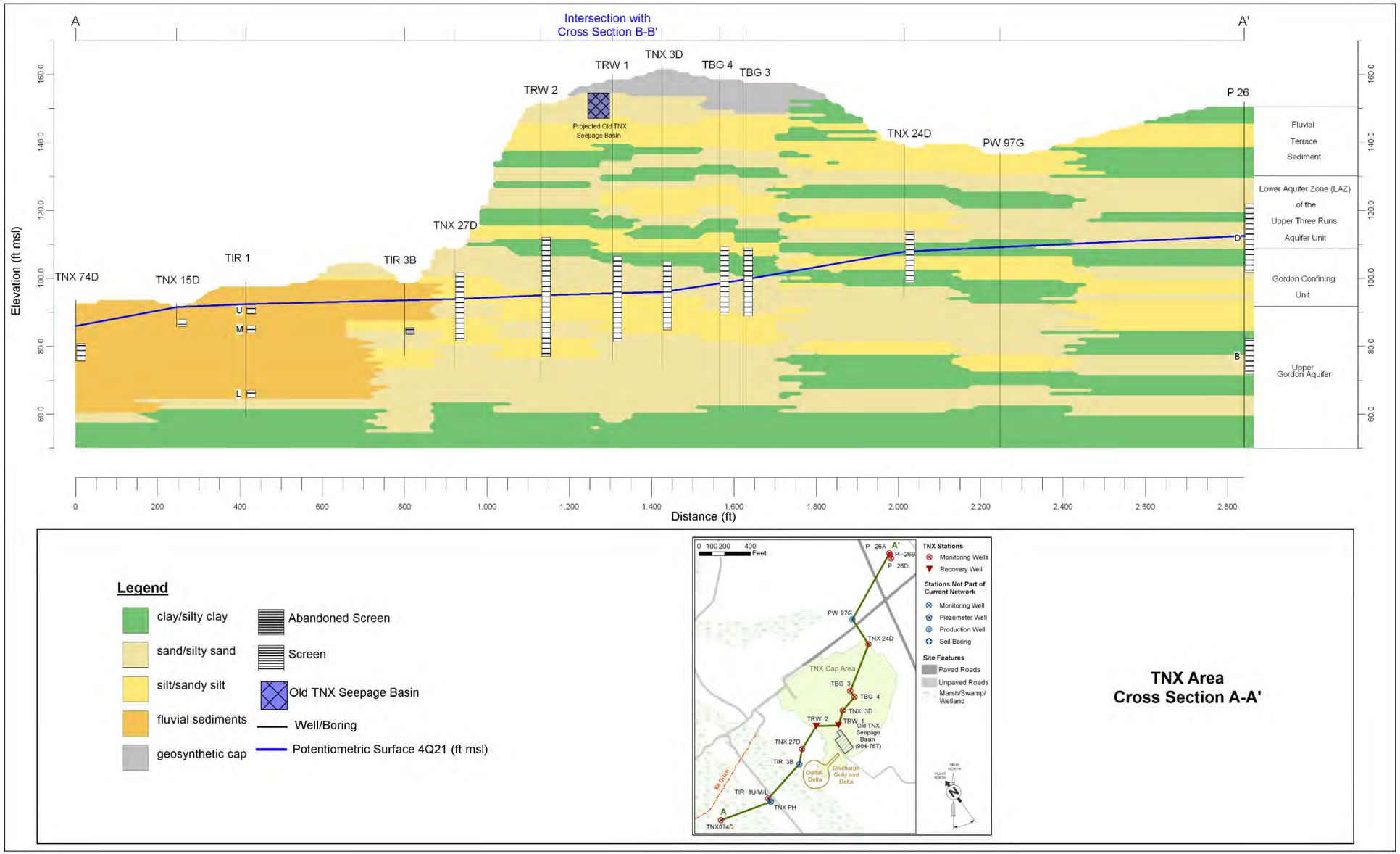


Figure A-4. TNX Area Cross Section A-A'

Figure A-5. TNX Area Cross Section B-B'

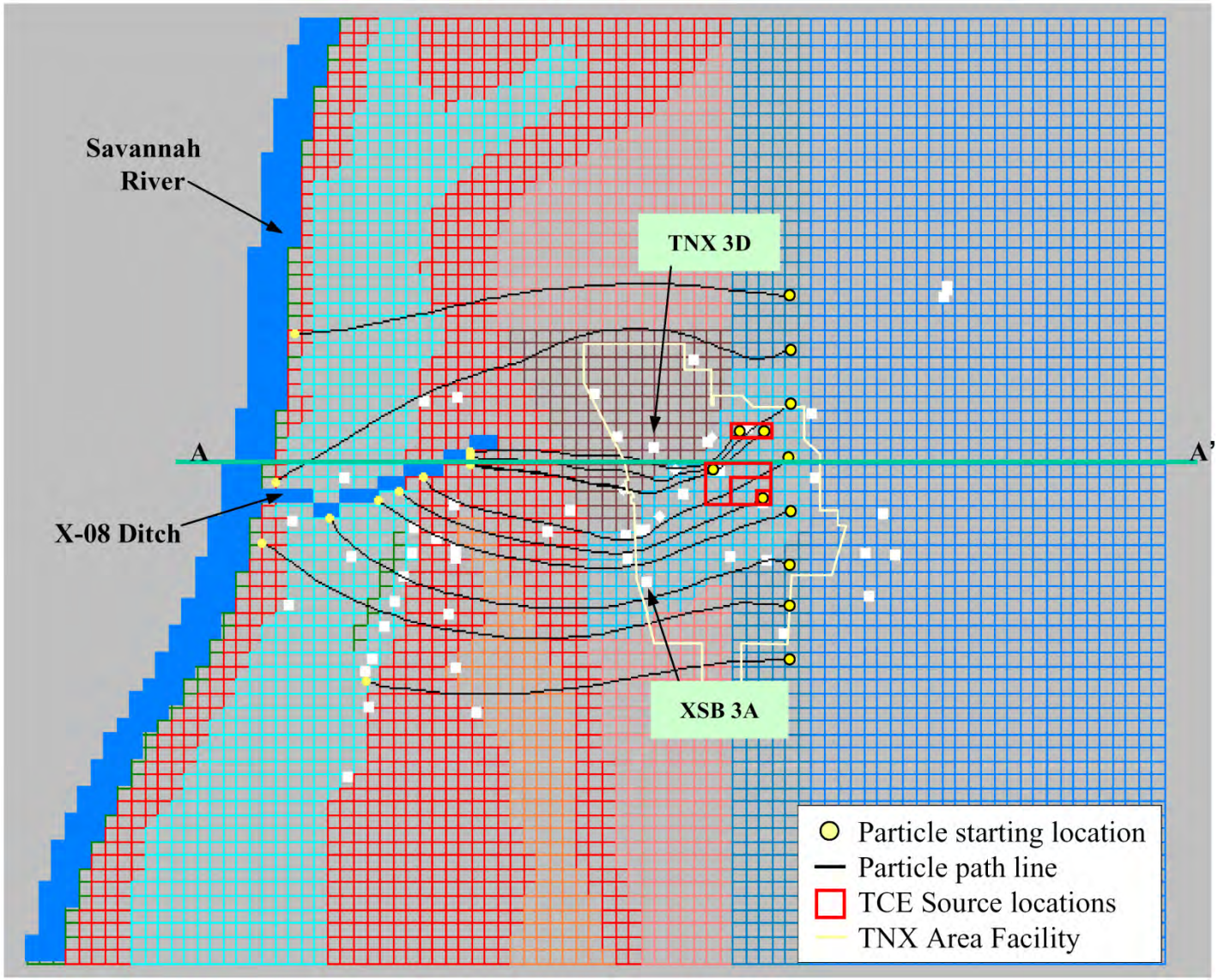


Figure A-6. Plan View of the TNX Area OU Showing Particle Starting Locations and Path Lines Towards the X-008 Ditch and the Savannah River

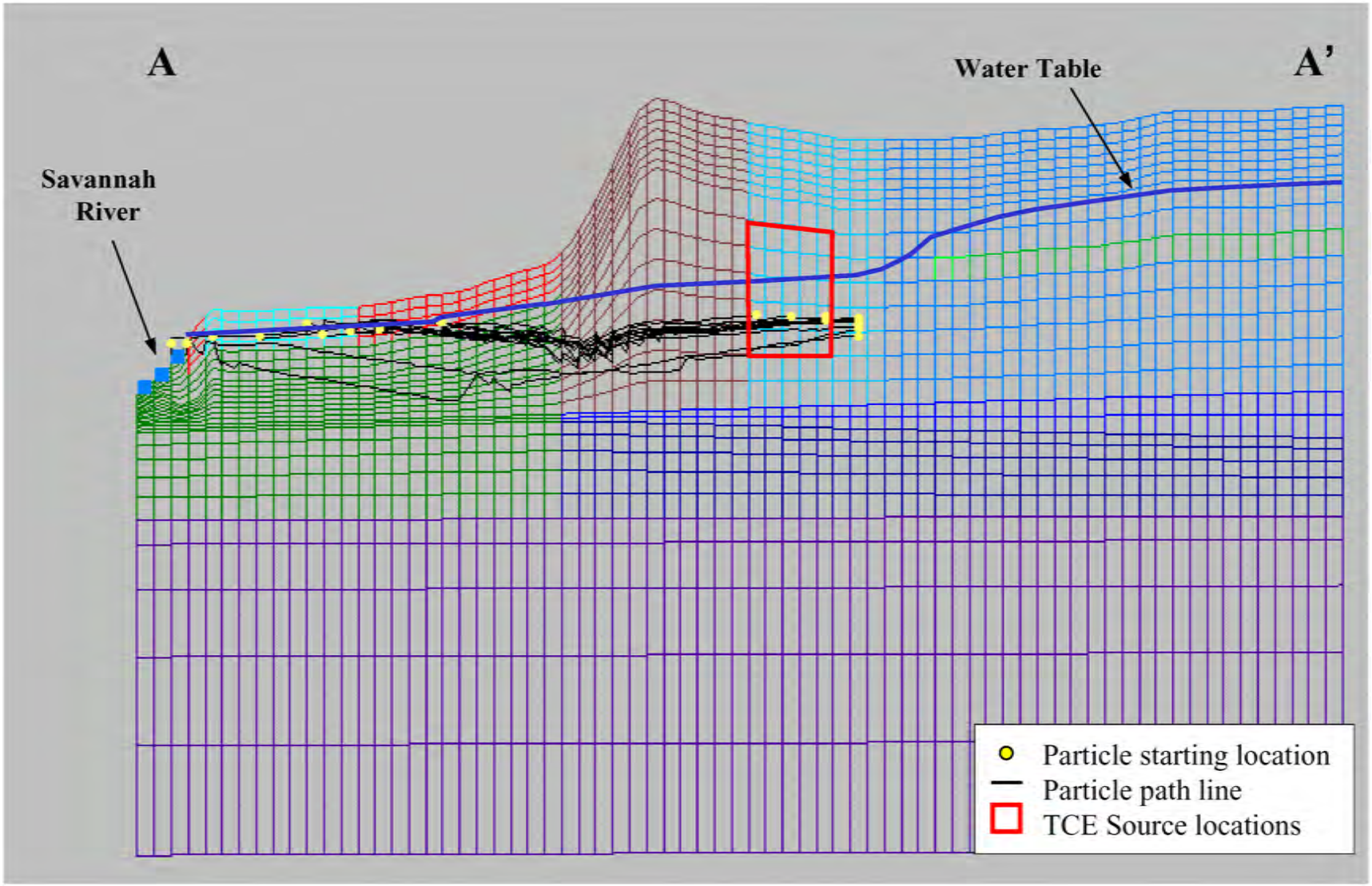


Figure A-7. Cross-sectional View along Section A-A' Showing the Vertical Locations and Particle Path Lines

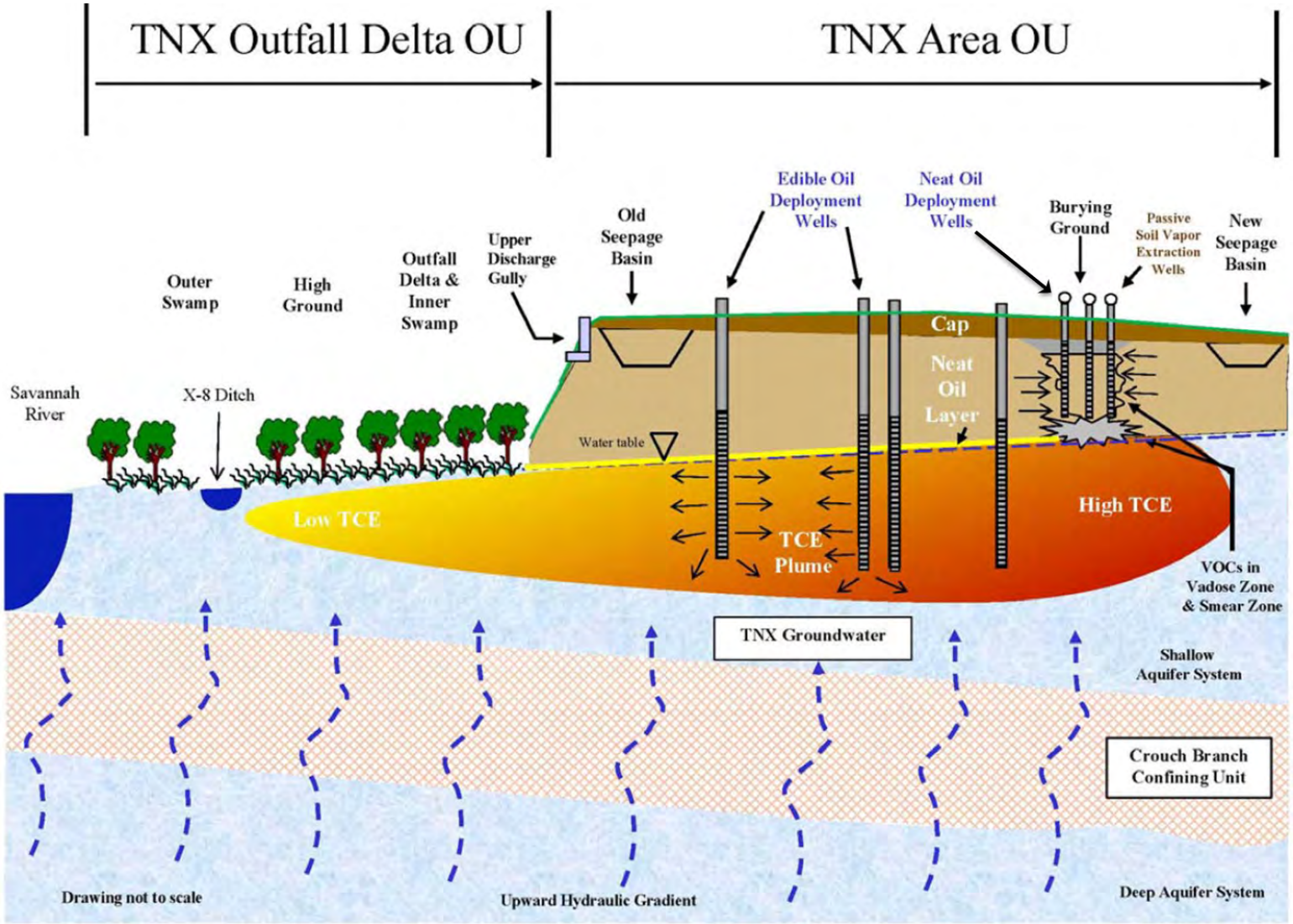


Figure A-8. Schematic Cross Section of TNX Operable Units and Remedial Action

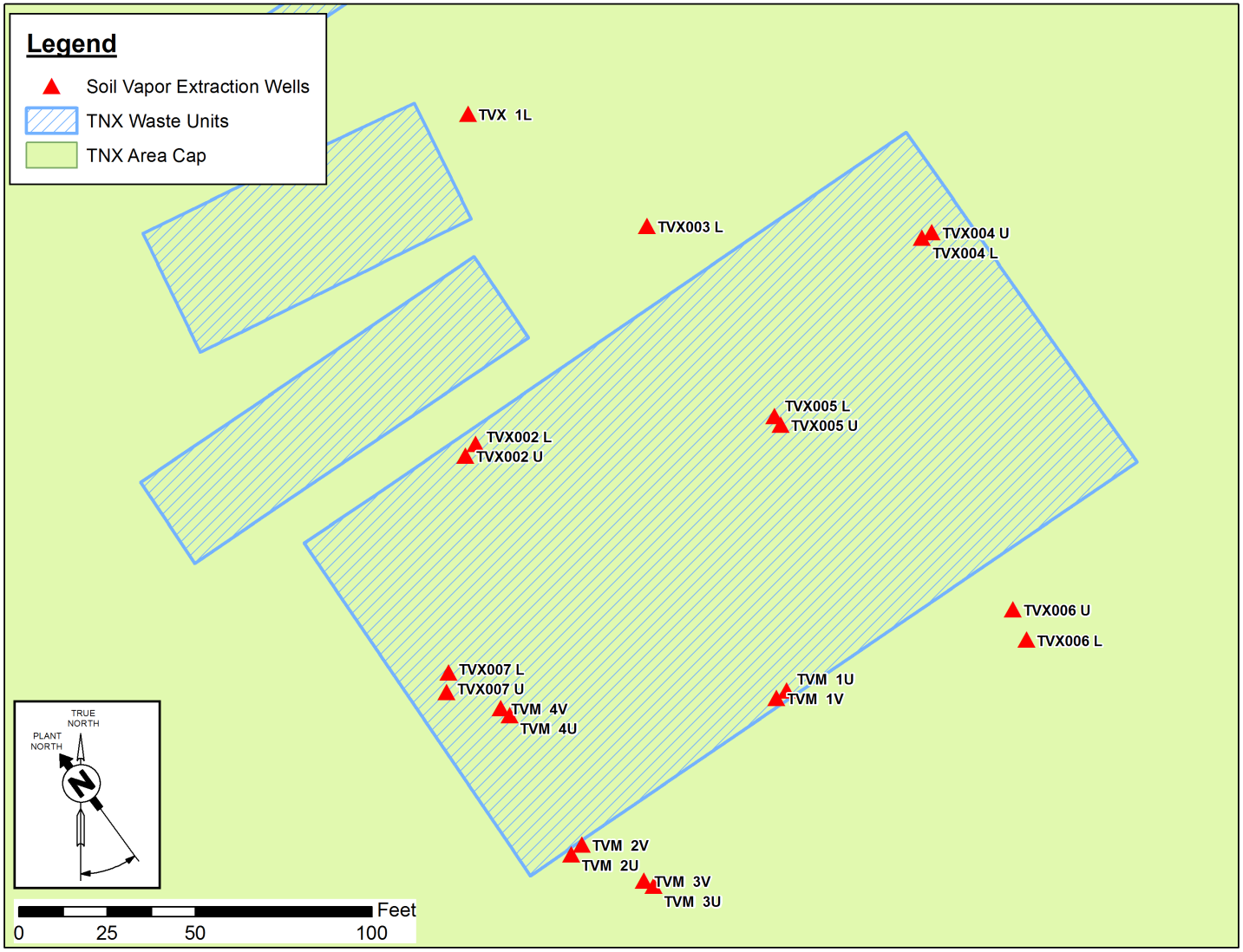


Figure A-9. Location of TNX Area SVE Monitoring Well System

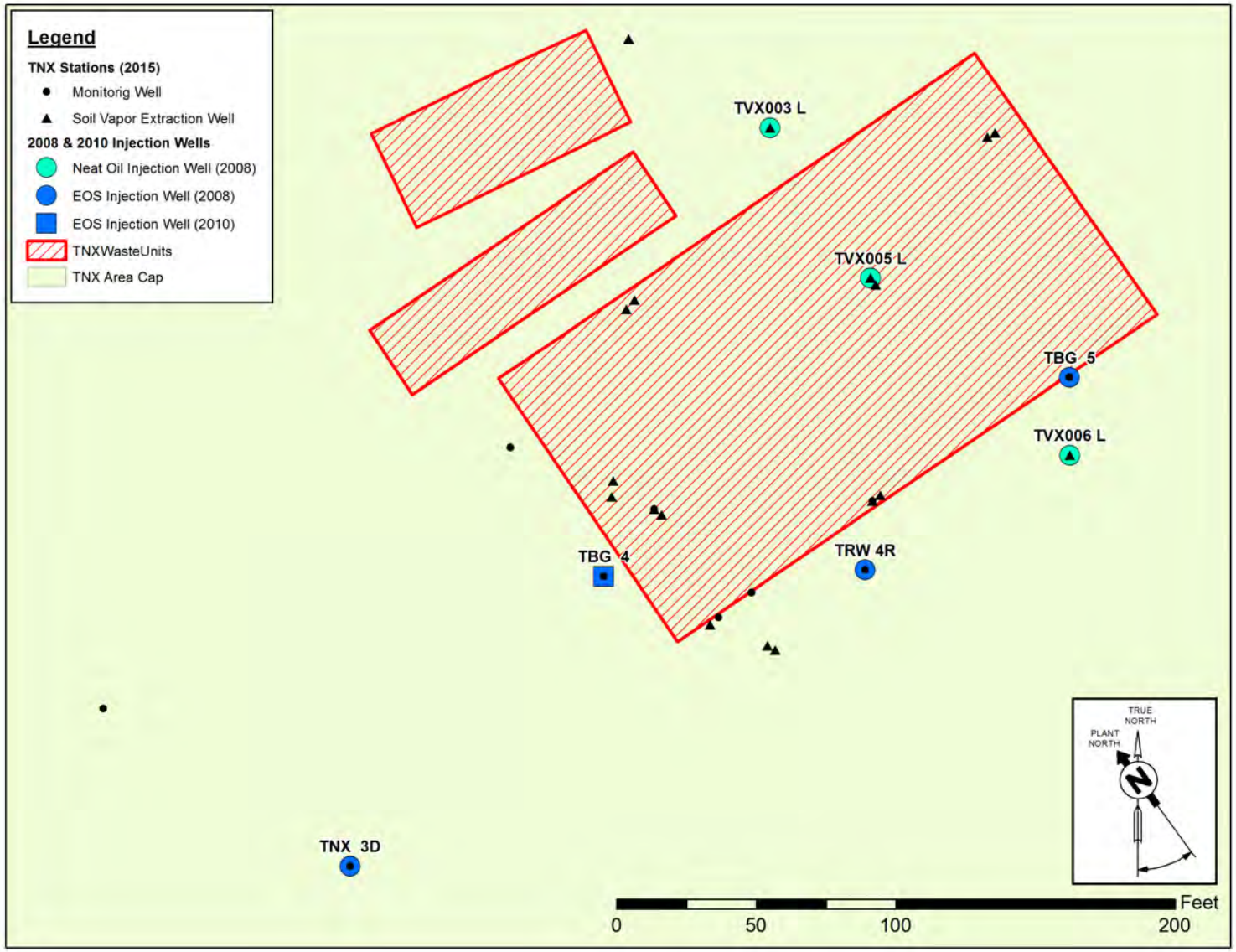


Figure A-10. Location of Edible Oil Injection Wells (2008 and 2010 Injections)

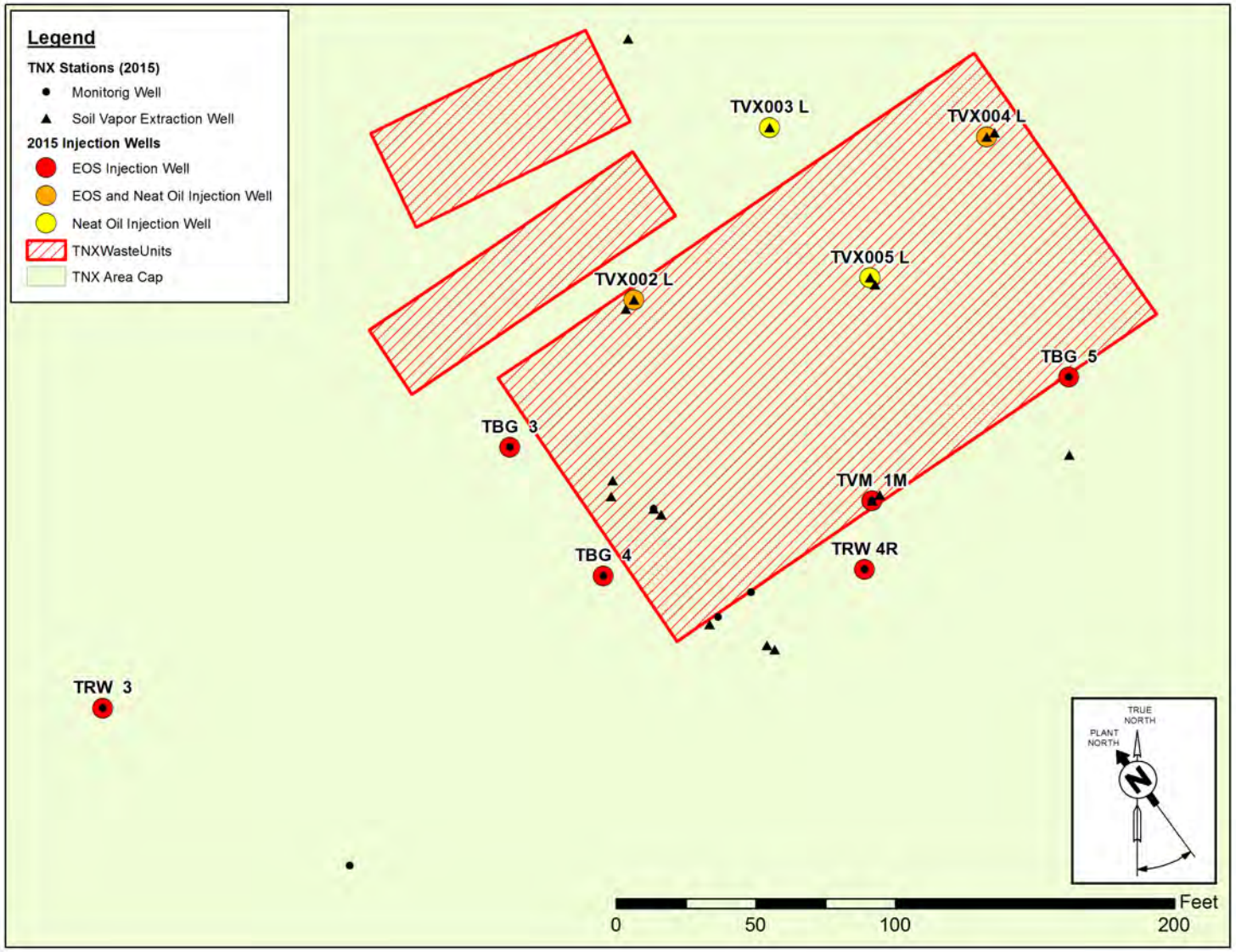


Figure A-11. Location of Edible Oil Injection Wells (2015 Injection)

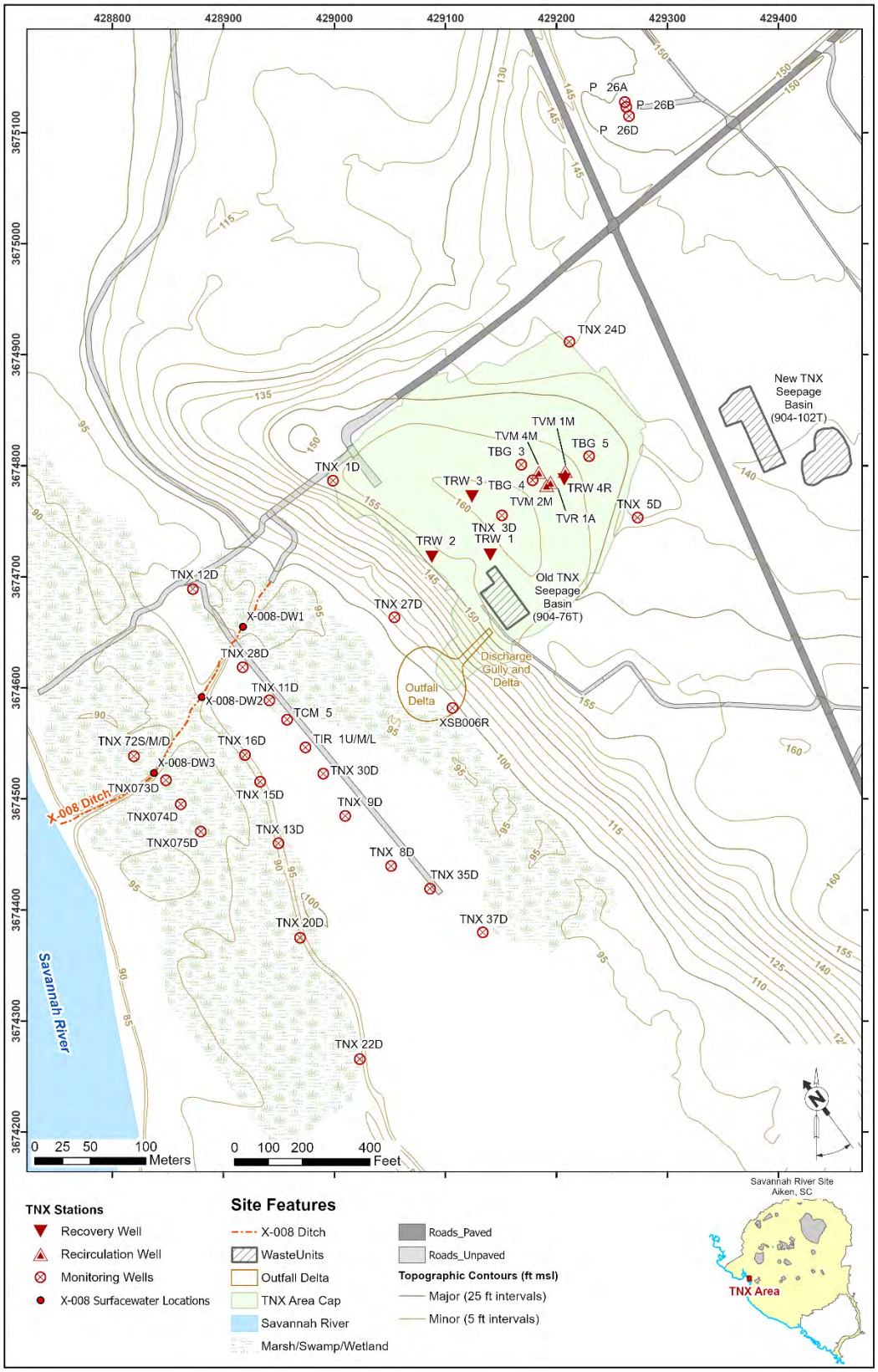


Figure A-12. TNX Area Well Locations

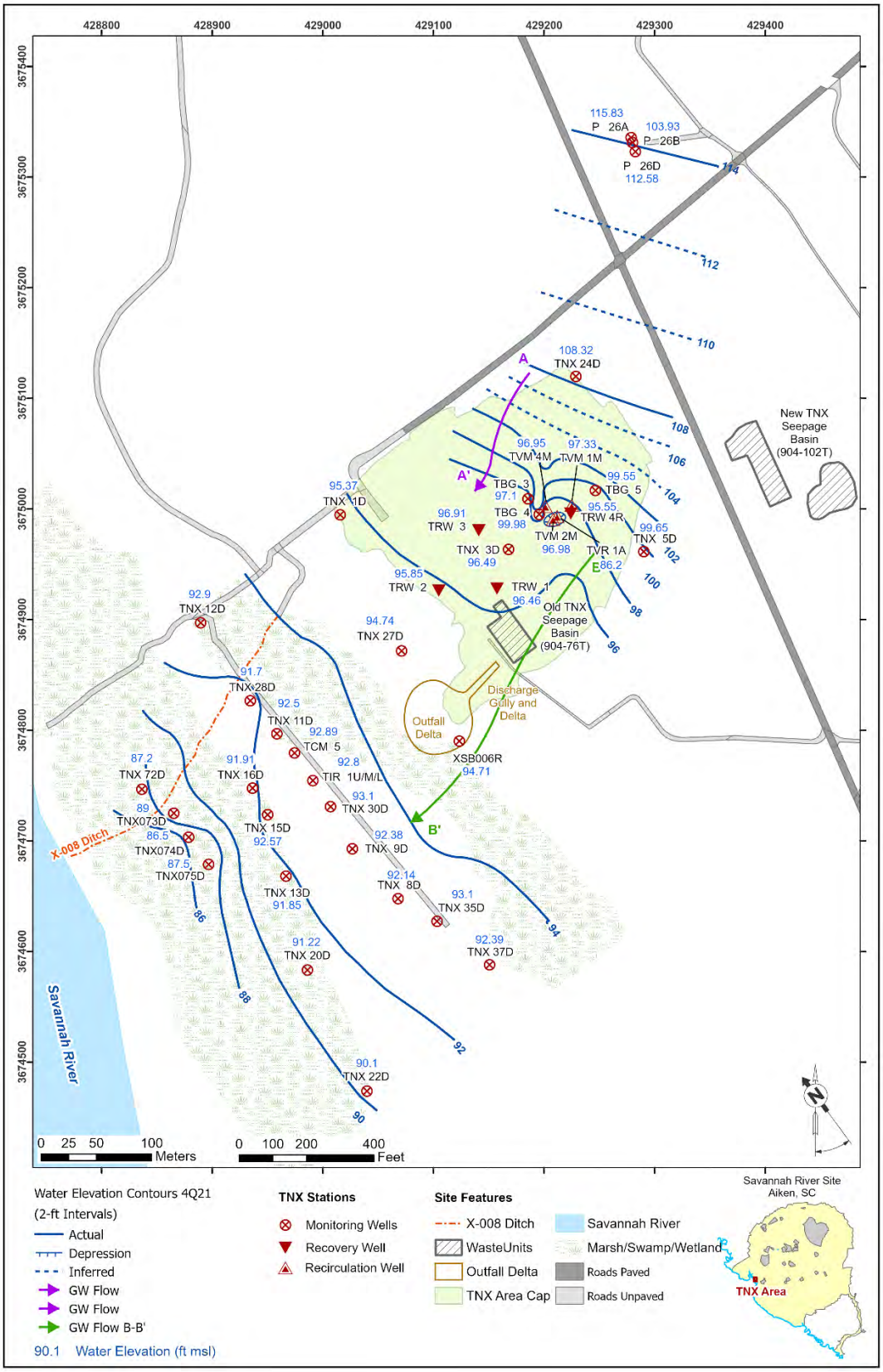


Figure A-13. TNX Area Water Table Elevation 4Q2021

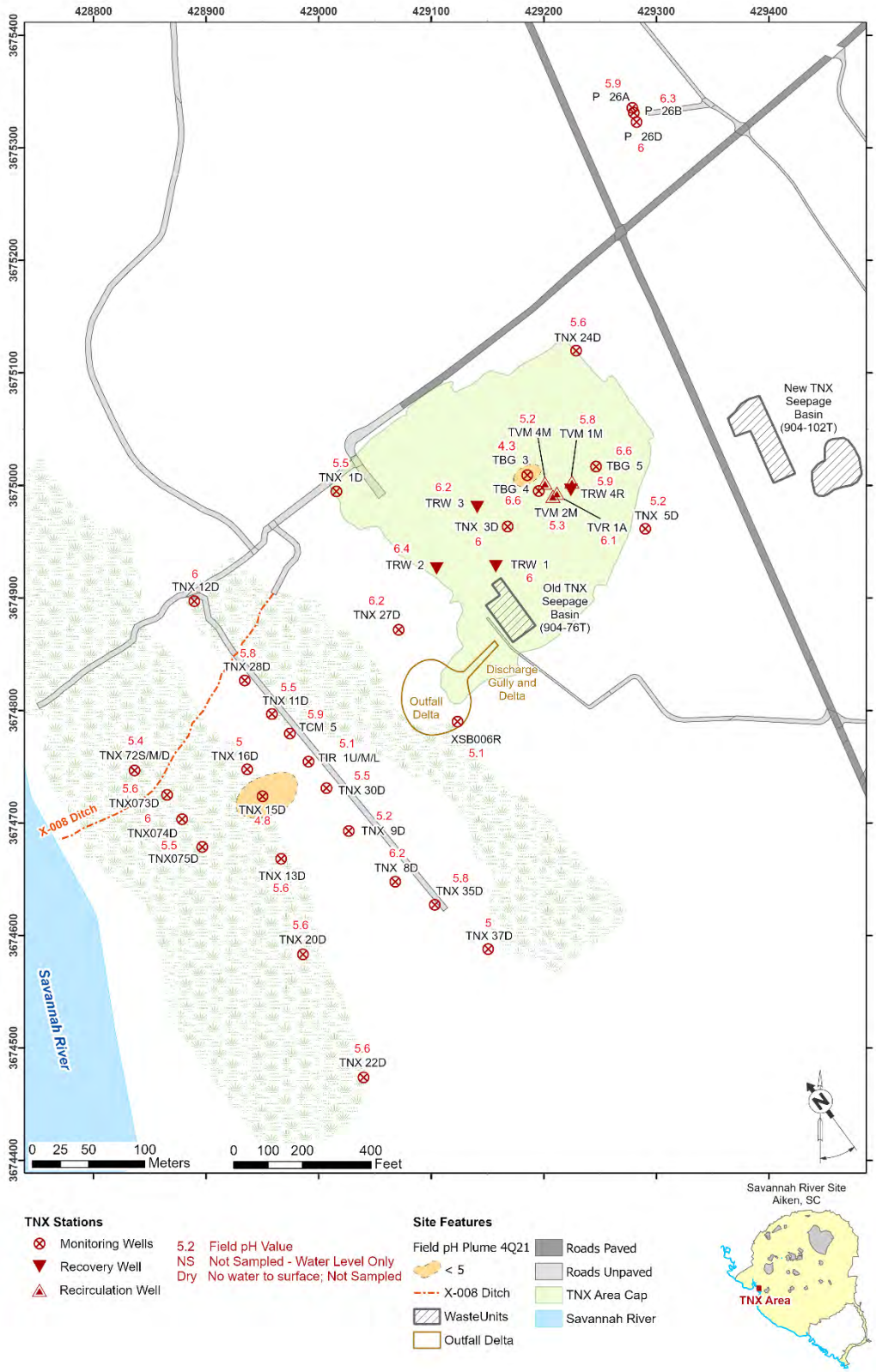


Figure A-14. TNX Area Field pH of Groundwater, 4Q2021

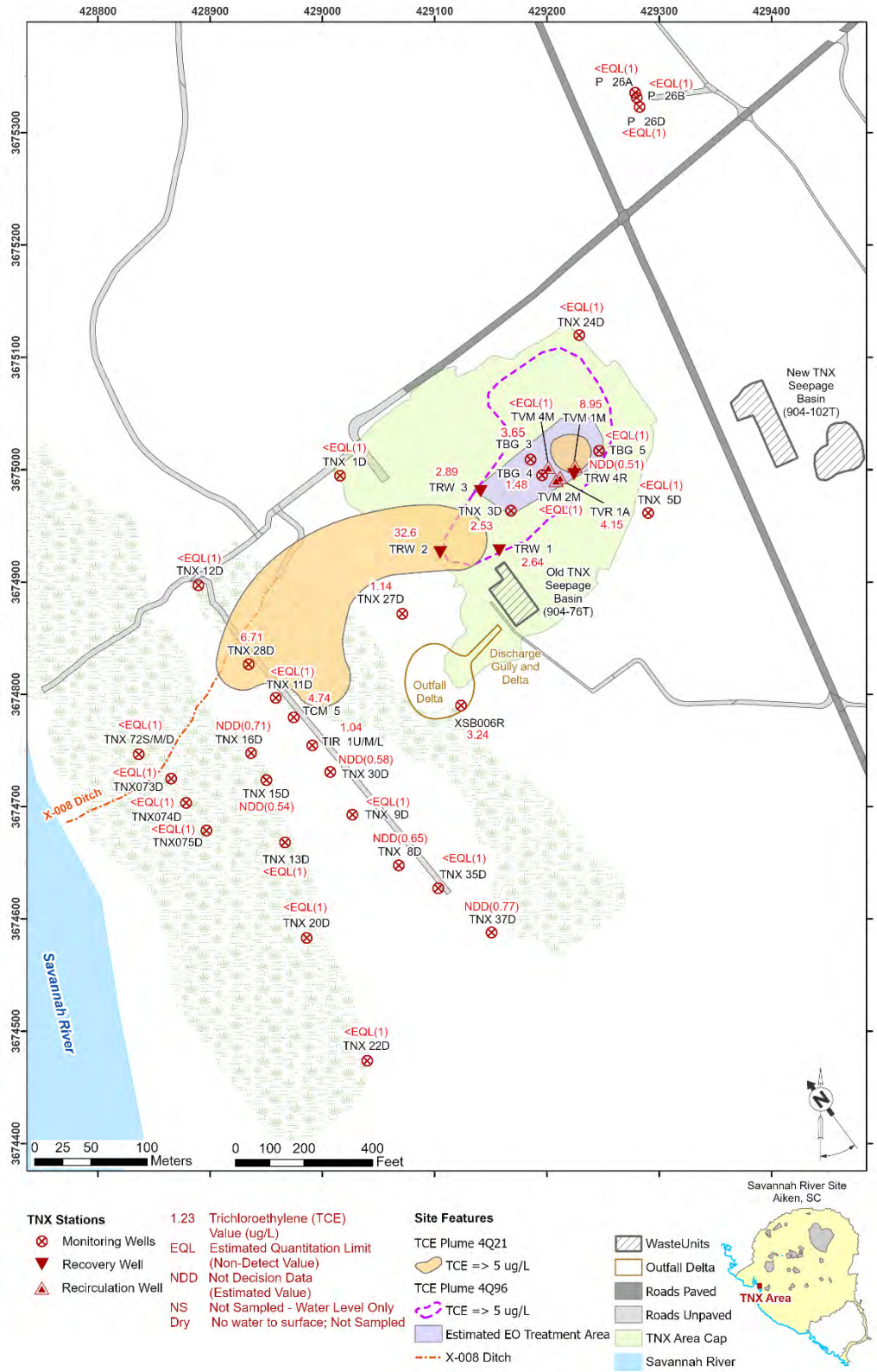


Figure A-15. TNX Area Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021 with >500 µg/L TCE Plume from 4Q1996 Superimposed

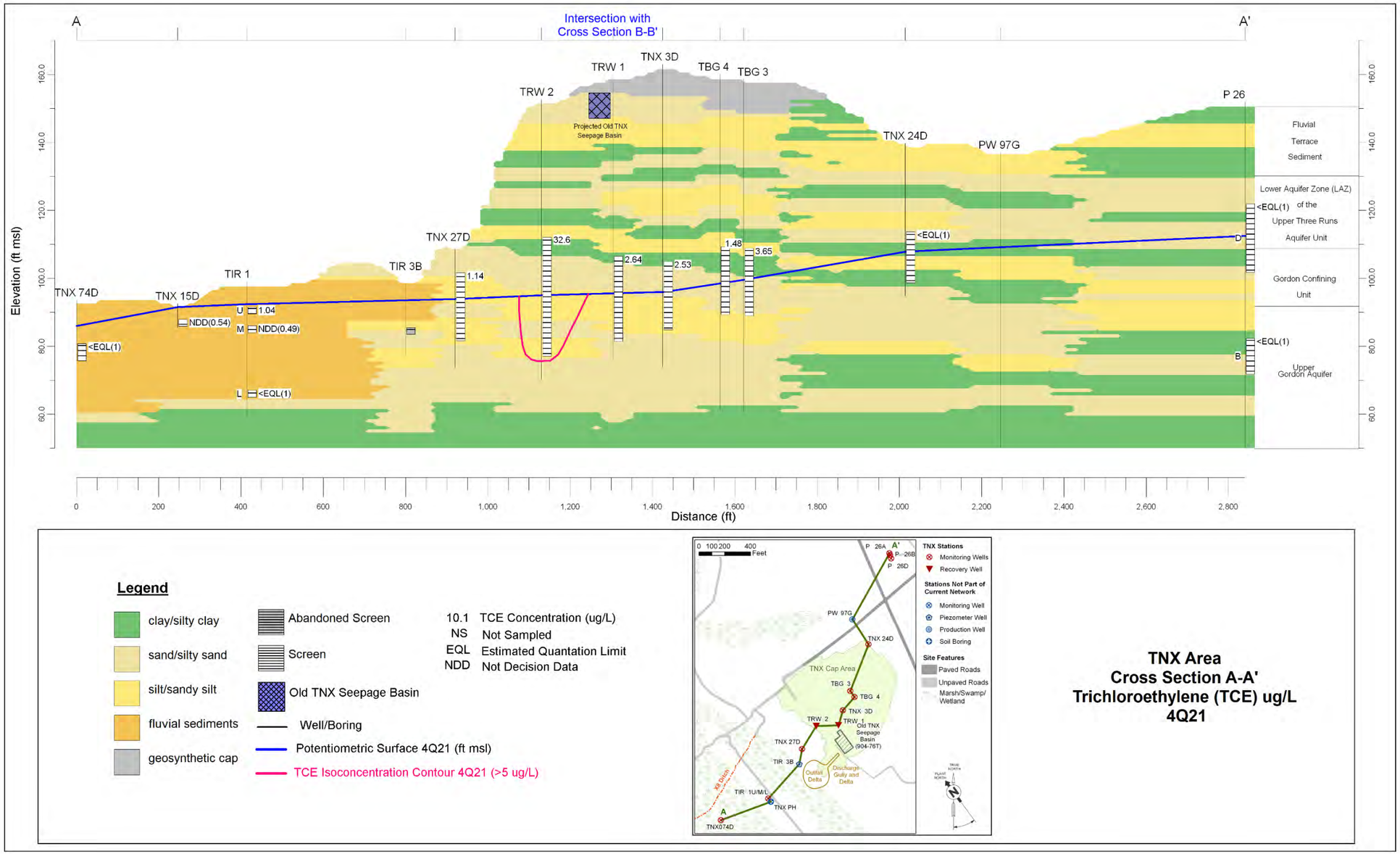


Figure A-16. TNX Area Cross Section A-A' Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021

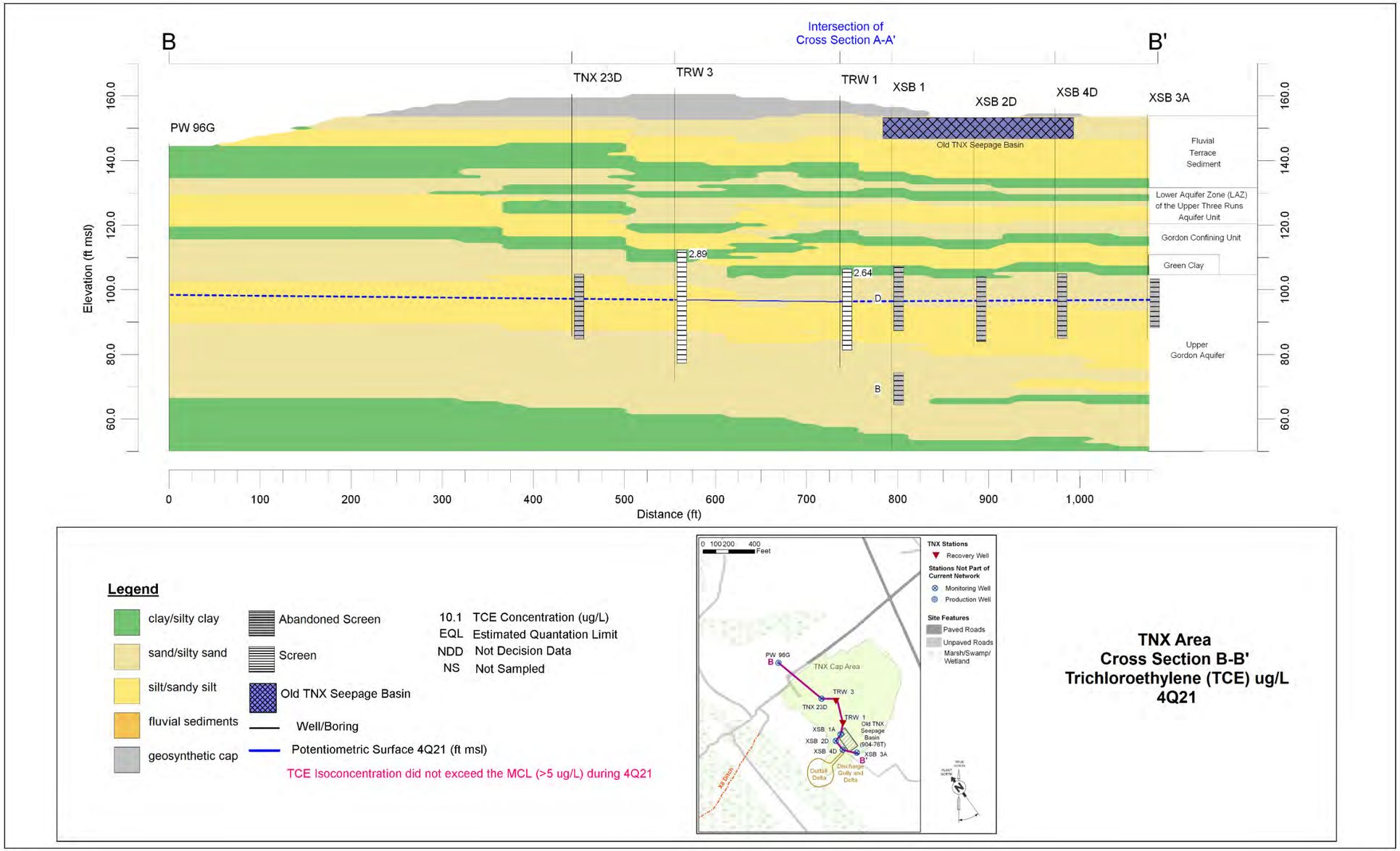


Figure A-17. TNX Area Cross Section B-B' Trichloroethylene (TCE) Concentration in Groundwater, 4Q2021

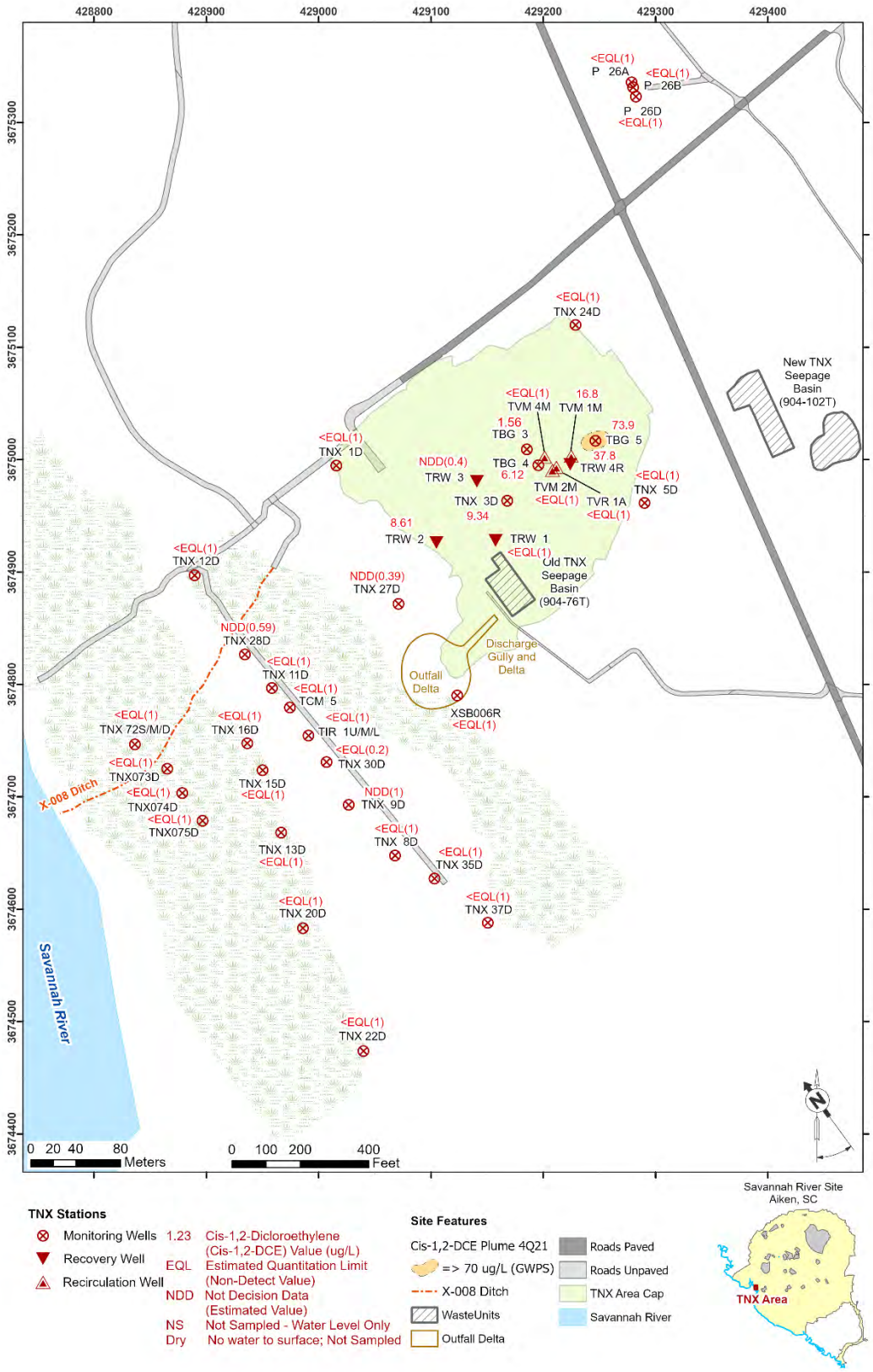


Figure A-18. TNX Area Cis-1,2-Dichloroethylene Concentration in Groundwater, 4Q2021

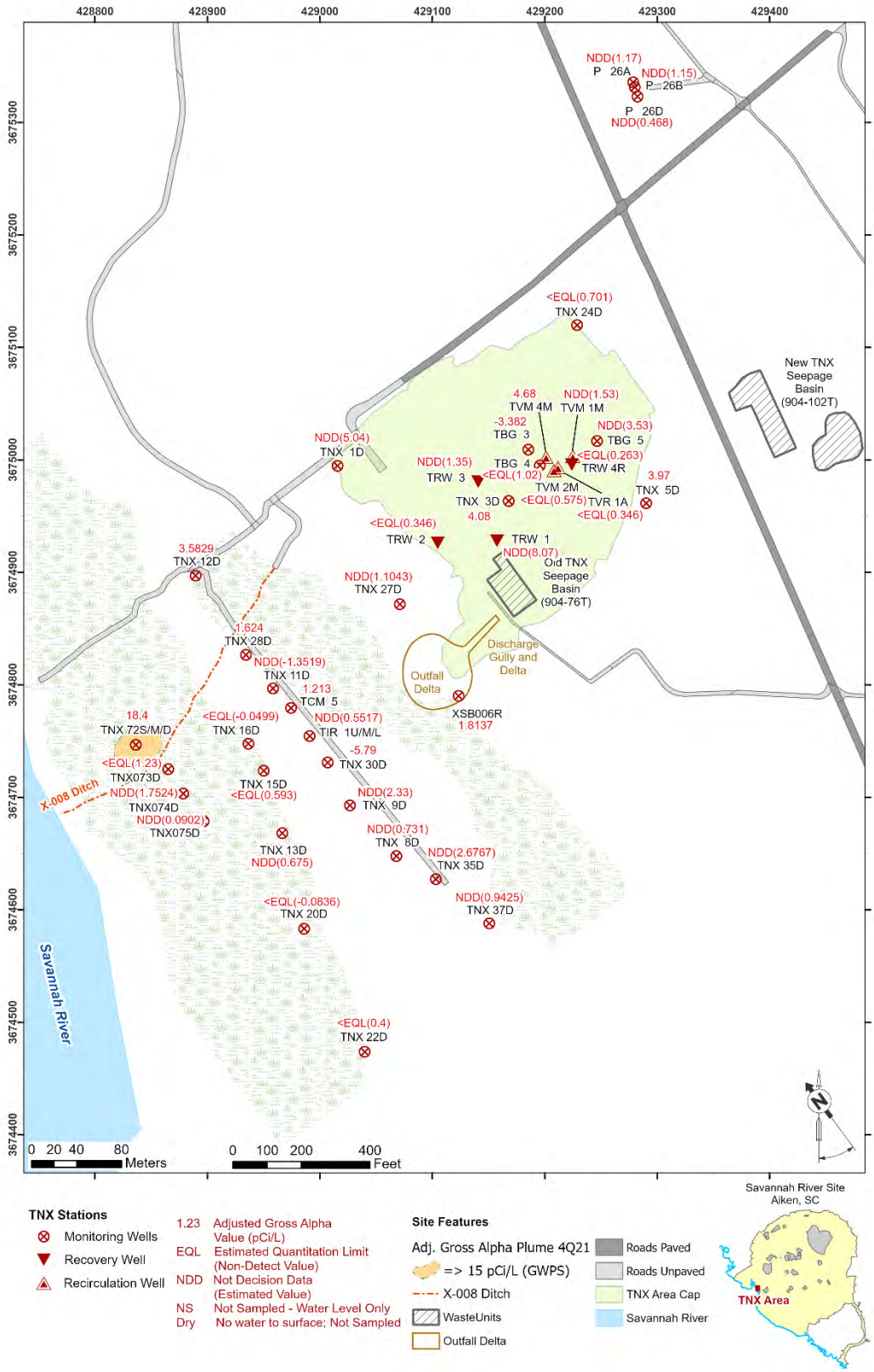


Figure A-19. TNX Area Adjusted Gross Alpha Activity in Groundwater, 4Q2021

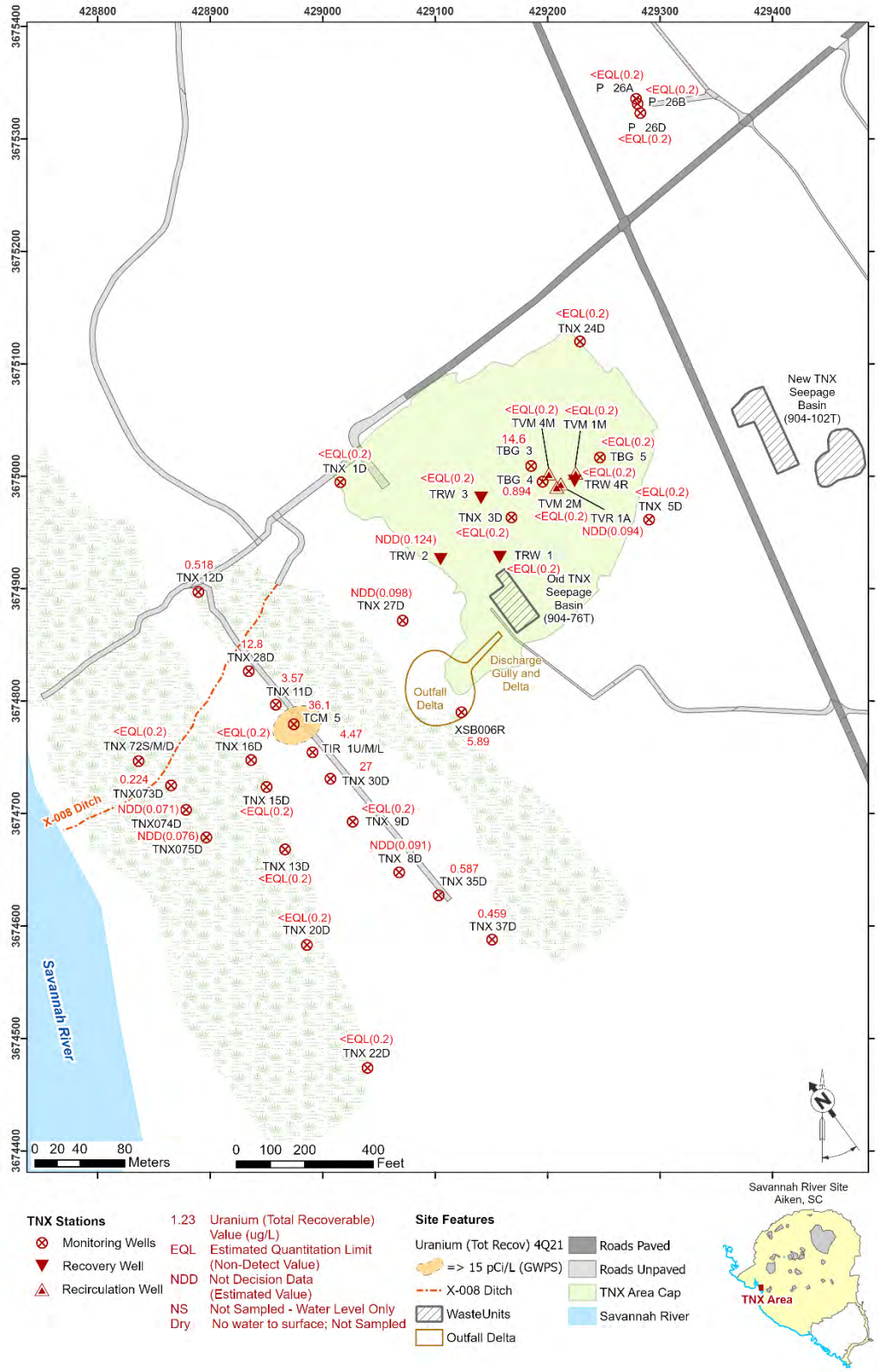


Figure A-20. TNX Area Uranium, Total Recoverable Concentration in Groundwater, 4Q2021

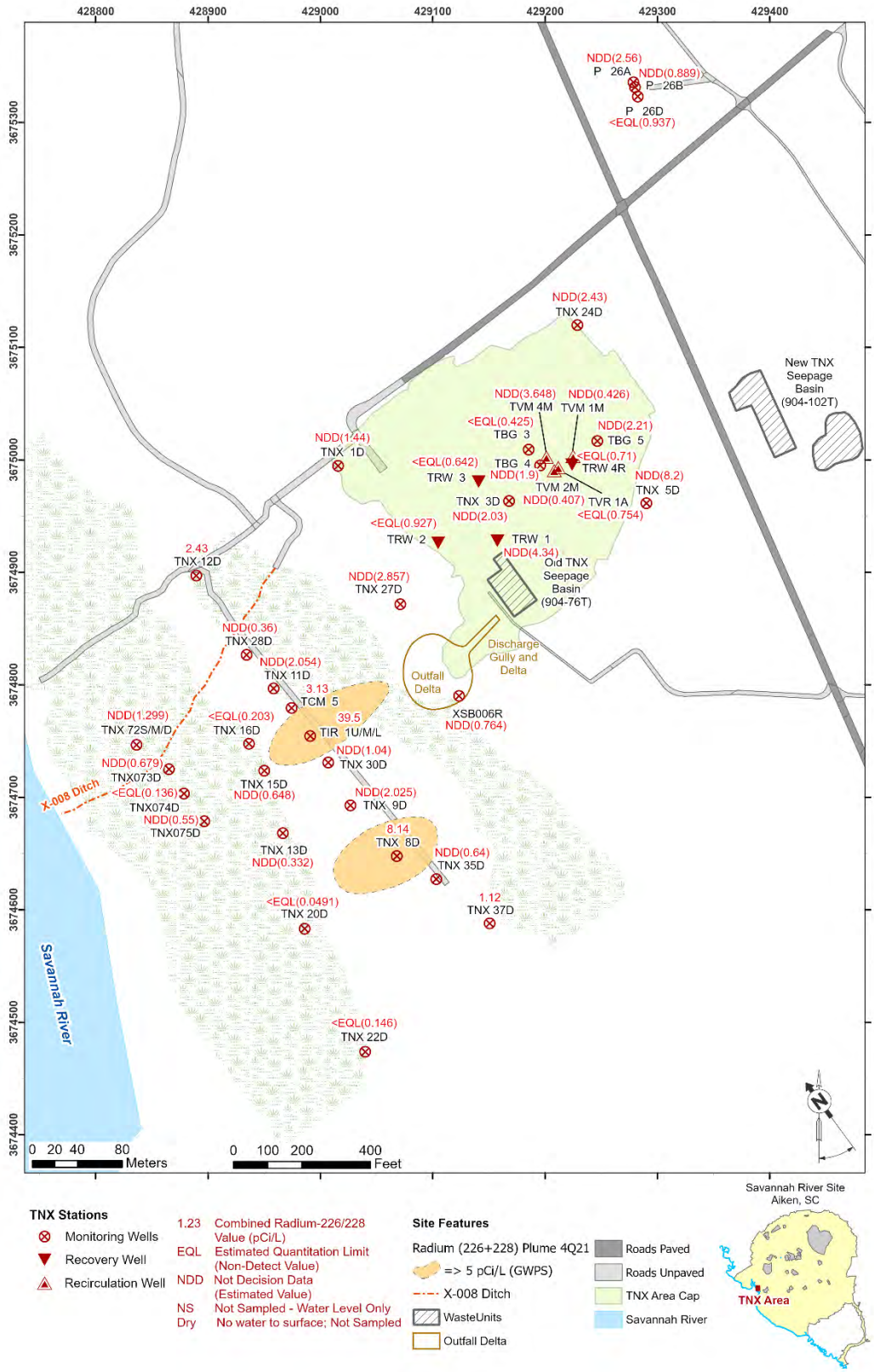


Figure A-21. TNX Area Combined Ra-226/228 Activity in Groundwater, 4Q2021

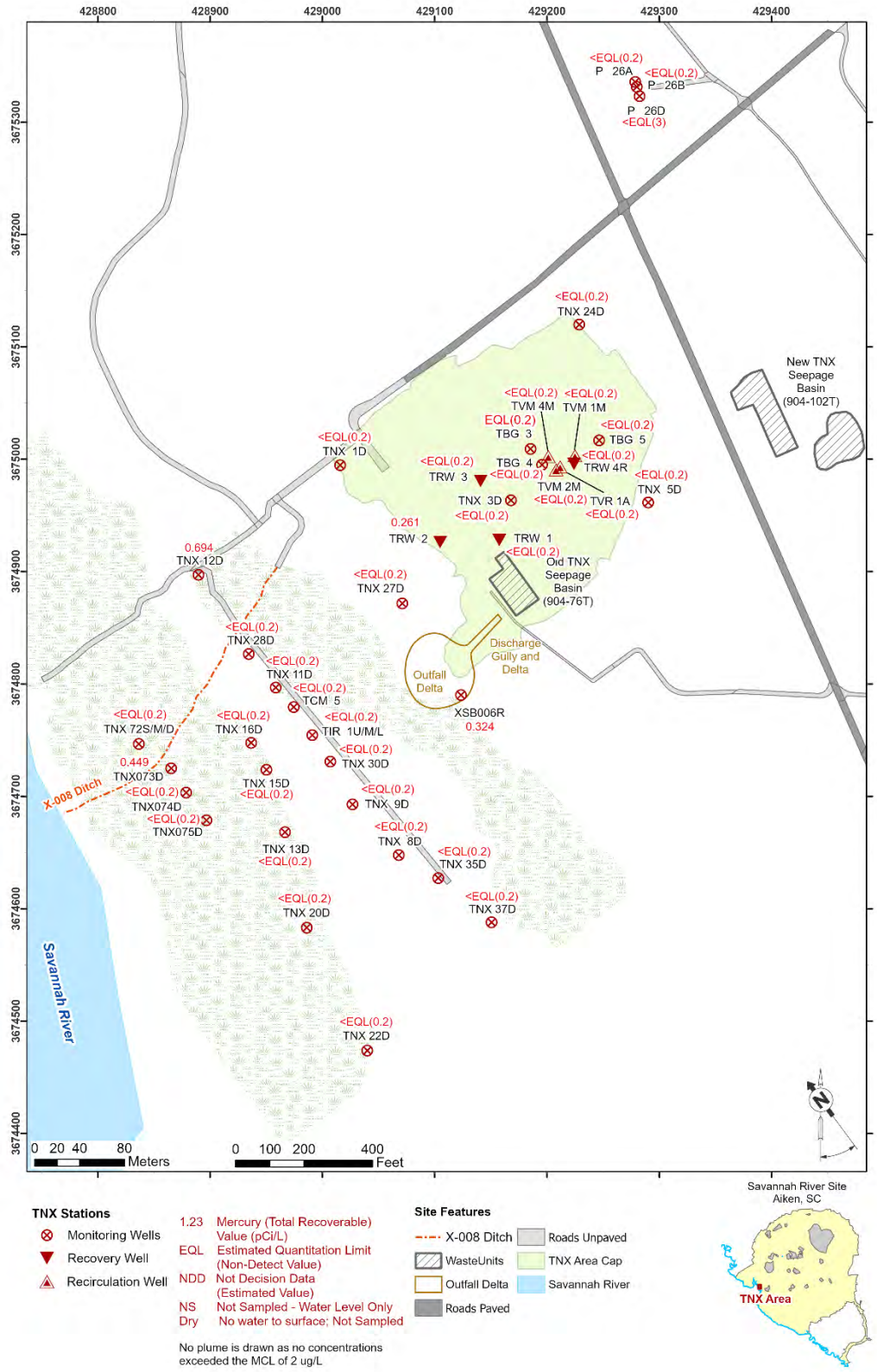


Figure A-22. TNX Area Mercury, Total Recoverable Concentration in Groundwater, 4Q2021

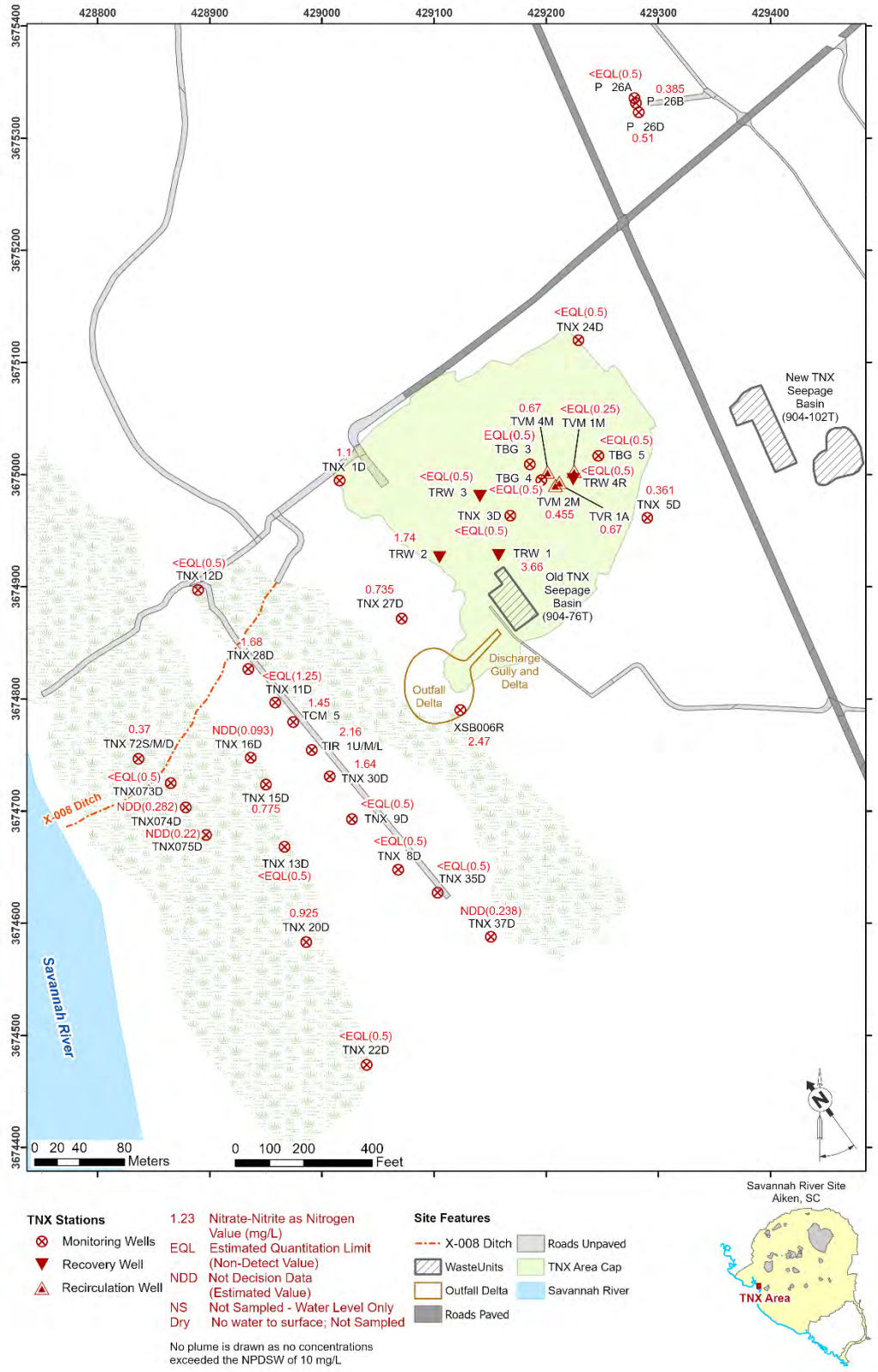


Figure A-23. TNX Area Nitrate-Nitrite as Nitrogen Concentration in Groundwater 4Q2021

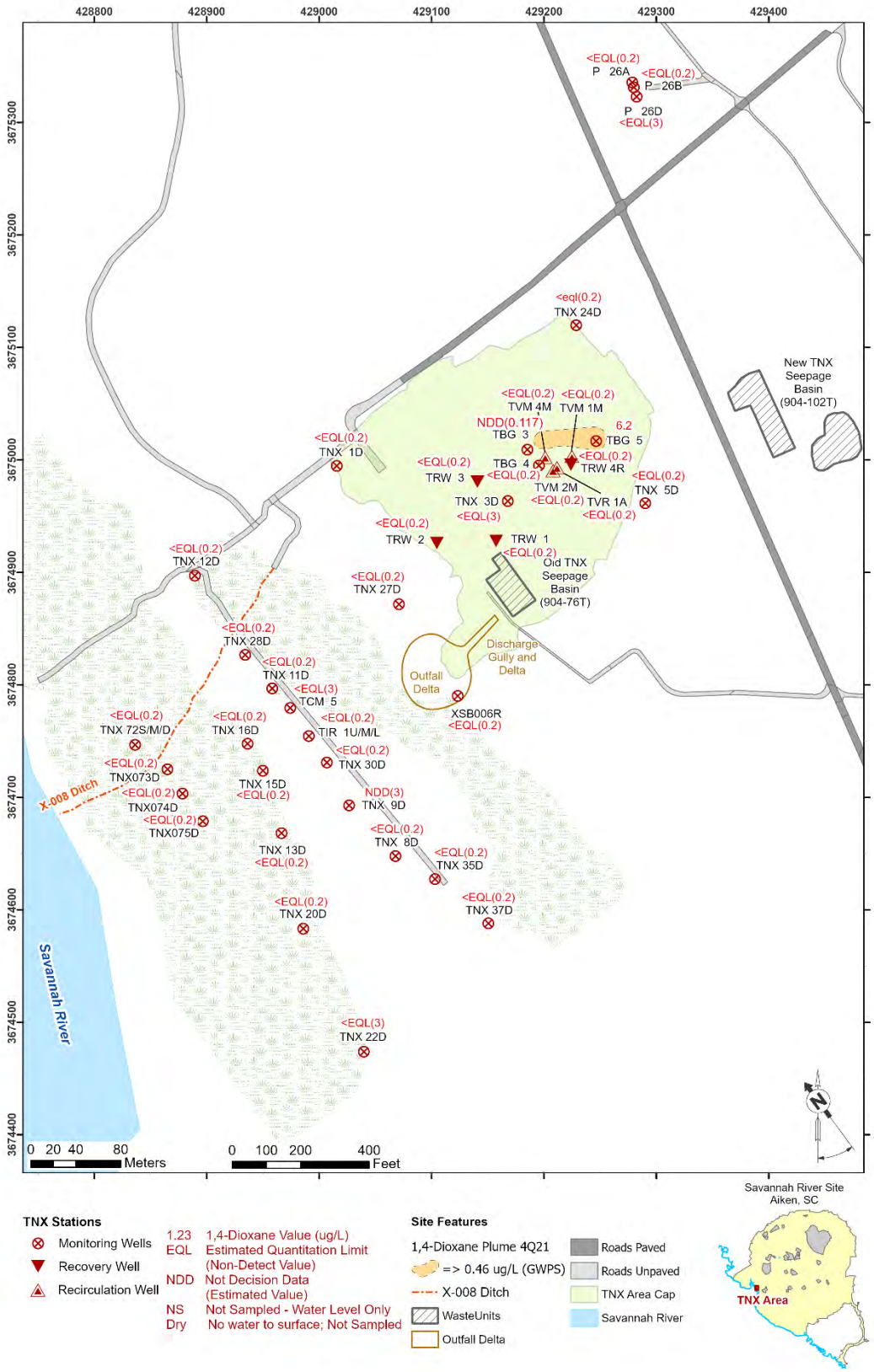


Figure A-24. TNX Area 1,4-Dioxane Concentration in Groundwater, 4Q2021

This page intentionally left blank.

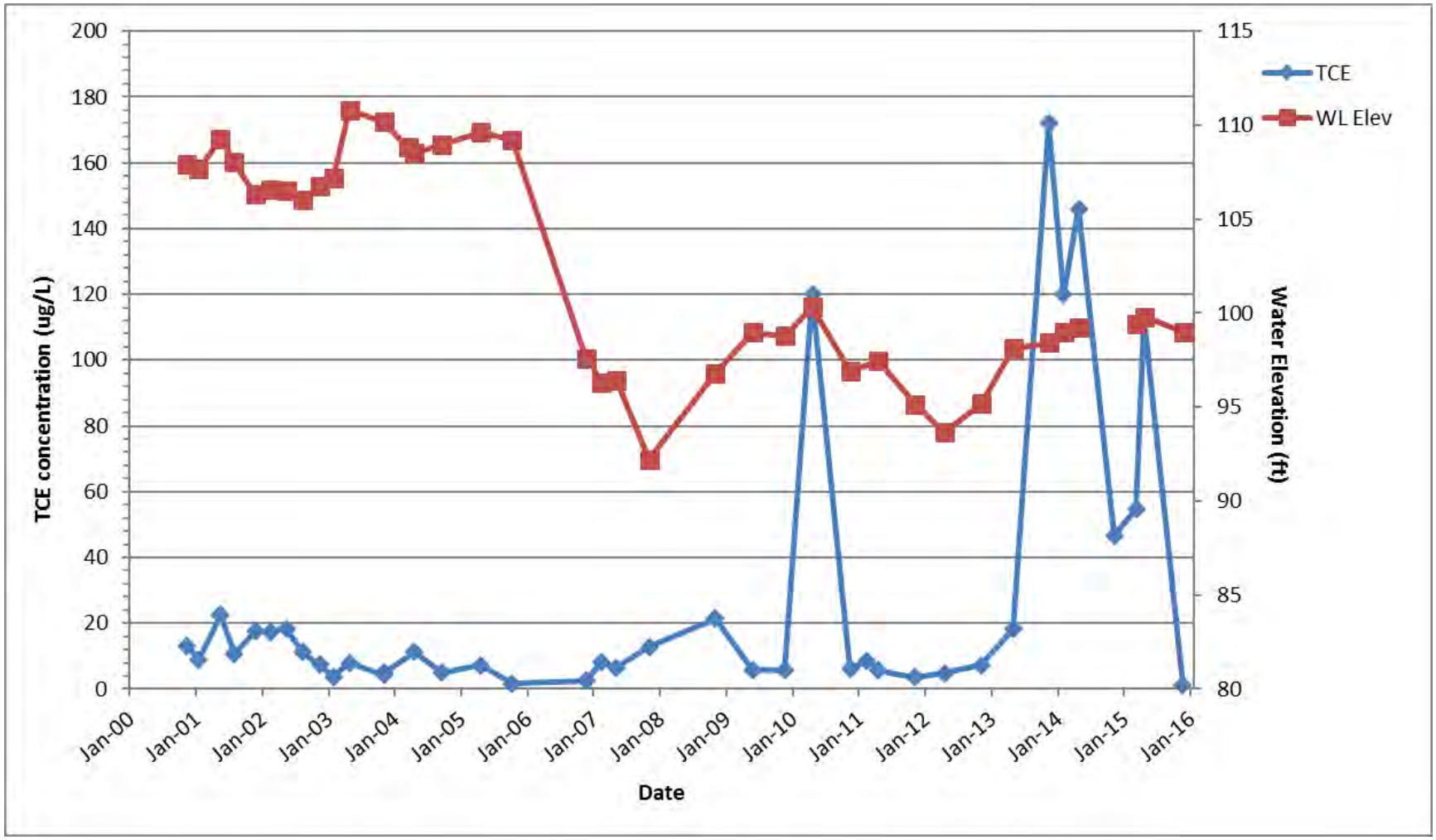


Figure A-25. Comparison of TCE Concentration and Water Elevation at TBG 3

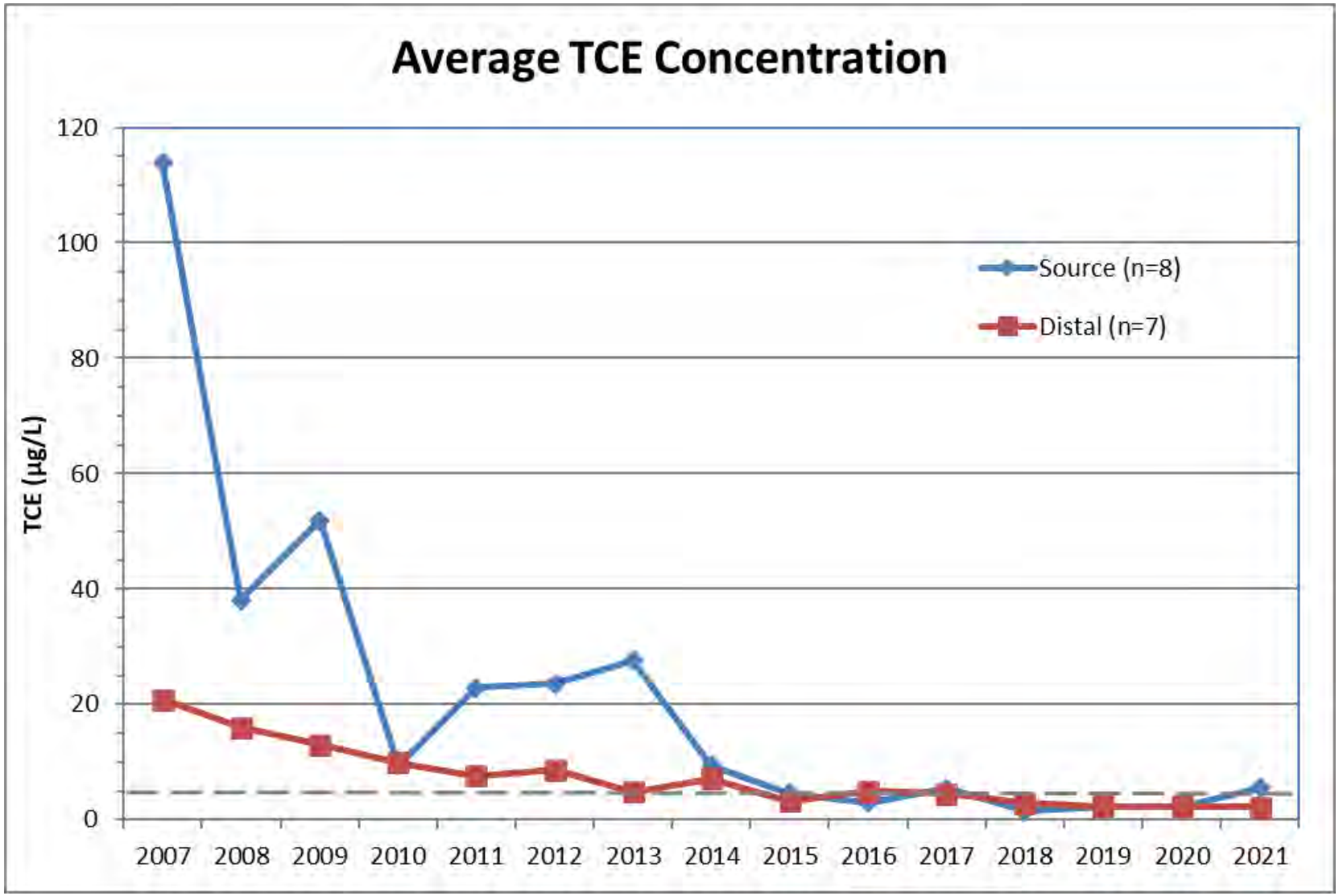


Figure A-27. Average TCE Concentrations of Monitoring Wells in the Treatment Zone and the Distal Plume

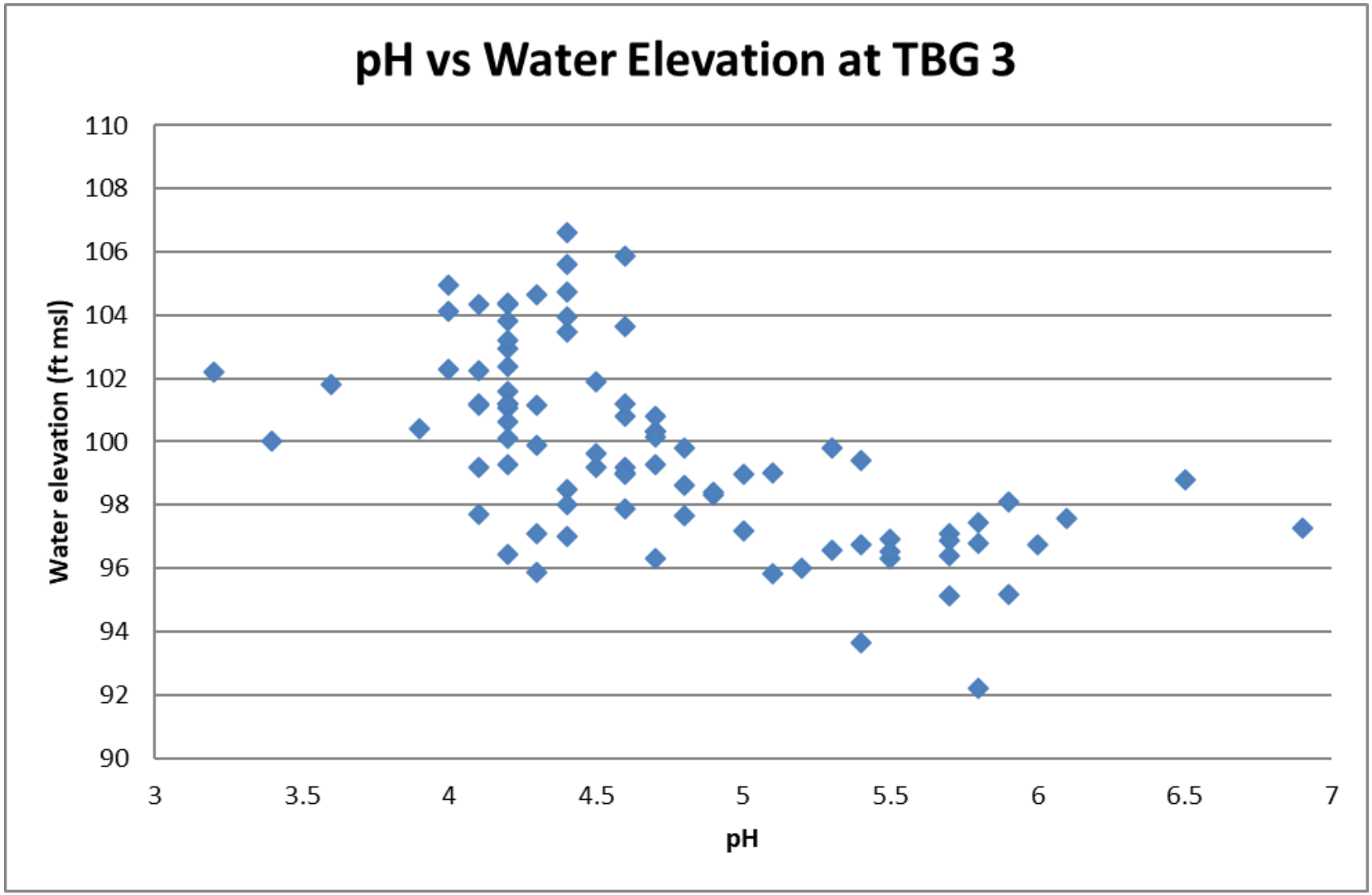


Figure A-28. Graphical Relationship of pH and Water Elevation at TBG 3

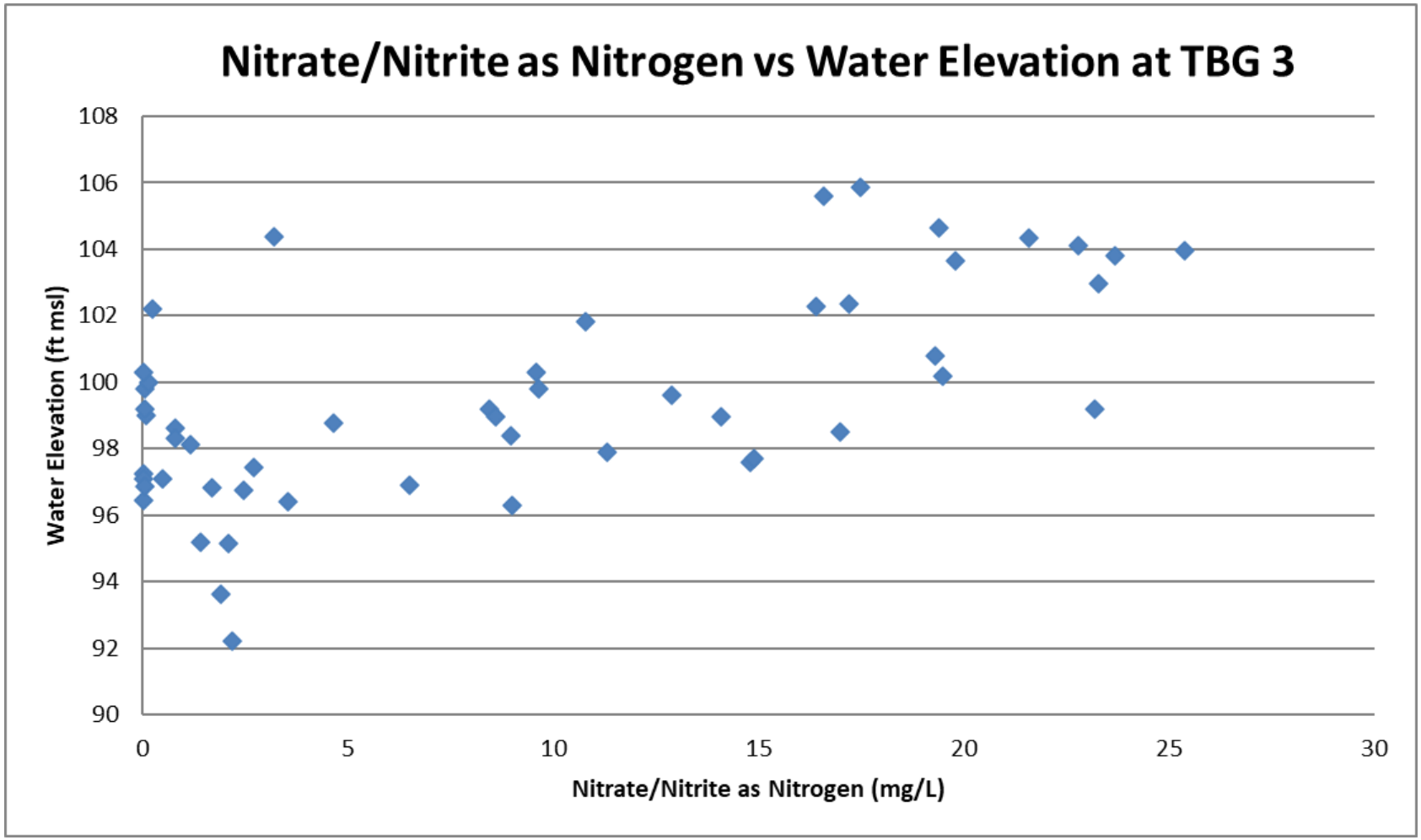


Figure A-29. Graphical Relationship of Nitrate/Nitrite as Nitrogen Concentration and Water Elevation at TBG 3

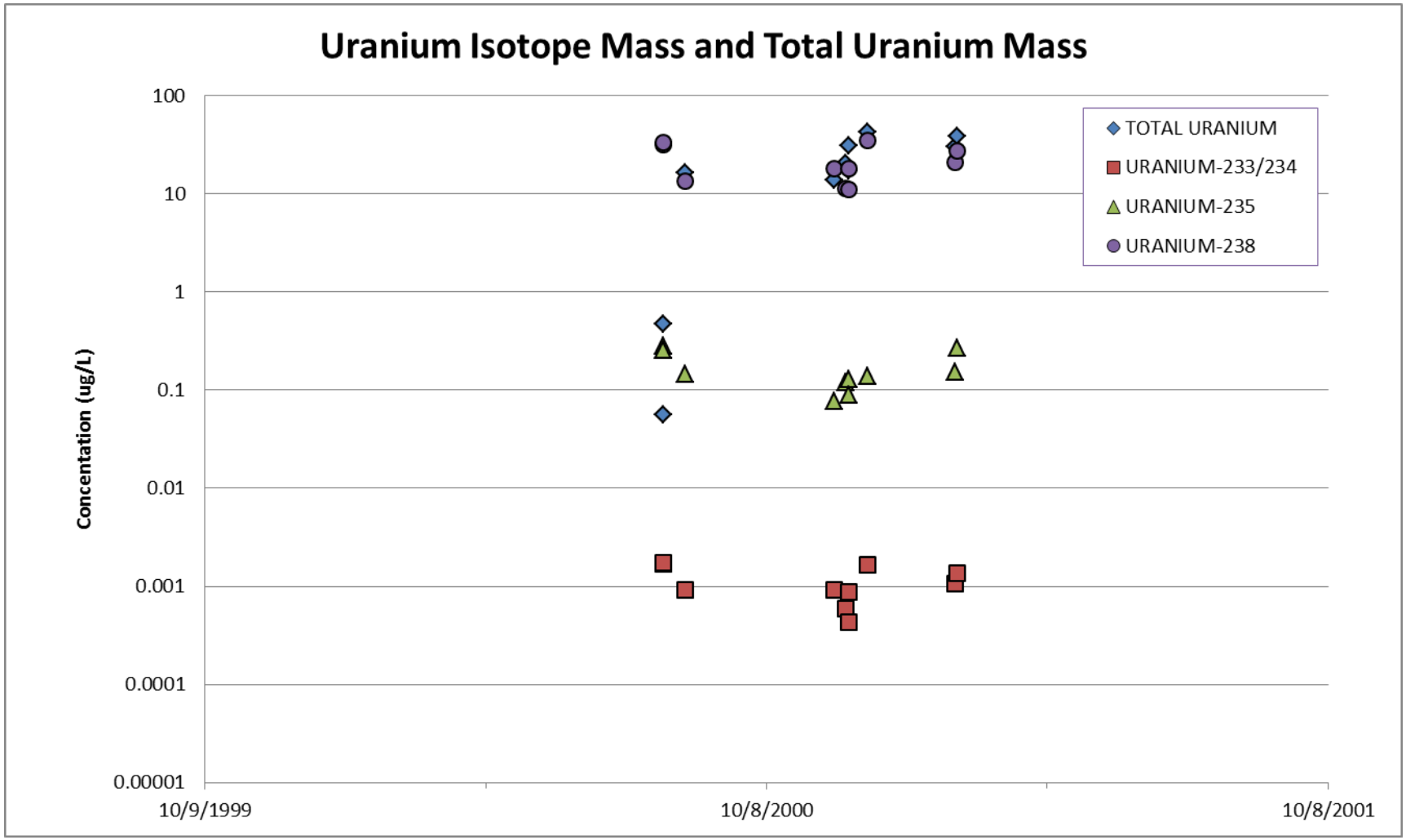


Figure A-30. Uranium Isotope Mass compared to Total Uranium Mass

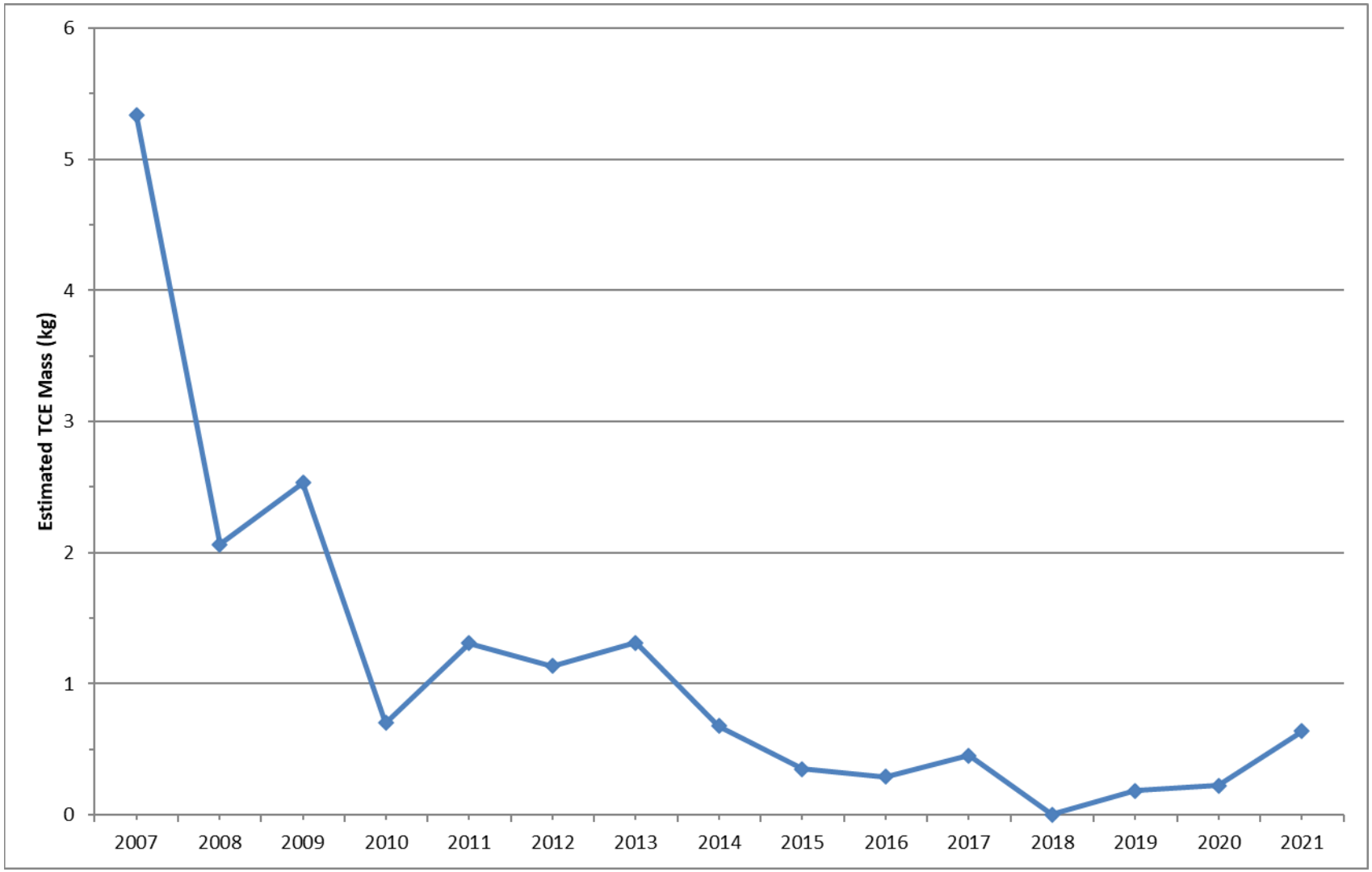


Figure A-31. Estimate of TCE Mass Reduction since Edible Oil Injections

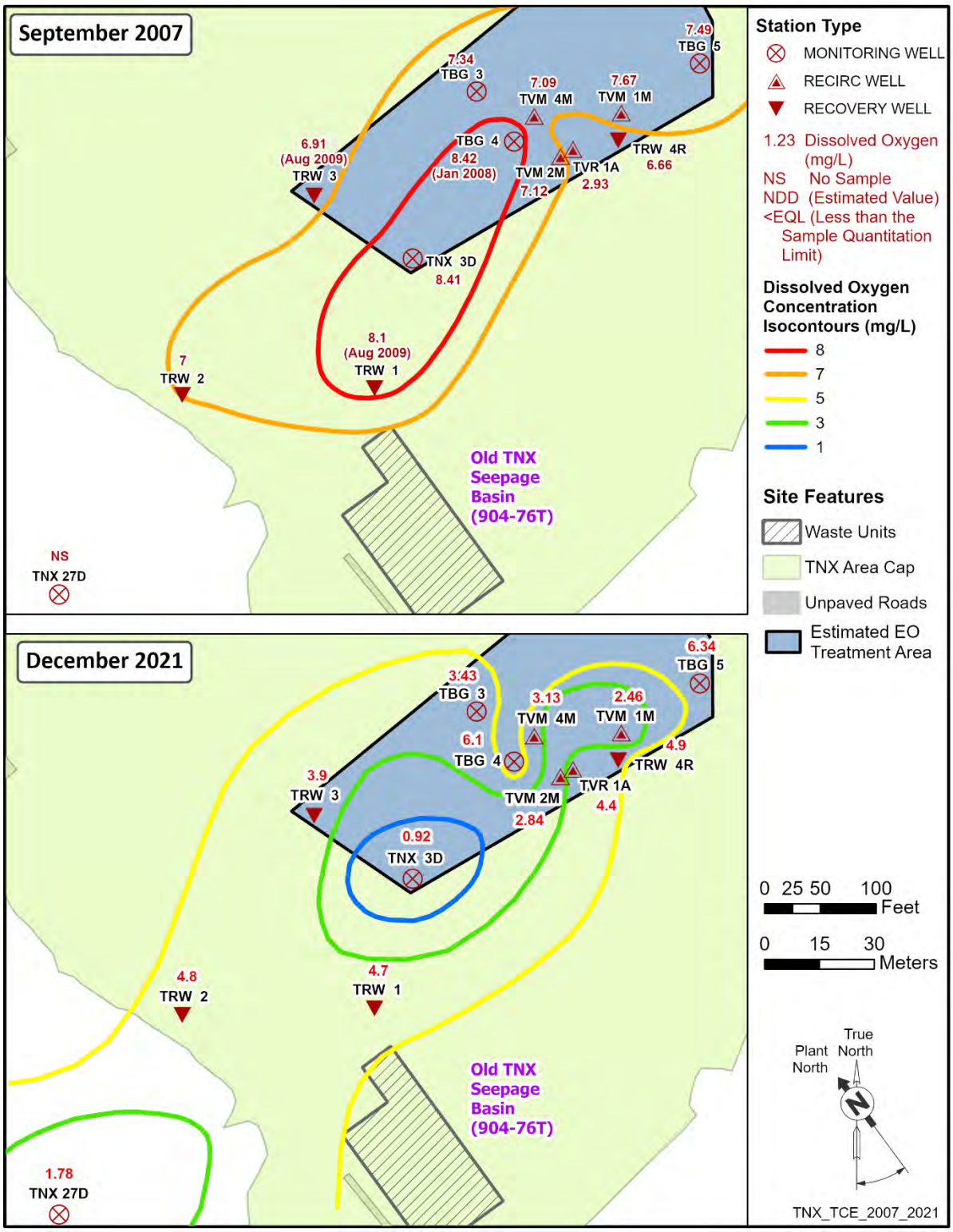


Figure A-32. Comparison of Dissolved Oxygen Concentration in the Treatment Zone in 2007 and 2021

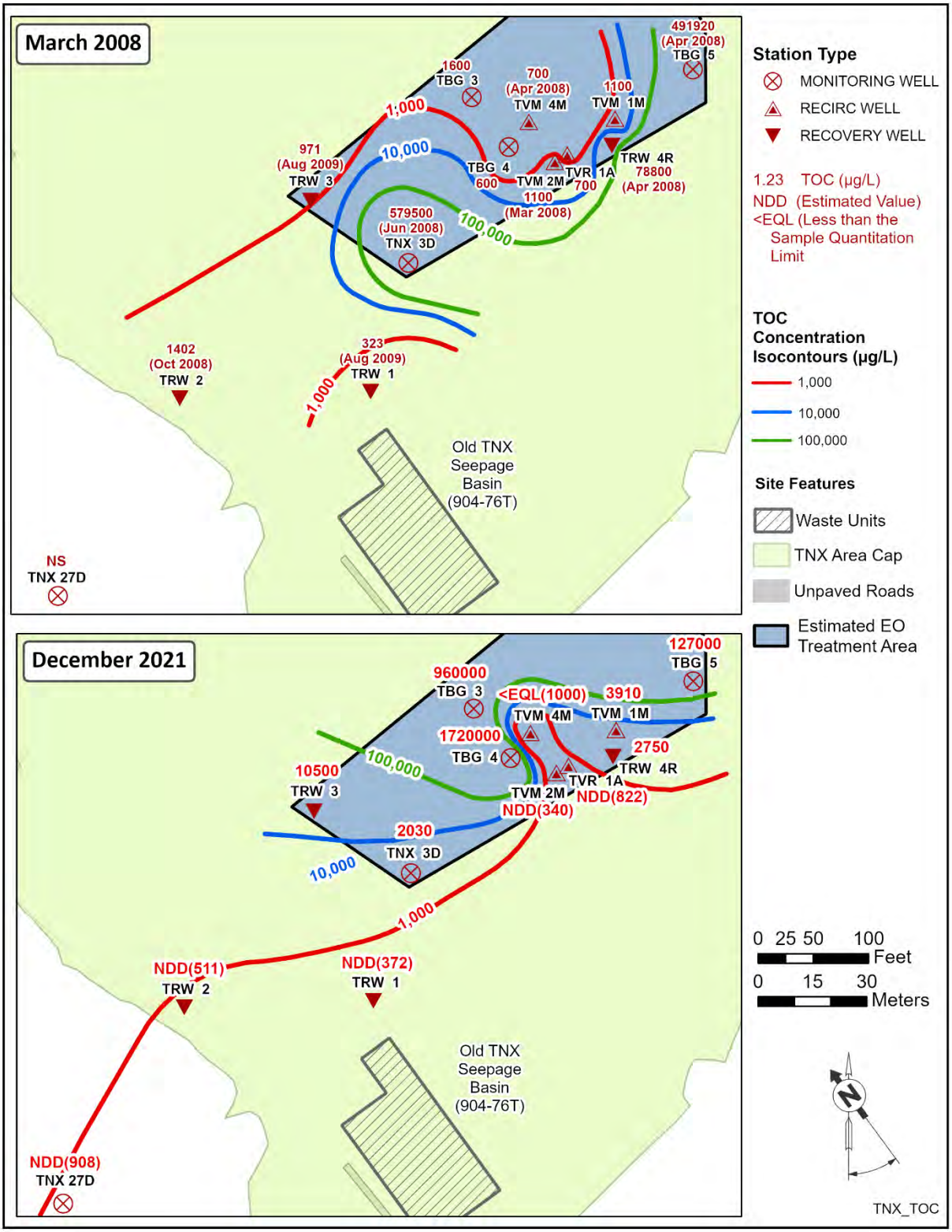


Figure A-33. Comparison of Total Organic Carbon Concentration in the Treatment Zone in 2008 and 2021

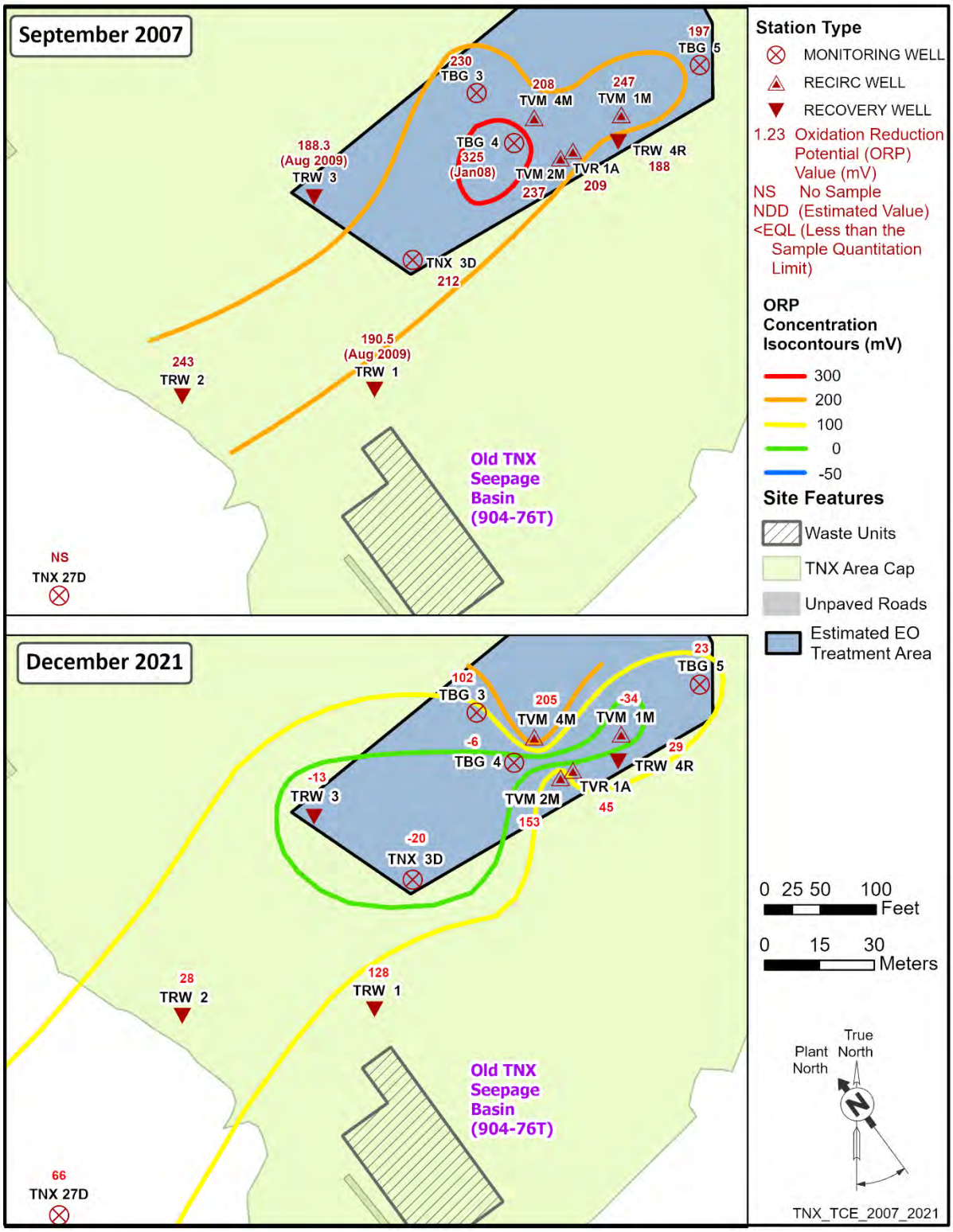


Figure A-34. Comparison of Oxidation Reduction Potential Concentration in the Treatment Zone in 2007 and 2021

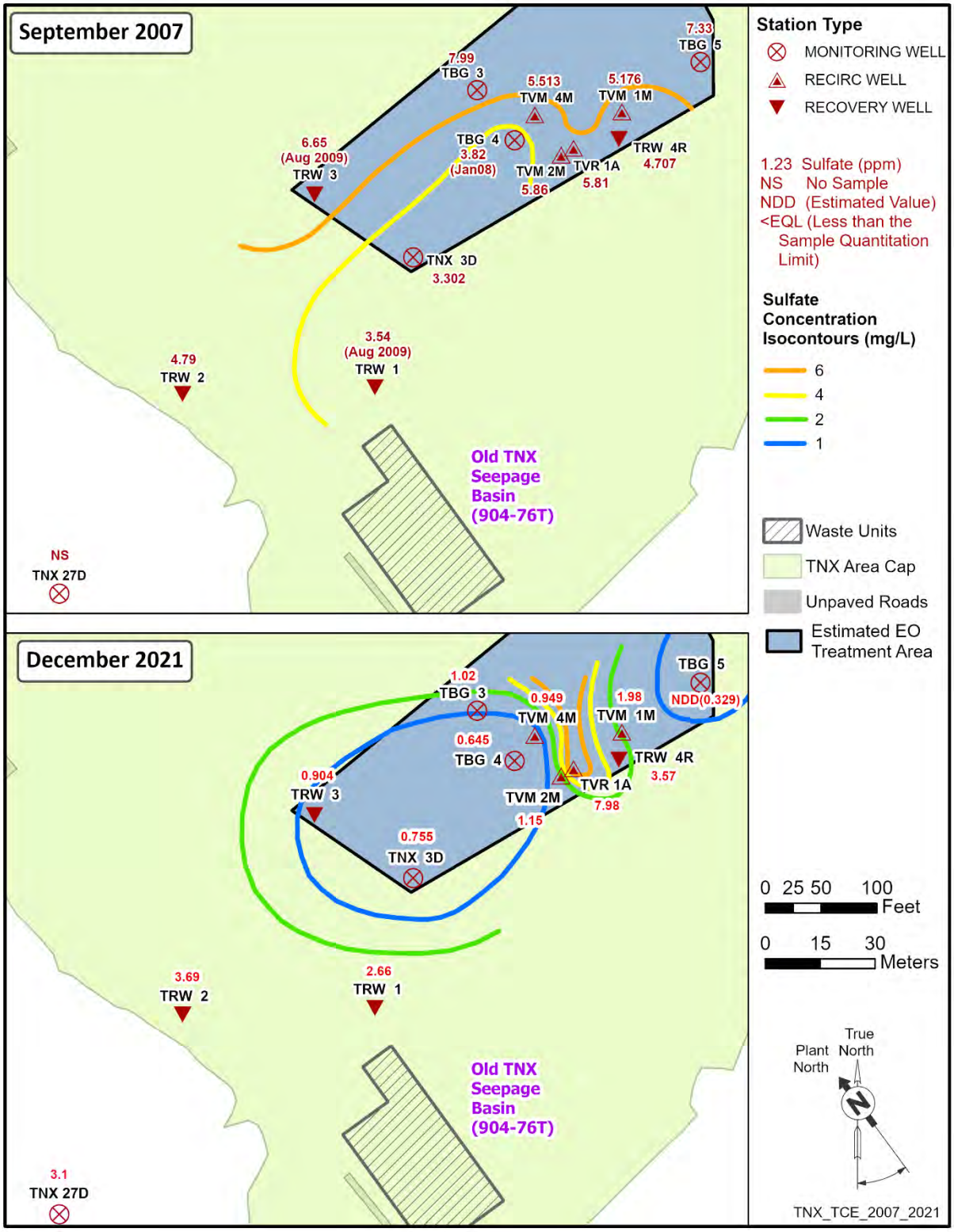


Figure A-35. Comparison of Sulfate Concentration in the Treatment Zone in 2007 and 2021

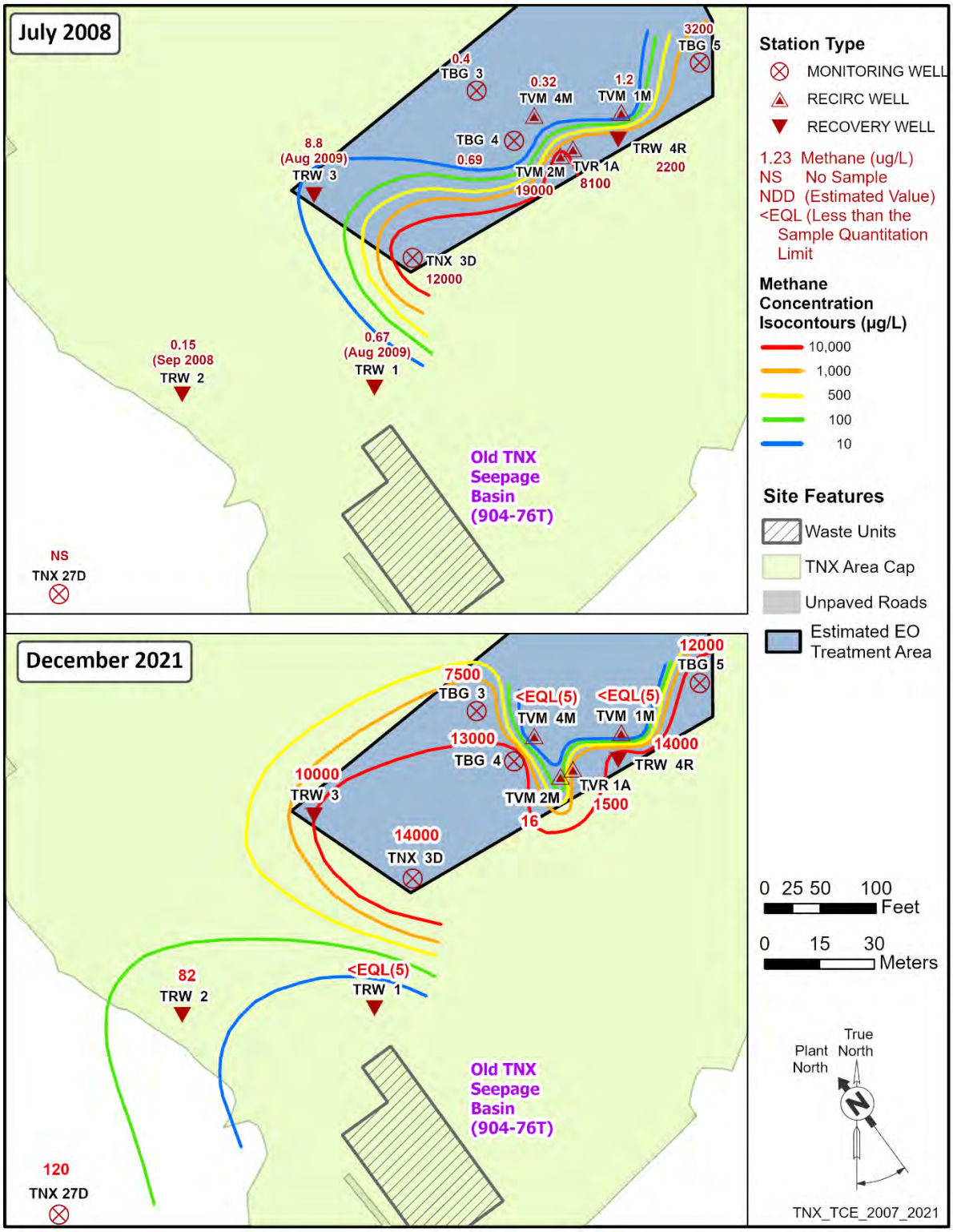


Figure A-36. Comparison of Methane Concentration in the Treatment Zone in 2008 and 2021

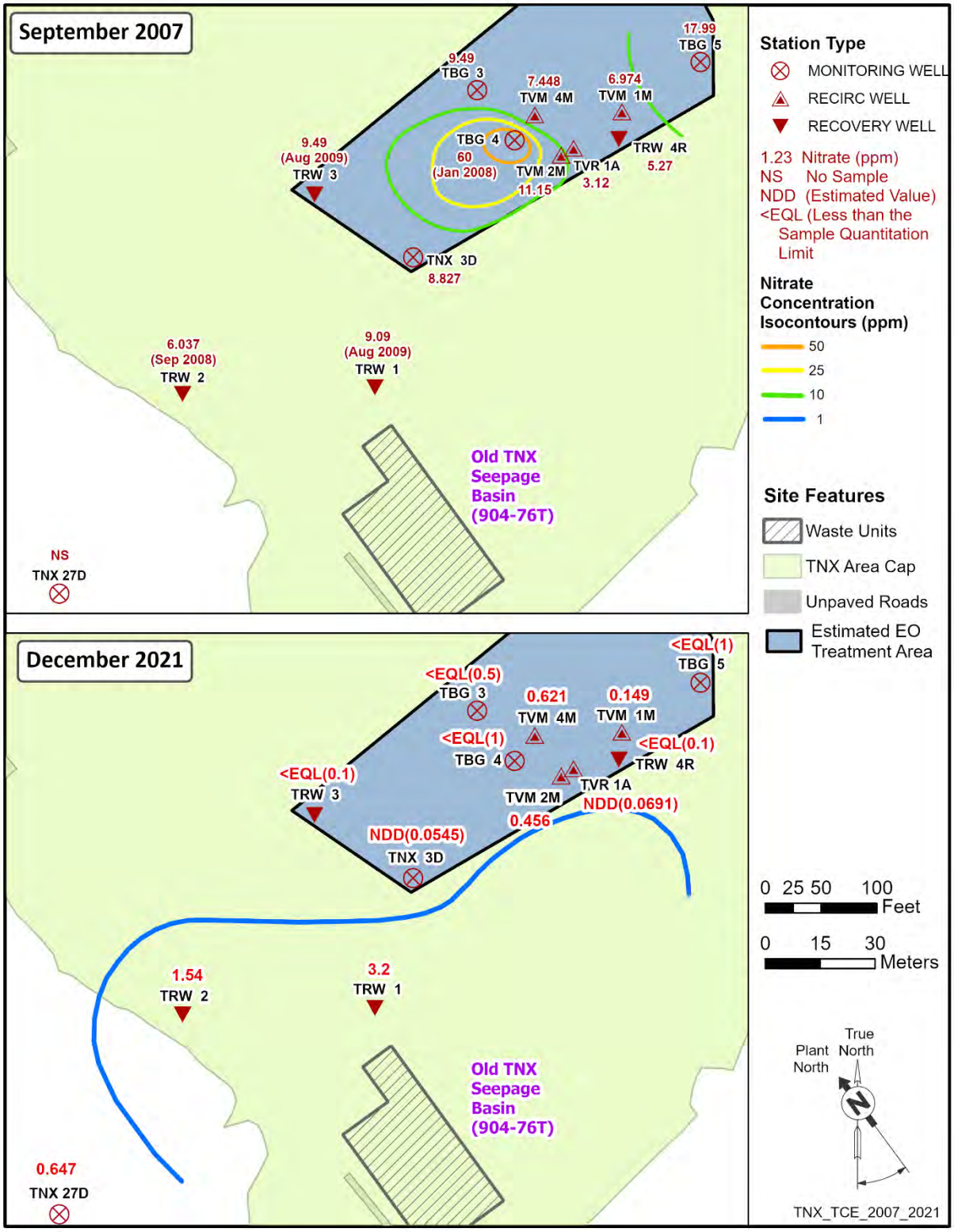


Figure A-37. Comparison of Nitrate Concentration in the Treatment Zone in 2007 and 2021

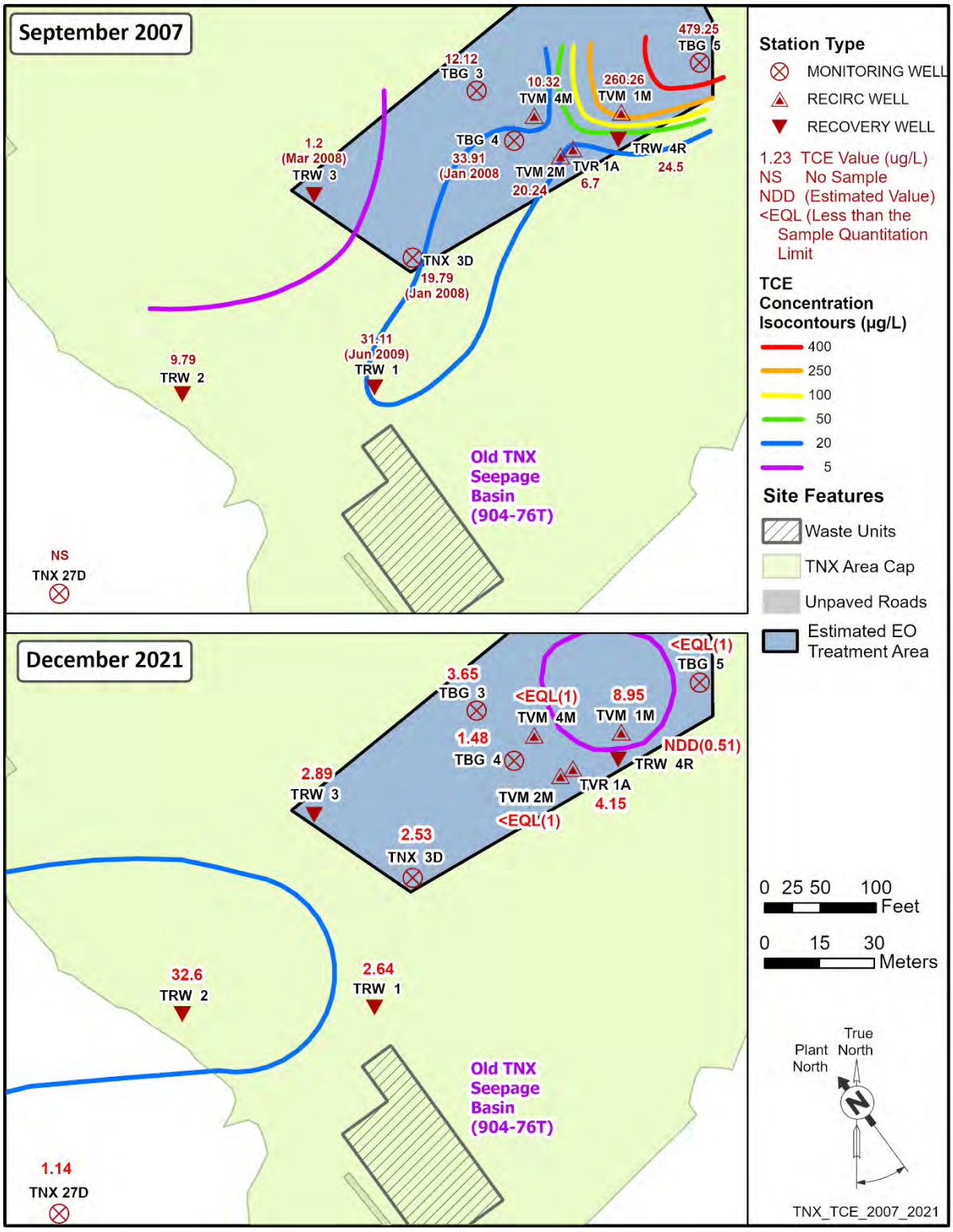


Figure A-38. Comparison of Trichloroethylene Concentration in the Treatment Zone in 2007 and 2021

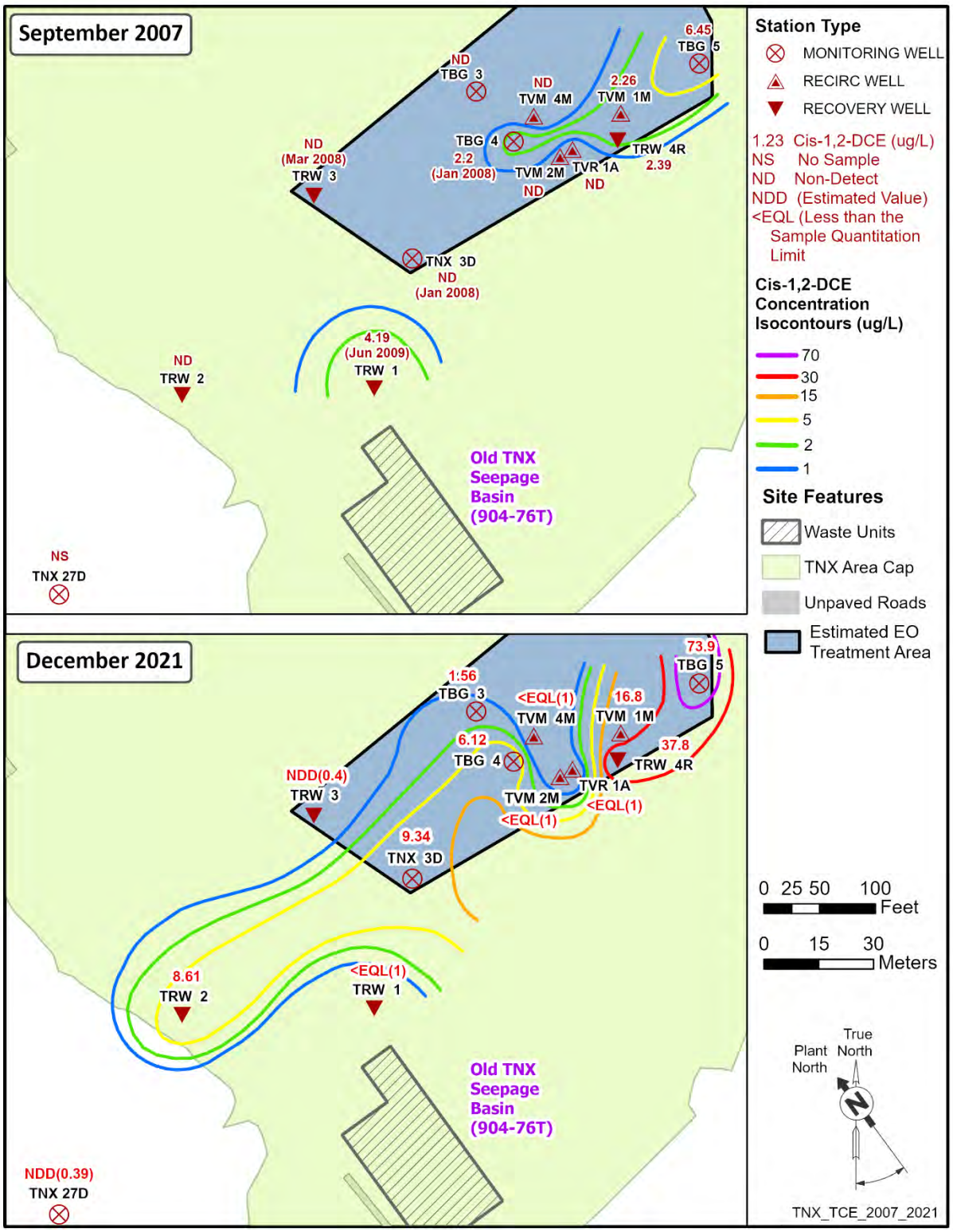


Figure A-39. Comparison of Cis-1,2-Dichloroethylene Concentration in the Treatment Zone in 2007 and 2021

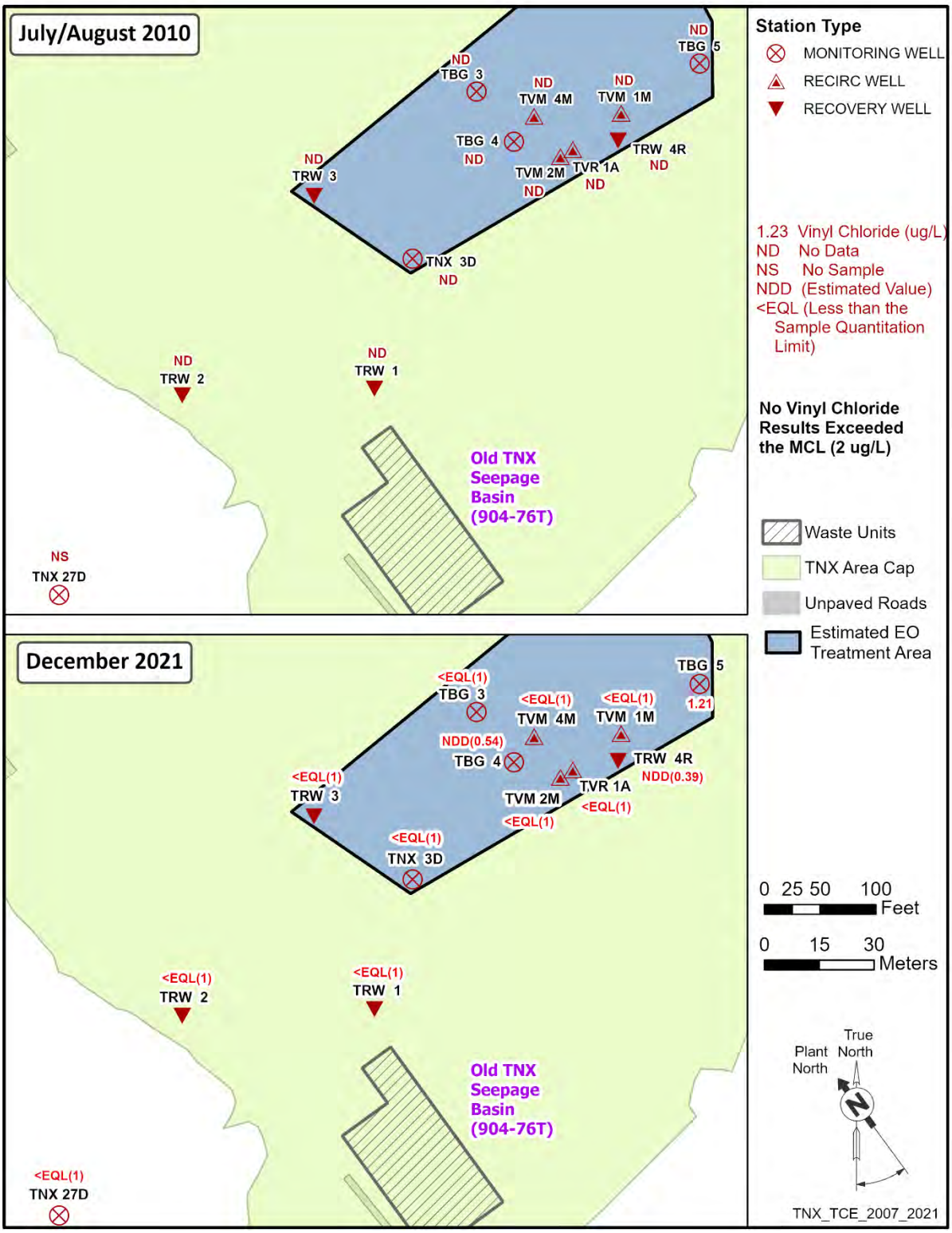


Figure A-40. Comparison of Vinyl Chloride Concentration in the Treatment Zone in 2010 and 2021

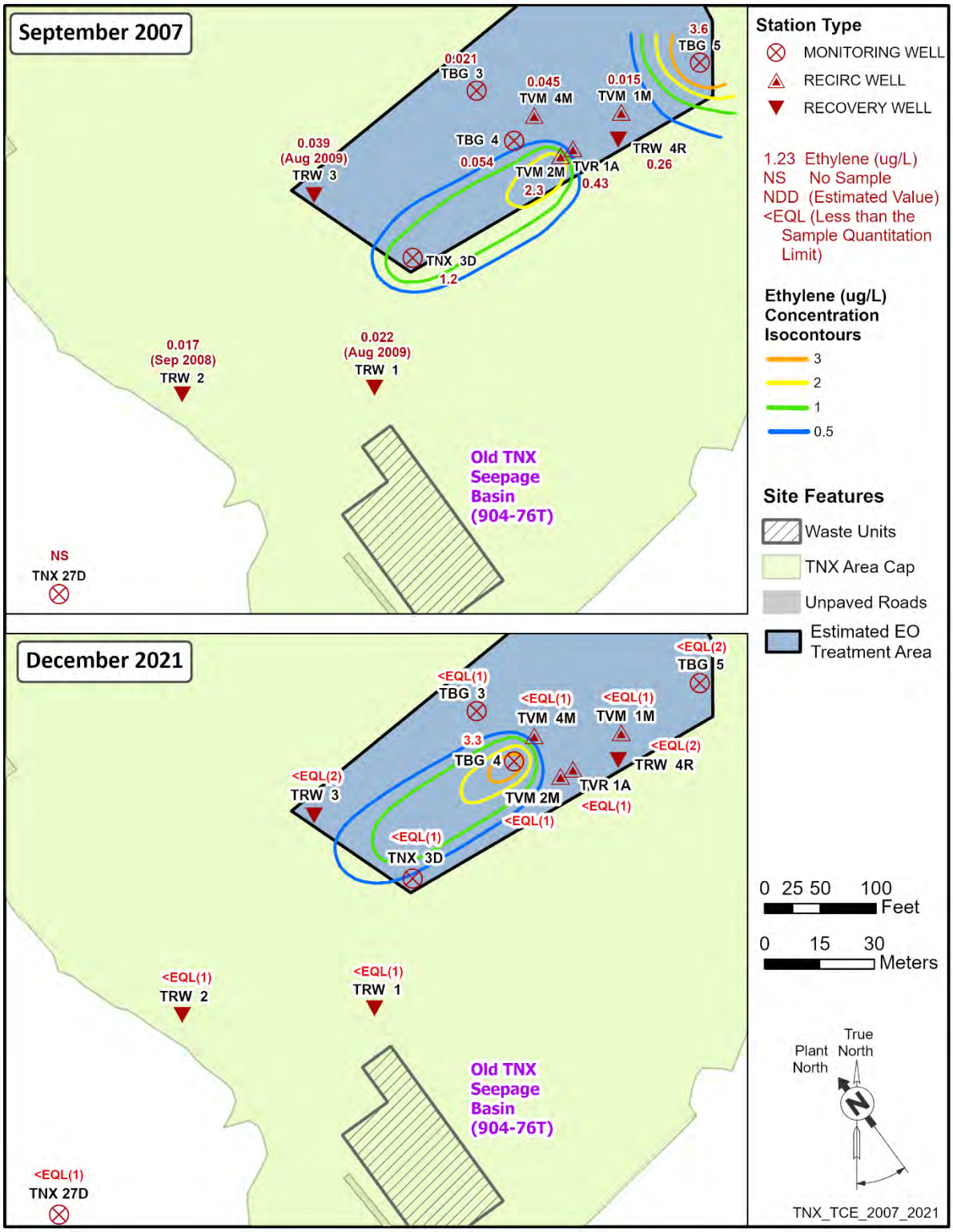


Figure A-41. Comparison of Ethylene Concentration in the Treatment Zone in 2008 and 2021

APPENDIX B

GROUNDWATER MONITORING RESULTS
(MATRIX TABLES)

This page intentionally left blank.

Table B-1. Groundwater Monitoring Results for TNX Area Wells, Second Quarter, 2021

| Table B-1 2Q 2021 TNX Annual Groundwater and Monitoring Report | | | Field Data | | |

Table B-2. Groundwater Monitoring Results for TNX Area Wells, Fourth Quarter, 2021

| Table B-2 4Q 2021 TNX Annual Groundwater and Monitoring Report | | | Field Data | | |

APPENDIX C

DATA REVIEW KEY

This page intentionally left blank.

Key to Reading the Tables

The following abbreviations may appear in the data tables:

Constituents

CCl_4	Carbon Tetrachloride
VC	Chloroethane (Vinyl Chloride)
cis-1,2-DCE	Cis-1,2-Dichloroethylene
NO_3/NO_2 as N	Nitrate-nitrite as Nitrogen
PCE	Tetrachloroethylene
TCE	Trichloroethylene

Contract Laboratories Available

EBL	Environmental Bioassay Lab
GEL	General Engineering Lab
LVL	Lionville Laboratory
STL	Severn Trent Lab

Nomenclature

AZ		Aquifer Zone
UTRA	UTRA	Upper Three Runs Aquifer Unit
GAU	GAU	Gordon Aquifer Unit
UNKNOWN	UNK	Unknown

Field Conditions

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

Field Conditions (continued)

21	Measurement Exceeded Criteria

Units

amsl	above mean sea level
Deg C	degrees Celsius
Deg N	Degrees North
Deg W	Degrees West
E	East
ft	feet
mg/L	milligrams per liter
mV	millivolts
N	North
nM	nanomoles
NTU	nepholometric turbidity unit
pCi/L	picoCuries per liter
pCi/mL	picoCuries per milliliter
pH	pH unit
μg/L	micrograms per liter
μS/cm	microSiemens per centimeter

Other

CLP	USEPA Functional Guideline Codes
E	exponential notation (e.g., 1.1E–09 = 1.1 x 10^{-9} = 0.0000000011)
STORET	USEPA STORET result qualifiers
Filt.	Data results after application of the Data Usability filter
MCL	Maximum Contaminant Level
NDD	"not decision data"
PDWS	primary drinking water standard
USEPA NPDWS	USEPA National Primary Drinking Water Standard
<EQL	less than the sample-specific estimated quantitation limit

Results Below Detection

For radiological analyses, the analytical result field contains the result recorded on the analytical instrument and reported by the laboratory, even if it is negative. For non-radiological analyses, if the analyte is not detected, the sample-specific estimated quantitation limit (EQL) is entered into the result field and is reported with a less than [<] sign. The EQL is defined as the lowest concentration that can be achieved reliably within specified limits of precision and accuracy during routine laboratory operating conditions. The sample-specific EQL is modified for sample concentration or dilution or unusual aliquot size that affects analytical sensitivity.

Calculated Result

The data tables (matrix tables) may include some calculated values of parameters to allow comparison of the sample concentration with the Maximum Contaminant Level (MCL) of the USEPA National Primary Drinking Water Standards. The calculated results have a "C" as the USEPA STORET code, listed in the "EPA" column. If any of the results used in the calculation were assigned a "J" qualifier, the calculated result was also assigned a "J" qualifier. Results for radium 226, radium 228, and uranium (total recoverable) that were <EQL, were treated as "zero" in the calculations.

- Radium-226 and radium-228 are counted as two contaminants, even though their standard is combined. The calculated result for "Radium 226 and Radium 228 (Combined)" is obtained by adding the result for radium 226 to the result for radium 228. If both results were below detection, the greater of the two values was used to represent the "<EQL" result for Radium 226 and Radium 228 (Combined)".

- The MCL for gross alpha particles radioactivity (15 pCi/L) applies to the calculated or "adjusted" gross alpha radioactivity. The "adjusted" gross alpha is defined as the gross alpha particle activity, excluding radon and naturally occurring uranium 234, 235, and 238. The result for "adjusted" gross alpha can also be determined by converting uranium (total recoverable) results from ug/L to pCi/L, using the conversion factor of 0.67 pCi/µg, and then subtracting the uranium activity from the unadjusted gross alpha activity. In some cases, uranium (total recoverable) was detected by the chemical method of analysis, but the gross alpha measurement of radioactivity was below detection. In these cases, since no calculation could be performed, the results for adjusted gross alpha was shown as less than the method detected limit.

- The Radionuclides Rule uses a "sum-of-the-fractions" method to determine whether a sample is in compliance with the MCL for beta particles and photon radioactivity. While the MCL is in "millirems", contaminants are analyzed in "pCi/L". Therefore, to determine compliance, each beta and photon emitter must be concerted from pCi/L to millirems using the conversion factors listed in the MCL column of the data tables (Matrix Tables). The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/yr (mrem/yr). For each emitter detected in a sample, the result was divided by the value in the MCL column of the data tables (Matrix Tables). This provided a fraction of how much the particular beta or photon emitter is providing towards the maximum of 4 mrem/yr for all of the beta photon emitters. Each fraction was then converted to a dose equivalent of 4 mrem/yr by multiplying the fraction by 4. The results for each emitter were then summed, and the calculated result shown as "beta and photon emitters' for comparison to the MCL of 4 mrem/yr.

Uncertainty and Data Usability

In April 1998, the South Carolina Department of Health and Environmental Control (SCDHEC) accepted guidance proposed by Savannah River Site (SRS) to apply a method for minimizing uncertainty in compliance decisions potentially affecting long-term monitoring or remediation (letter, Taylor to Cook; April 21, 1998). The method is applied by processing or "filtering" the data, using the United States Environmental Protection Agency (USEPA) Functional Guideline Codes (USEPA 1994; USEPA 1999) applied by the laboratories to qualify the analytical results. By removing all data with a result qualifier of "L", "R", "U", and "J" from consideration, groundwater data users can ensure that only quantified numerical results are applied to the decision process. The output of the filtering process populates the "Filt" column as follows:

1) "Null" or "blank" – Data not remarked. The analytical result is acceptable for use as reported, and the result is not greater than an associated concentration limit for the analyte.
   Rationale: The best result would be one without qualifiers, so the preferred choice would be the maximum result that did not have any qualifiers.
2) "J", "L", "N", "NJ", or "JL" – "J" identifies that the analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample. "L" Indicates the sample result is off scale high. "JL" Indicates an estimated quantity of a sample that is off scale high. "N" is used for all TIC (tentatively identified compounds) and indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification. "NJ" means the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.
   Rationale: an estimate can still provide useful information. Although there may be a range of uncertainty around the actual value, the value itself may still grossly exceed a regulatory standard. However, a estimated value is less certain than an unqualified result. Therefore, this would be labeled as "NDD" (not decision data).
3) "U" - material analyzed for, but not detected. The analyte concentration is less than the sample specific Estimated Quantitation Limit and labeled "<EQL".

   Rationale: a result above the detection limit would be chosen before a result below detection so that the process is not biased toward false negatives.
4) "UJ" - result is not above the reported sample quantitation limit, but the reported quantitation limit itself is approximate, and may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

   Rationale: the additional qualifiers make this result less reliable for use than the "U" without qualifiers. These results would be labeled "<EQL".
5) "Rejected" – The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

   Rationale: the only value in providing this result in the report is to indicate that the lab attempted to analyze the sample. If there are any other results available, the result with the "R" qualifier should not be reported. If it is reported, it is definitely "NDD" (not decision data).

Holding Times

Standard analytical methods include a limit, called holding time, on the maximum elapsed time between sample collection and extraction or analysis by the laboratory. In the data tables (matrix tables), the result qualifier Q in the "EPA" column indicates that holding time was exceeded. Analyses performed beyond holding times may not yield valid results.

SCDHEC allows only 15 minutes elapse between sampling and analysis for pH. Thus, only field pH measurements can meet the holding time criterion; laboratory pH analyses always will exceed it.

The laboratory procedure used for the determination of specific conductance allows one day to elapse between sampling and analysis. Thus, laboratory specific conductance measurements may exceed the holding time criterion.

Data Qualification

The contract laboratories submit sample- or batch-specific quality assurance/quality control information either at the same time as analytical results or in a quarterly summary. Properly defined and used, data qualifiers can be a key component in assessing data usability. The USEPA Functional Guideline Codes (USEPA 1994; EPA 1999) used by the analytical laboratories are shown in the CLP result qualifier column are defined below. These modifiers appear in the data tables (matrix tables) under the associated with the "Qual code" in the drop down comment box of the result cell in the data tables (matrix tables). US EPA STORET codes appear in the data tables (matrix tables) associated with the "EPA code" in the drop down comment box of the result cell in the Matrix tables. USEPA STORET codes are defined below.

Concentrations that exceeded the USEPA NPDWS and are not "estimated quantities" (i.e. do not have a USEPA Functional Guideline Code of "J") are identified in the tables by a red background. Results shown in a lavender background are estimated quantities. Blue font indicates that a particular analysis is not required for a given well for the sampling event presented. An "NS" with a yellow background identifies analyses that were required but could not be completed. Results that were rejected by the laboratory are listed in the data tables (matrix tables) as "REJ", with a pink background.

"CLP" Qualifiers - USEPA Functional Guidelines Codes (USEPA 1994 and USEPA 1999)

(Blank)	Data not remarked. The analytical result is acceptable for use as reported.
J	The analyte was positively identified; the associated numerical value is an estimated concentration of the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence of absence of the analyte cannot be verified. Assignment of *R* requires approval by the appropriate WSRC data validation coordinator.
U	Material analyzed for but not detected. Analytical result reported is less than the sample quantitation limit.
U J	The analyte was not detected above the reported sample quantitation limit. The reported quantitation limit is approximate, and may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Note: These are only some of the qualifiers present in the database. All modifiers associated with the data are published in the official repository of the data.

"EPA" Qualifiers – USEPA STORET Codes

(Blank)	Data not remarked
C	The result is calculated.
I	The result is less than the ssEQL, but equal to or greater than the MDL. Always reported with an associated EPA functional Guideline Code qualifier of *J*.
K	The actual concentration is known to be less than the reported result.
L	The actual concentration is known to be less than the reported result.
N	There is presumptive evidence of the presence of an analyte.
O	Sample received by laboratory, but the analysis was lost or not performed.
Q	Sample was held beyond normal holding time prior to analysis.
V	The analyte was detected in both the method blank and the sample.
Y	The result is from an unpreserved or incorrectly preserved sample; the data may not be accurate.

Note: These are only some of the qualifiers present in the database. All modifiers associated with the data are published in the official repository of the data.

In addition, to the USEPA STORET codes, SRS applies qualifier codes to provide additional information. The SRS codes, also associated with the "EPA code" in the Matrix Tables are defined below.

"SRS" Qualifiers

1 Compound identification criteria were not met.
2 Laboratory control sample (LCS) or blank spike (BS) criteria were not met.
3 Inductively coupled plasma (ICP) serial dilution criteria were not met.
4 Matrix interference is present.
5 Matrix spike concentration was < 0.25× the sample concentration, and the percent recovery cannot be determined.
6 The analyte was detected in both the sample and associated field blank.
7 The analyte was detected in both the sample and associated rinsate.
8 The analyte was detected in both the sample and associated trip blank.
9 The field duplicate RPD was not within control limits.
10 Internal standard (IS) criteria were not met when the IS was used for quantitation.
11 Matrix spike recovery was not within the control limits.
12 A tentatively identified compound is a suspected aldol-condensation product.
13 Initial or continuing calibration criteria were not met.
14 Surrogate or tracer spike recovery is out of specification.
15 Graphite furnace atomic absorption QC: a. Duplicate injection criteria were not met; b. Post-digestion spike recovery was not within control limits and the sample absorbance is > 50% of the post-digestion spike absorbance.
16 The sample was analyzed by the method of standard additions.
17 Graphite furnace atomic absorption QC: the post-digestion spike recovery is not within control limits and the sample absorbance is < 50% of the post-digestion spike absorbance.
18 The laboratory duplicate relative percent difference (RPD) or matrix spike/matrix spike duplicate (MS/MSD) (RPD) was not within control limits.

Note: These are only some of the qualifiers present in the database. All modifiers associated with the data are published in the official repository of the data, the Environmental Restoration Data Management System database.

REFERENCES

SCDHEC, 1998. *RE: Groundwater Data Reporting Change at SRS*, Letter, G. K. Taylor (SCDHEC) to J. W. Cook (EPD/WSRC); April 21, 1998

USEPA, 1994. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, 9240.1-05-01, PB 94-963502, EPA540/R-94/013, February 1994; U.S. Environmental Protection Agency, Washington, DC

USEPA, 2000. EPA (U.S. Environmental Protection Agency, Office of Water), 2000. Federal Register, Vol. 56, No 236, Thursday, December 7, 2000, Rules and Regulations, 40 CFR Parts 9, 141, and 142; National Primary Drinking Water Regulations; Radionuclides; Final Rule

USEPA, 2002. EPA (U.S. Environmental Protection Agency, Office of Water), 2002. Implementation Guidance for Radionuclides; Appendix I, (beta and photon emitter conversion tables); EPA 816-F-00-002, March 2002. http://www.epa.gov/safewater

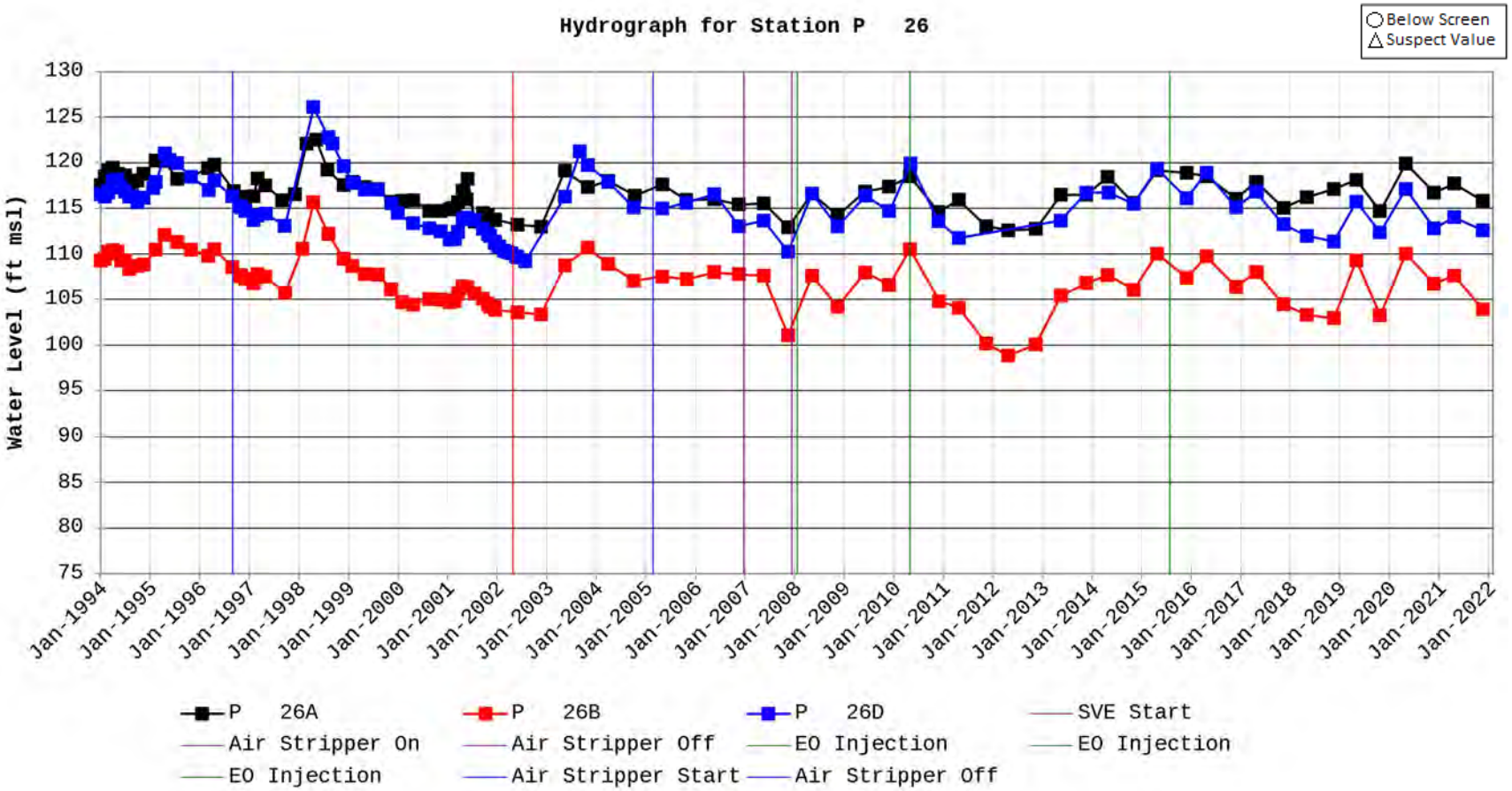
USEPA, 2003. EPA (U.S. Environmental Protection Agency, Office of Water), 2003. Alphabetical version in .pdf format of the EPA National Primary Drinking Water Regulations; EPA 816-F-03-016, June 2003. (For copies of the complete regulations regarding these contaminants, follow the links to the National Primary Drinking Water Regulations. http://www.epa.gov/safewater/consumer/pdf/mcl.pdf)

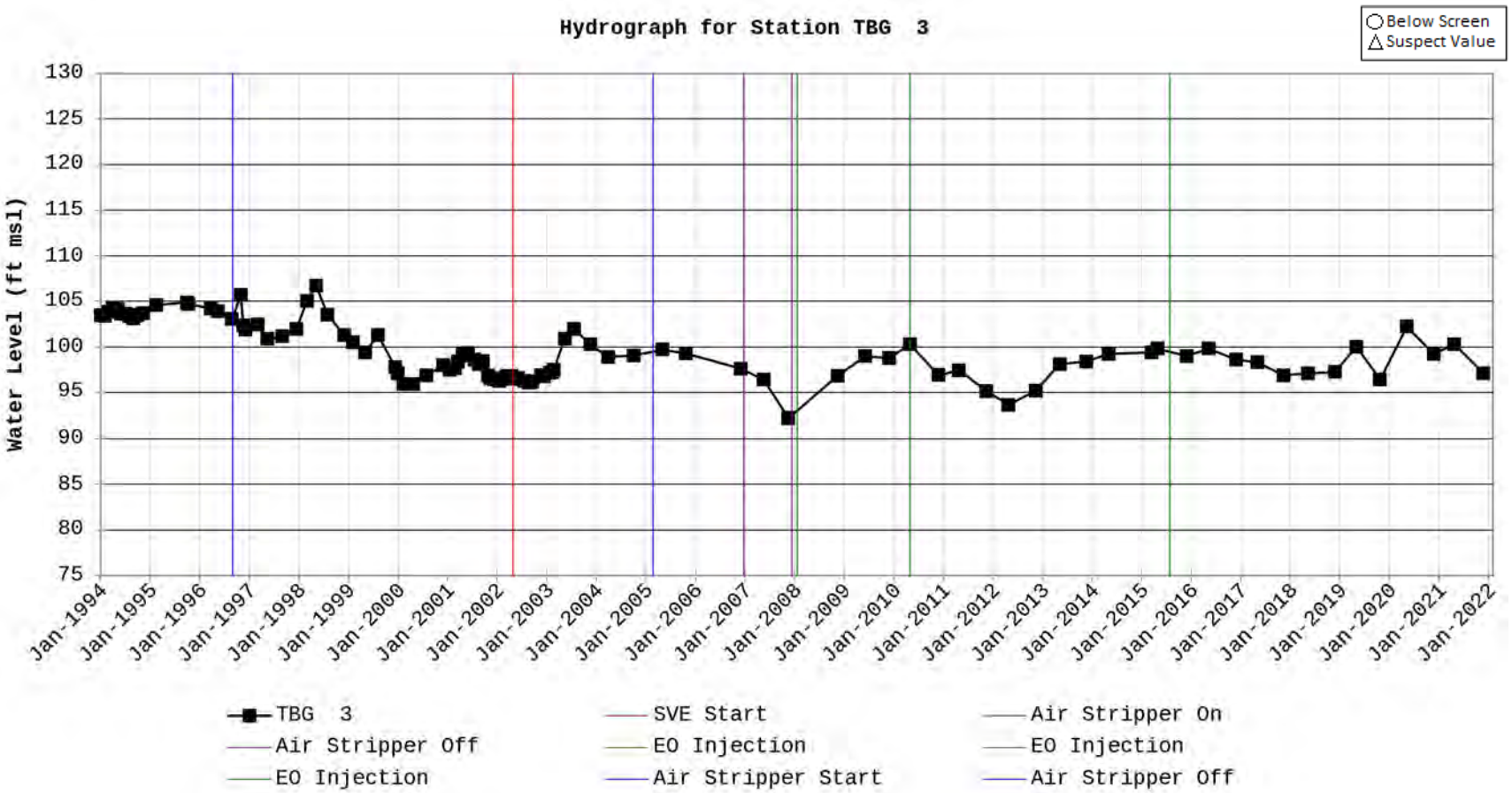
This page intentionally left blank.

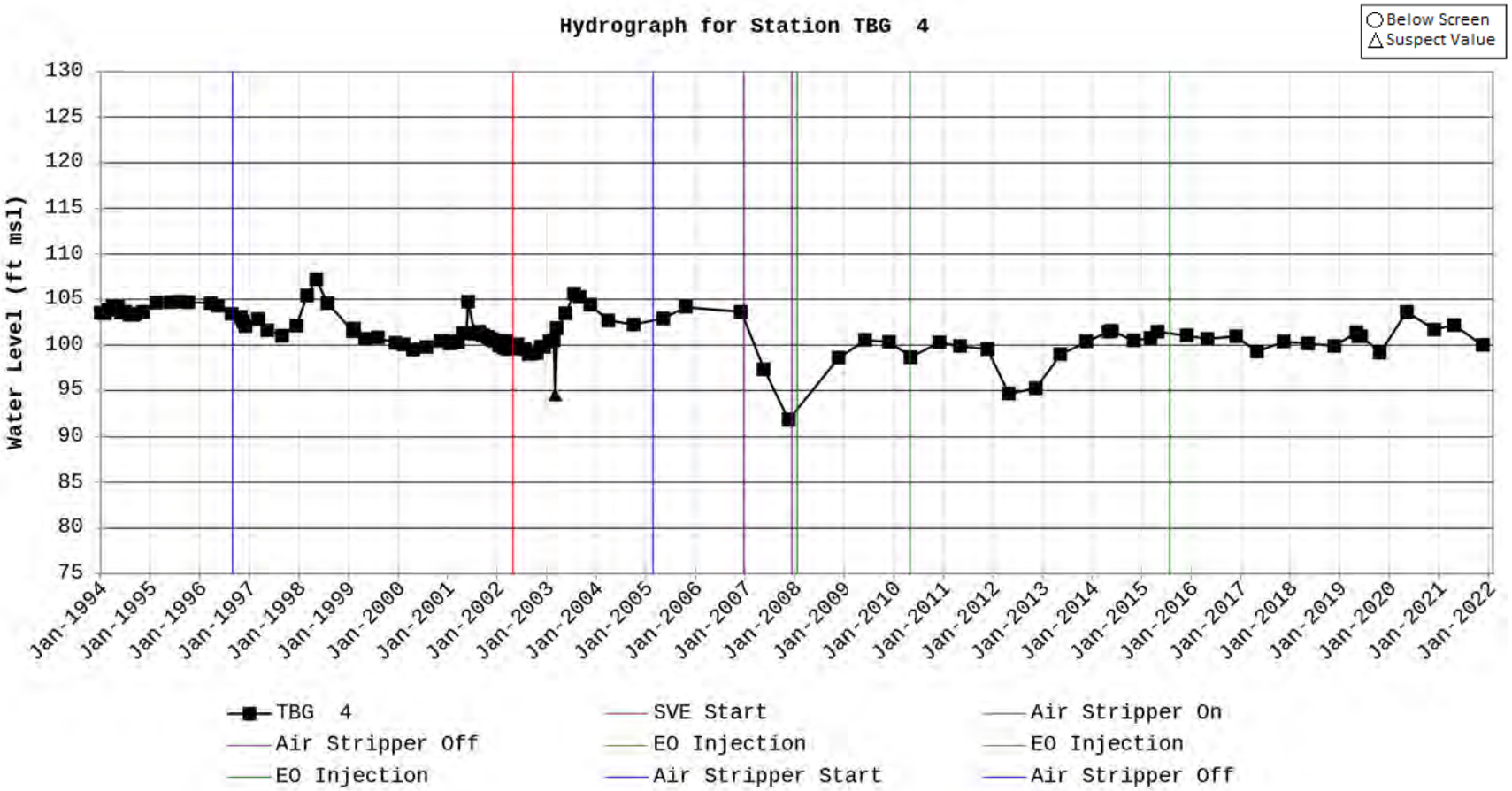
APPENDIX D

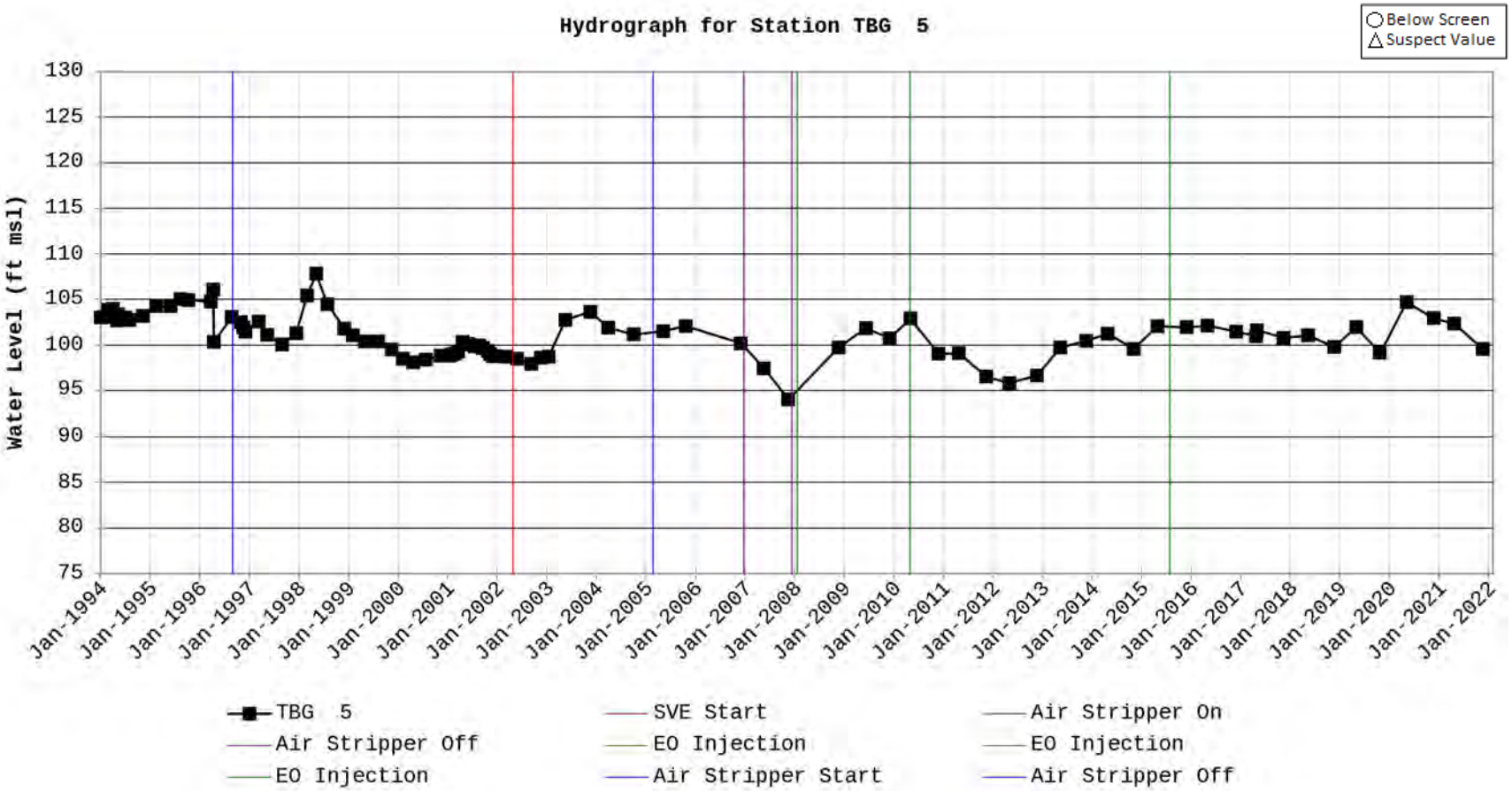
HYDROGRAPHS

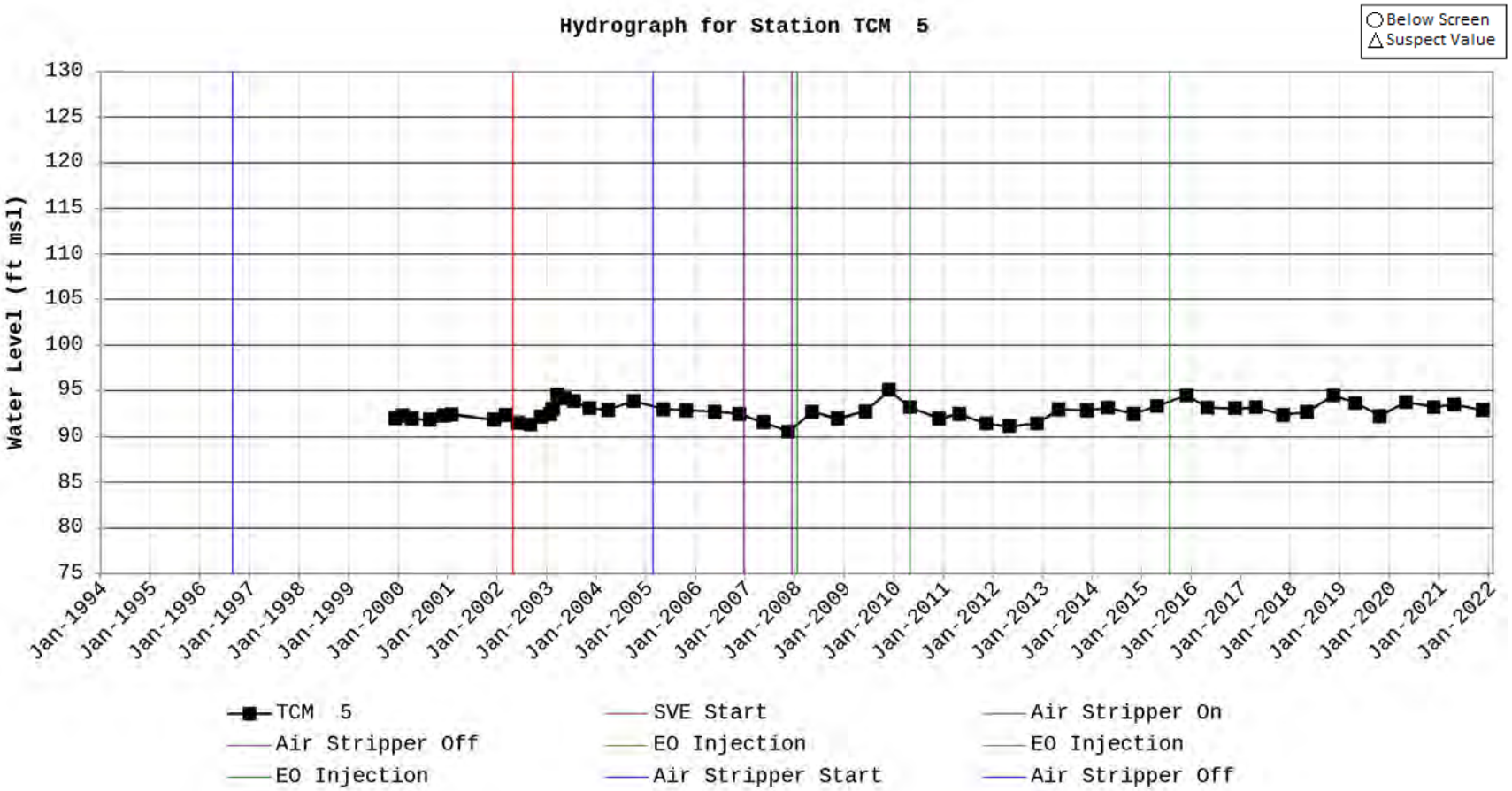
This page intentionally left blank.

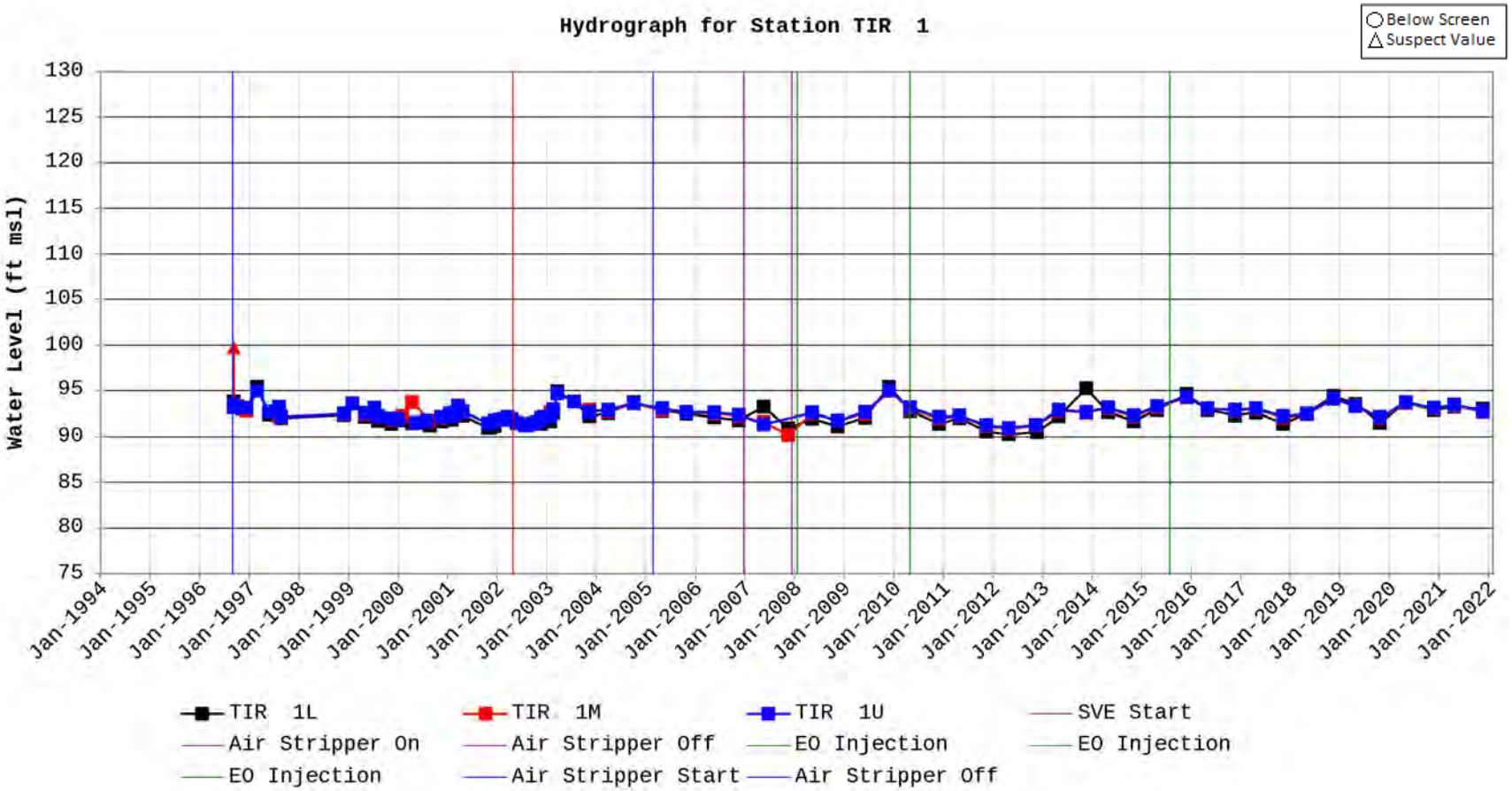

Hydrograph for Station P 26
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
P 26A
P 26B
P 26D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

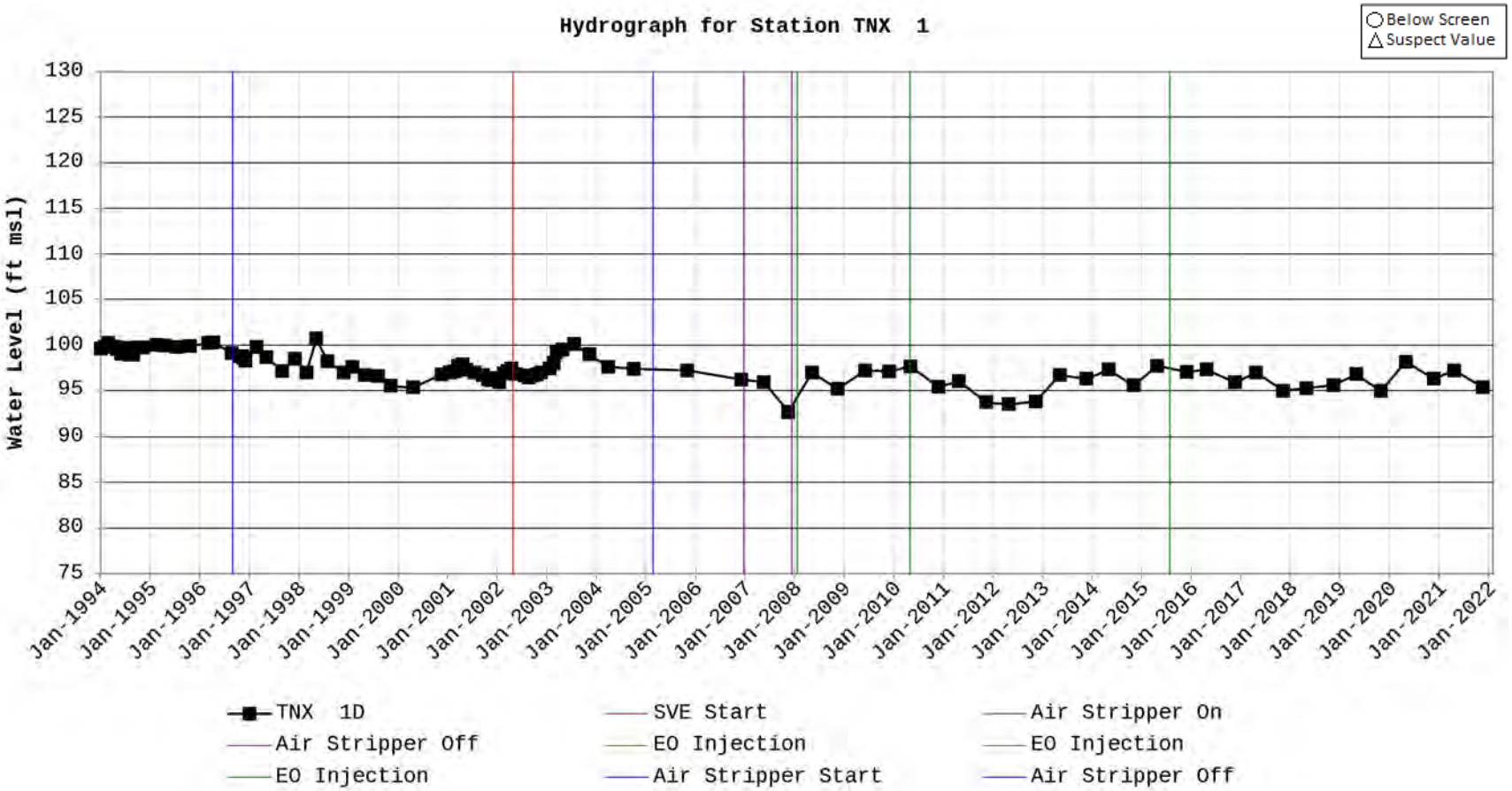

Hydrograph for Station TBG 3
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

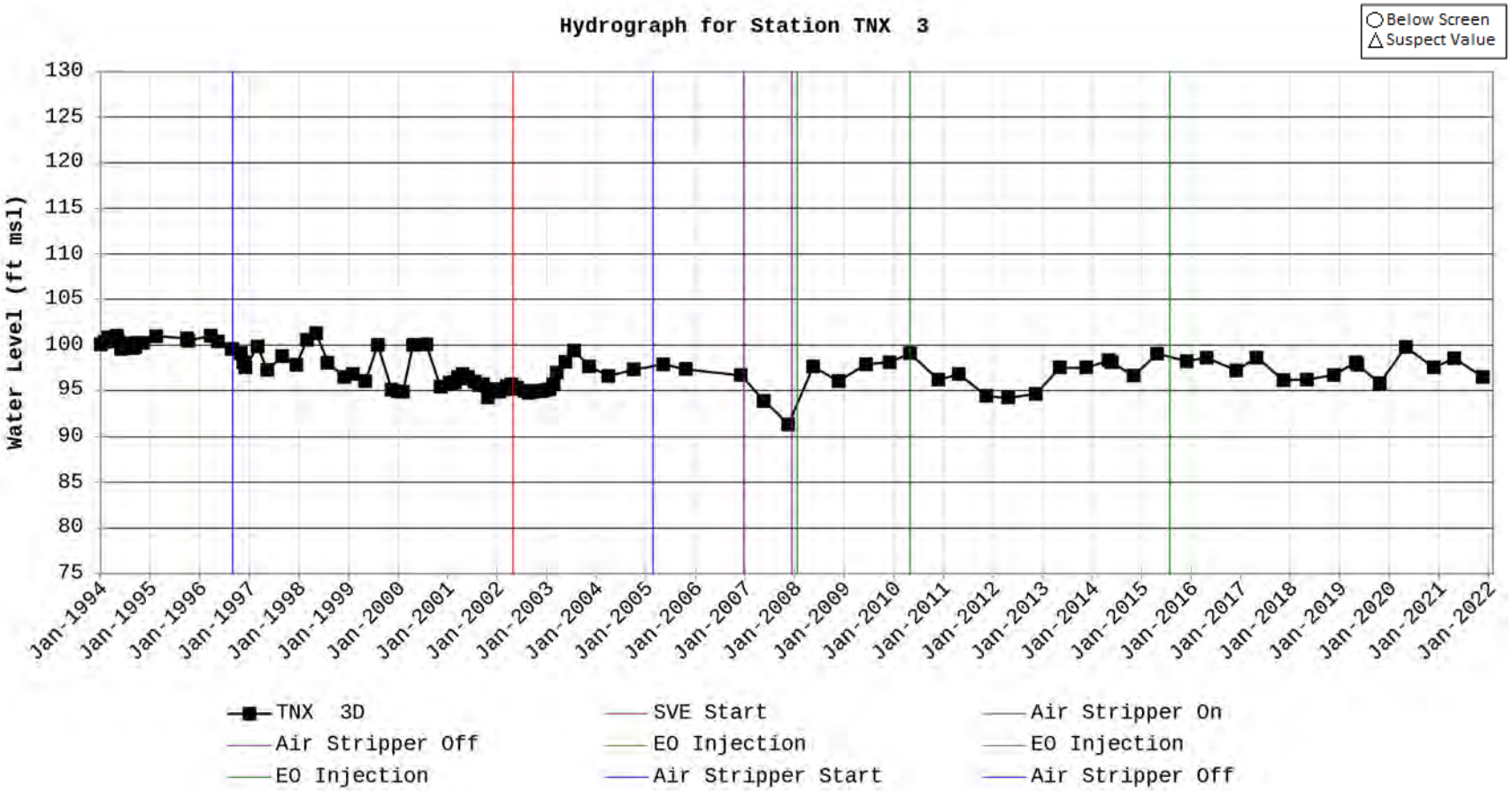

Hydrograph for Station TBG 4
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

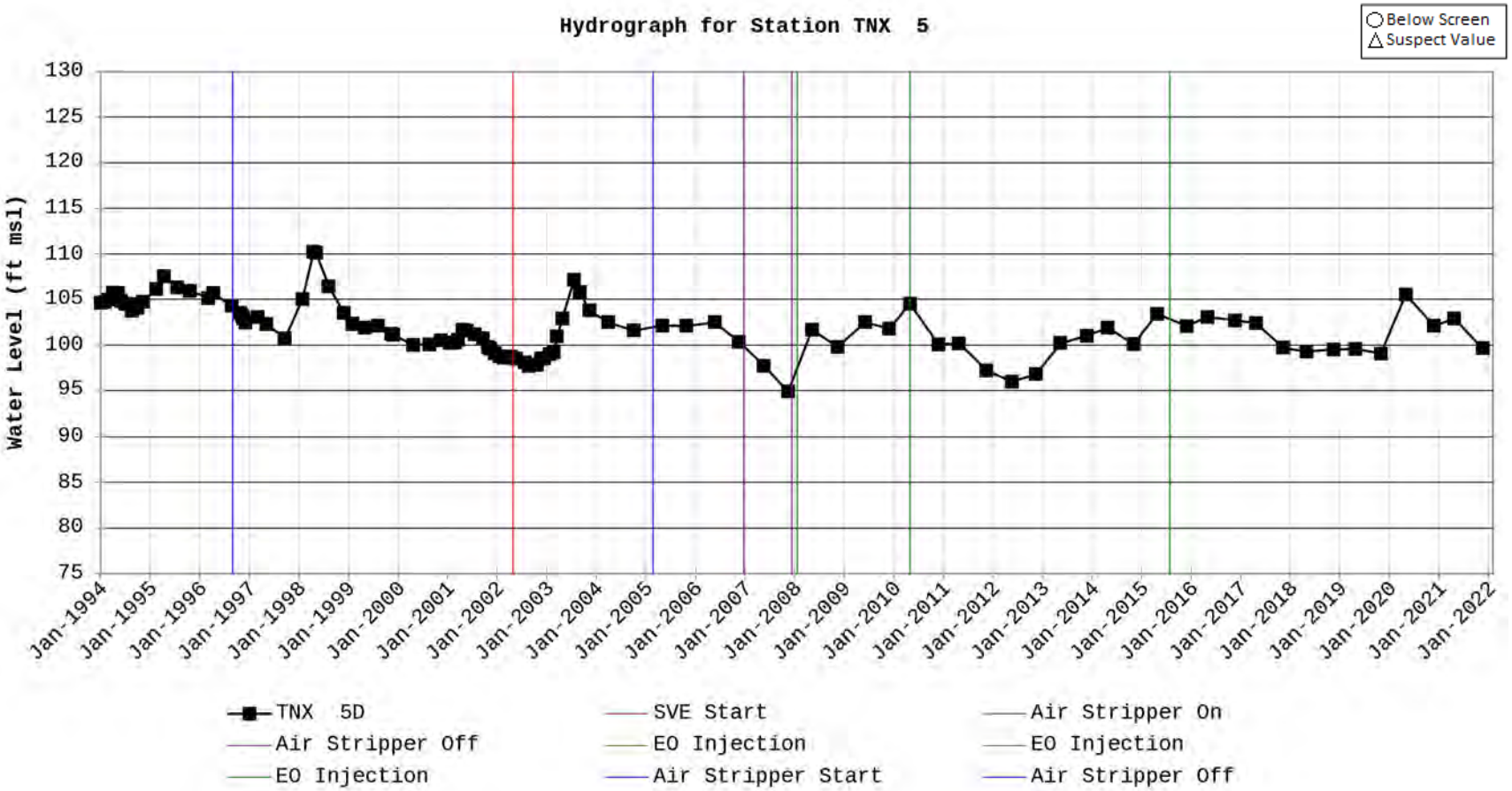

Hydrograph for Station TBG 5
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

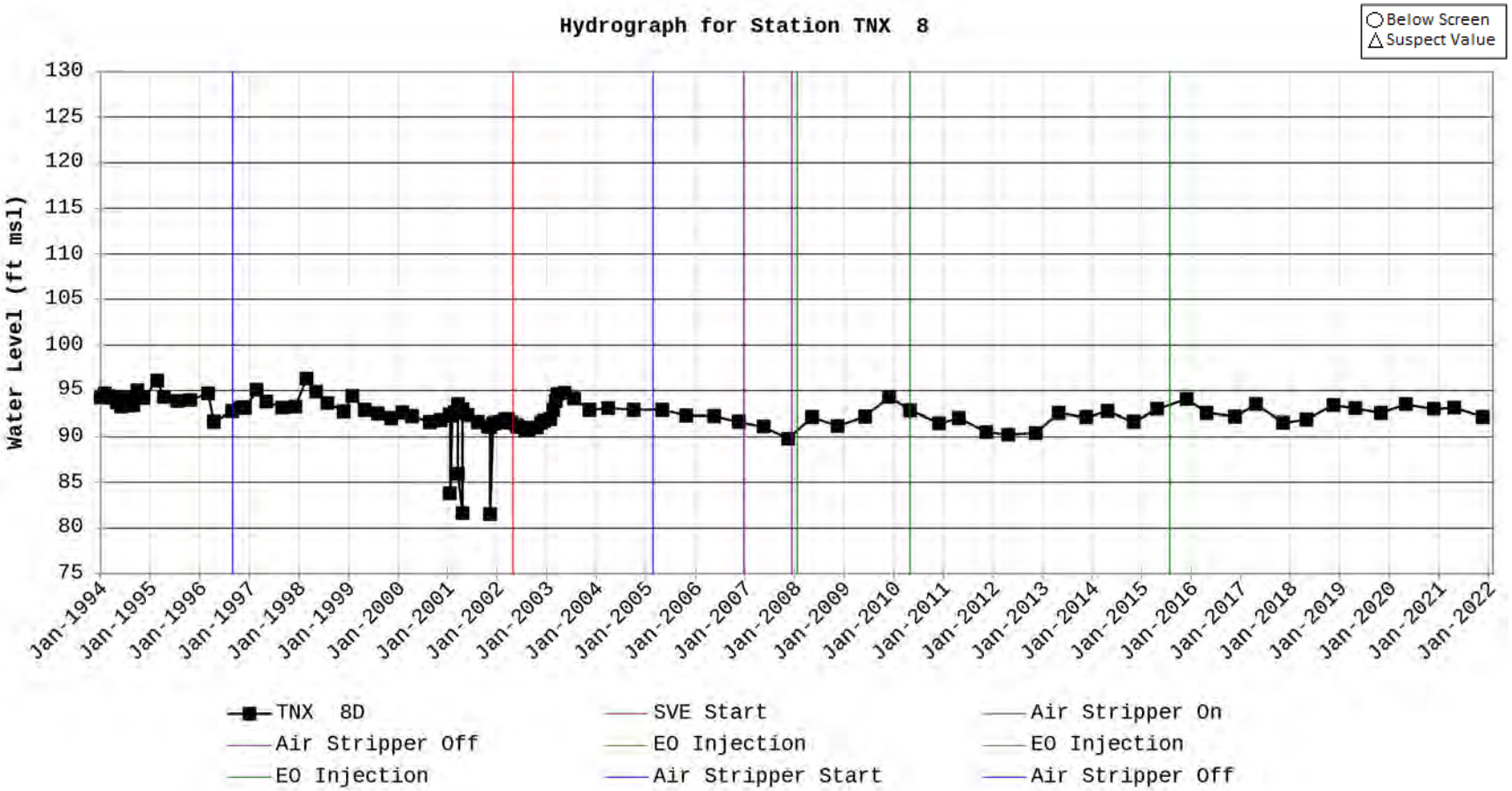

Hydrograph for Station TCM 5
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

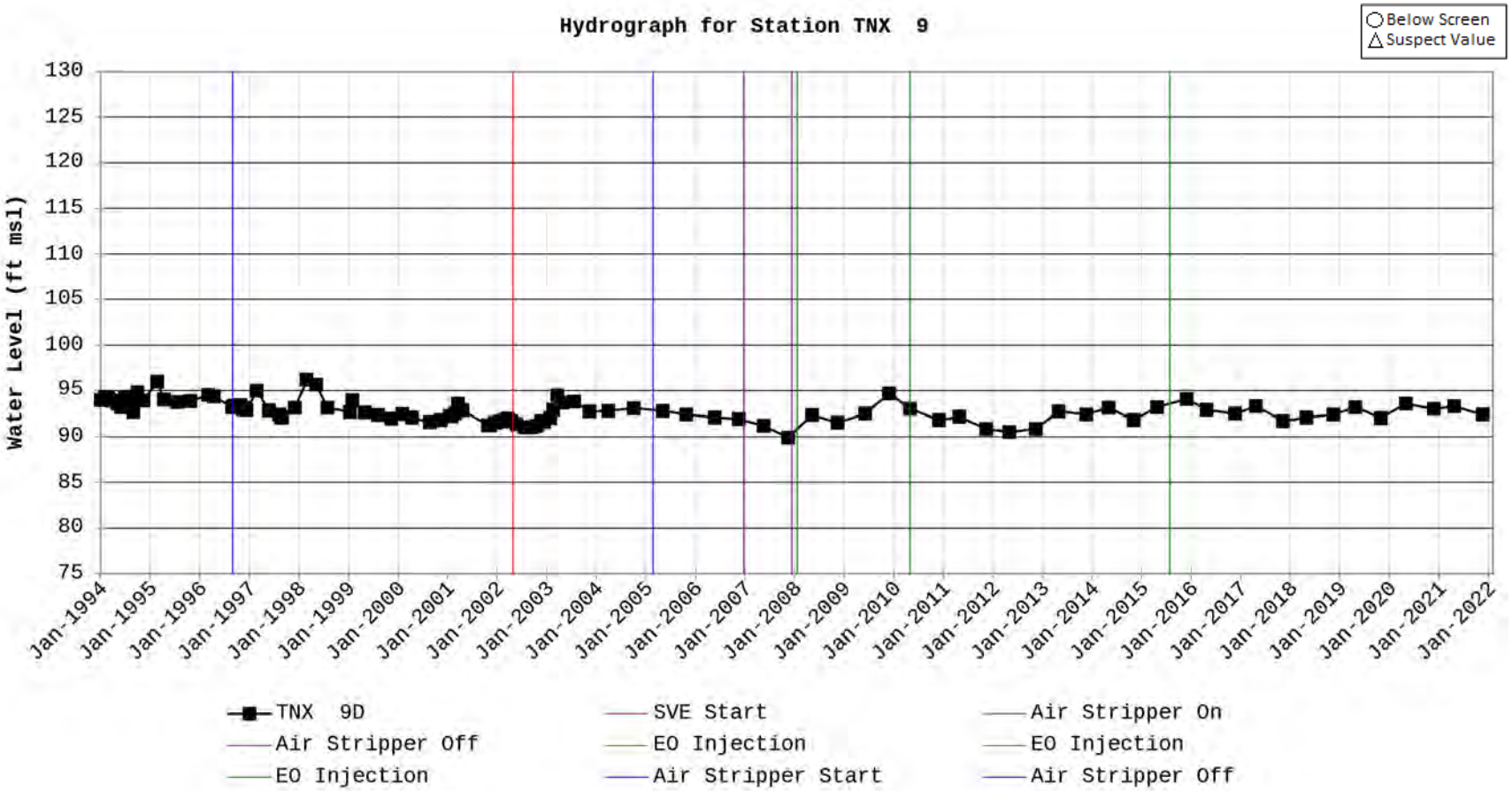

Hydrograph for Station TIR 1
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
TIR 1M
TIR 1U
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

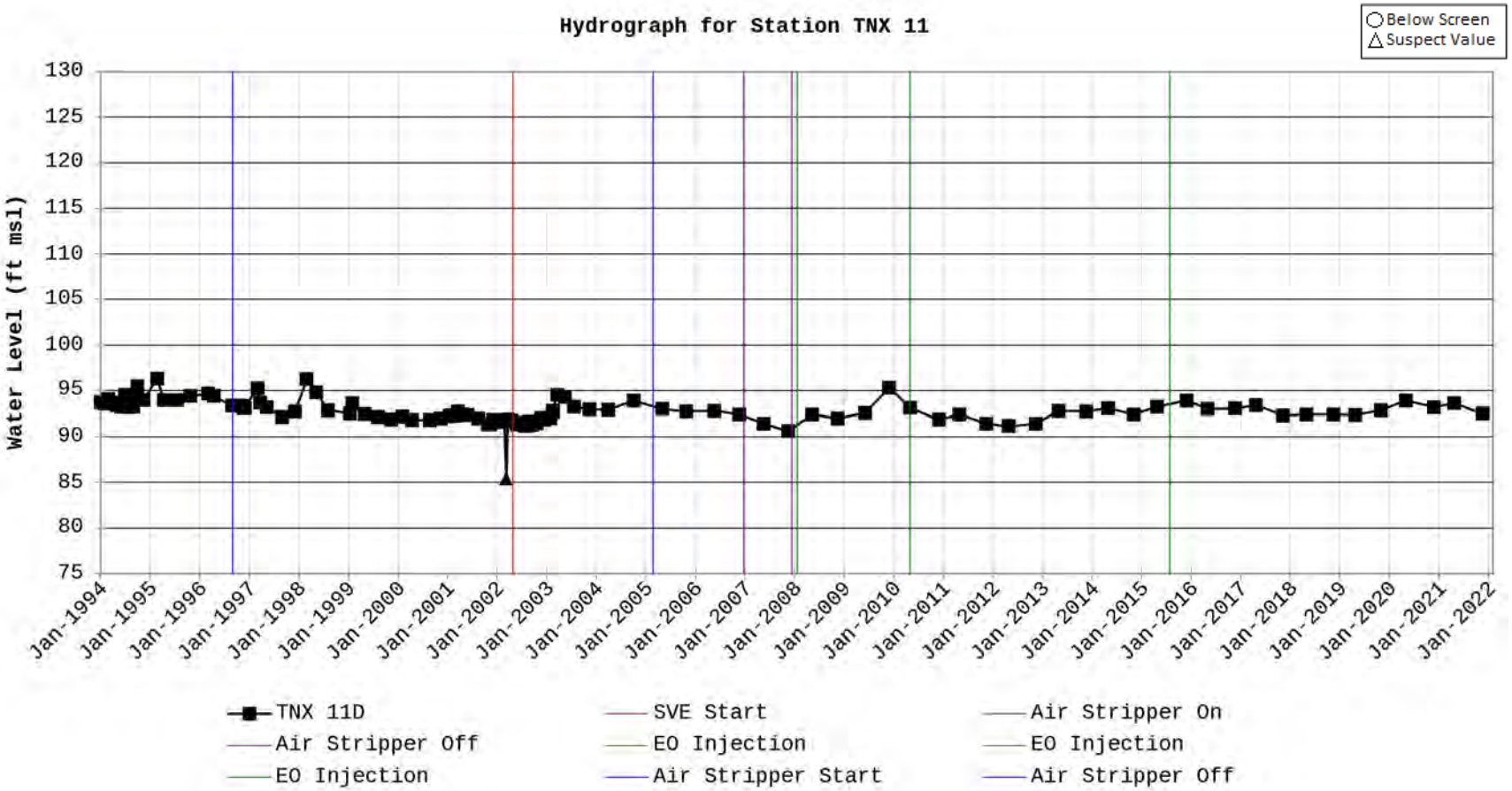

Hydrograph for Station TNX 1
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 1D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

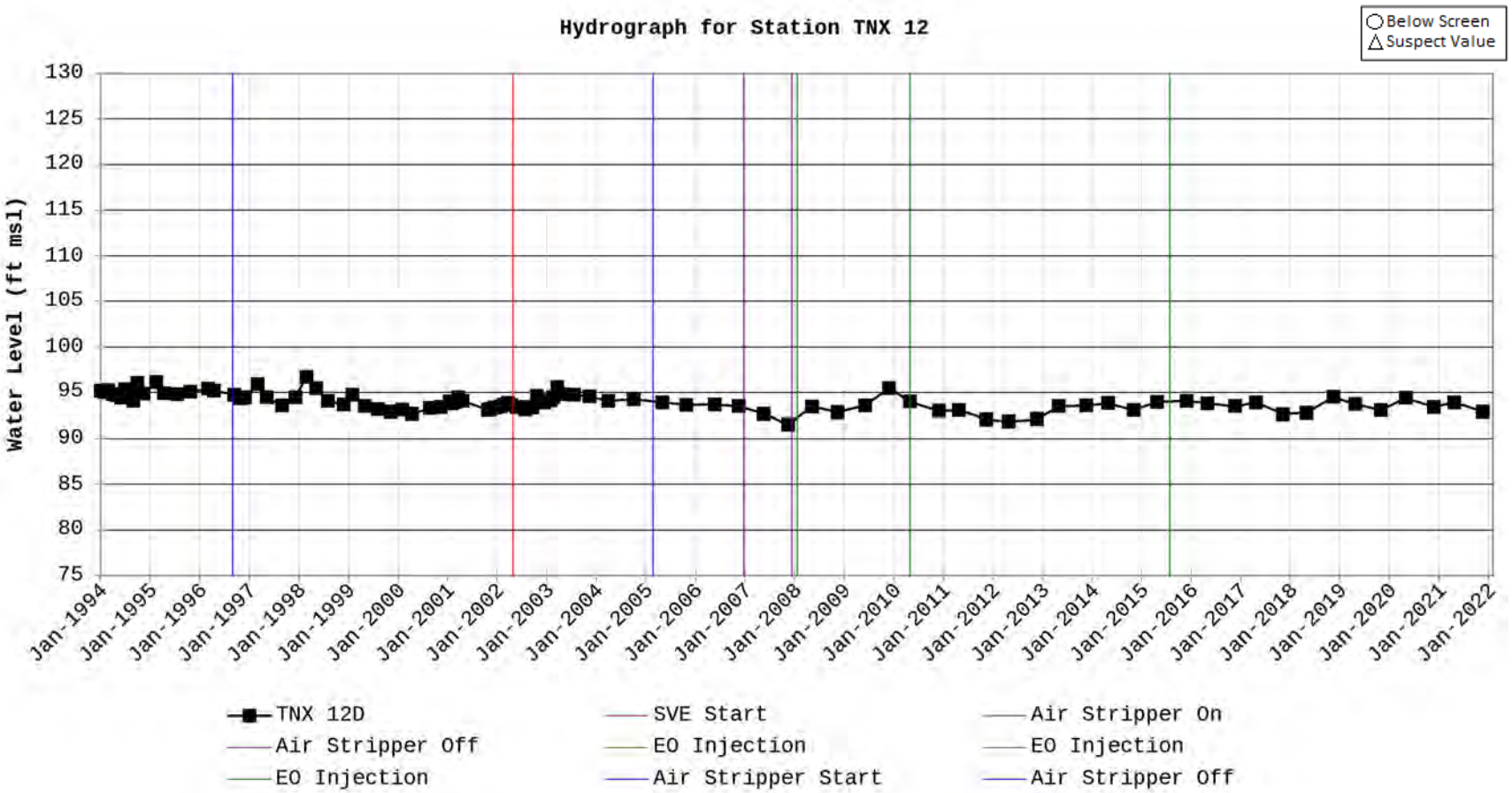

Hydrograph for Station TNX 3
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

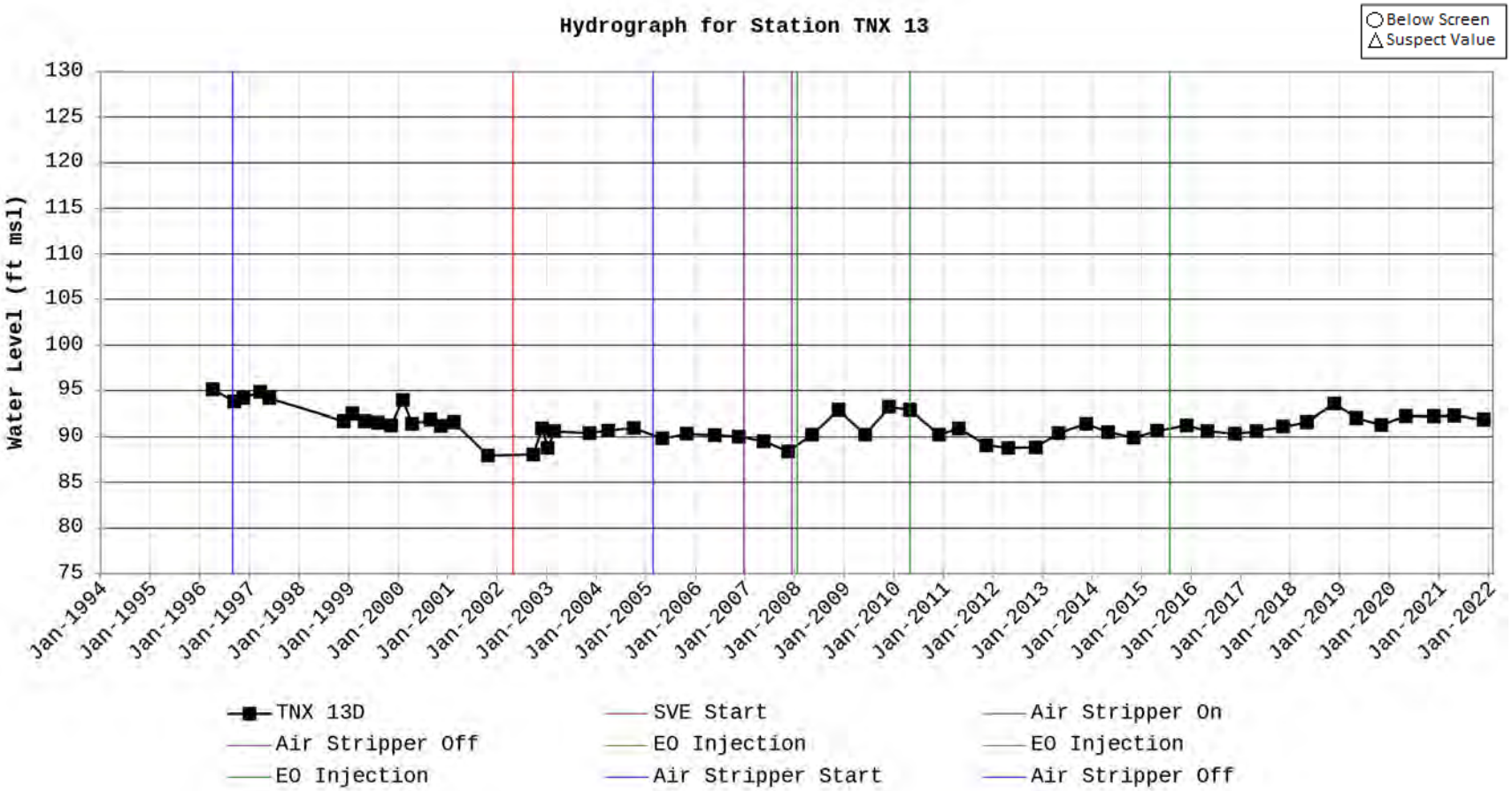

Hydrograph for Station TNX 5
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

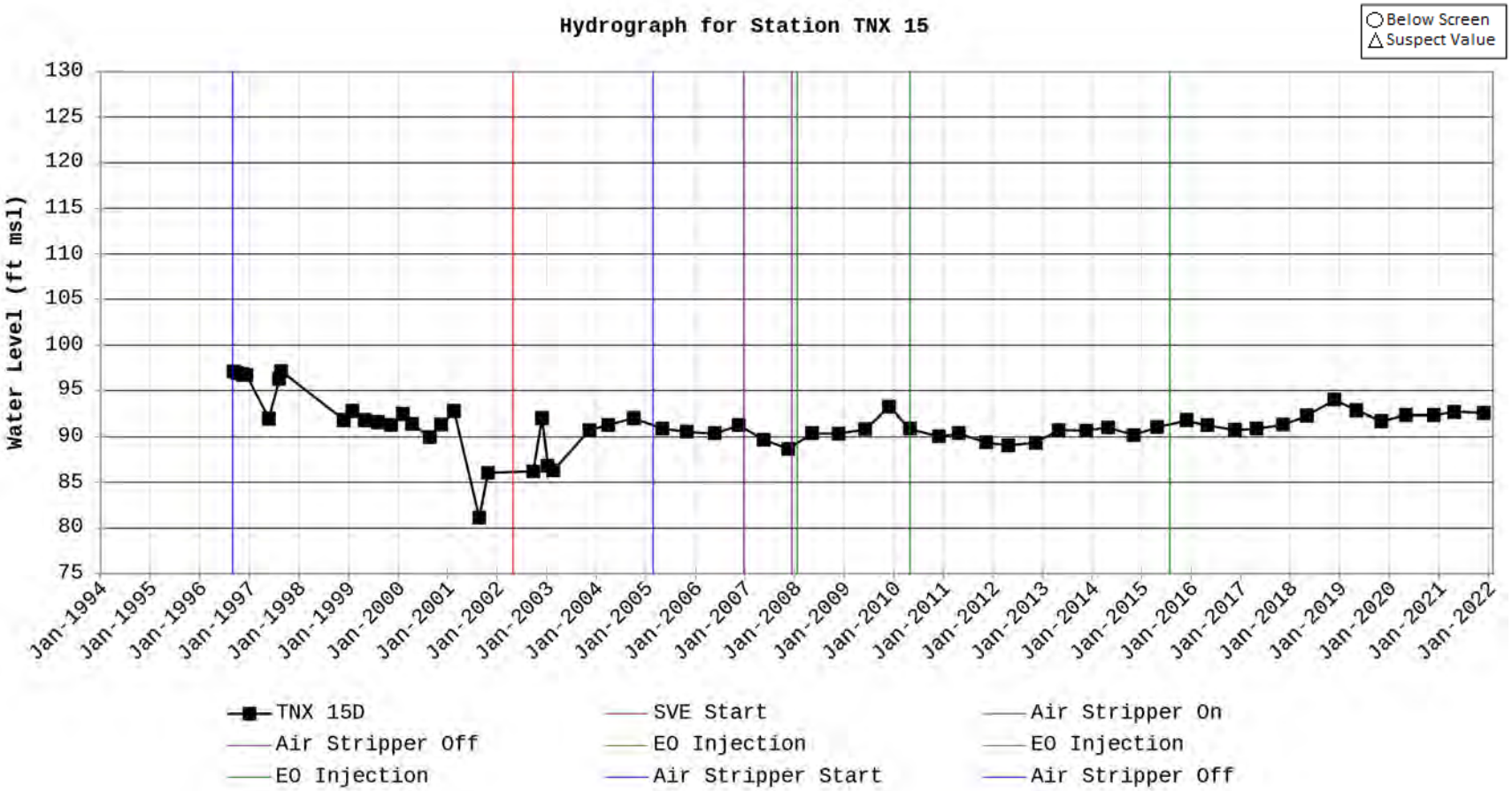

Hydrograph for Station TNX 8
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

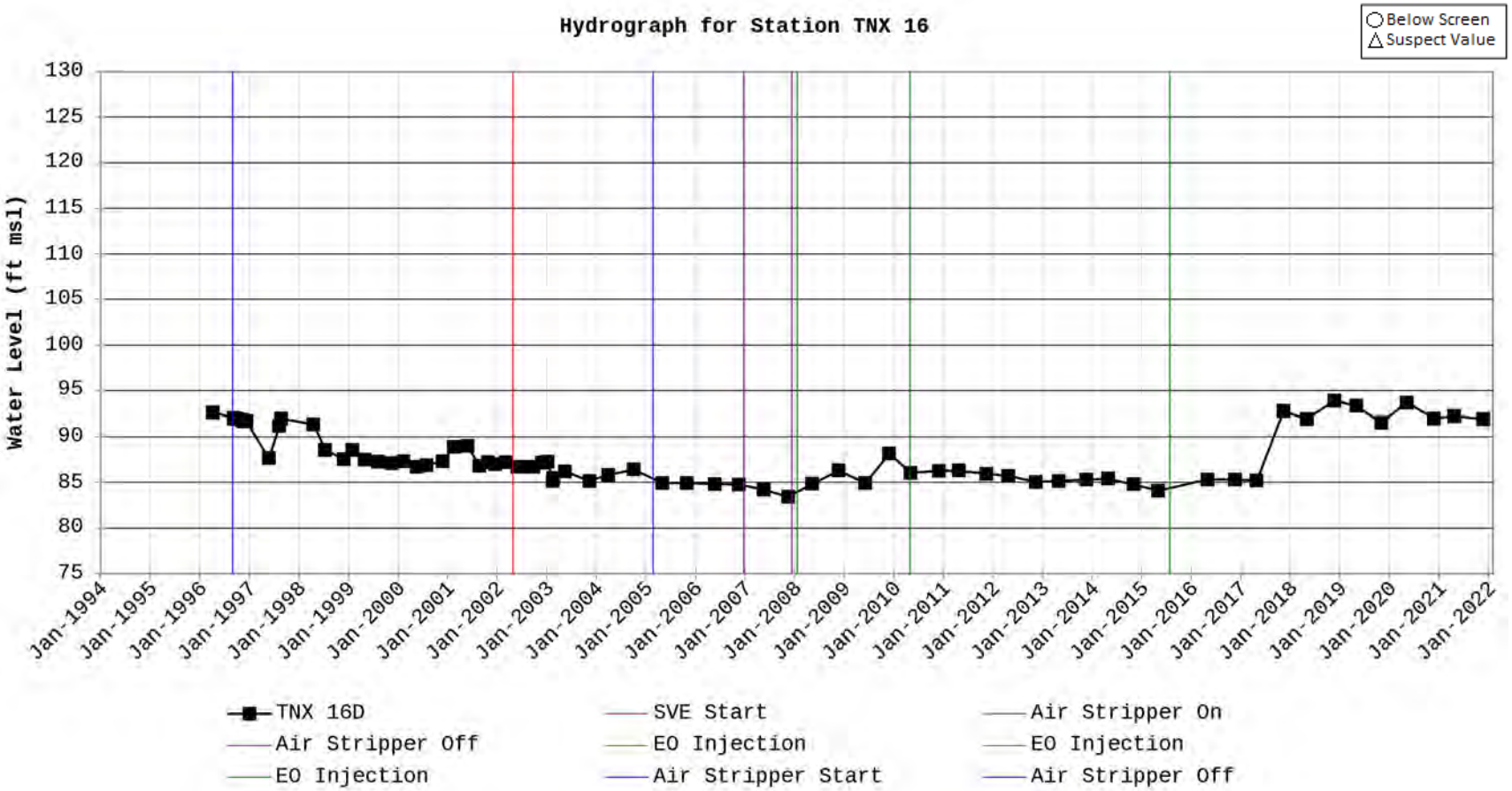

Hydrograph for Station TNX 9
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 9D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

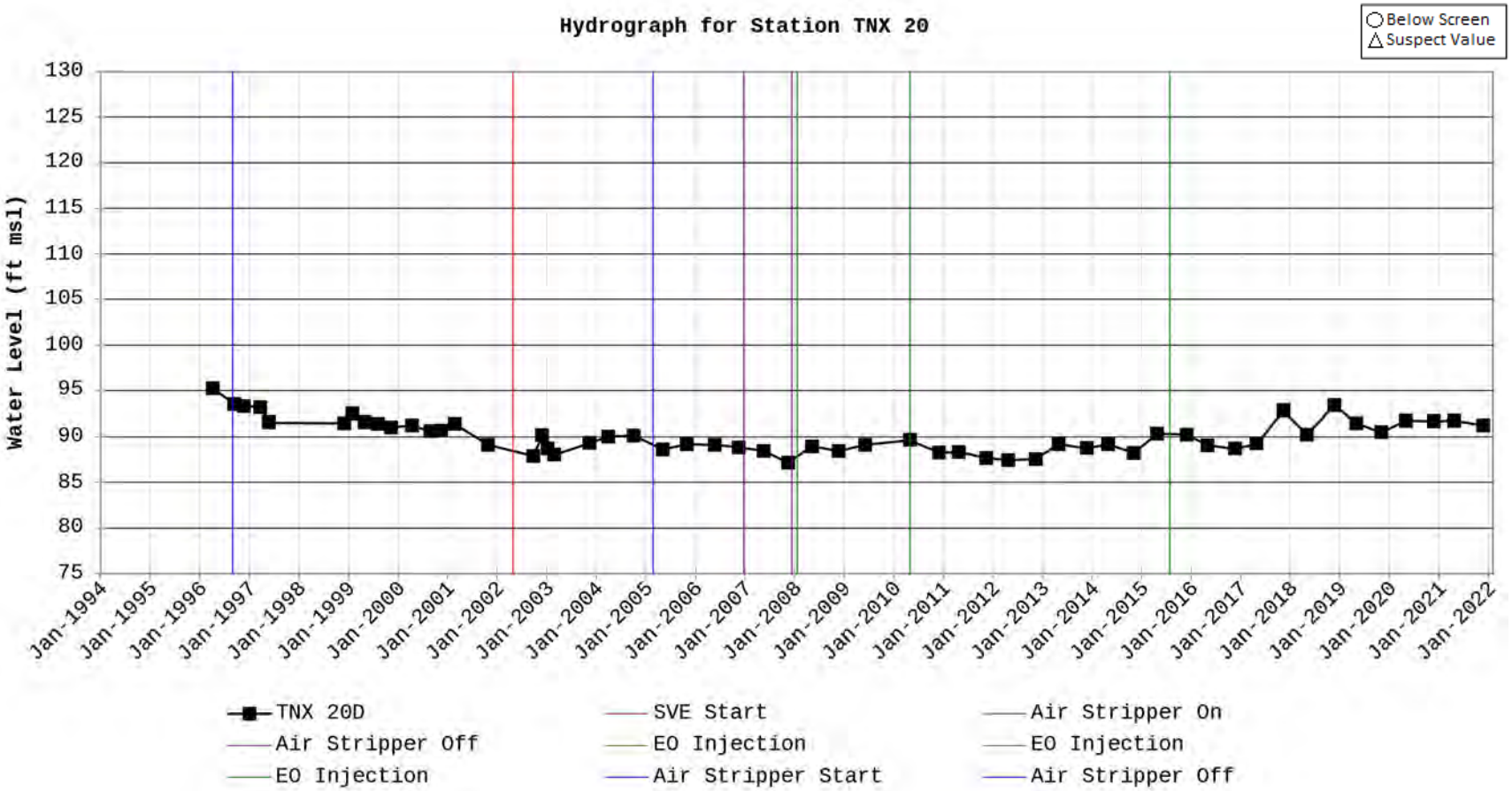

Hydrograph for Station TNX 11
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

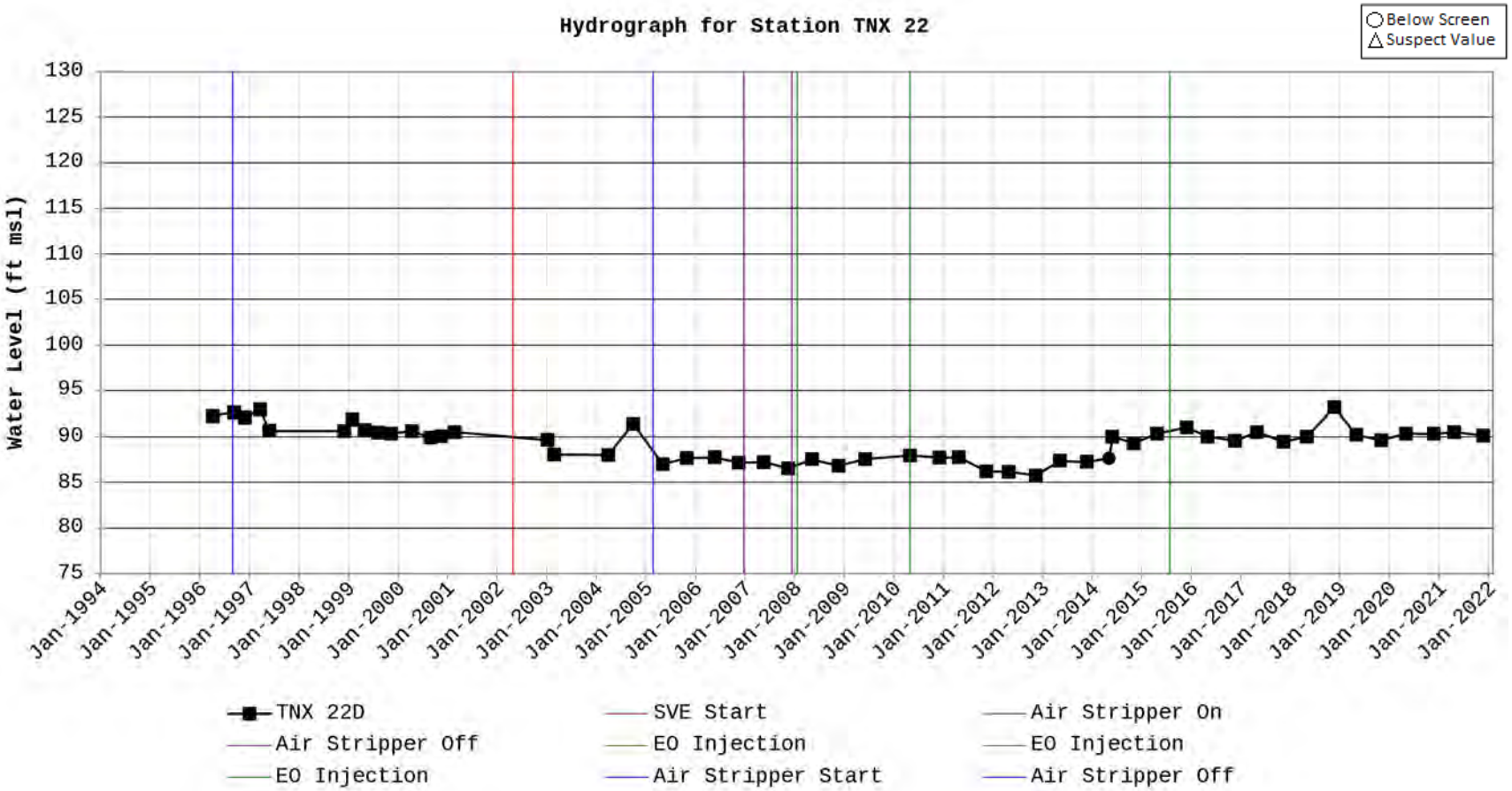

Hydrograph for Station TNX 12
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 12D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

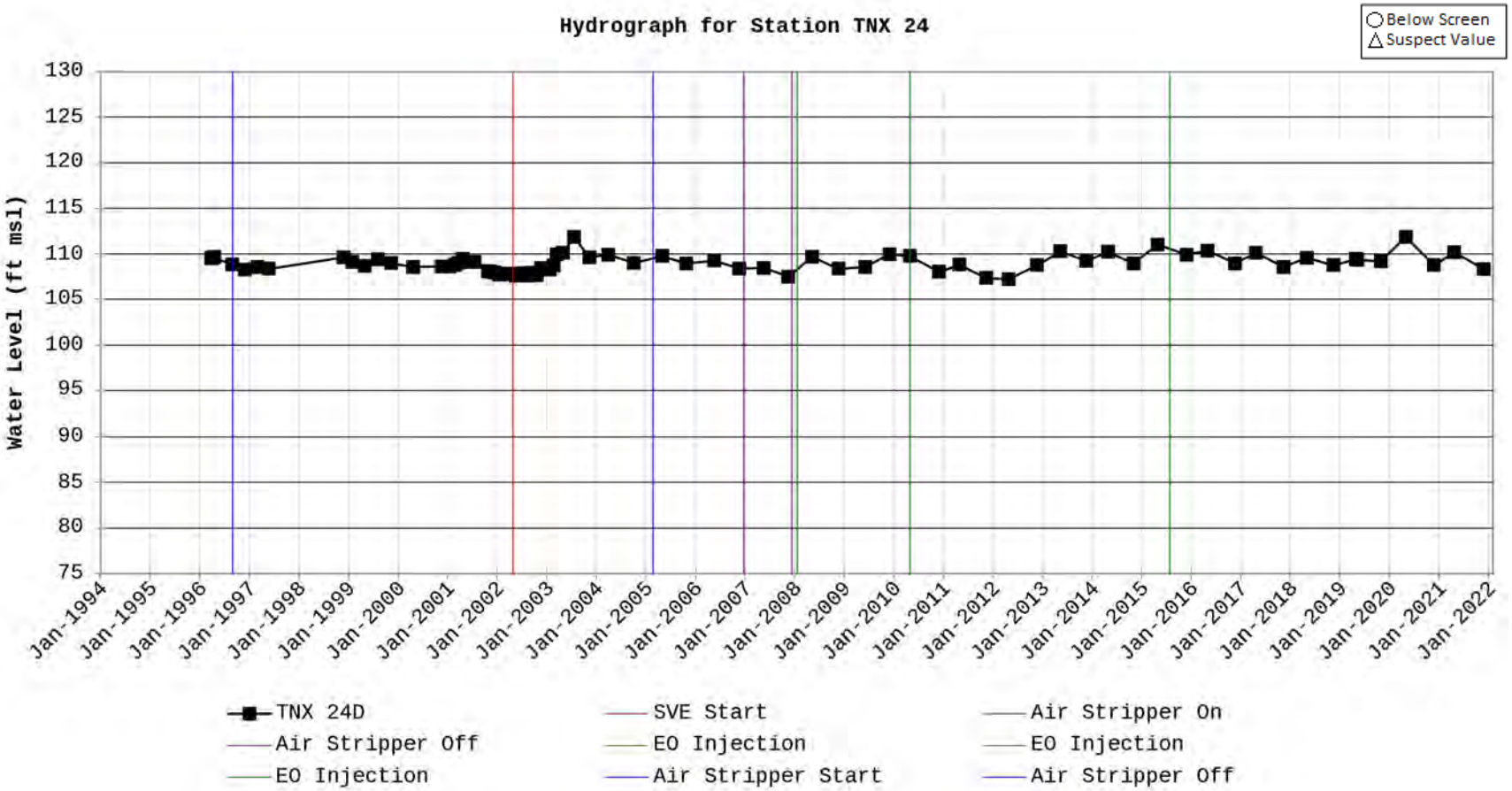

Hydrograph for Station TNX 13
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

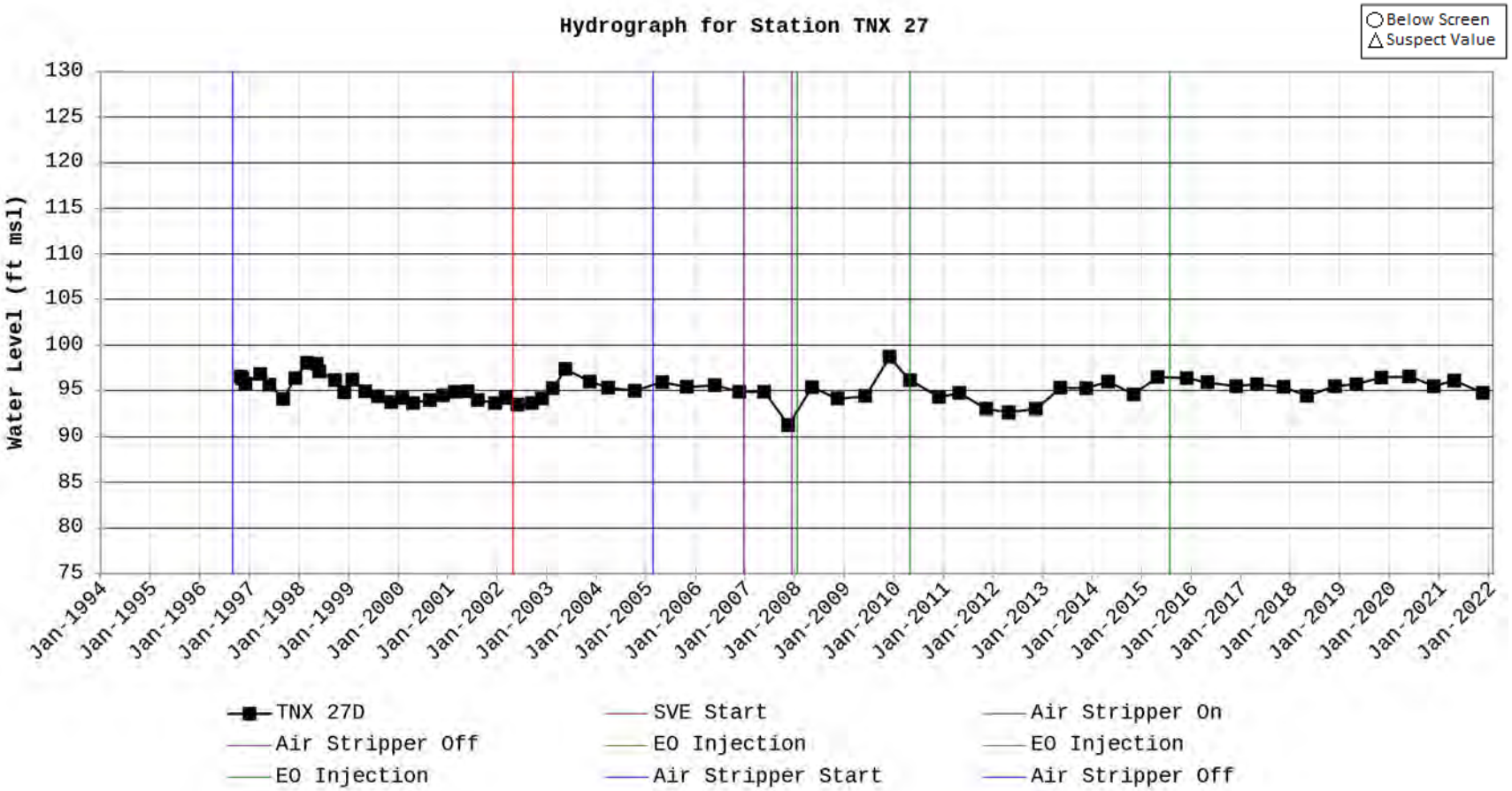

Hydrograph for Station TNX 15
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 15D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

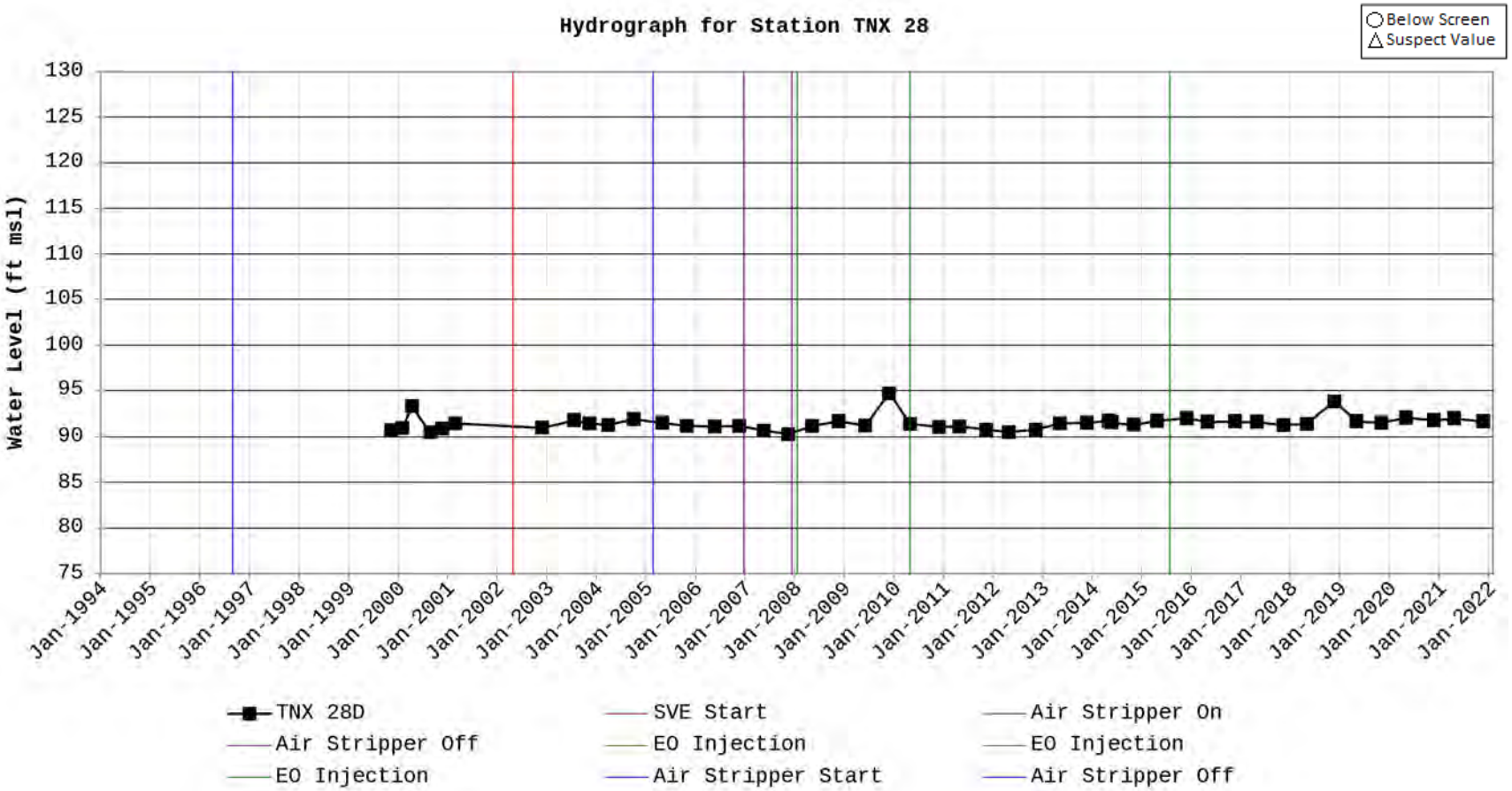

Hydrograph for Station TNX 16
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 16D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

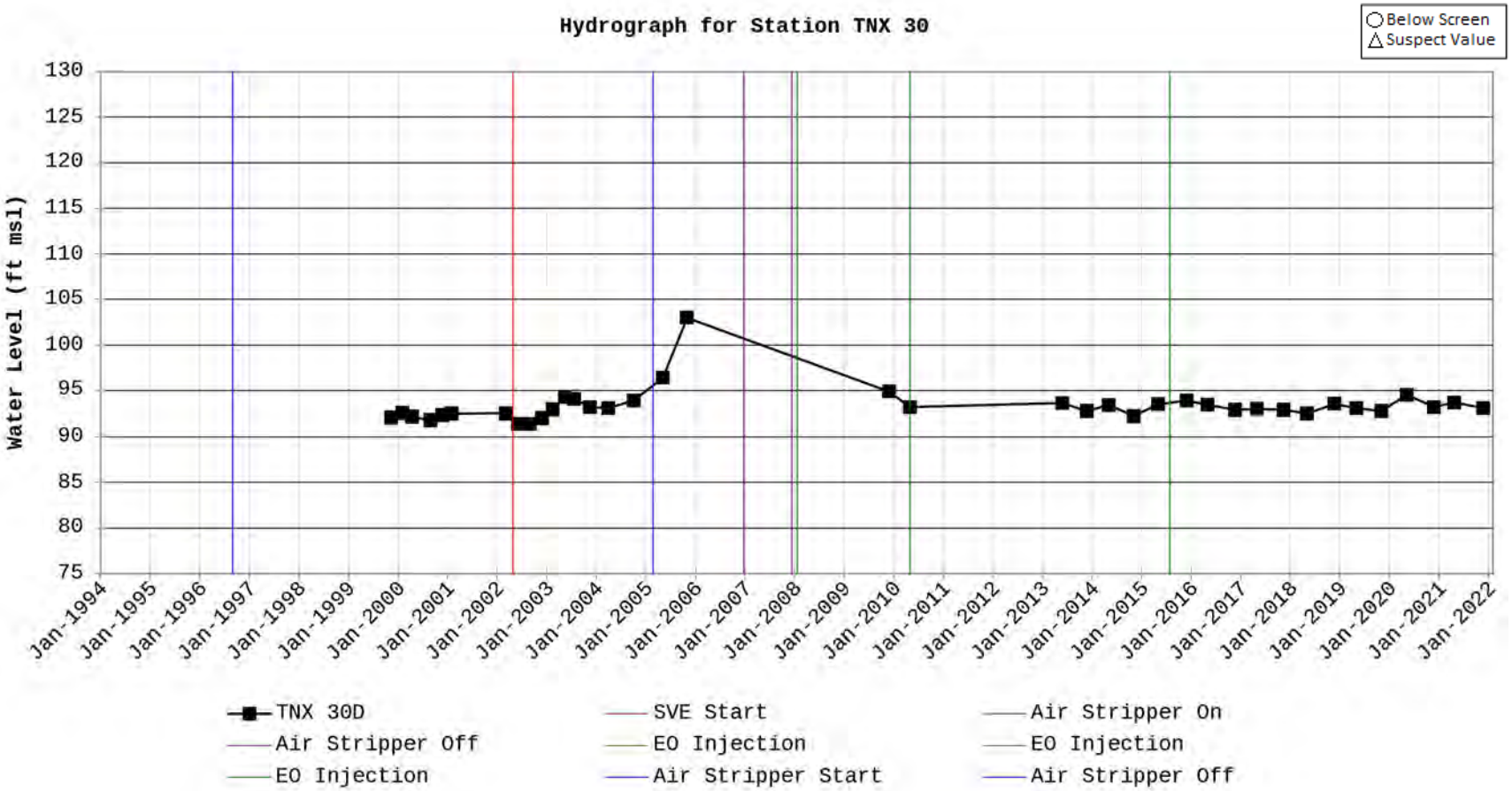

Hydrograph for Station TNX 20
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 20D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

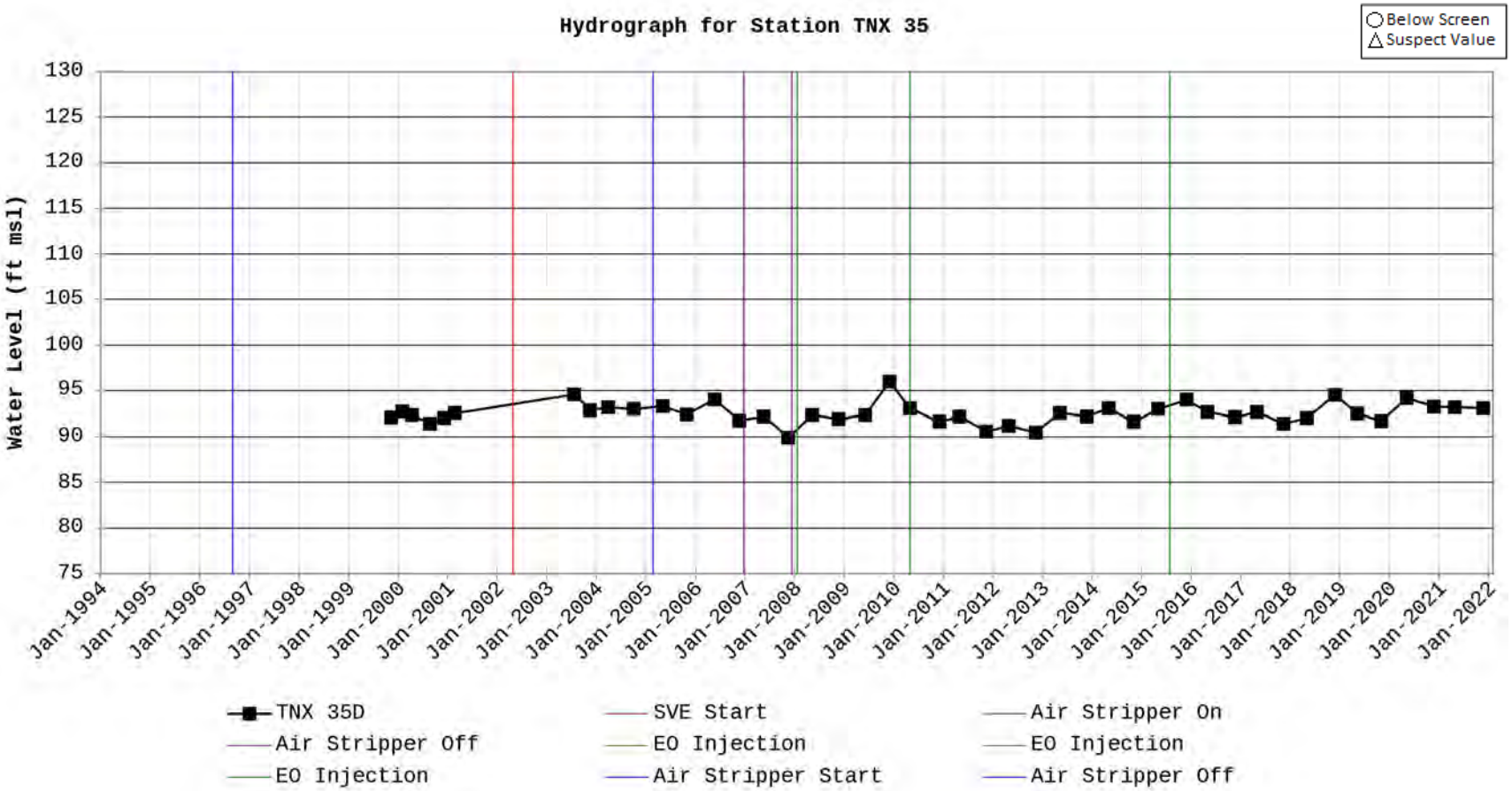

Hydrograph for Station TNX 22
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 22D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

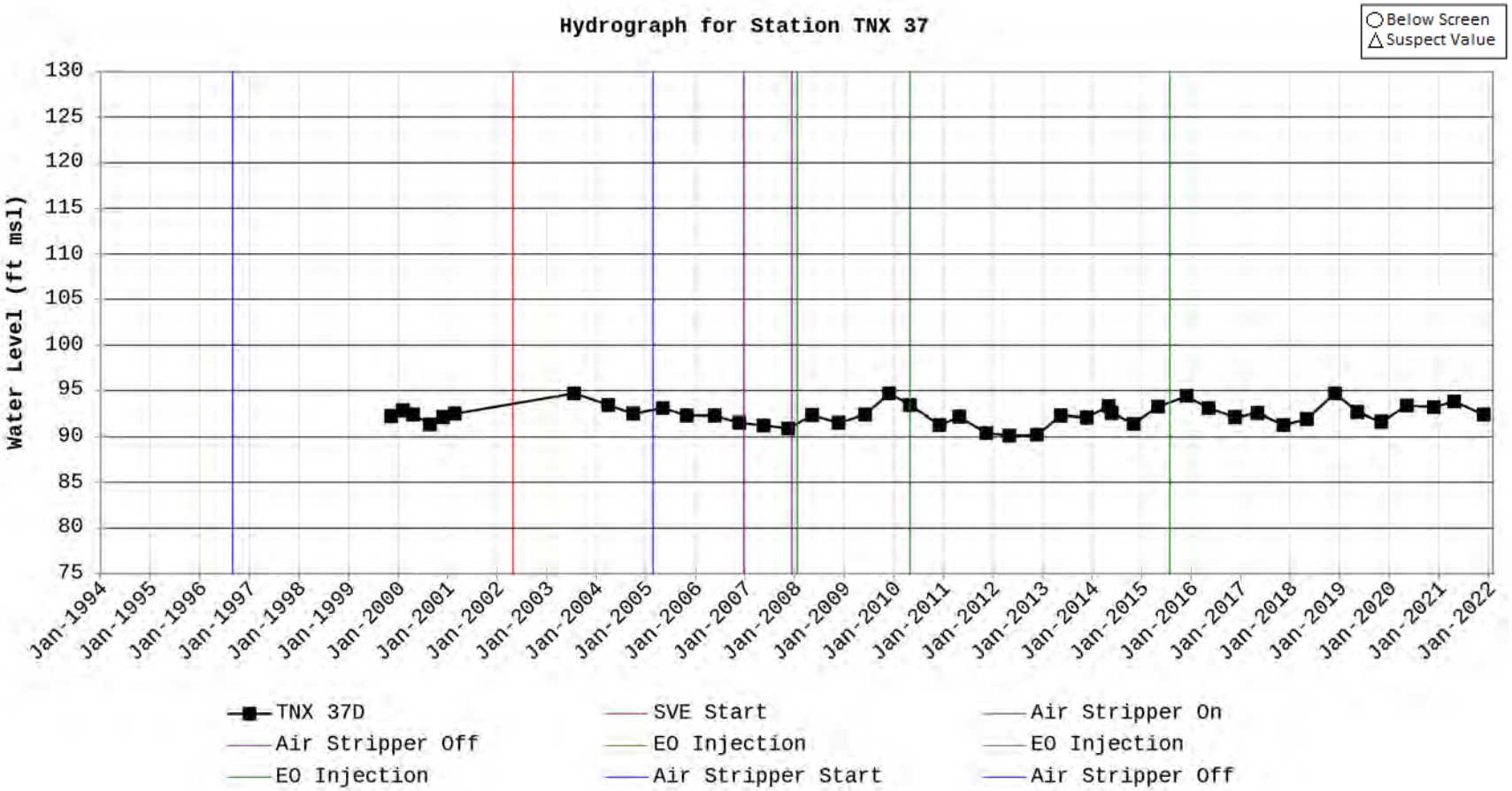

Hydrograph for Station TNX 24
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 24D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

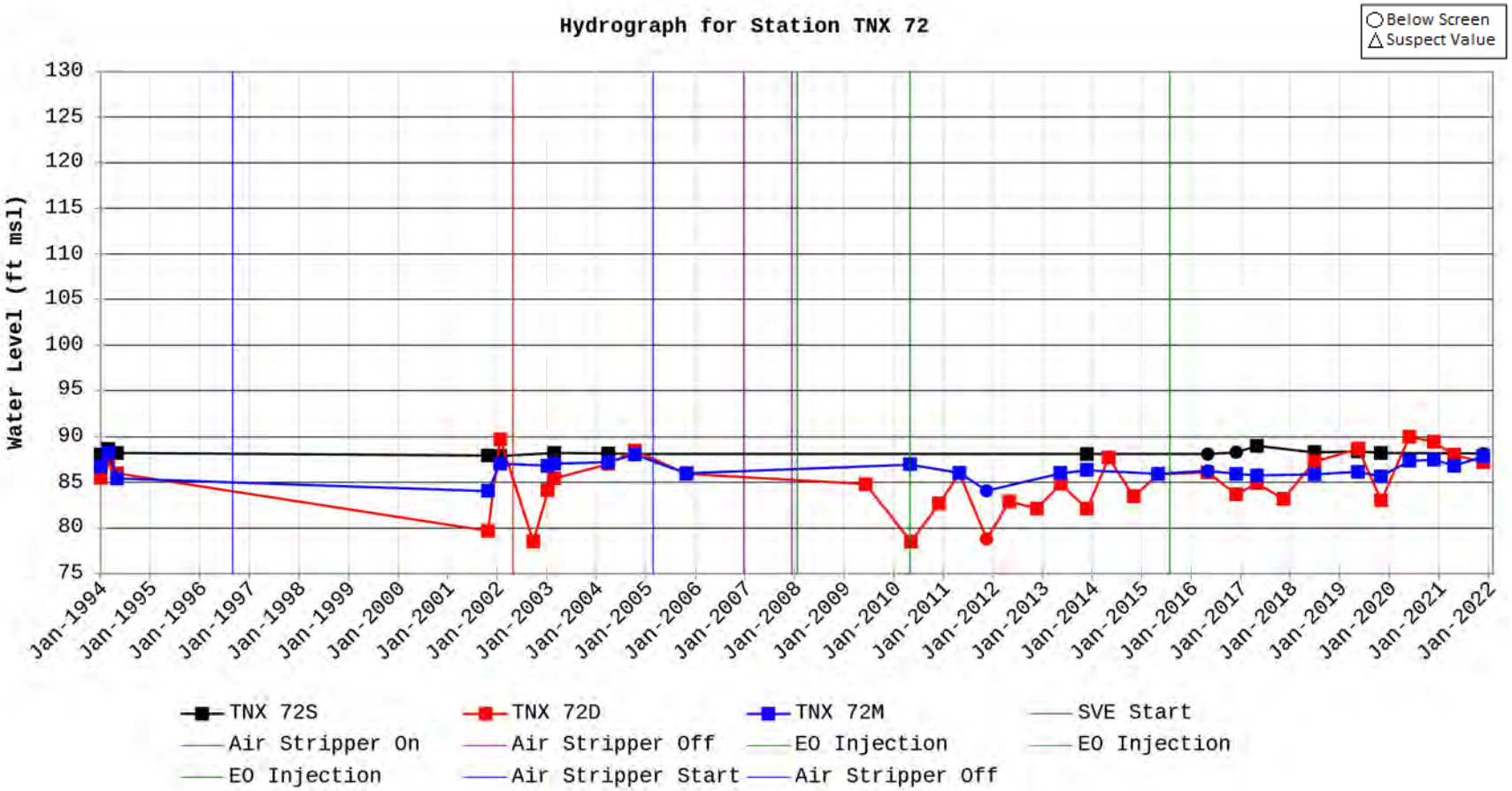

Hydrograph for Station TNX 27
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

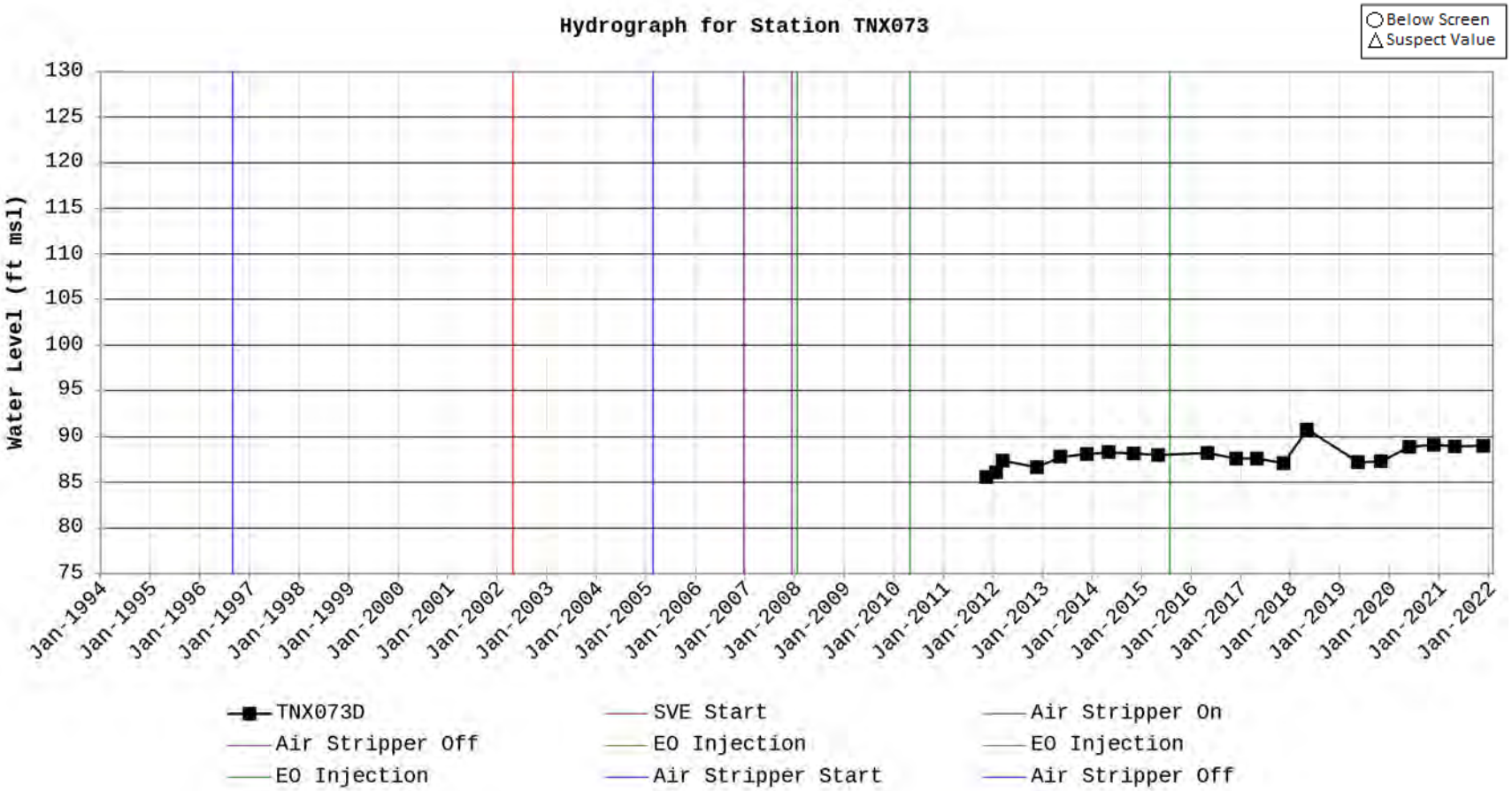

Hydrograph for Station TNX 28
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

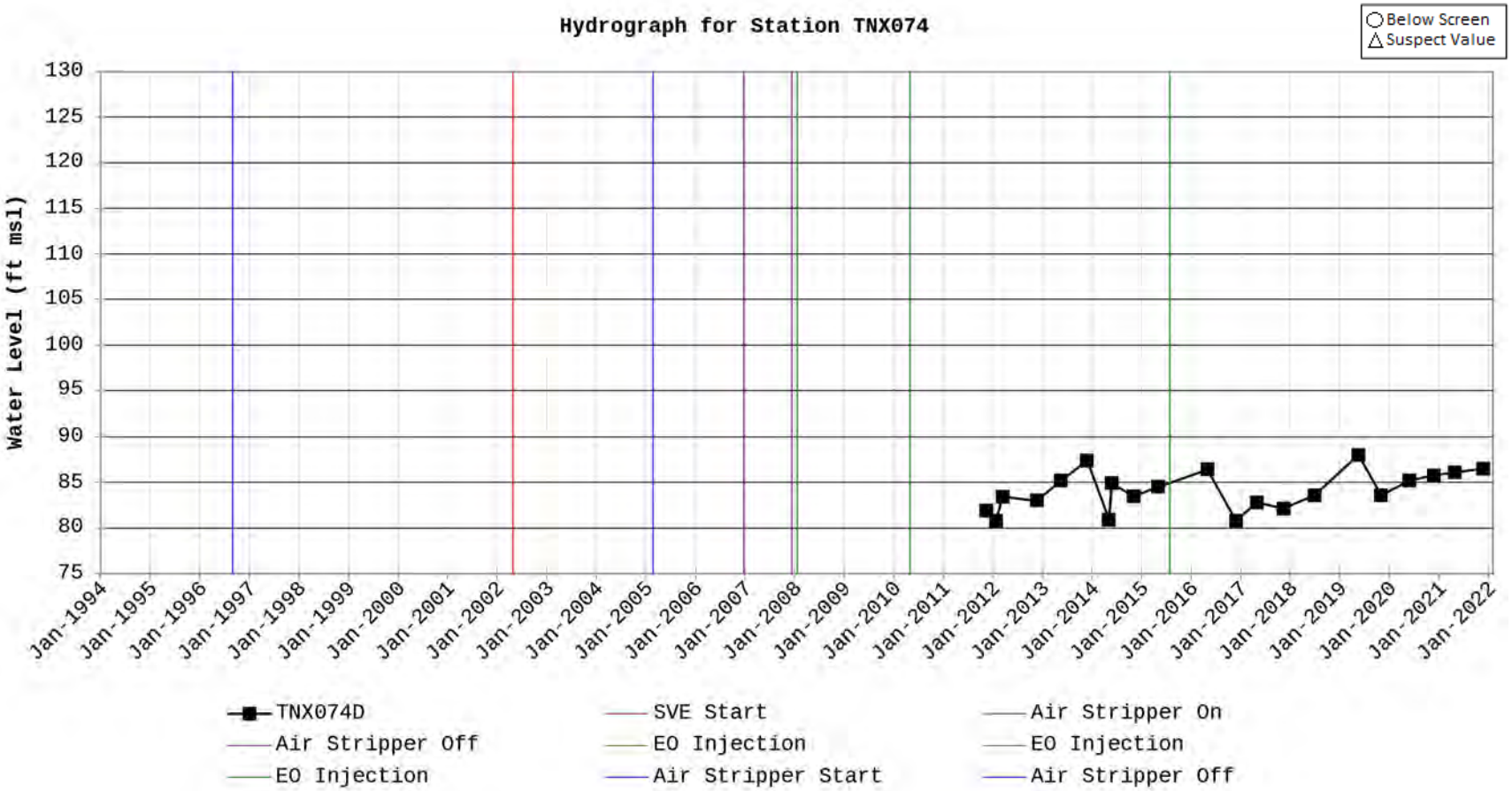

Hydrograph for Station TNX 30
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

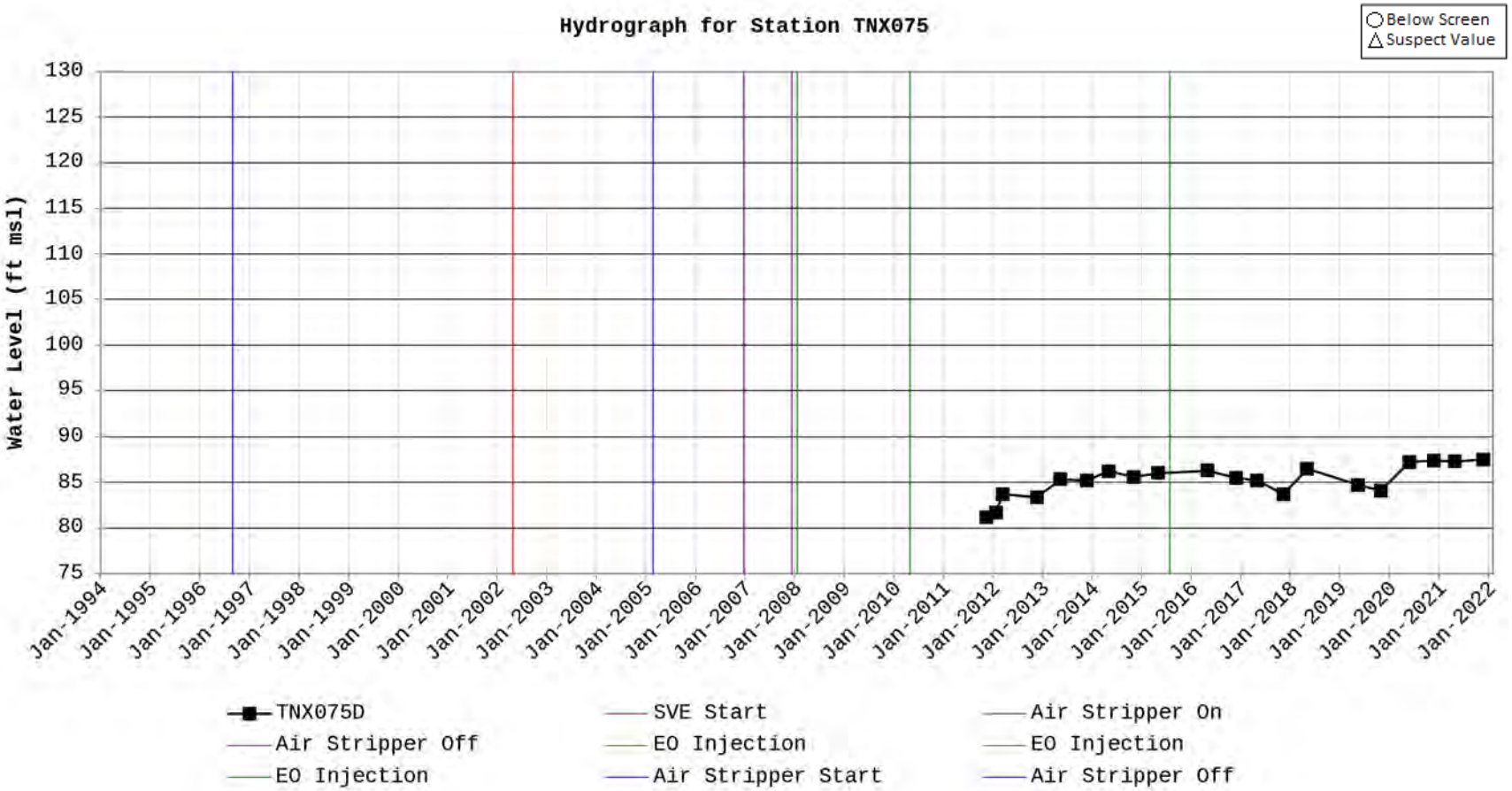

Hydrograph for Station TNX 35
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

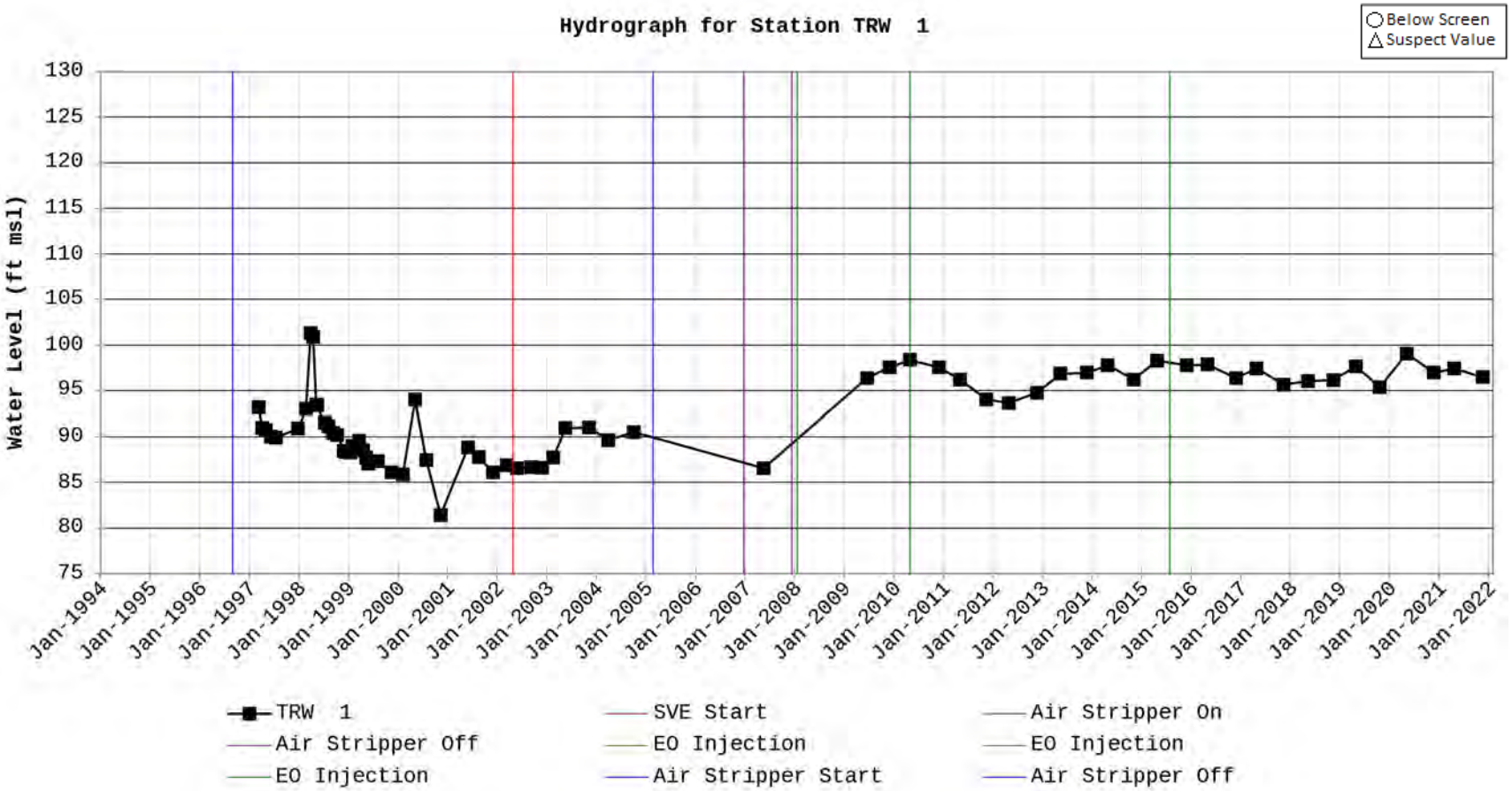

Hydrograph for Station TNX 37
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

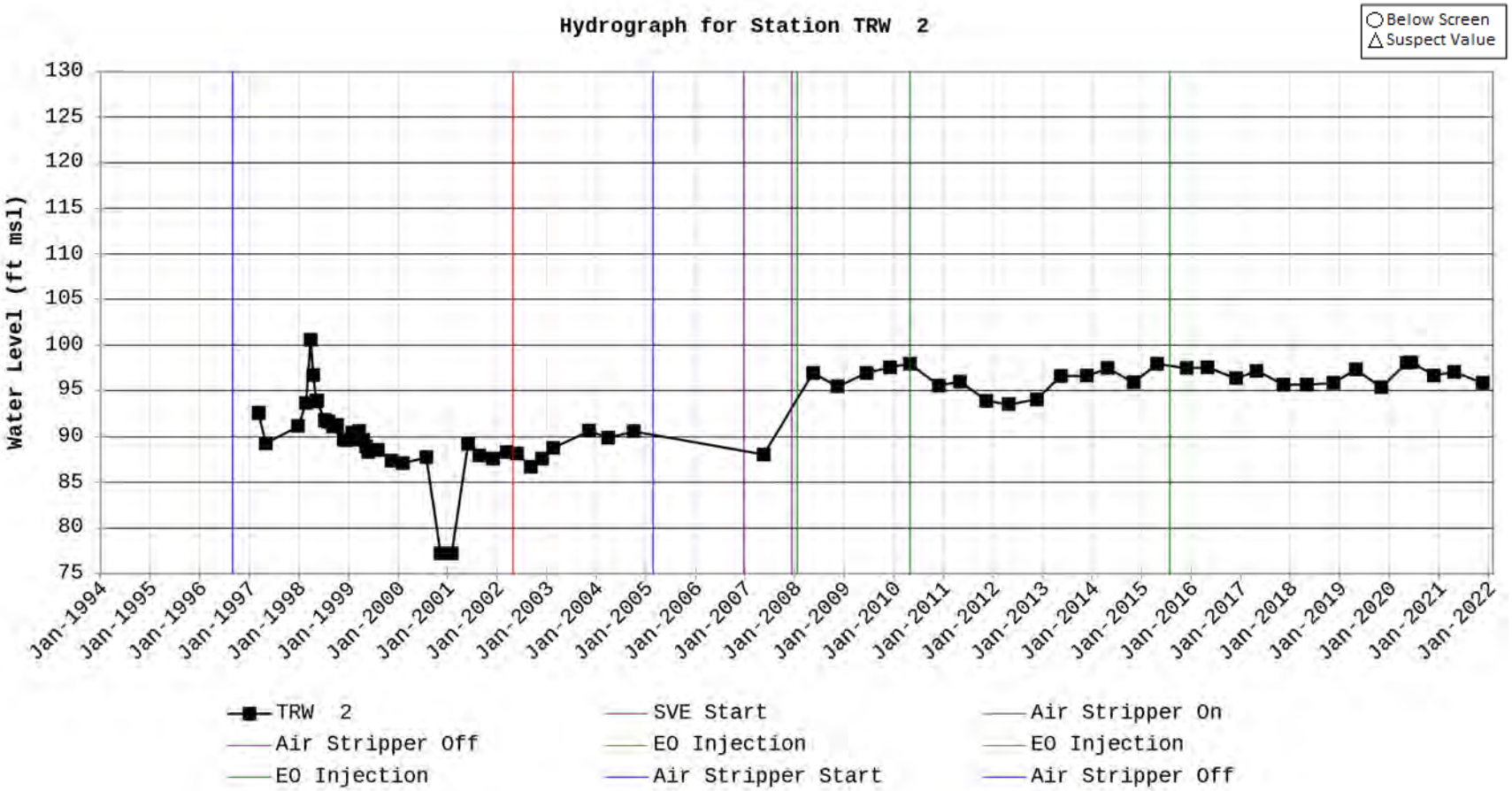

Hydrograph for Station TNX 72
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 72S
TNX 72D
TNX 72M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

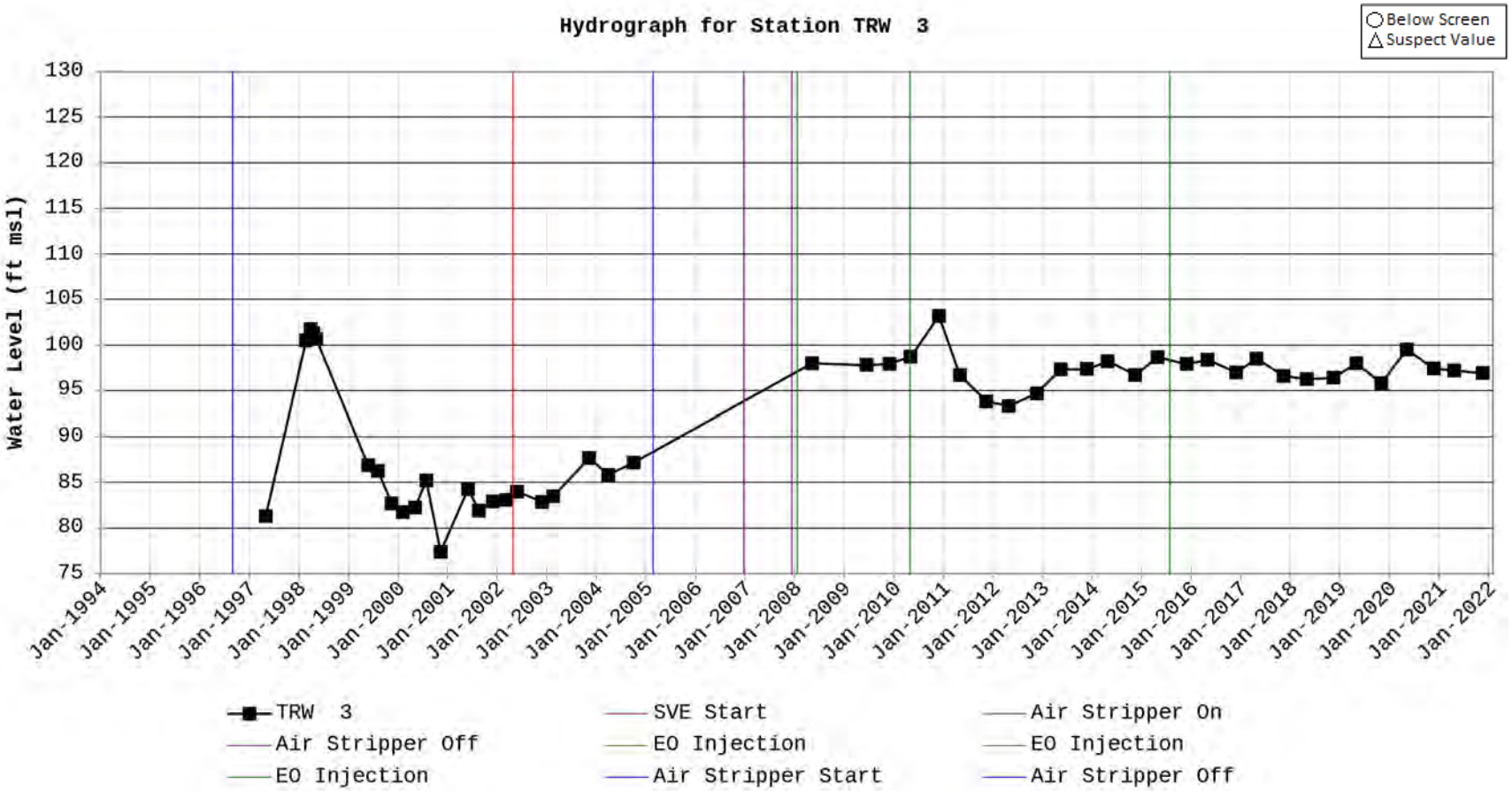

Hydrograph for Station TNX073
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

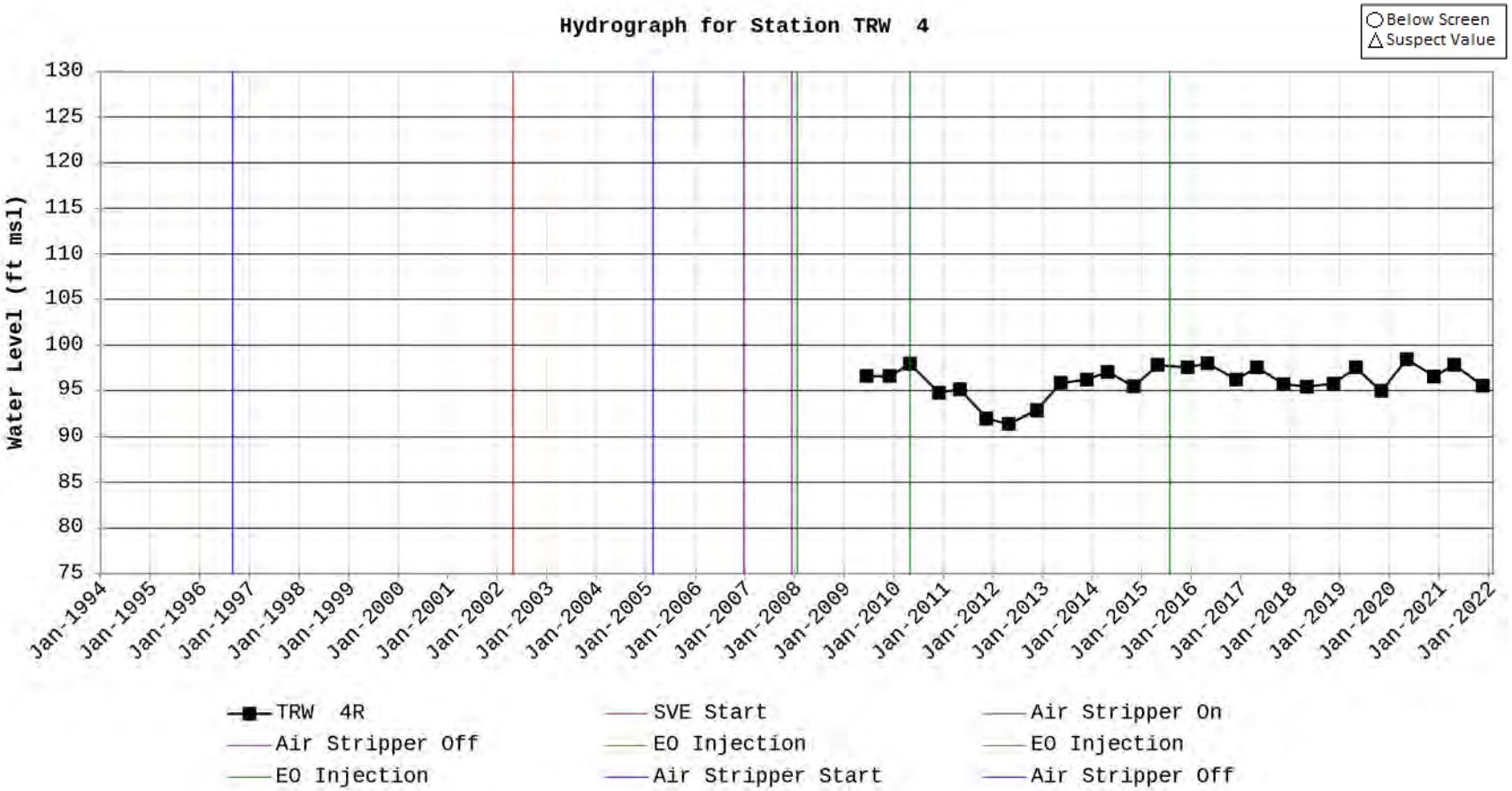

Hydrograph for Station TNX074
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

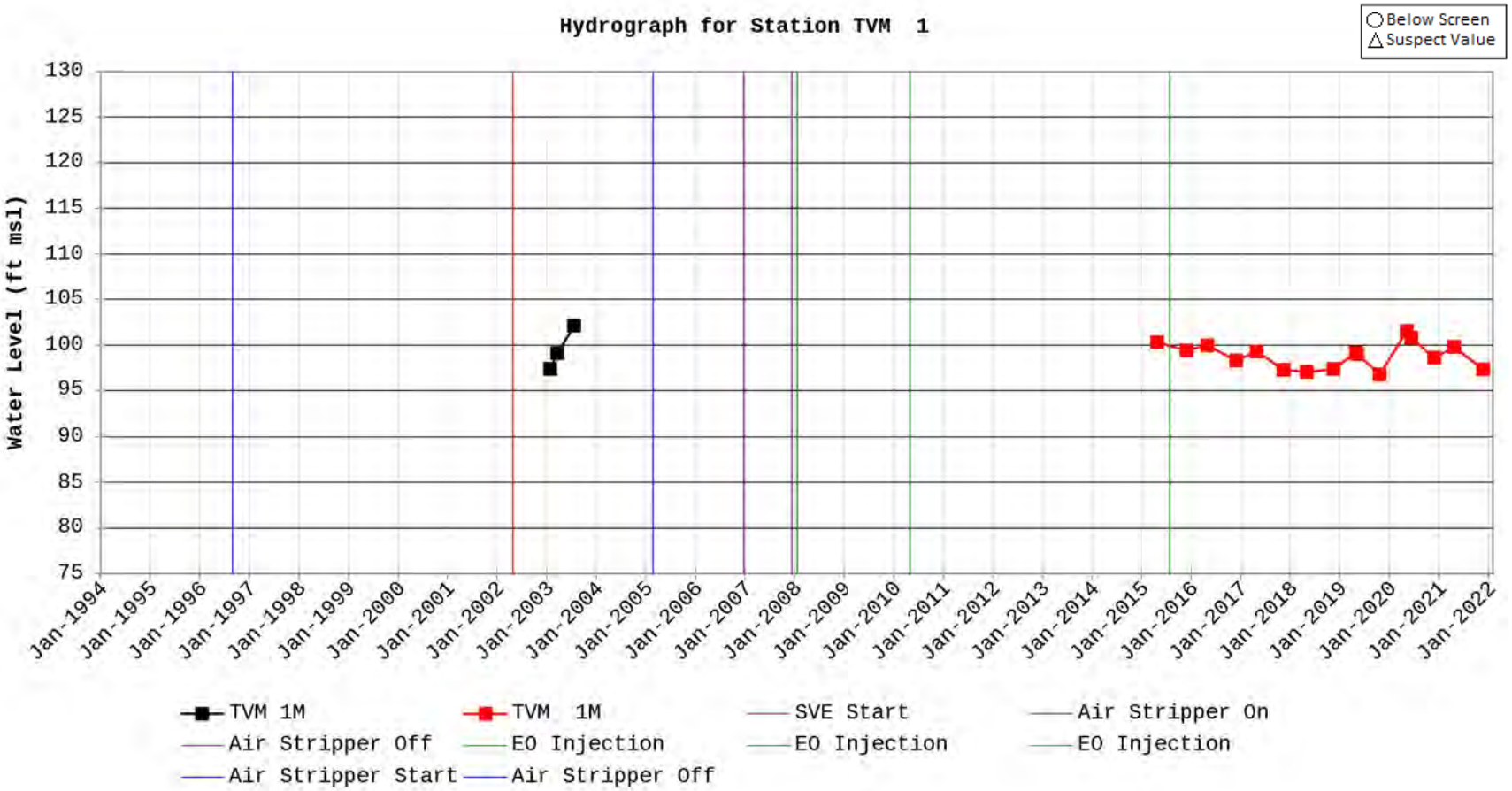

Hydrograph for Station TNX075
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX075D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

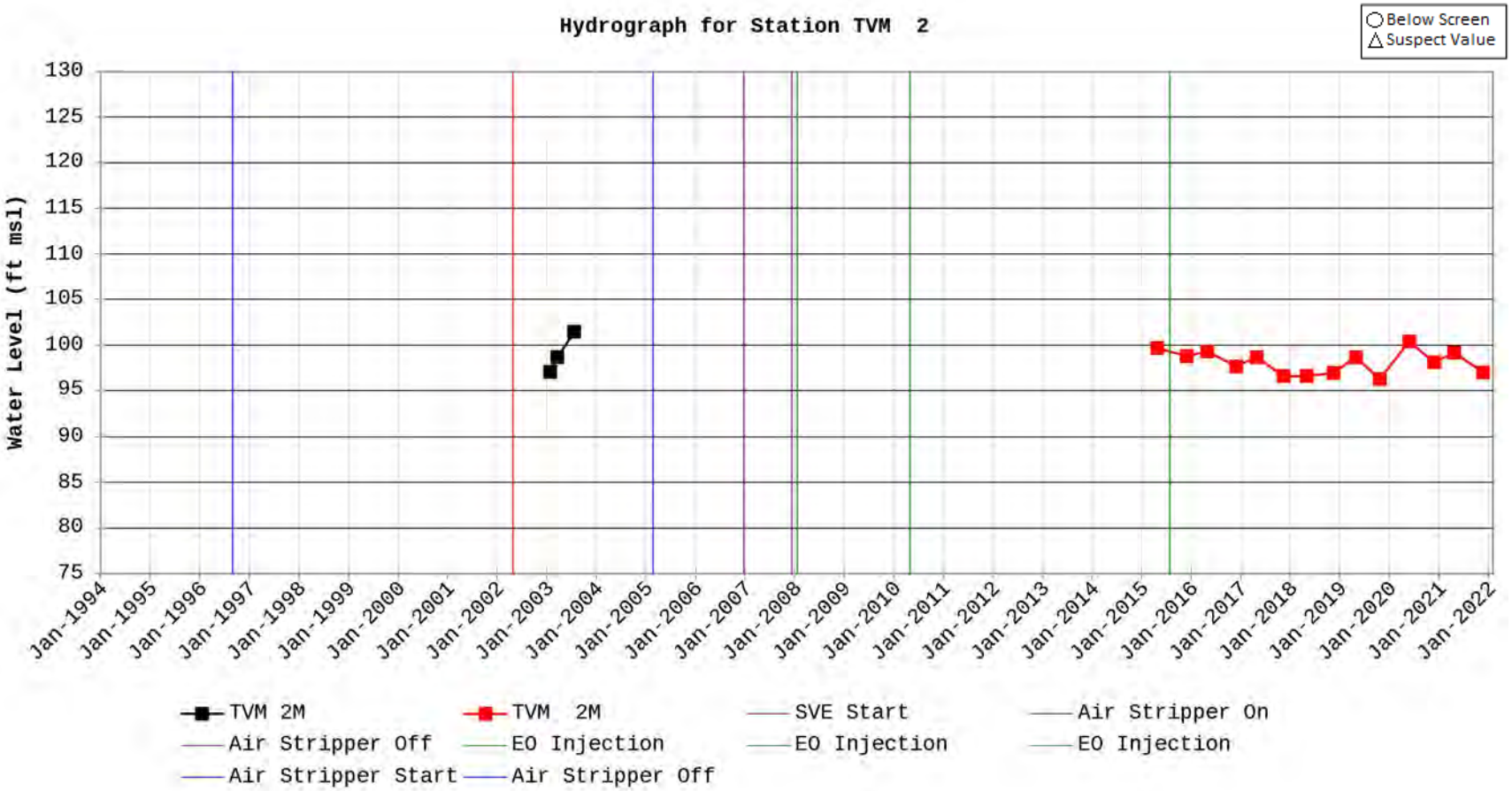

Hydrograph for Station TRW 1
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

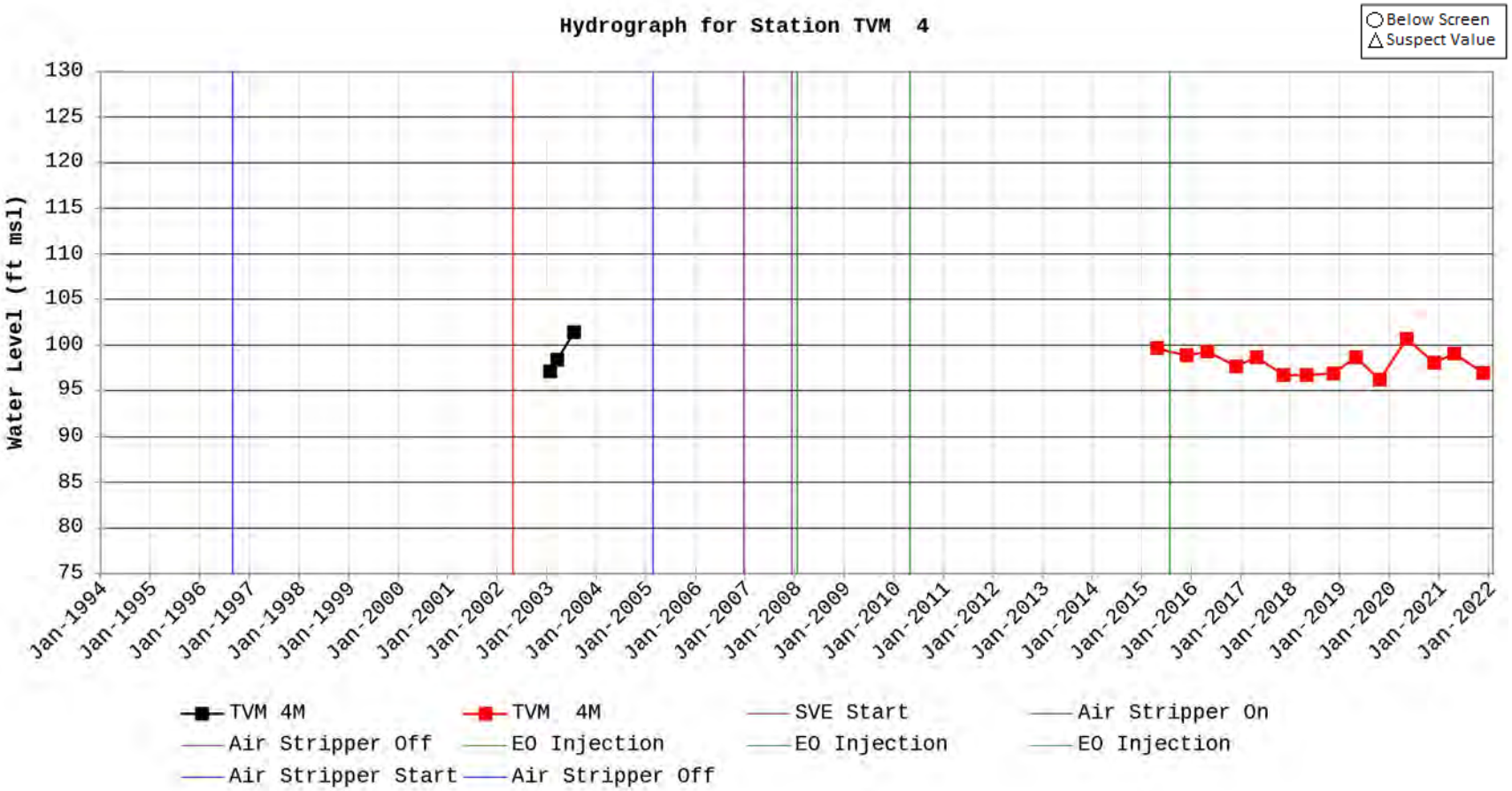

Hydrograph for Station TRW 2
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

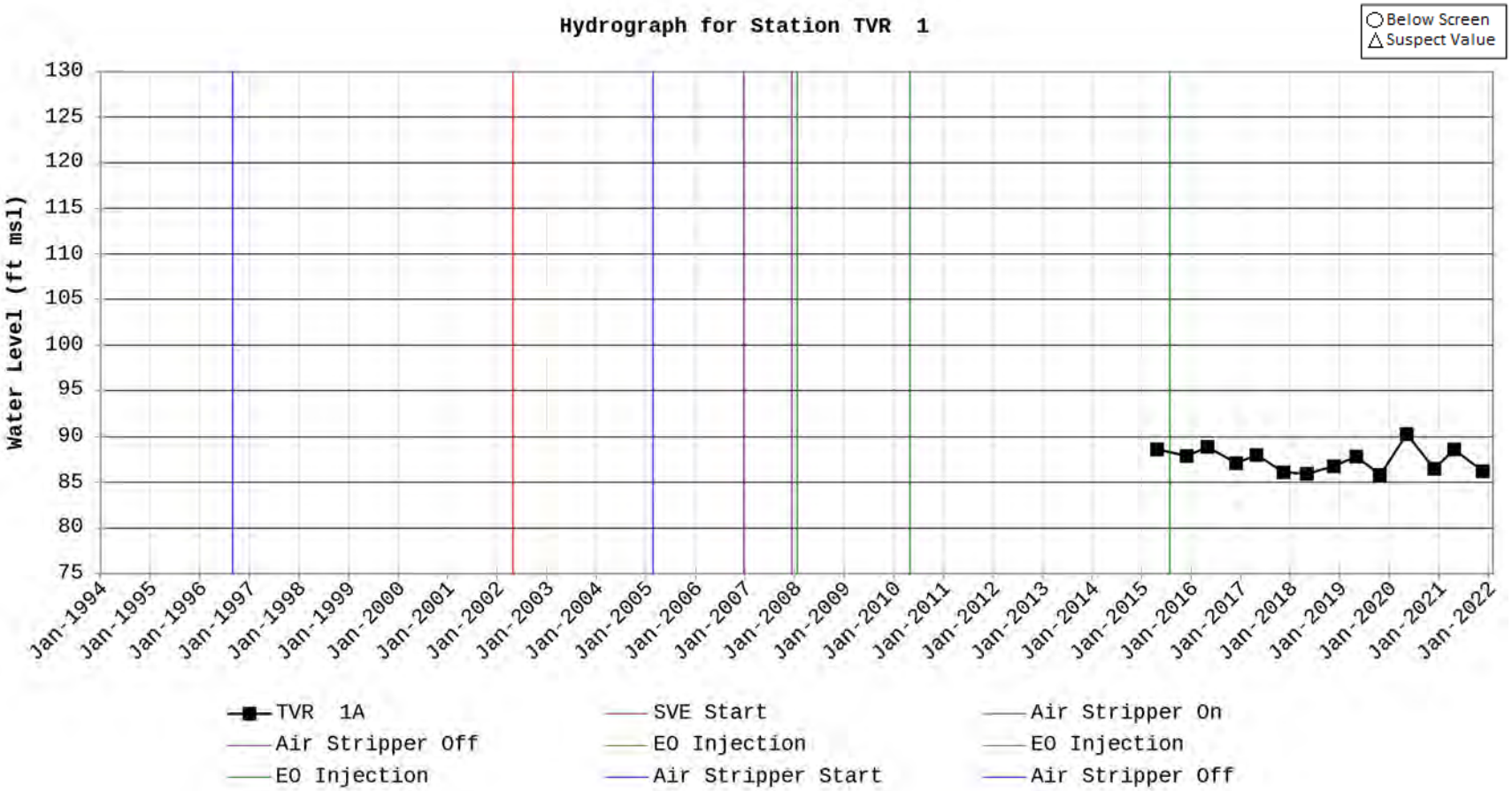

Hydrograph for Station TRW 3
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

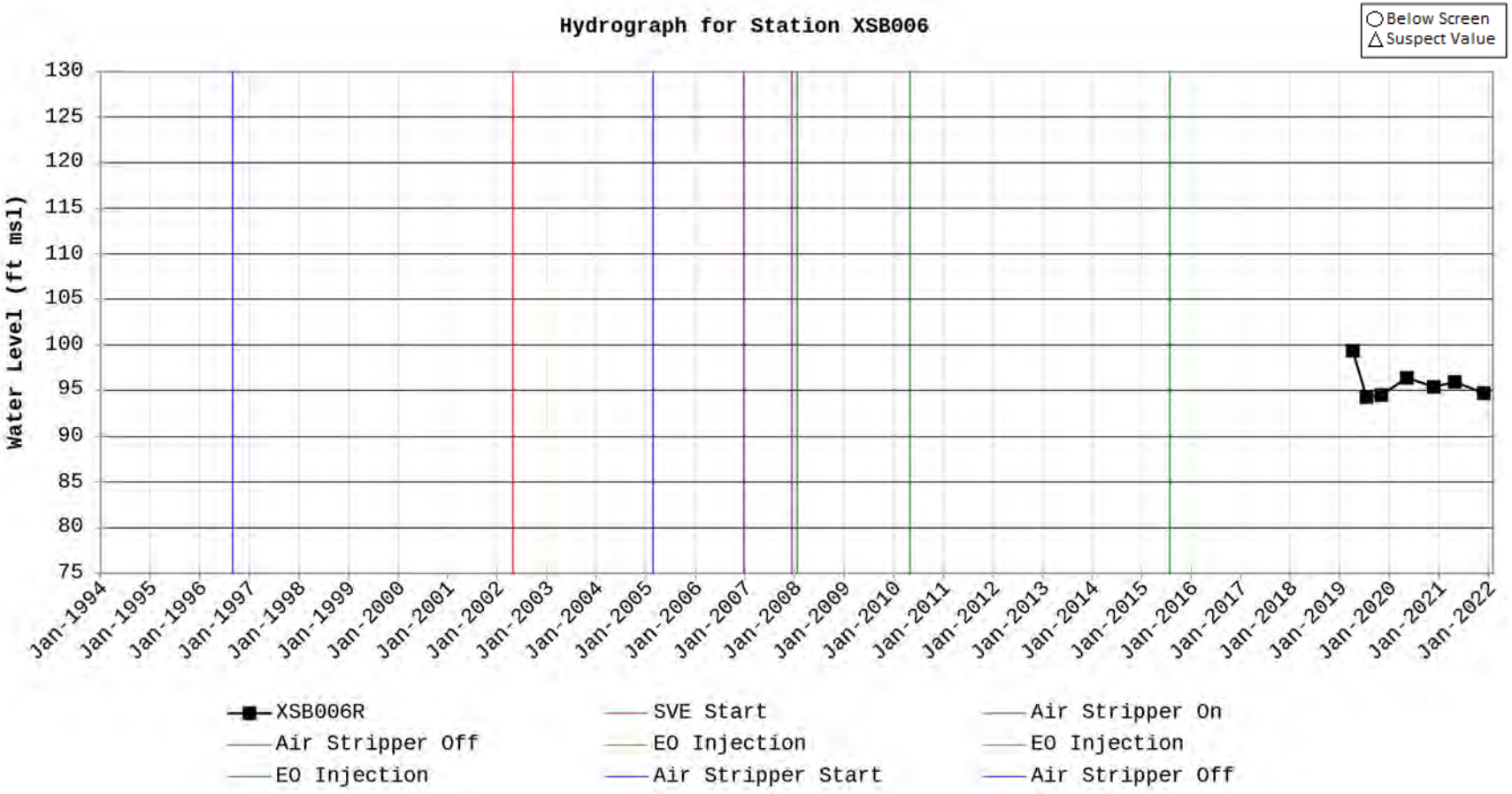

Hydrograph for Station TRW 4
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off


Hydrograph for Station TVM 1
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
TVM 1M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off


Hydrograph for Station TVM 2
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
TVM 2M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off


Hydrograph for Station TVM 4
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
TVM 4M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off


Hydrograph for Station TVR 1
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

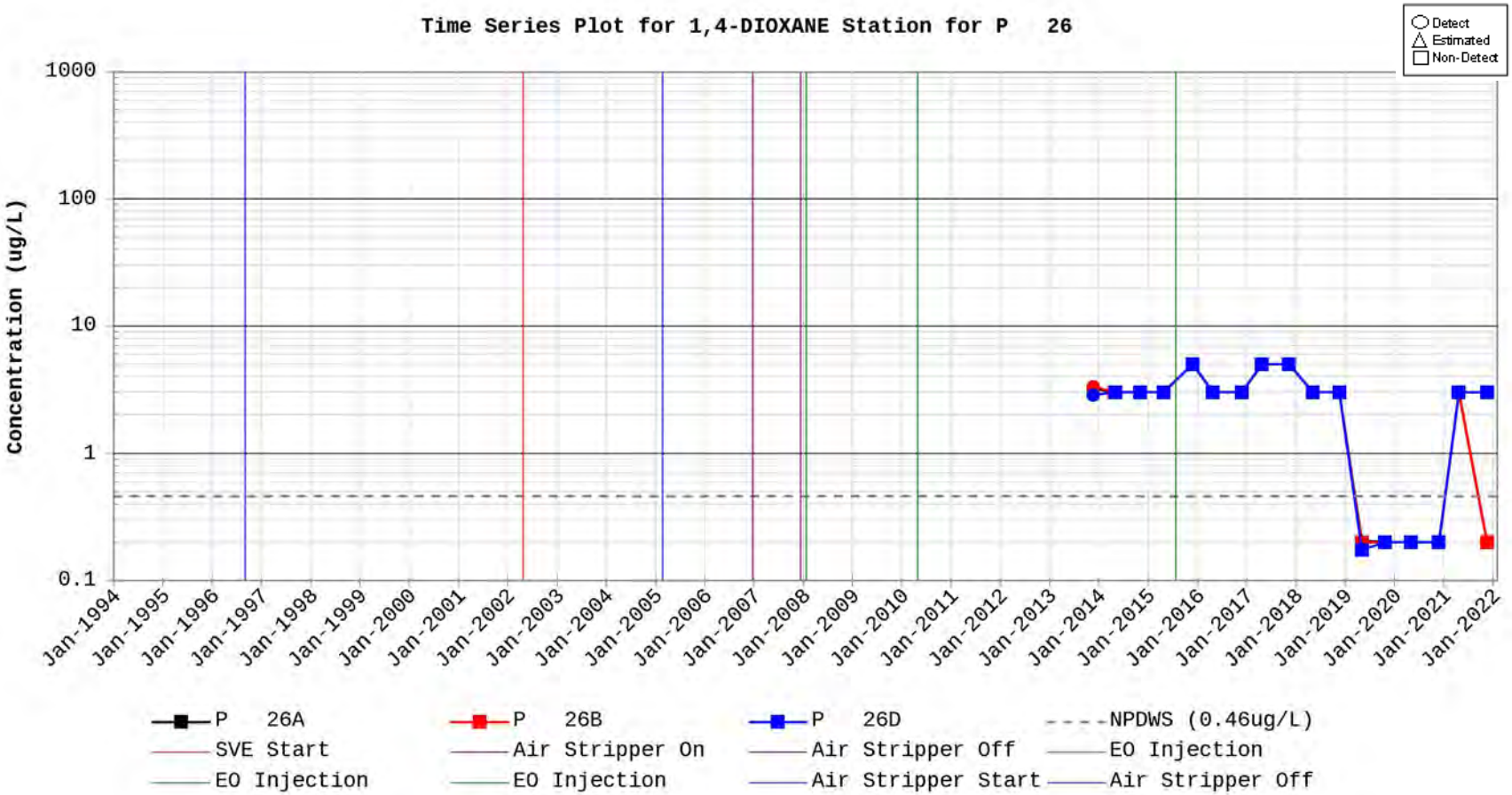

Hydrograph for Station XSB006
Below Screen
Suspect Value
Water Level (ft msl)
130
125
120
115
110
105
100
95
90
85
80
75
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

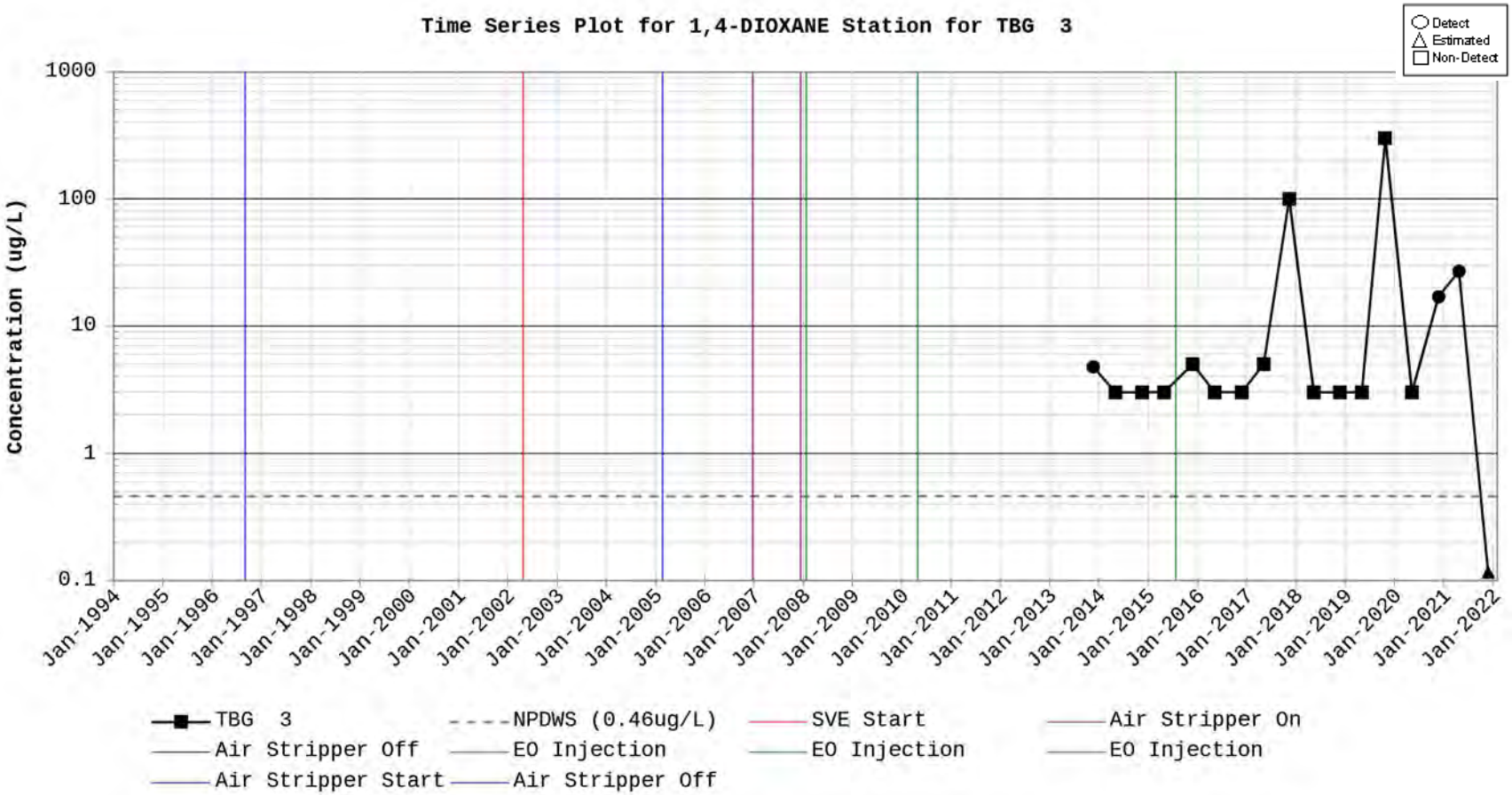
This page intentionally left blank.

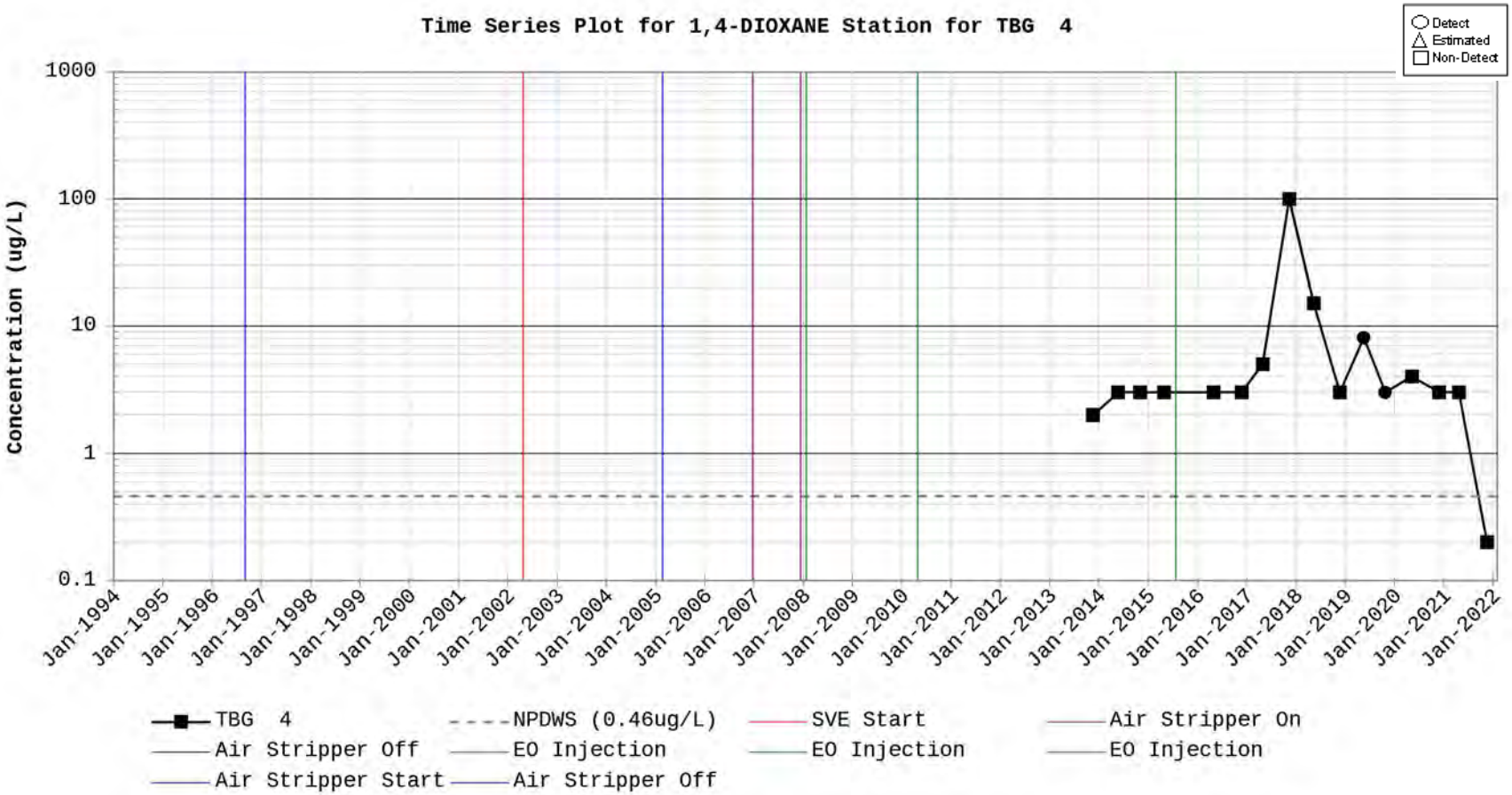
APPENDIX E

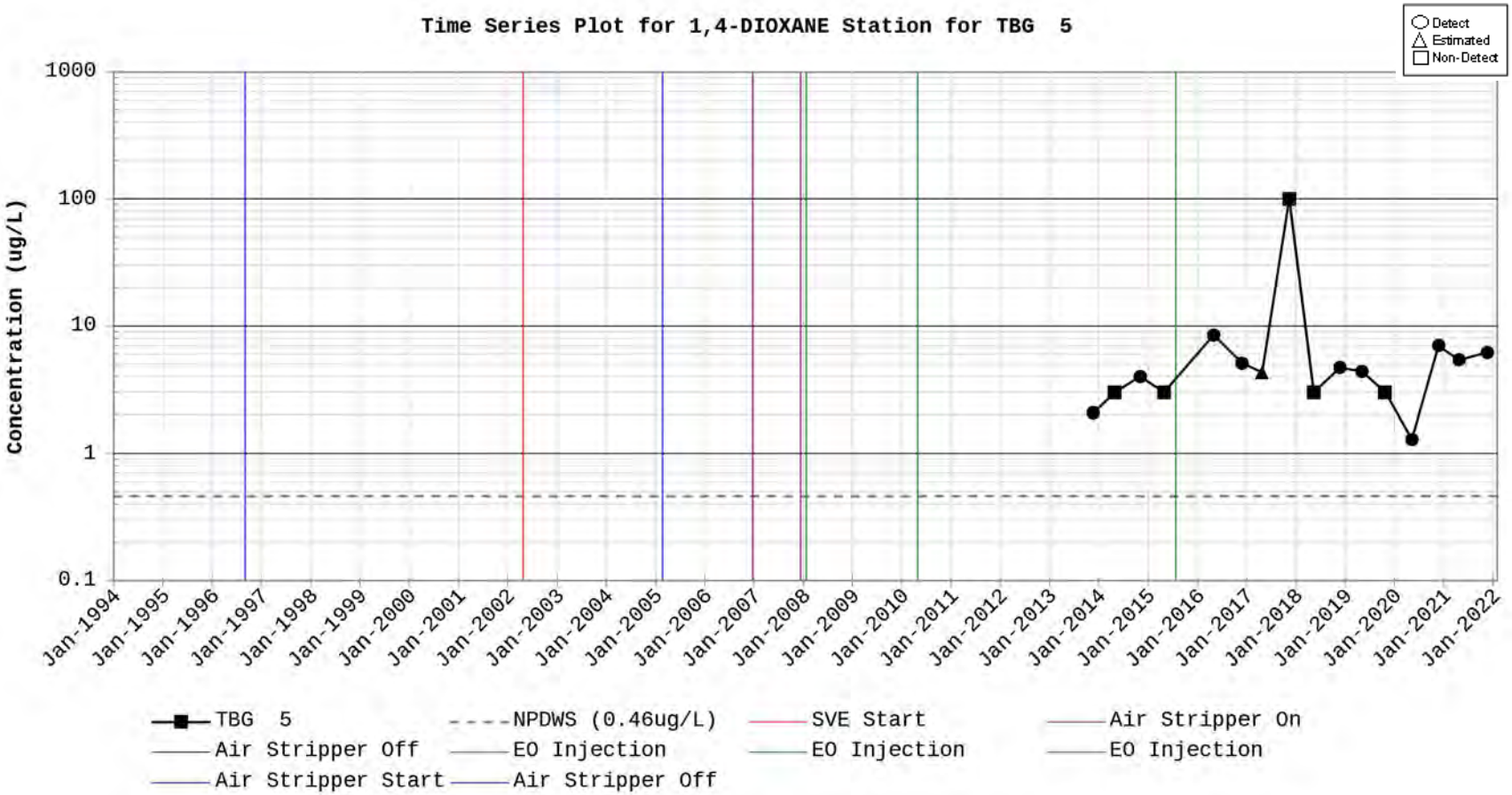
TIME SERIES PLOTS

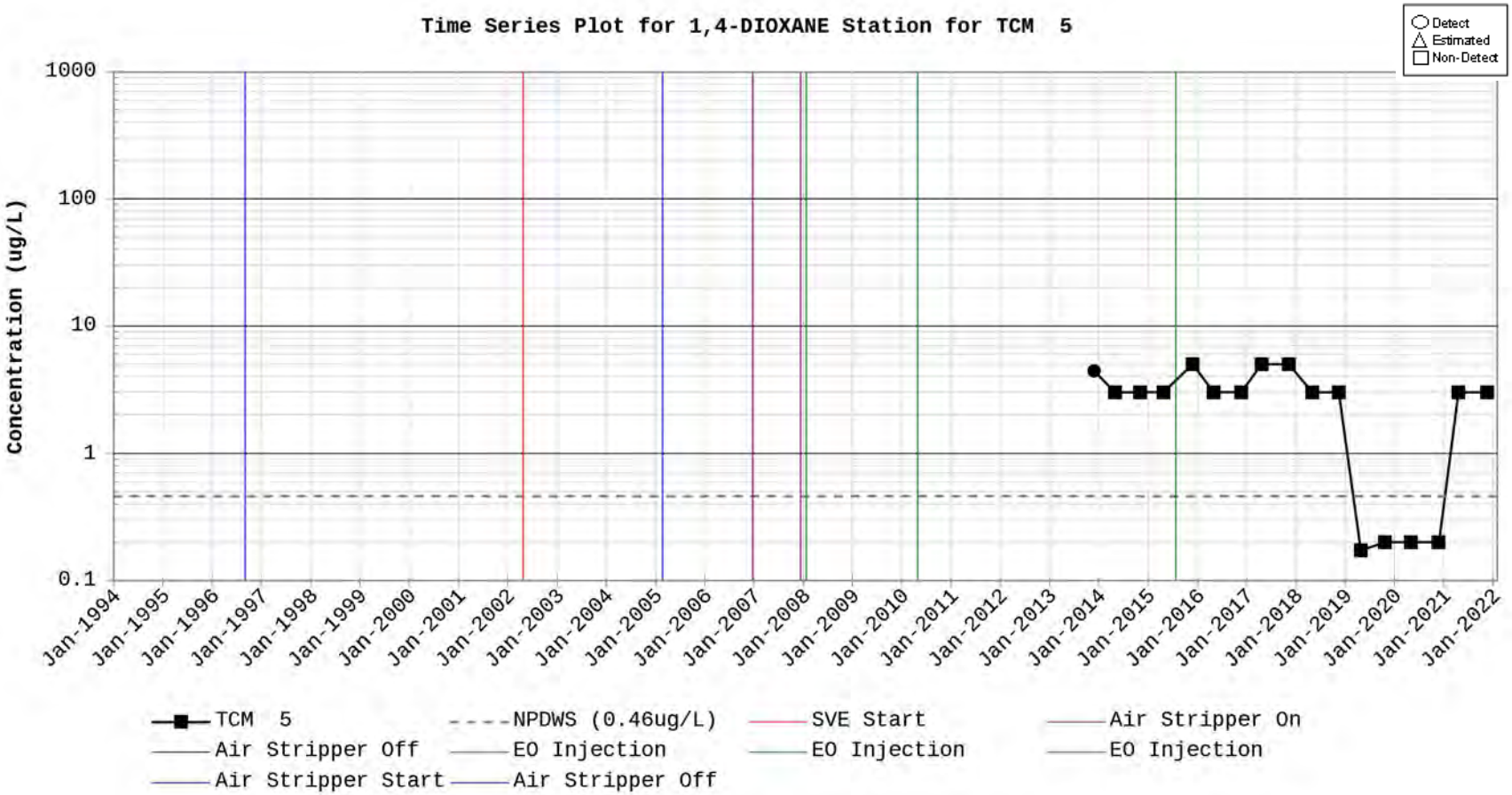
This page intentionally left blank.

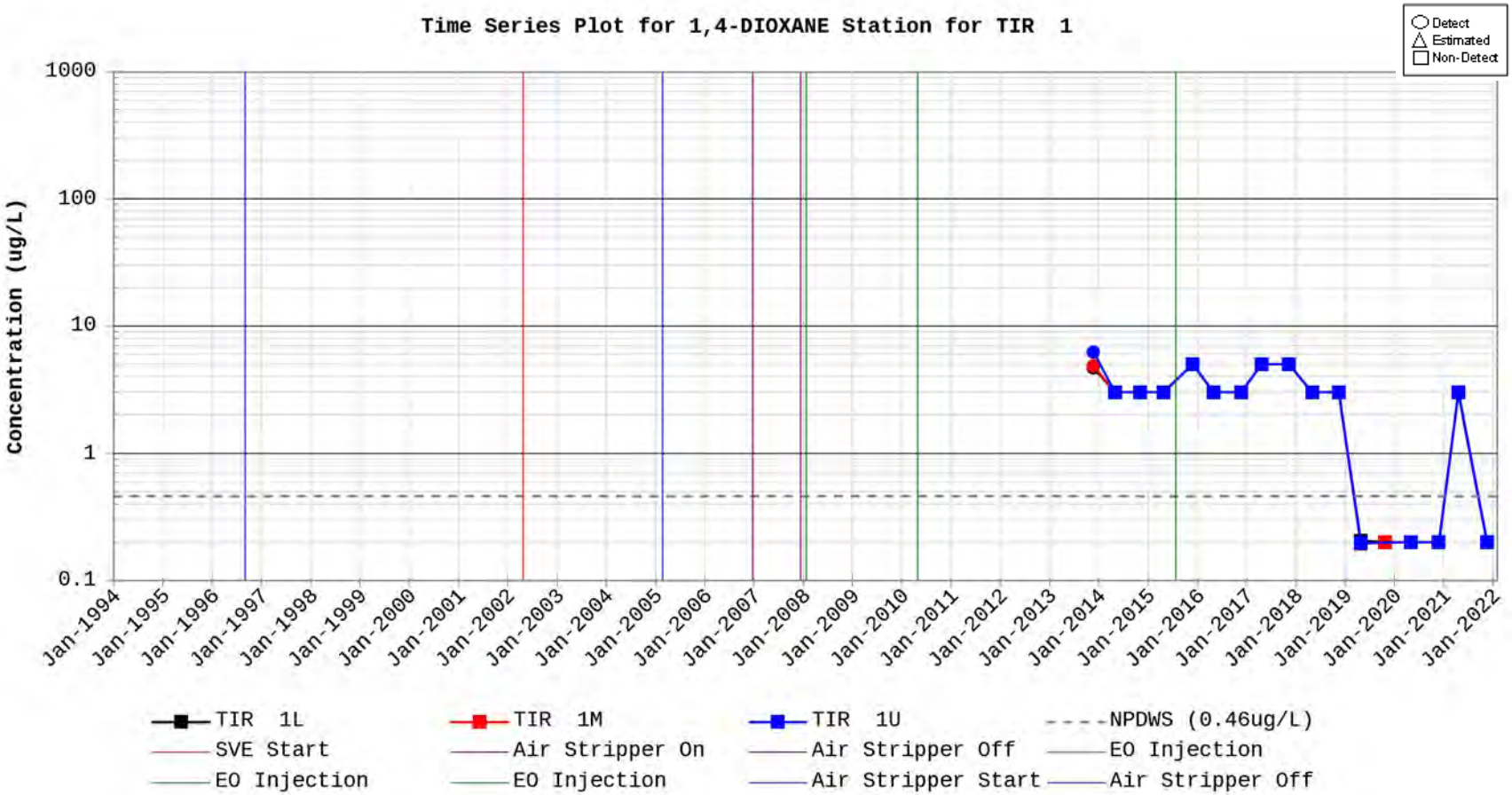

Time Series Plot for 1,4-DIOXANE Station for P 26
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
P 26A
P 26B
P 26D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

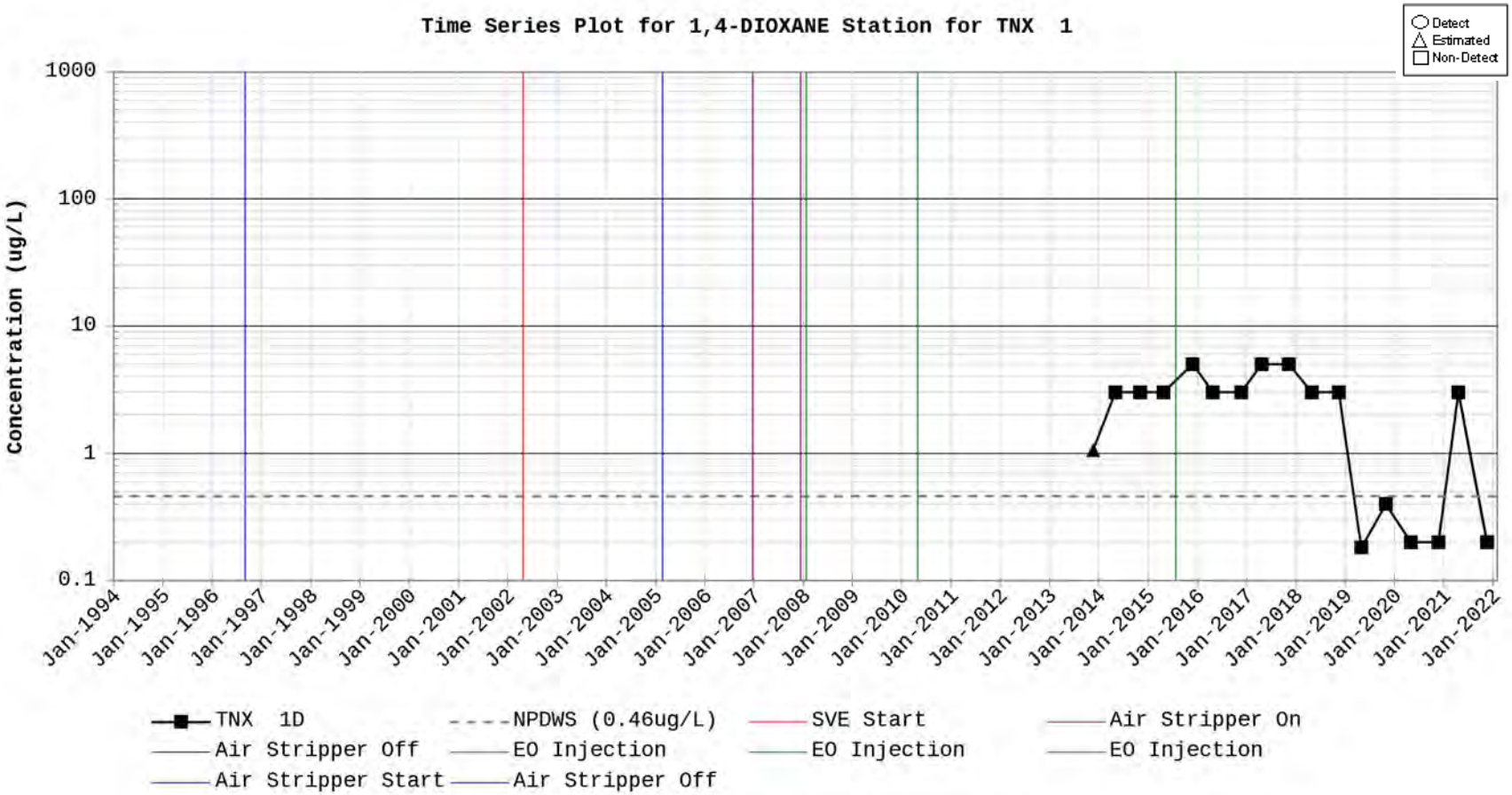

Time Series Plot for 1,4-DIOXANE Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

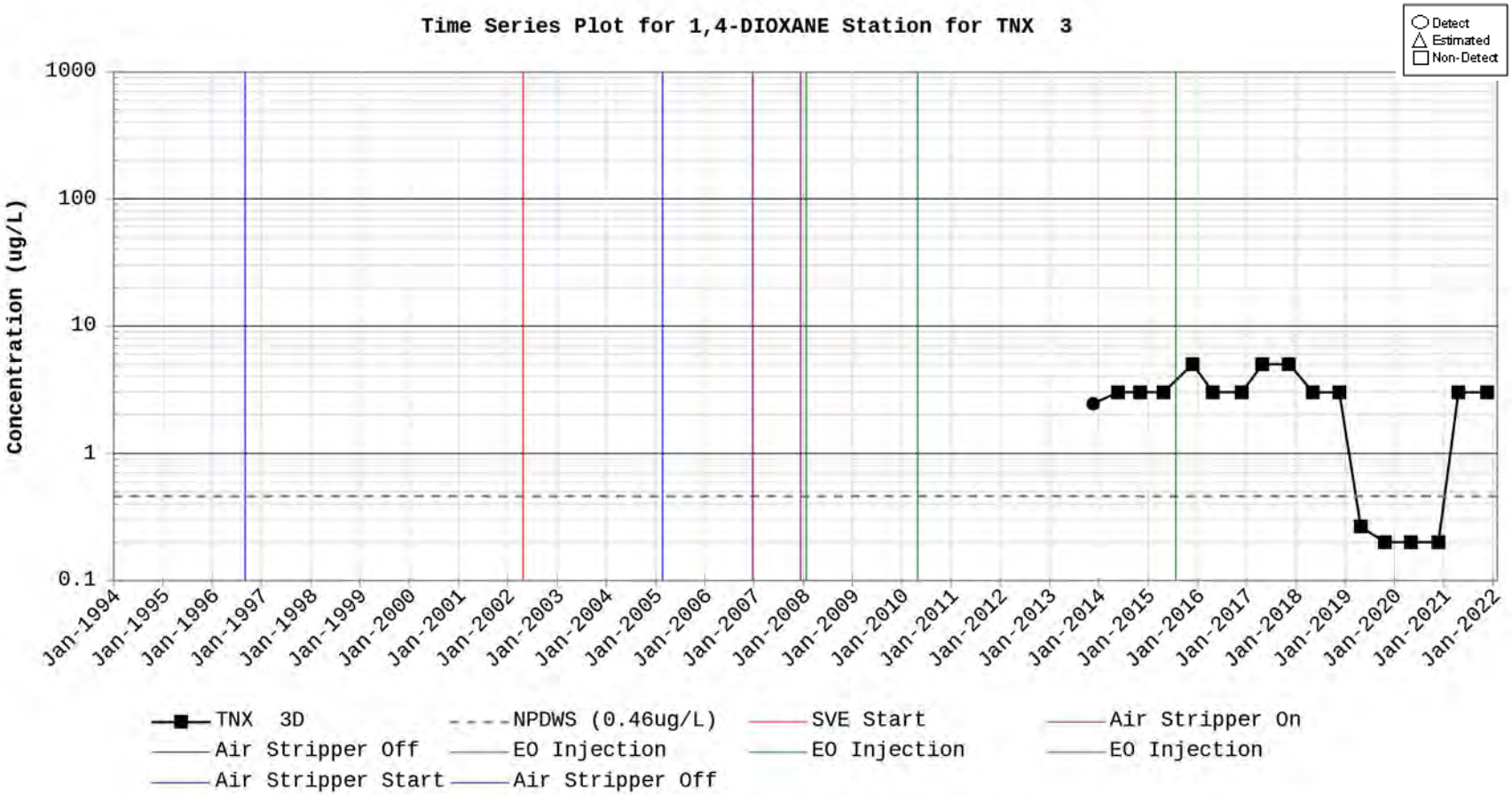

Time Series Plot for 1,4-DIOXANE Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

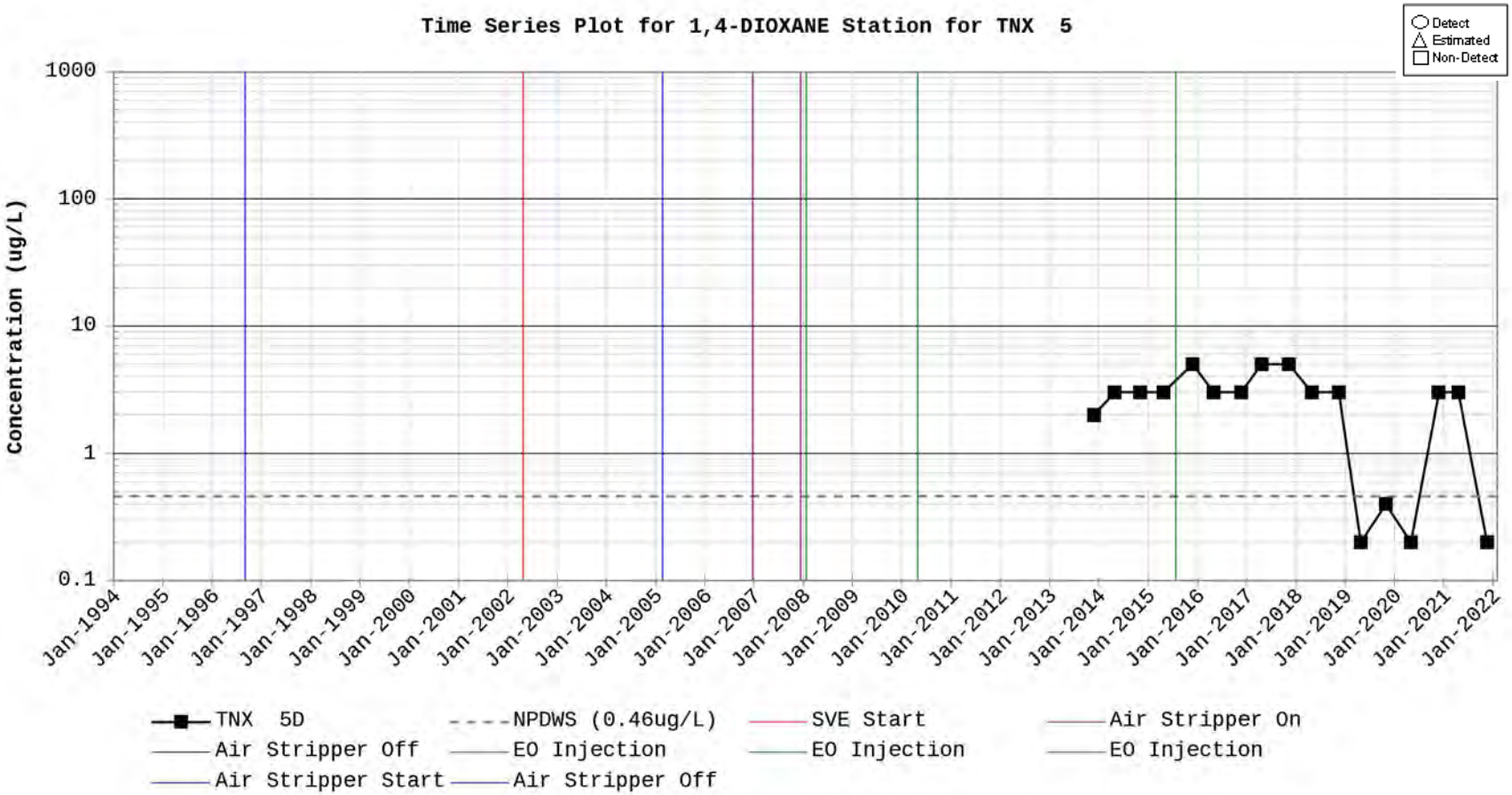

Time Series Plot for 1,4-DIOXANE Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

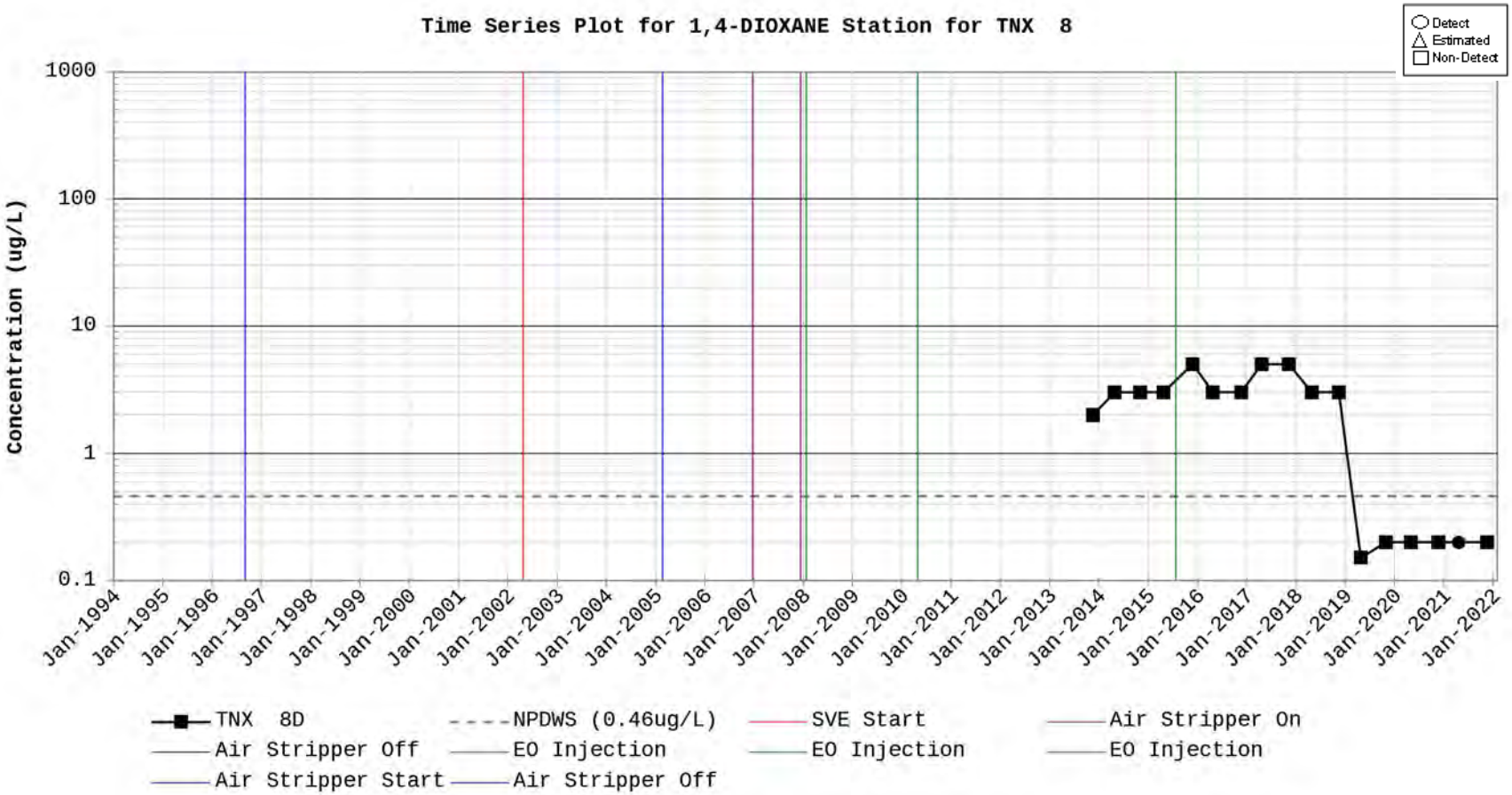

Time Series Plot for 1,4-DIOXANE Station for TCM 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

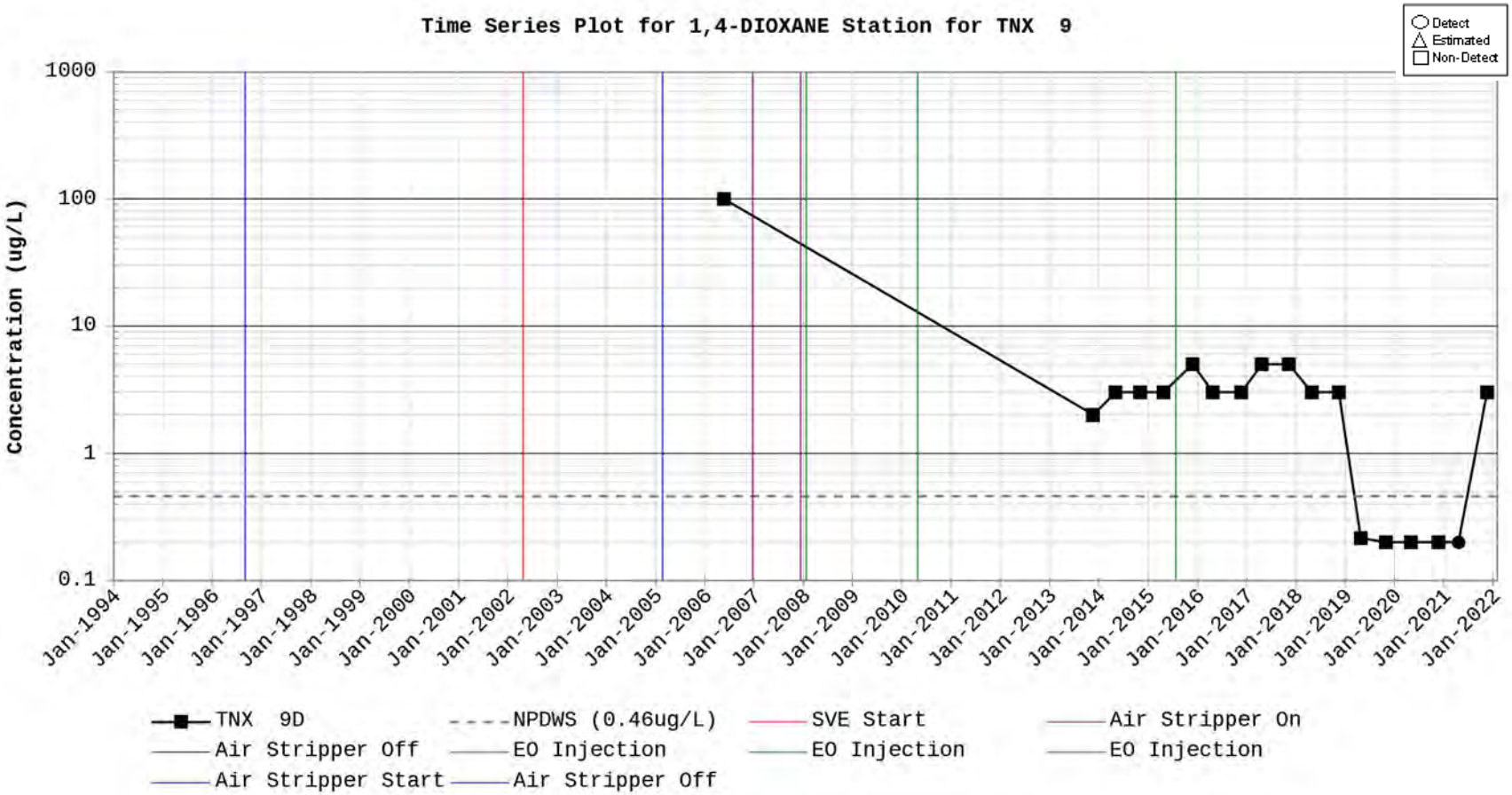

Time Series Plot for 1,4-DIOXANE Station for TIR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
TIR 1M
TIR 1U
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

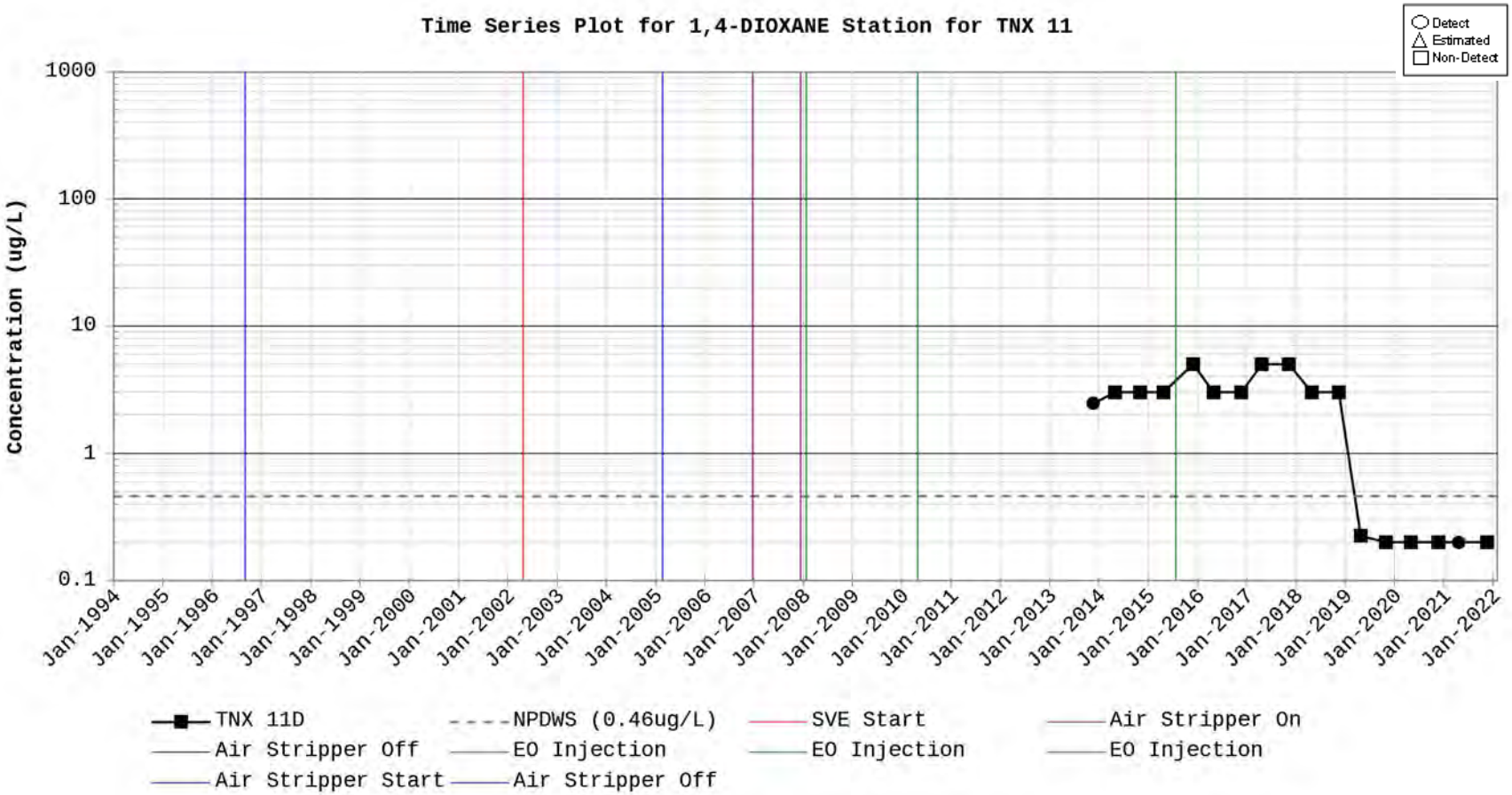

Time Series Plot for 1,4-DIOXANE Station for TNX 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 1D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

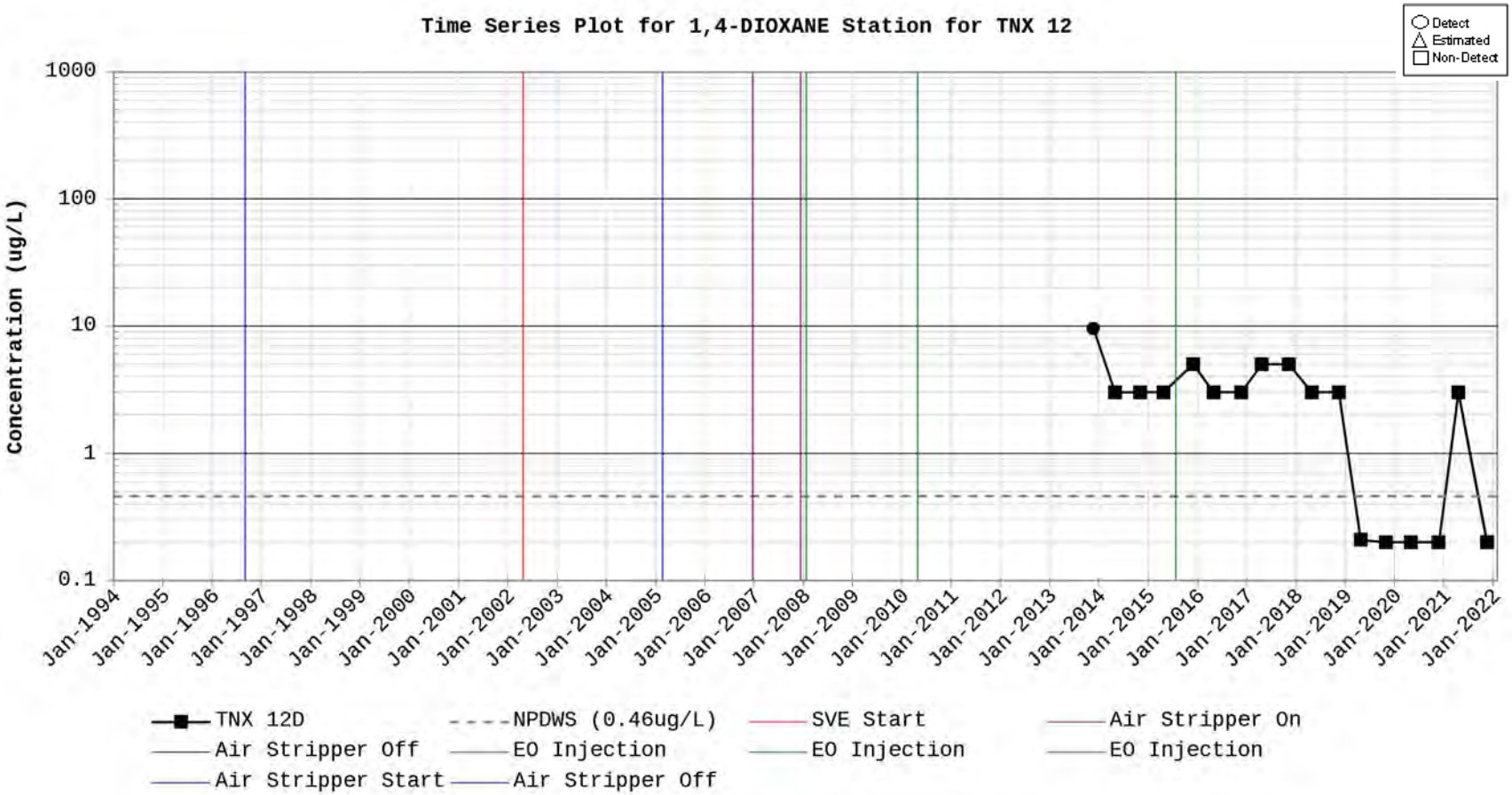

Time Series Plot for 1,4-DIOXANE Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

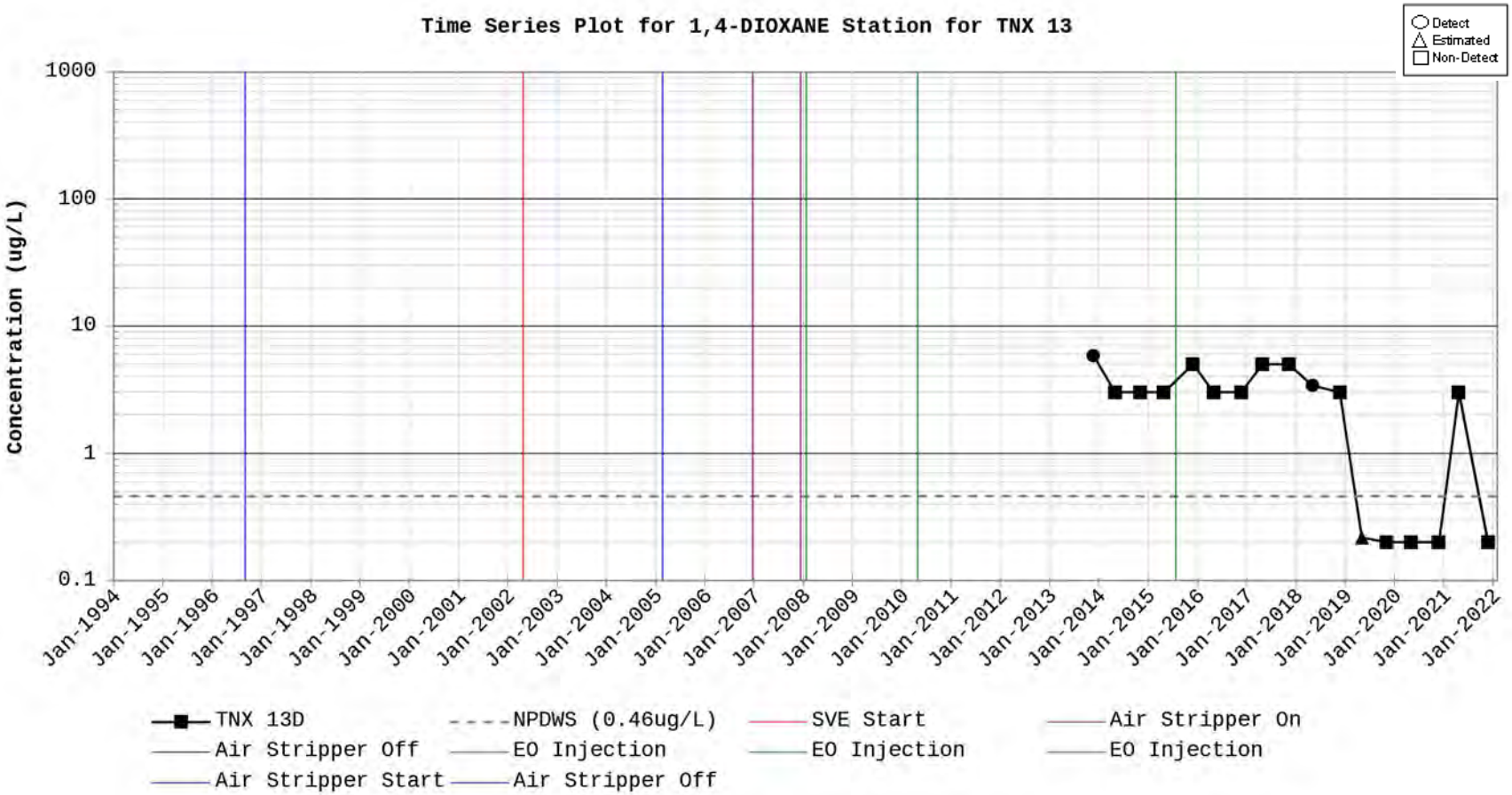

Time Series Plot for 1,4-DIOXANE Station for TNX 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

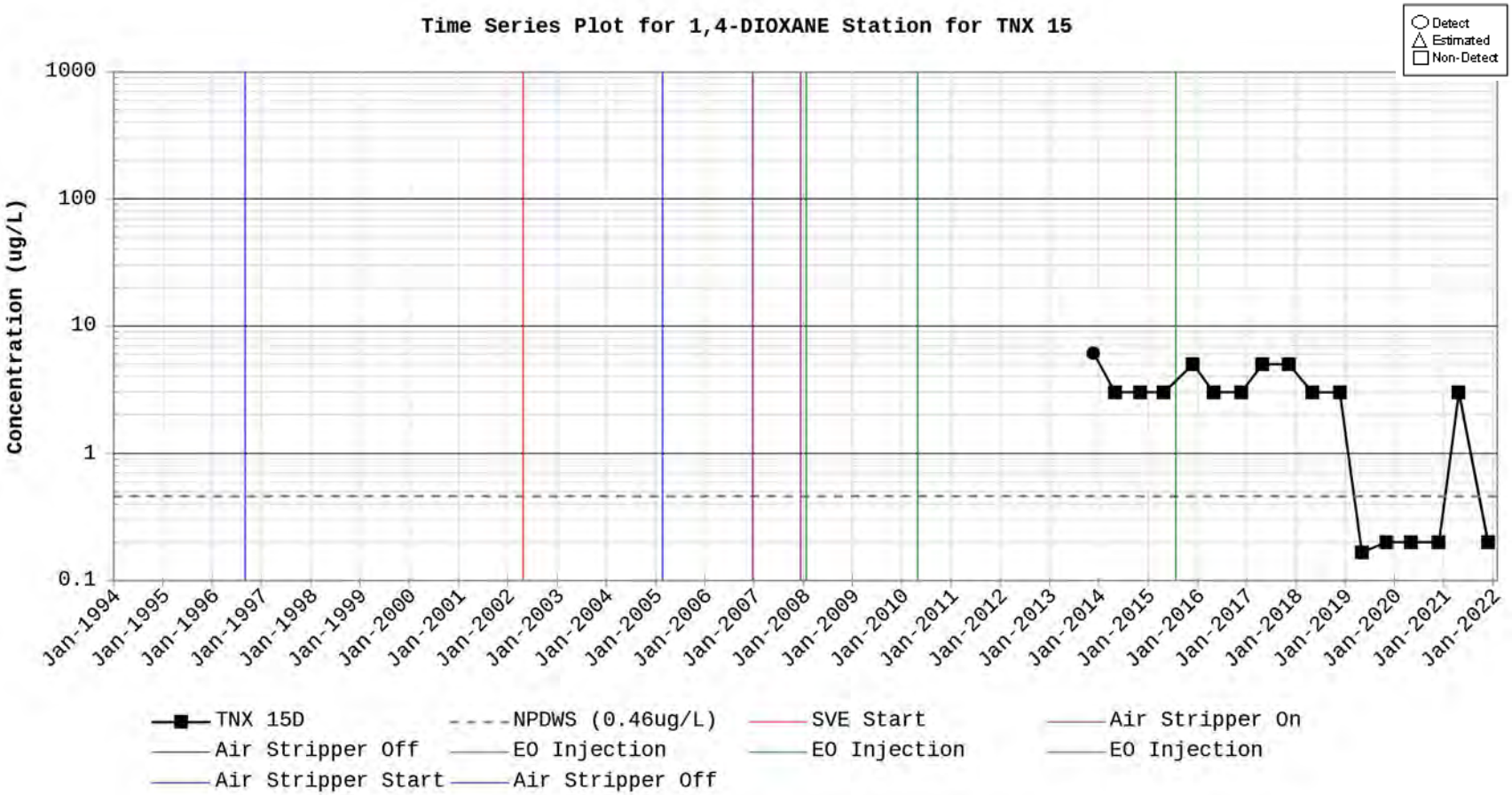

Time Series Plot for 1,4-DIOXANE Station for TNX 8
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

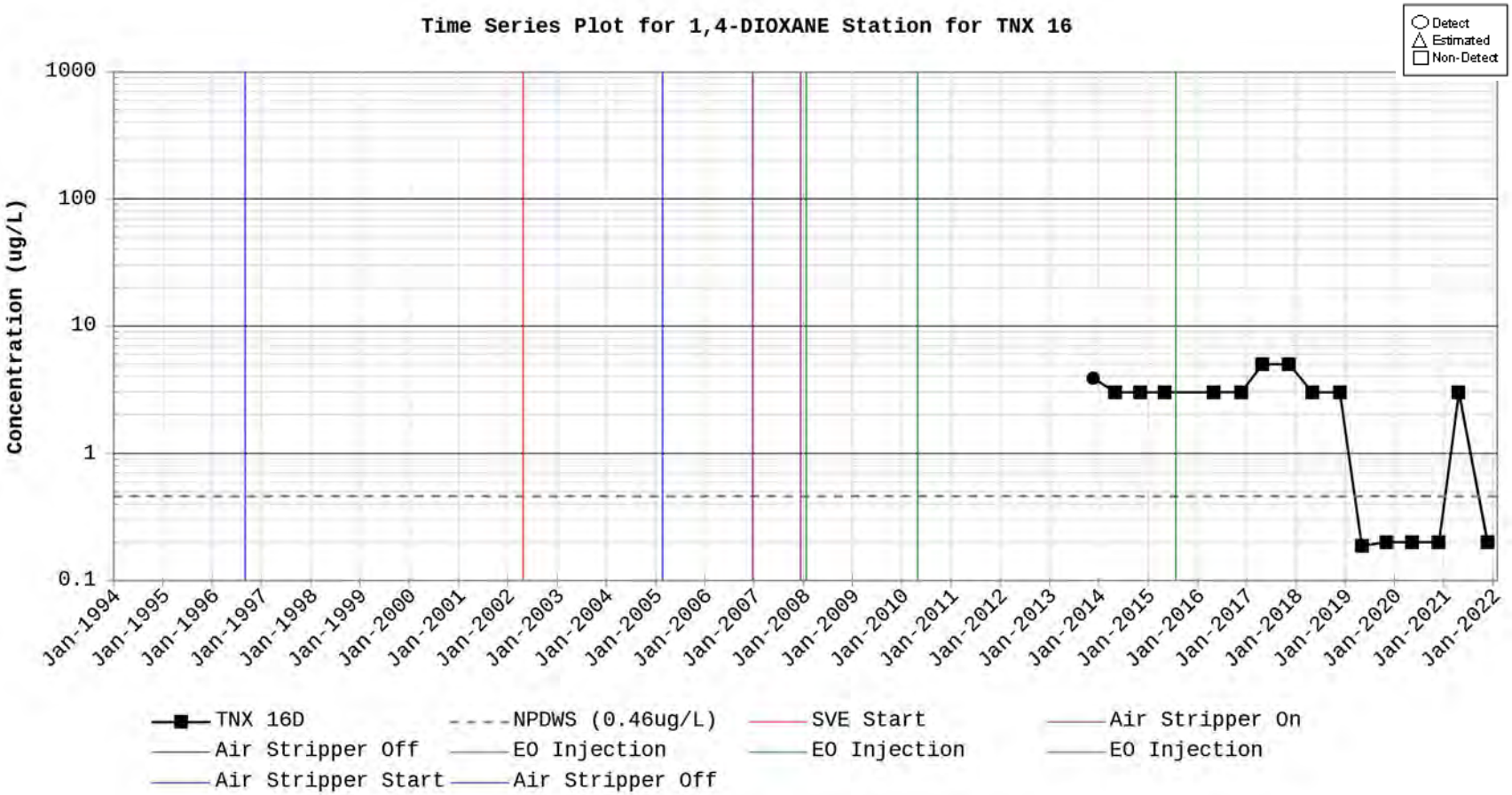

Time Series Plot for 1,4-DIOXANE Station for TNX 9
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 9D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

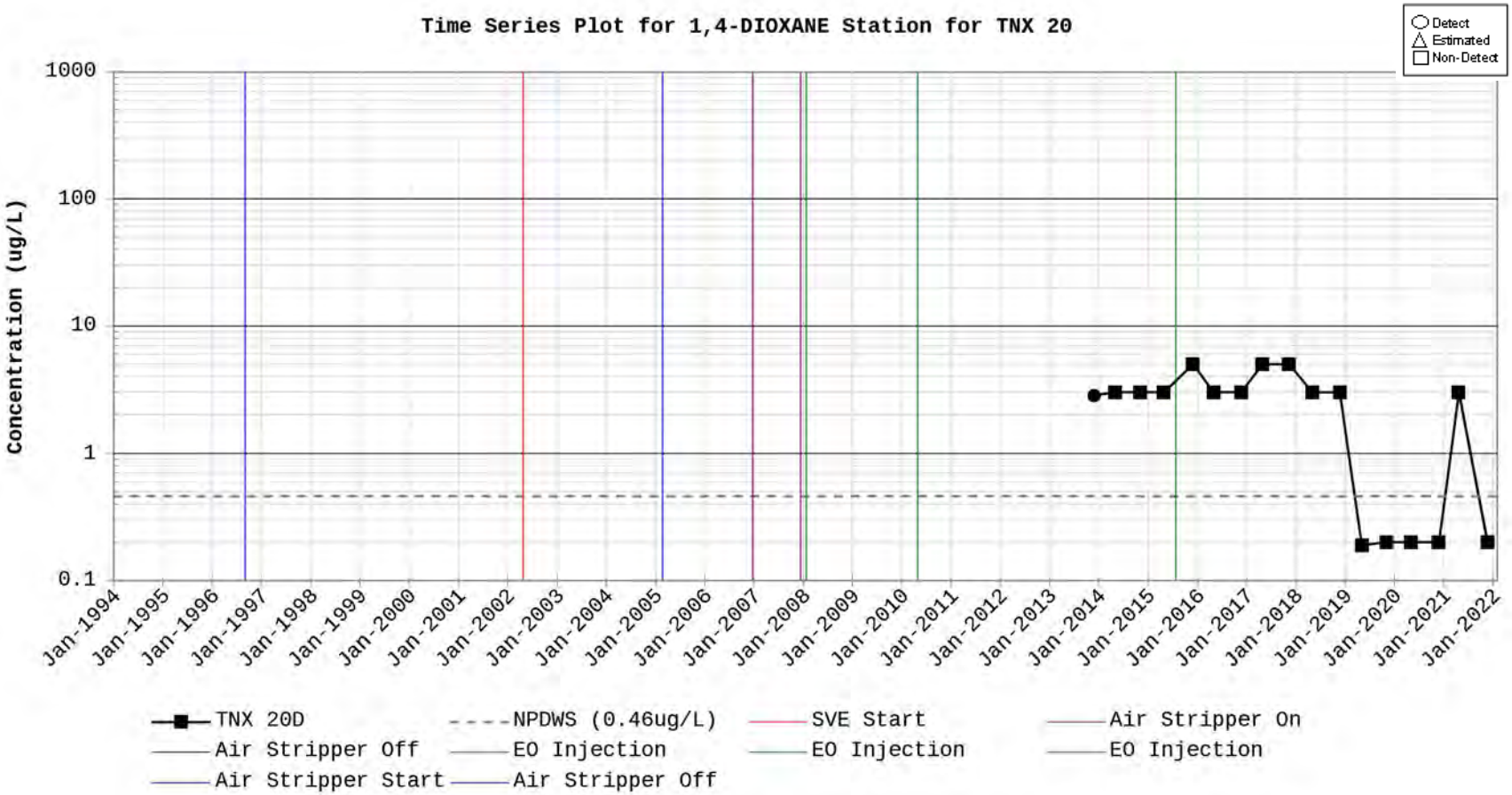

Time Series Plot for 1,4-DIOXANE Station for TNX 11
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

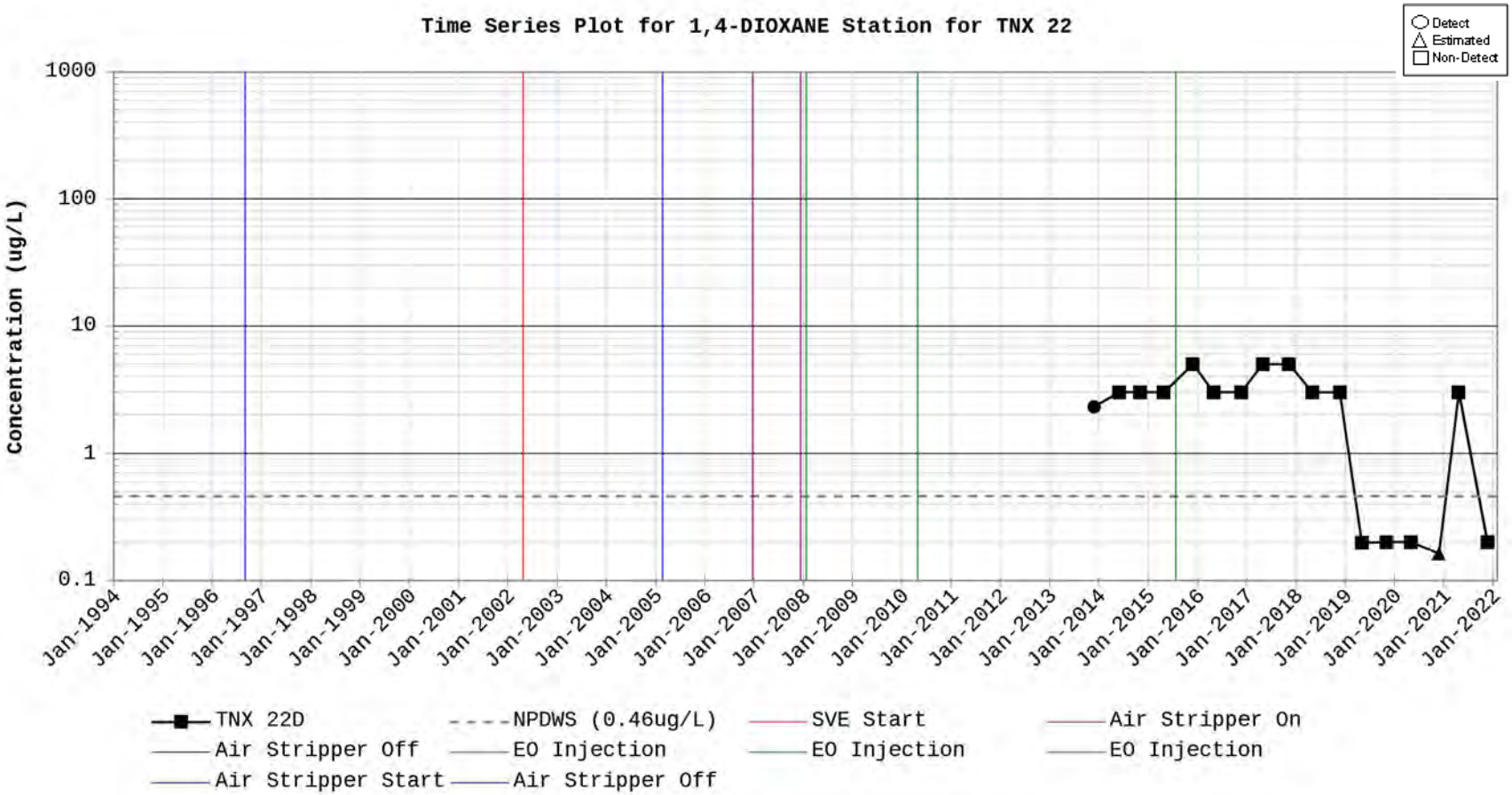

Time Series Plot for 1,4-DIOXANE Station for TNX 12
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 12D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

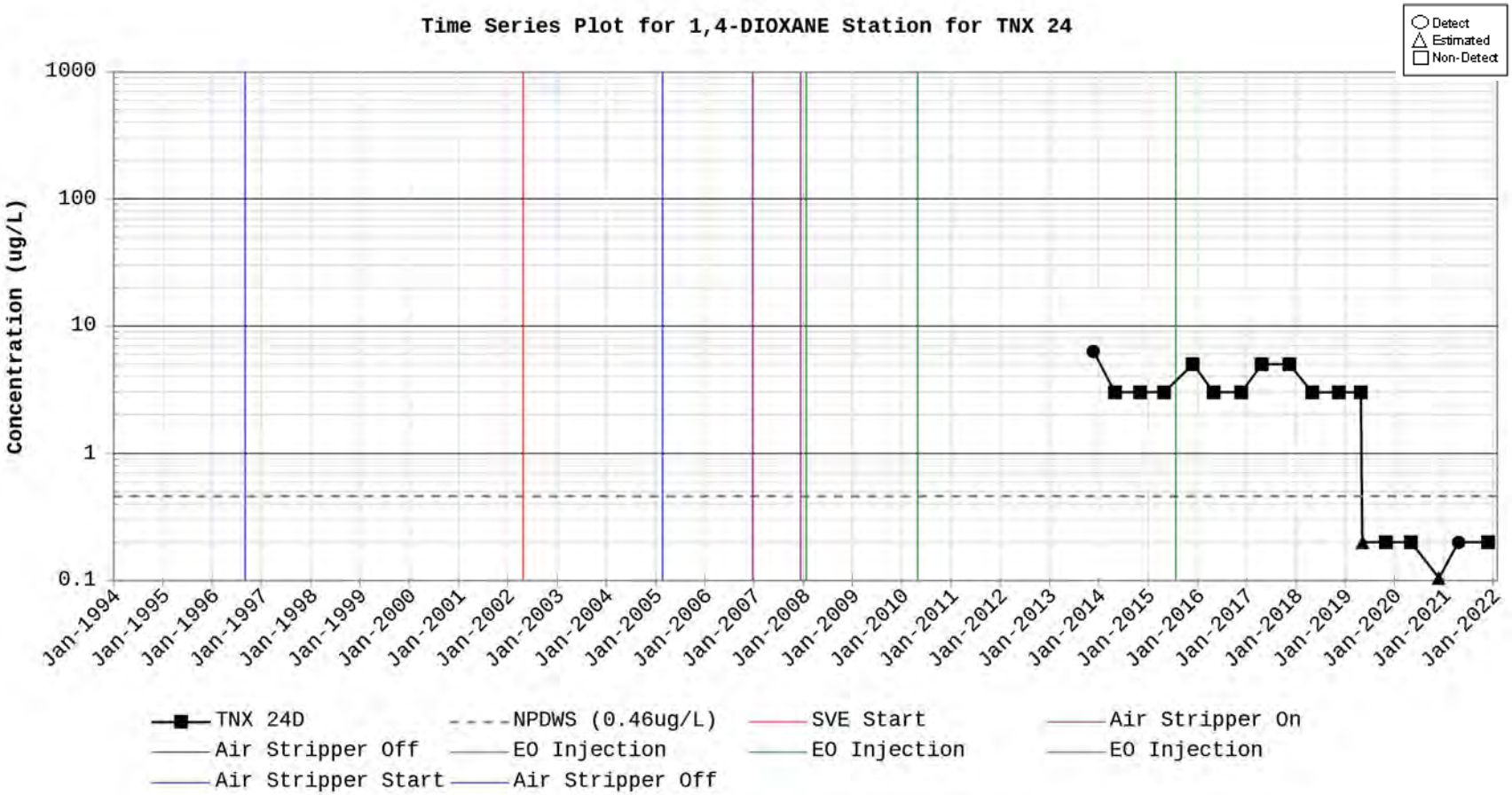

Time Series Plot for 1,4-DIOXANE Station for TNX 13
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

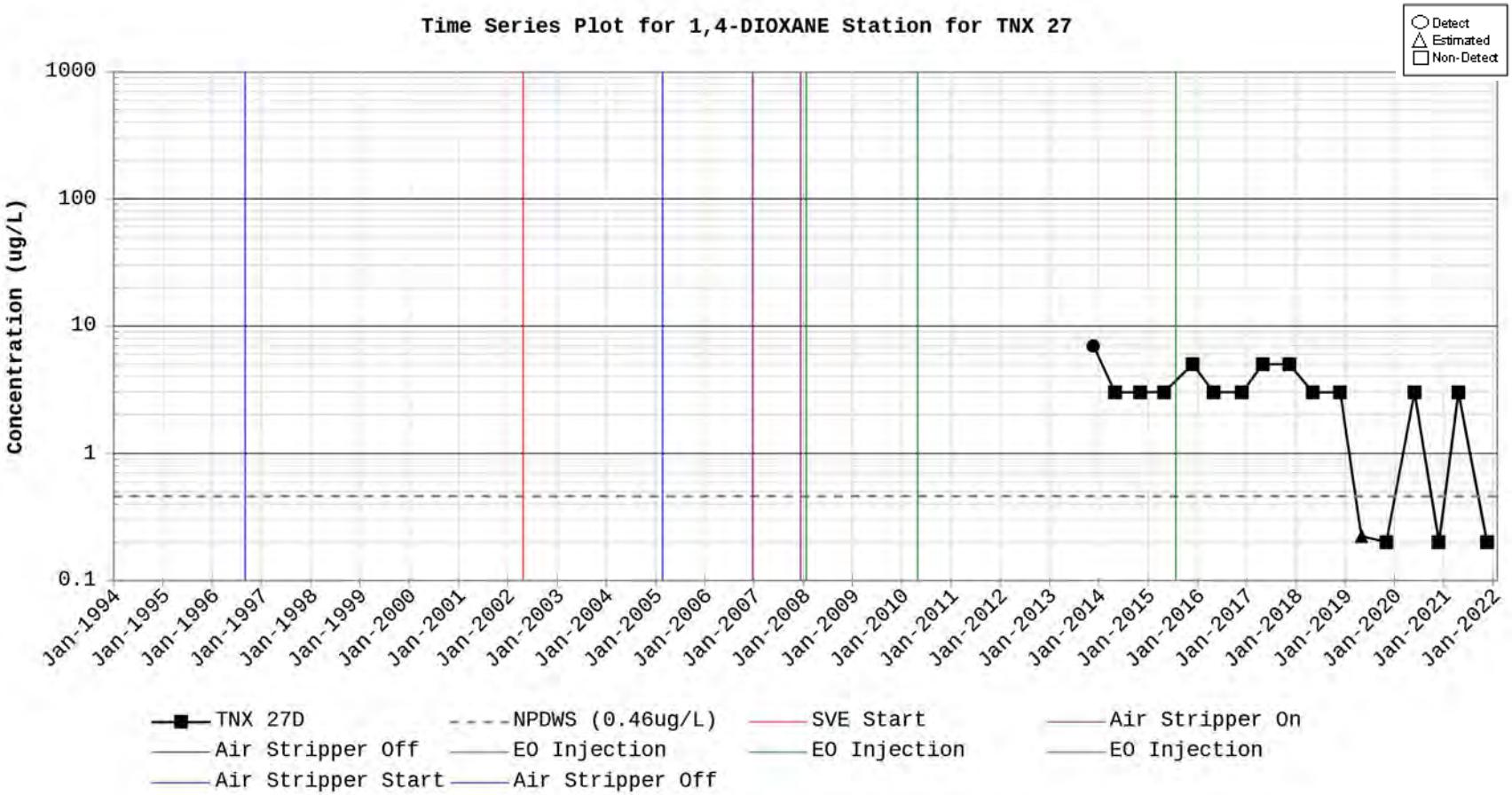

Time Series Plot for 1,4-DIOXANE Station for TNX 15
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 15D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

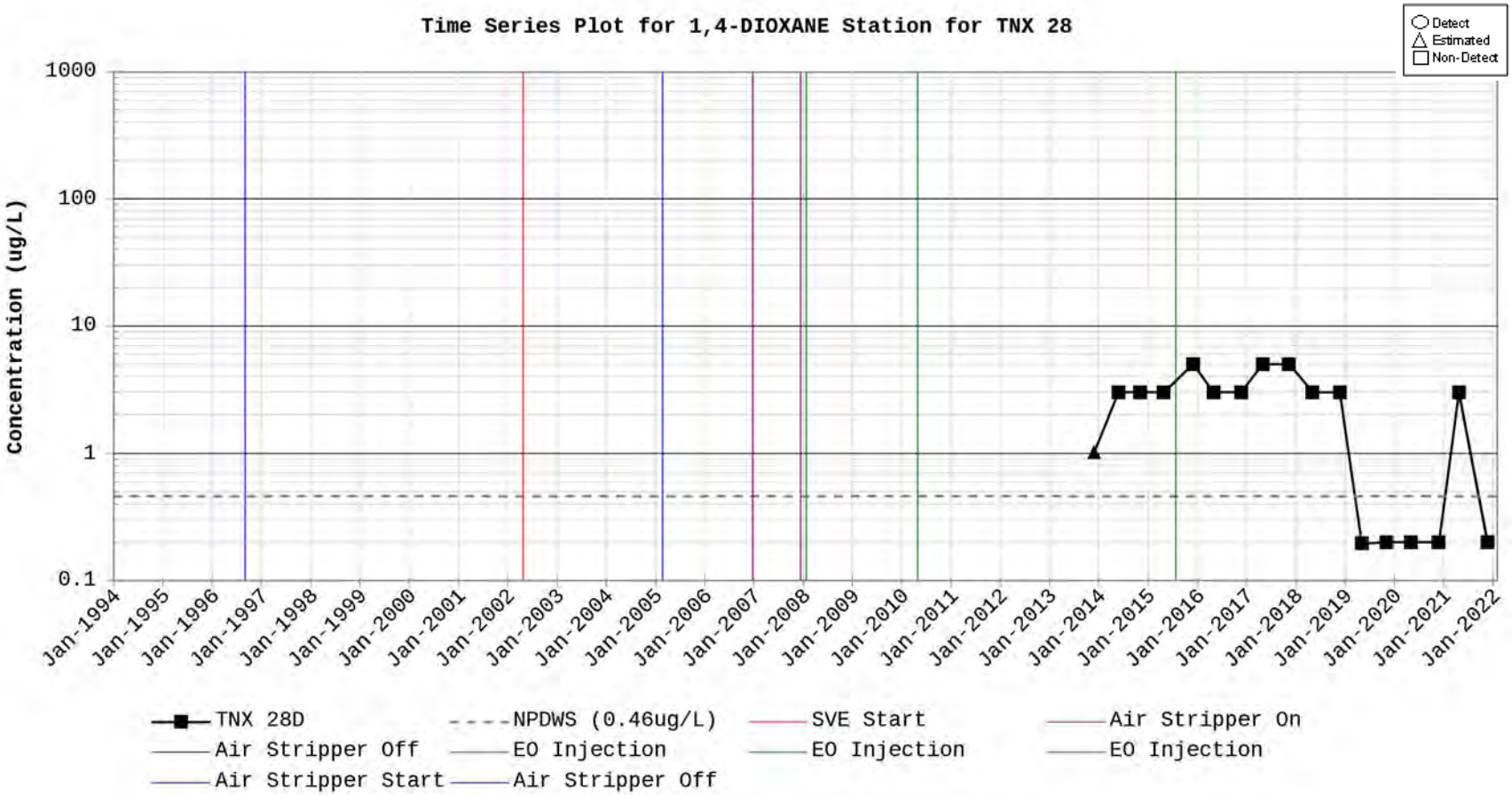

Time Series Plot for 1,4-DIOXANE Station for TNX 16
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 16D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

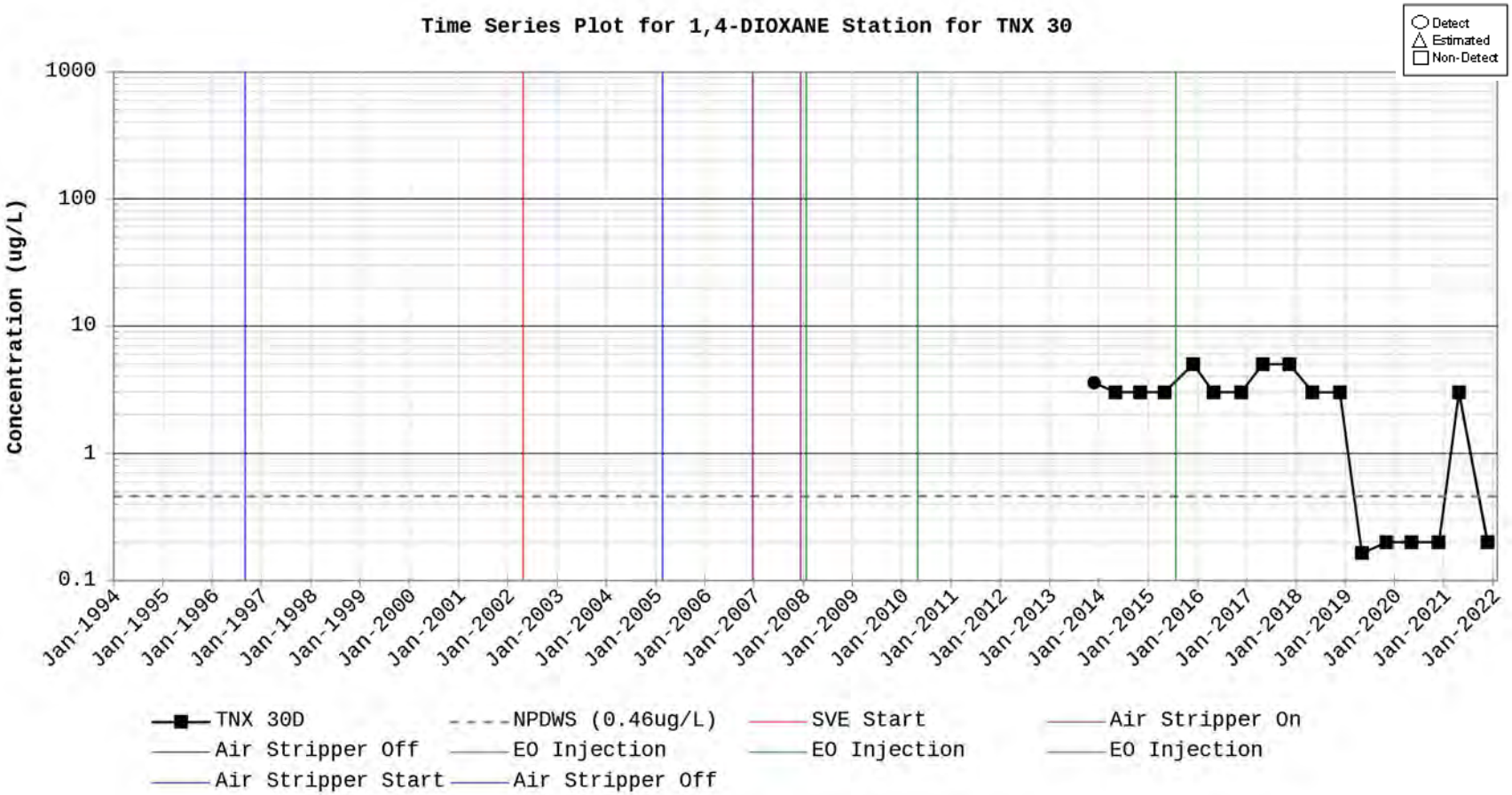

Time Series Plot for 1,4-DIOXANE Station for TNX 20
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 20D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

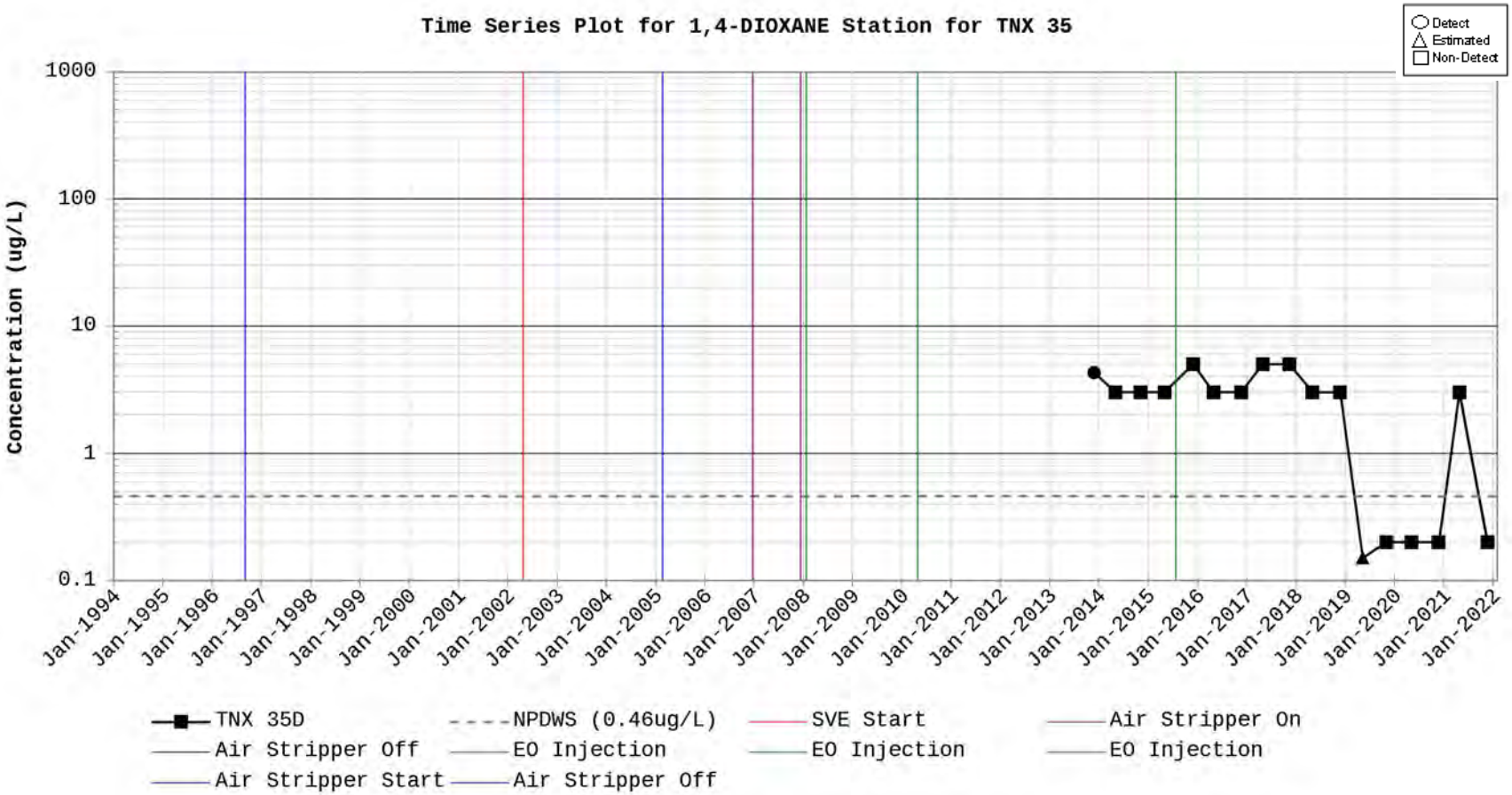

Time Series Plot for 1,4-DIOXANE Station for TNX 22
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 22D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

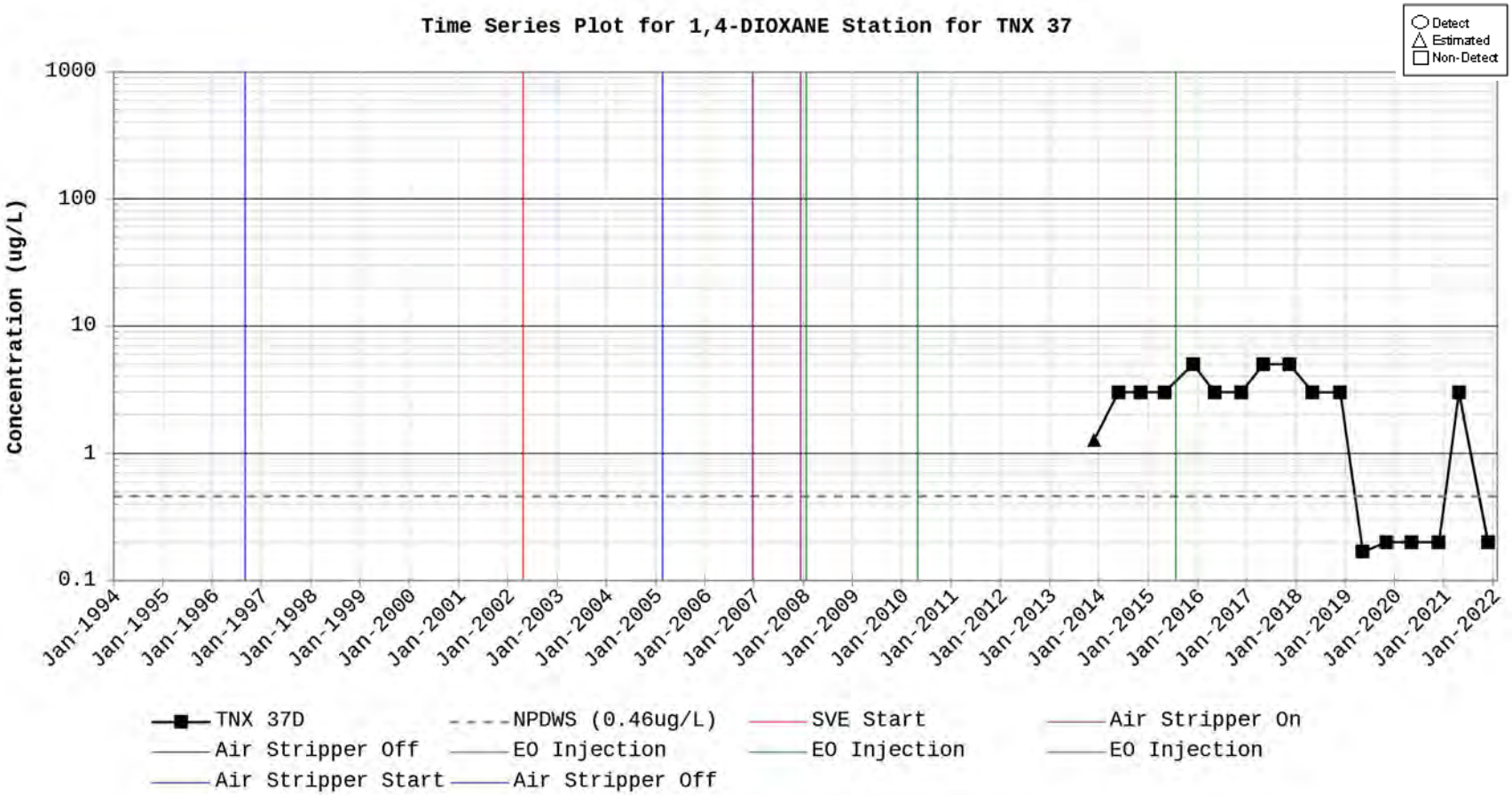

Time Series Plot for 1,4-DIOXANE Station for TNX 24
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 24D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

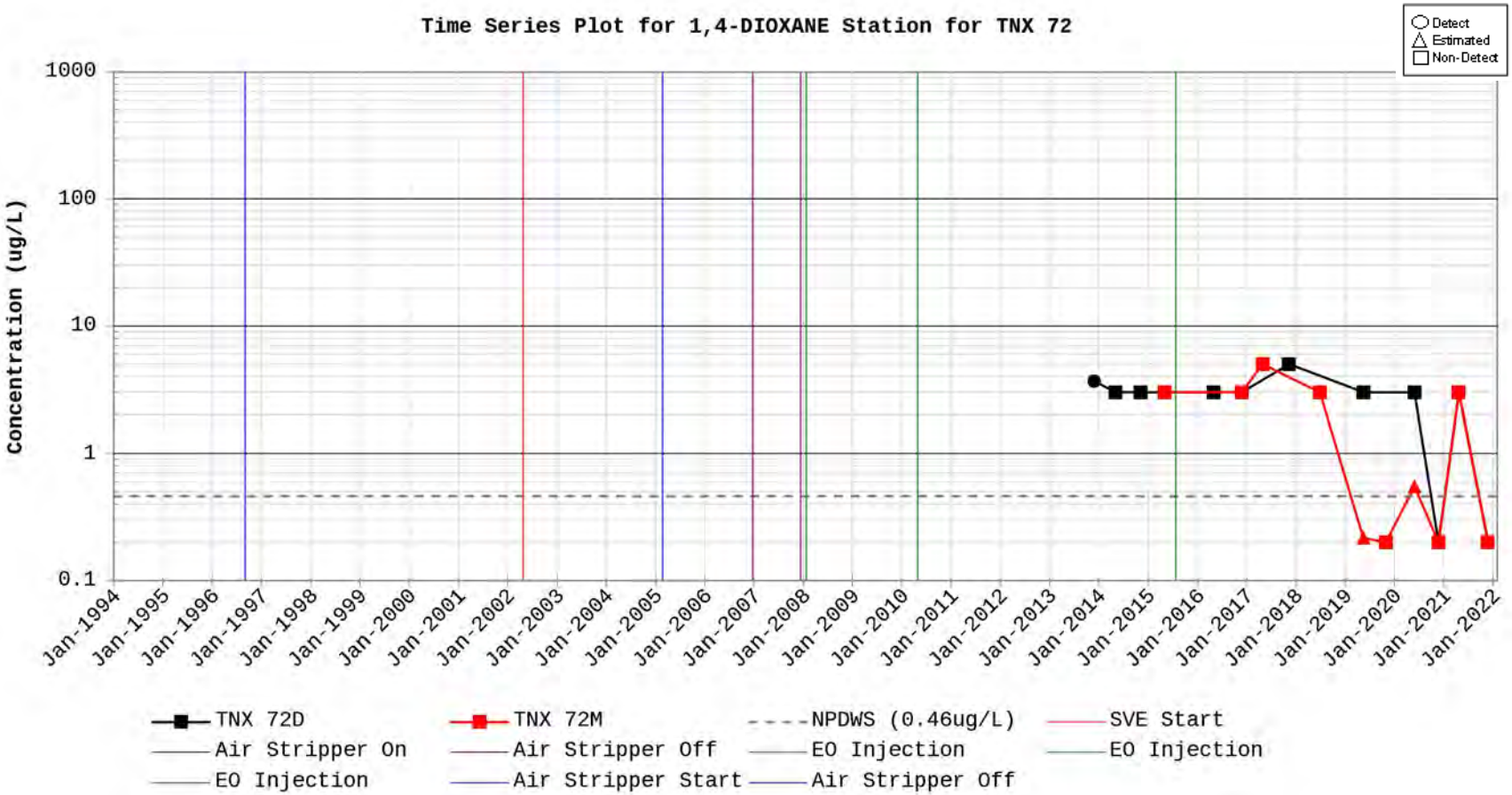

Time Series Plot for 1,4-DIOXANE Station for TNX 27
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

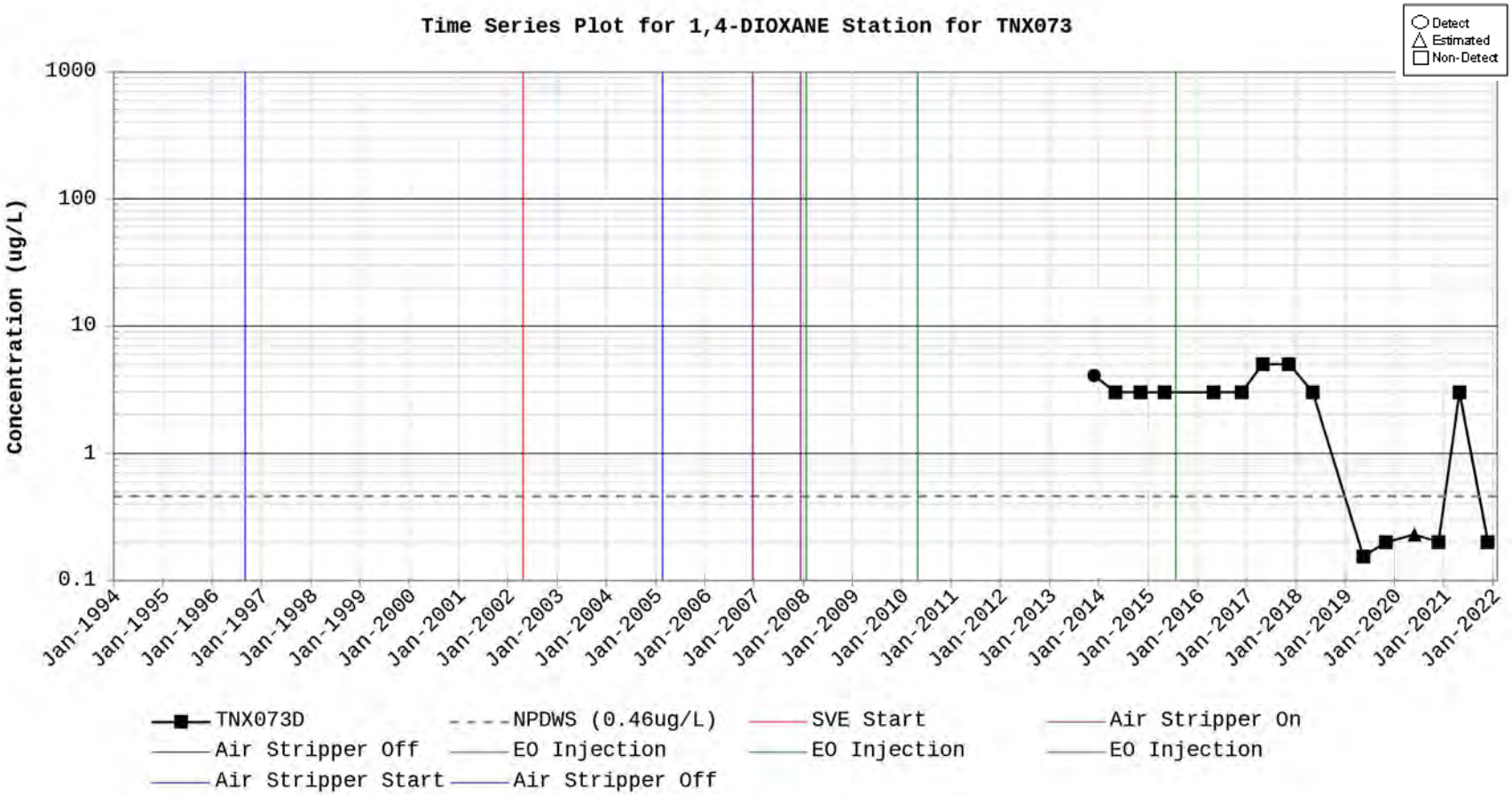

Time Series Plot for 1,4-DIOXANE Station for TNX 28
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

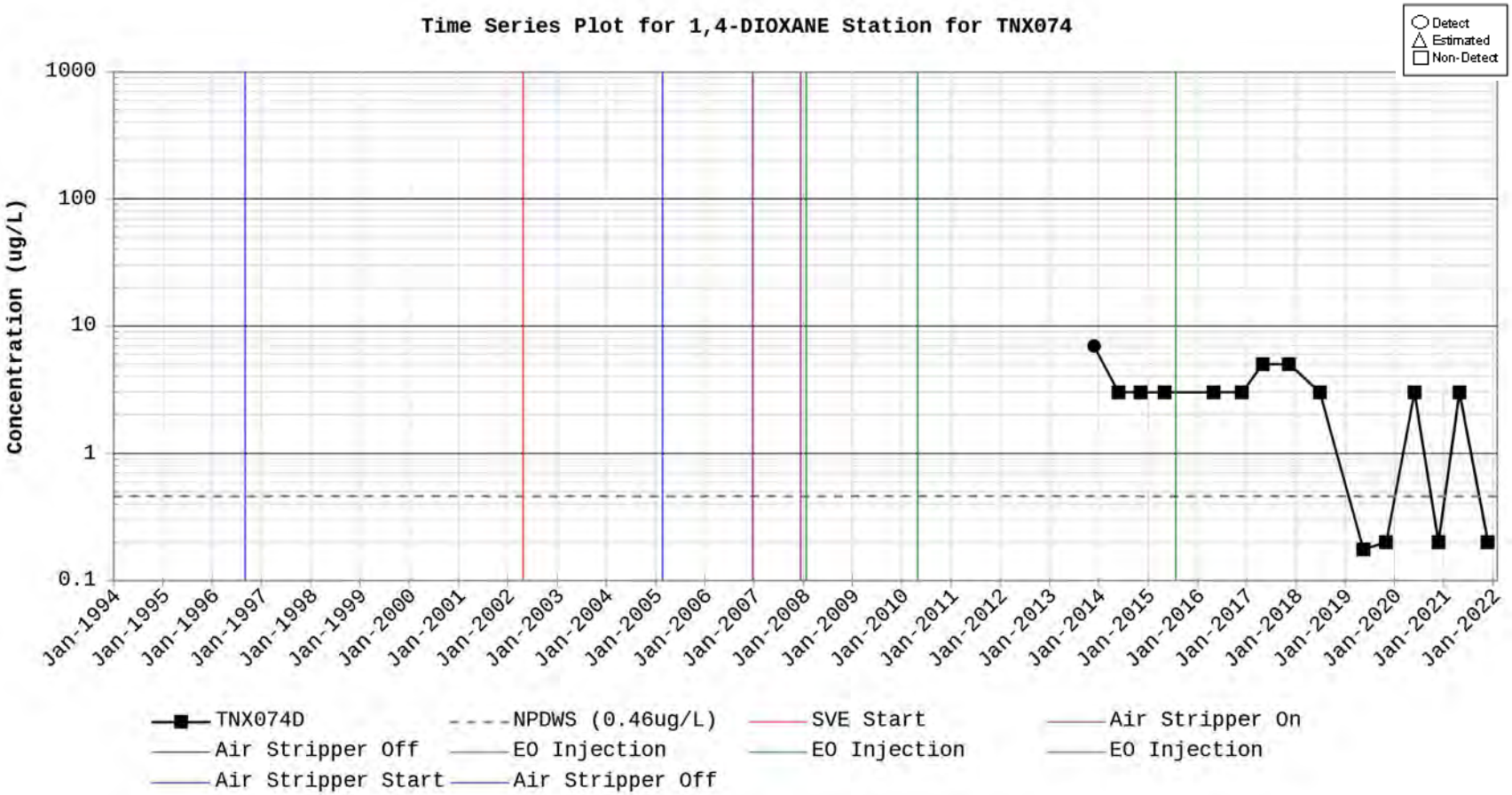

Time Series Plot for 1,4-DIOXANE Station for TNX 30
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

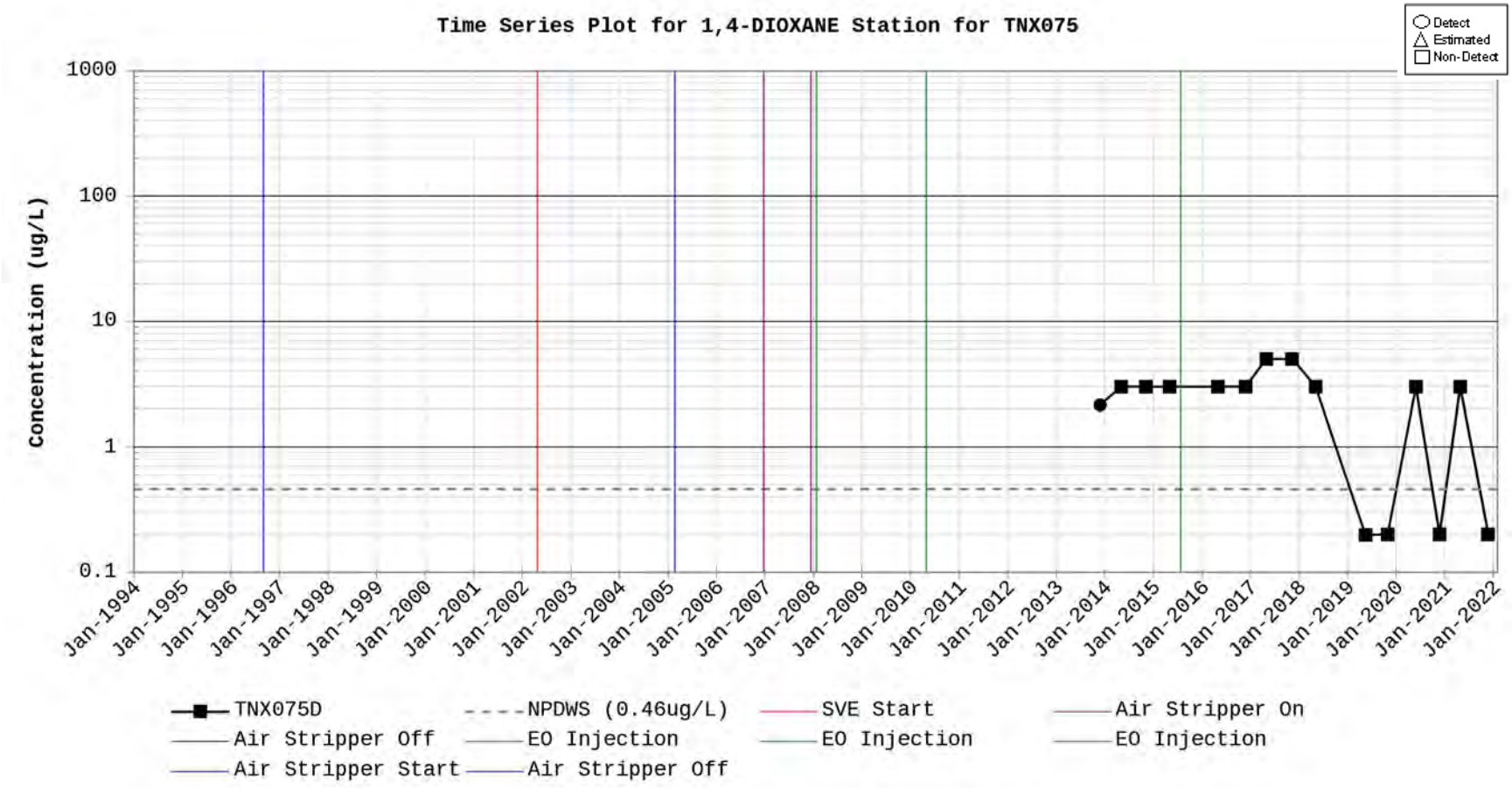

Time Series Plot for 1,4-DIOXANE Station for TNX 35
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

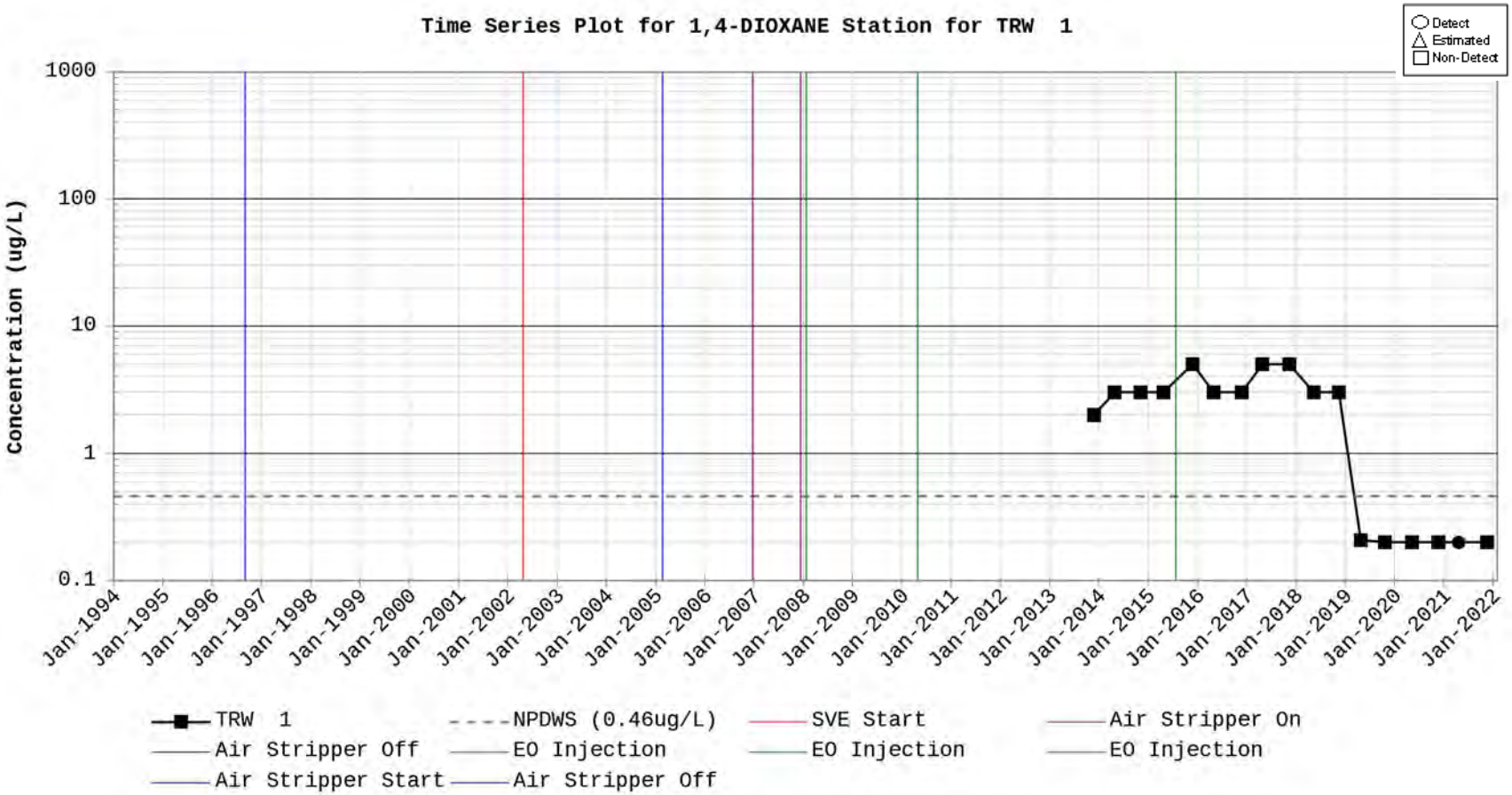

Time Series Plot for 1,4-DIOXANE Station for TNX 37
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

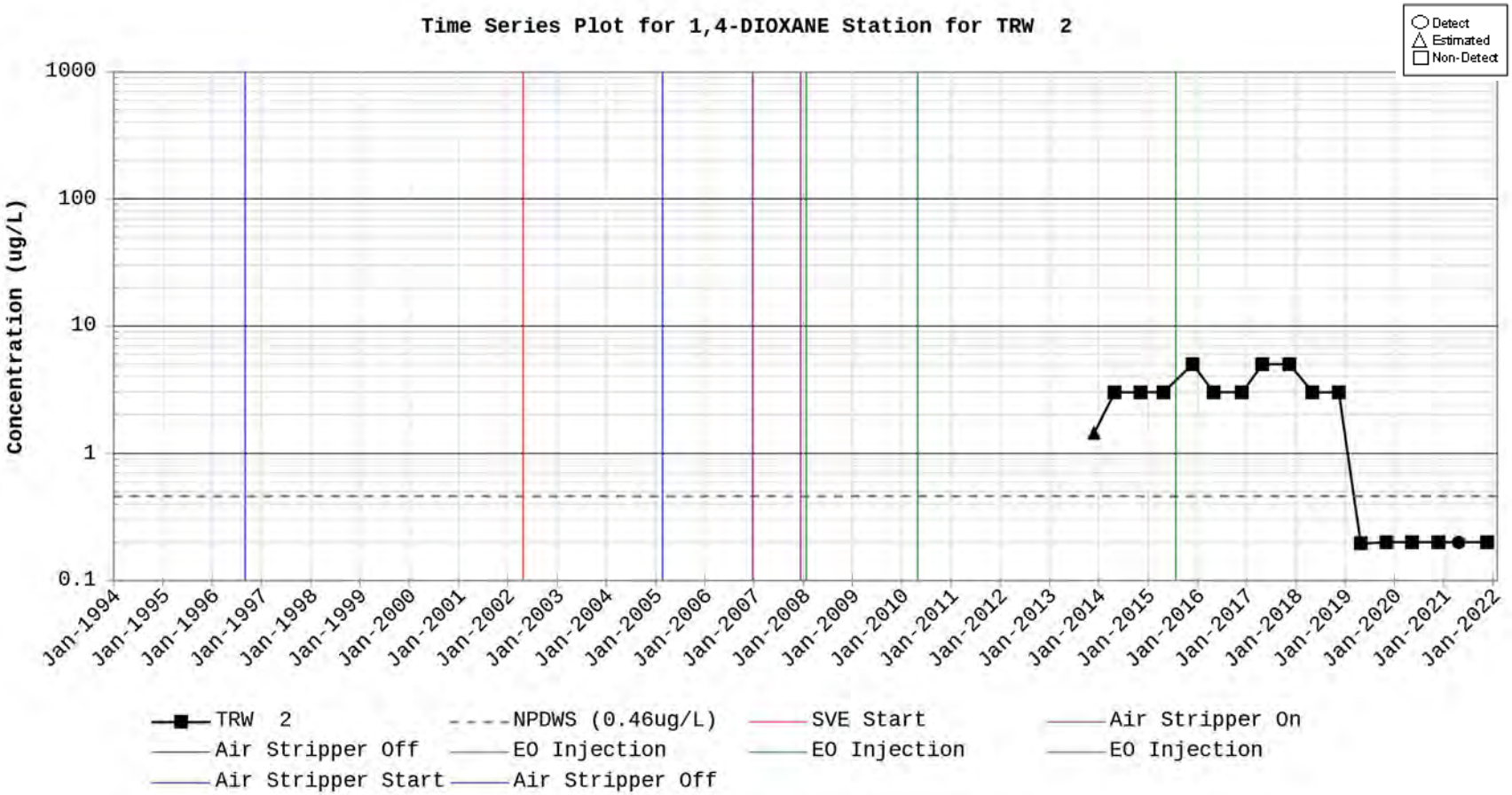

Time Series Plot for 1,4-DIOXANE Station for TNX 72
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 72D
TNX 72M
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

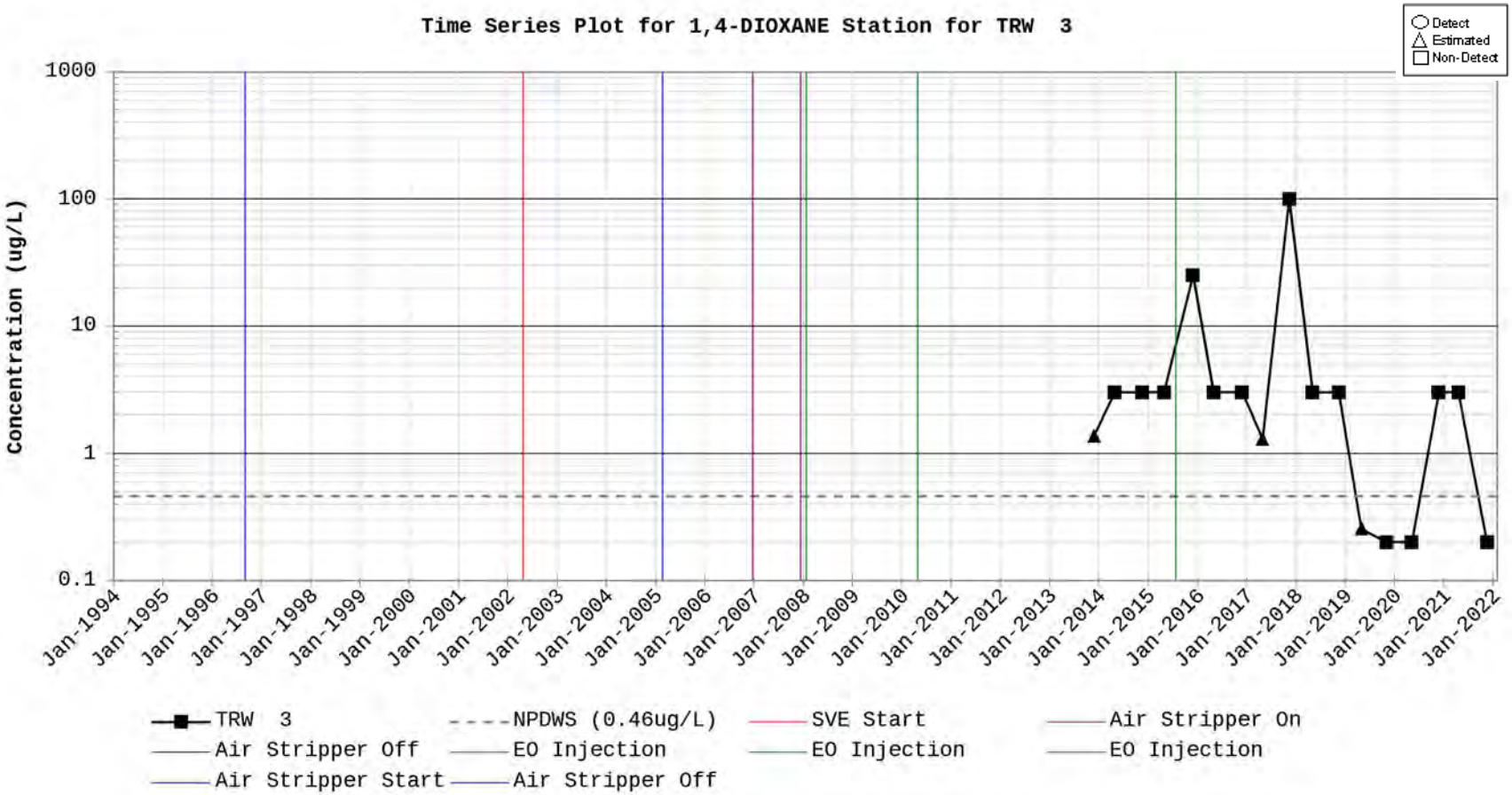

Time Series Plot for 1,4-DIOXANE Station for TNX073
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

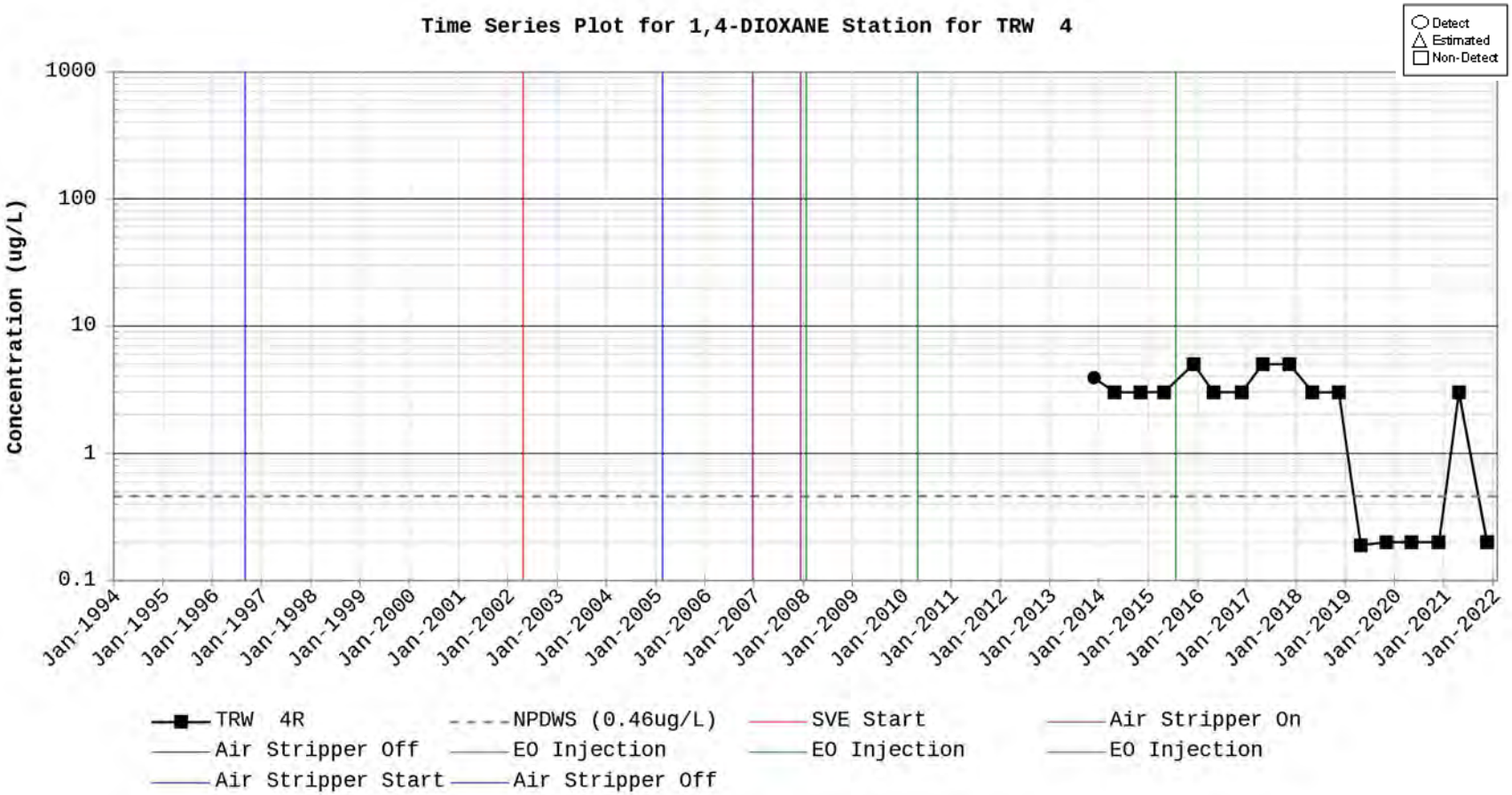

Time Series Plot for 1,4-DIOXANE Station for TNX074
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

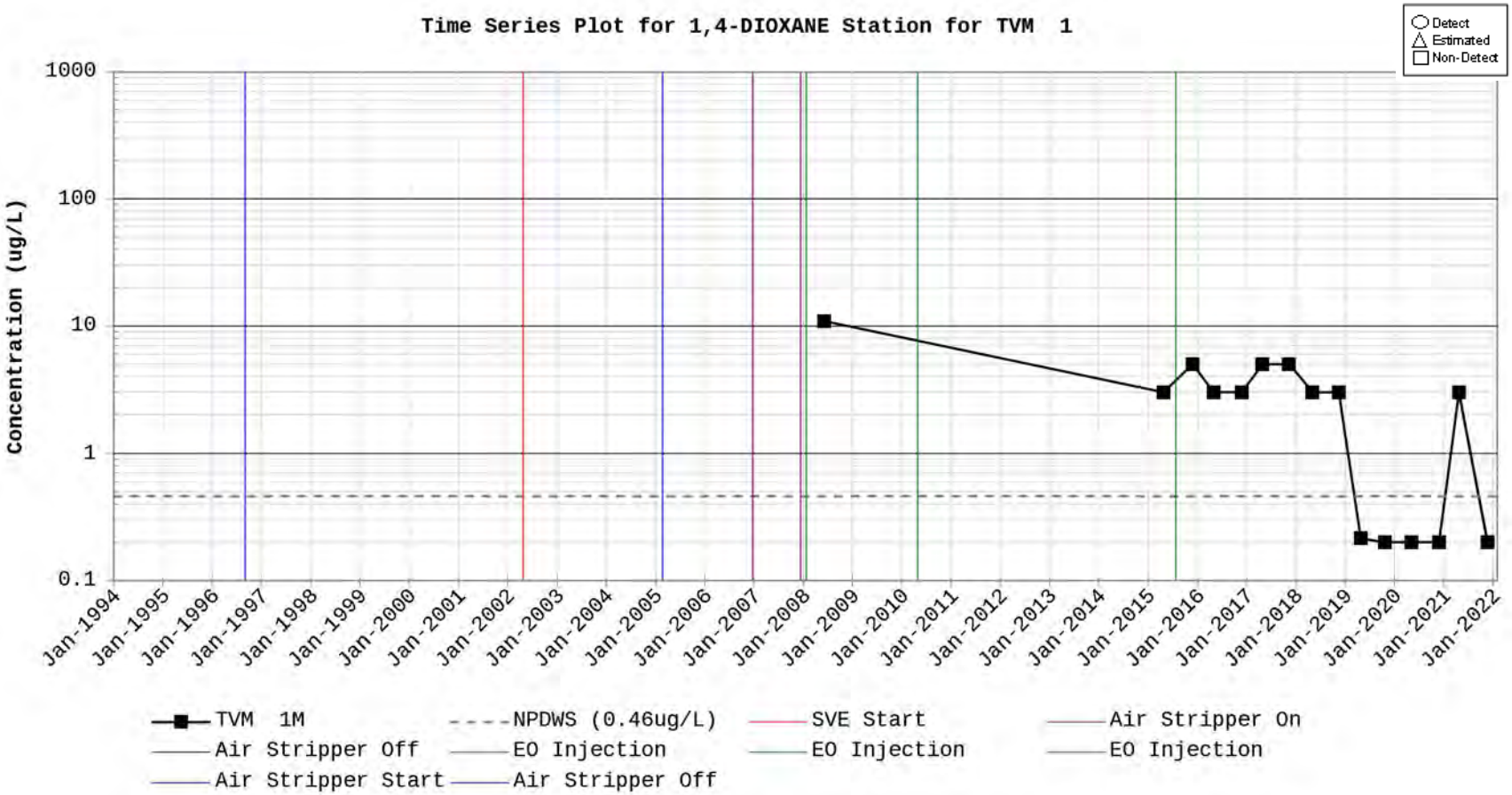

Time Series Plot for 1,4-DIOXANE Station for TNX075
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX075D
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

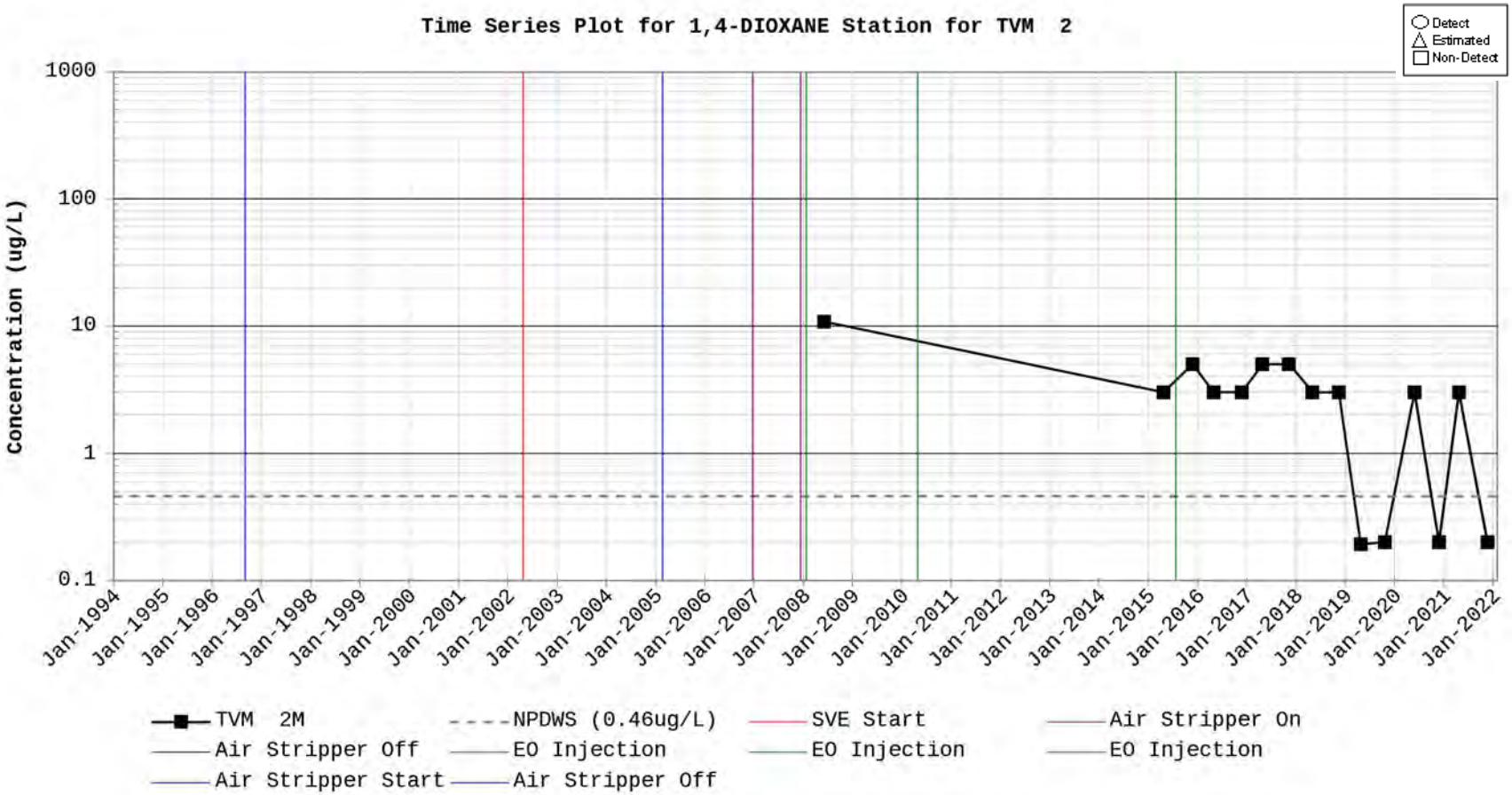

Time Series Plot for 1,4-DIOXANE Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

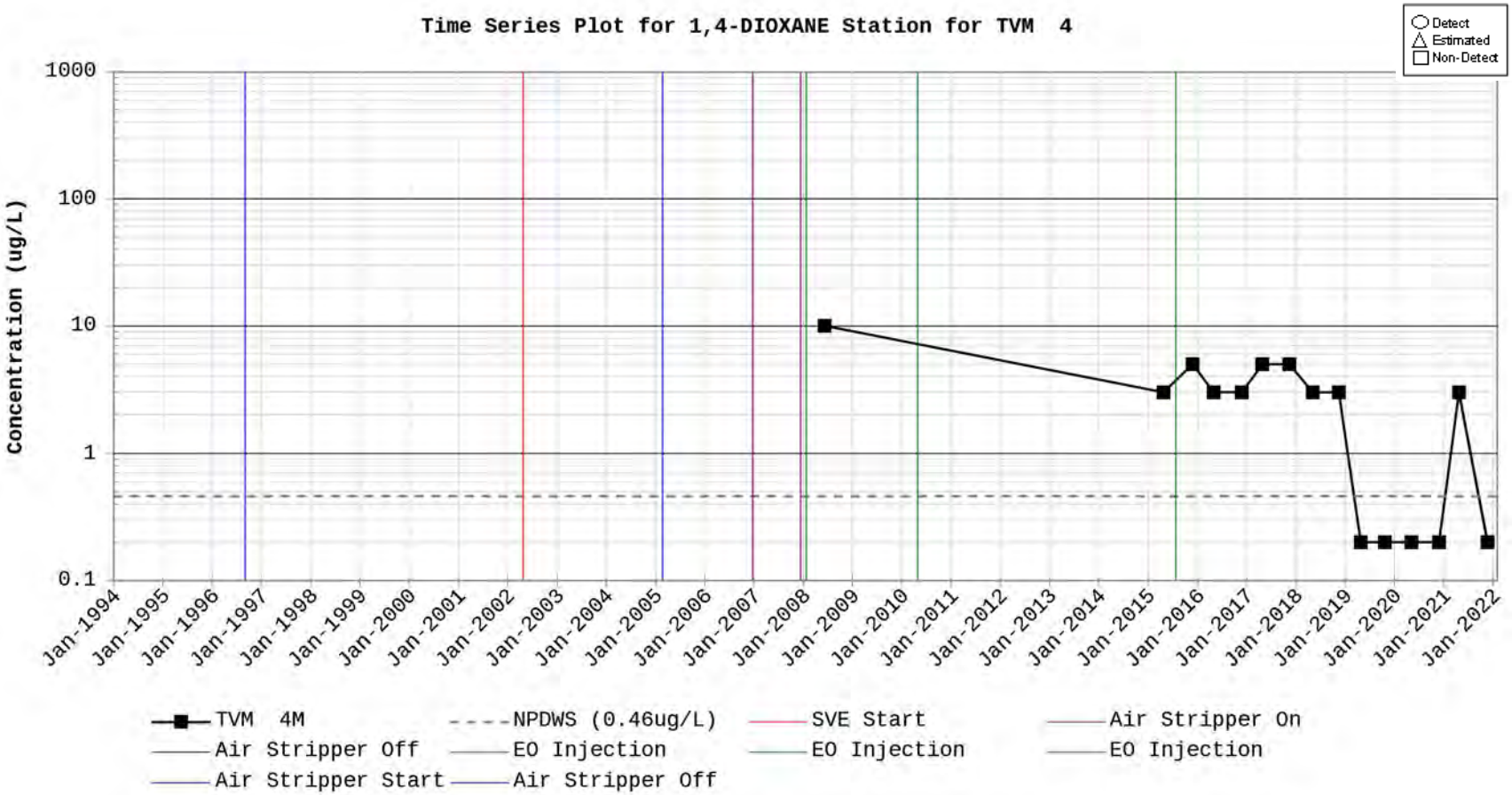

Time Series Plot for 1,4-DIOXANE Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

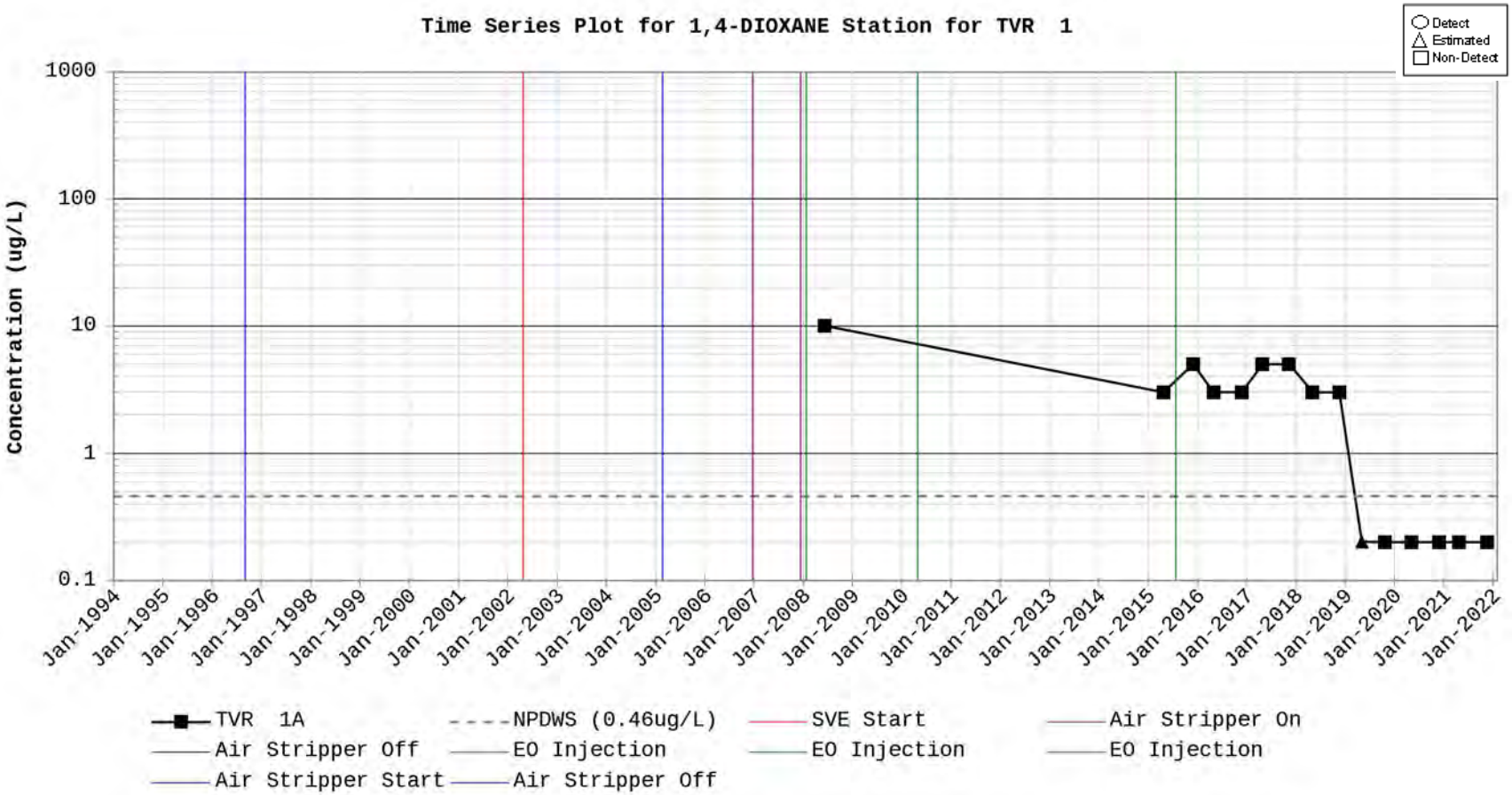

Time Series Plot for 1,4-DIOXANE Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

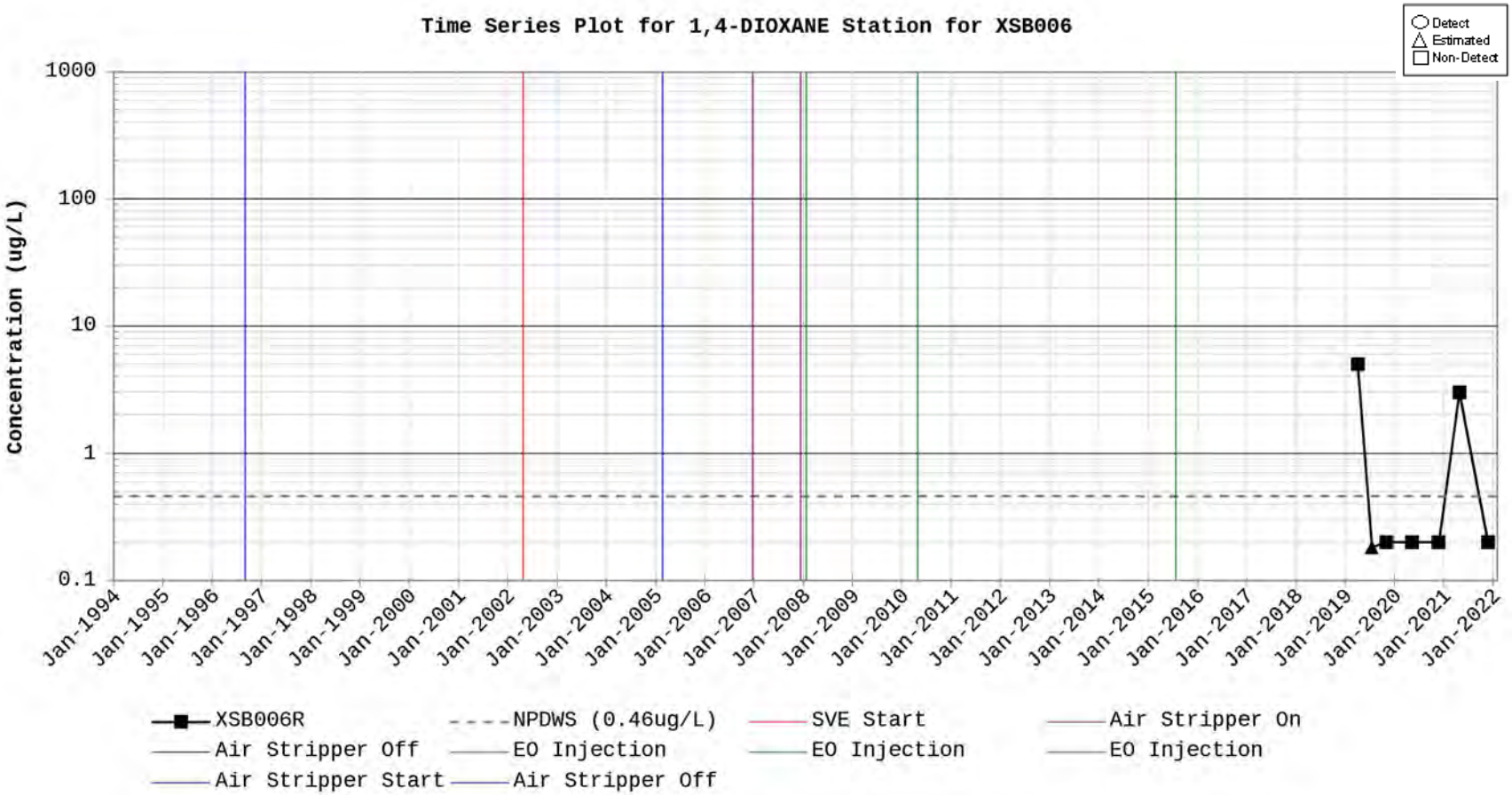

Time Series Plot for 1,4-DIOXANE Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

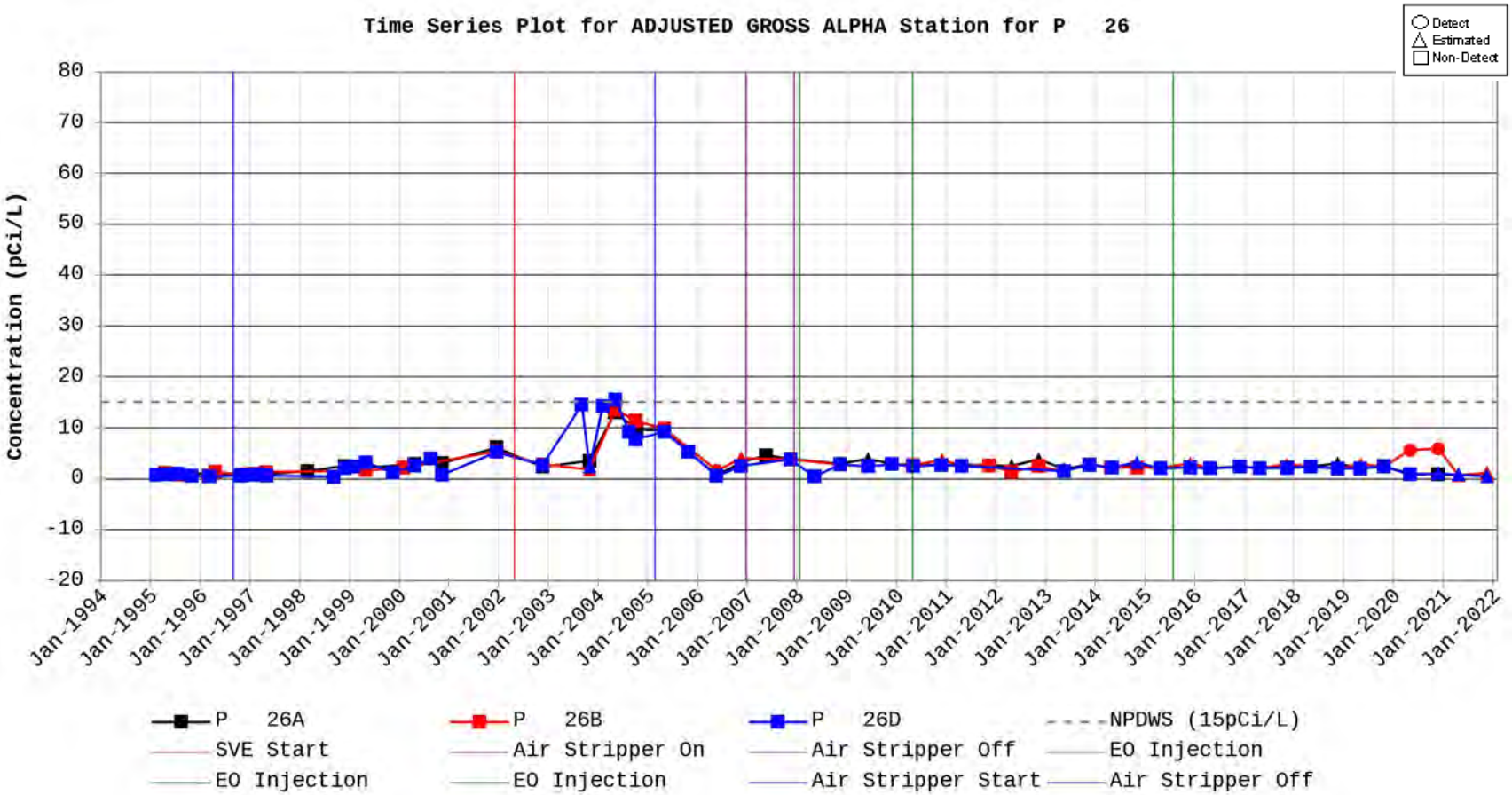

Time Series Plot for 1,4-DIOXANE Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

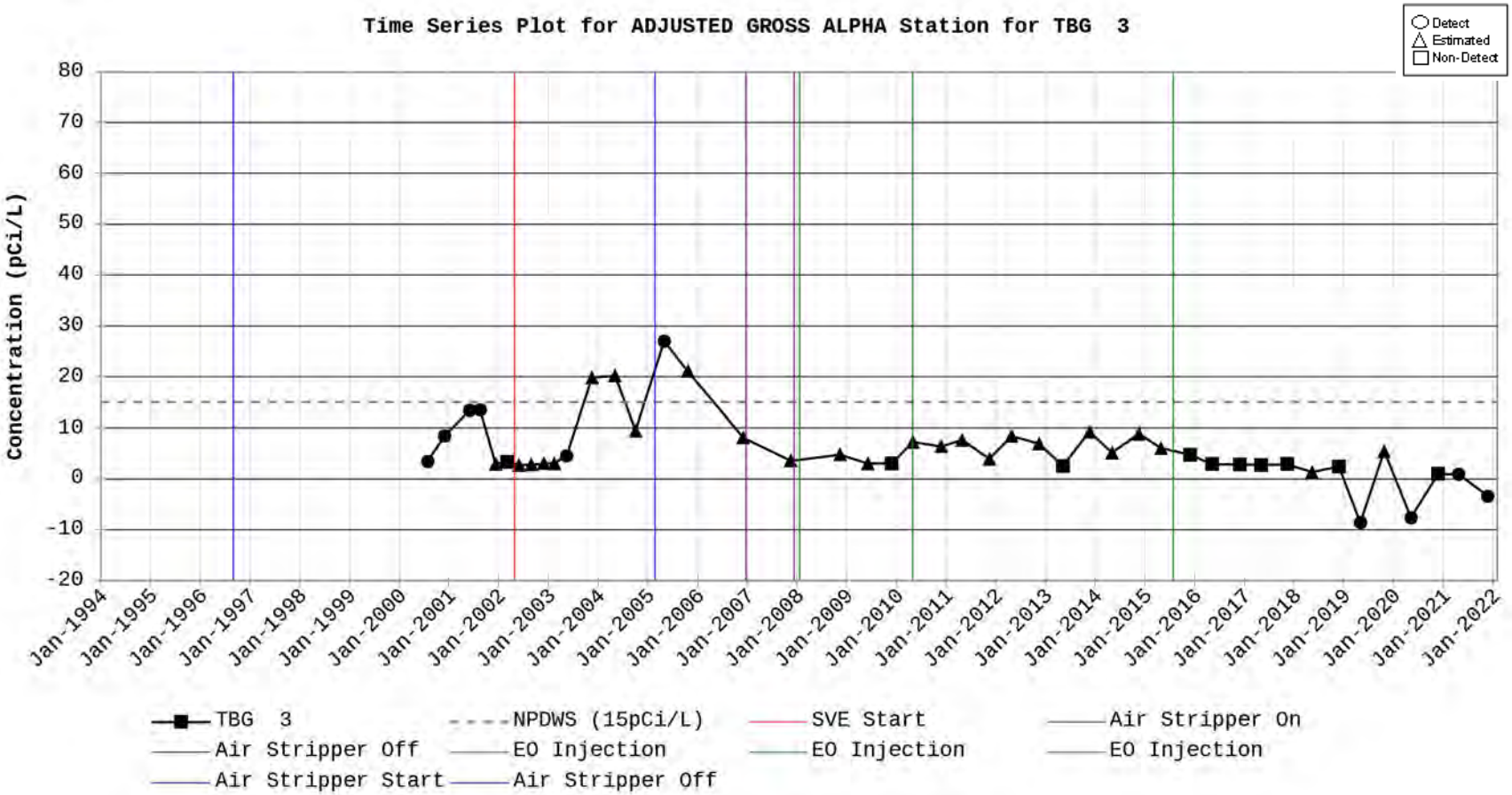

Time Series Plot for 1,4-DIOXANE Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

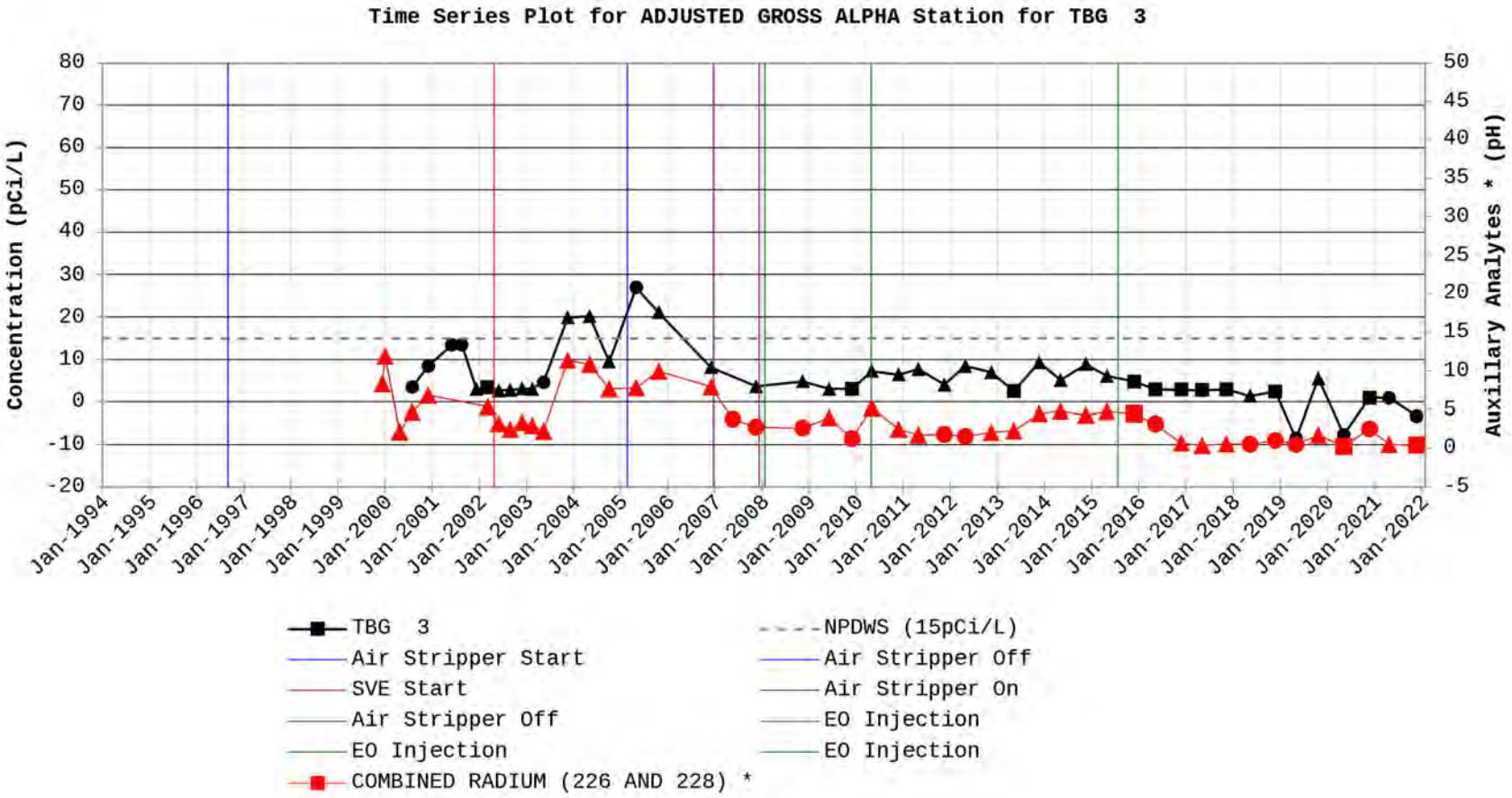

Time Series Plot for 1,4-DIOXANE Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

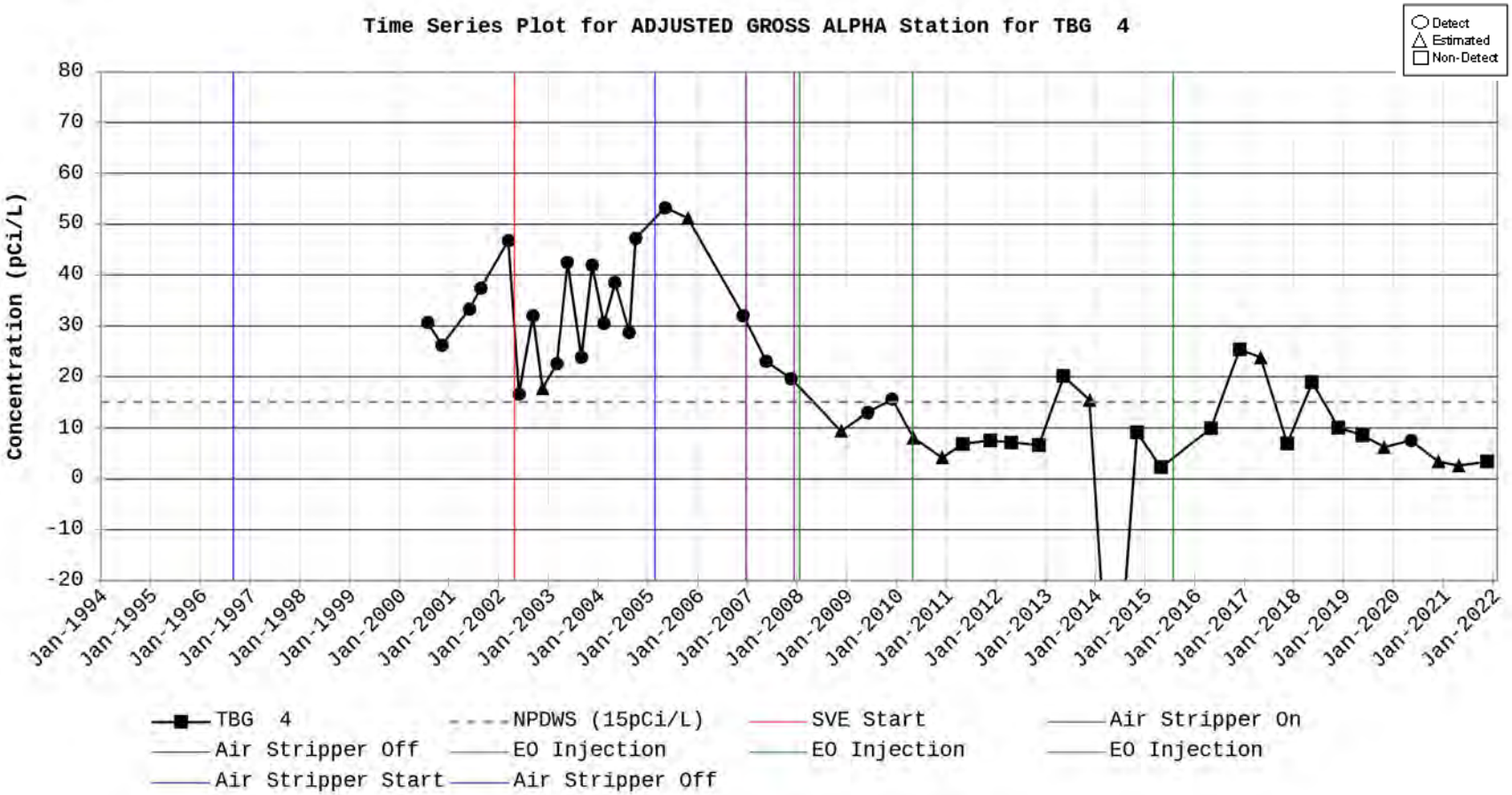

Time Series Plot for 1,4-DIOXANE Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

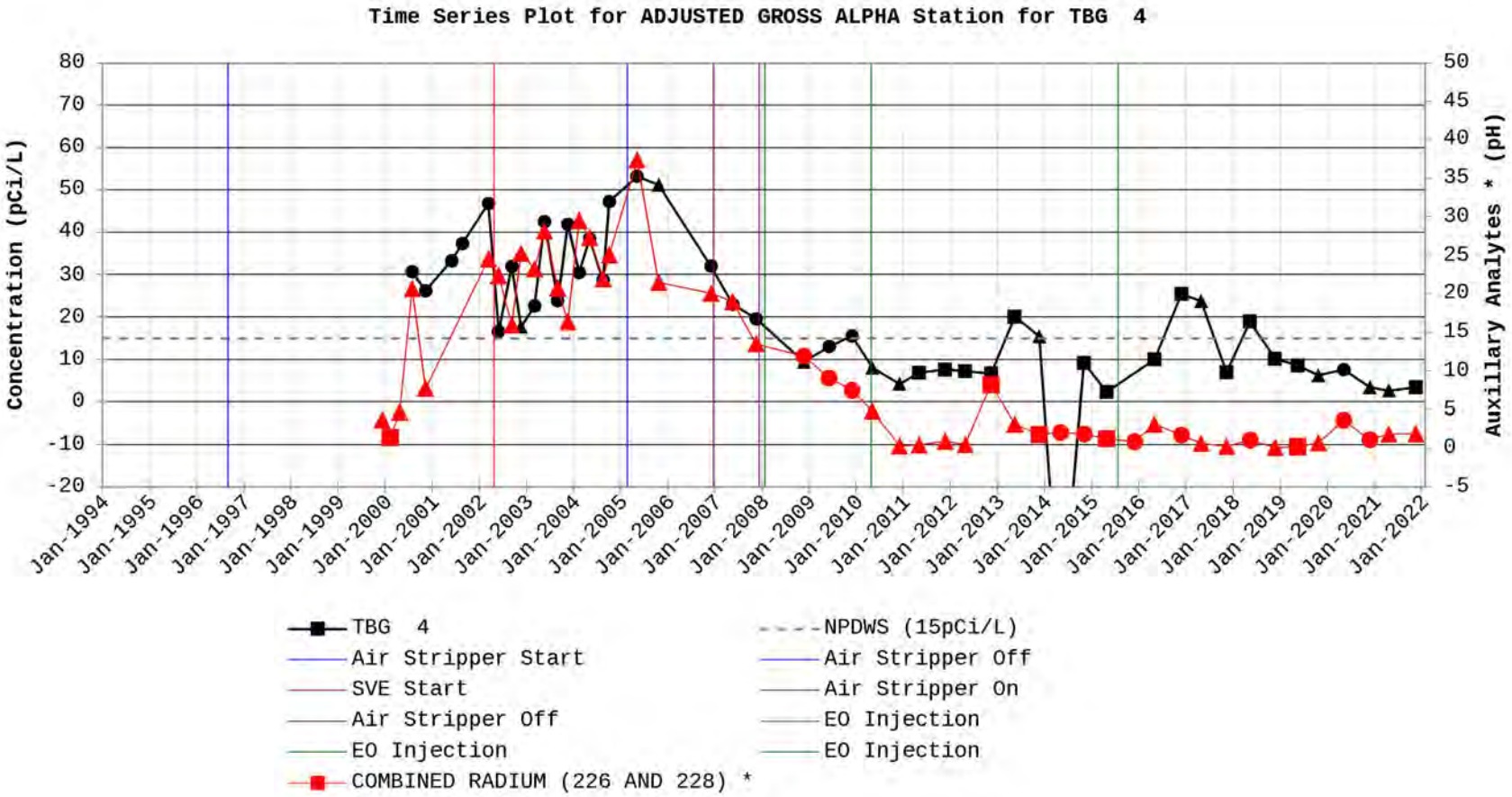

Time Series Plot for 1,4-DIOXANE Station for XSB006
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (0.46ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

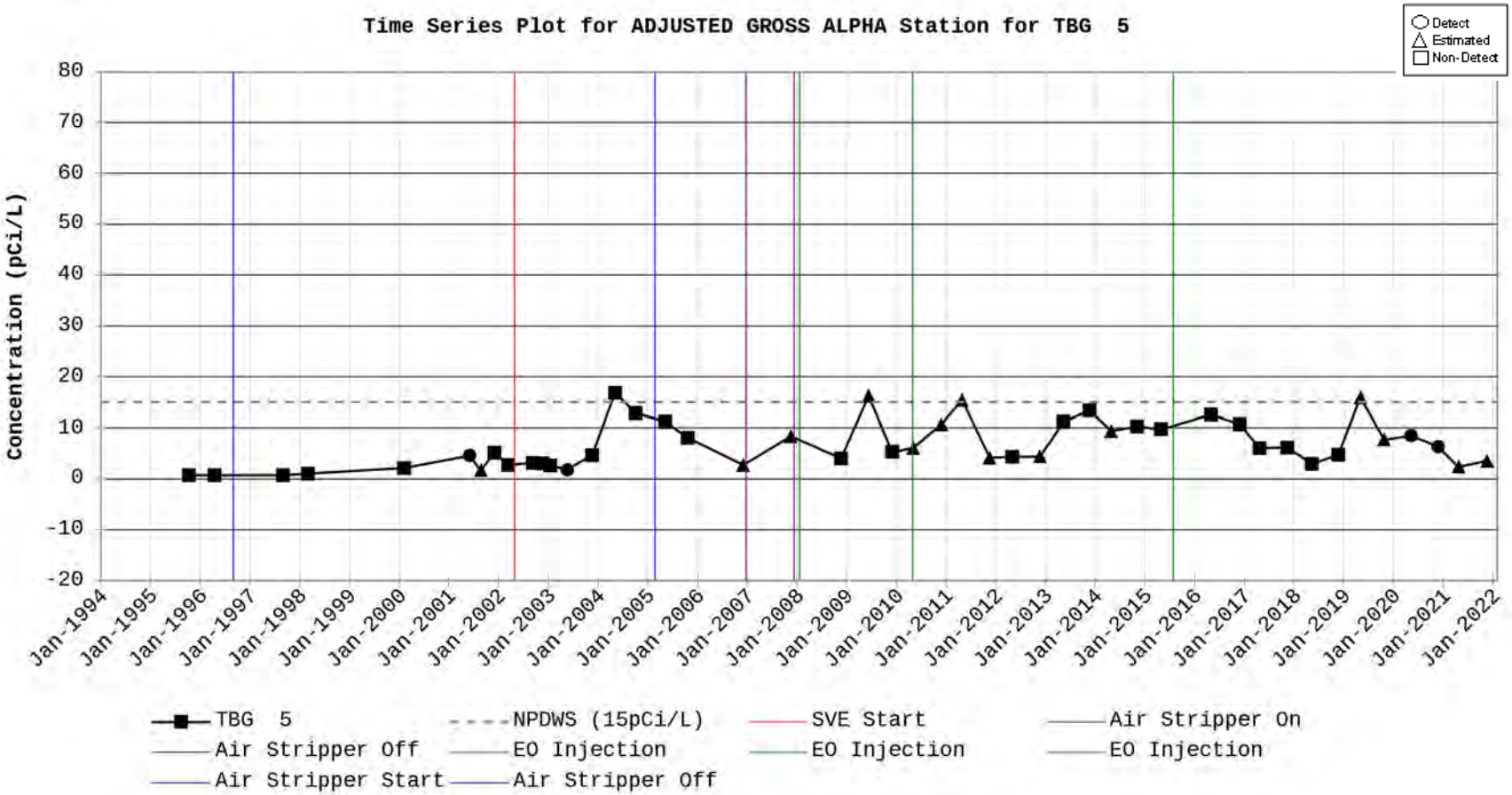

Time Series Plot for ADJUSTED GROSS ALPHA Station for P 26
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
P 26A
P 26B
P 26D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

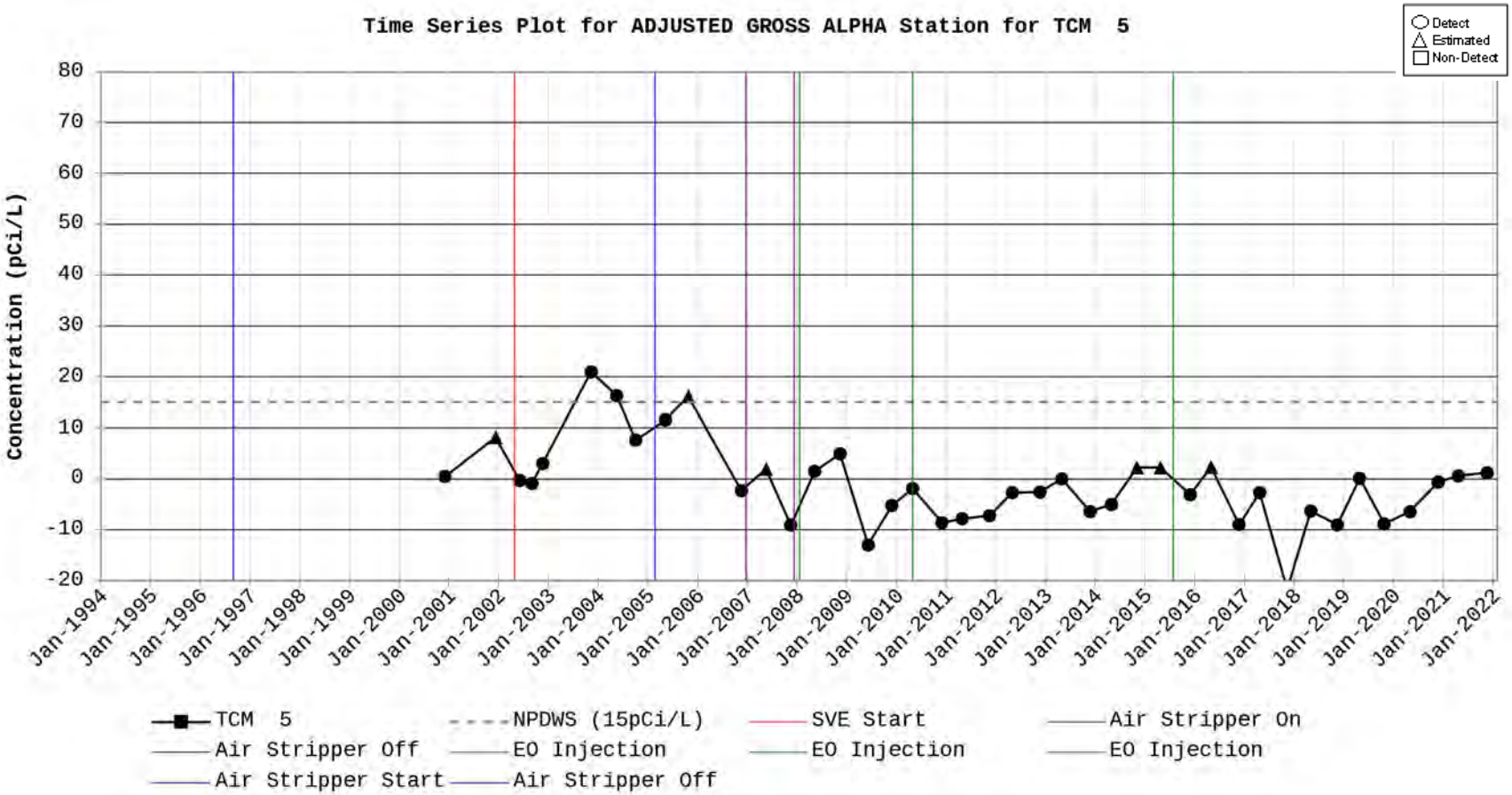

Time Series Plot for ADJUSTED GROSS ALPHA Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

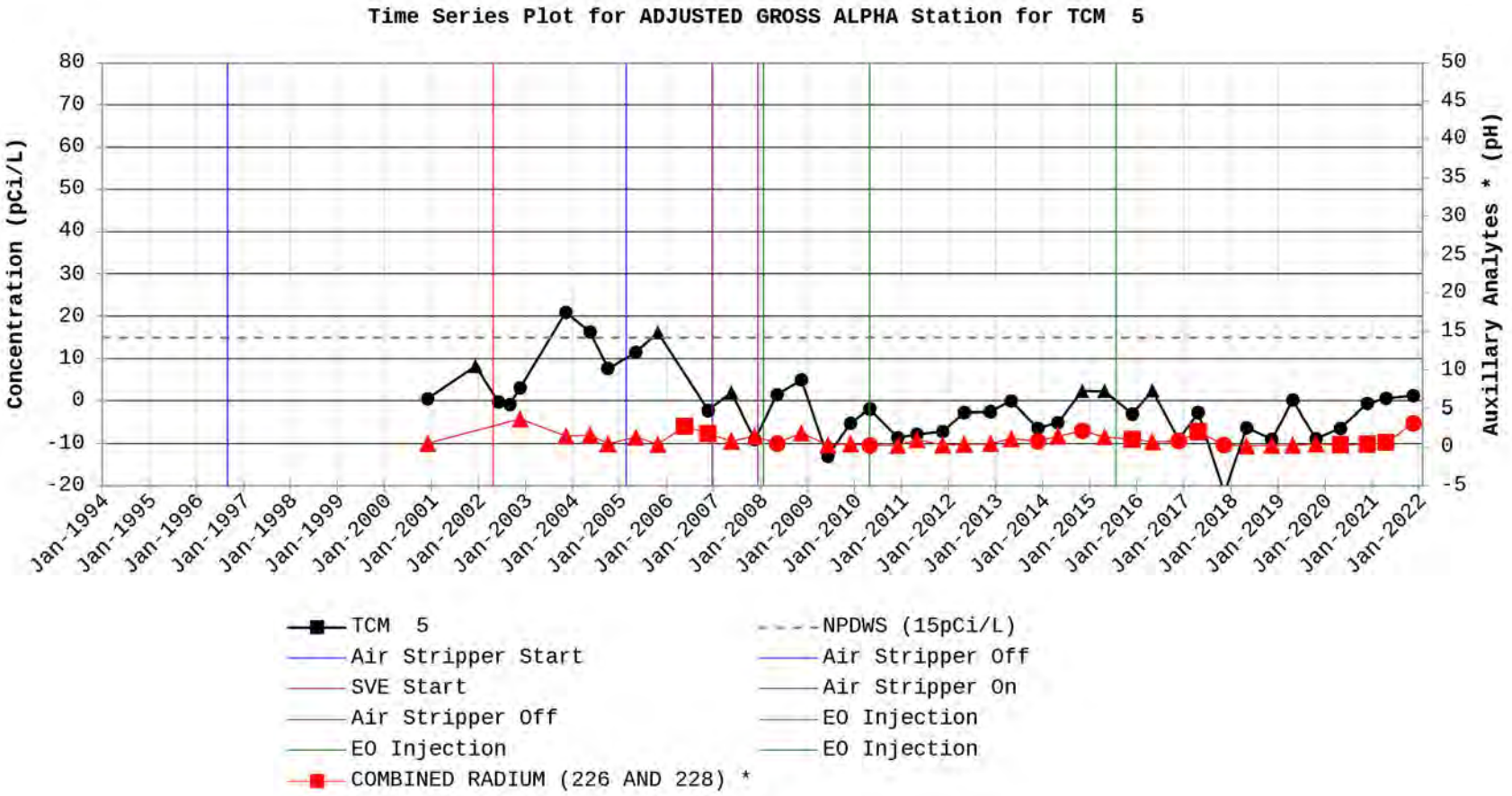

Time Series Plot for ADJUSTED GROSS ALPHA Station for TBG 3
Concentration (pCi/L)
Auxillary Analytes * (pH)
80
70
60
50
40
30
20
10
0
-10
-20
50
45
40
35
30
25
20
15
10
5
0
-5
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (15pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
COMBINED RADIUM (226 AND 228) *

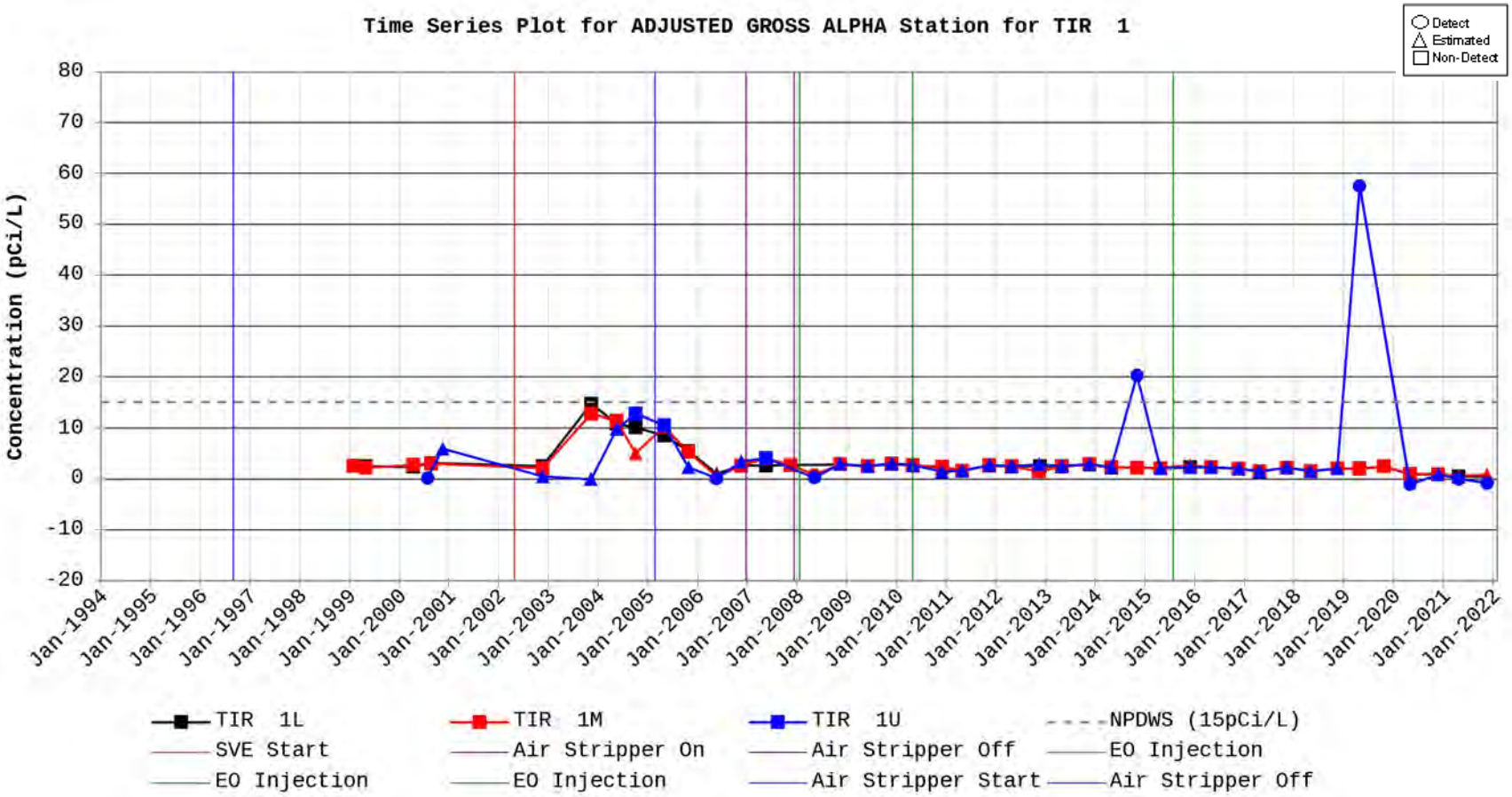

Time Series Plot for ADJUSTED GROSS ALPHA Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

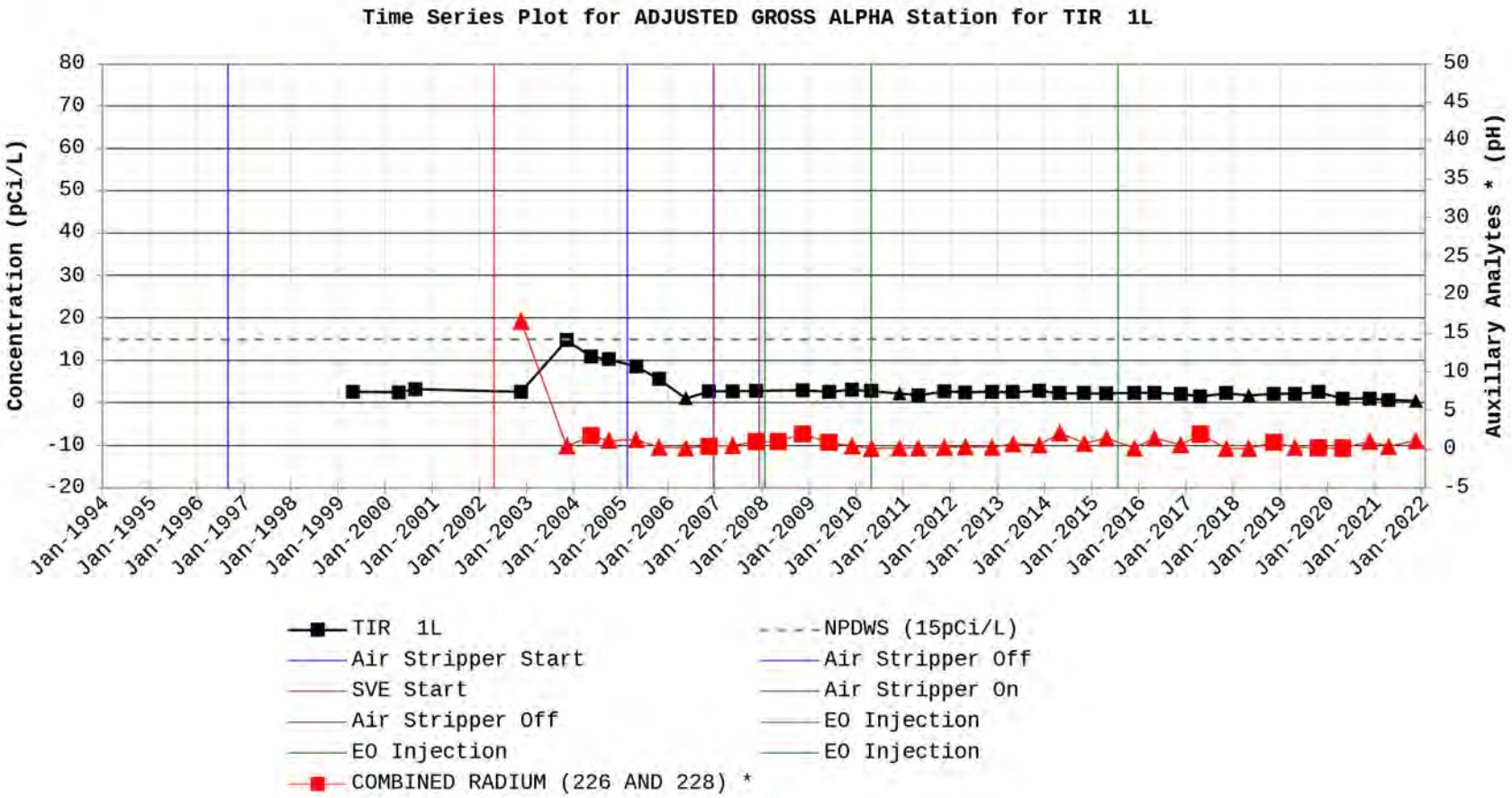

Time Series Plot for ADJUSTED GROSS ALPHA Station for TBG 4
Concentration (pCi/L)
Auxillary Analytes * (pH)
80
70
60
50
40
30
20
10
0
-10
-20
50
45
40
35
30
25
20
15
10
5
0
-5
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (15pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
COMBINED RADIUM (226 AND 228) *

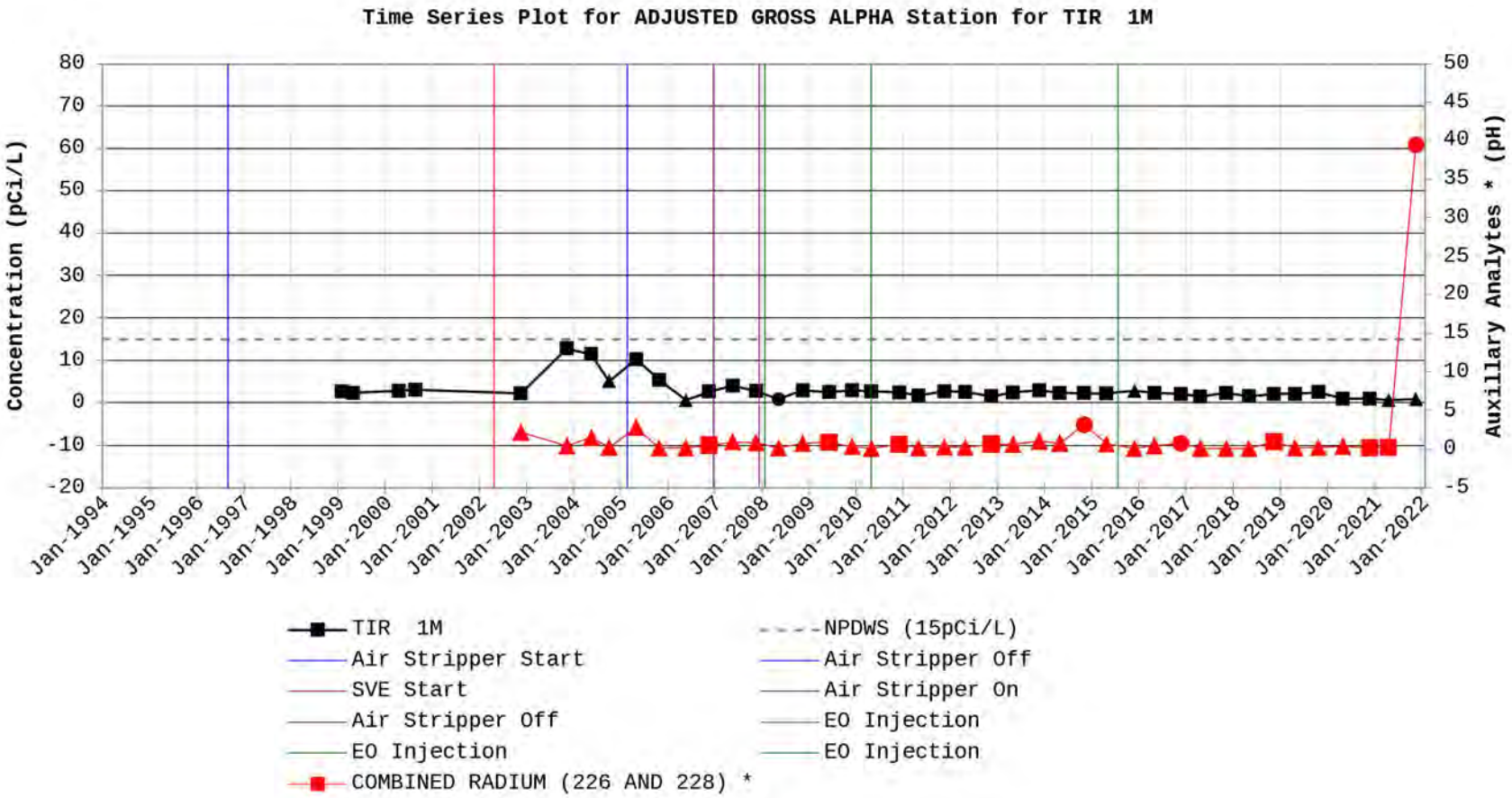

Time Series Plot for ADJUSTED GROSS ALPHA Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

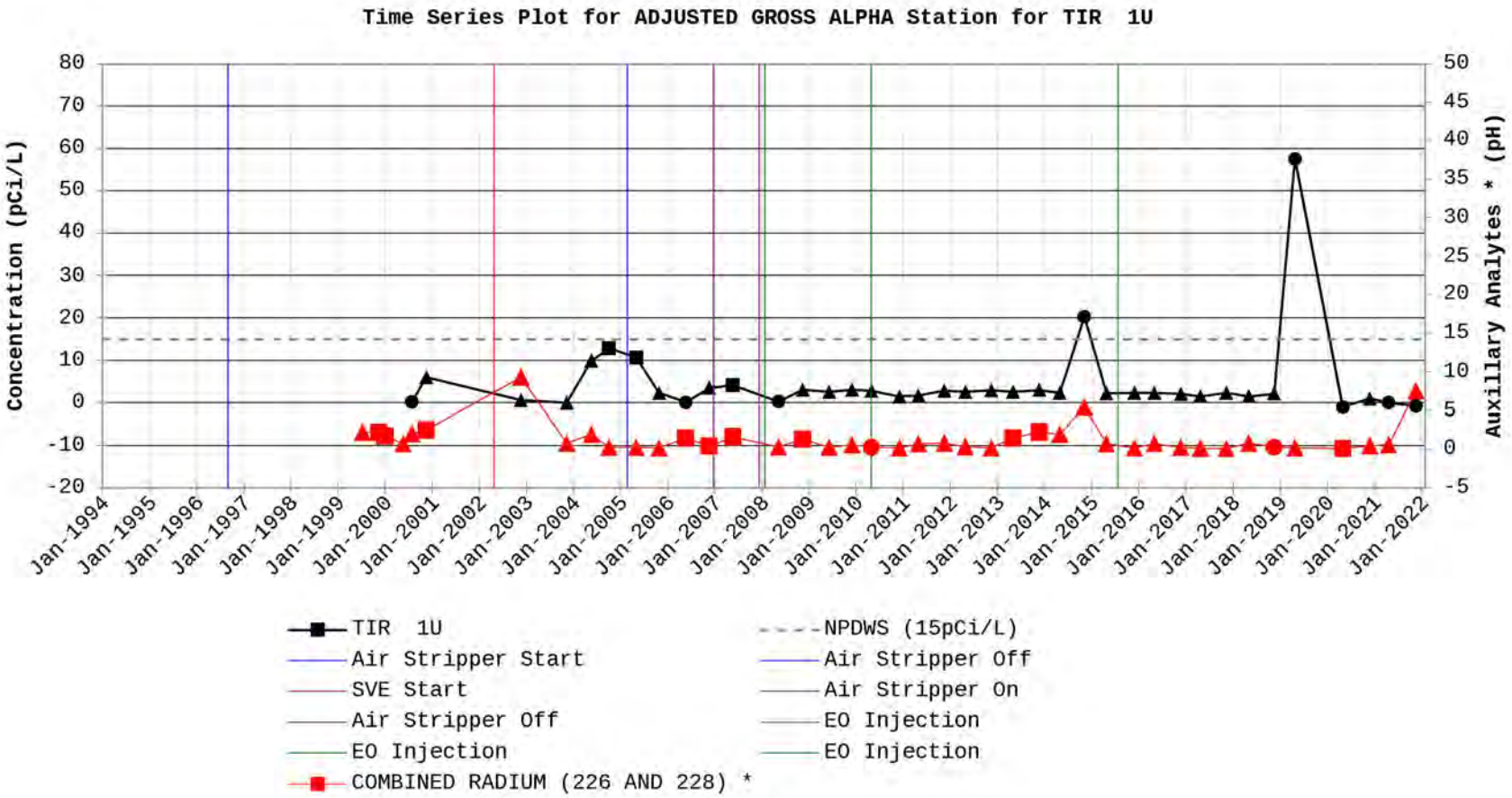

Time Series Plot for ADJUSTED GROSS ALPHA Station for TCM 5
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

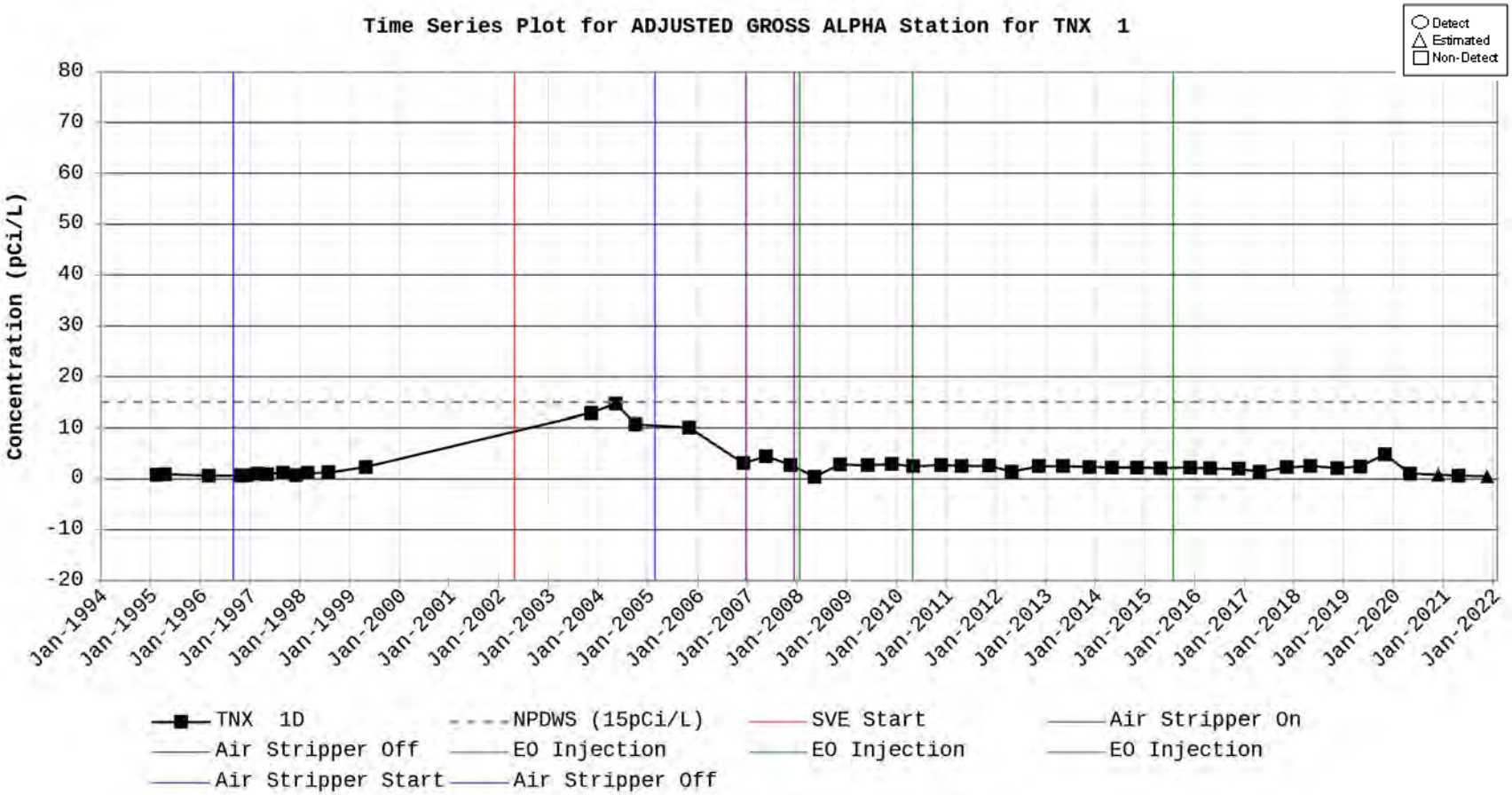

Time Series Plot for ADJUSTED GROSS ALPHA Station for TCM 5
Concentration (pCi/L)
Auxillary Analytes * (pH)
80
70
60
50
40
30
20
10
0
-10
-20
50
45
40
35
30
25
20
15
10
5
0
-5
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (15pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
COMBINED RADIUM (226 AND 228) *

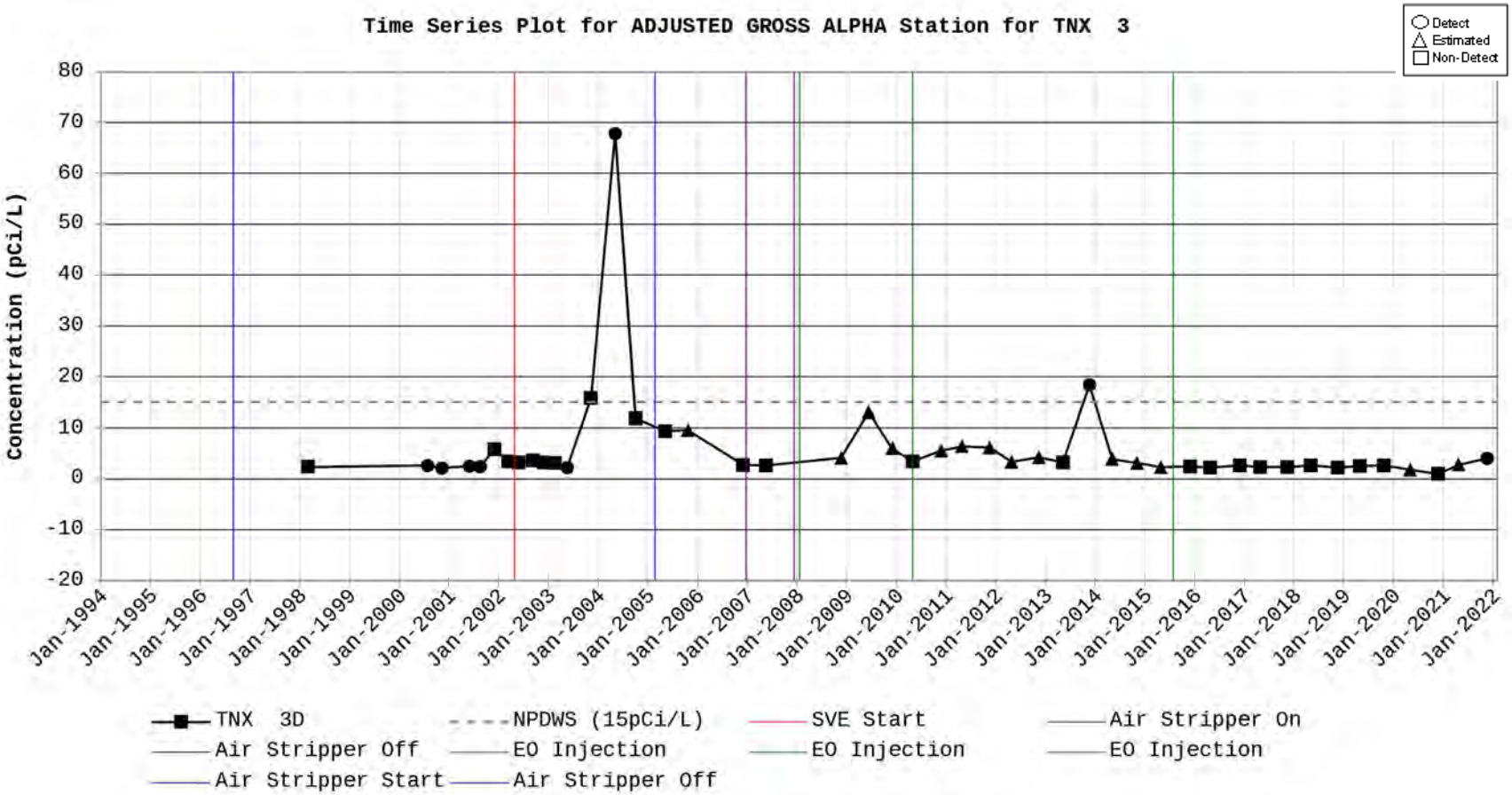

Time Series Plot for ADJUSTED GROSS ALPHA Station for TIR 1
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
TIR 1M
TIR 1U
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

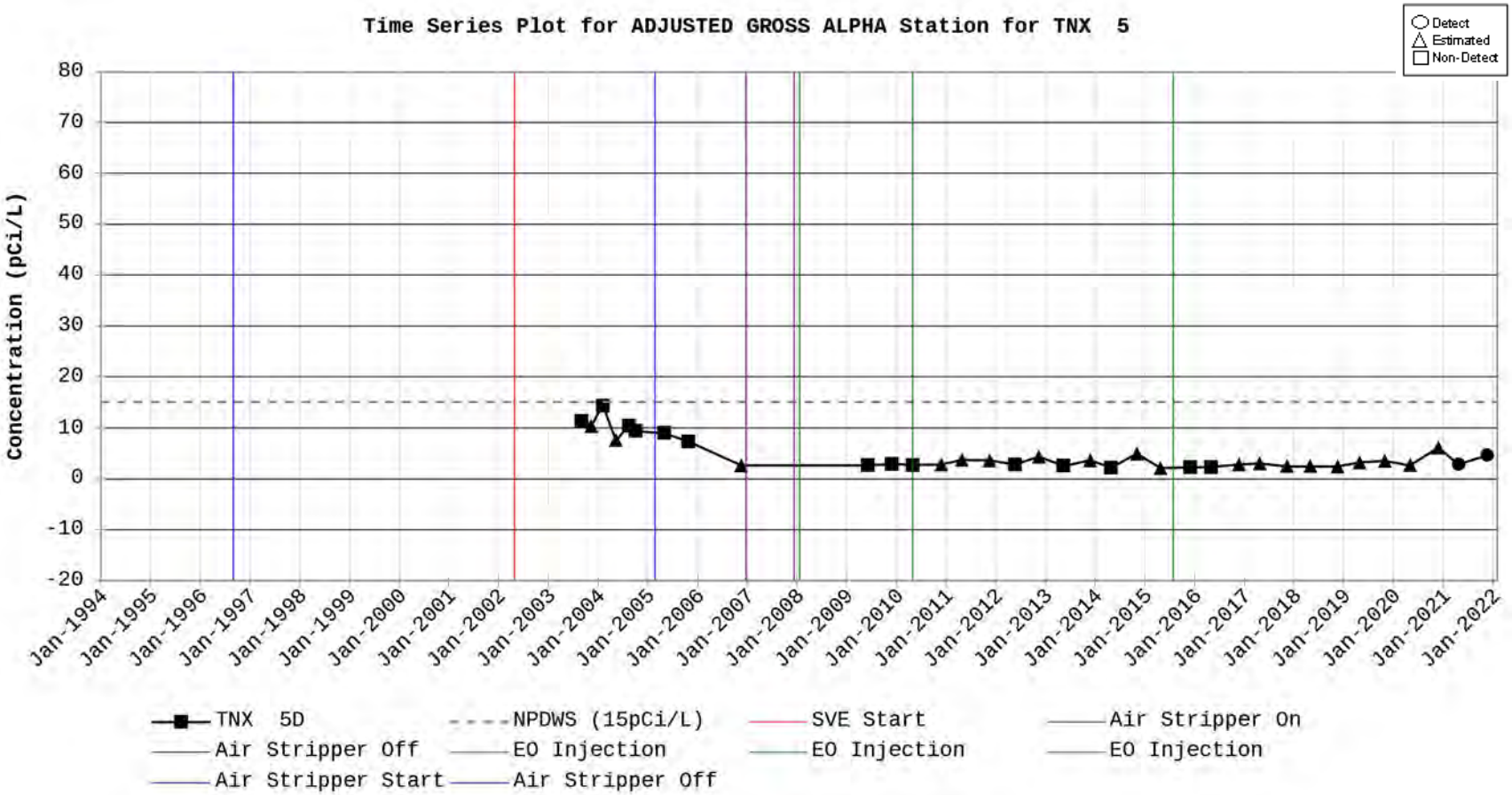

Time Series Plot for ADJUSTED GROSS ALPHA Station for TIR 1L
Concentration (pCi/L)
Auxillary Analytes * (pH)
80
70
60
50
40
30
20
10
0
-10
-20
50
45
40
35
30
25
20
15
10
5
0
-5
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
NPDWS (15pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
COMBINED RADIUM (226 AND 228) *

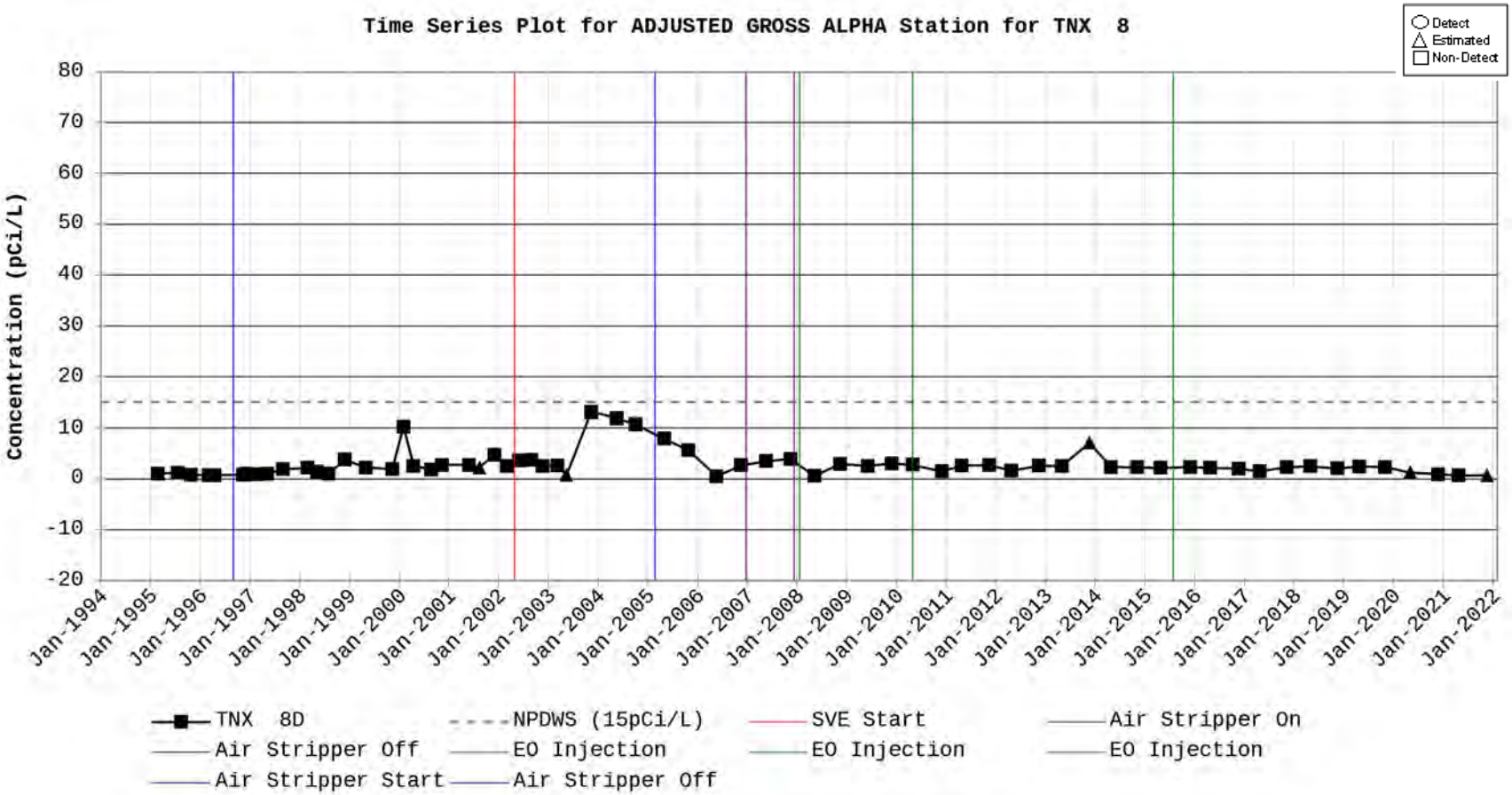

Time Series Plot for ADJUSTED GROSS ALPHA Station for TIR 1M
Concentration (pCi/L)
Auxillary Analytes * (pH)
80
70
60
50
40
30
20
10
0
-10
-20
50
45
40
35
30
25
20
15
10
5
0
-5
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1M
NPDWS (15pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
COMBINED RADIUM (226 AND 228) *

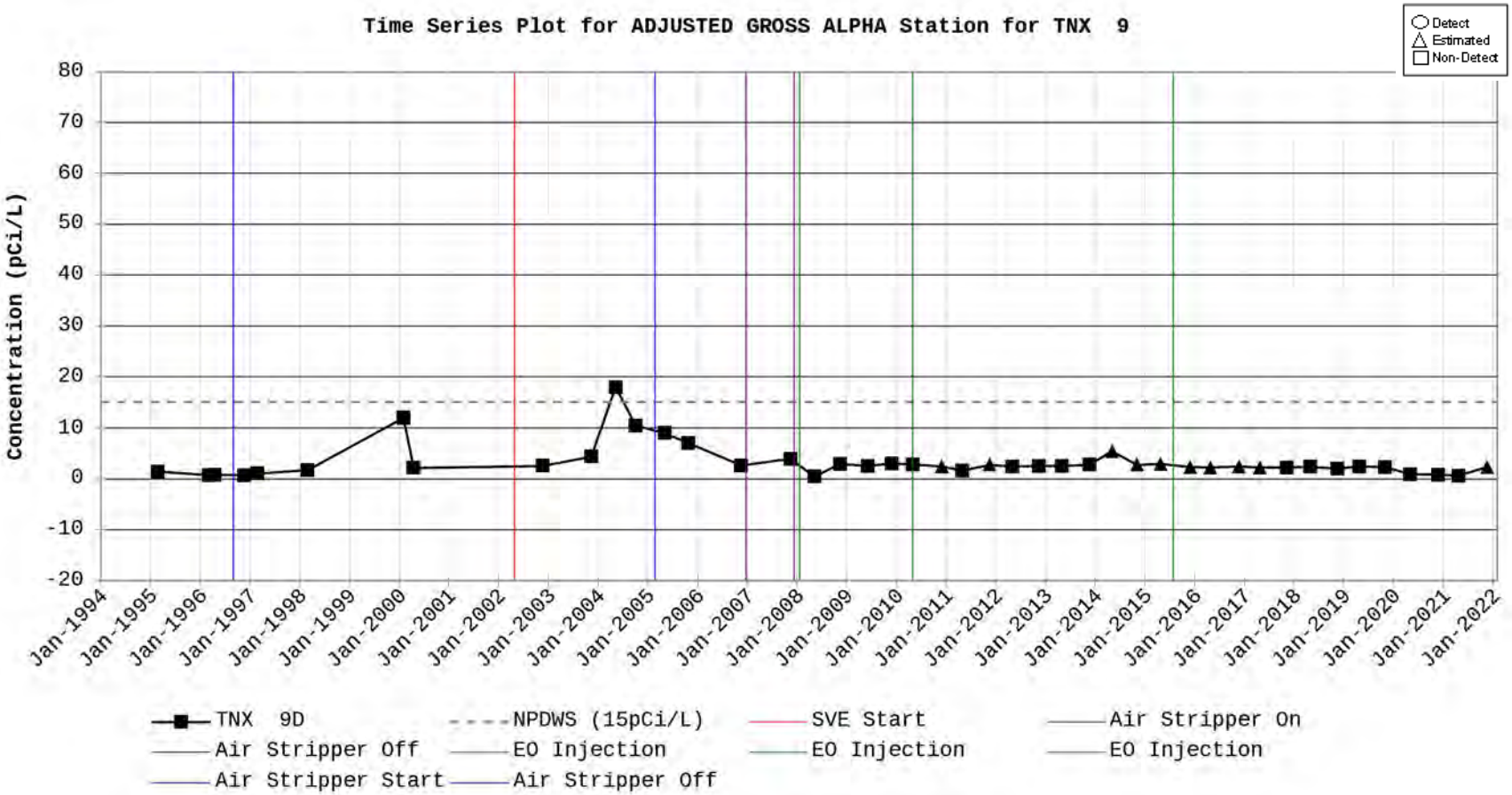

Time Series Plot for ADJUSTED GROSS ALPHA Station for TIR 1U
Concentration (pCi/L)
Auxillary Analytes * (pH)
80
70
60
50
40
30
20
10
0
-10
-20
50
45
40
35
30
25
20
15
10
5
0
-5
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1U
NPDWS (15pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
COMBINED RADIUM (226 AND 228) *

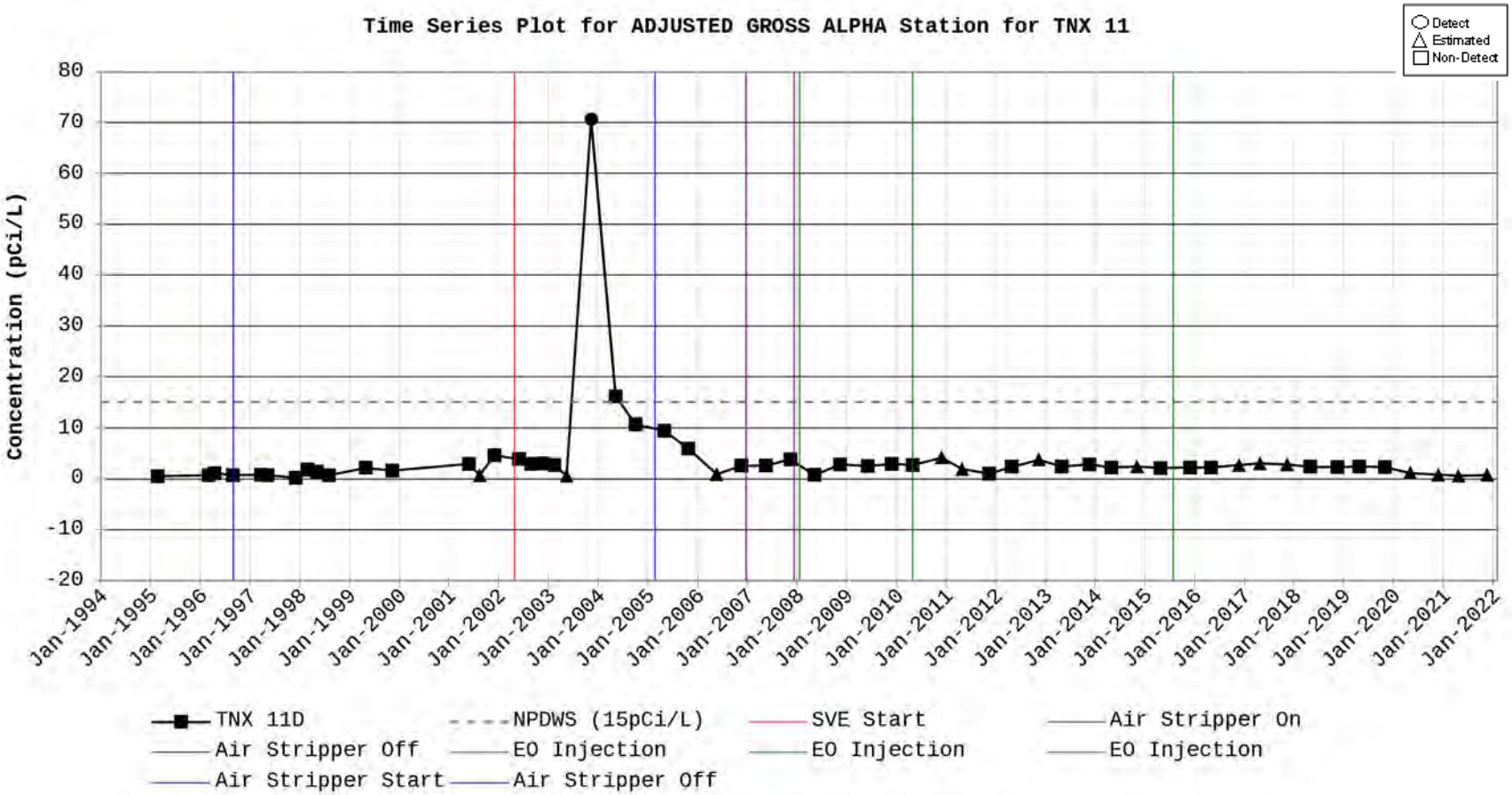

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 1
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 1D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

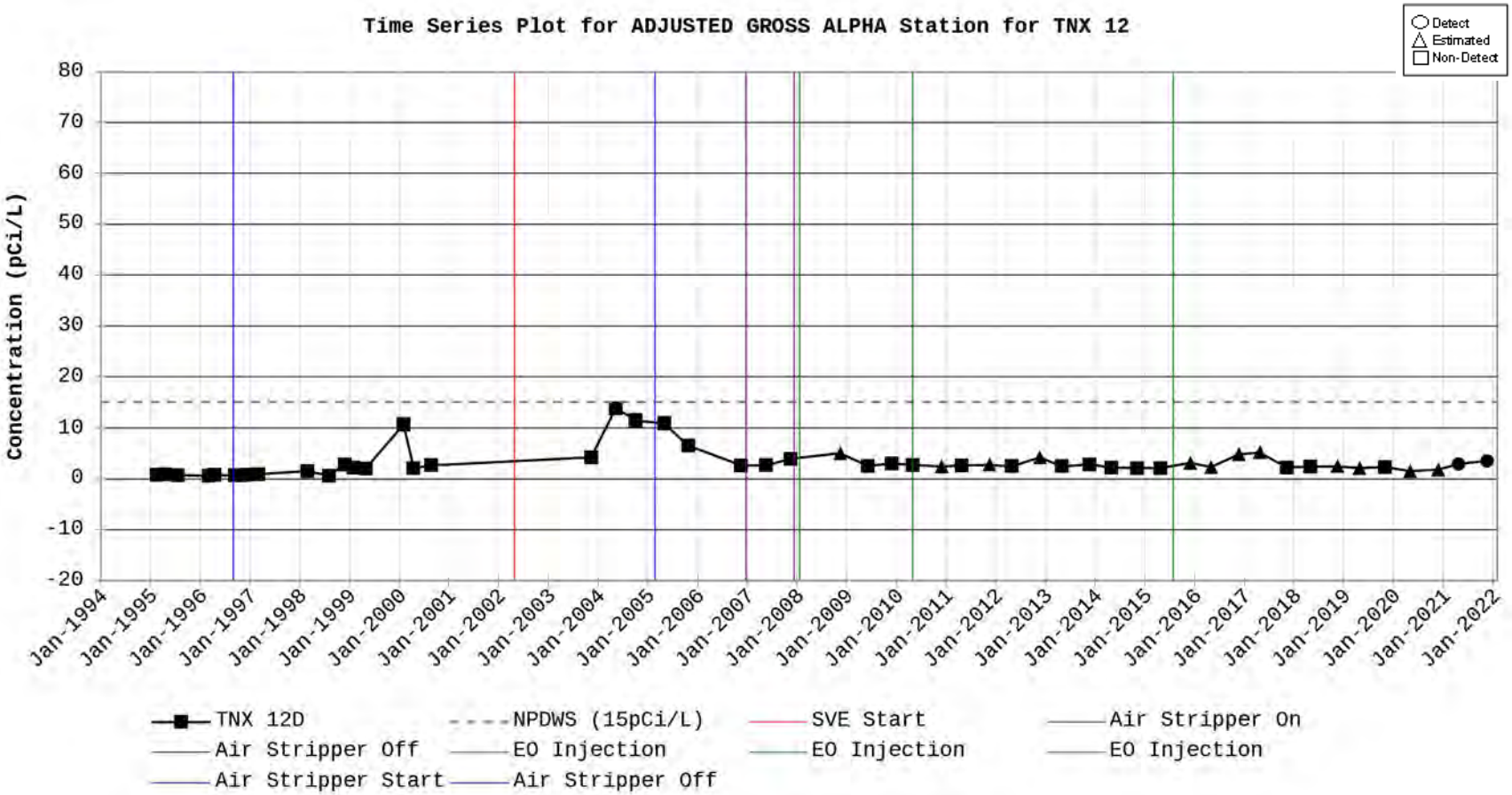

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

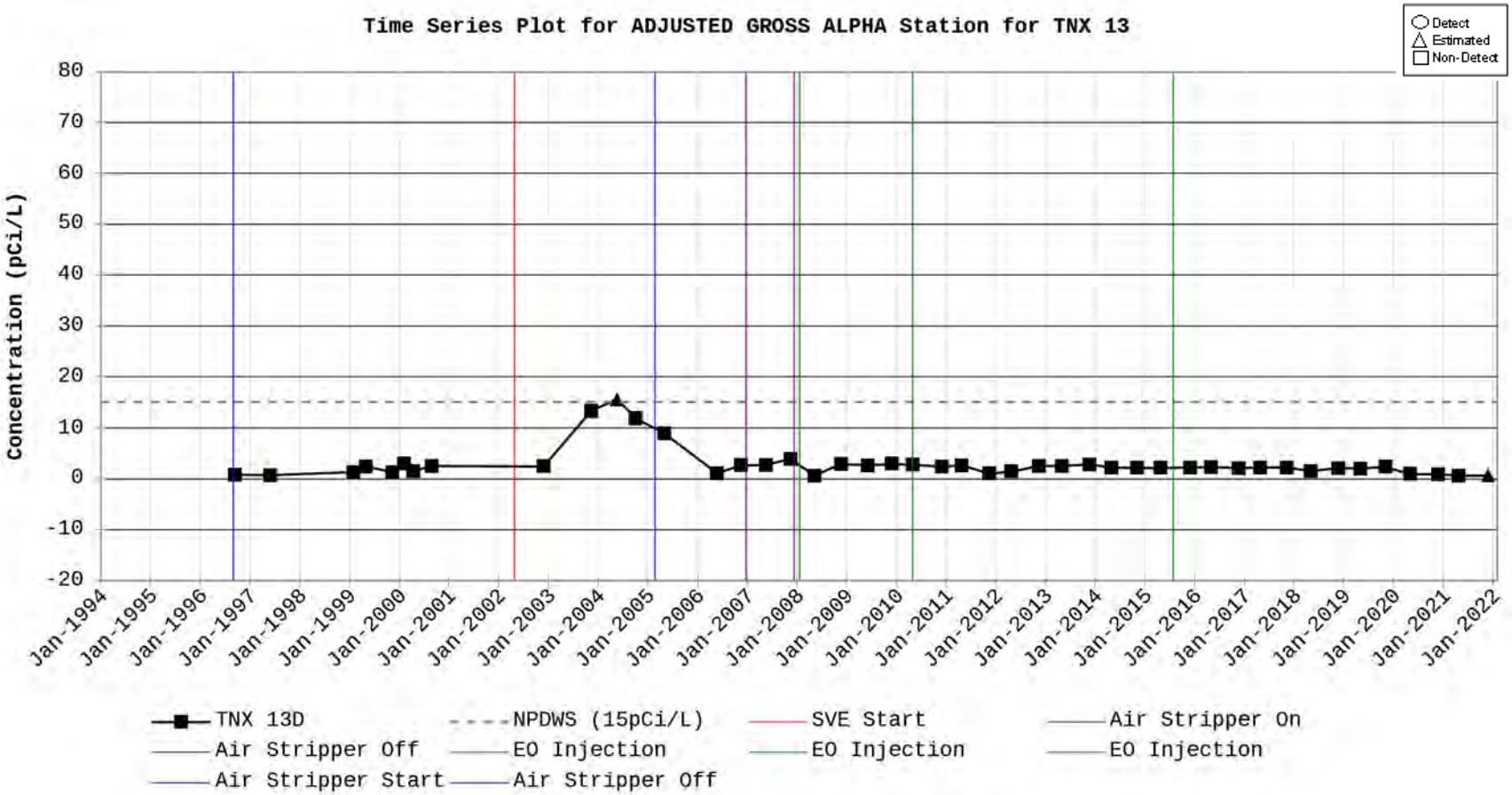

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 5
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

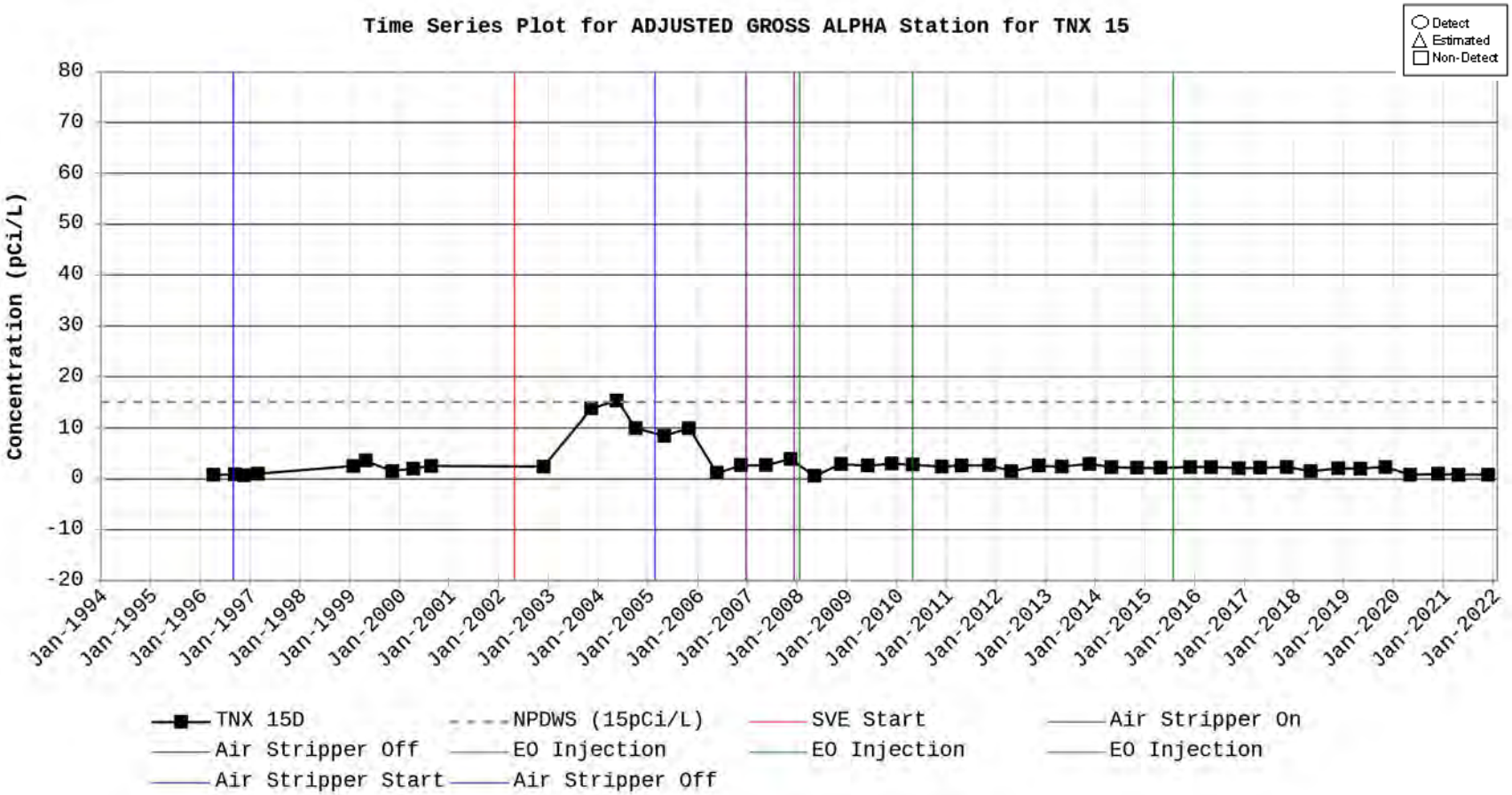

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 8
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

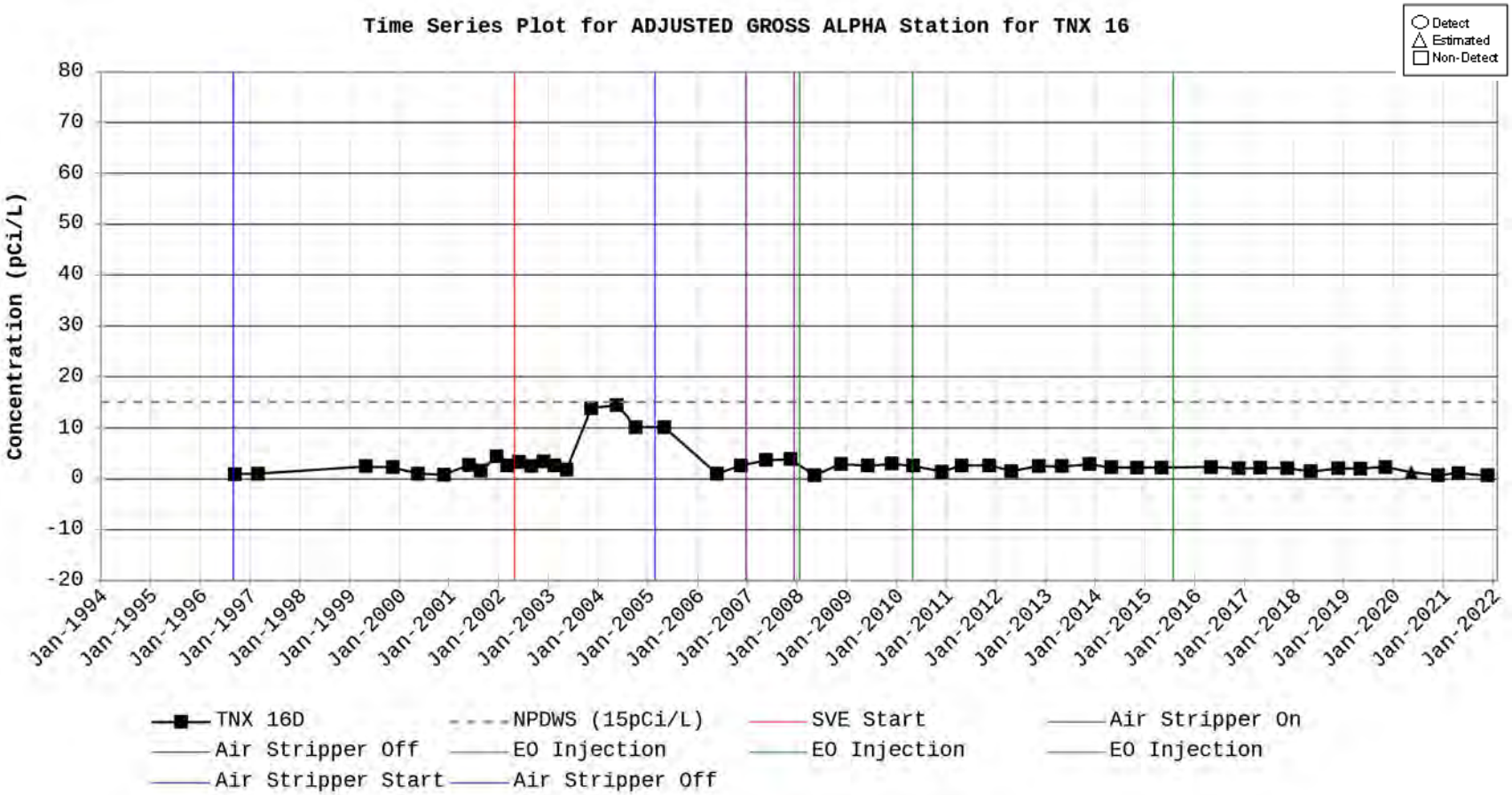

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 9
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 9D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

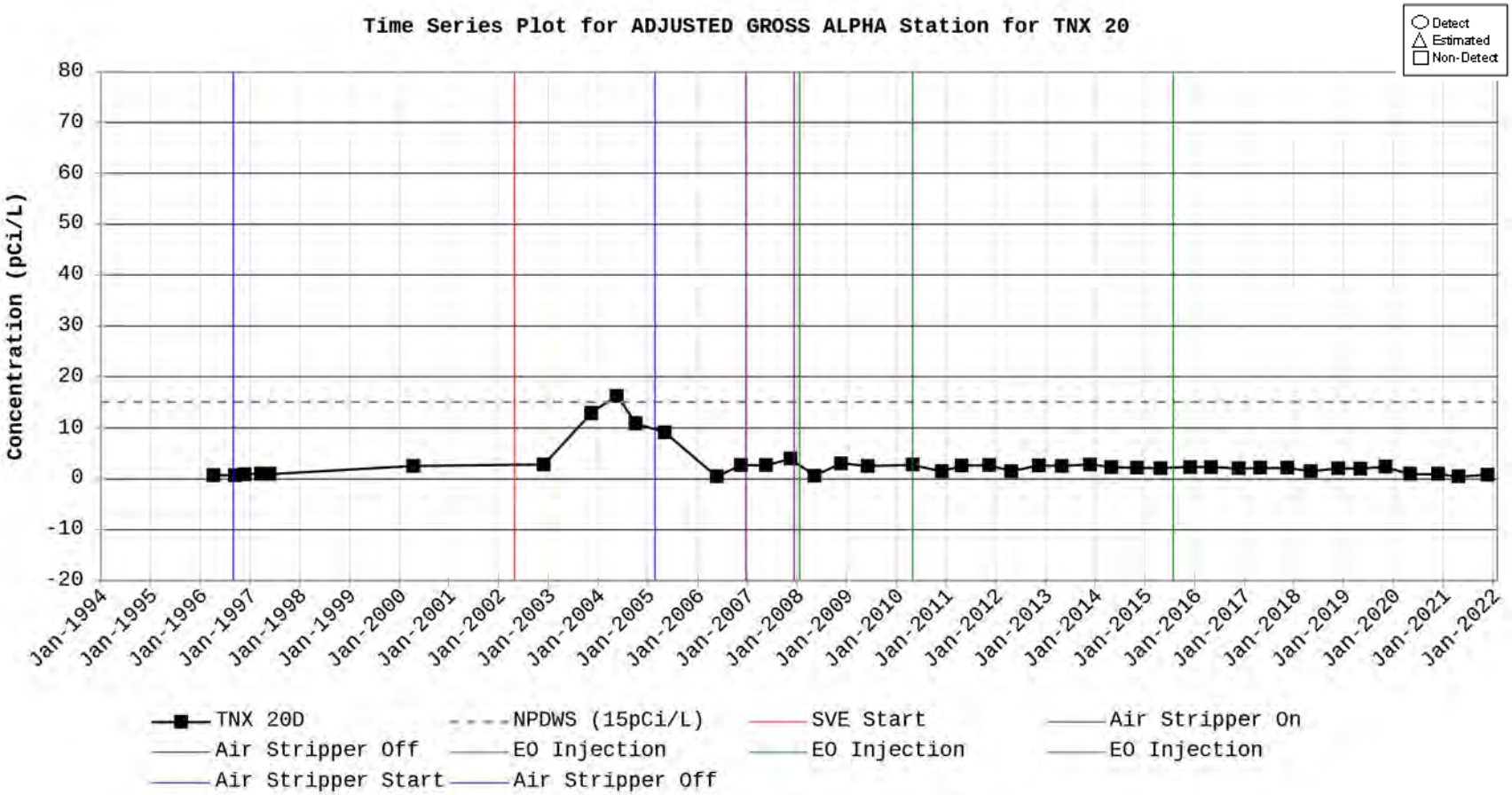

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 11
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

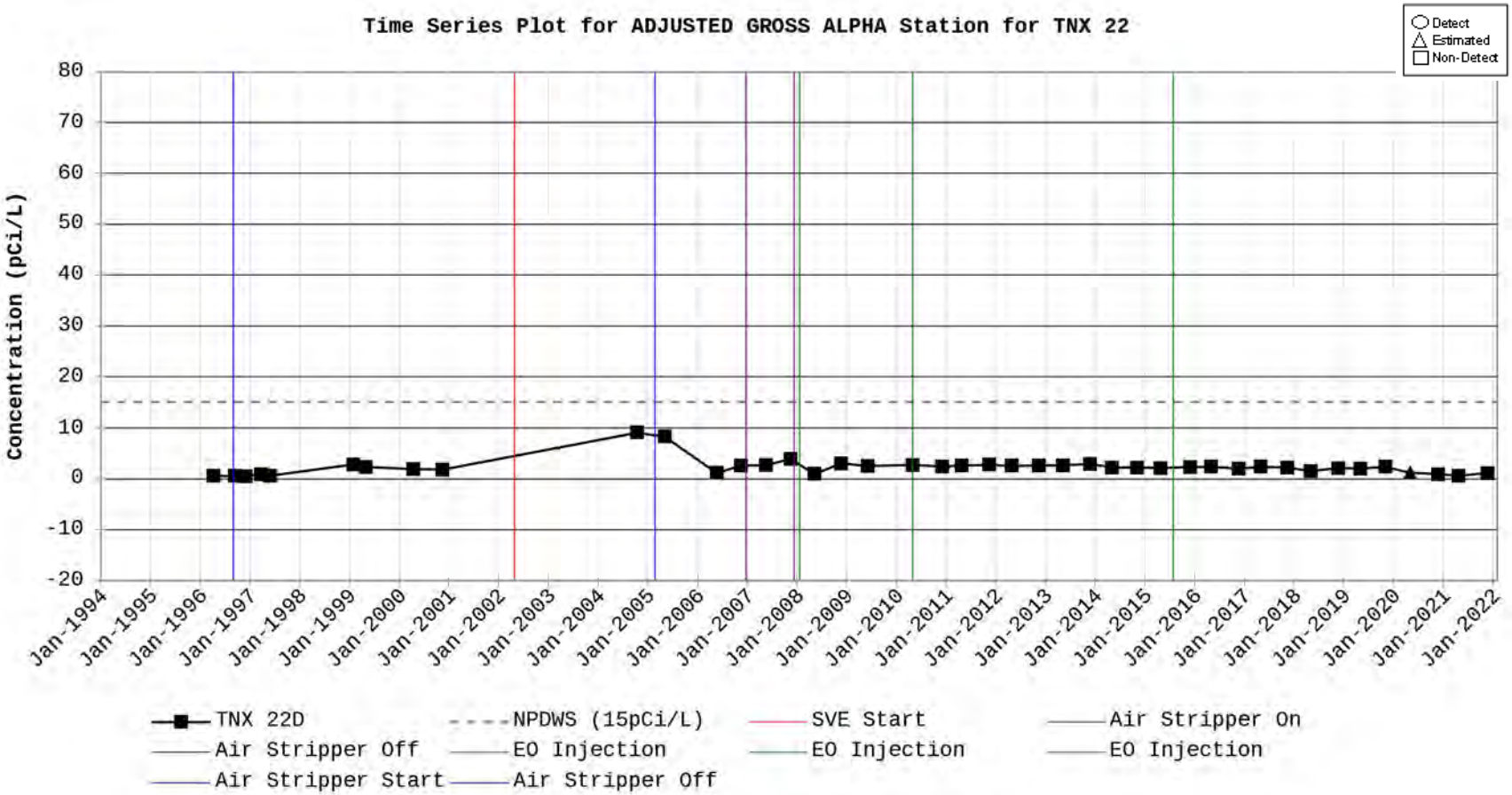

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 12
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 12D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

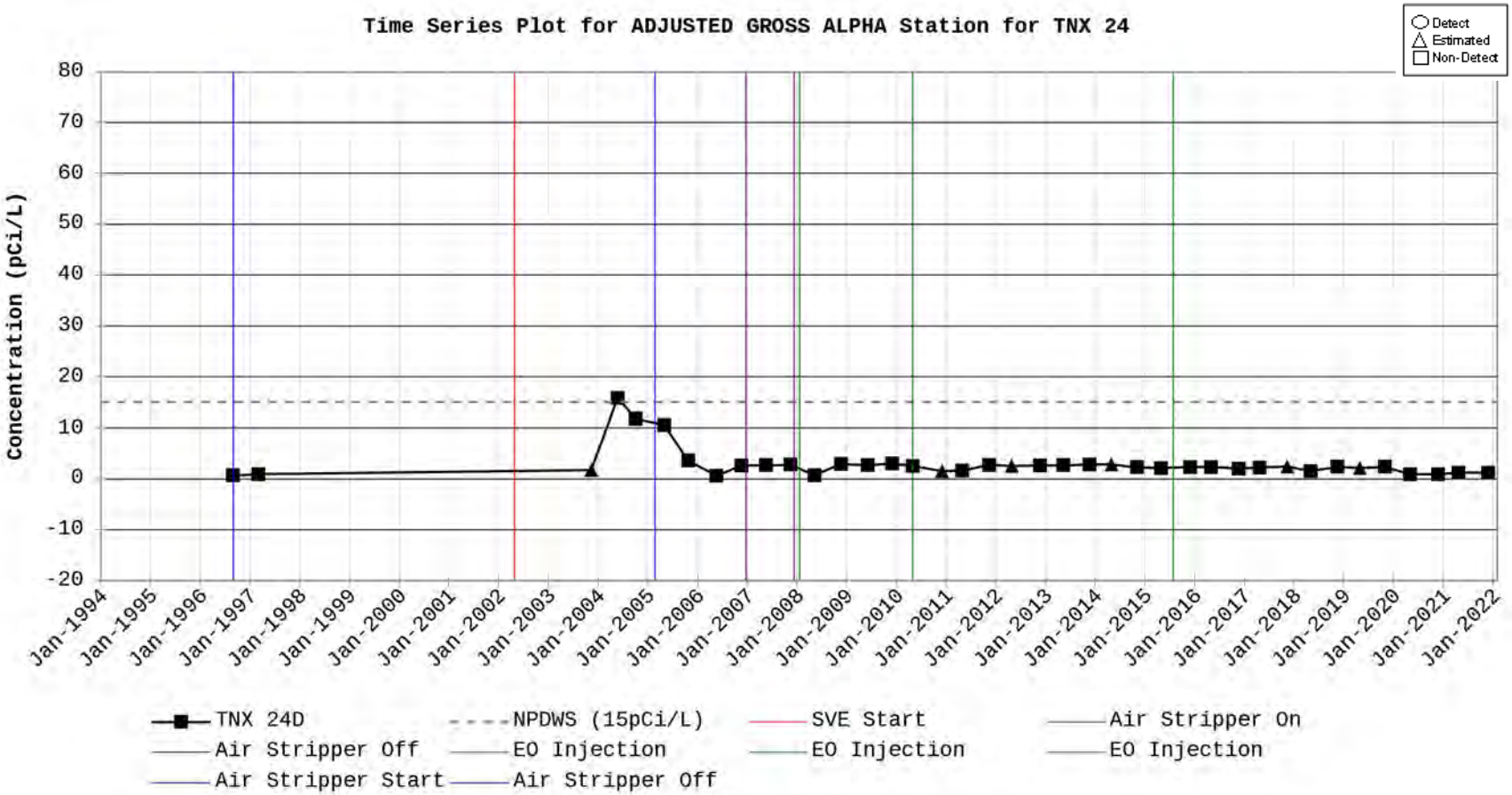

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 13
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

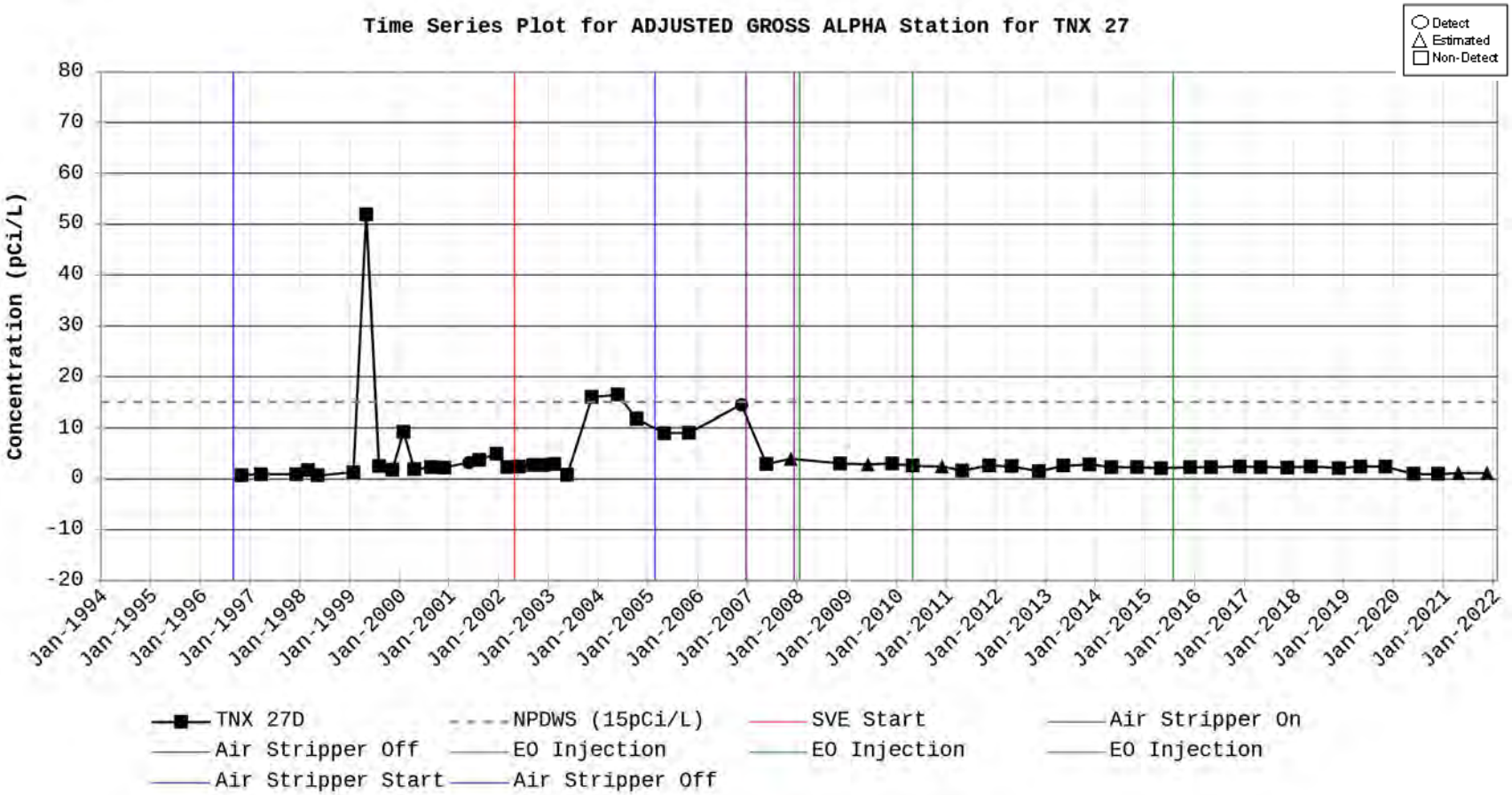

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 15
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 15D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

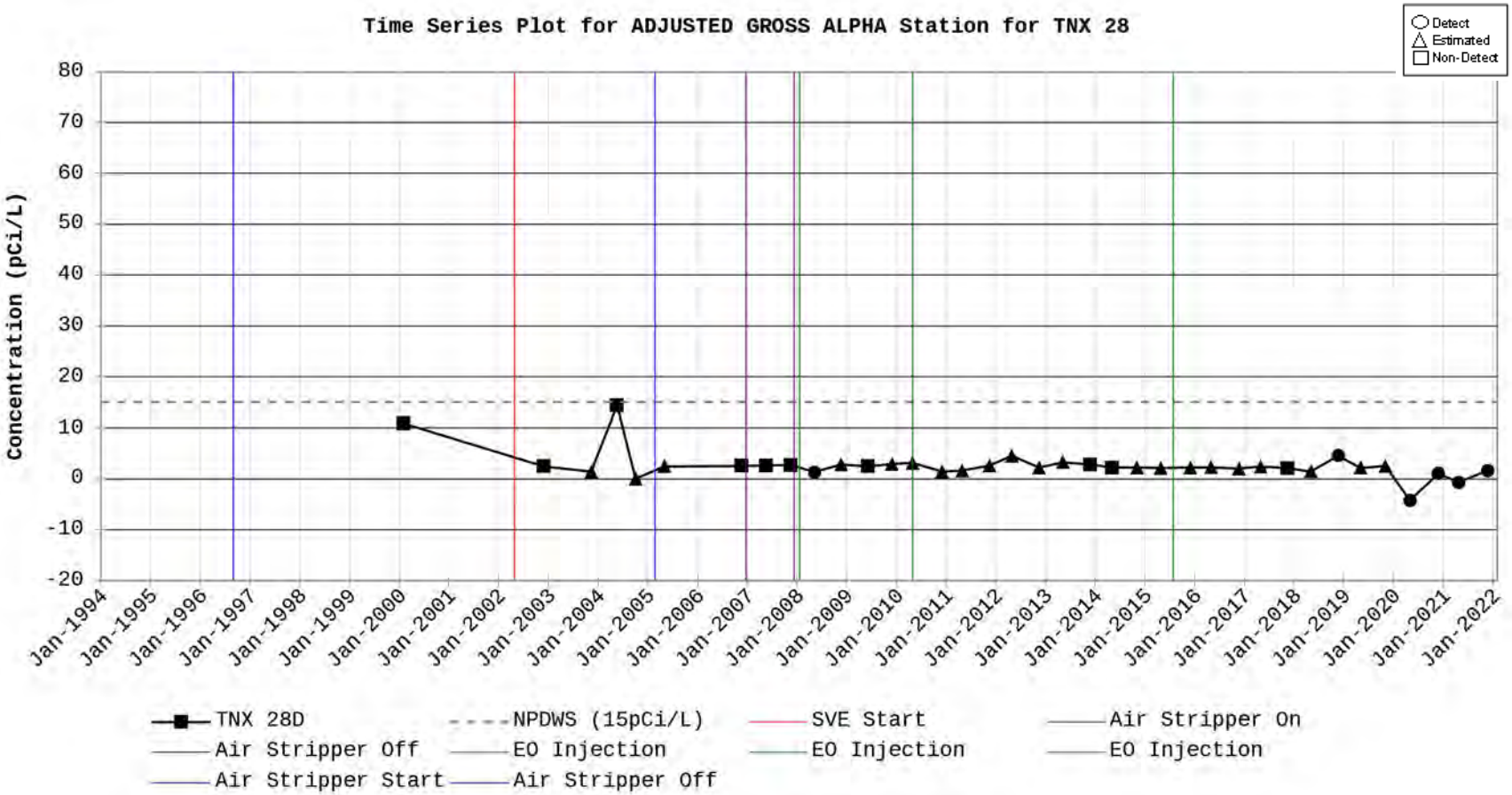

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 16
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 16D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

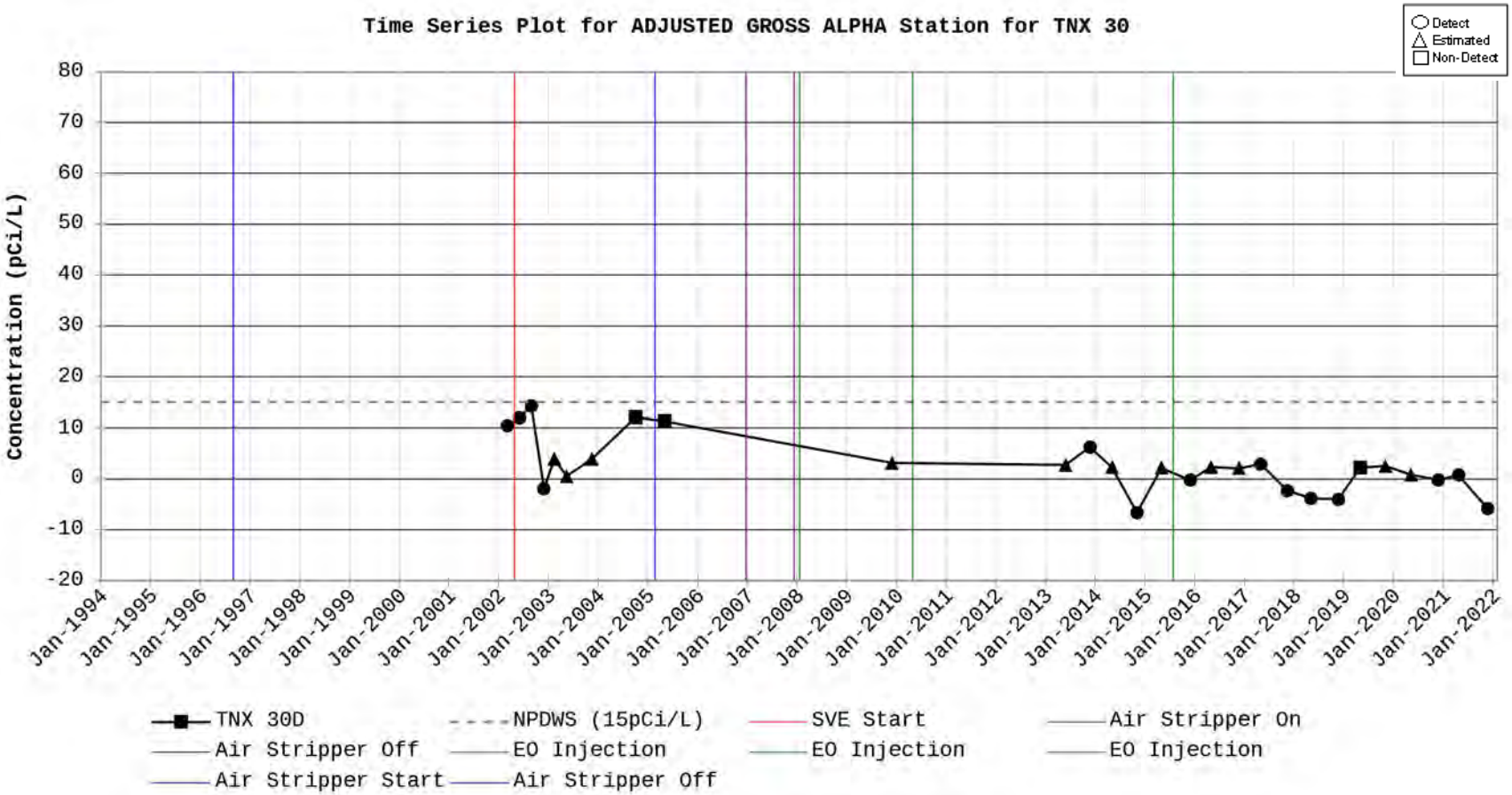

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 20
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 20D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

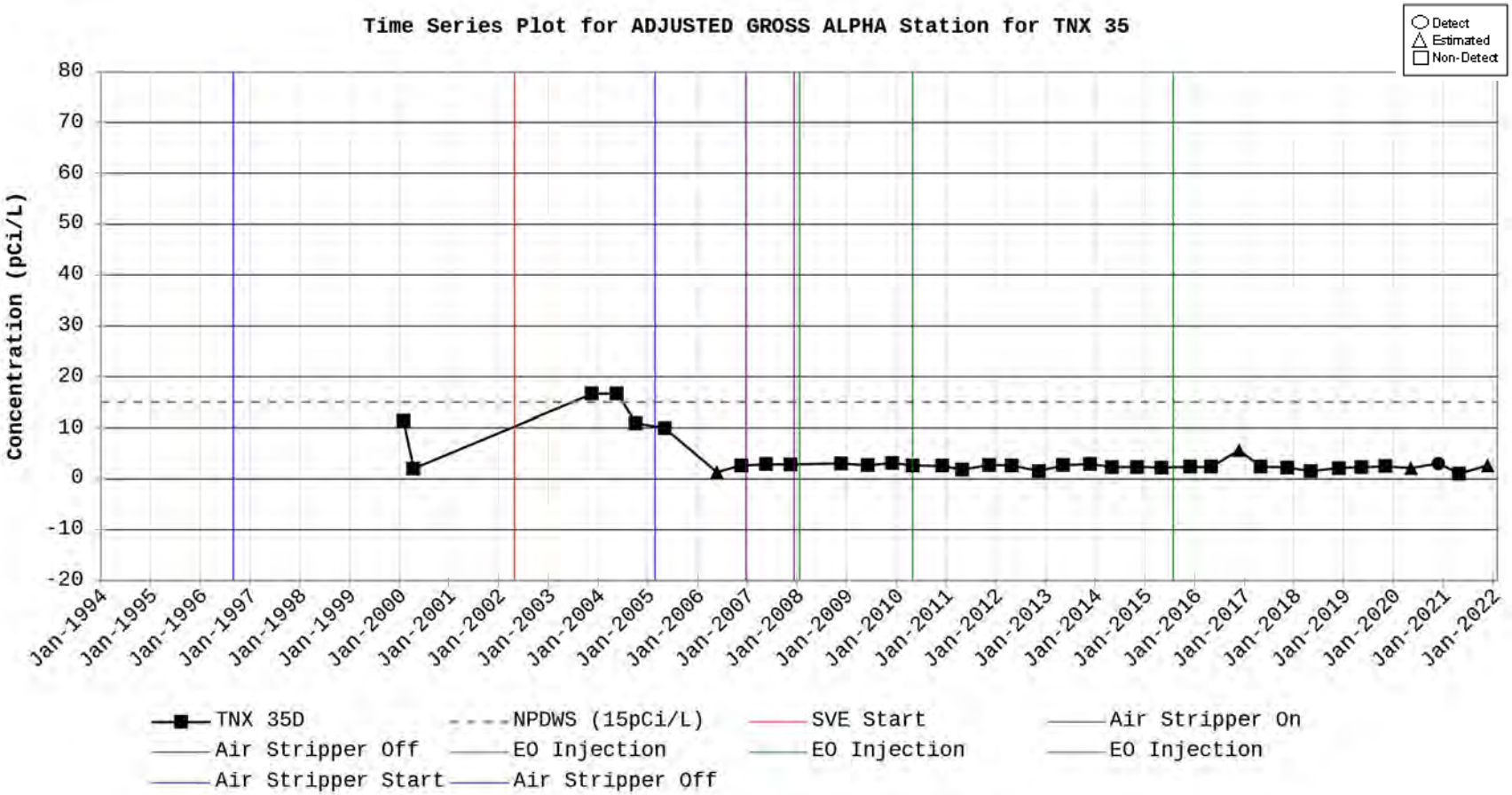

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 22
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 22D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

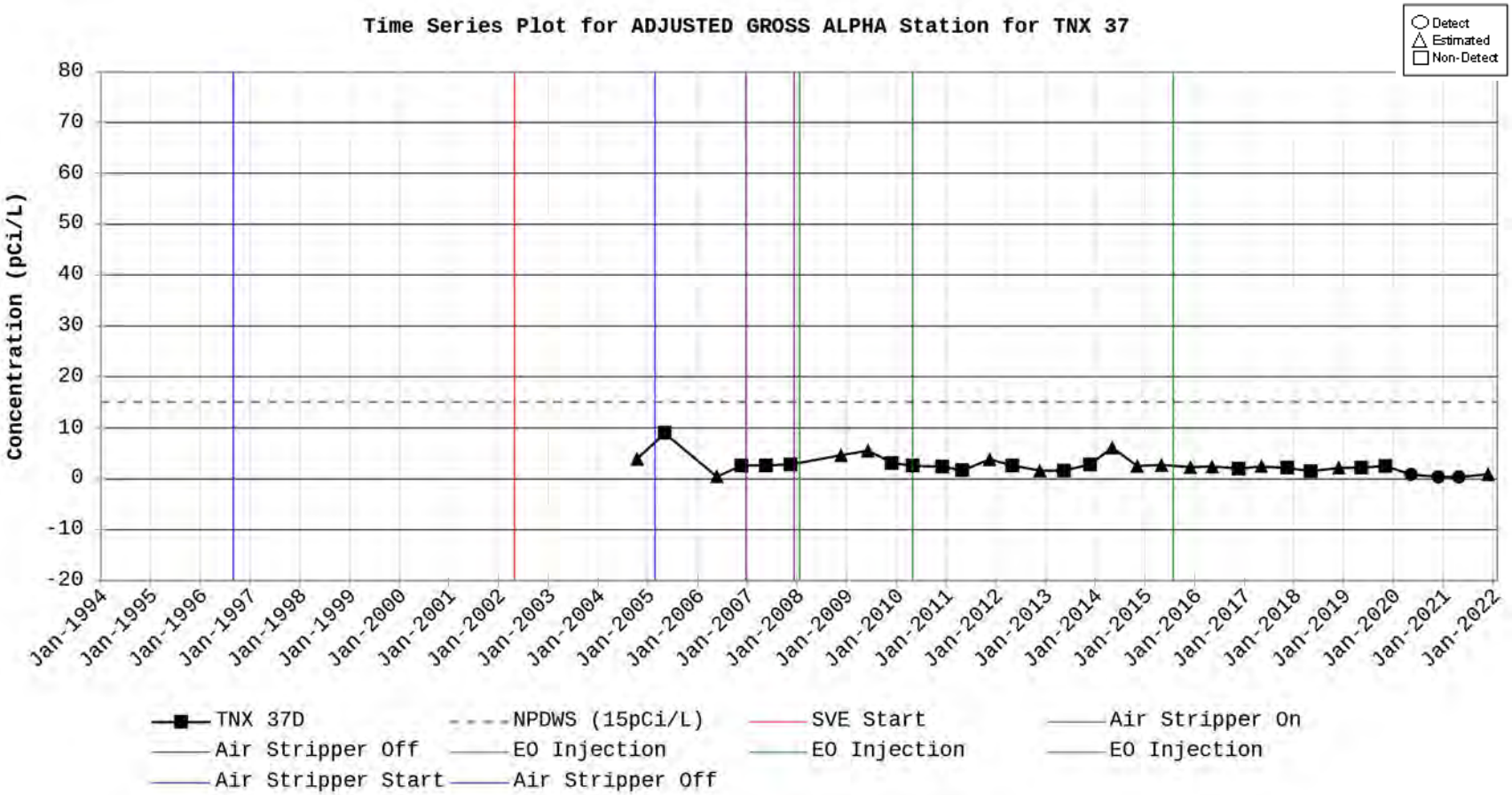

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 24
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 24D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

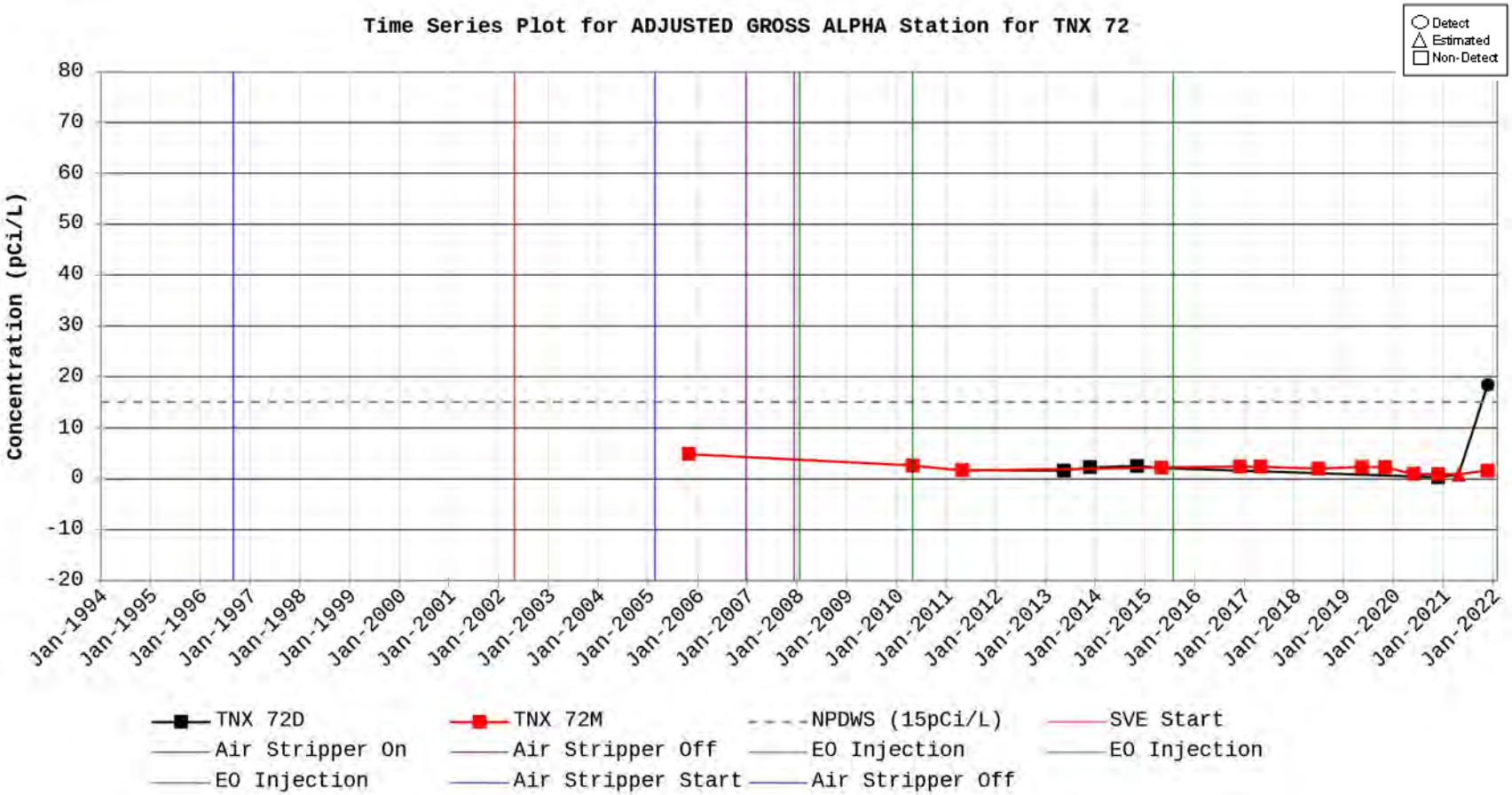

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 27
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

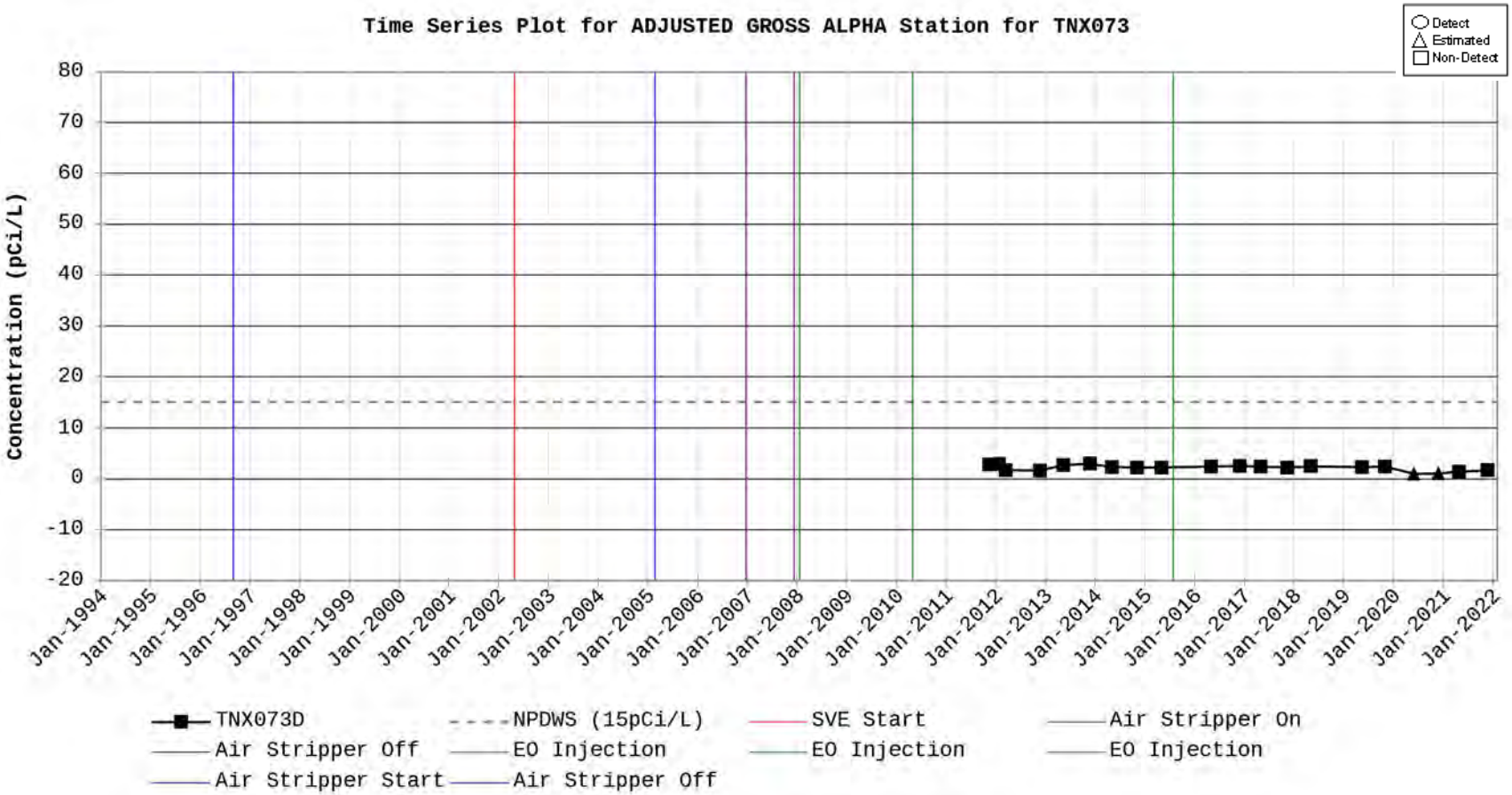

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 28
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

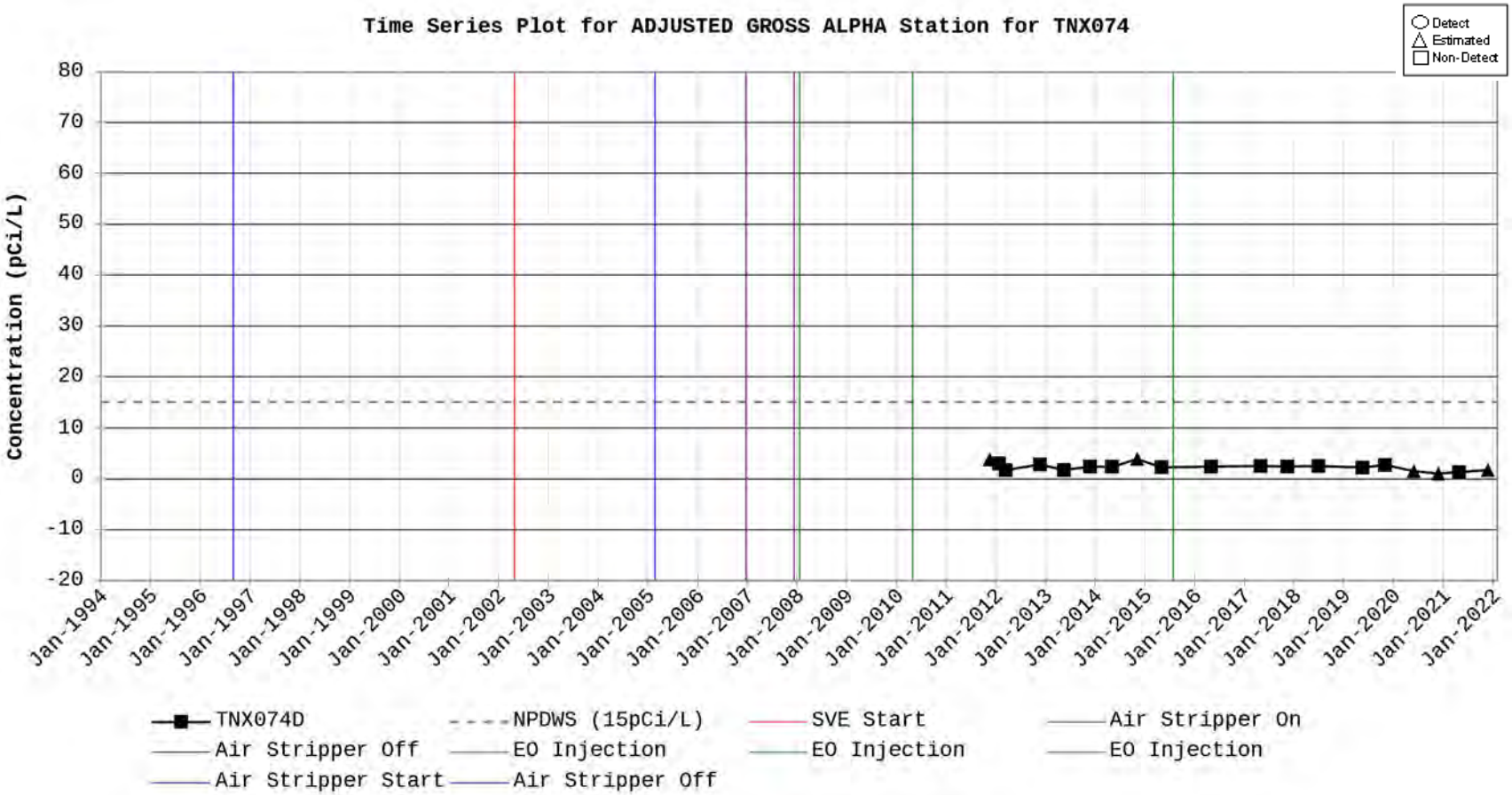

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 30
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

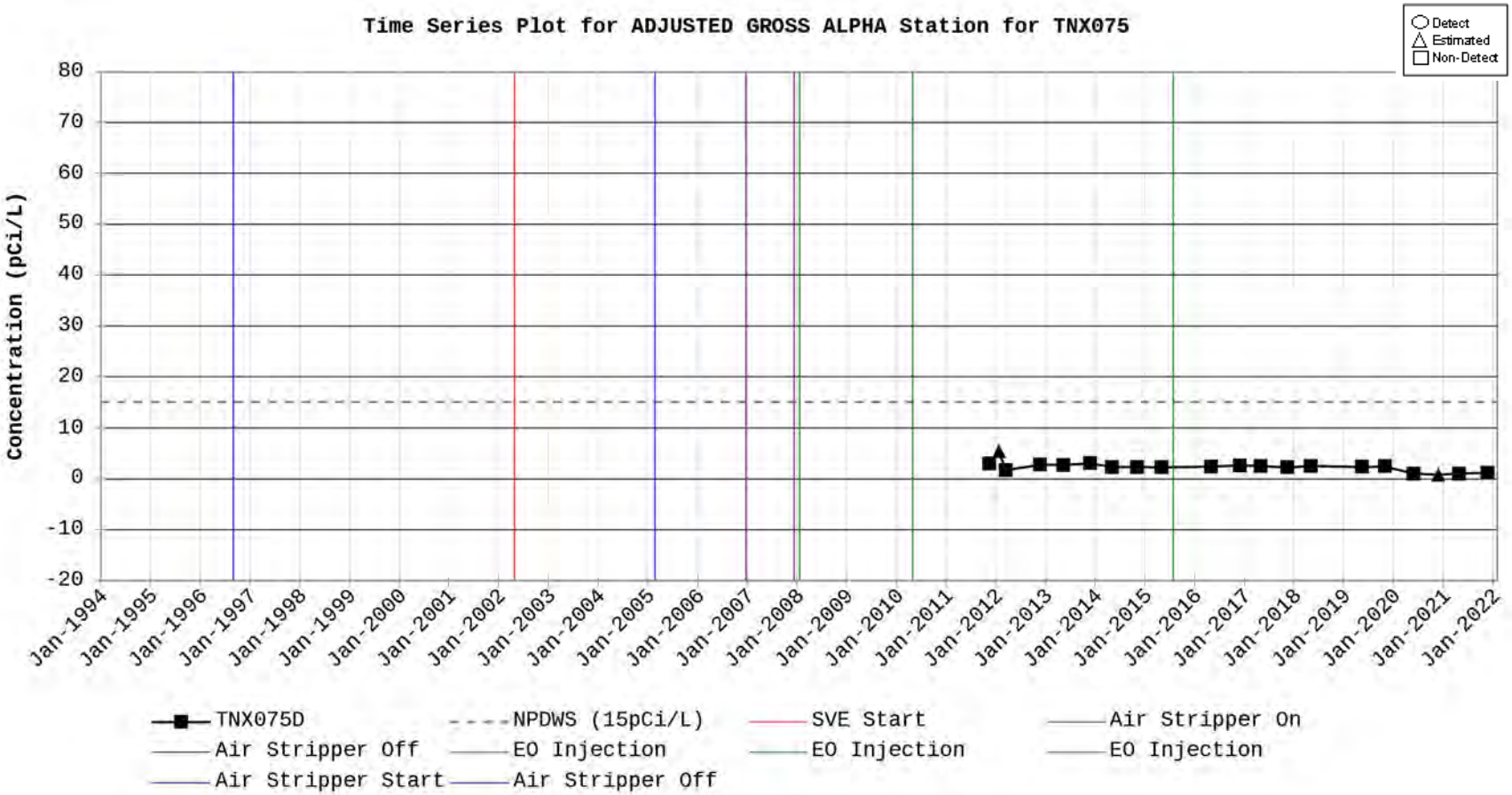

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 35
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

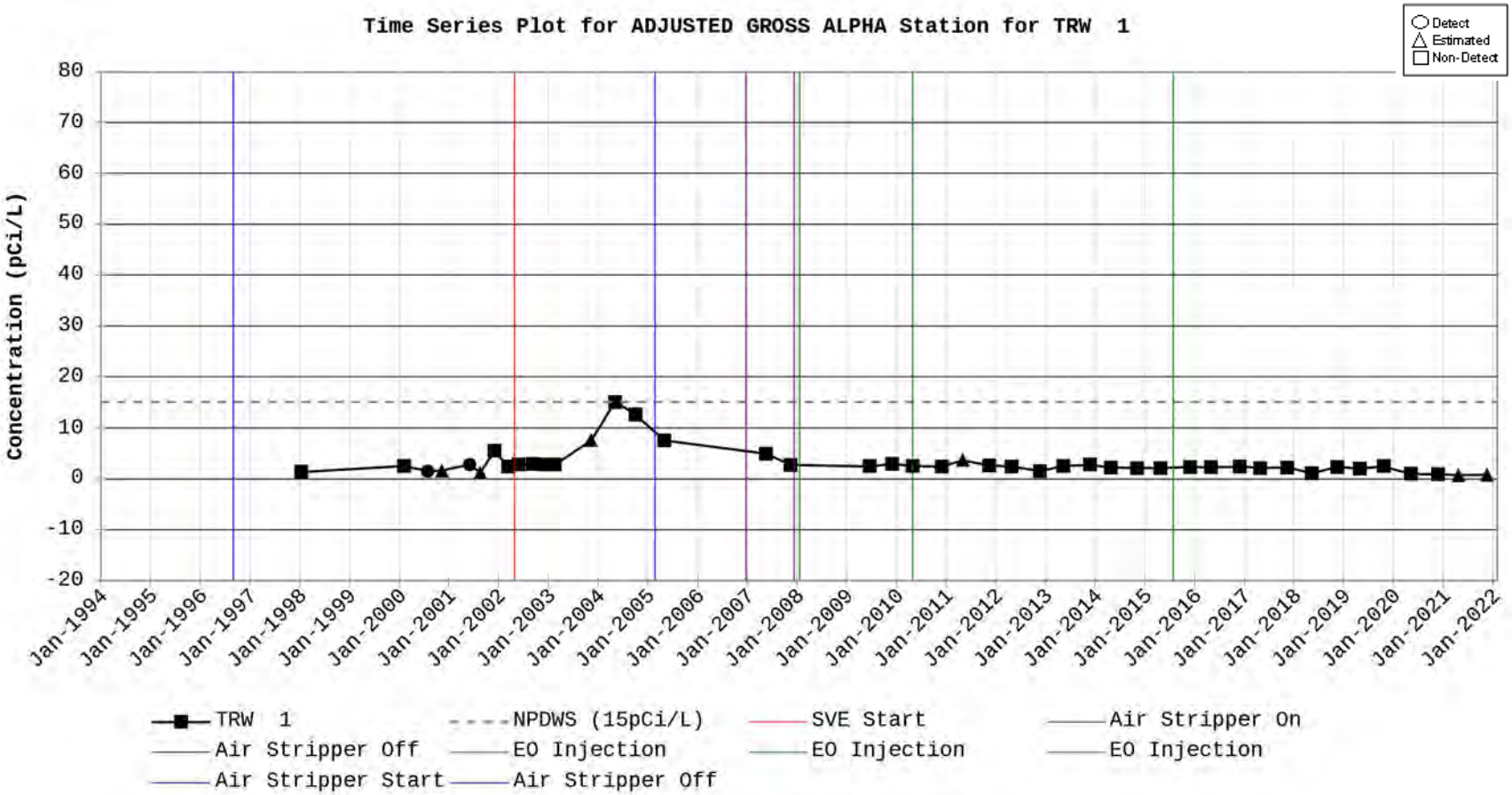

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 37
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

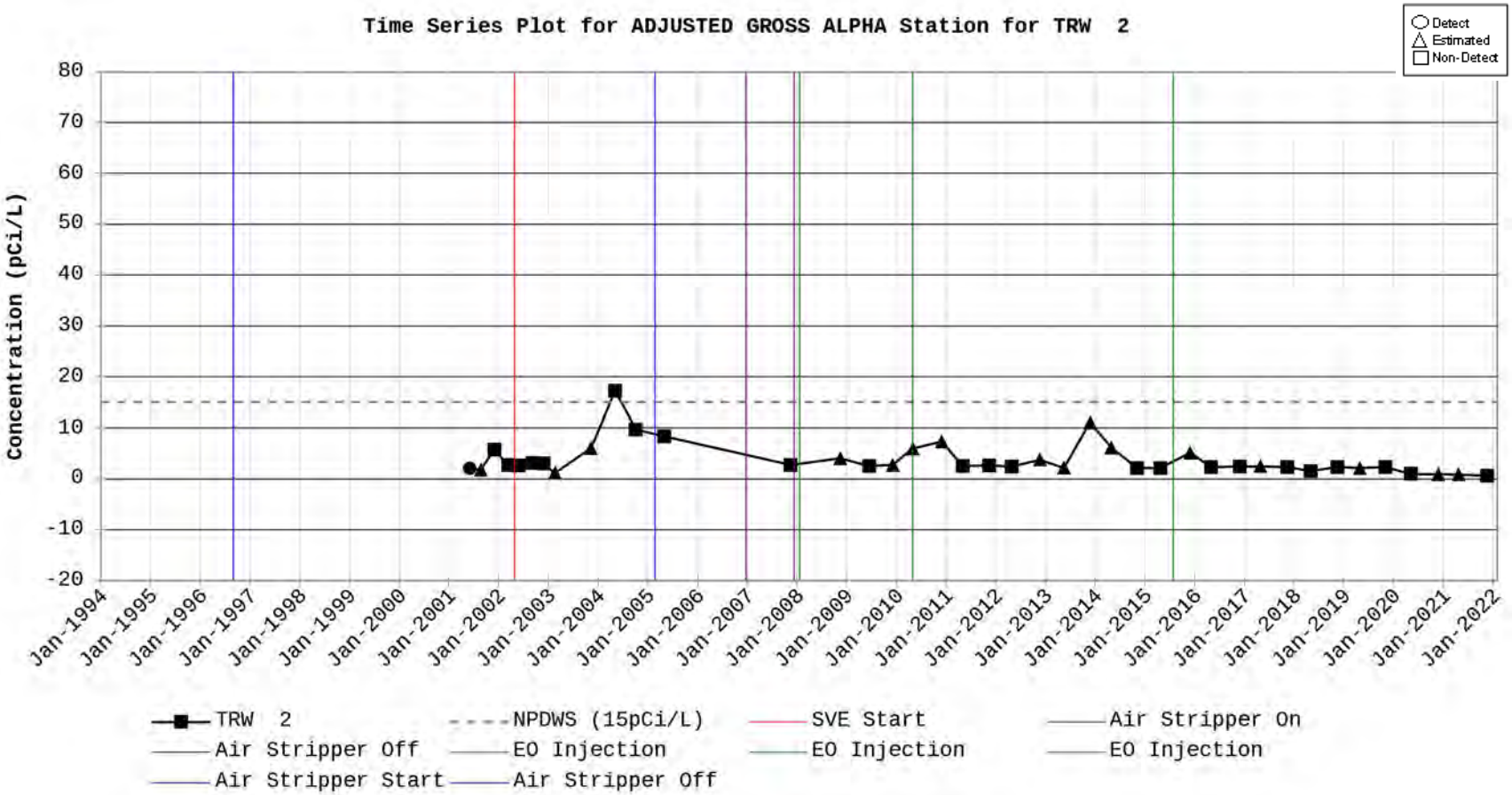

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX 72
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 72D
TNX 72M
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

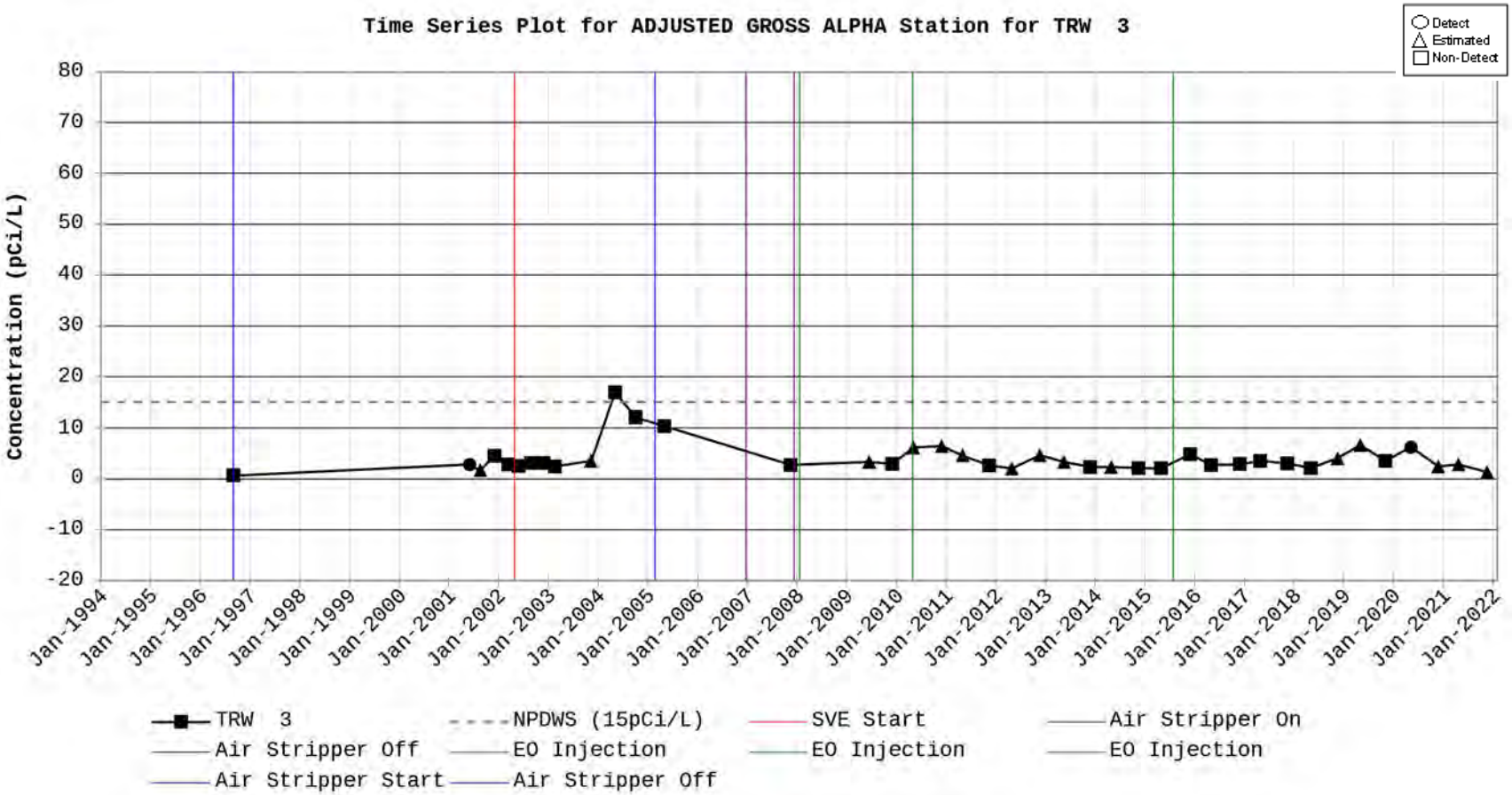

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX073
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

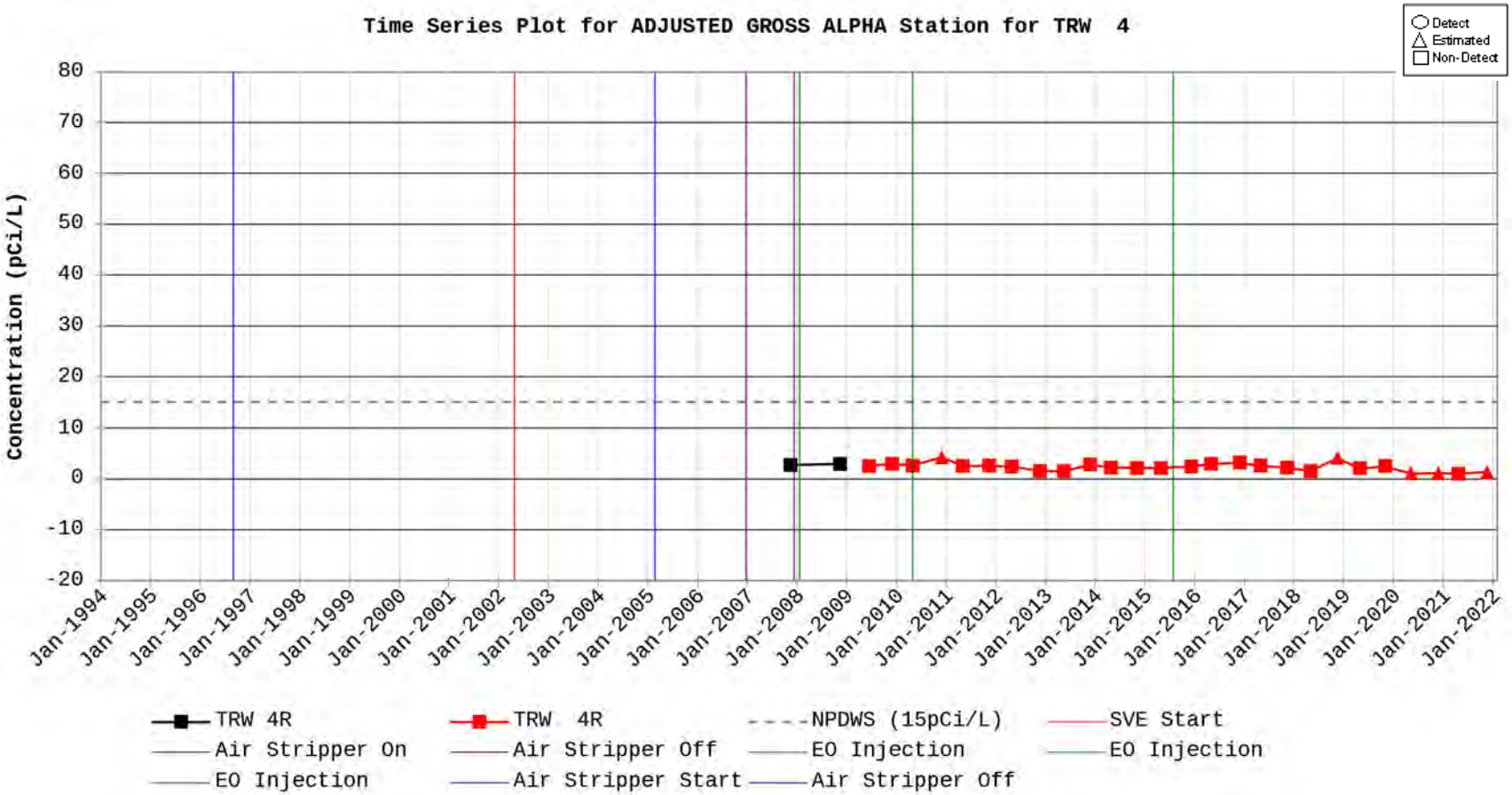

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX074
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

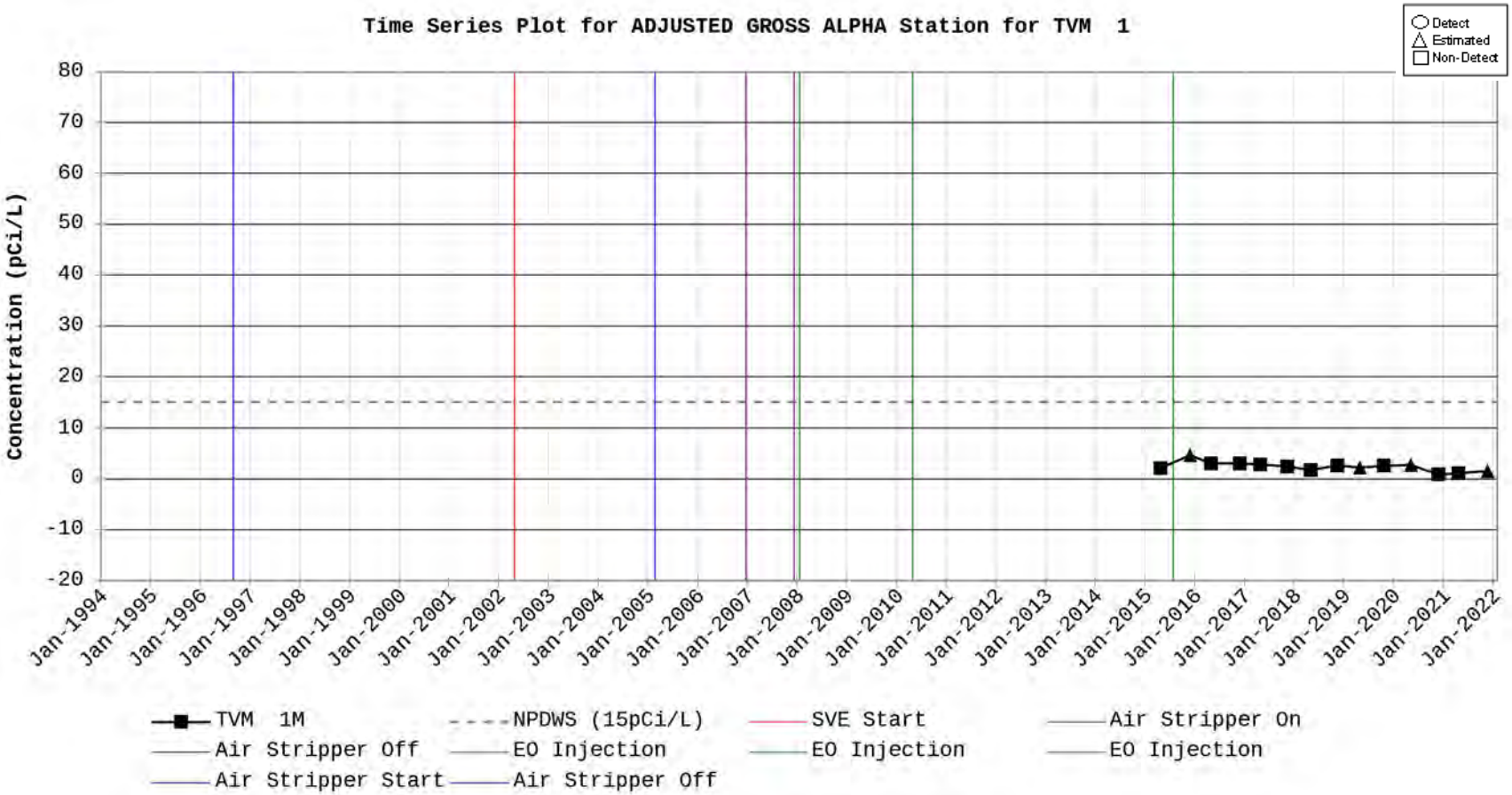

Time Series Plot for ADJUSTED GROSS ALPHA Station for TNX075
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX075D
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

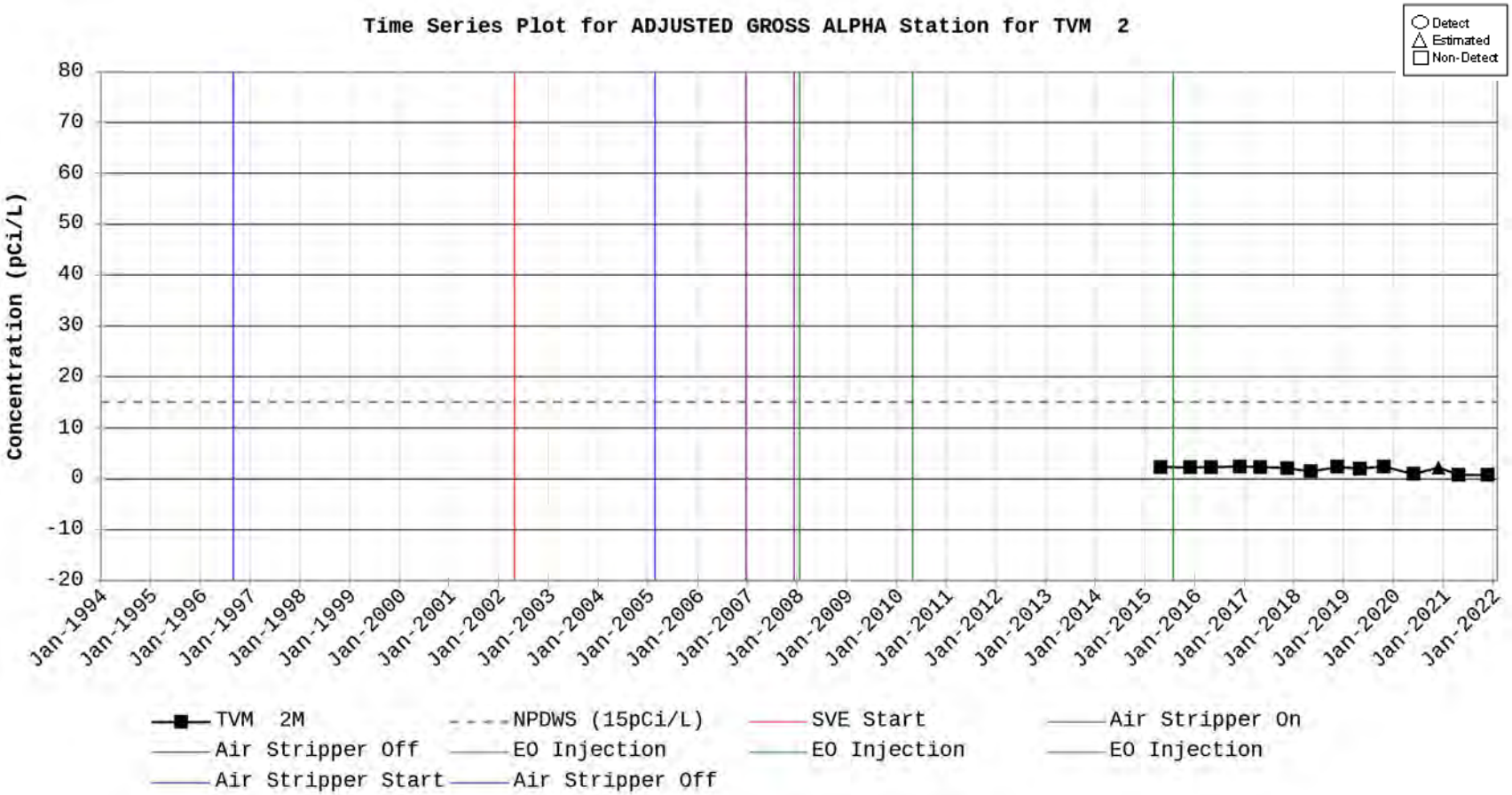

Time Series Plot for ADJUSTED GROSS ALPHA Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

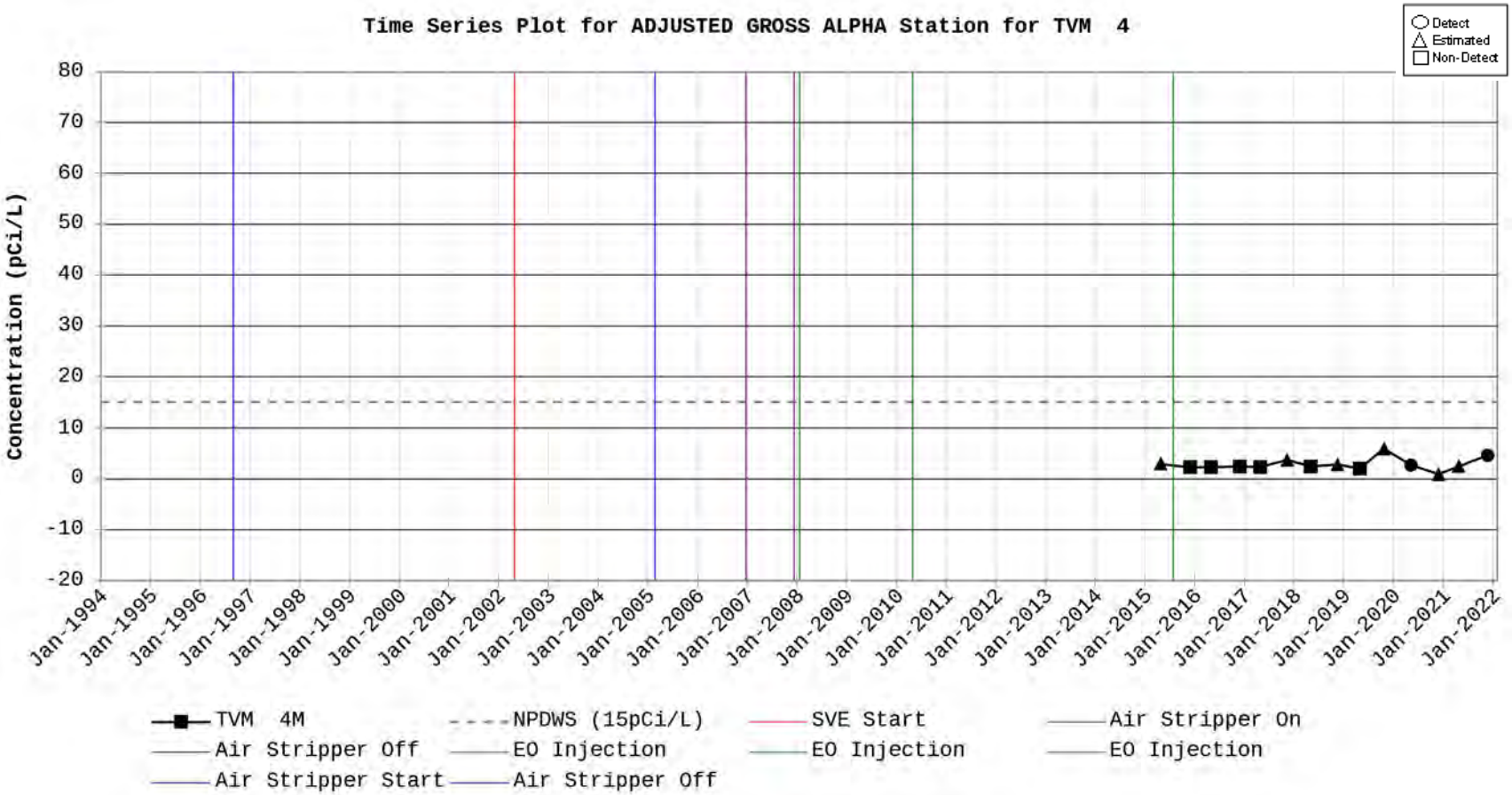

Time Series Plot for ADJUSTED GROSS ALPHA Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

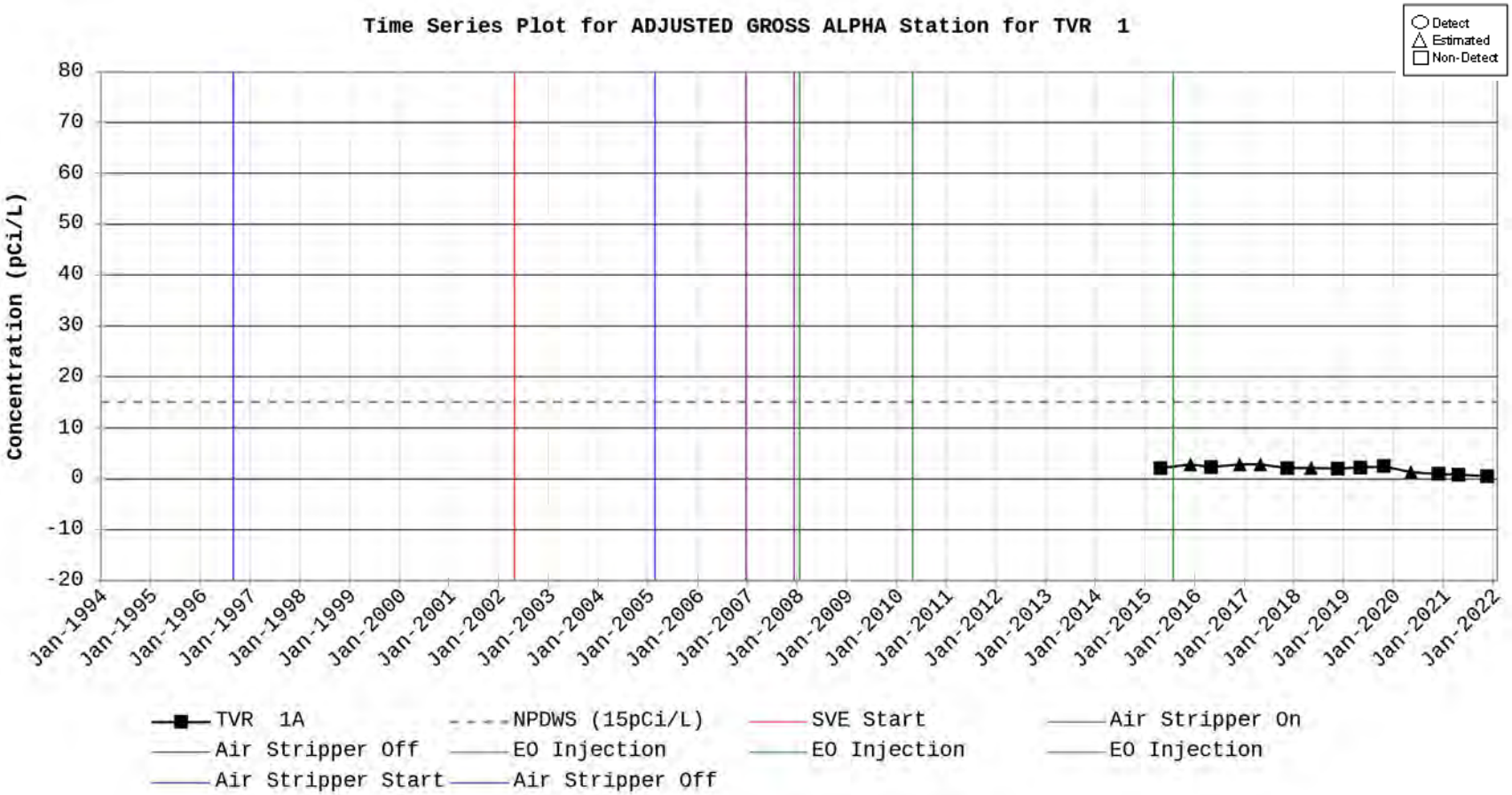

Time Series Plot for ADJUSTED GROSS ALPHA Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

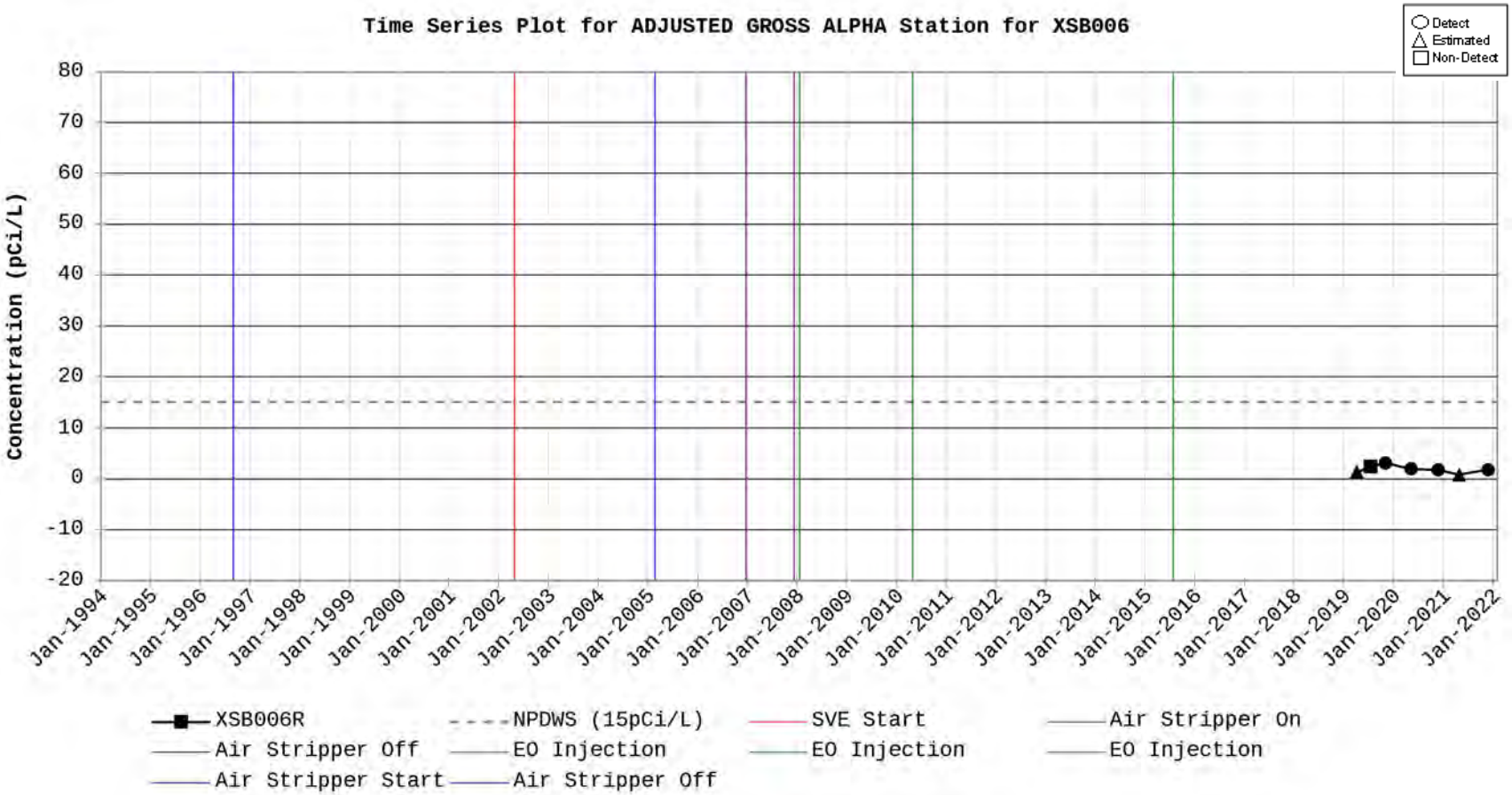

Time Series Plot for ADJUSTED GROSS ALPHA Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
TRW 4R
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

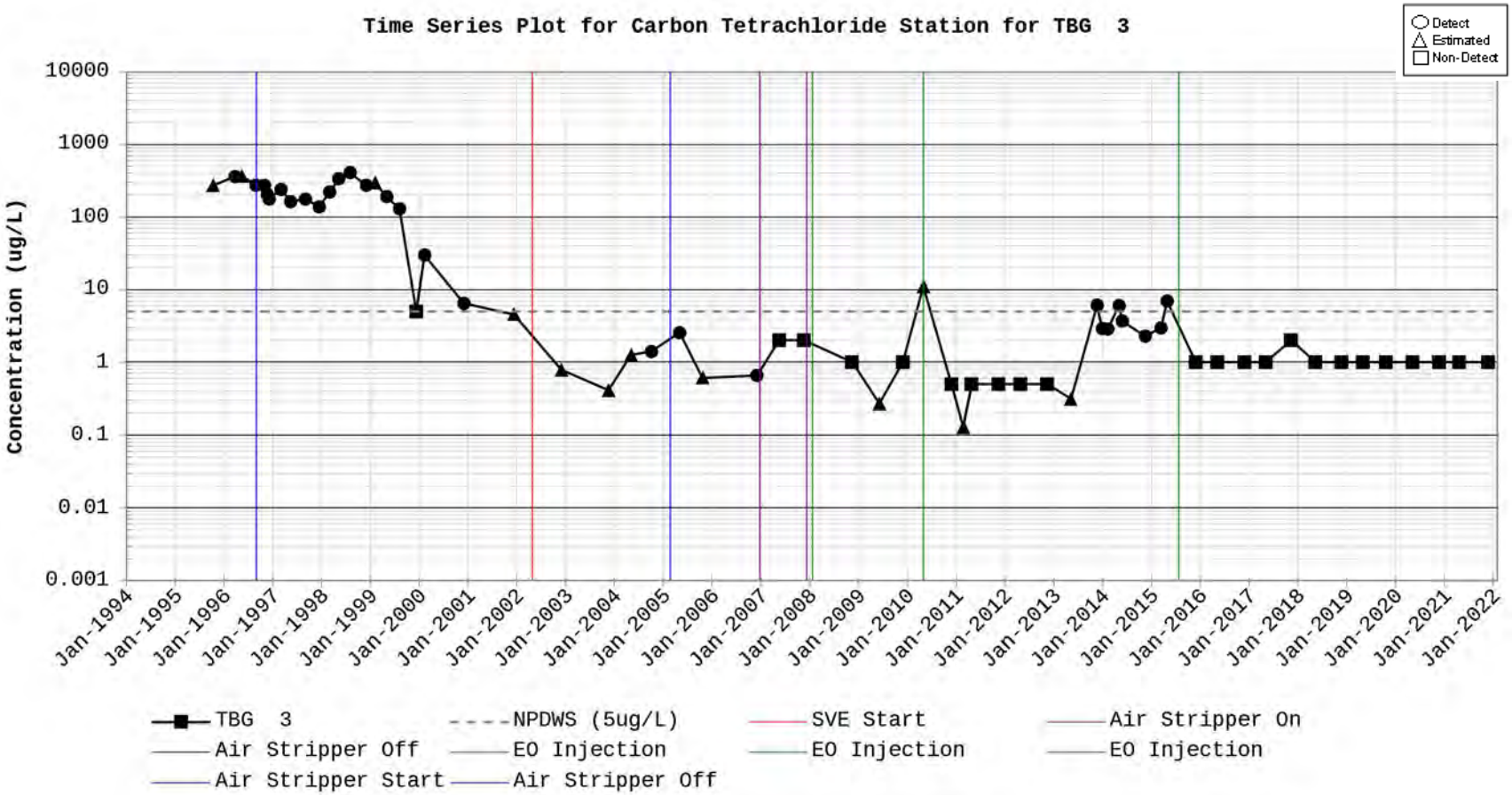

Time Series Plot for ADJUSTED GROSS ALPHA Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

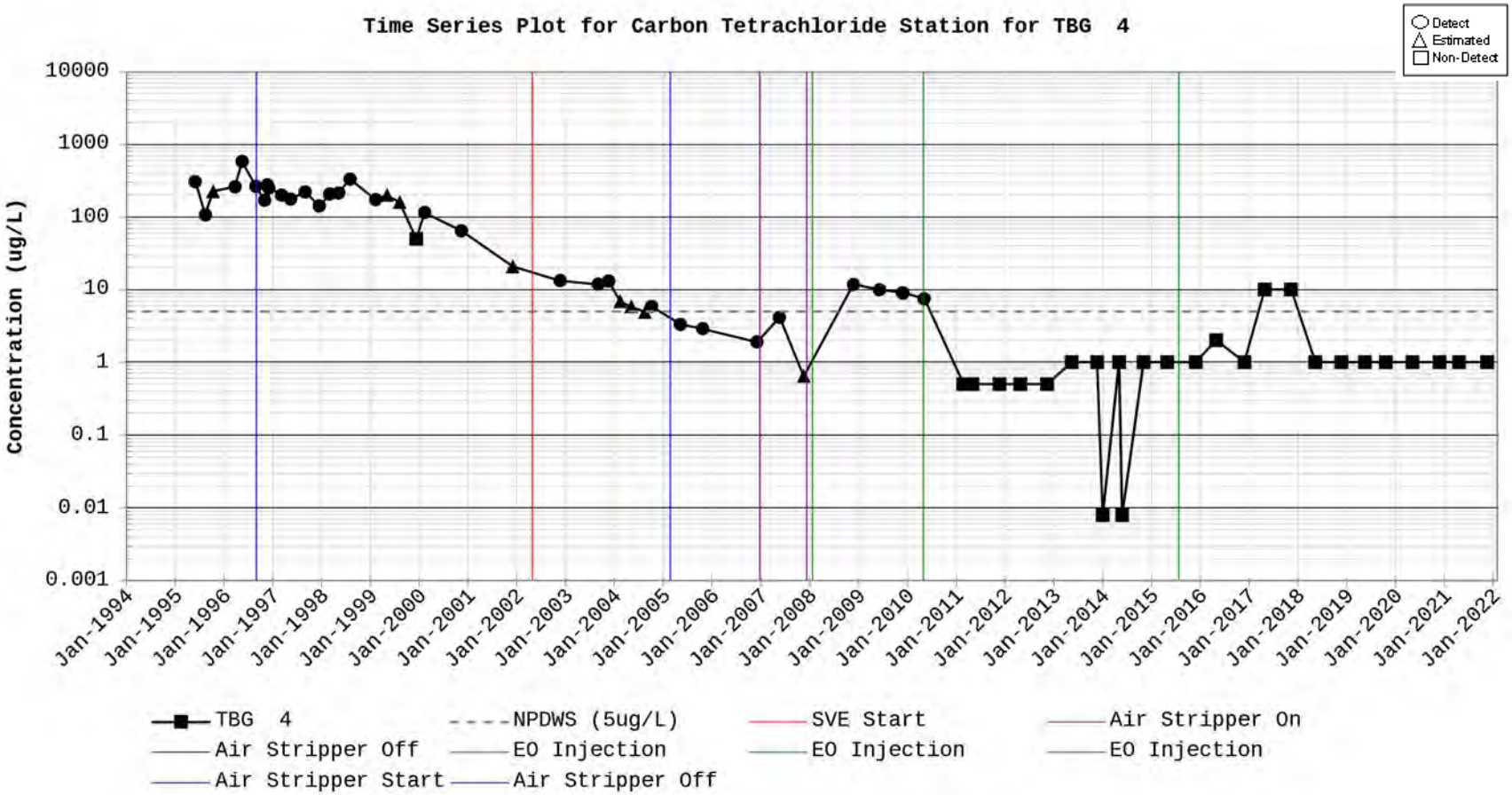

Time Series Plot for ADJUSTED GROSS ALPHA Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

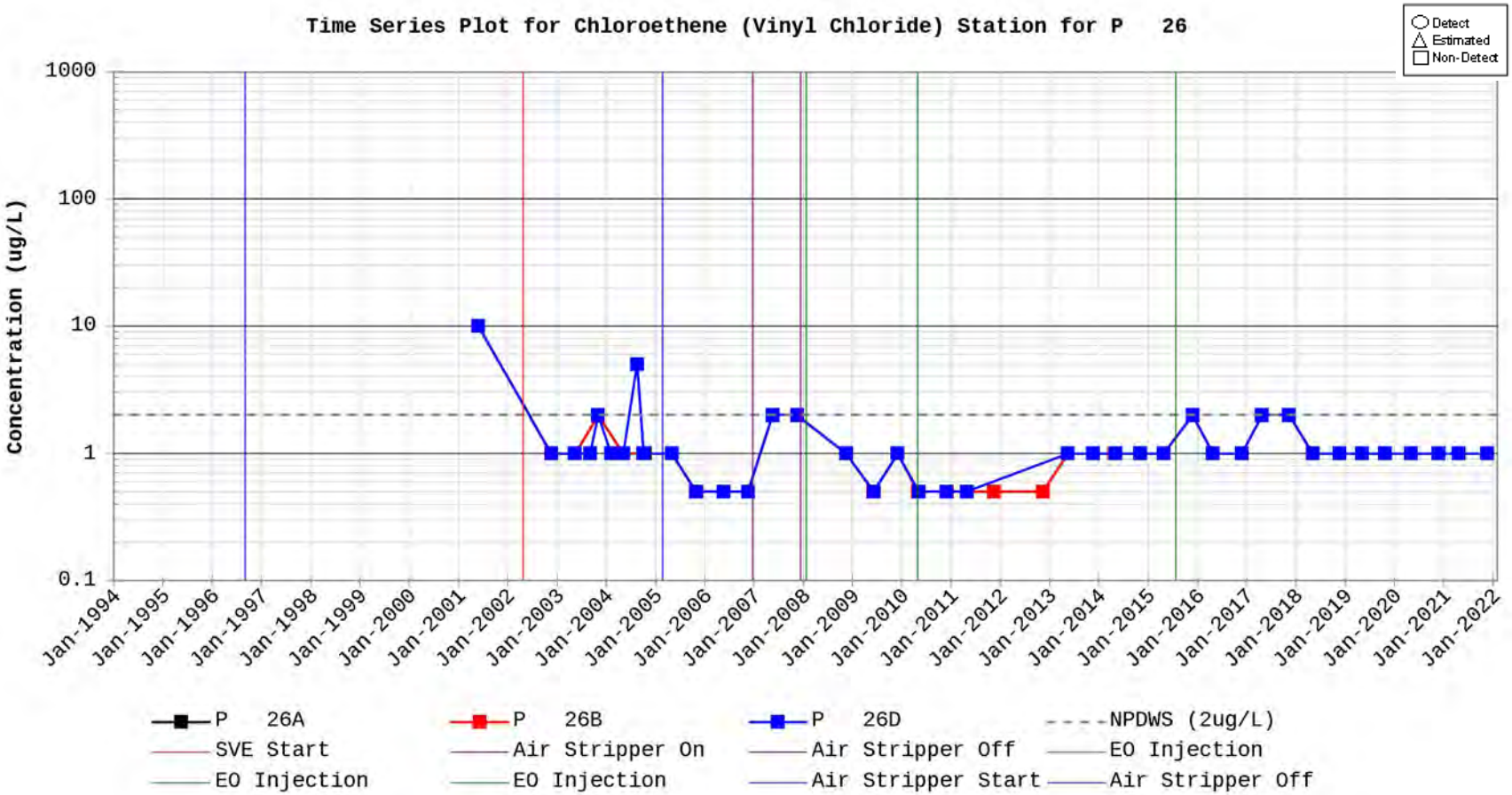

Time Series Plot for ADJUSTED GROSS ALPHA Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

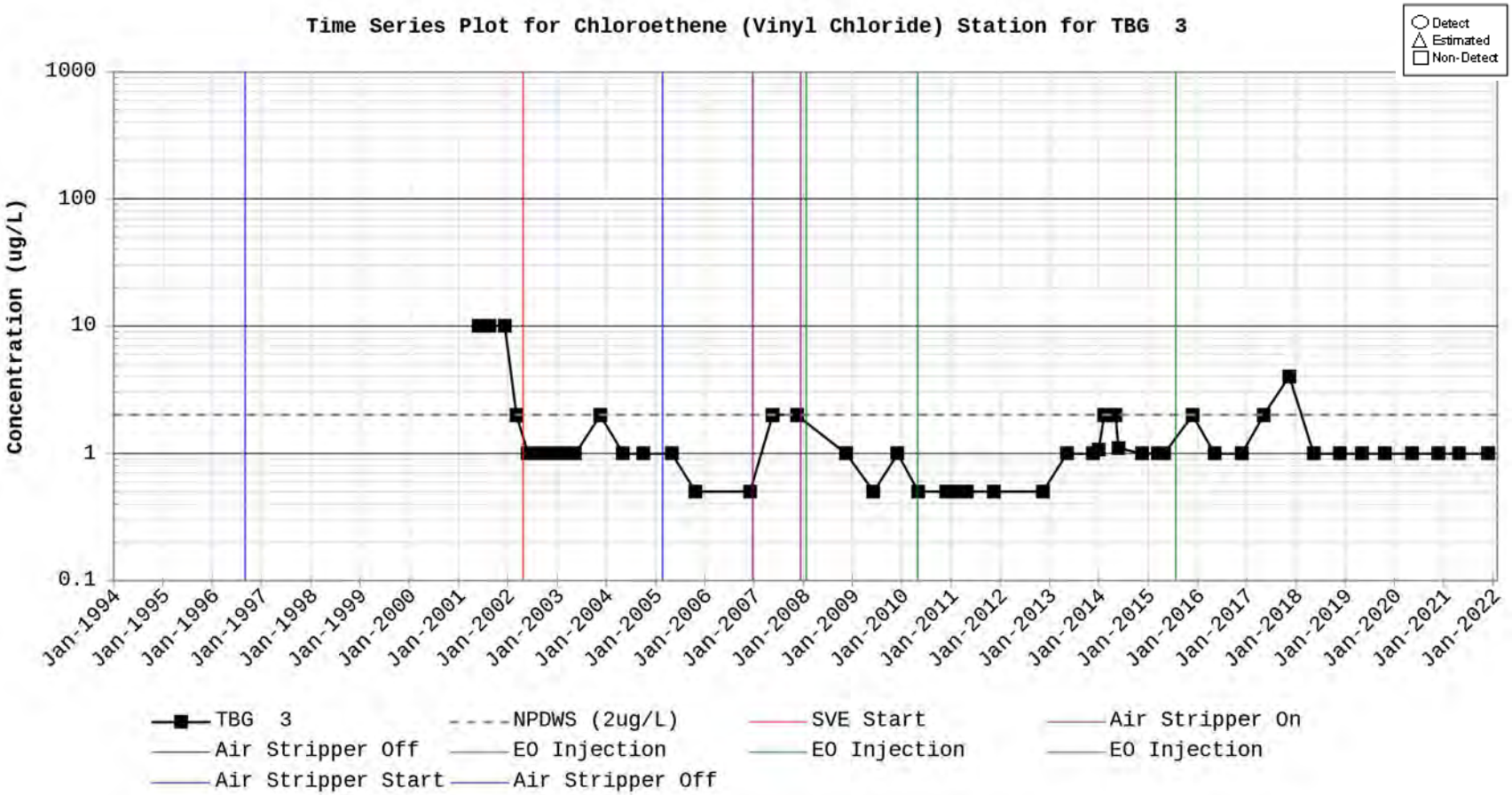

Time Series Plot for ADJUSTED GROSS ALPHA Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

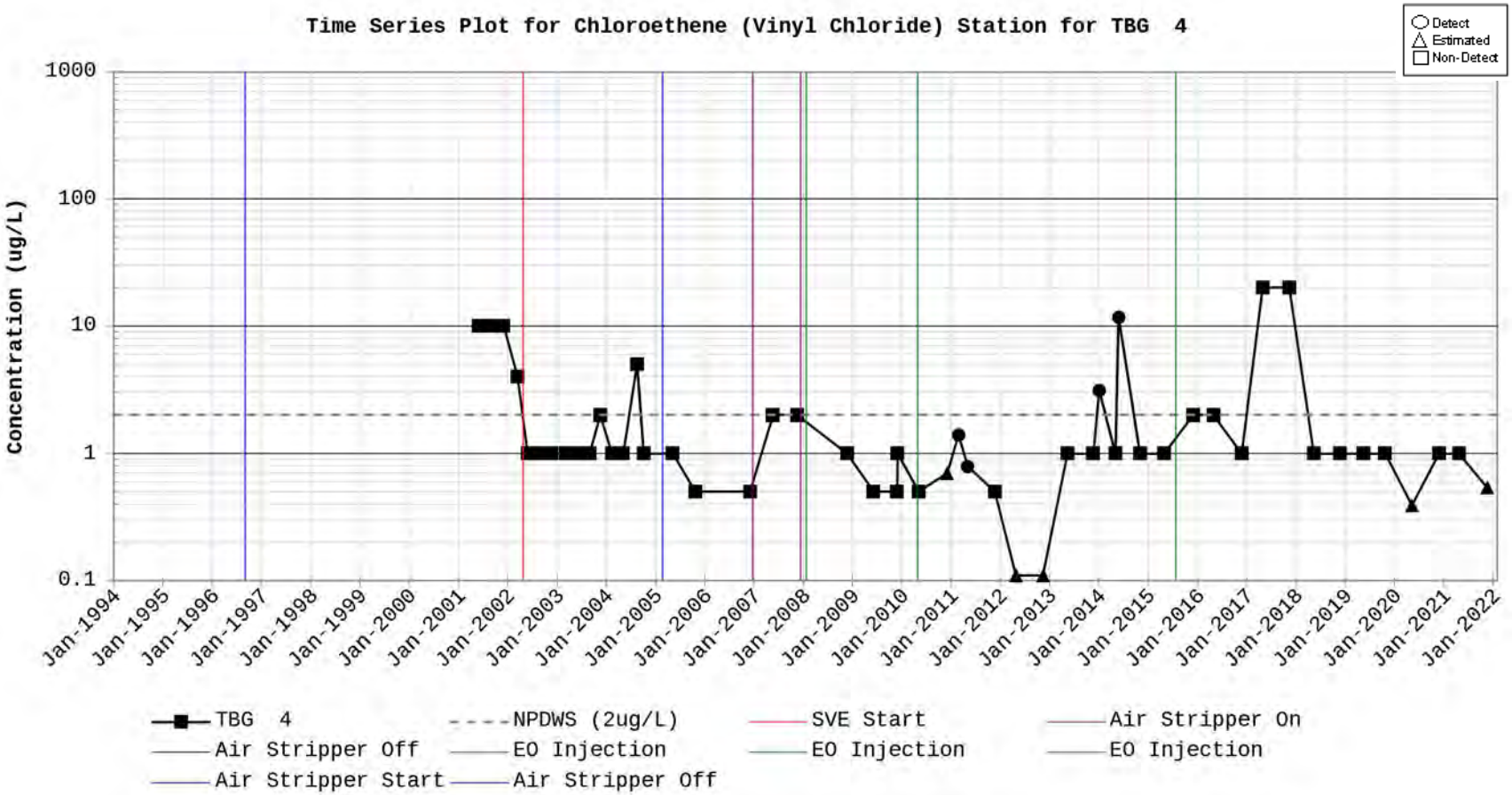

Time Series Plot for ADJUSTED GROSS ALPHA Station for XSB006
Detect
Estimated
Non-Detect
Concentration (pCi/L)
80
70
60
50
40
30
20
10
0
-10
-20
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (15pCi/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

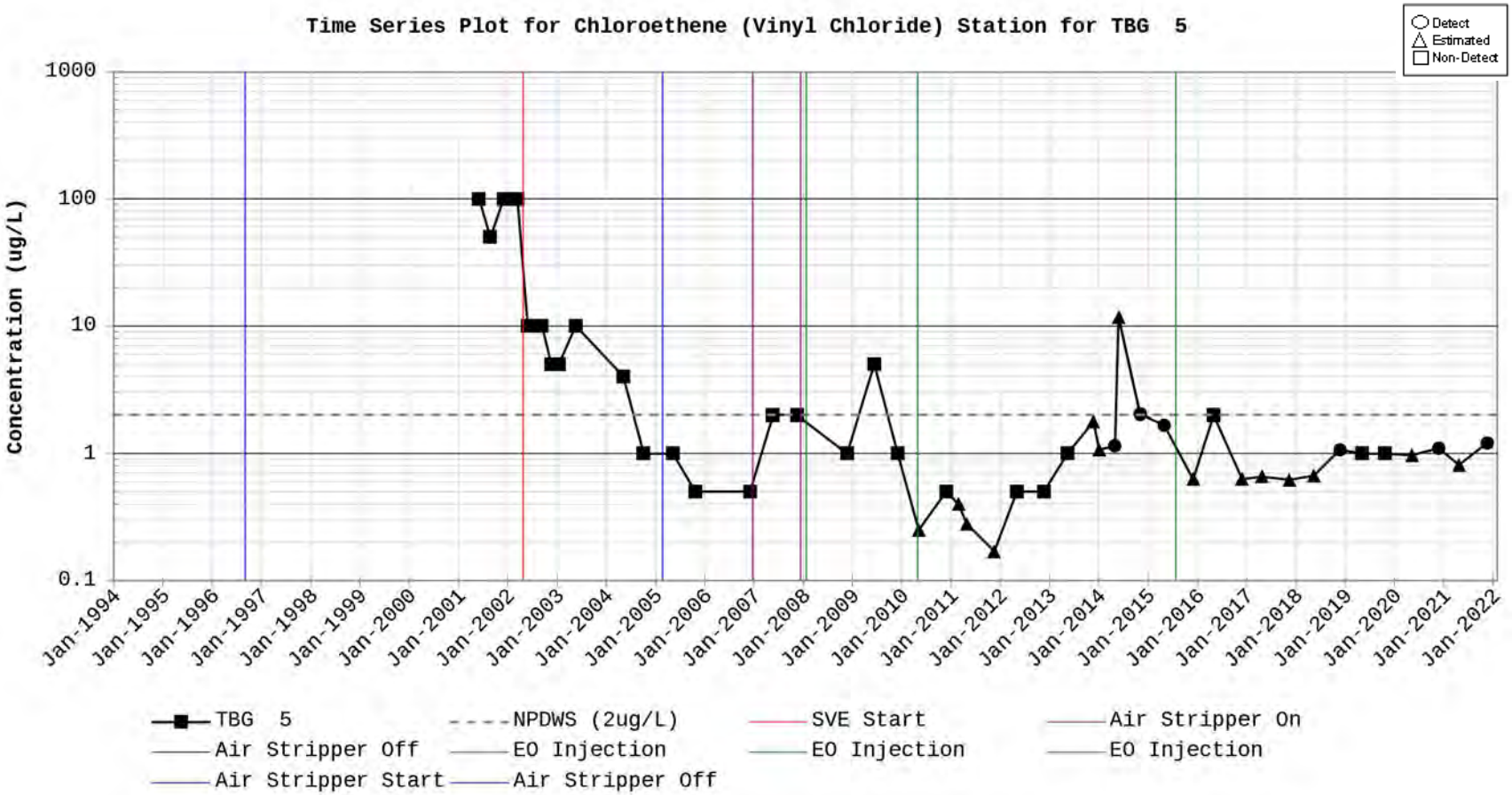

Time Series Plot for Carbon Tetrachloride Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
0.001
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

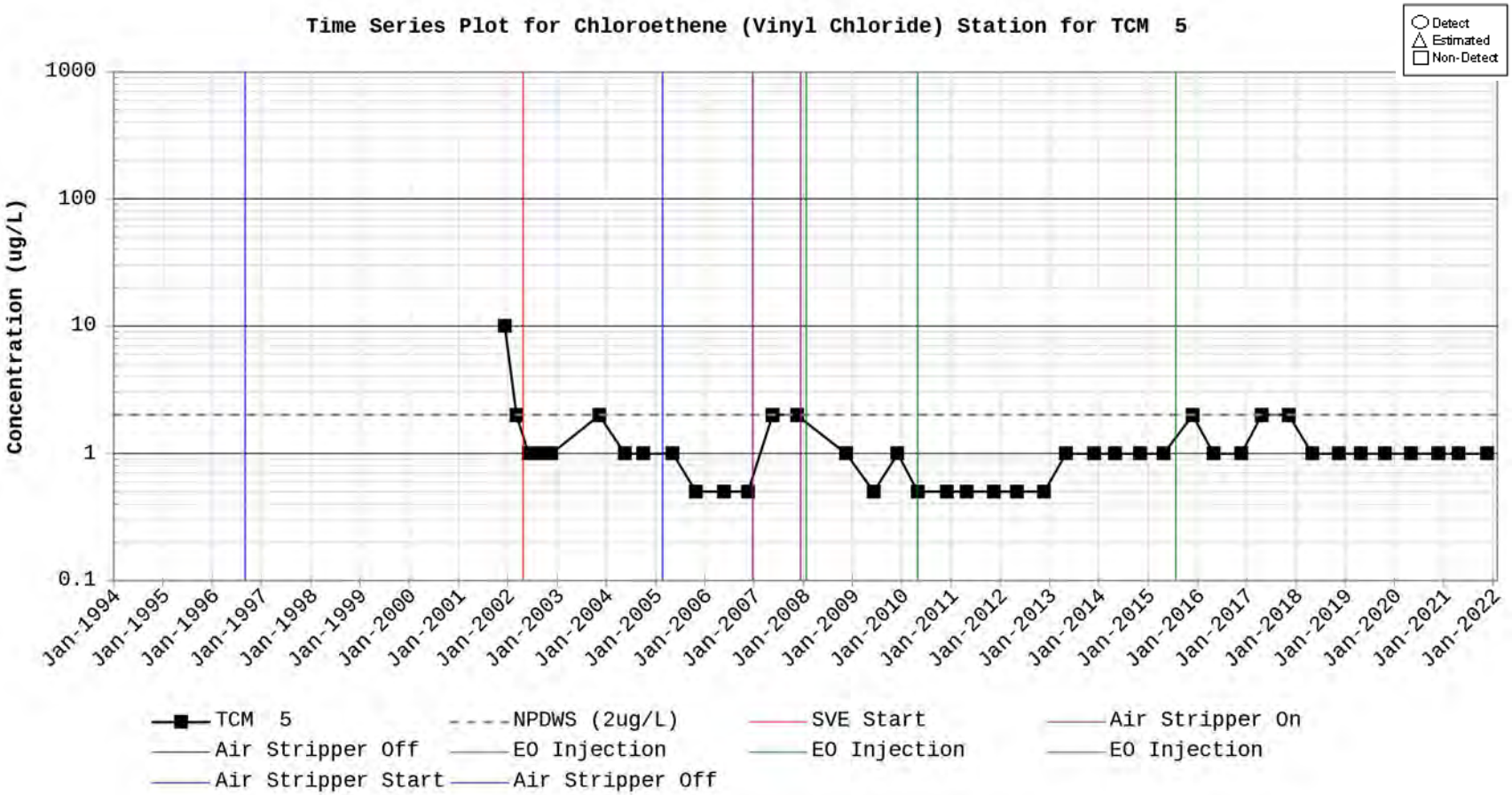

Time Series Plot for Carbon Tetrachloride Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
0.001
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

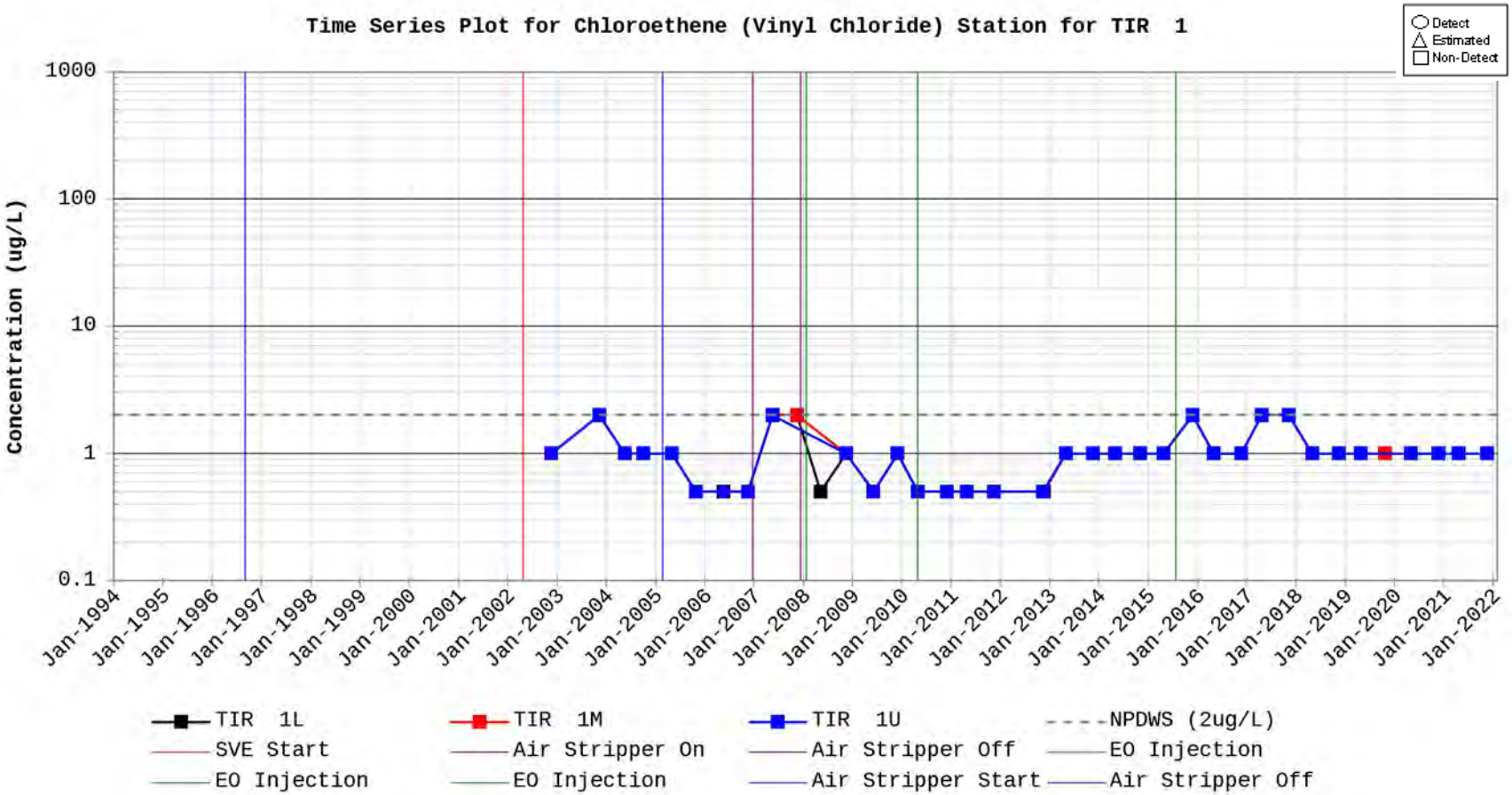

Time Series Plot for Chloroethene (Vinyl Chloride) Station for P 26
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
P 26A
P 26B
P 26D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

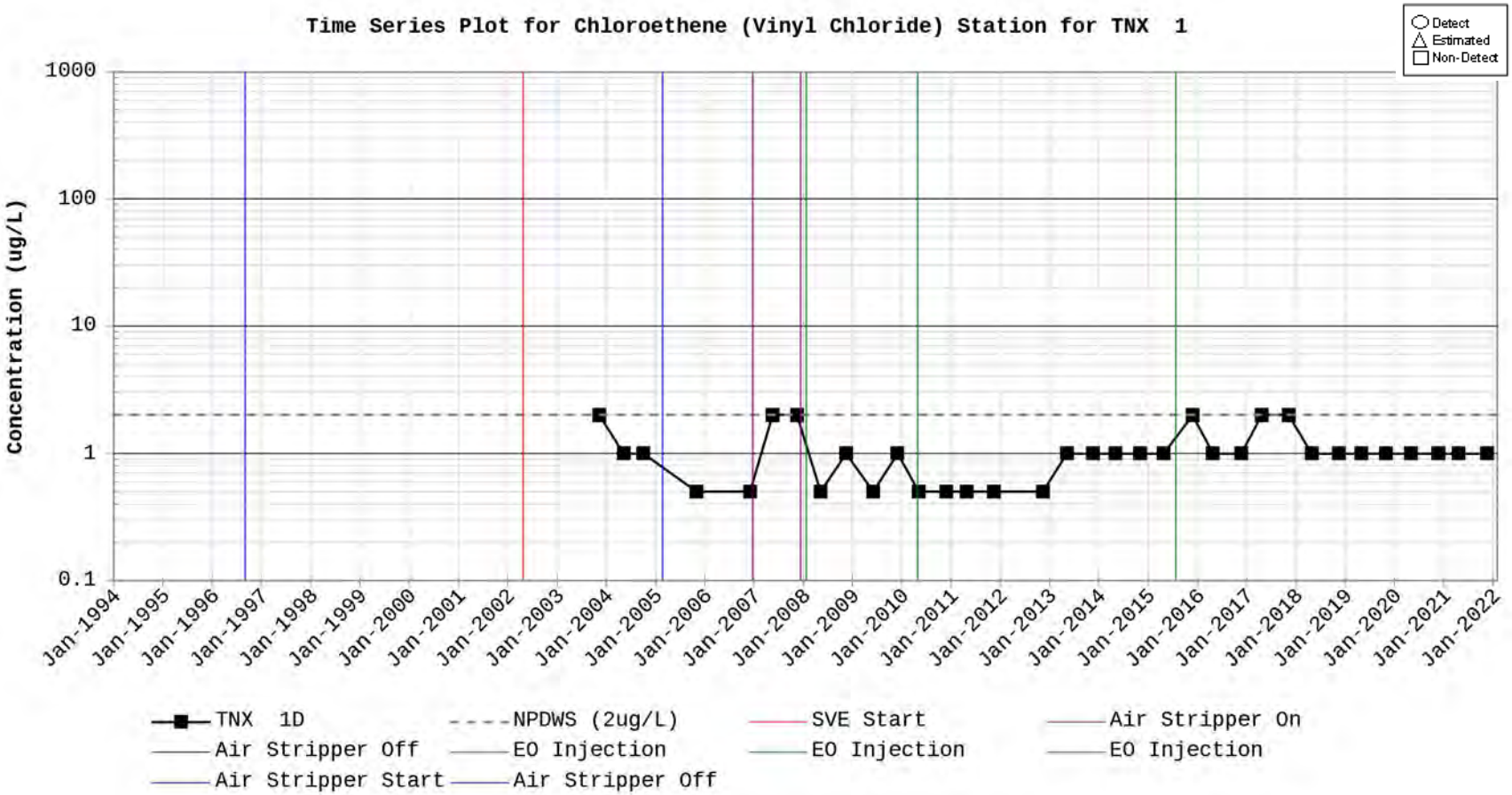

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

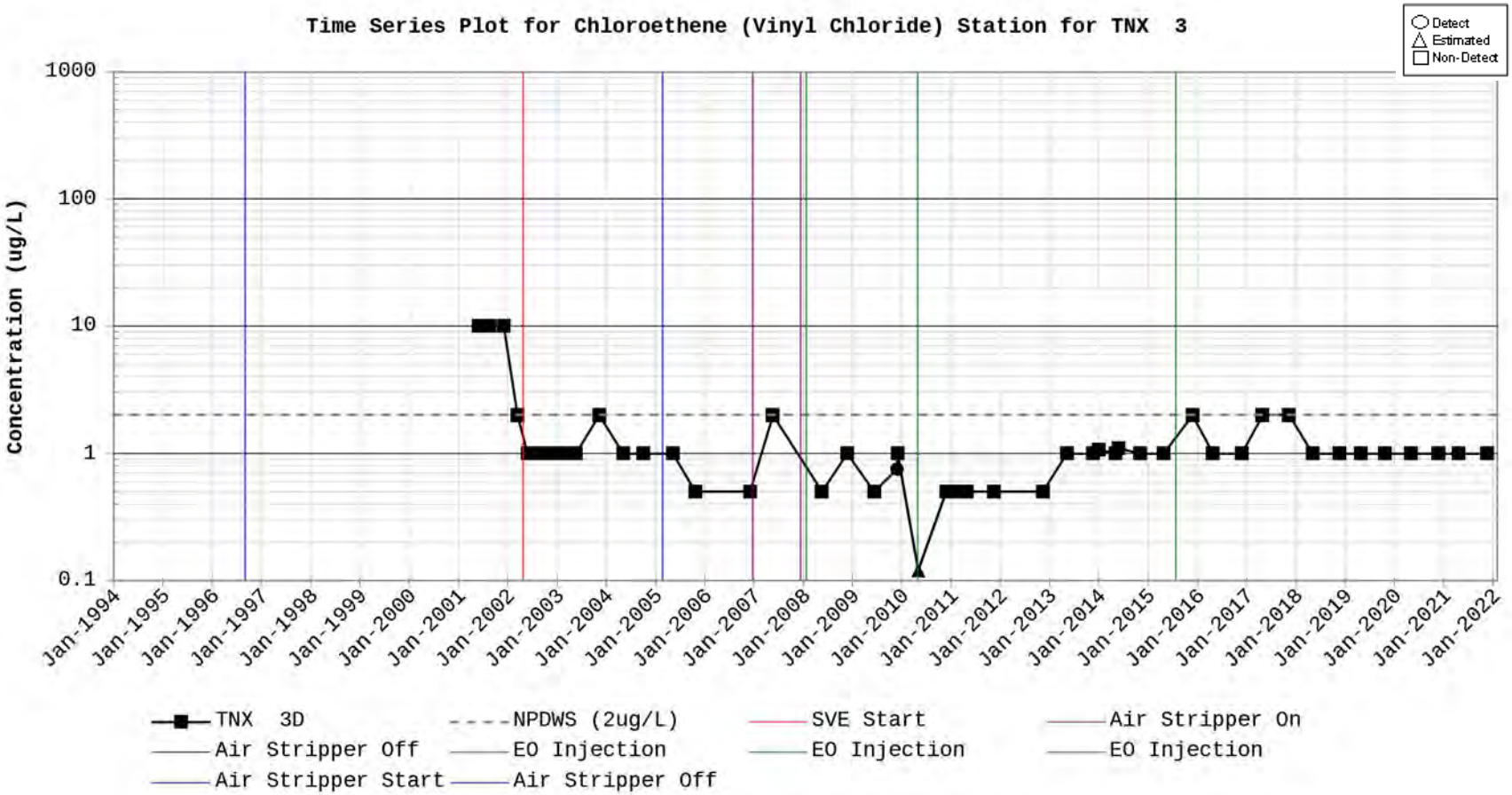

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

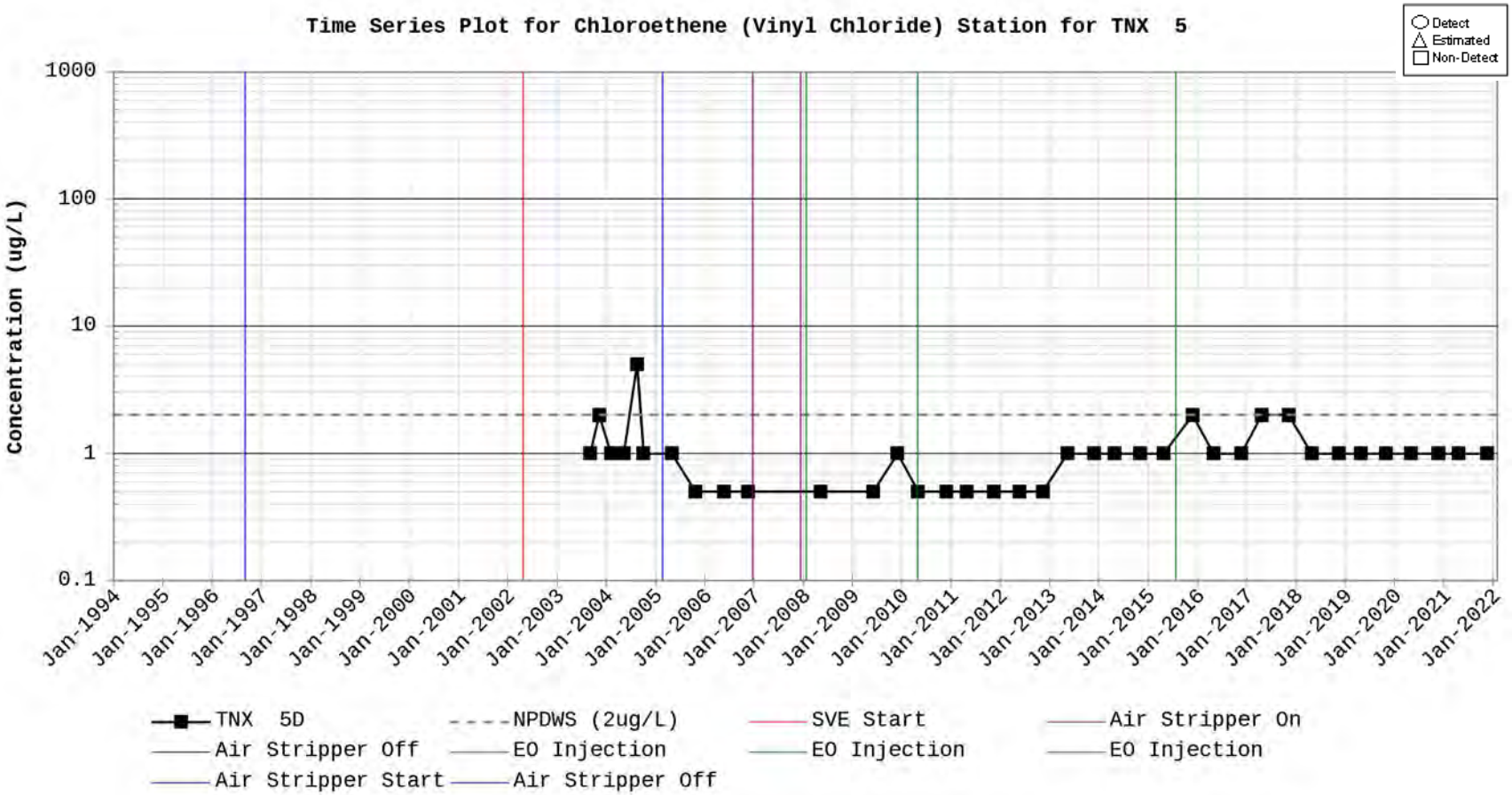

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

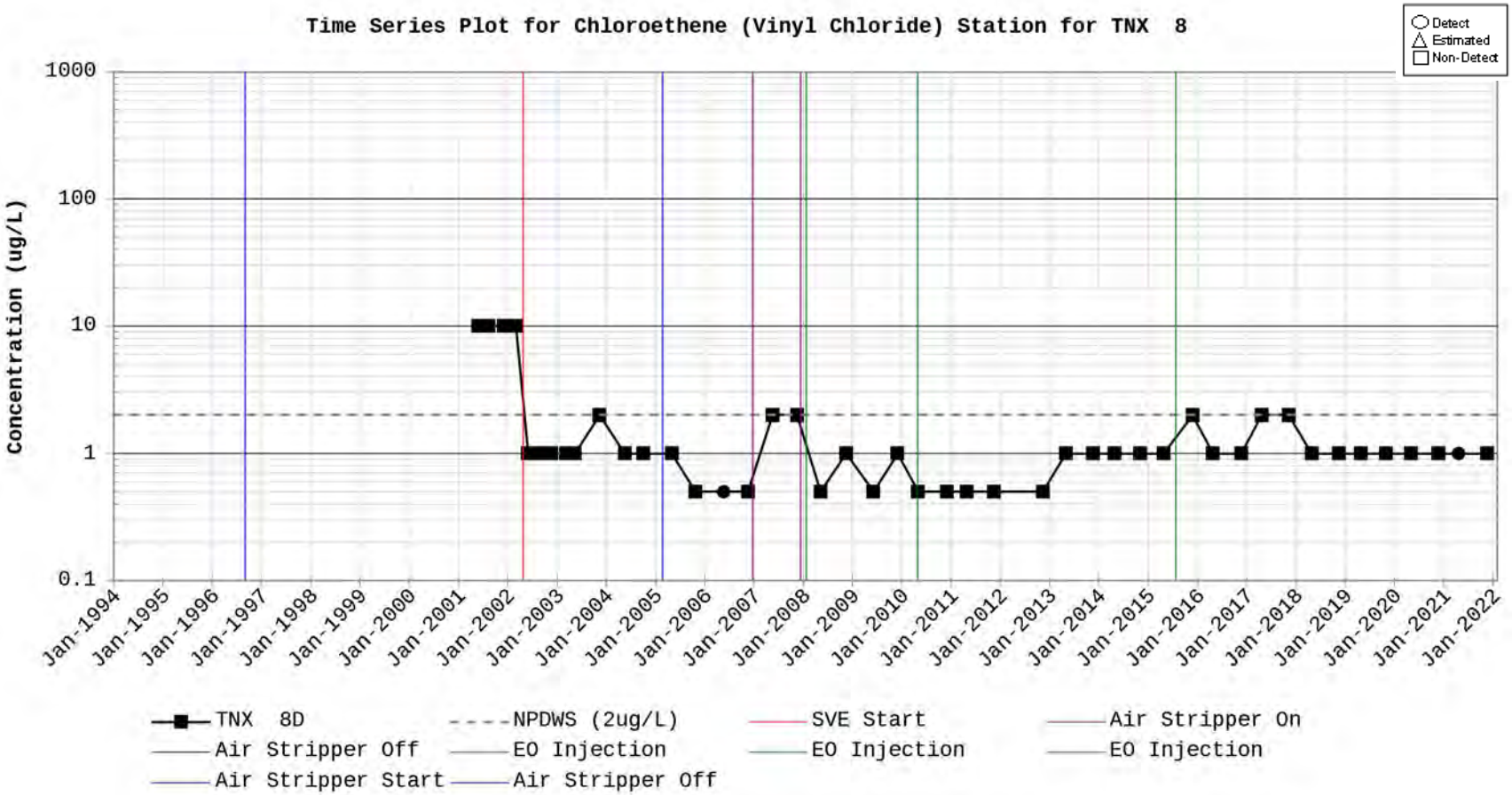

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TCM 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

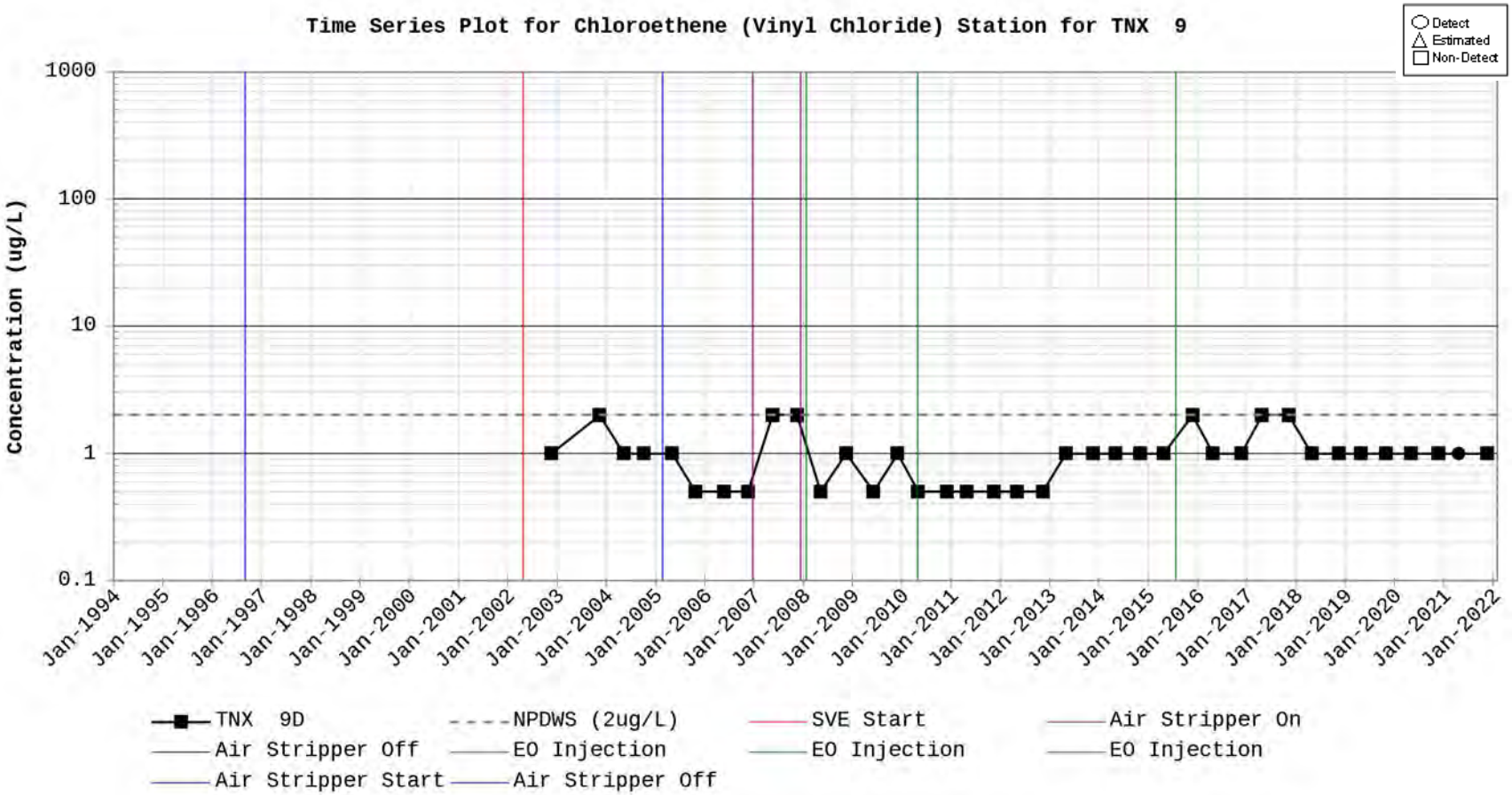

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TIR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
TIR 1M
TIR 1U
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

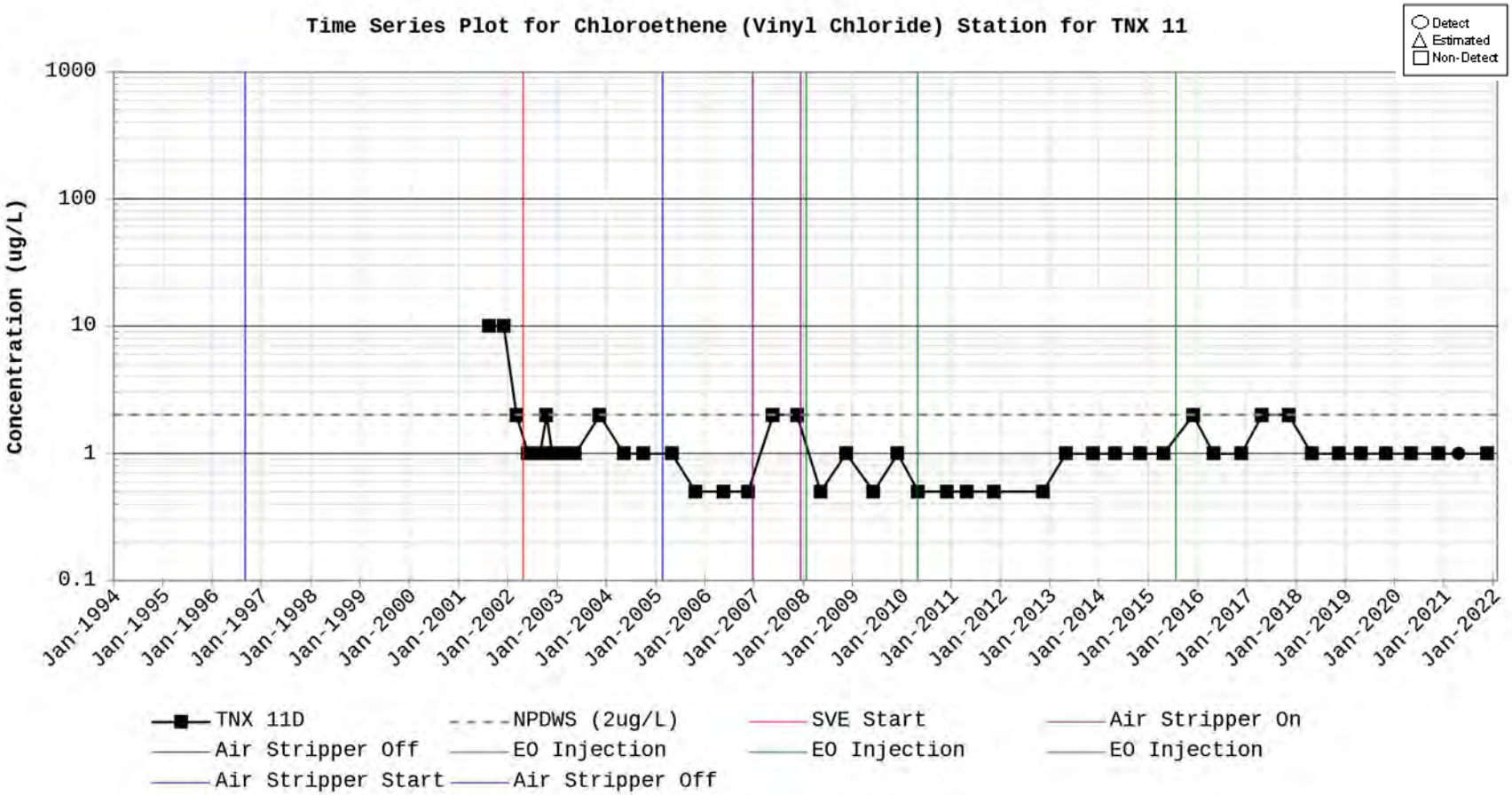

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 1D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

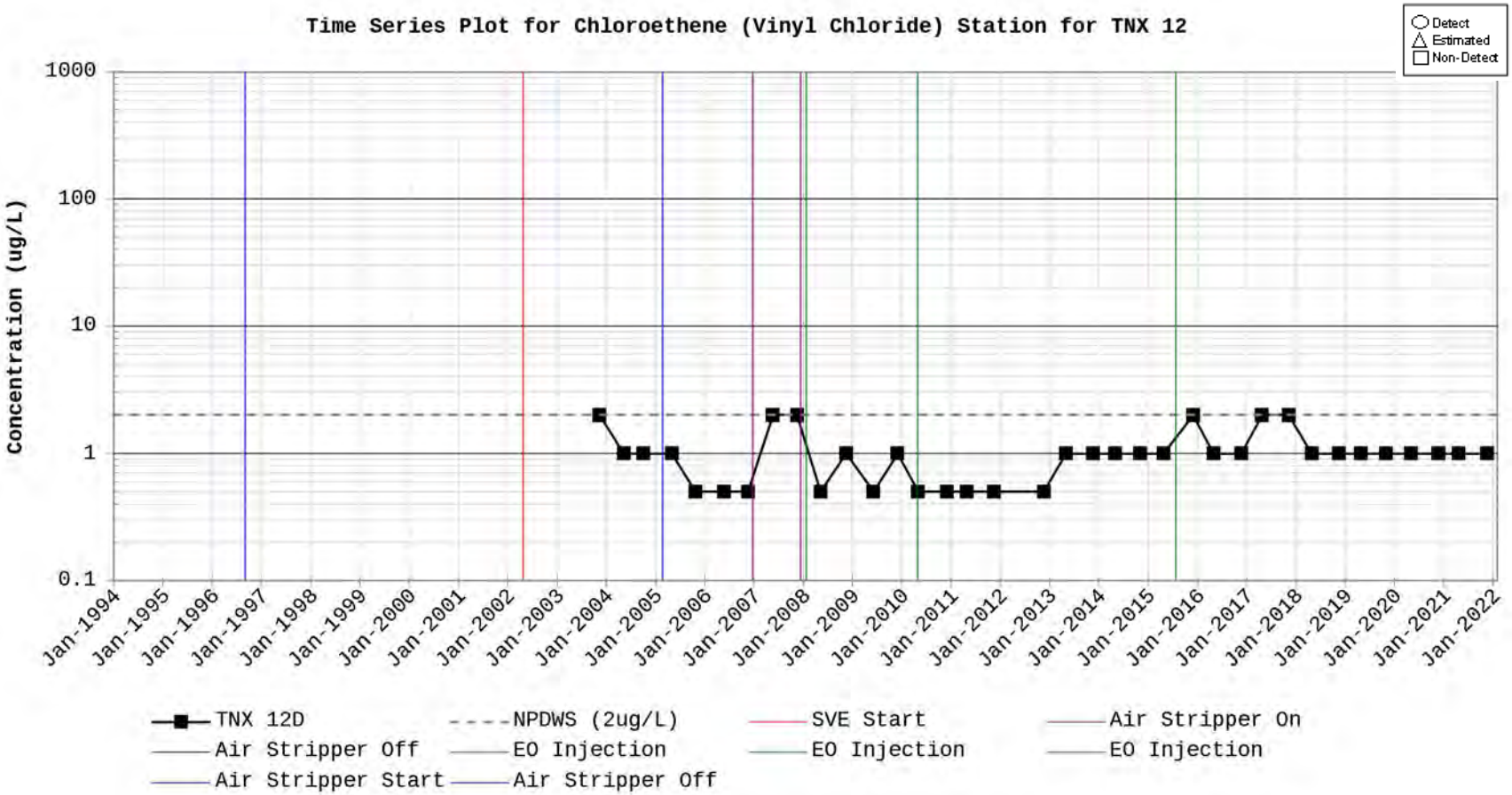

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

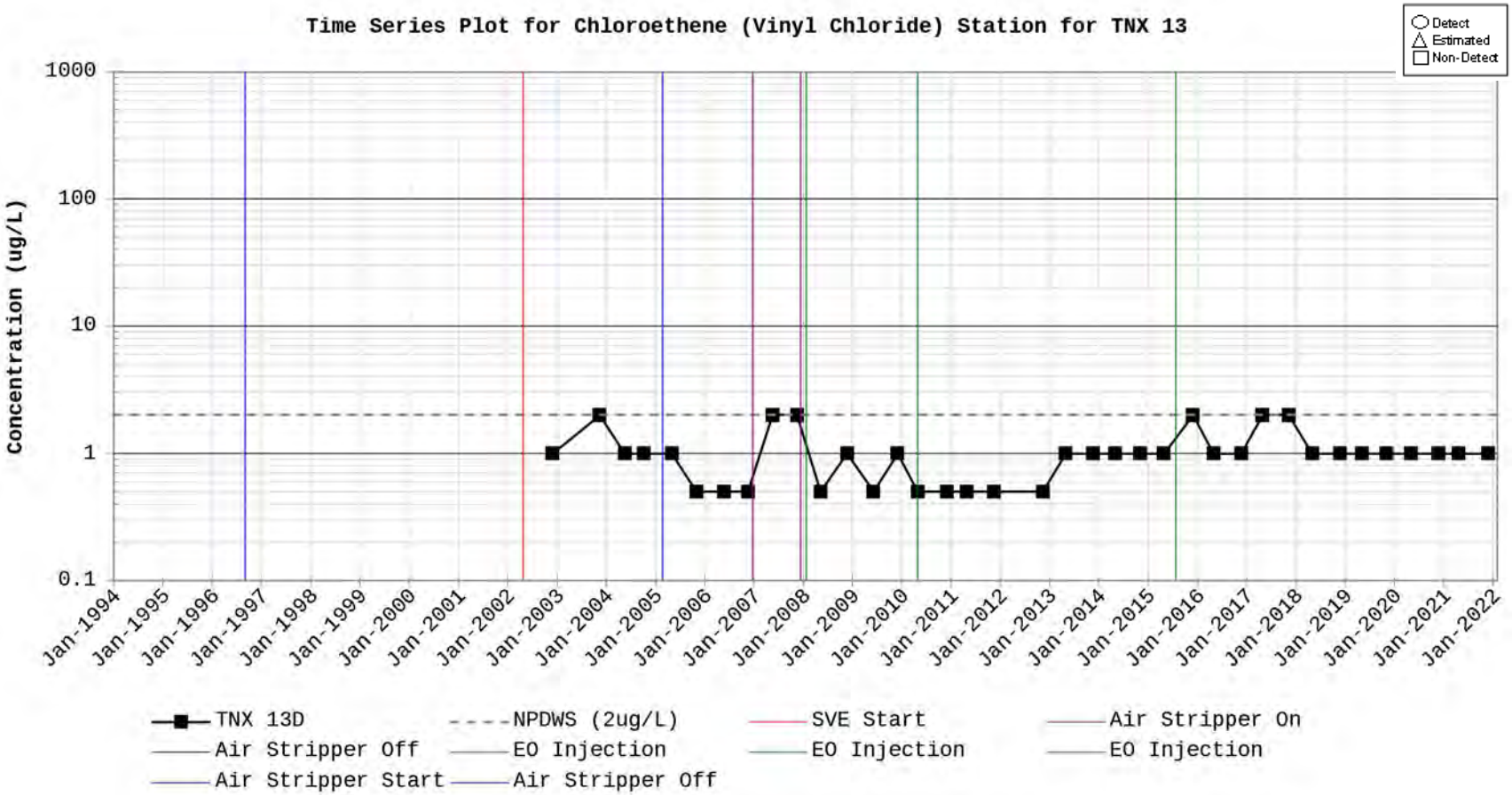

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

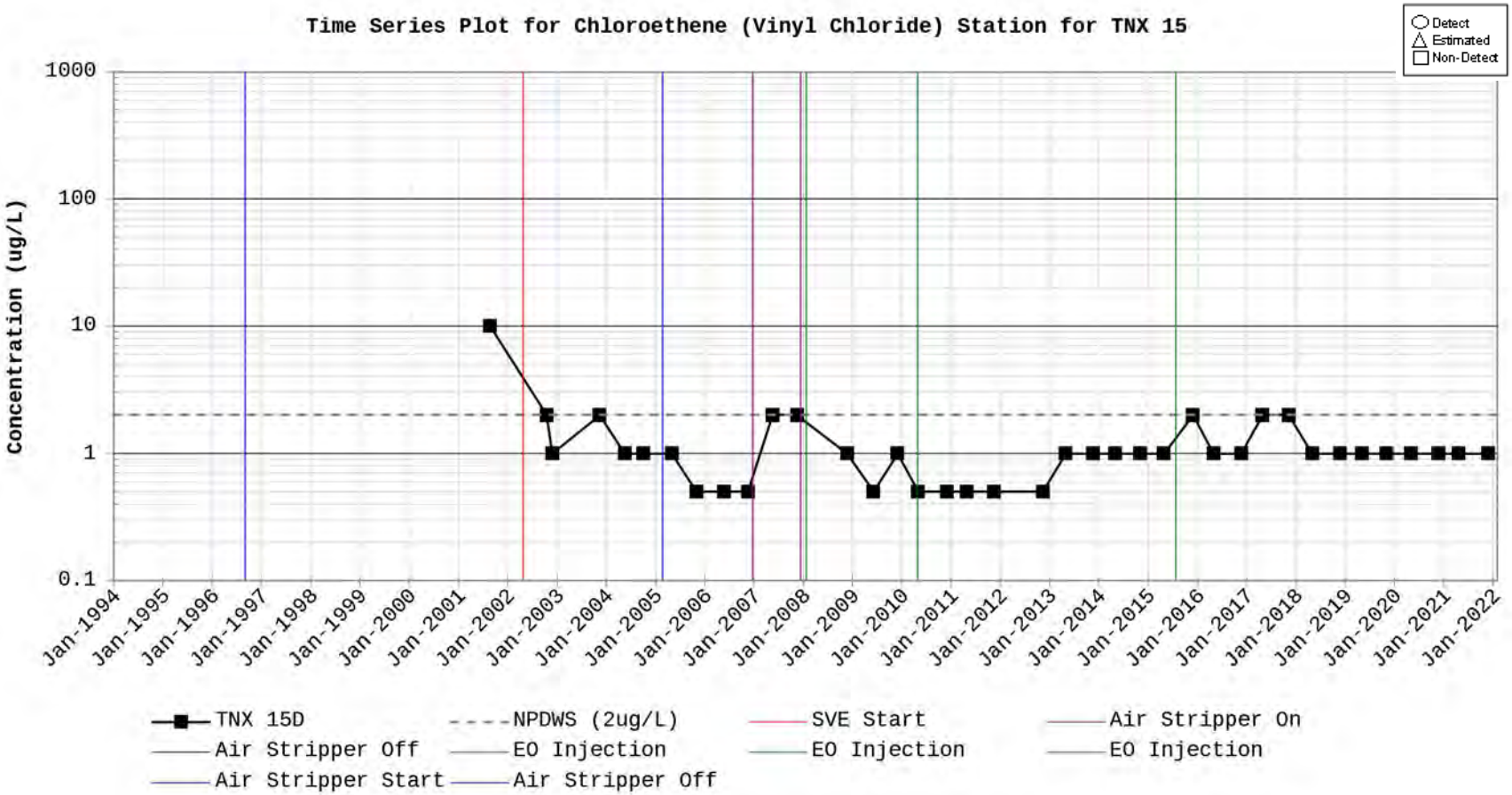

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 8
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

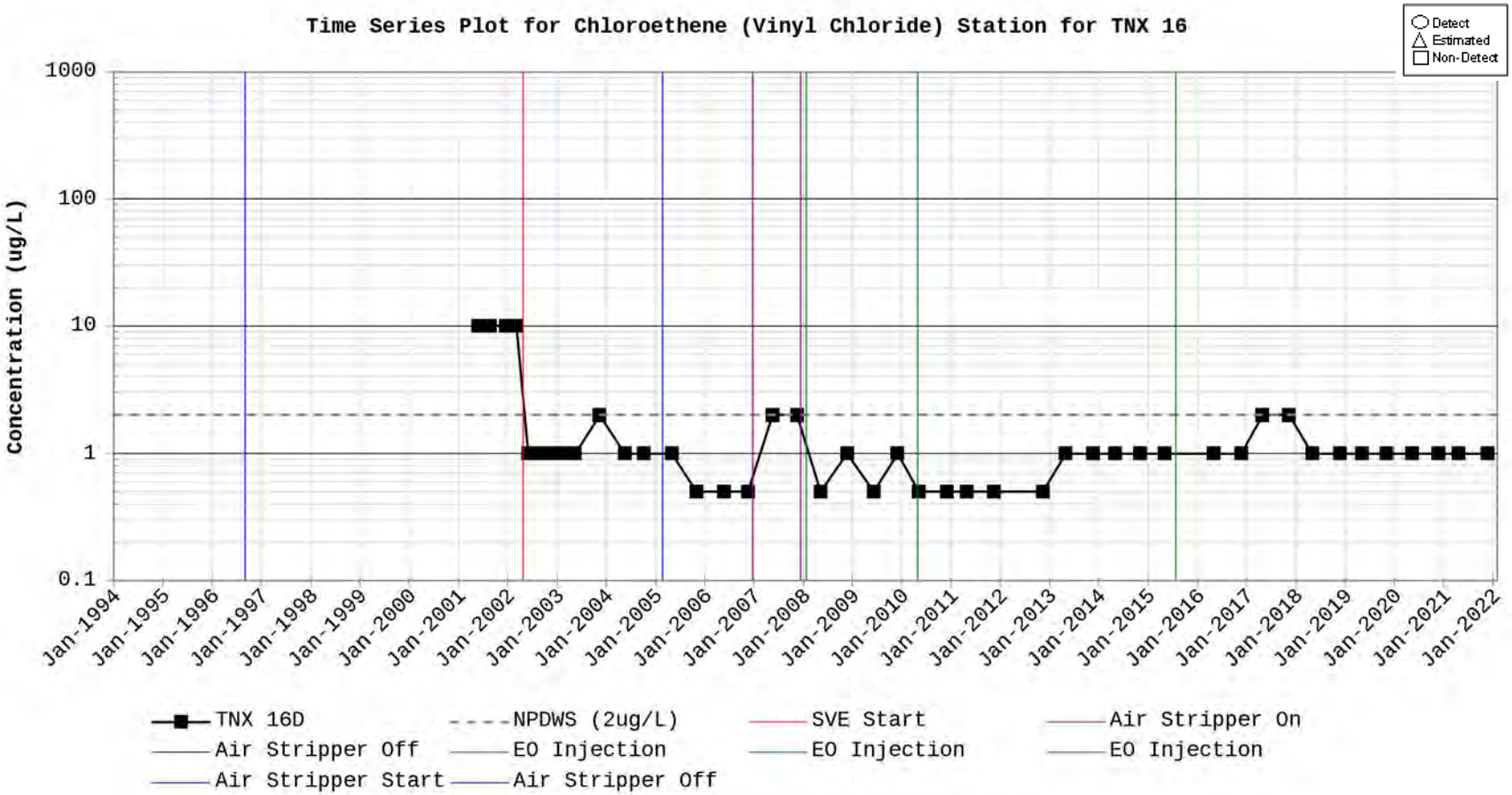

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 9
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 9D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

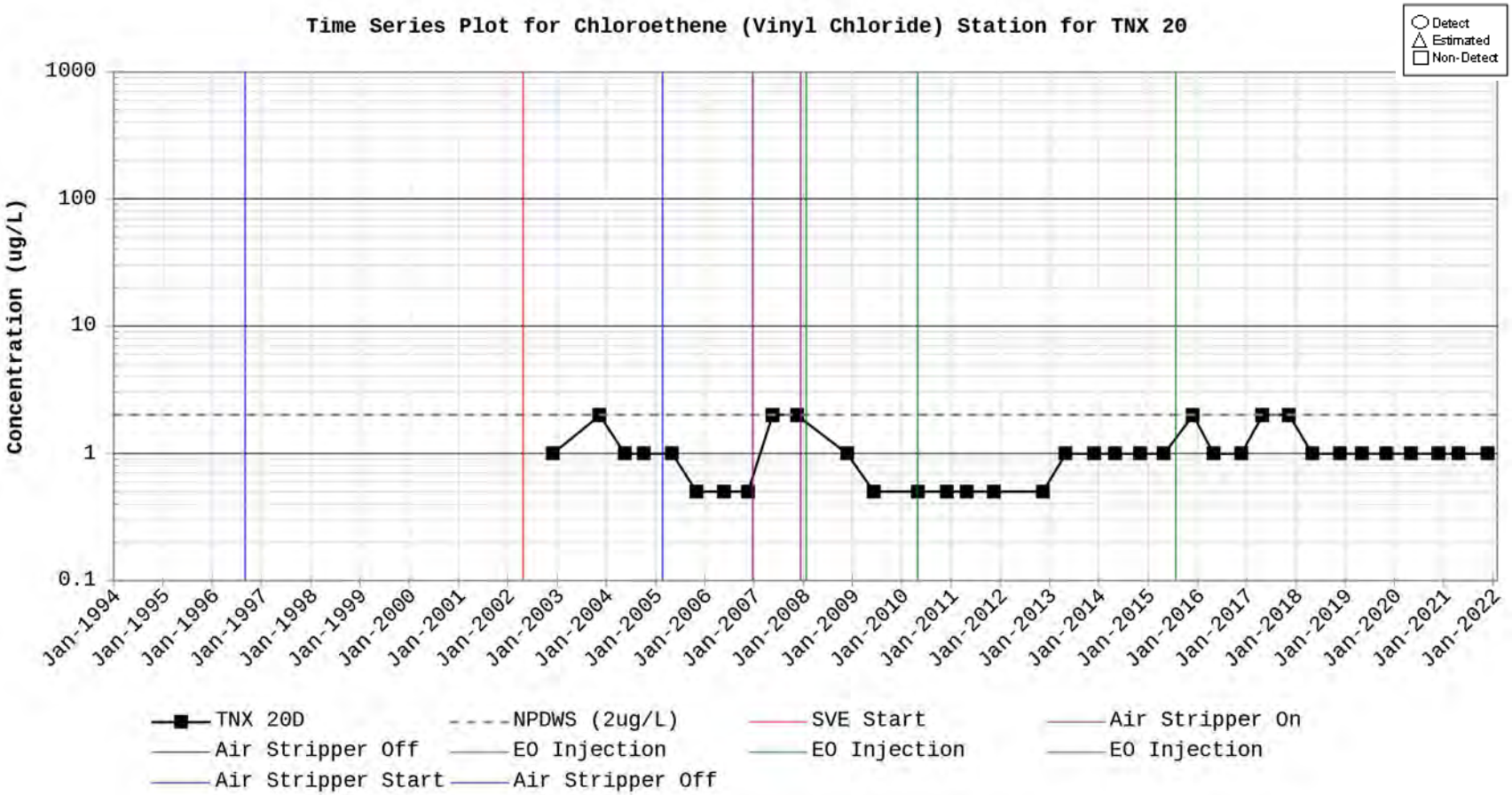

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 11
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

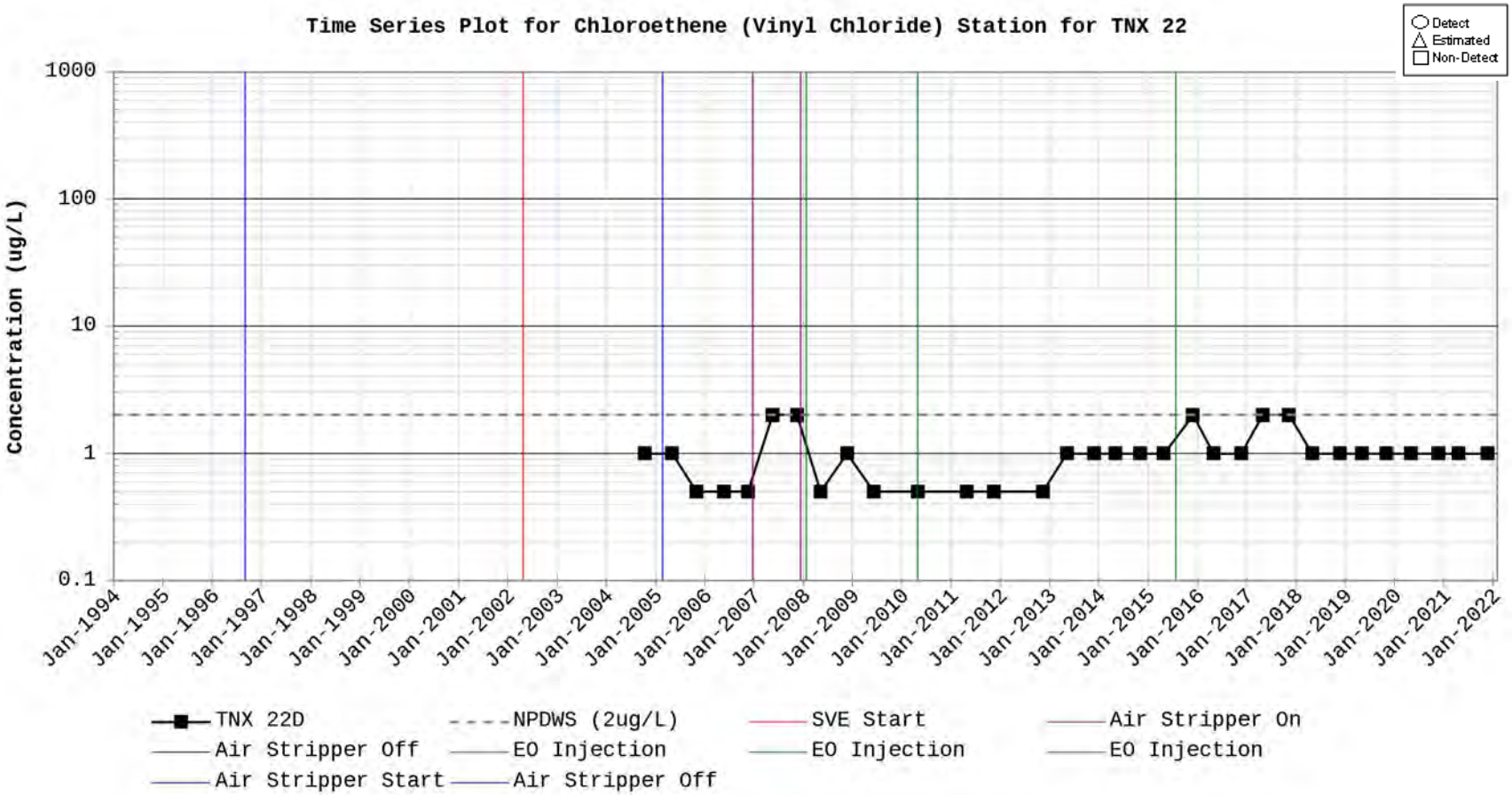

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 12
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 12D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

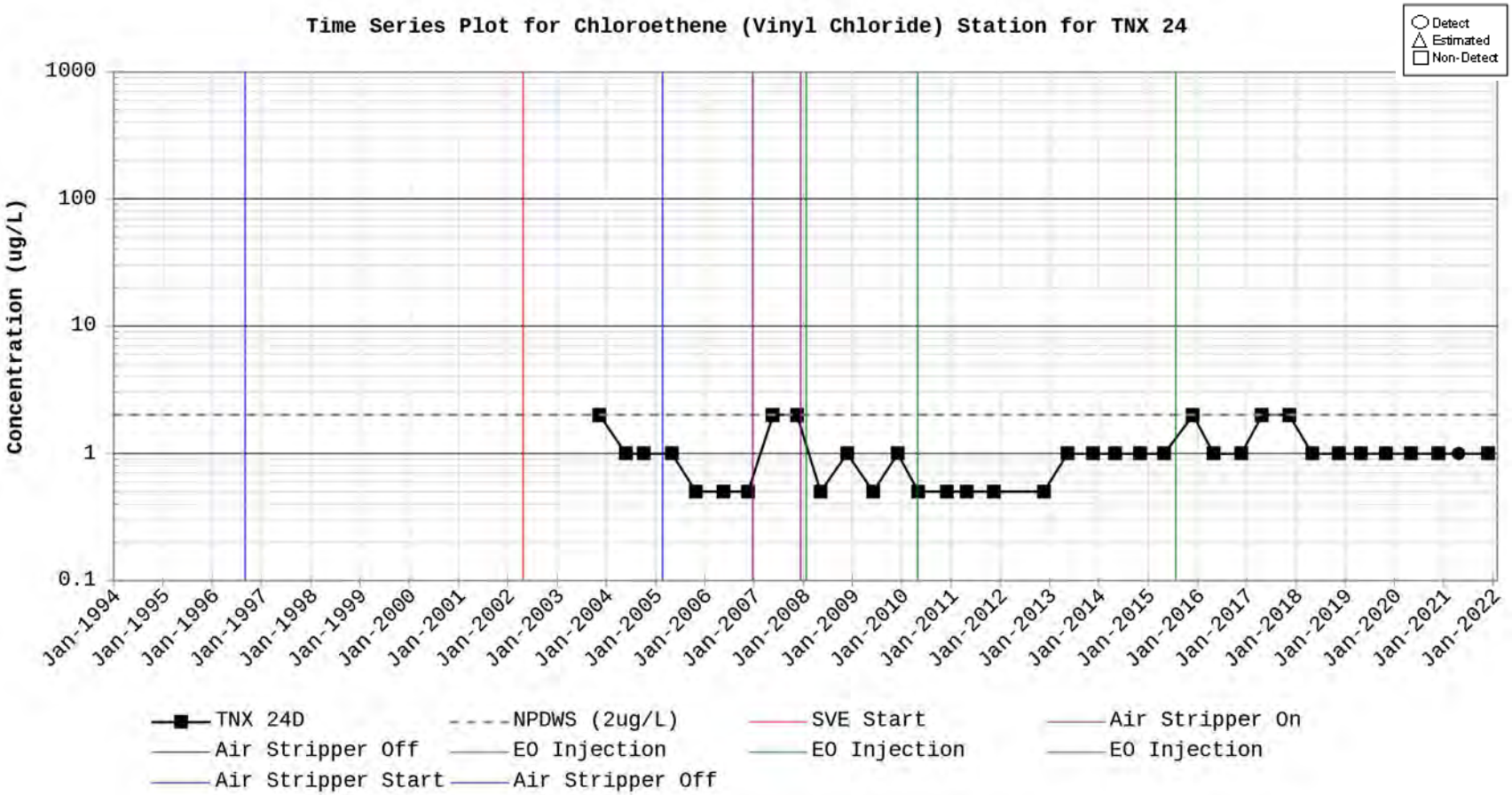

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 13
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

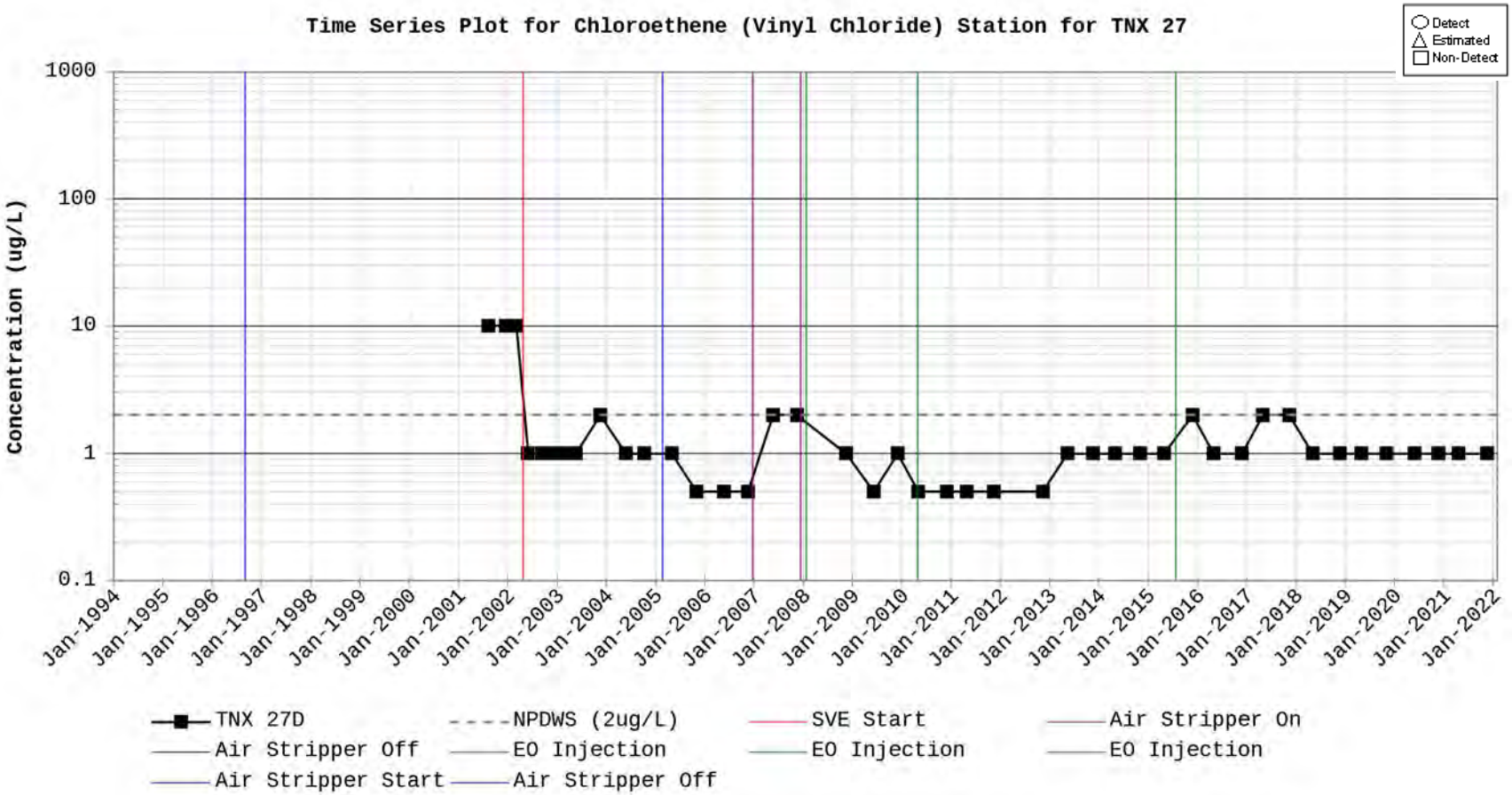

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 15
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 15D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

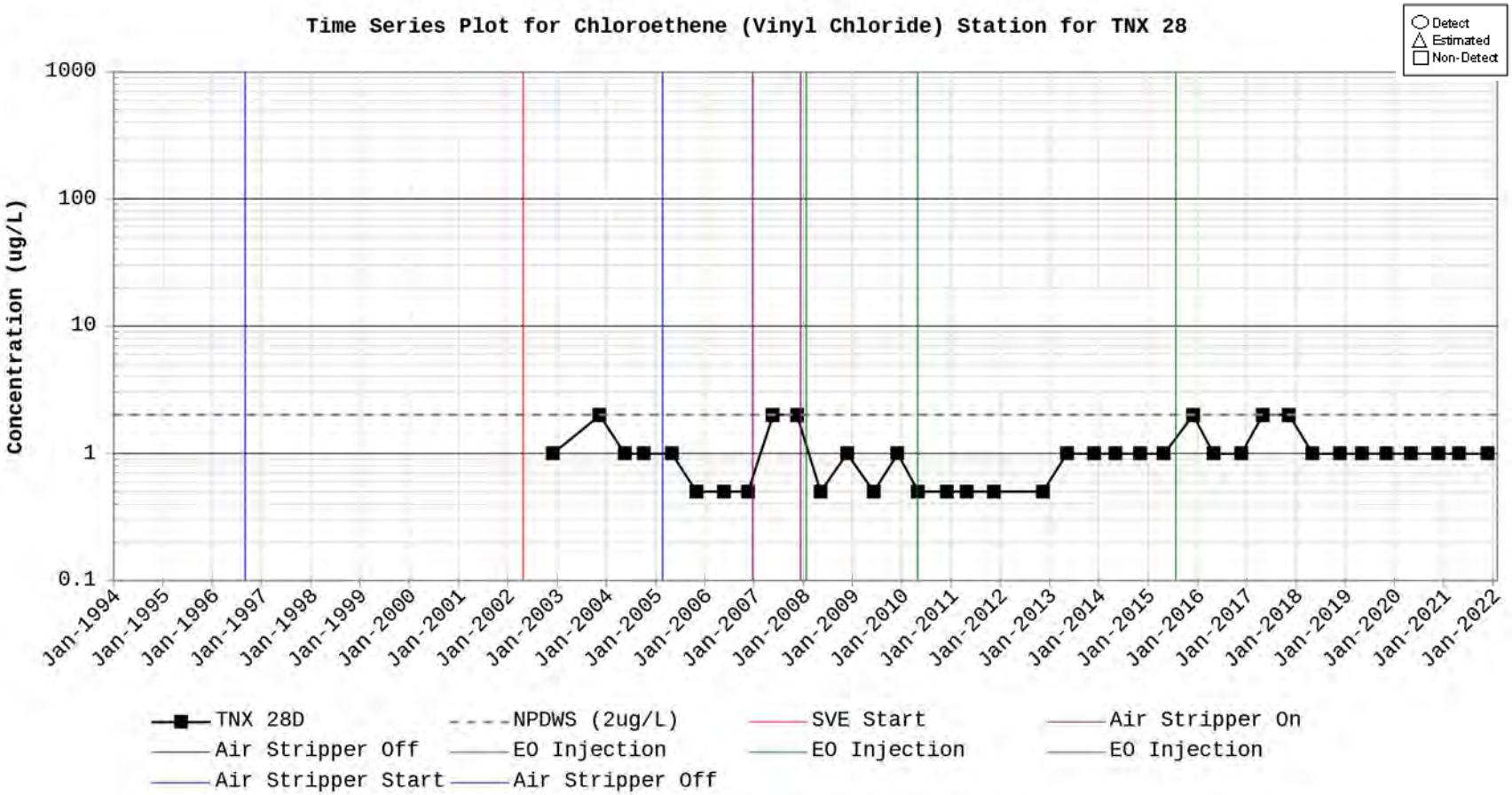

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 16
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 16D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

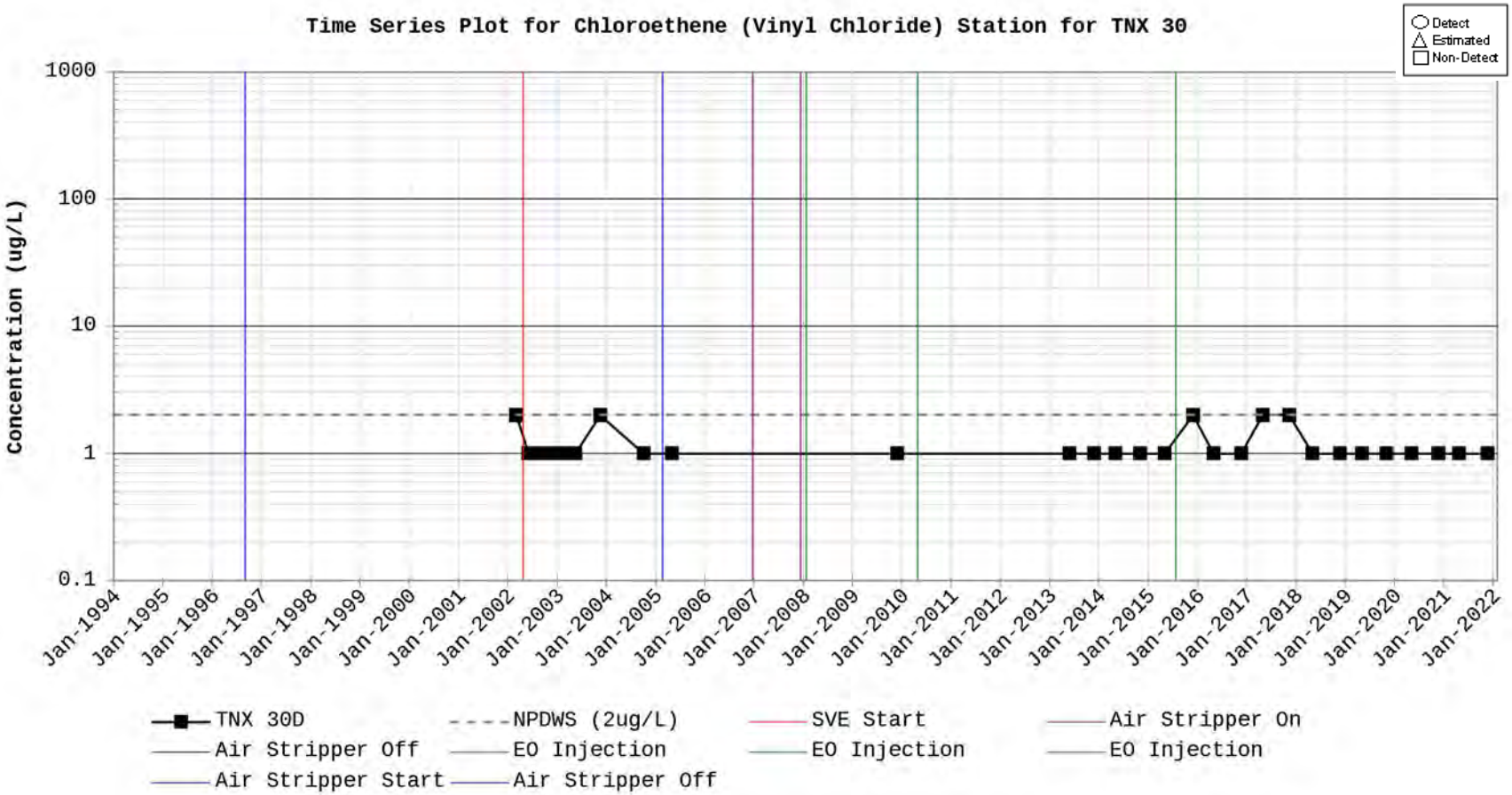

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 20
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 20D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

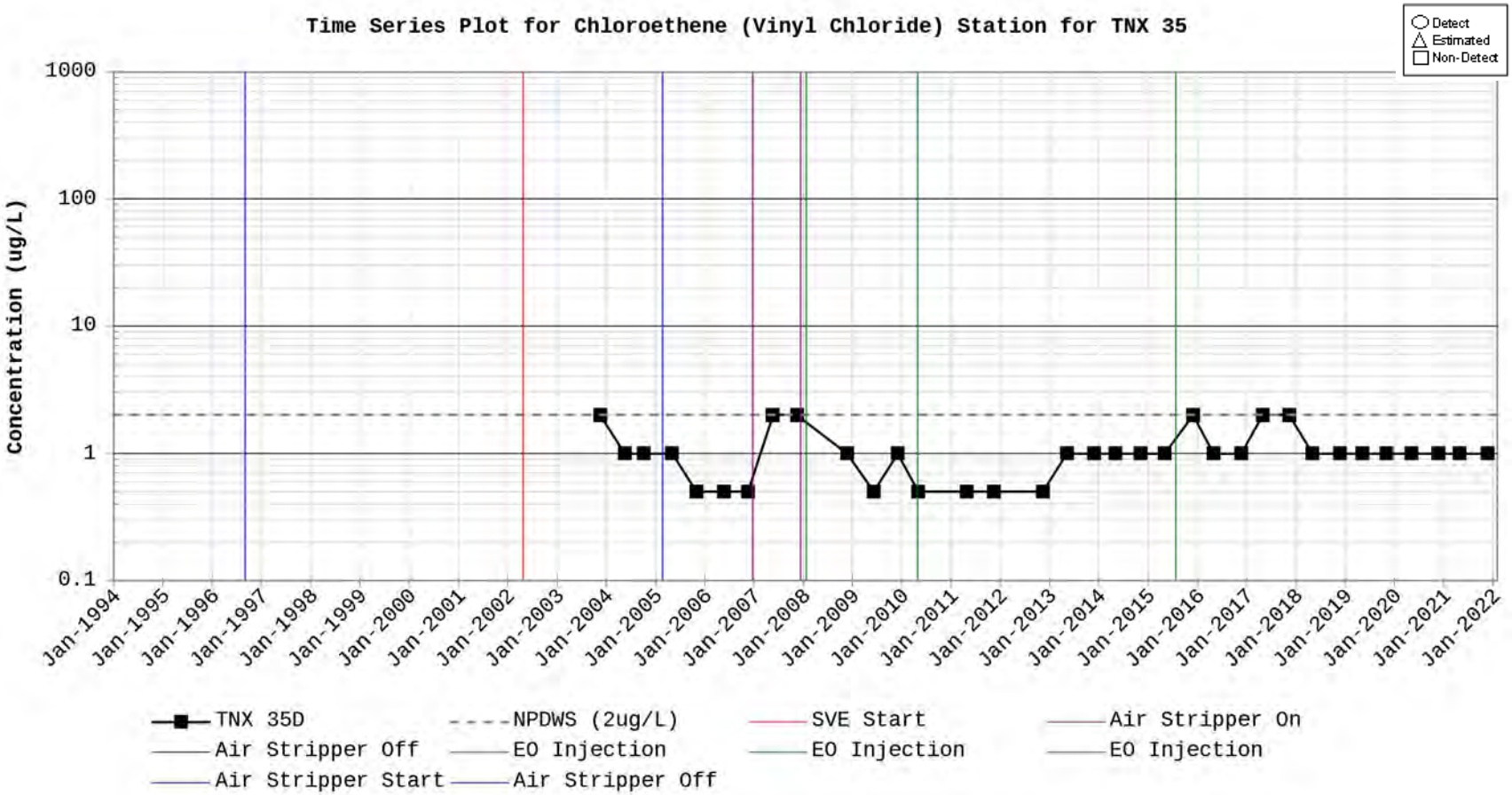

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 22
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 22D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

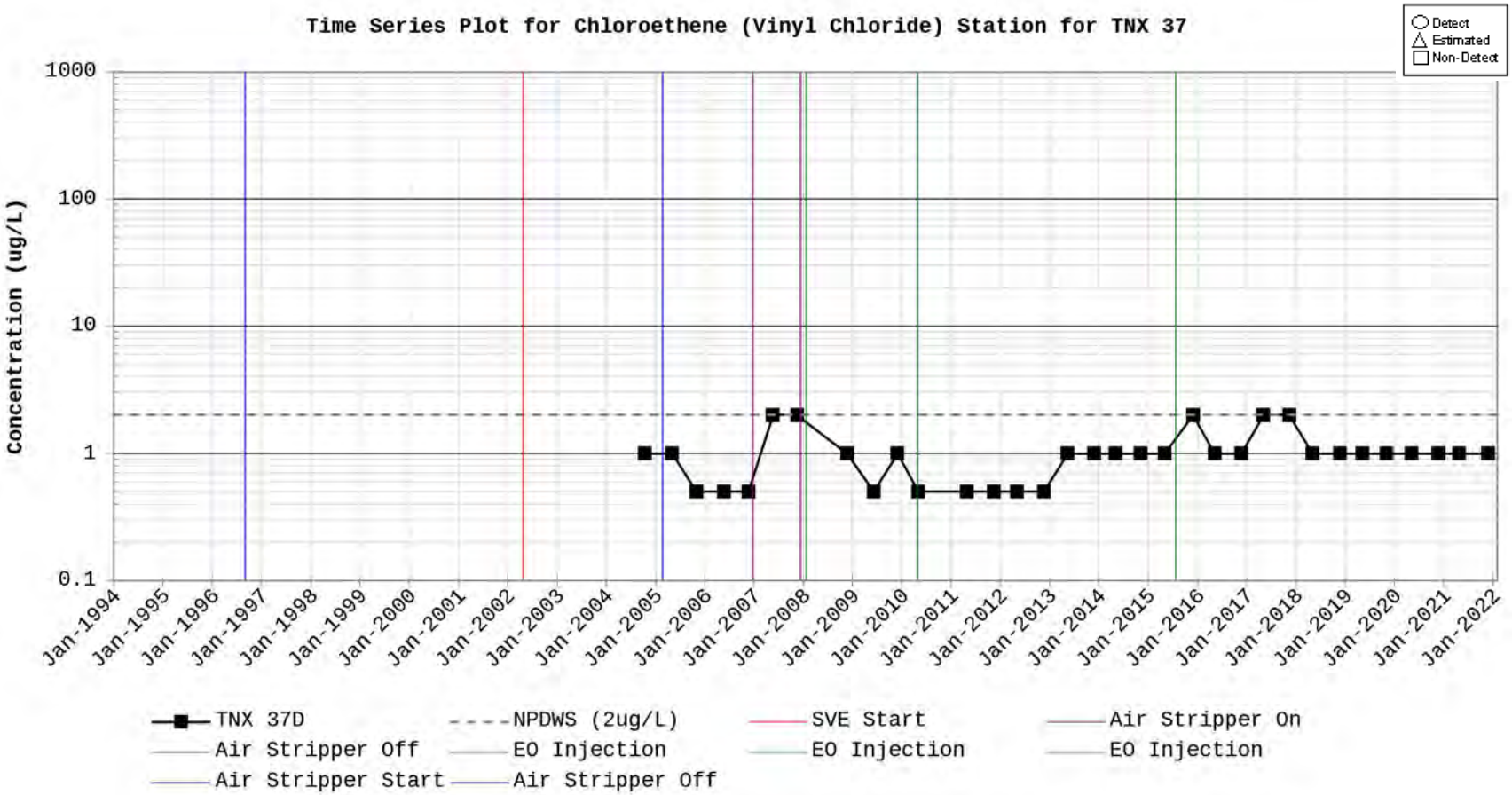

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 24
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 24D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

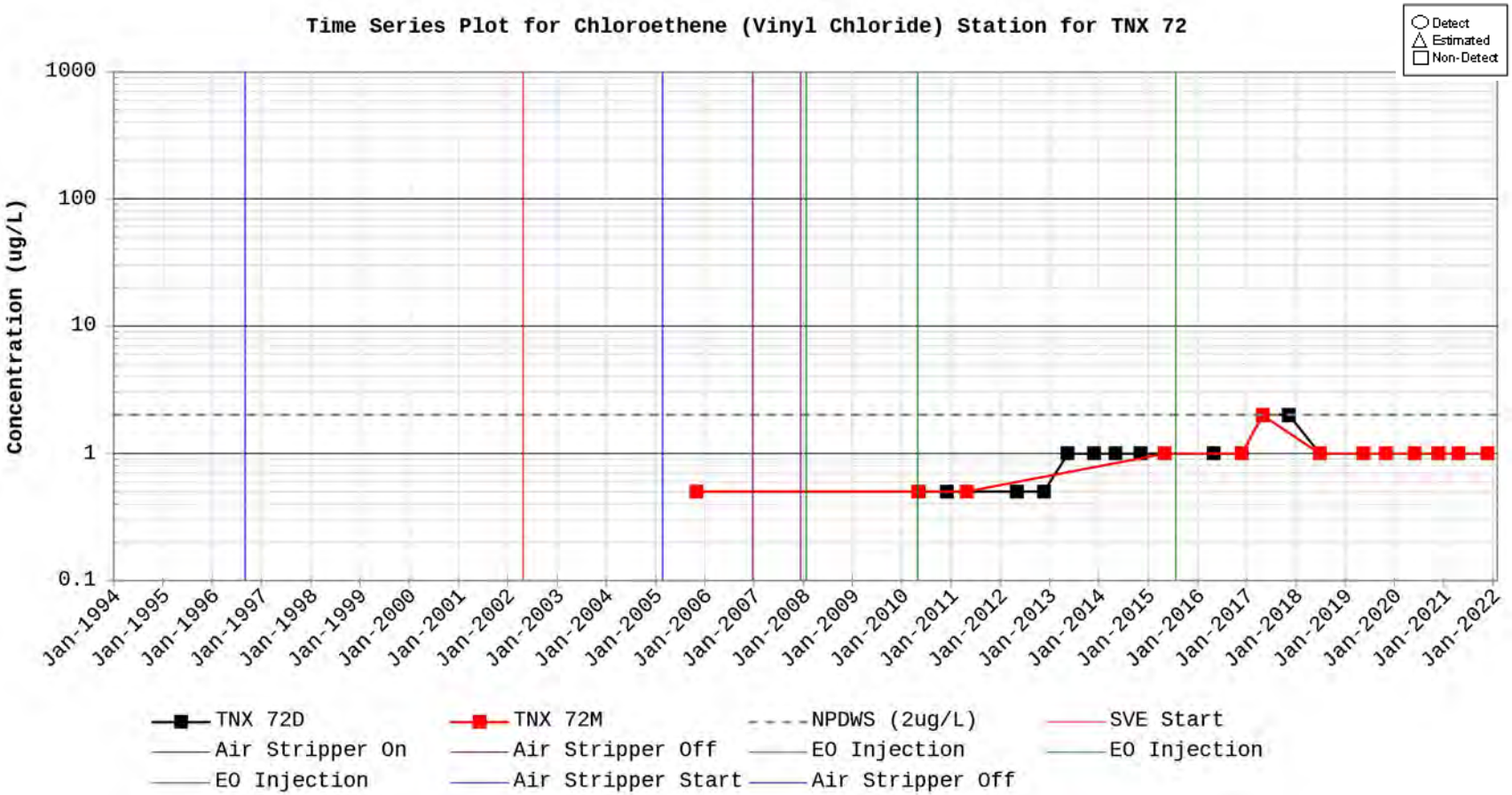

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 27
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

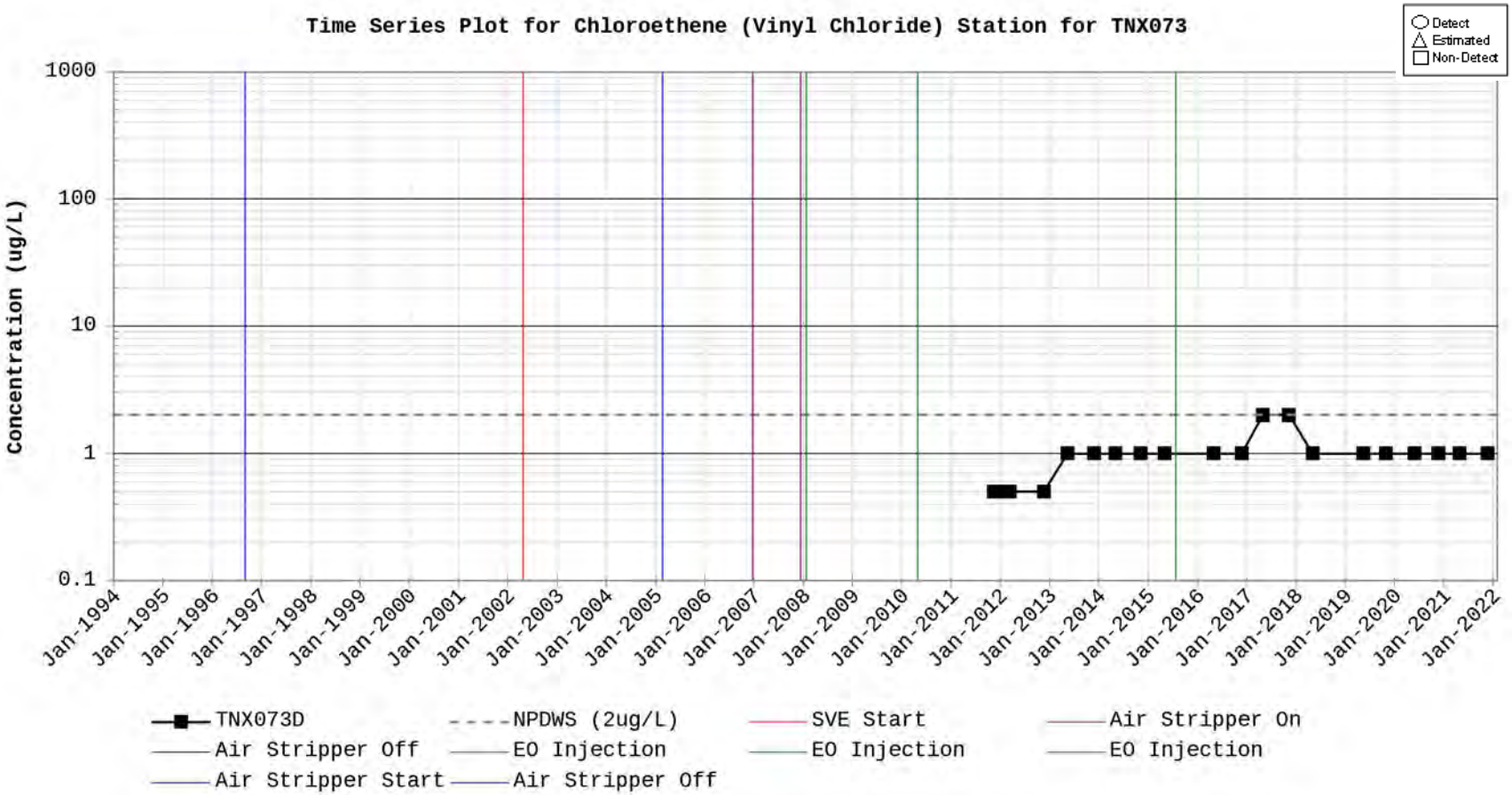

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 28
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

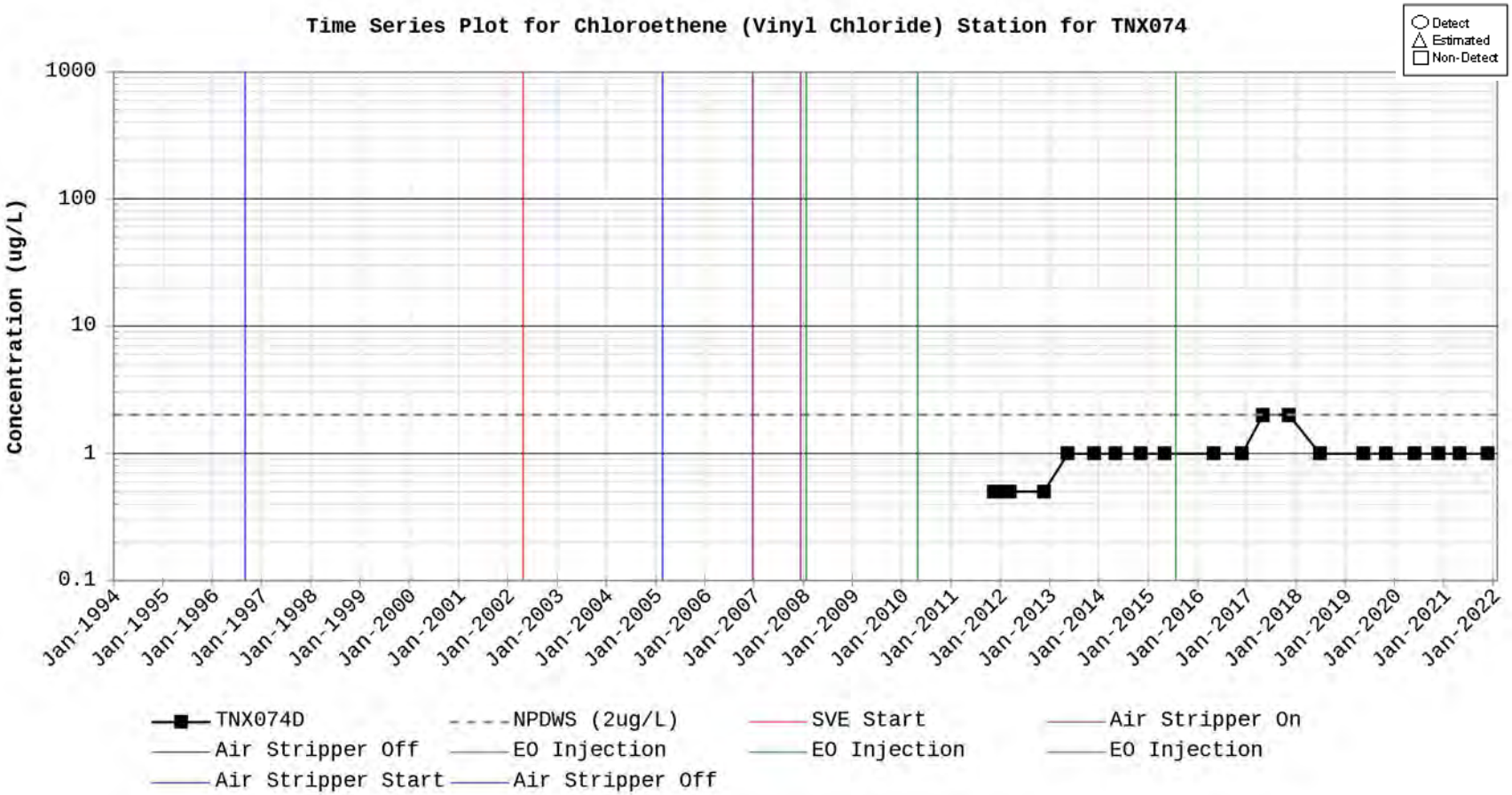

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 30
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

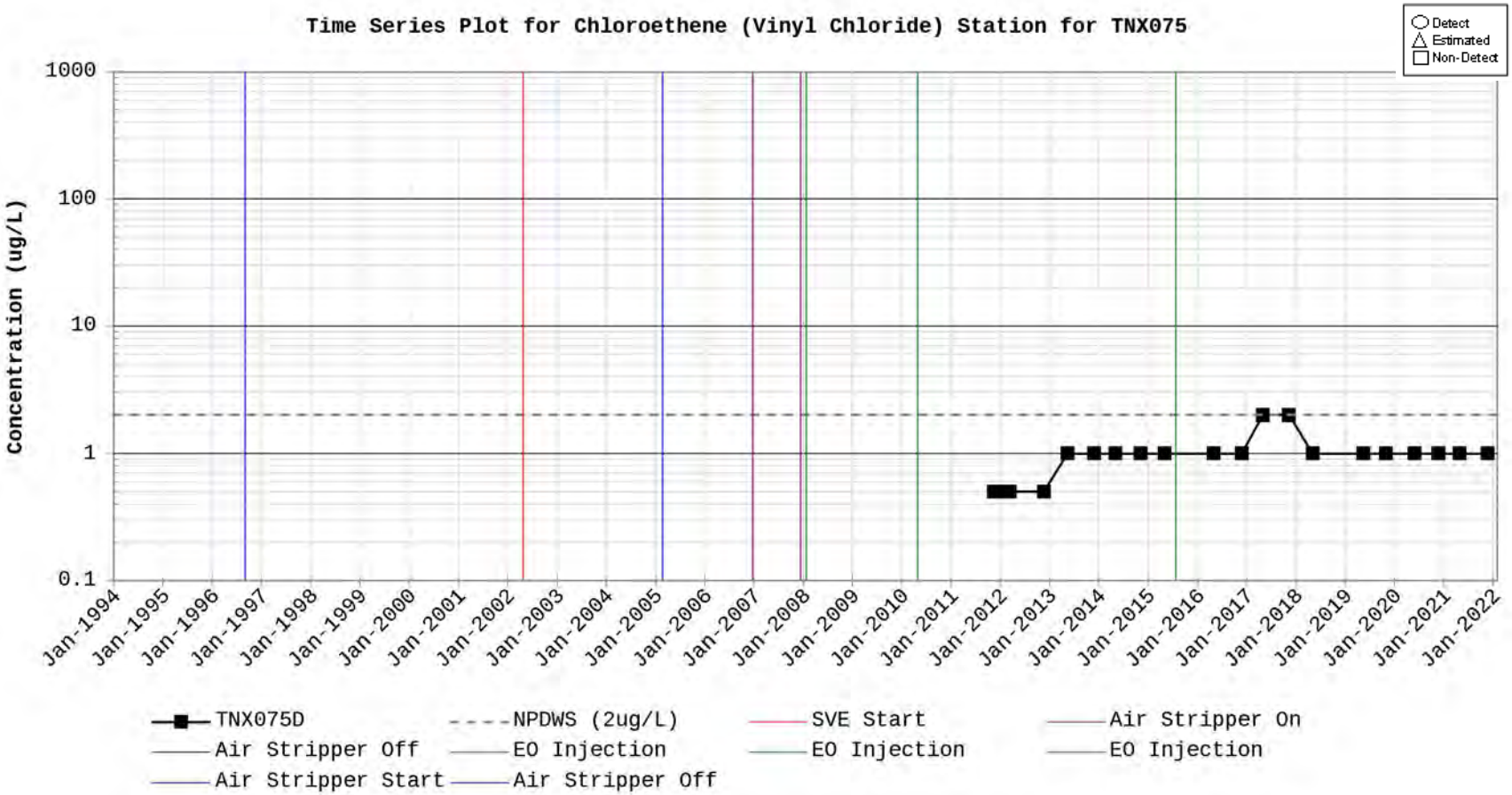

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 35
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

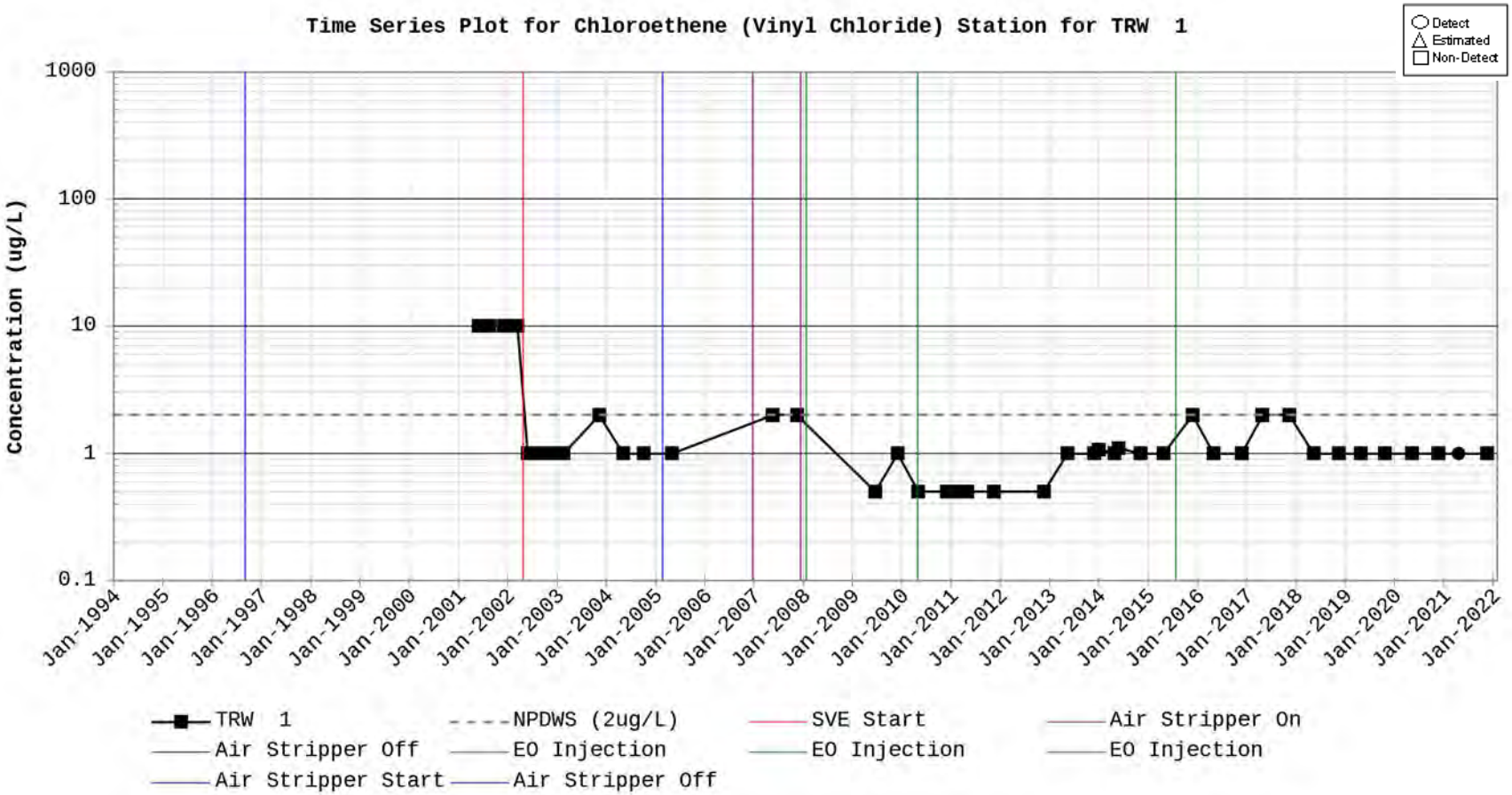

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 37
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

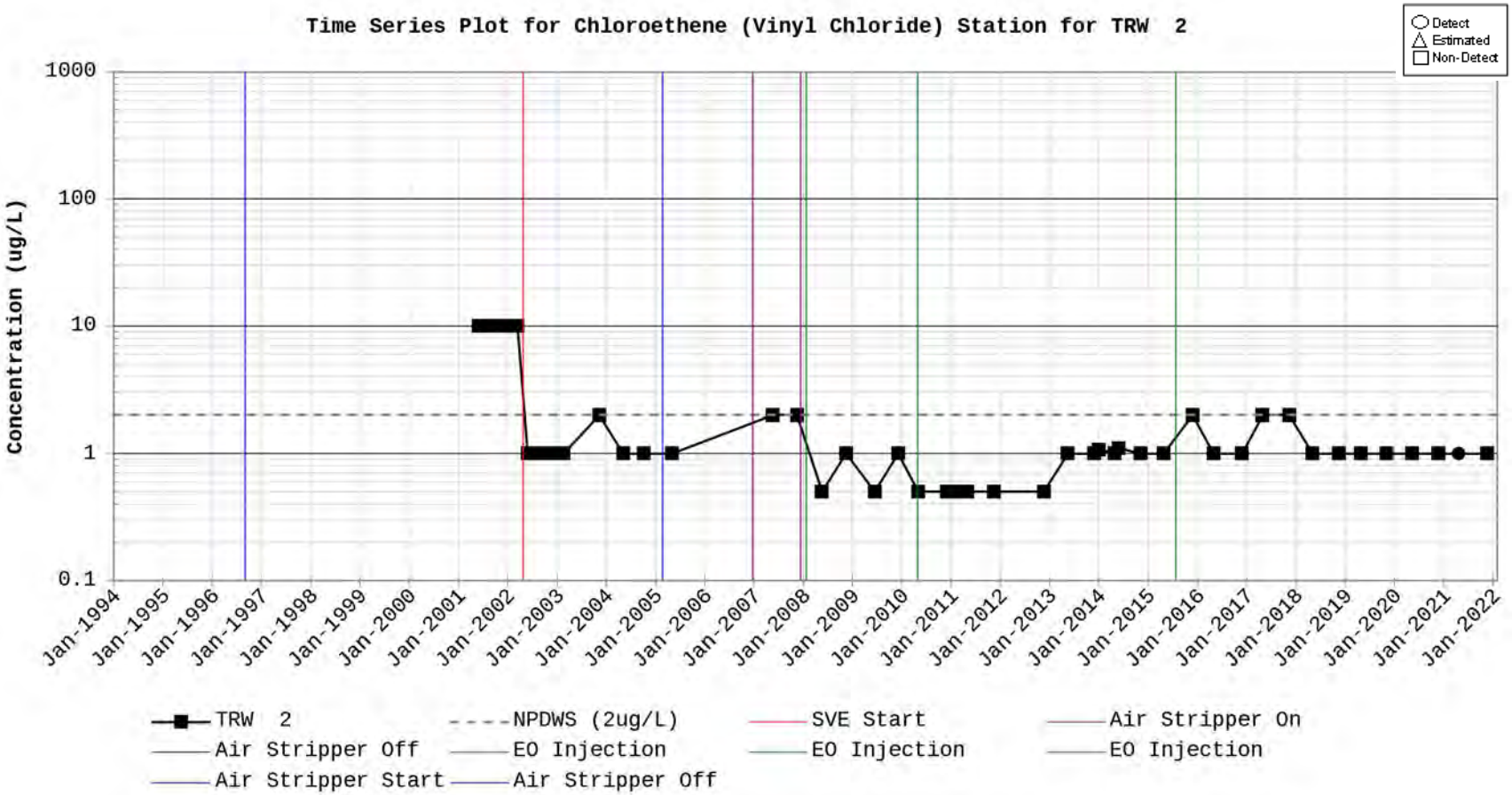

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX 72
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 72D
TNX 72M
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

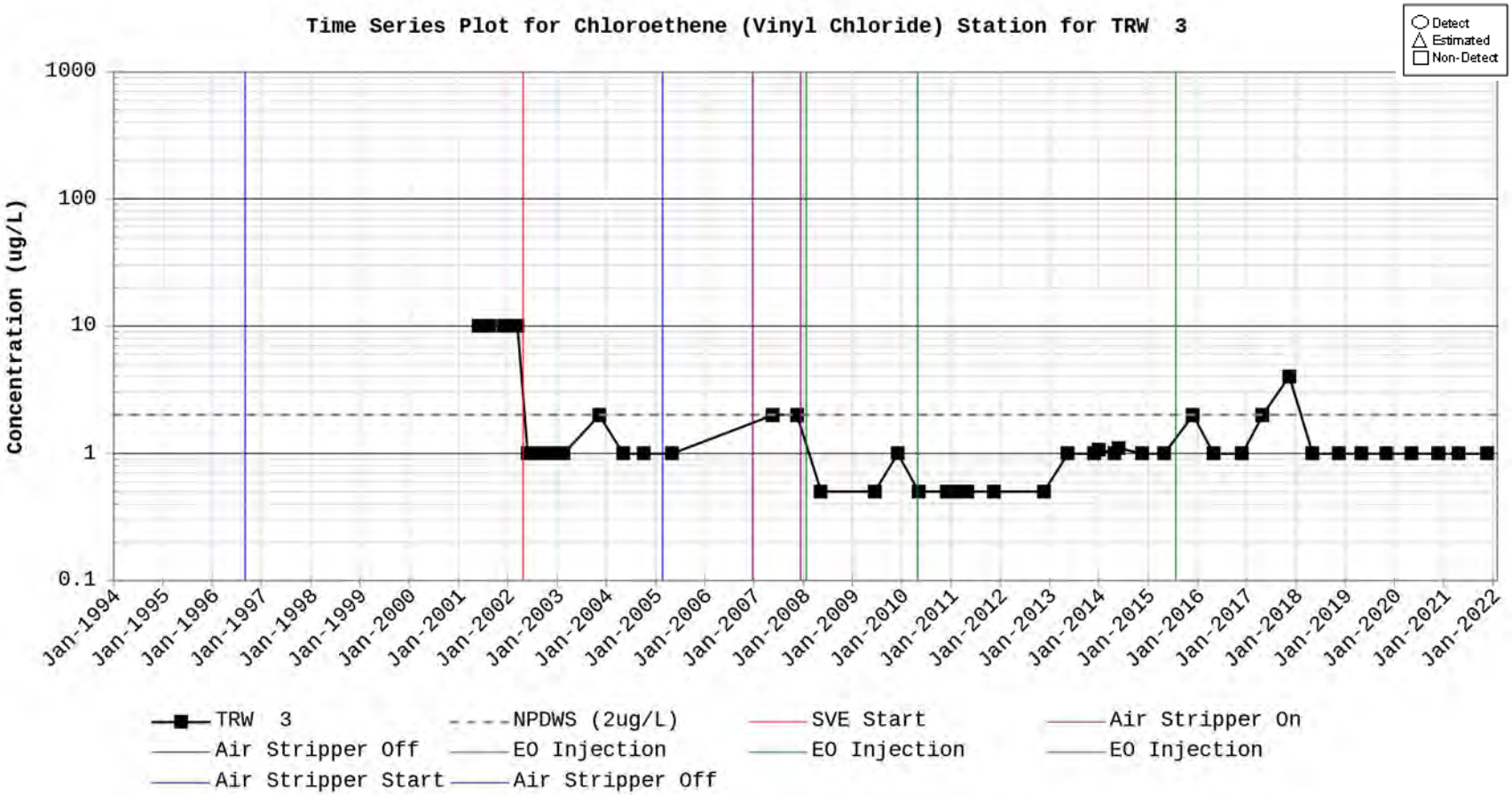

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX073
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

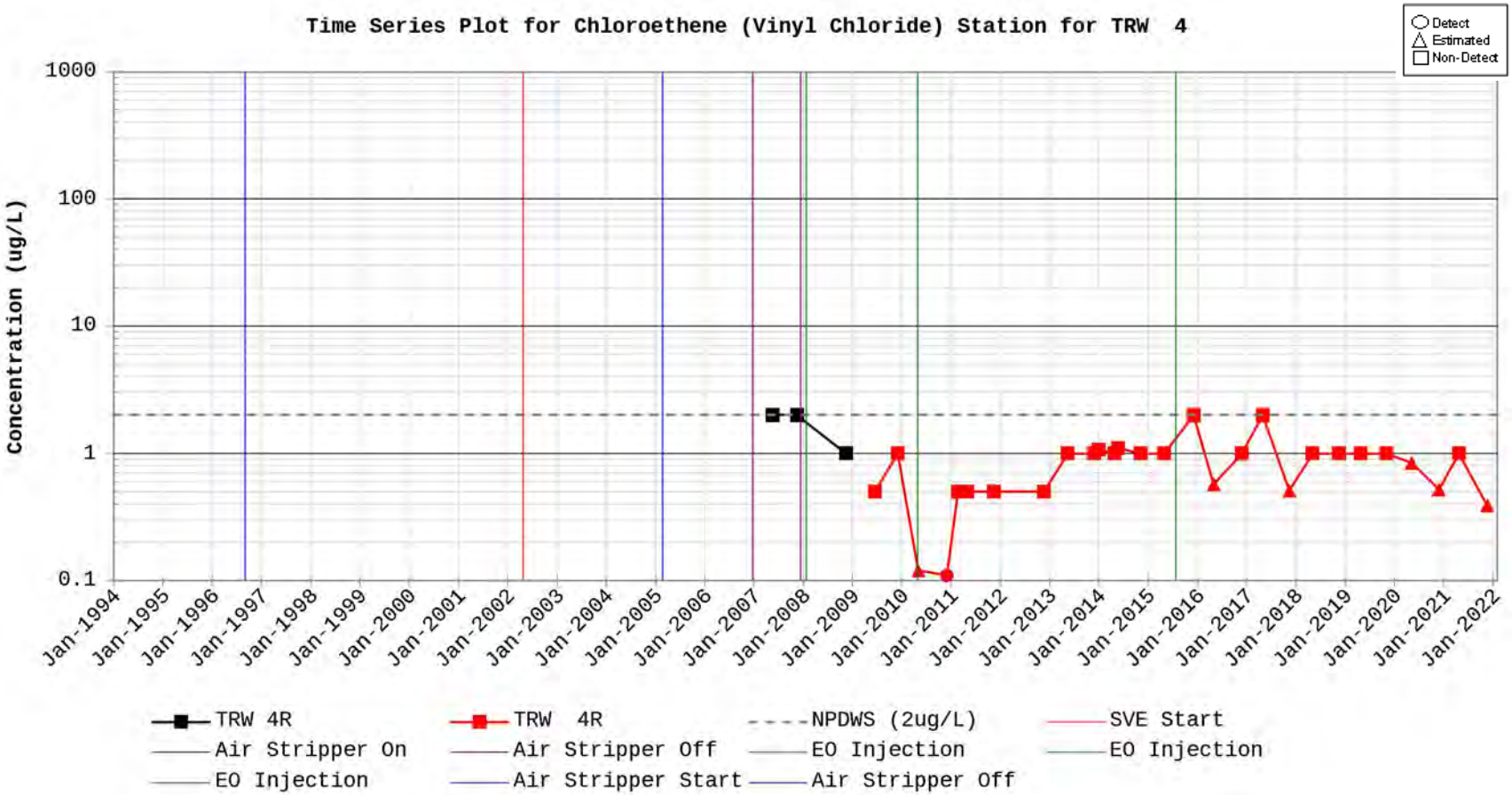

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX074
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

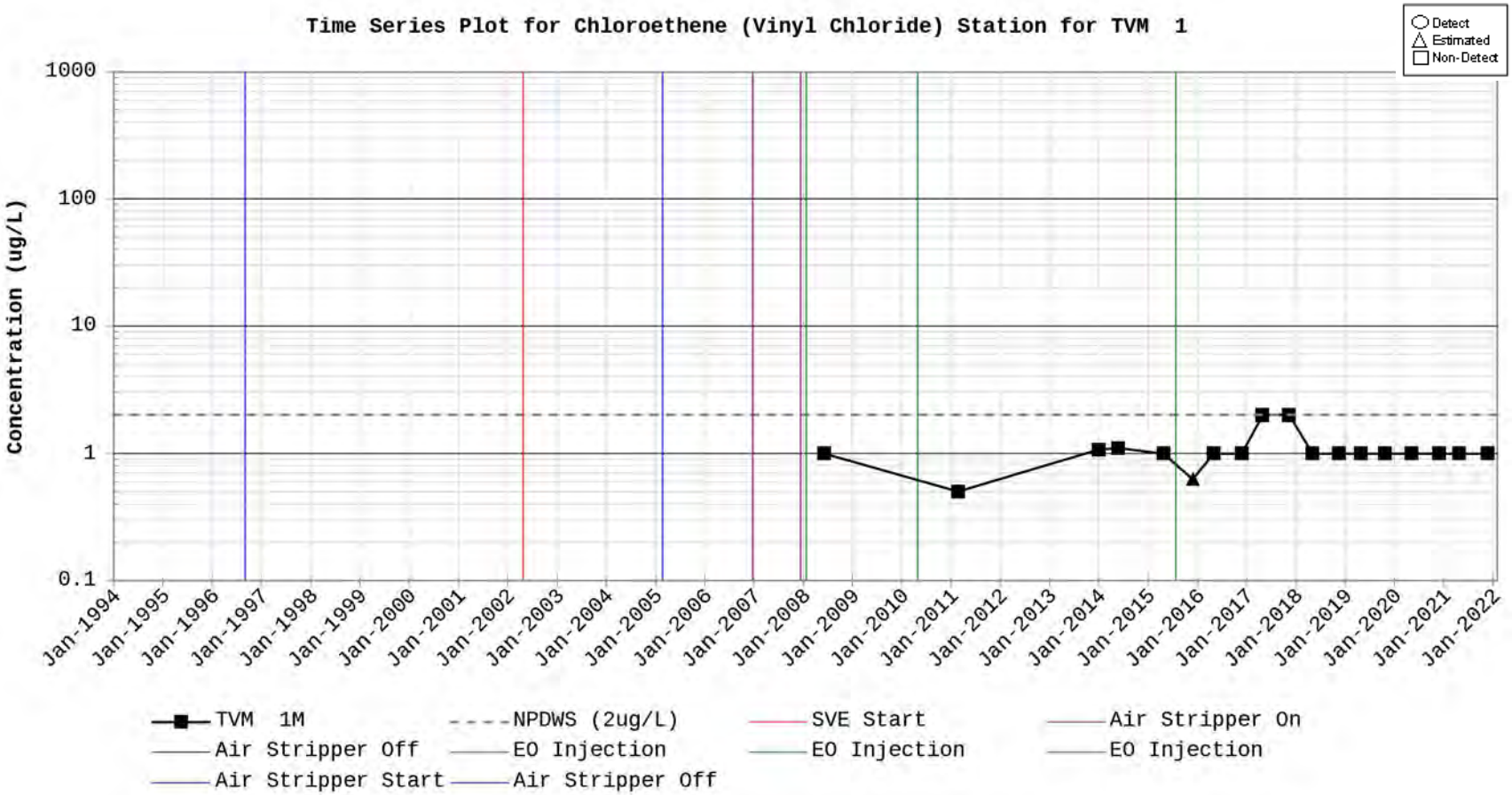

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TNX075
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX075D
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

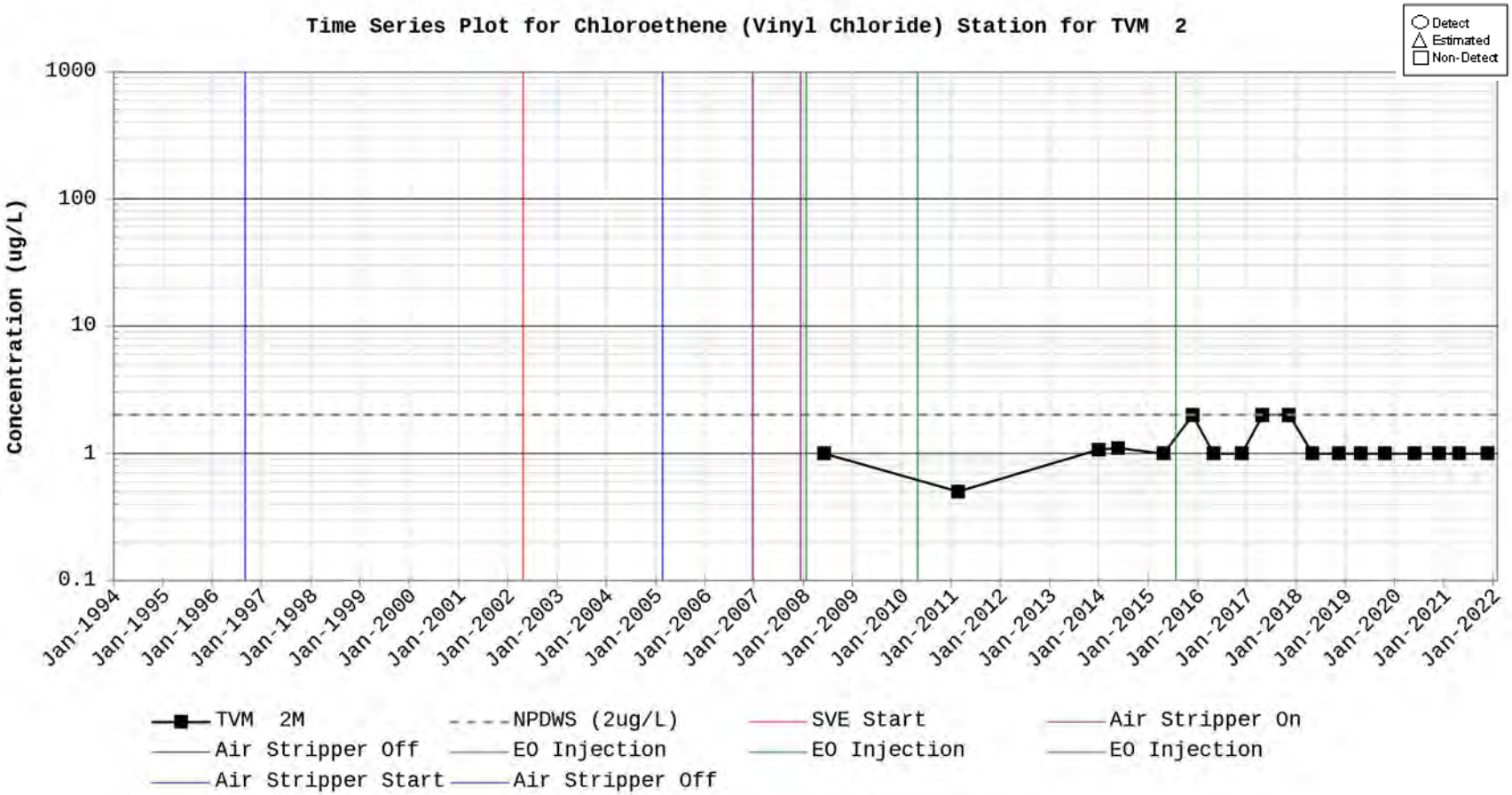

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

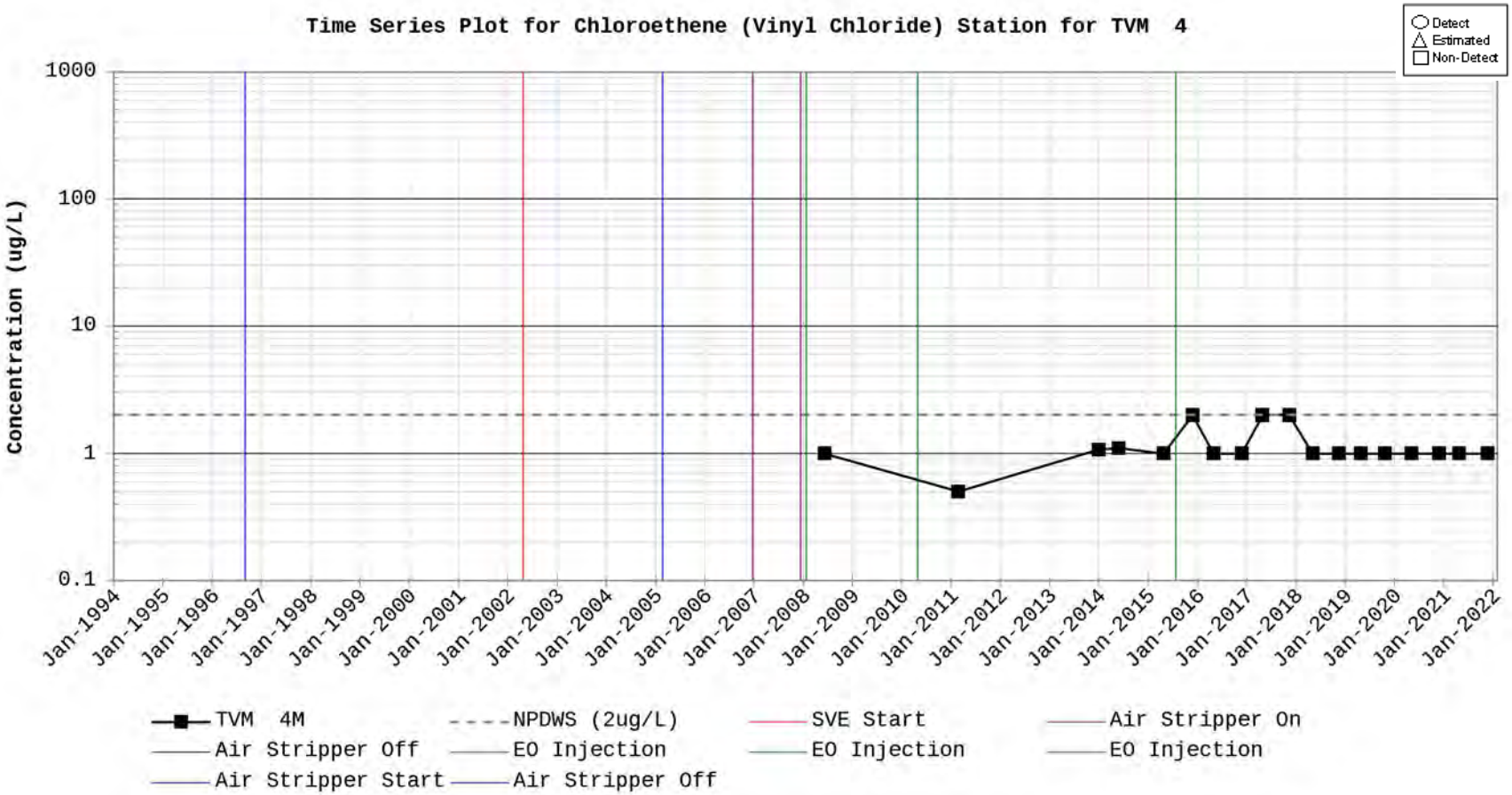

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

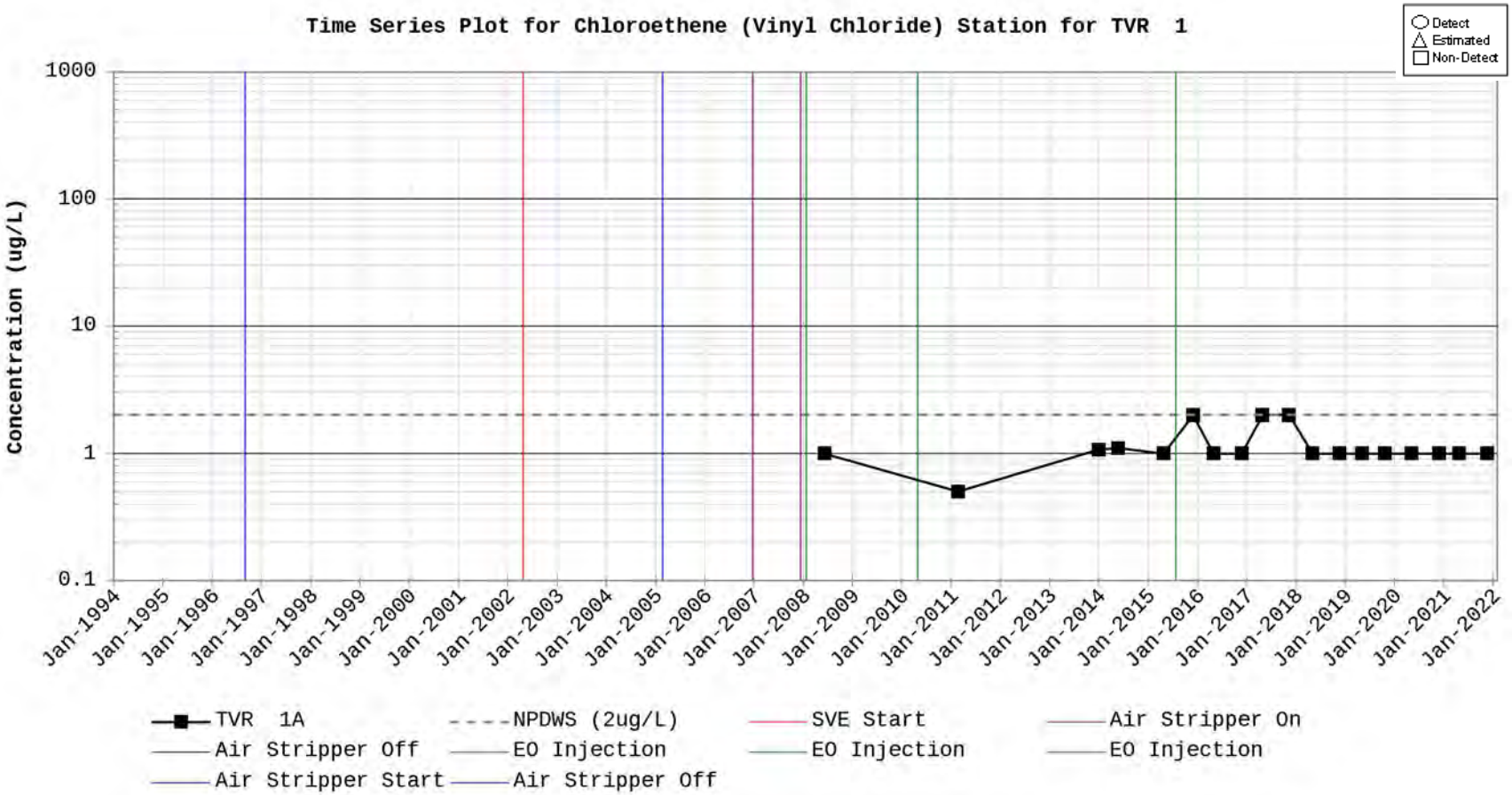

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

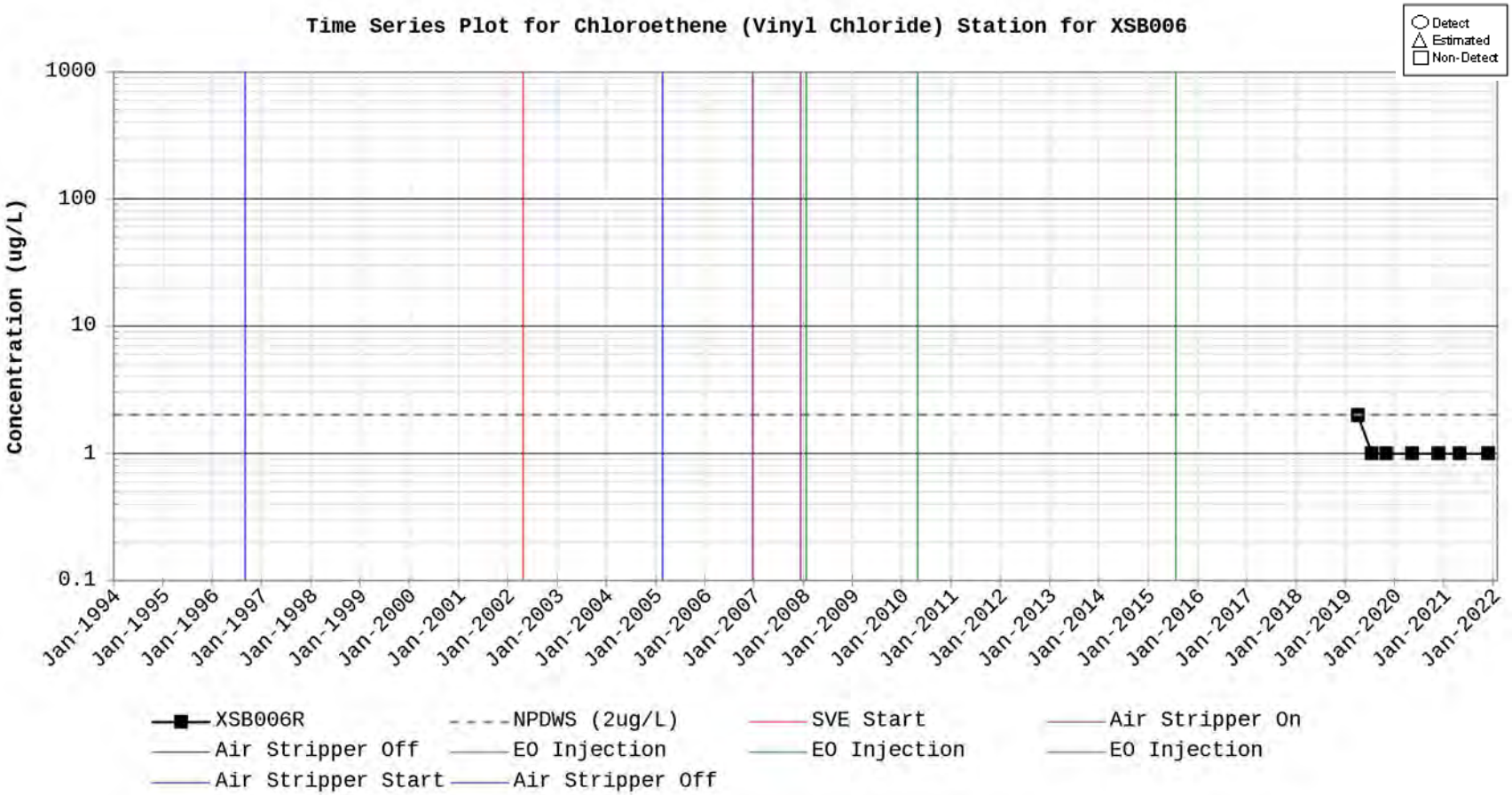

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
TRW 4R
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

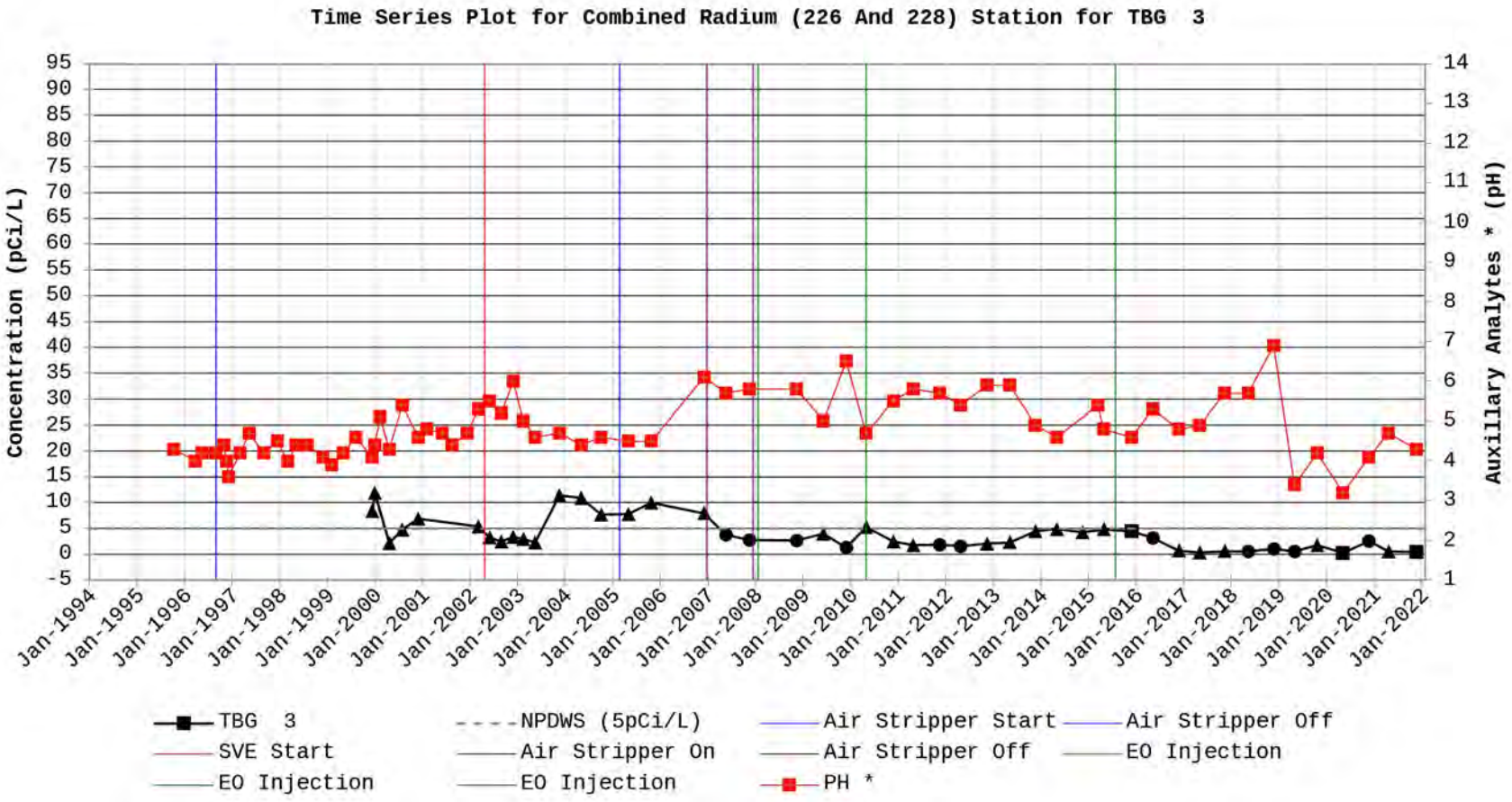

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

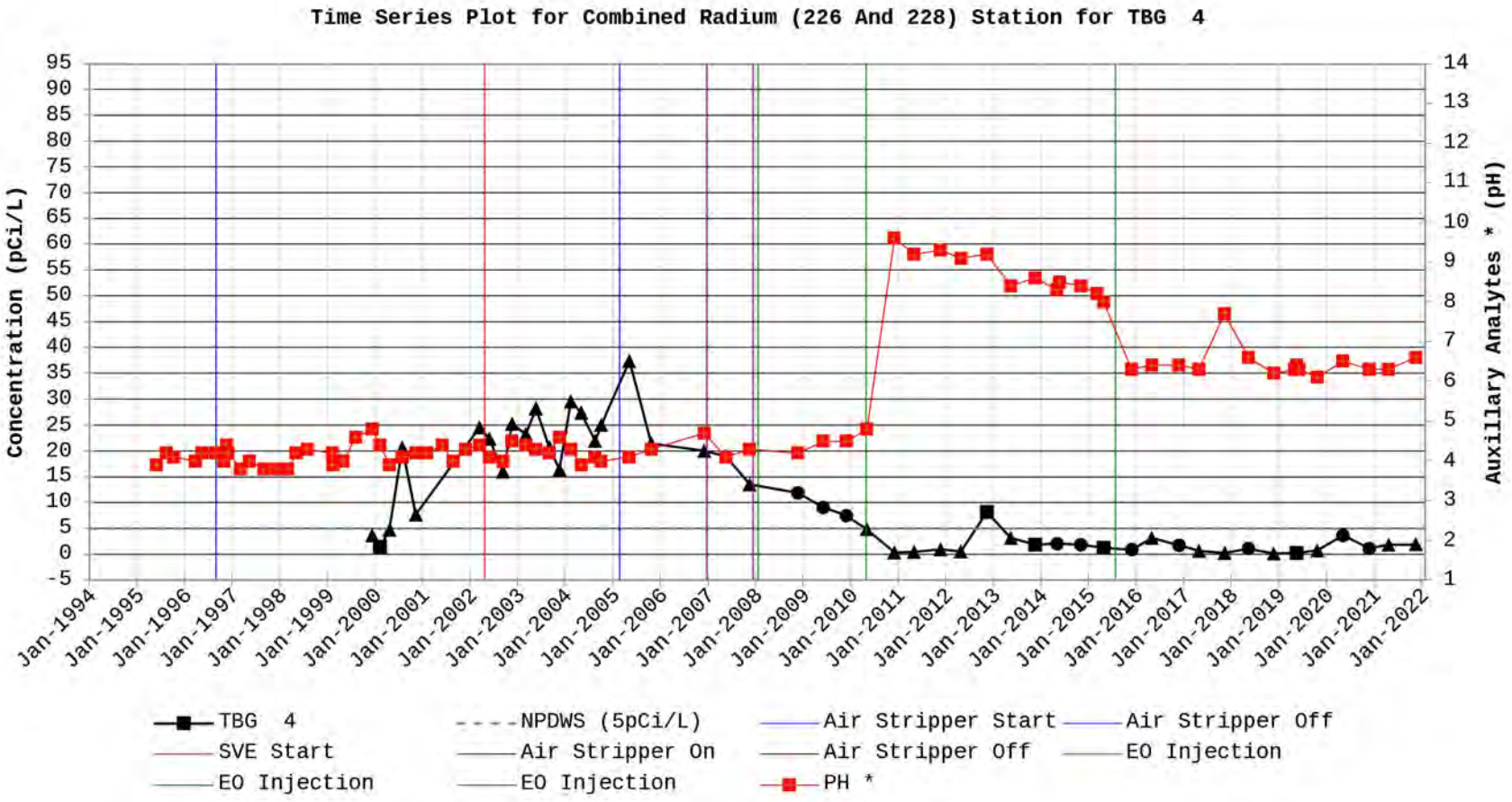

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

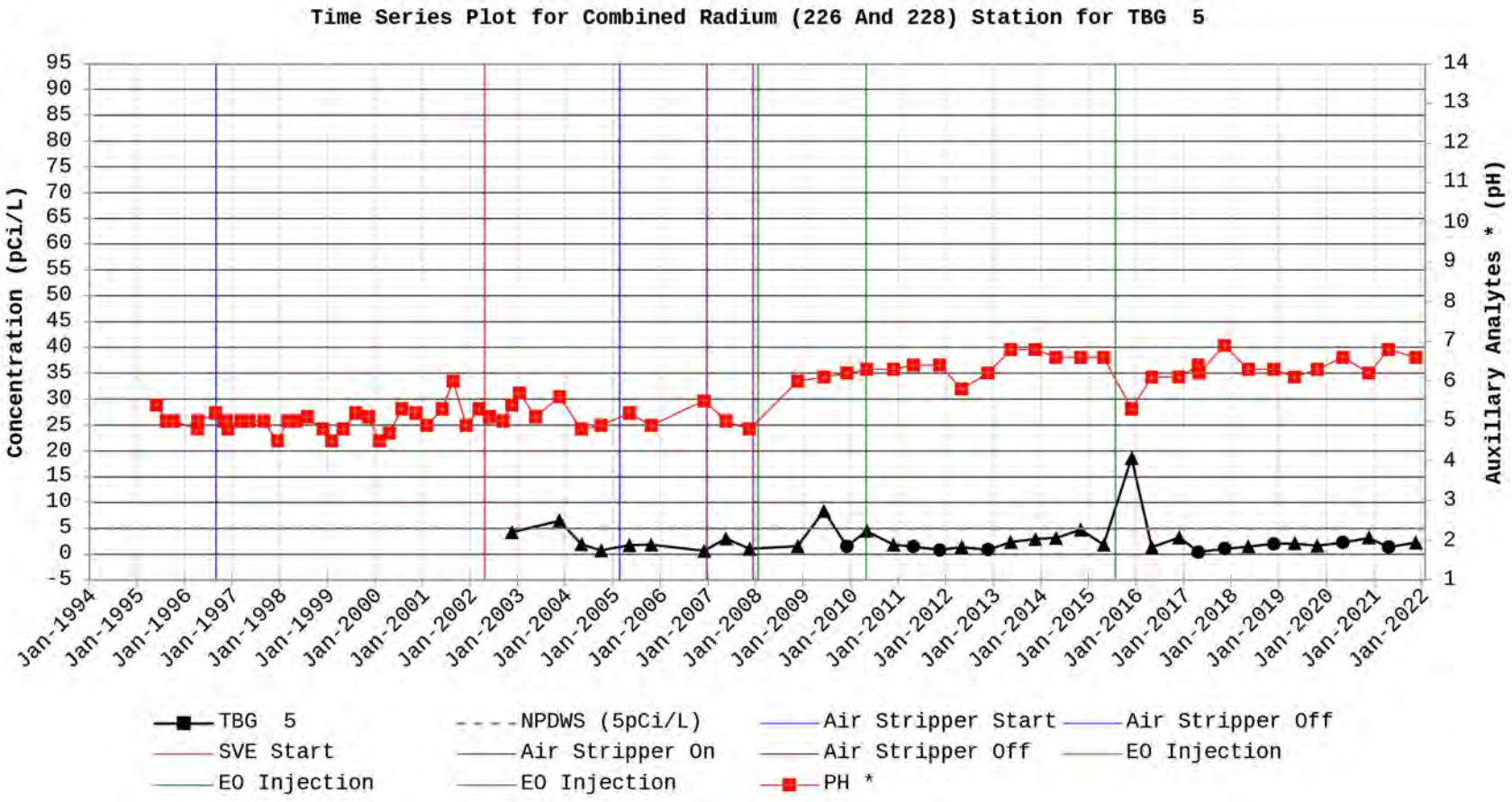

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

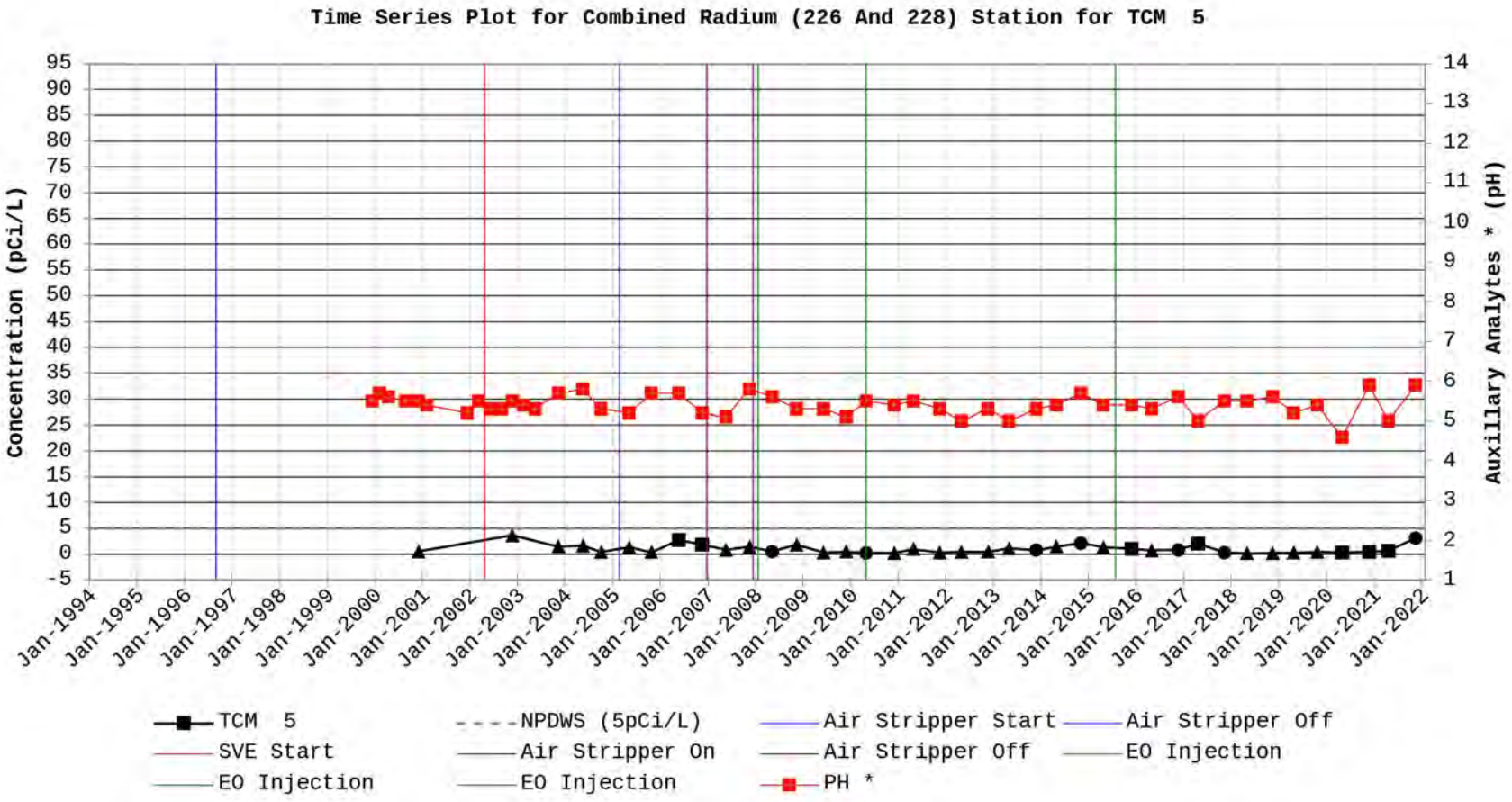

Time Series Plot for Chloroethene (Vinyl Chloride) Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

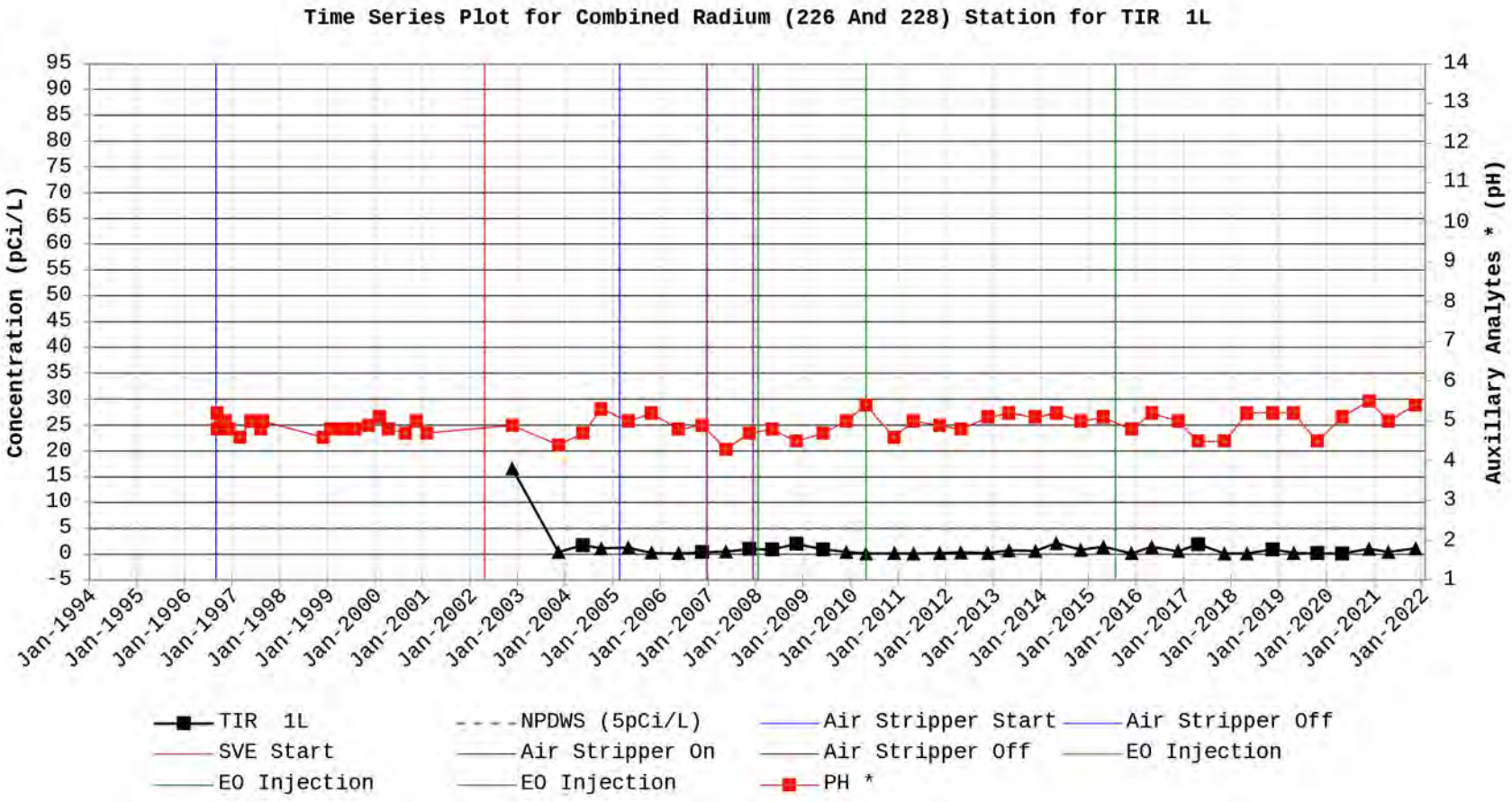

Time Series Plot for Chloroethene (Vinyl Chloride) Station for XSB006
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (2ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

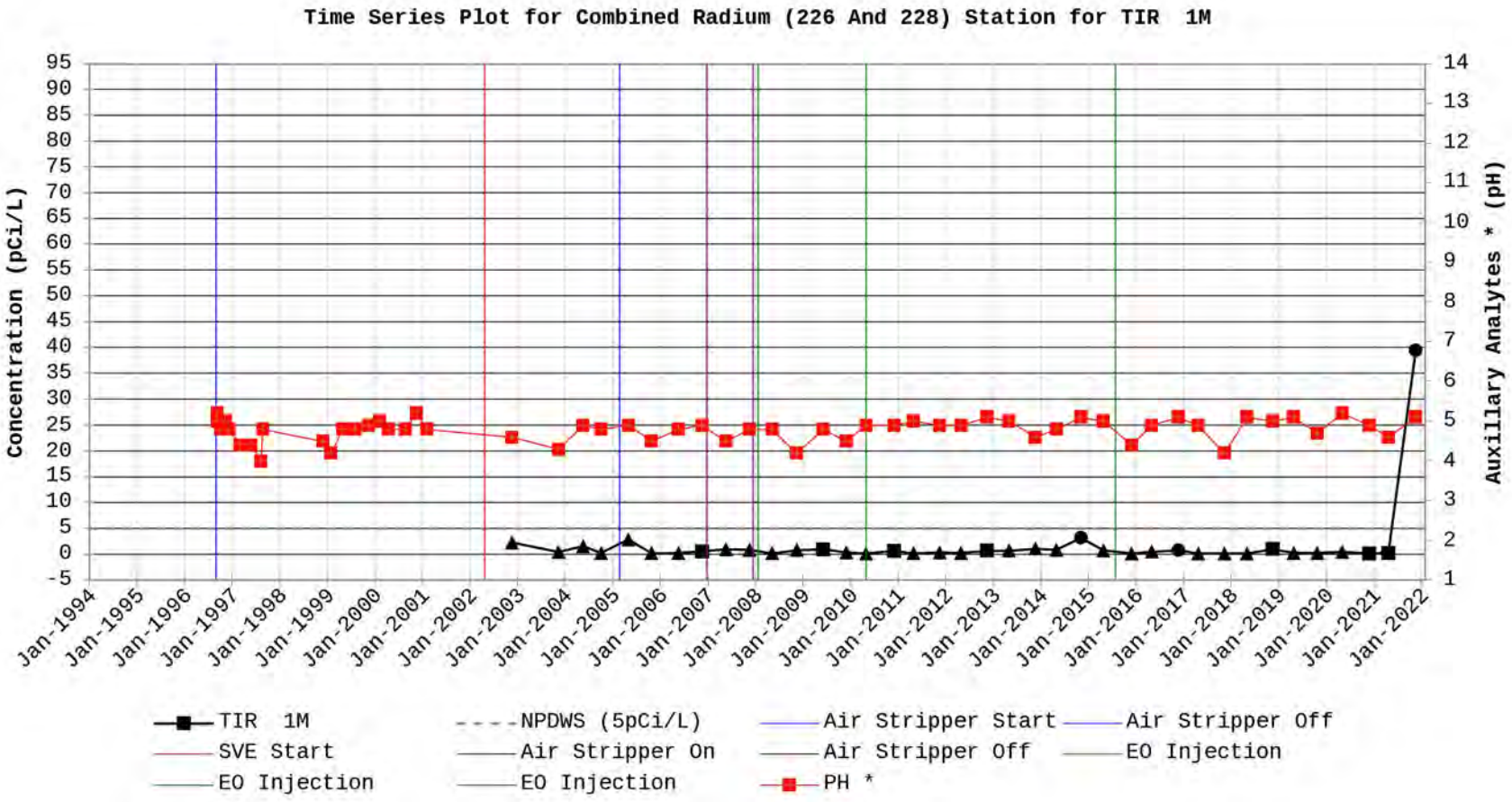

Time Series Plot for Combined Radium (226 And 228) Station for TBG 3
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

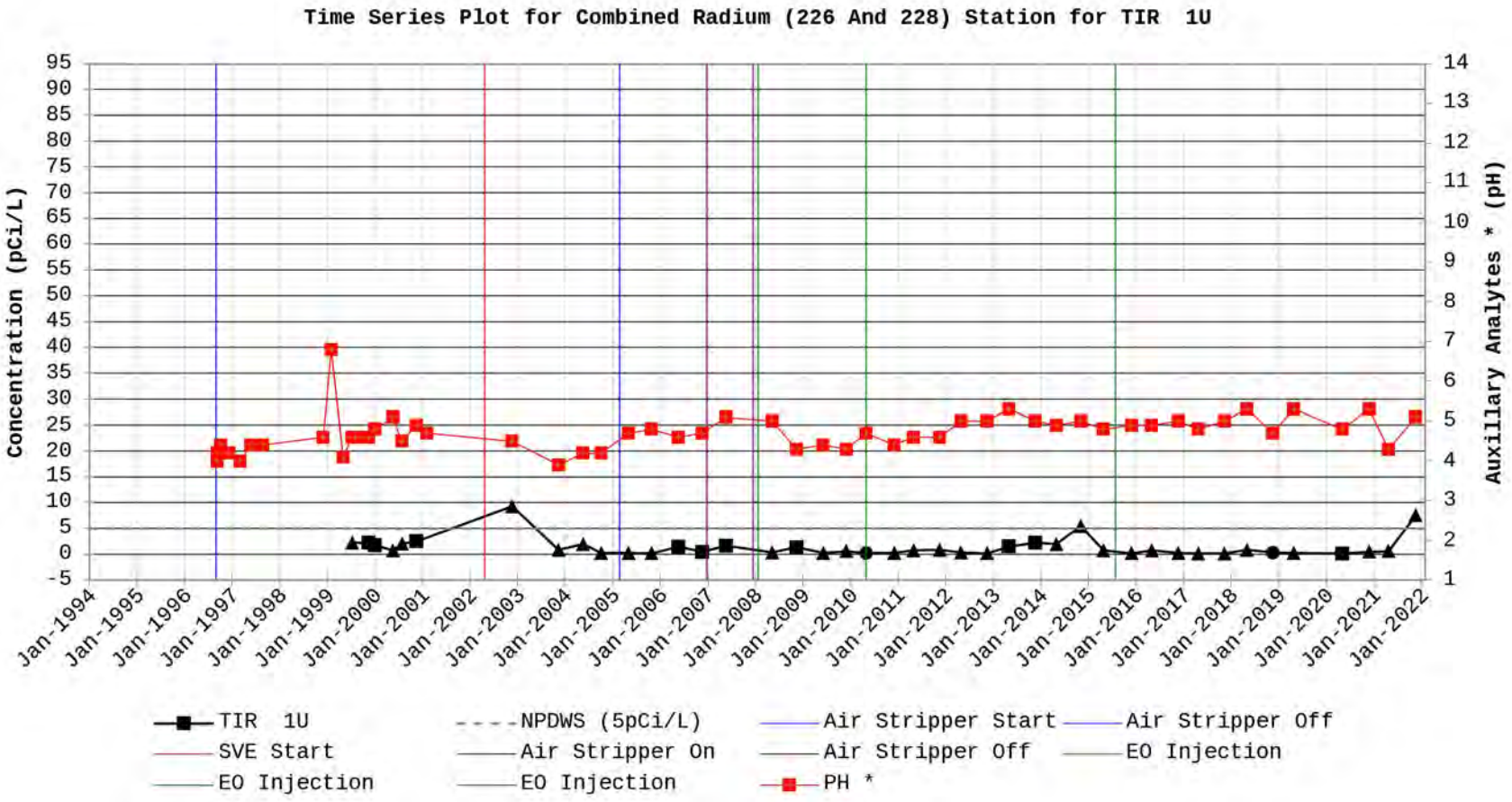

Time Series Plot for Combined Radium (226 And 228) Station for TBG 4
Concentration (pCi/L)
Auxillary Analytes * (pH)
TBG 4
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

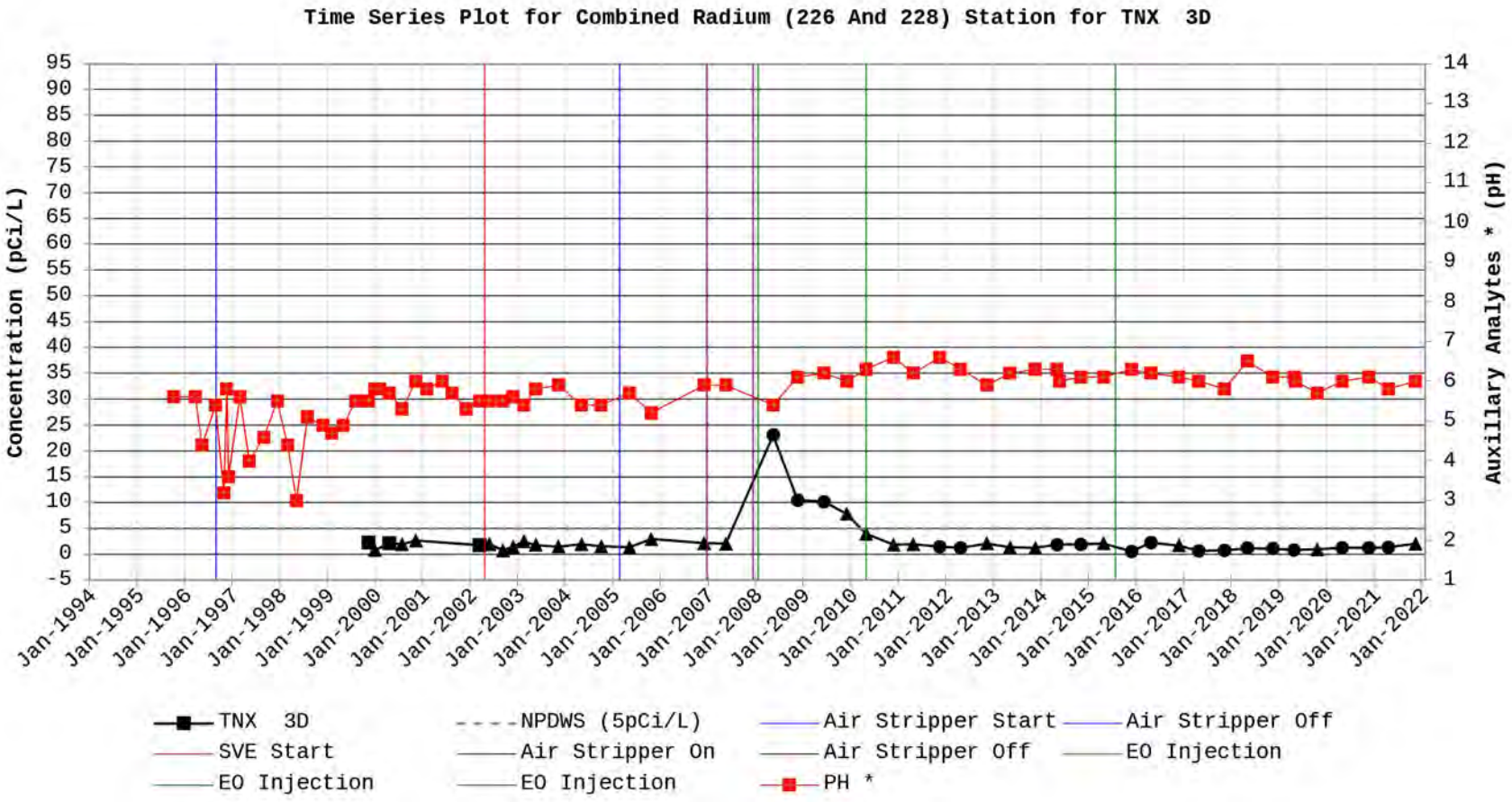

Time Series Plot for Combined Radium (226 And 228) Station for TBG 5
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

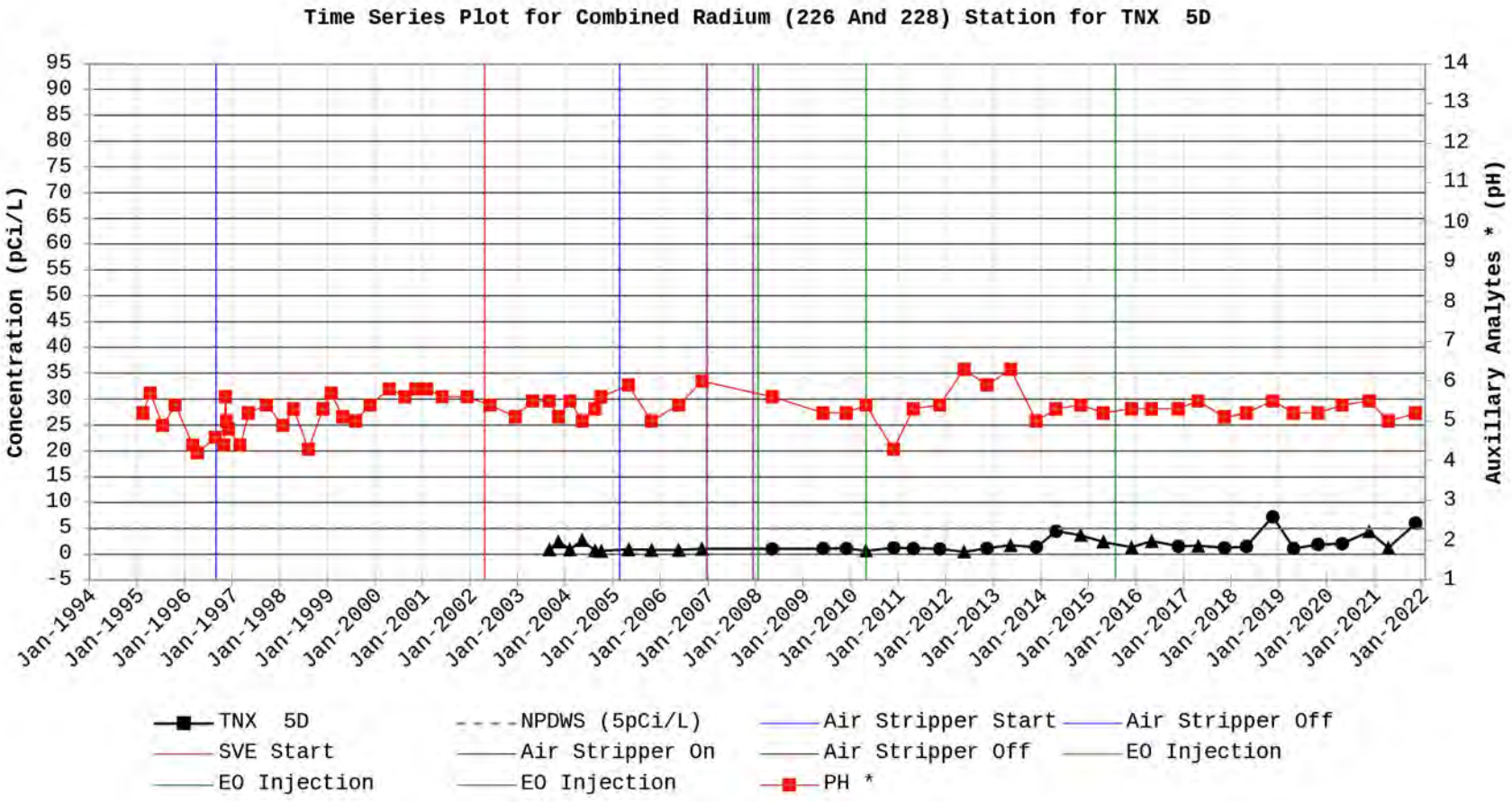

Time Series Plot for Combined Radium (226 And 228) Station for TCM 5
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

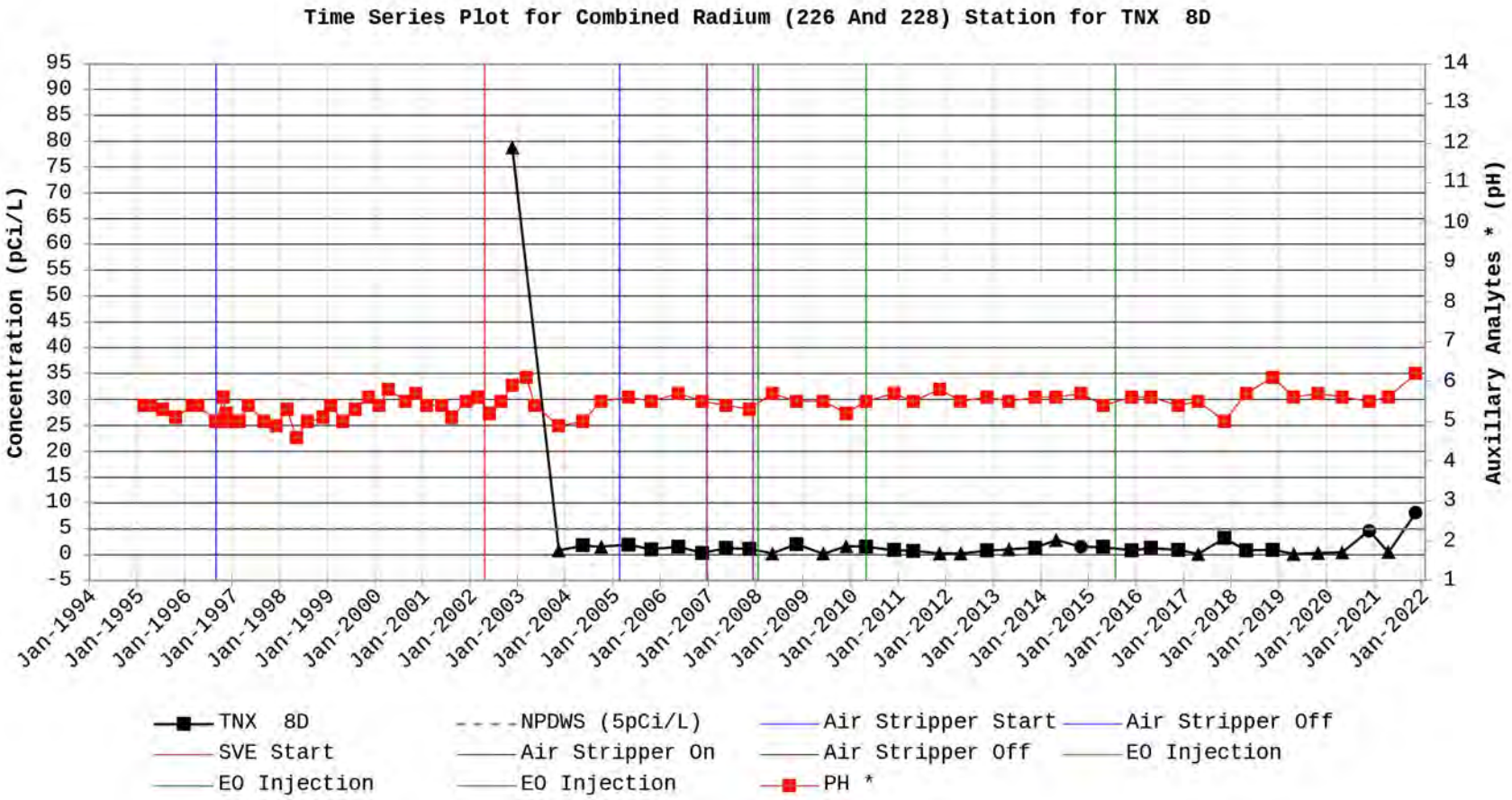

Time Series Plot for Combined Radium (226 And 228) Station for TIR 1L
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

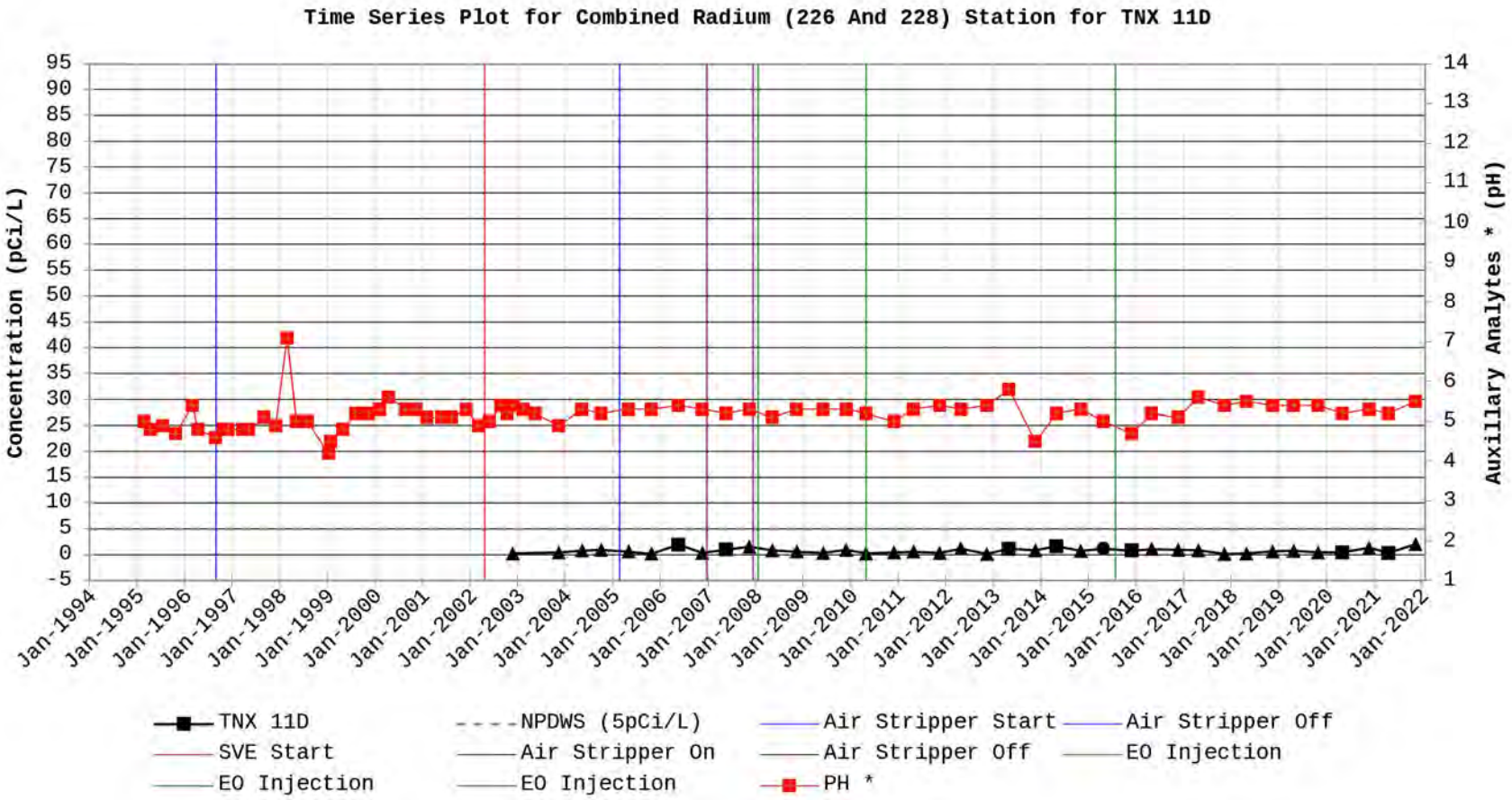

Time Series Plot for Combined Radium (226 And 228) Station for TIR 1M
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1M
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

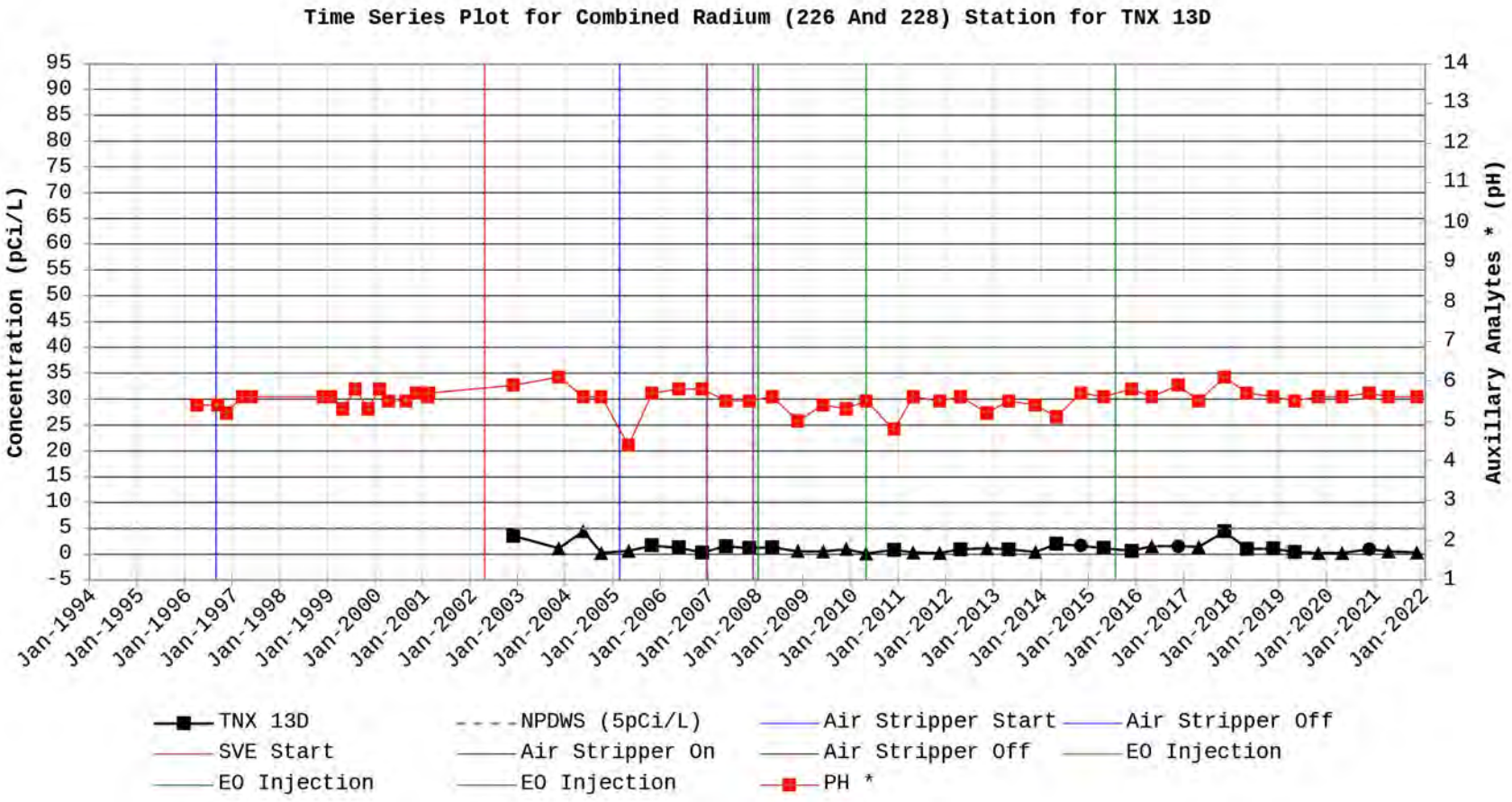

Time Series Plot for Combined Radium (226 And 228) Station for TIR 1U
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1U
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

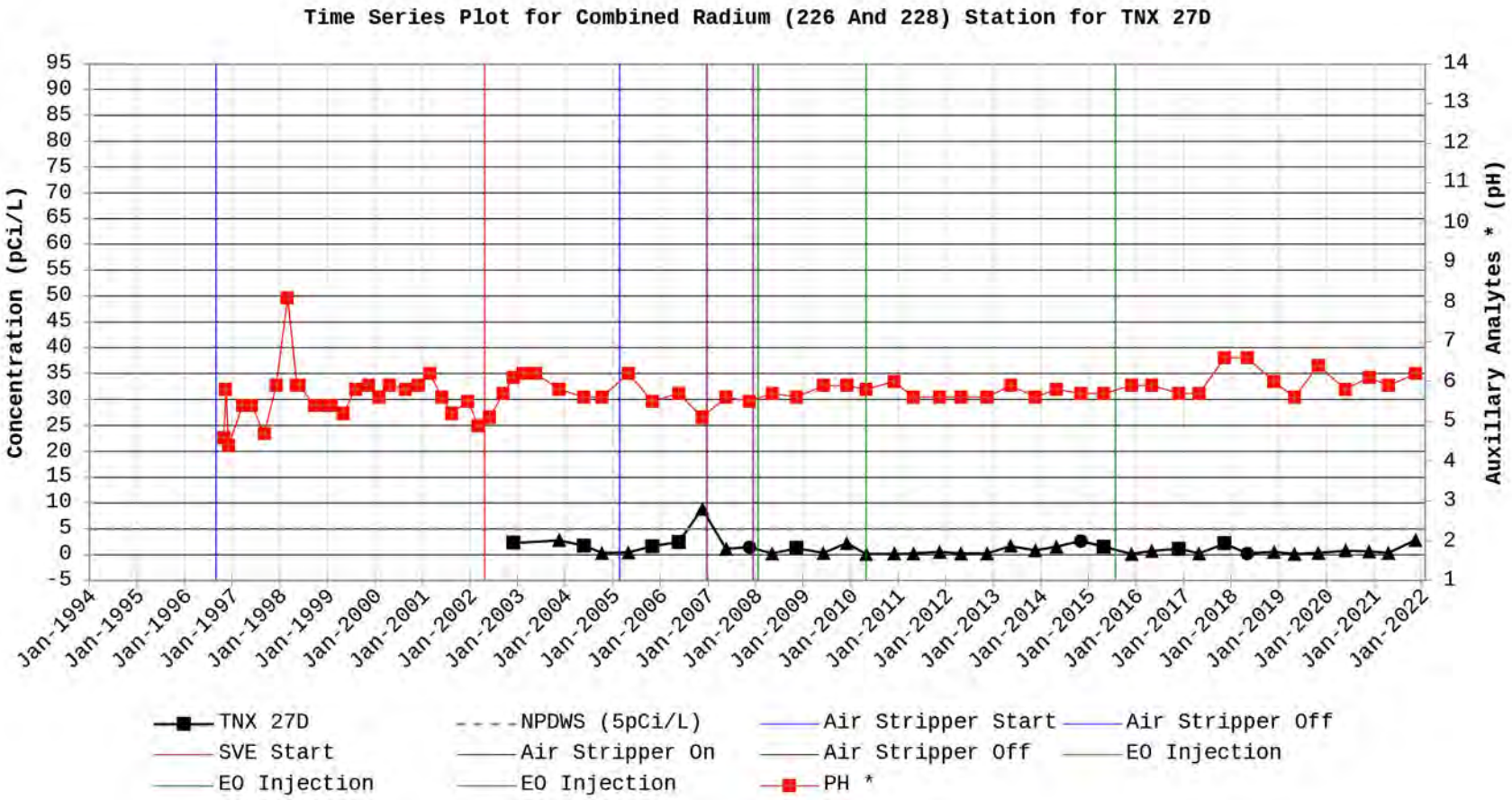

Time Series Plot for Combined Radium (226 And 228) Station for TNX 3D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

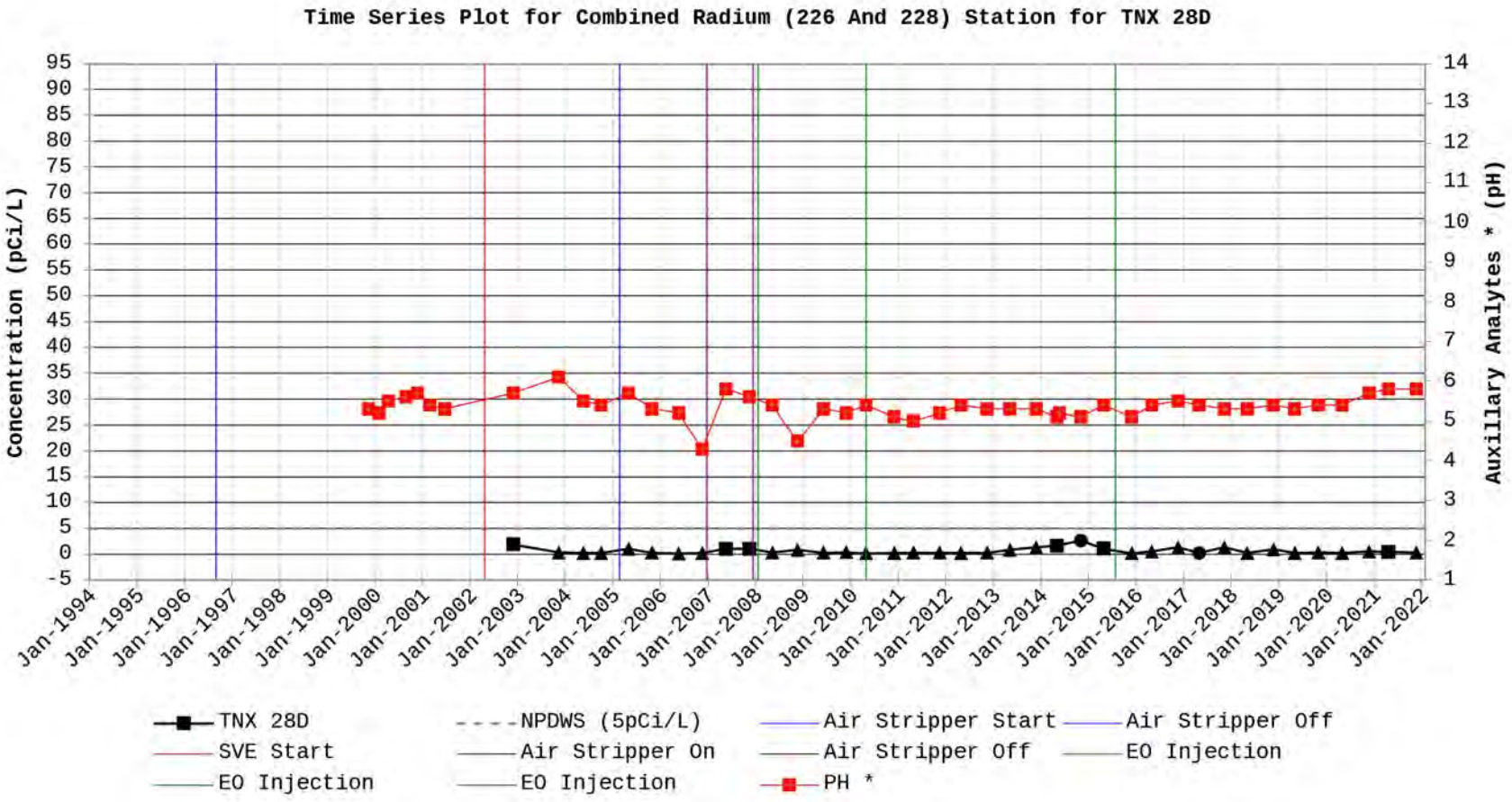

Time Series Plot for Combined Radium (226 And 228) Station for TNX 5D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

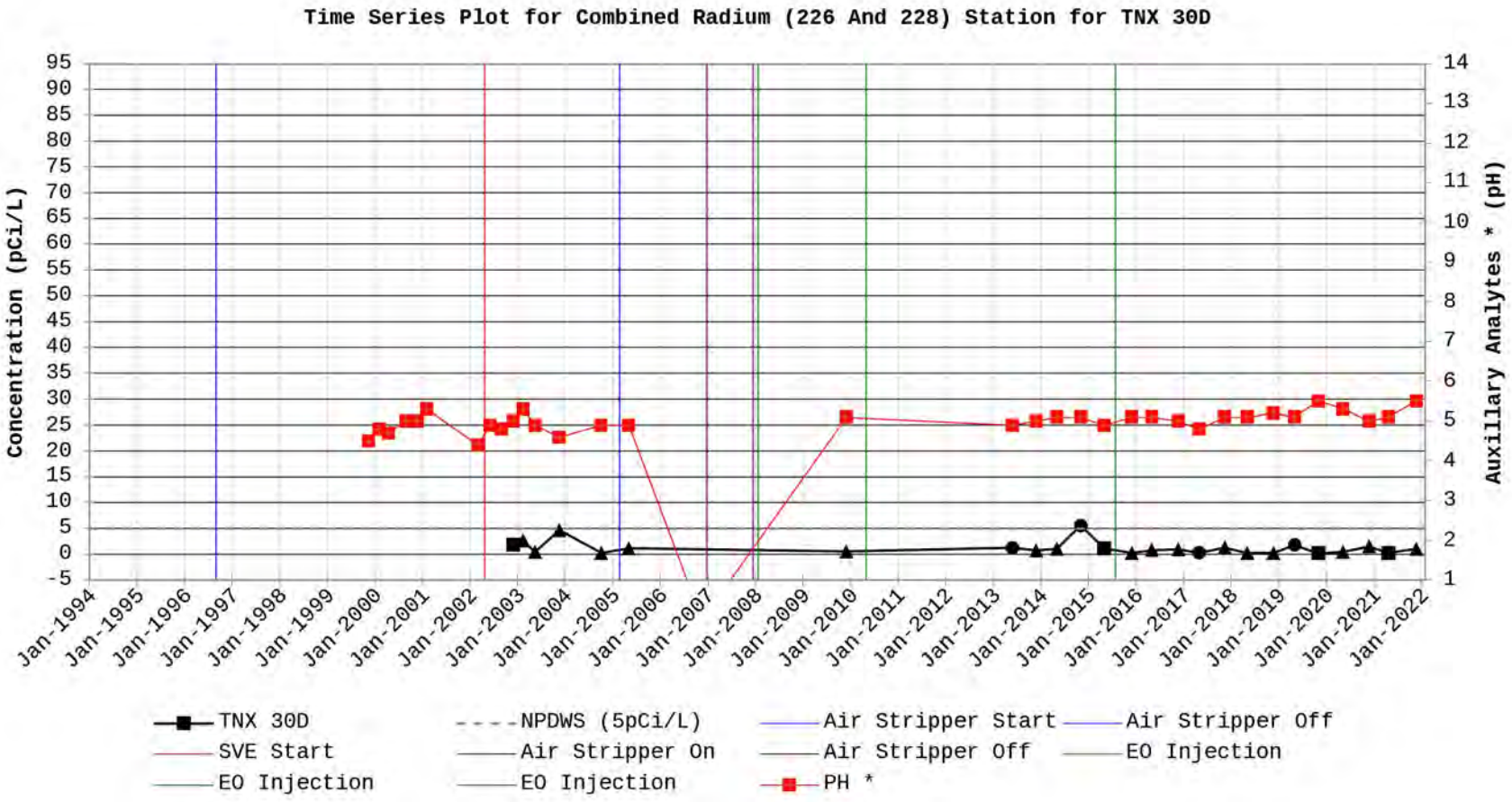

Time Series Plot for Combined Radium (226 And 228) Station for TNX 8D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

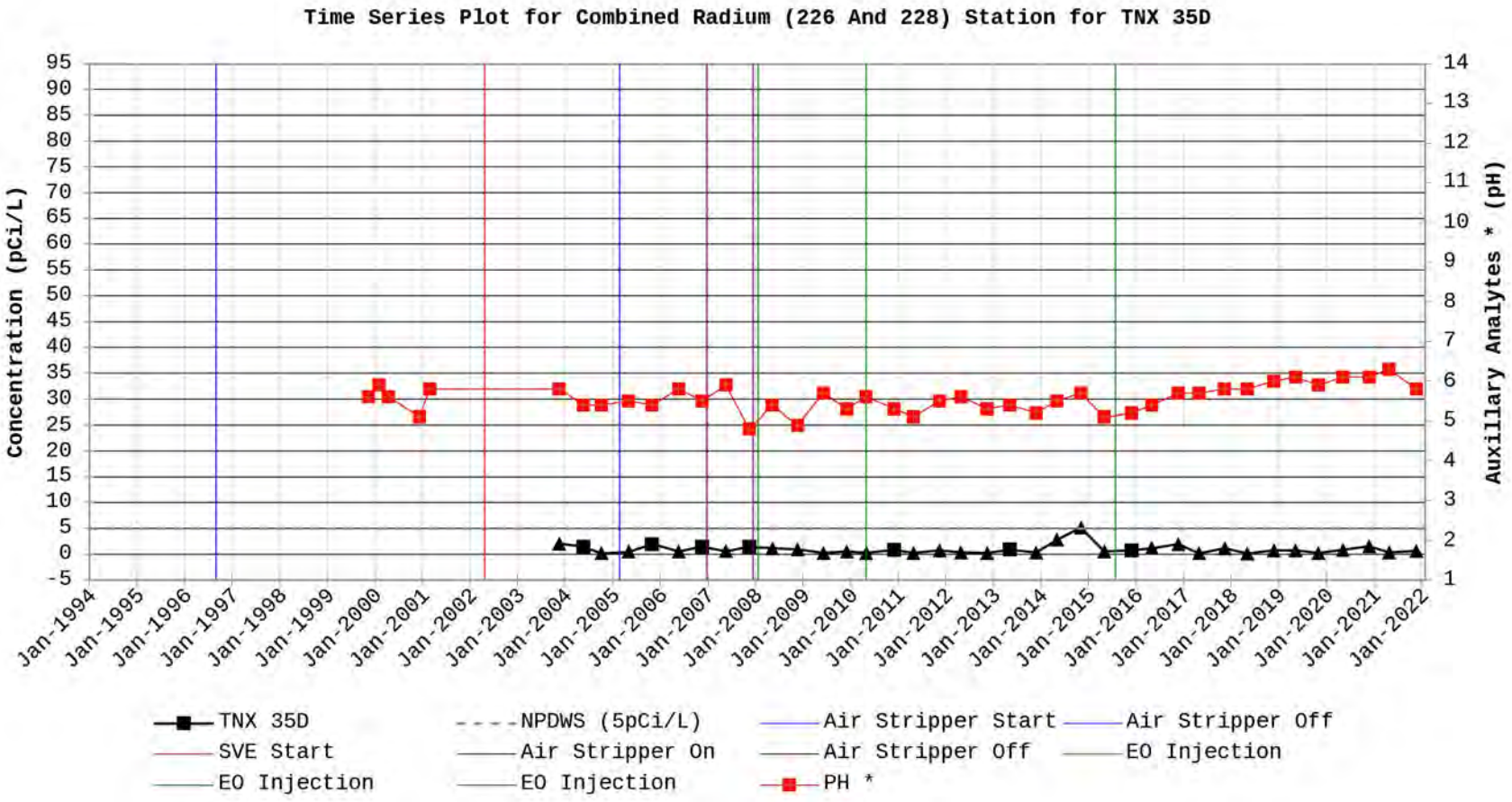

Time Series Plot for Combined Radium (226 And 228) Station for TNX 11D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

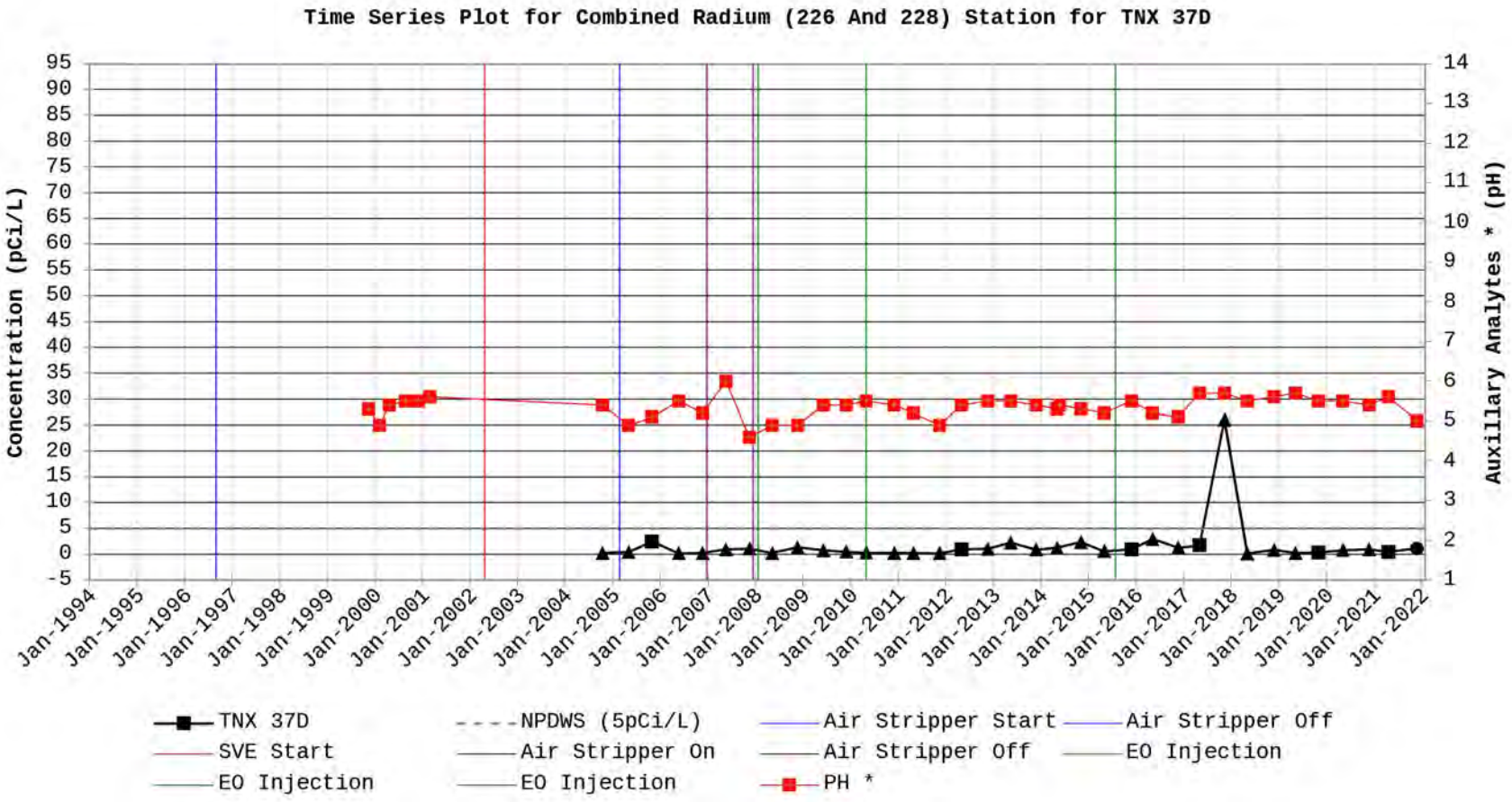

Time Series Plot for Combined Radium (226 And 228) Station for TNX 13D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

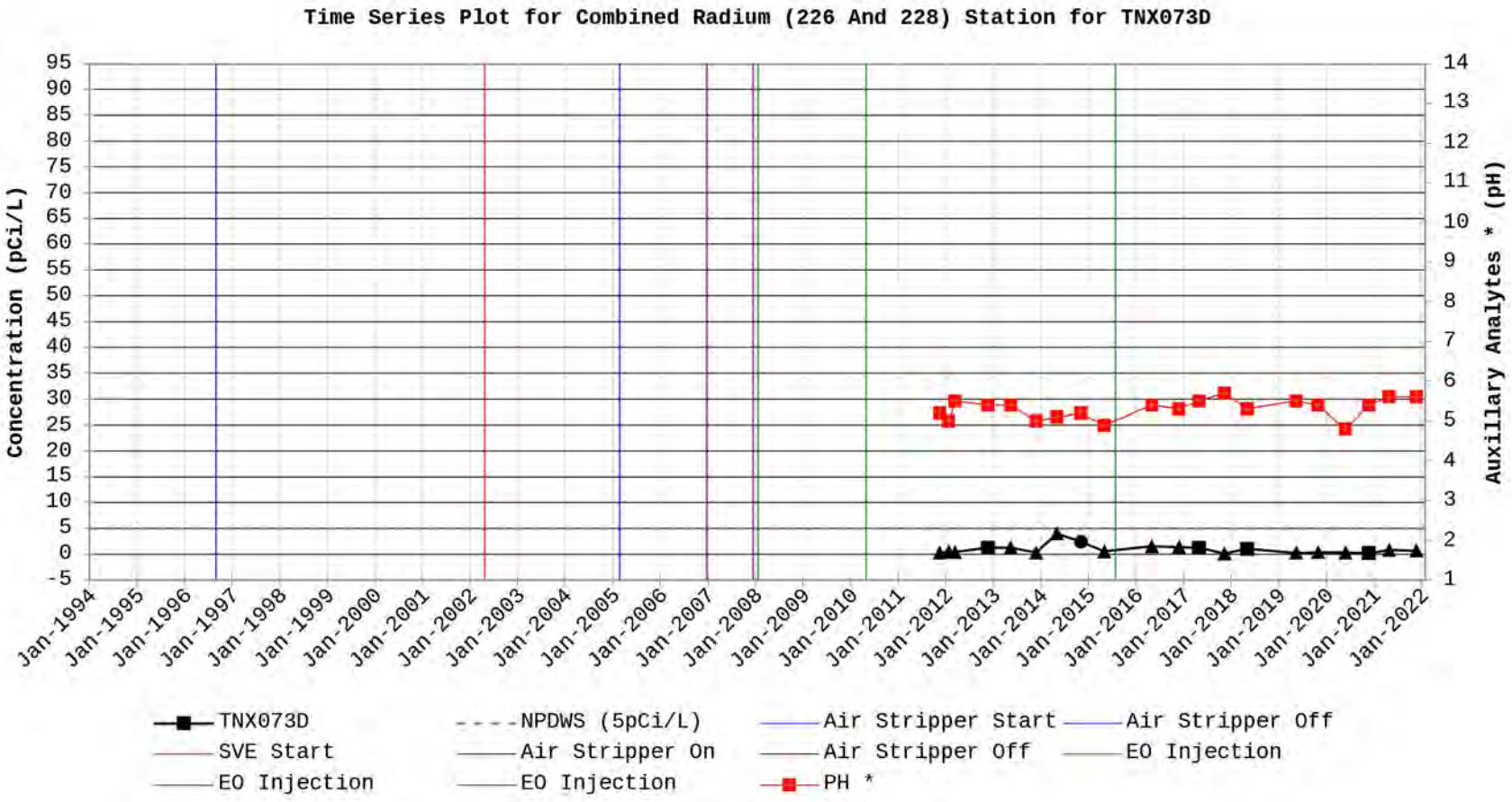

Time Series Plot for Combined Radium (226 And 228) Station for TNX 27D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

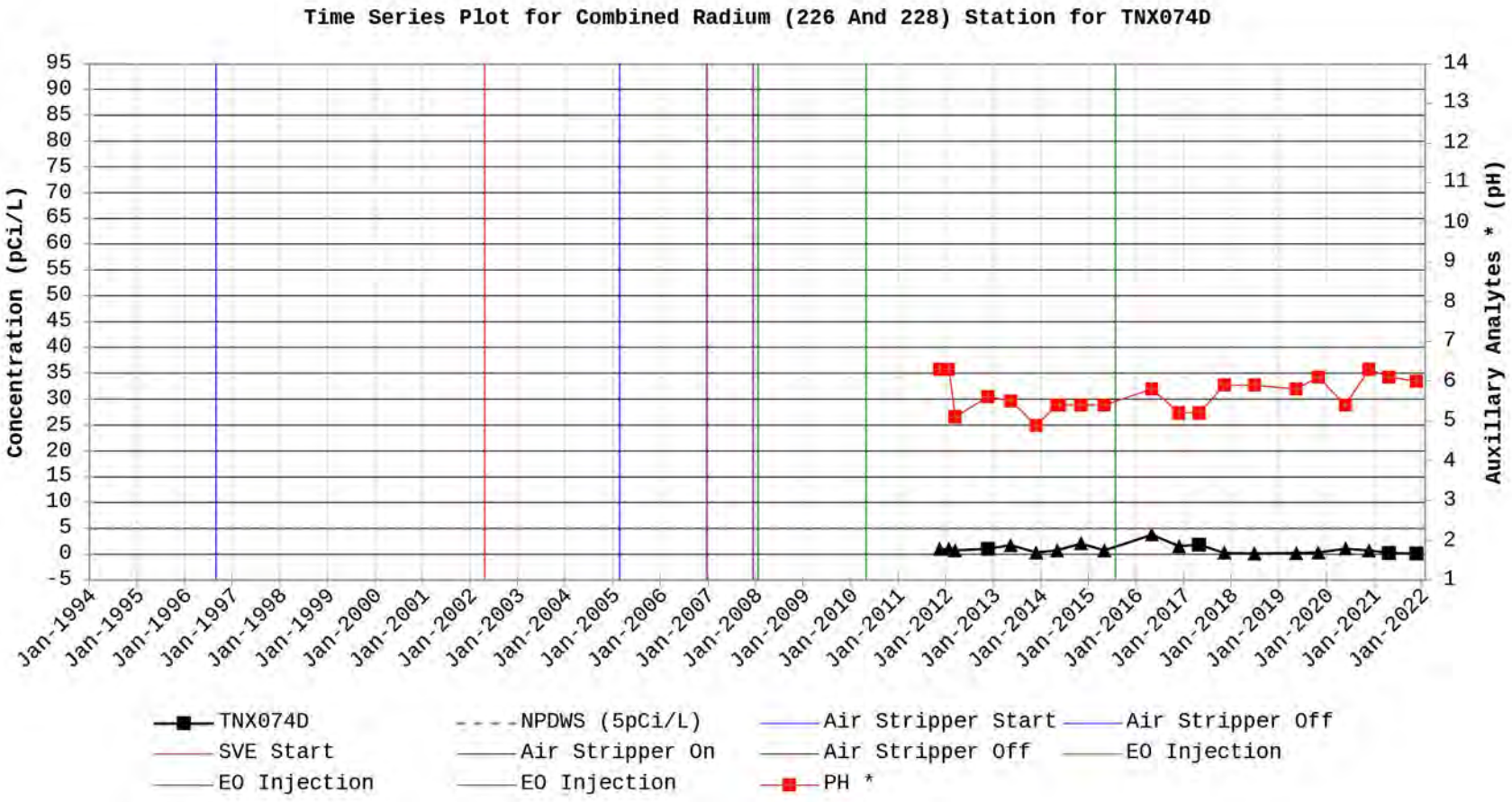

Time Series Plot for Combined Radium (226 And 228) Station for TNX 28D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

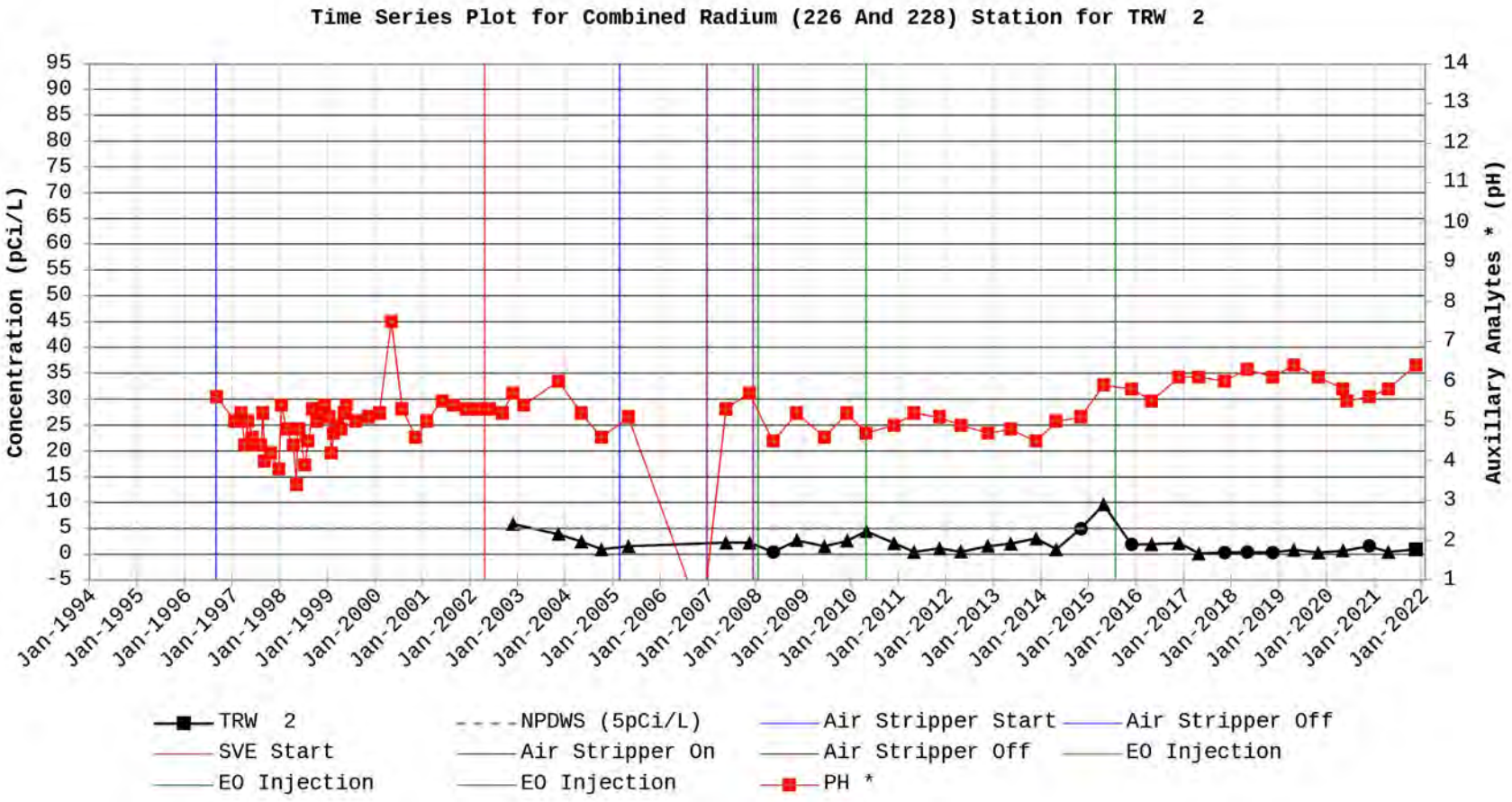

Time Series Plot for Combined Radium (226 And 228) Station for TNX 30D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

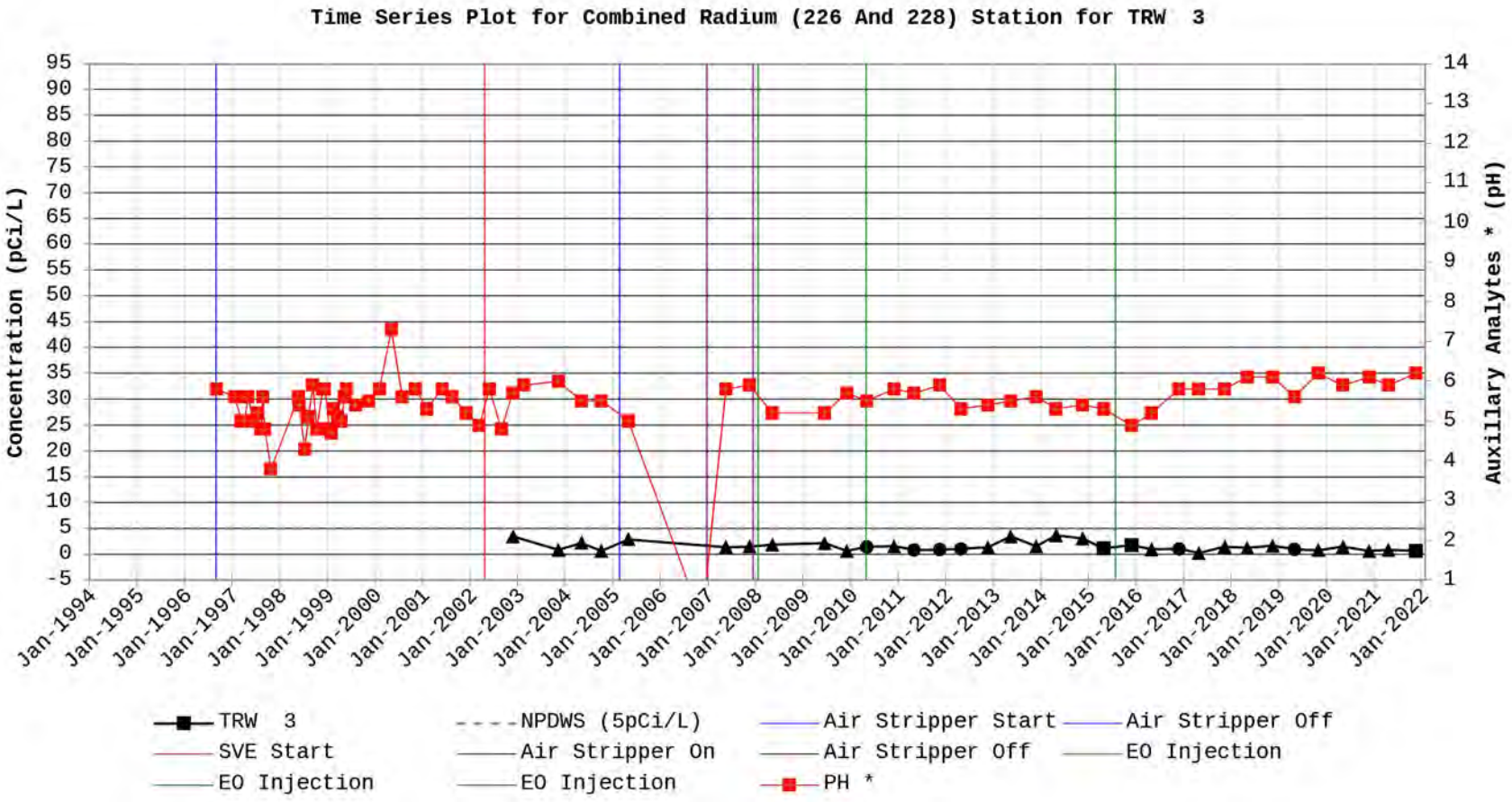

Time Series Plot for Combined Radium (226 And 228) Station for TNX 35D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

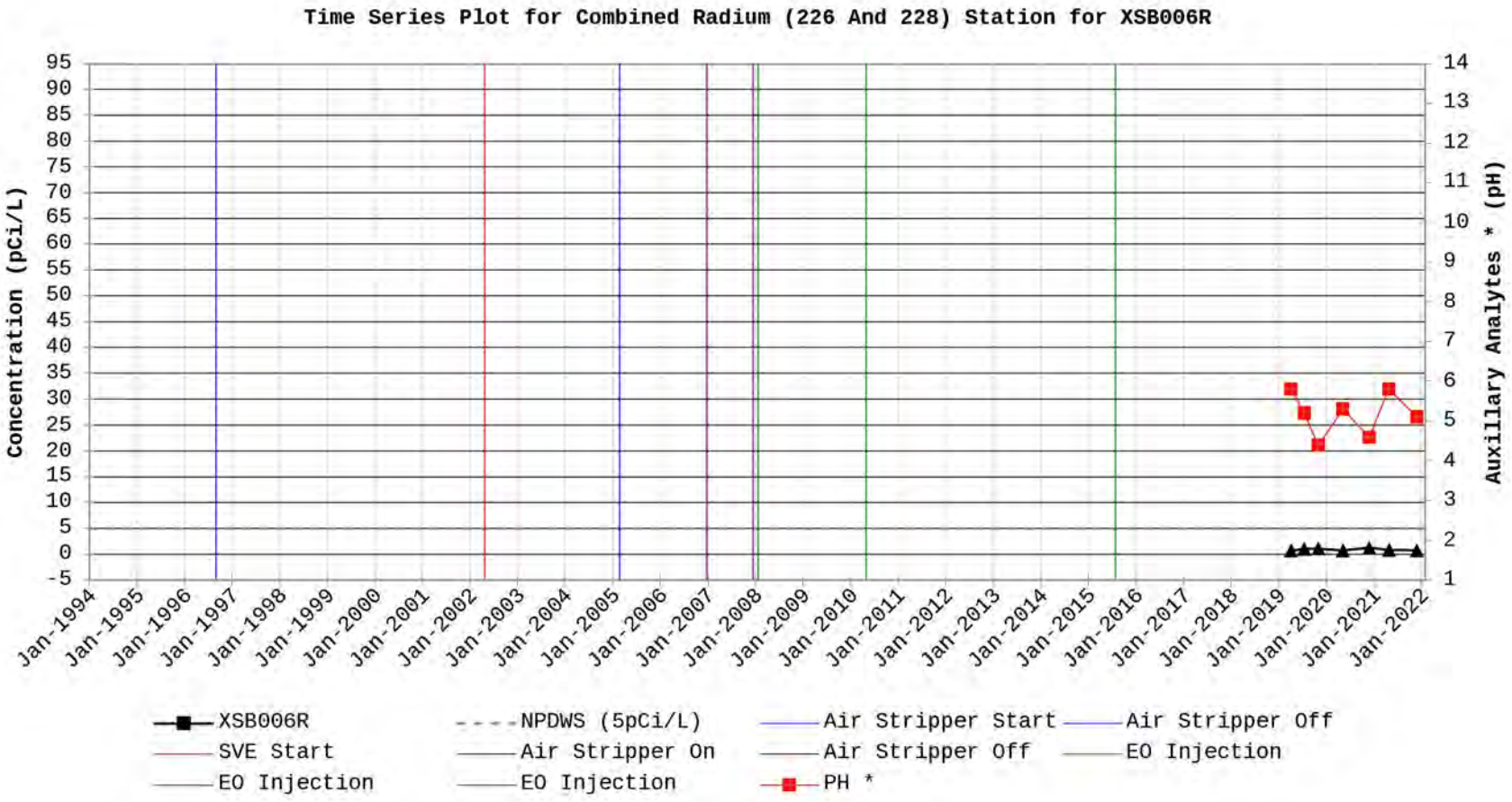

Time Series Plot for Combined Radium (226 And 228) Station for TNX 37D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

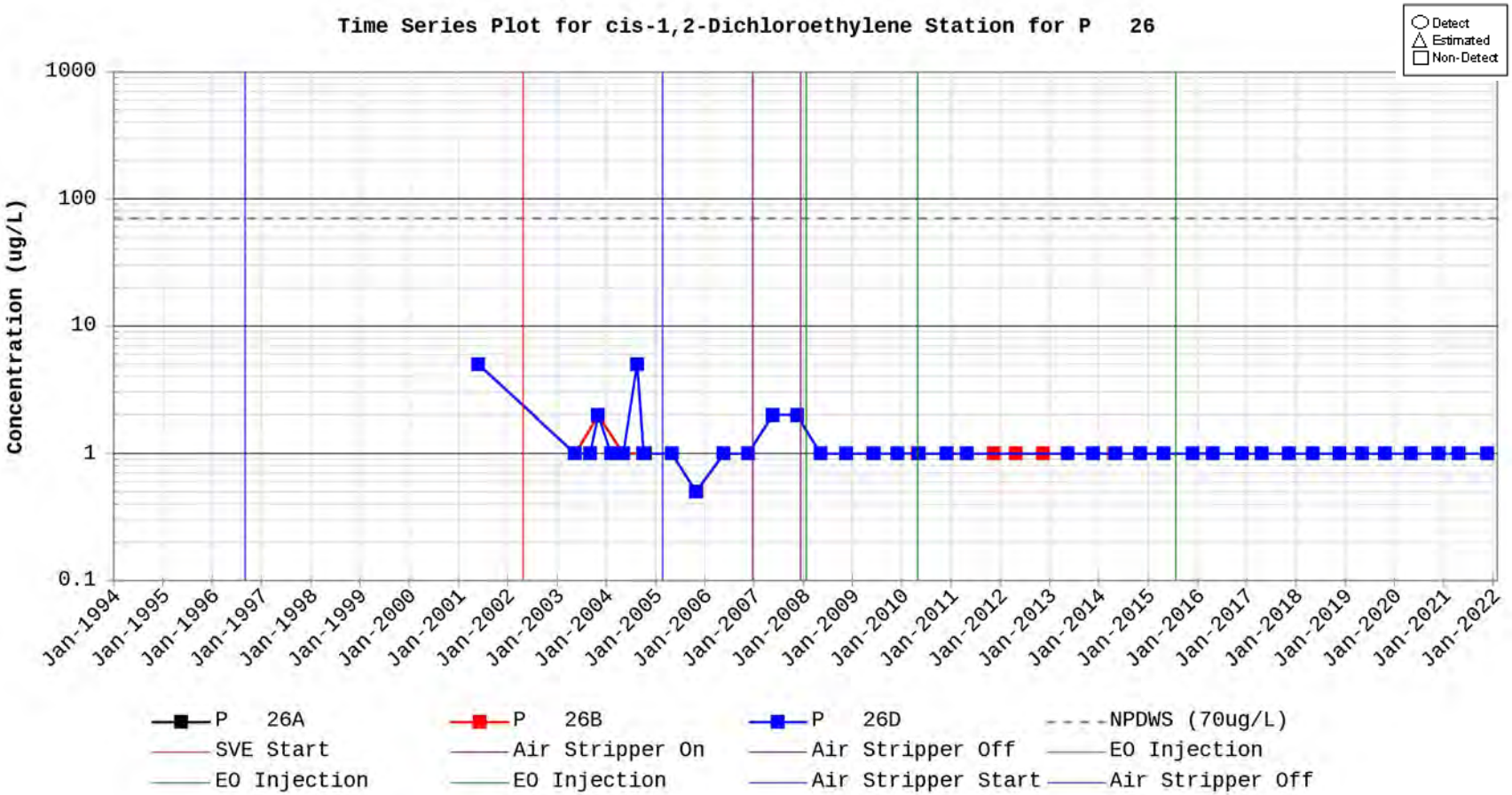

Time Series Plot for Combined Radium (226 And 228) Station for TNX073D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

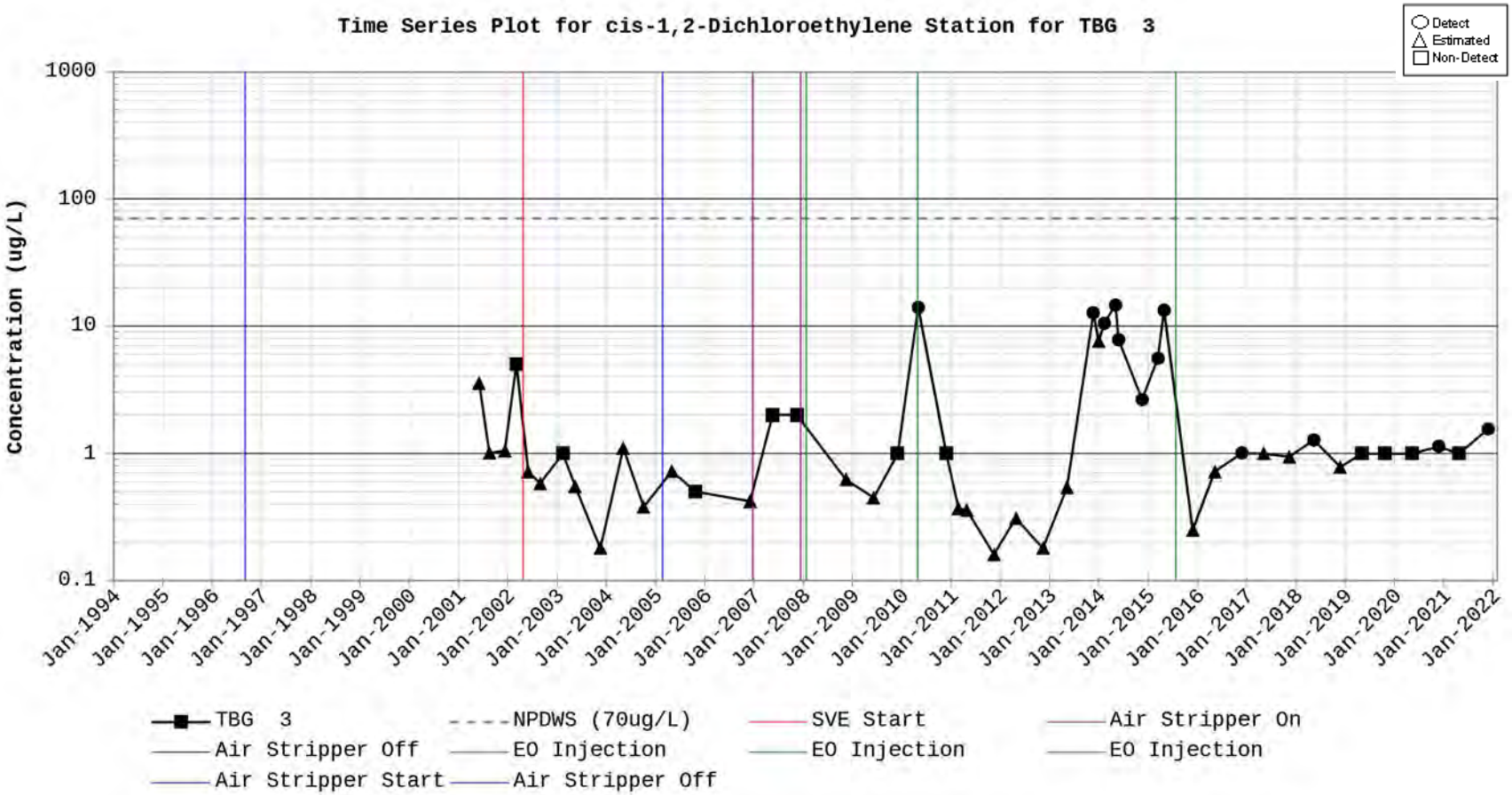

Time Series Plot for Combined Radium (226 And 228) Station for TNX074D
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

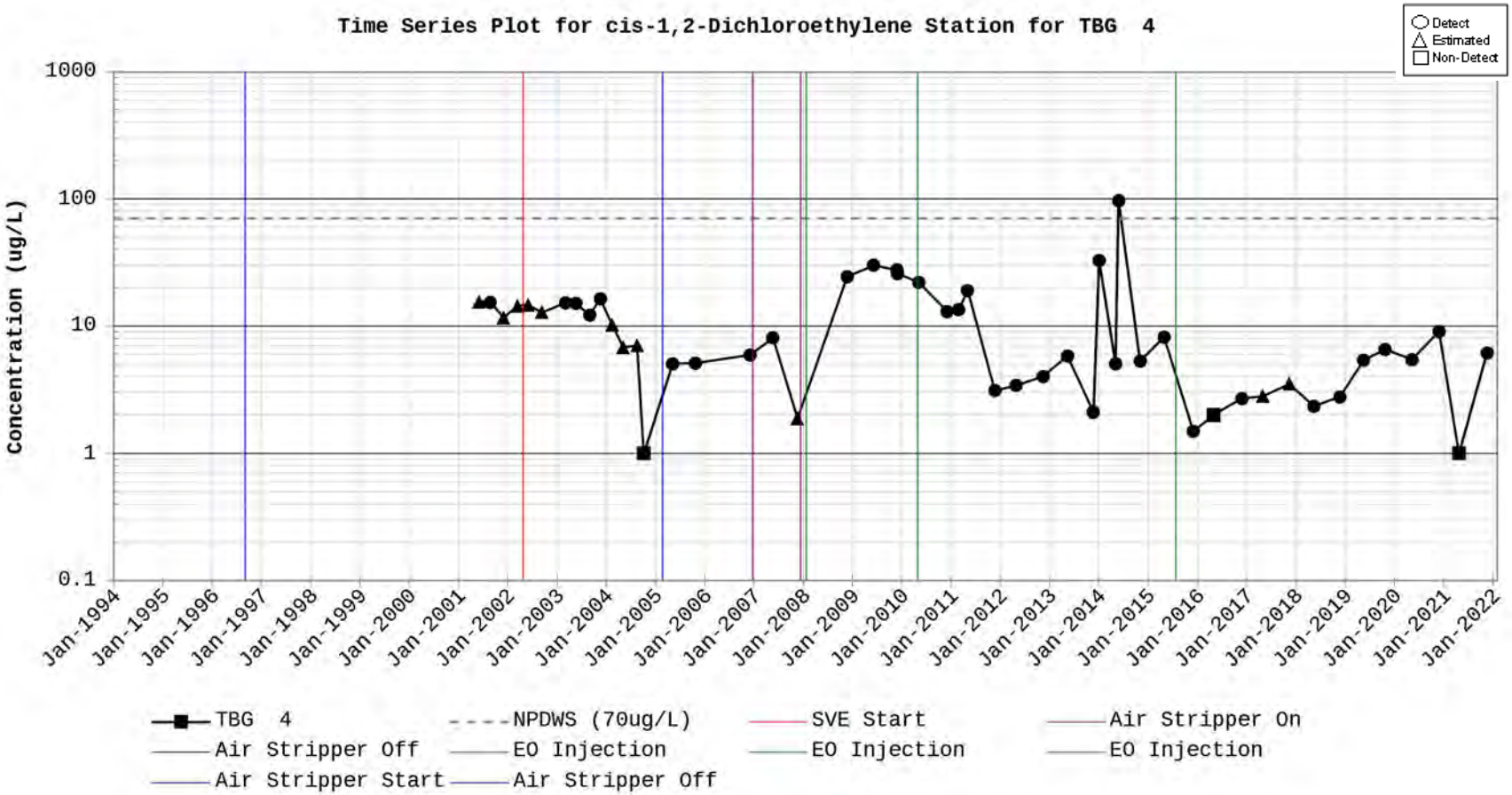

Time Series Plot for Combined Radium (226 And 228) Station for TRW 2
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

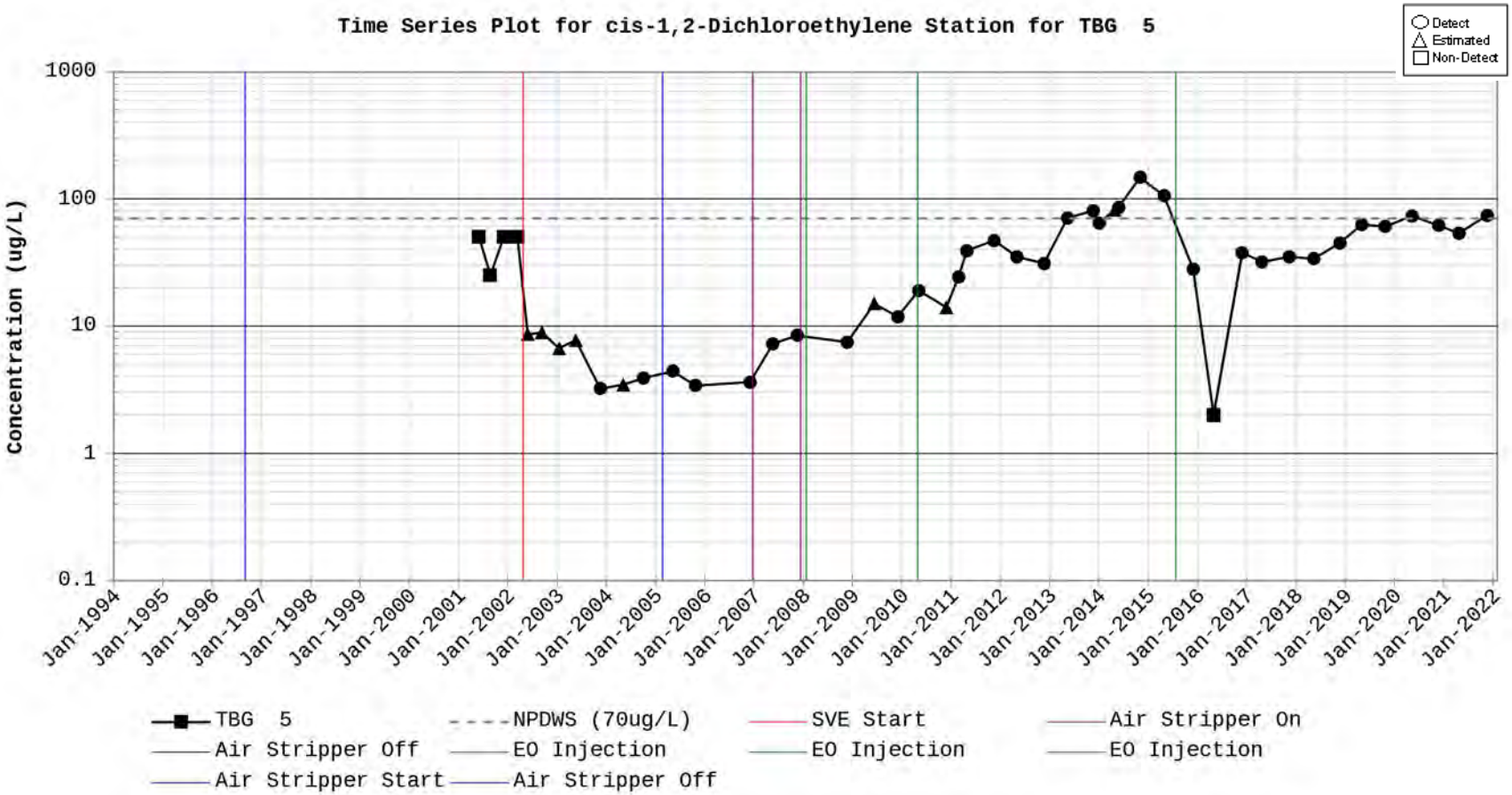

Time Series Plot for Combined Radium (226 And 228) Station for TRW 3
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

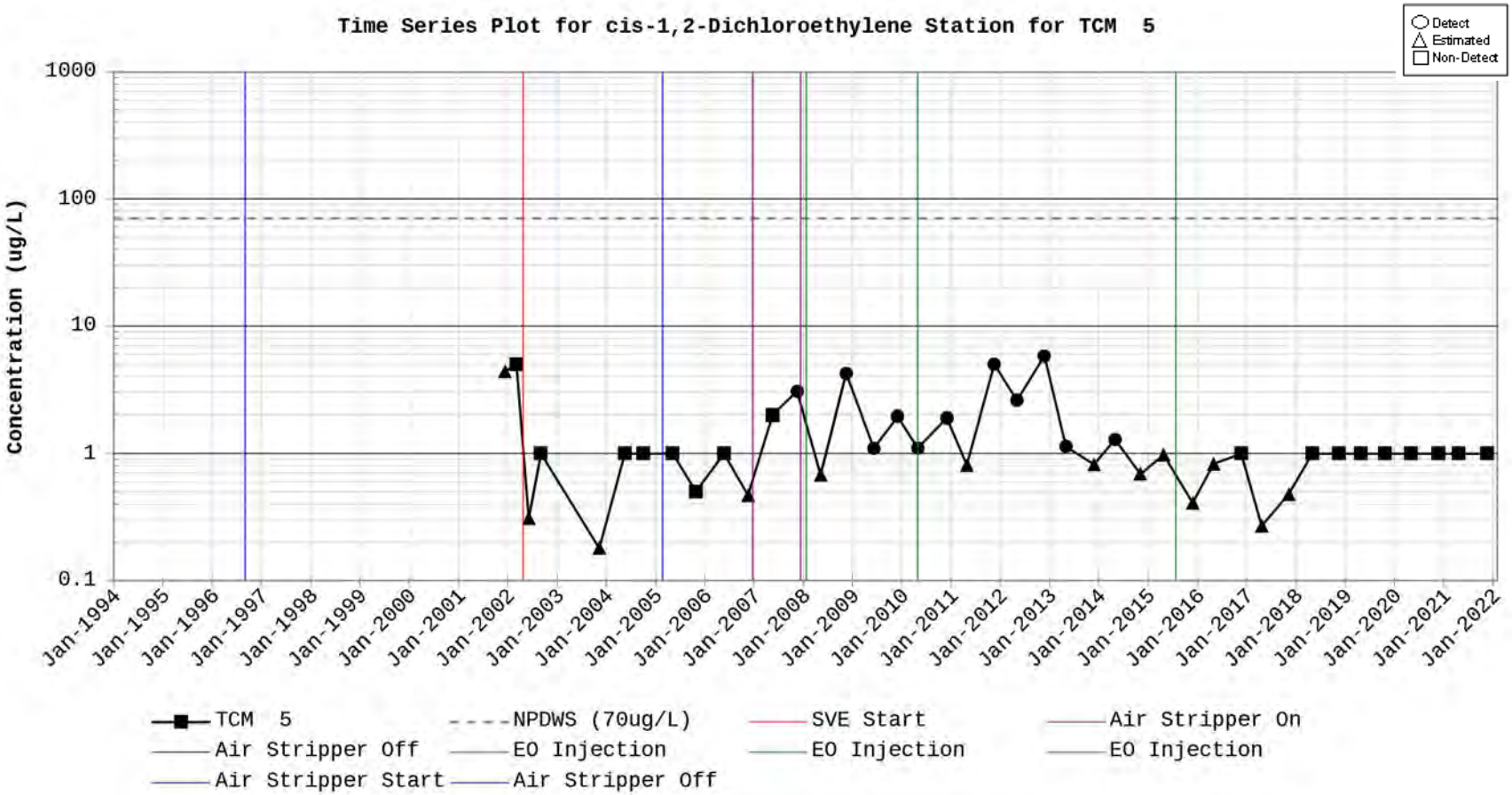

Time Series Plot for Combined Radium (226 And 228) Station for XSB006R
Concentration (pCi/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (5pCi/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

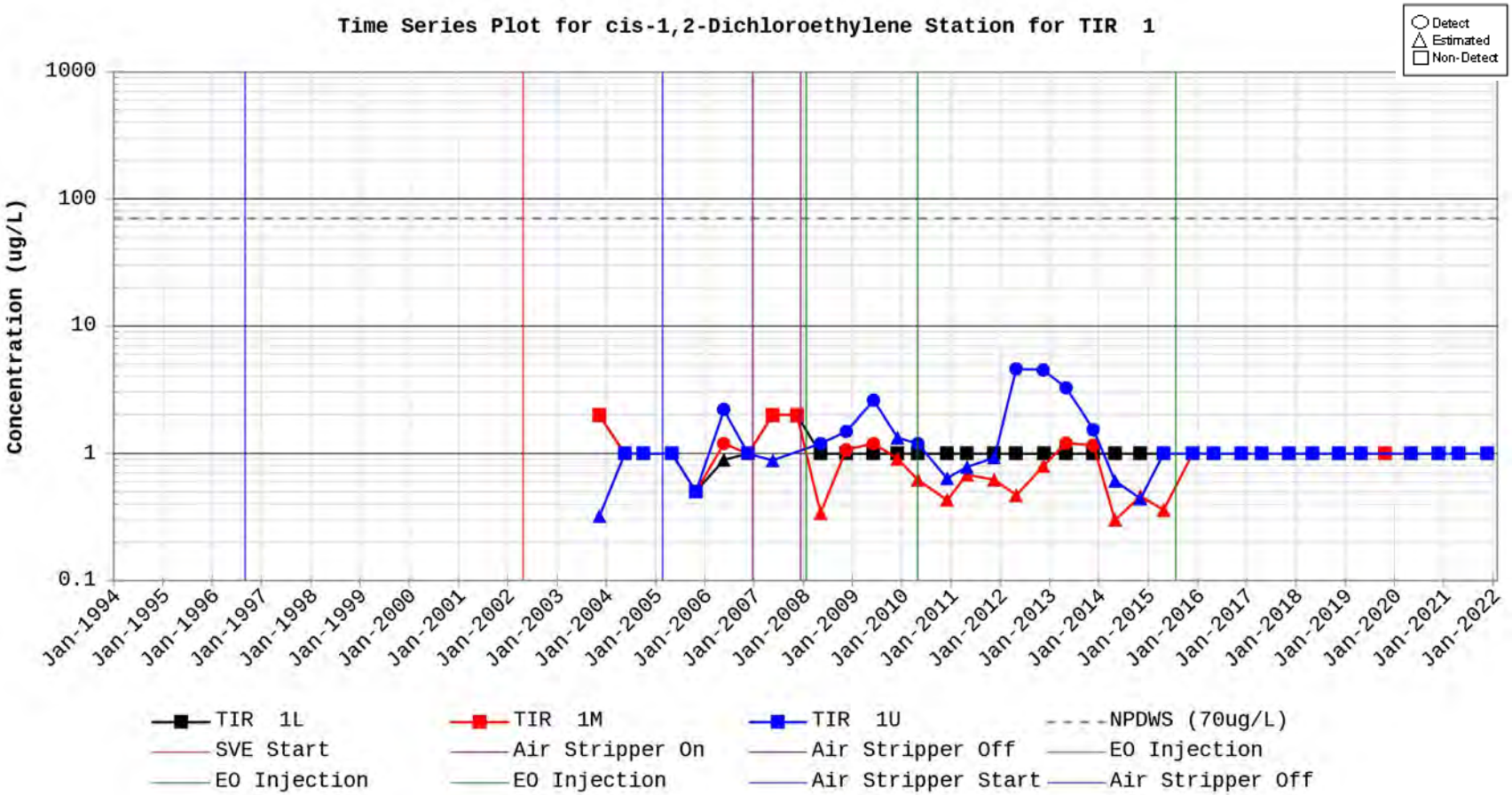

Time Series Plot for cis-1,2-Dichloroethylene Station for P 26
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
P 26A
P 26B
P 26D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

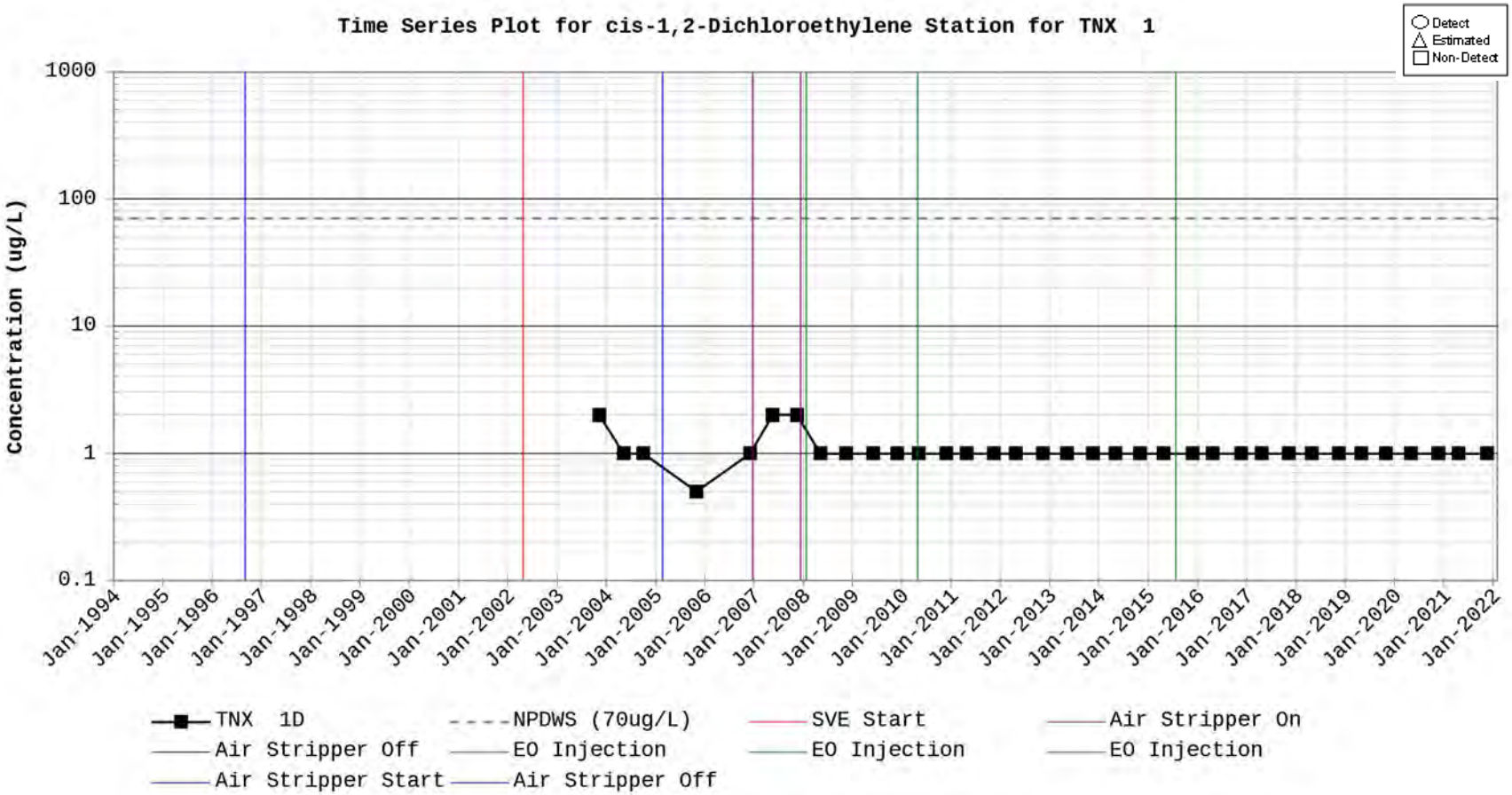

Time Series Plot for cis-1,2-Dichloroethylene Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

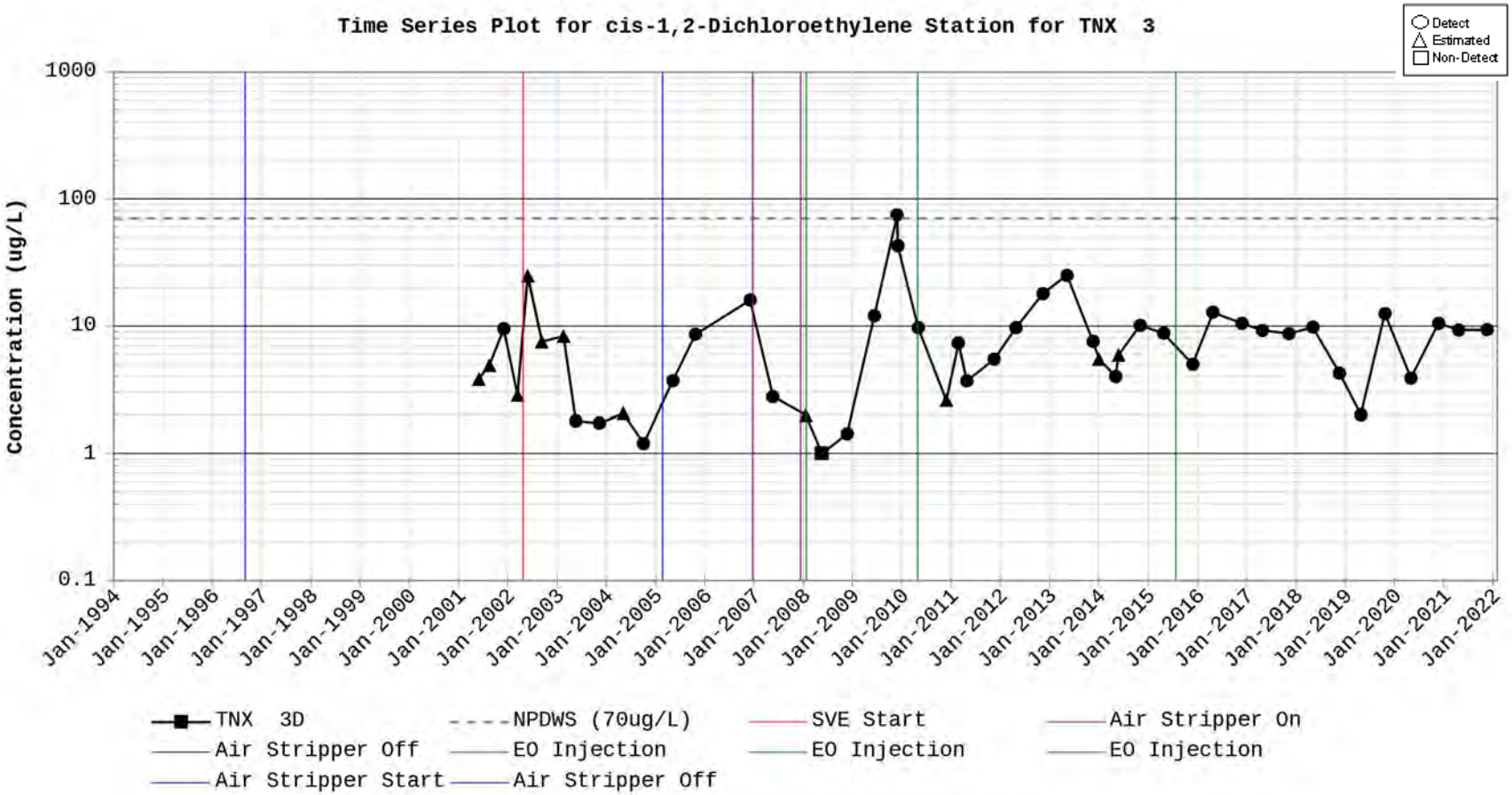

Time Series Plot for cis-1,2-Dichloroethylene Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

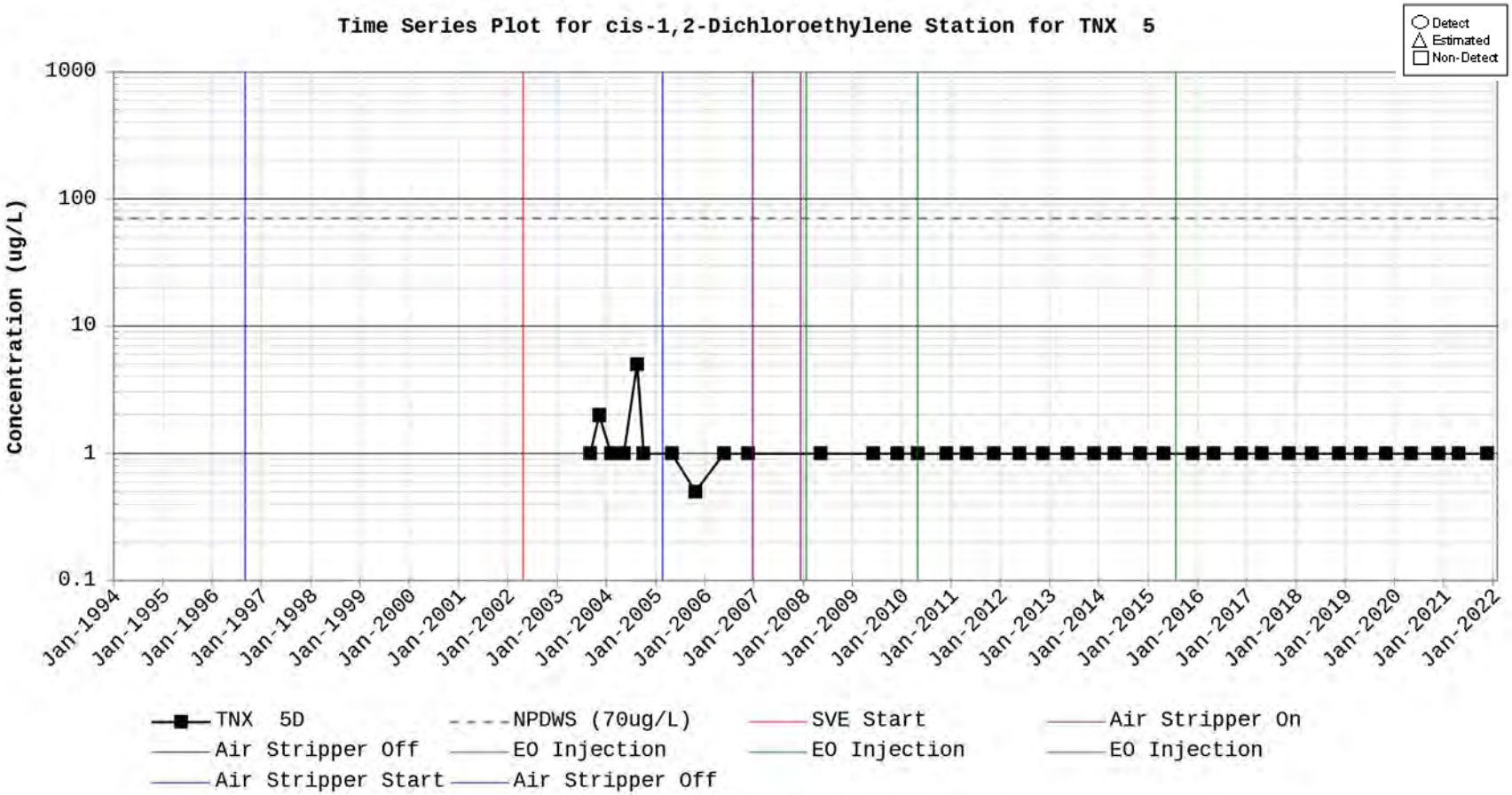

Time Series Plot for cis-1,2-Dichloroethylene Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

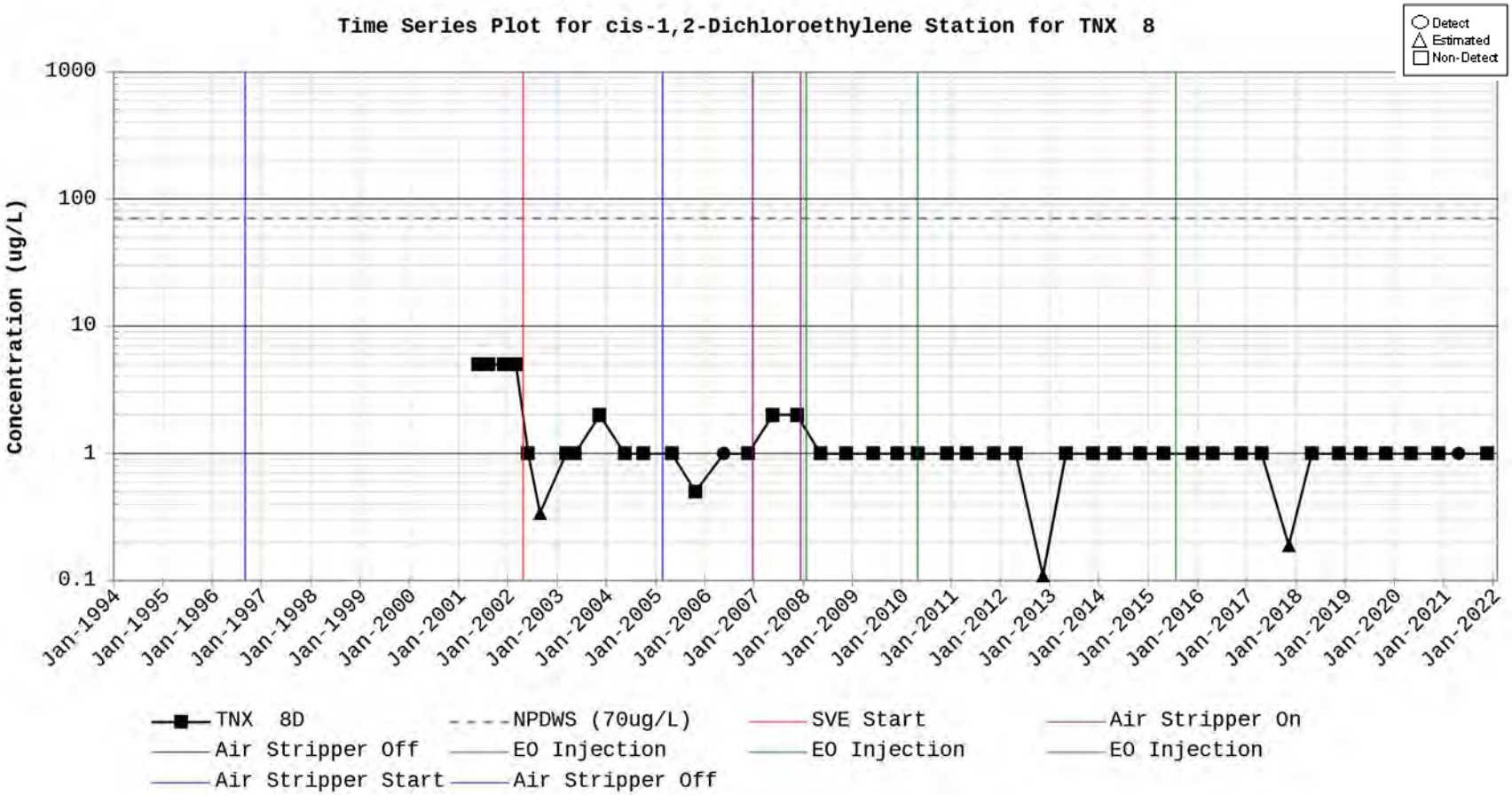

Time Series Plot for cis-1,2-Dichloroethylene Station for TCM 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

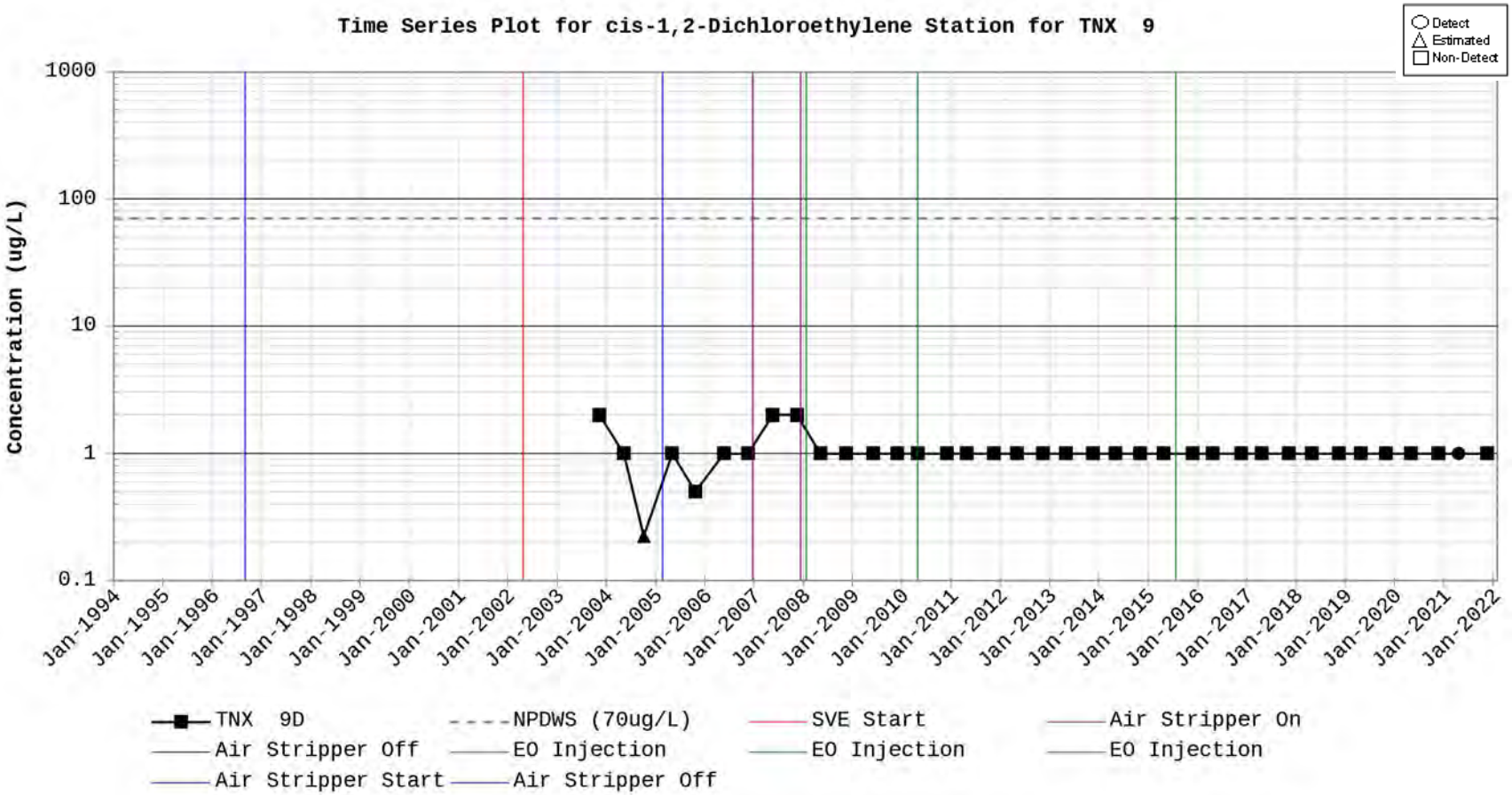

Time Series Plot for cis-1,2-Dichloroethylene Station for TIR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
TIR 1M
TIR 1U
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

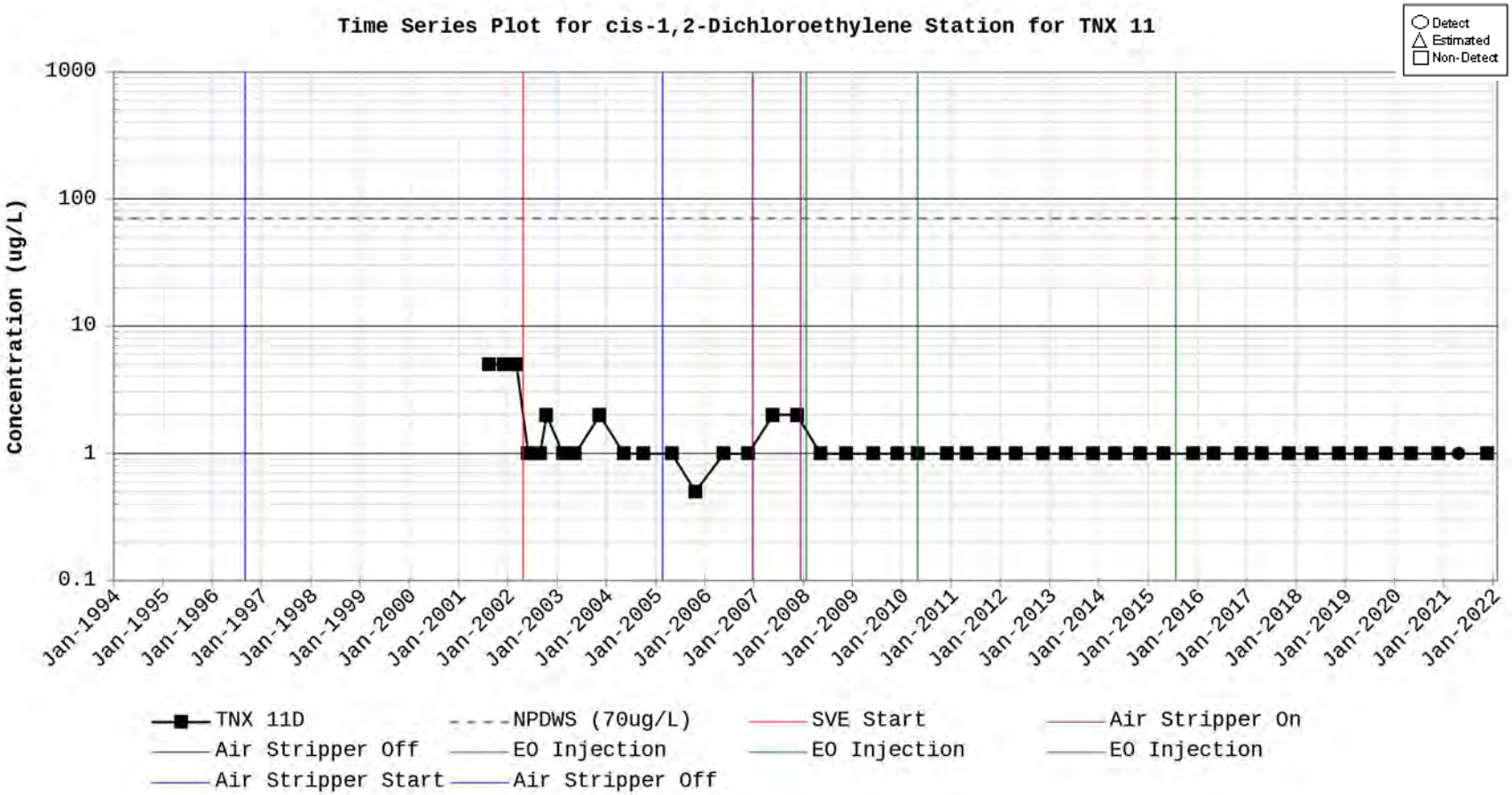

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 1D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

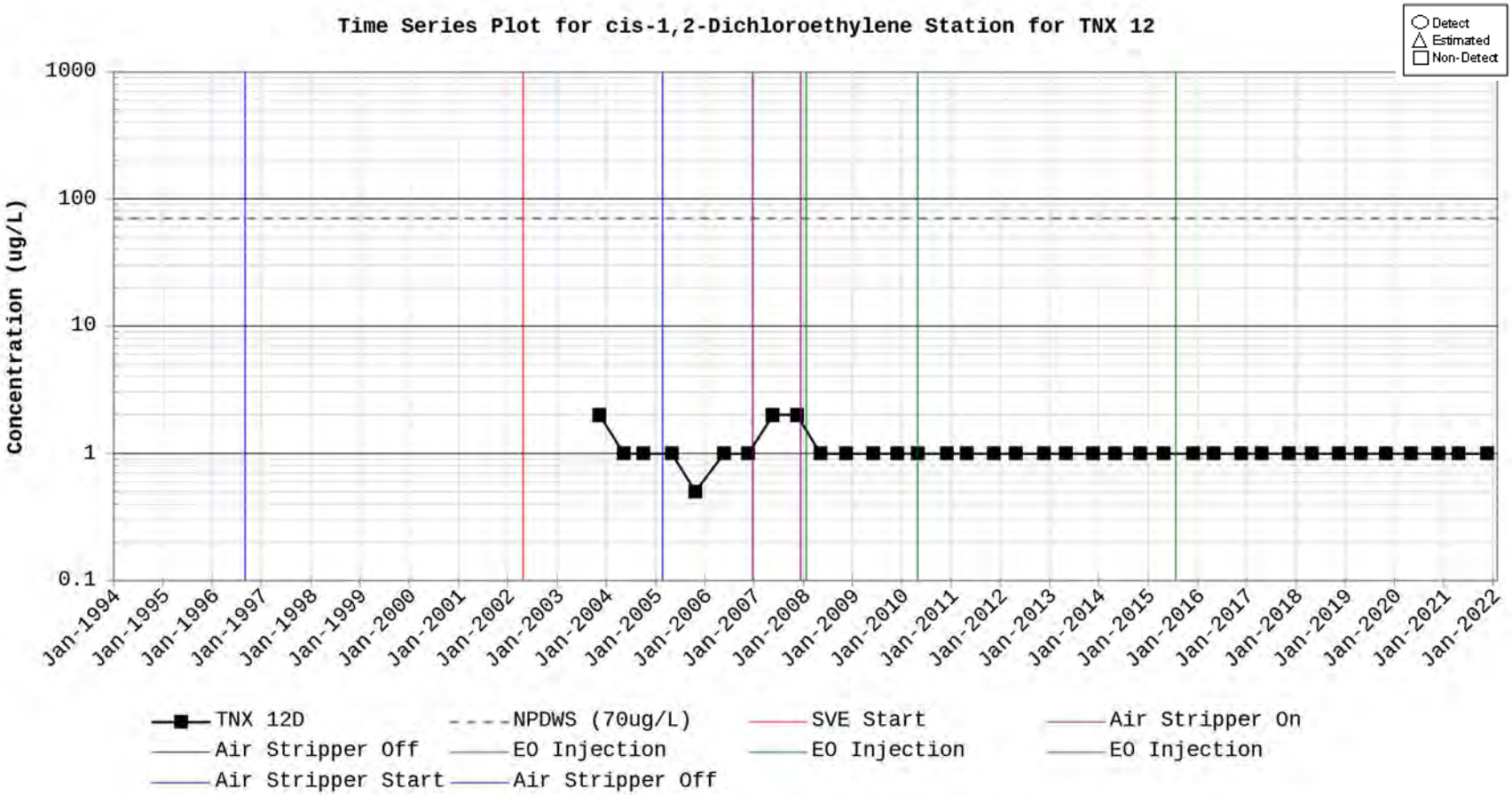

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

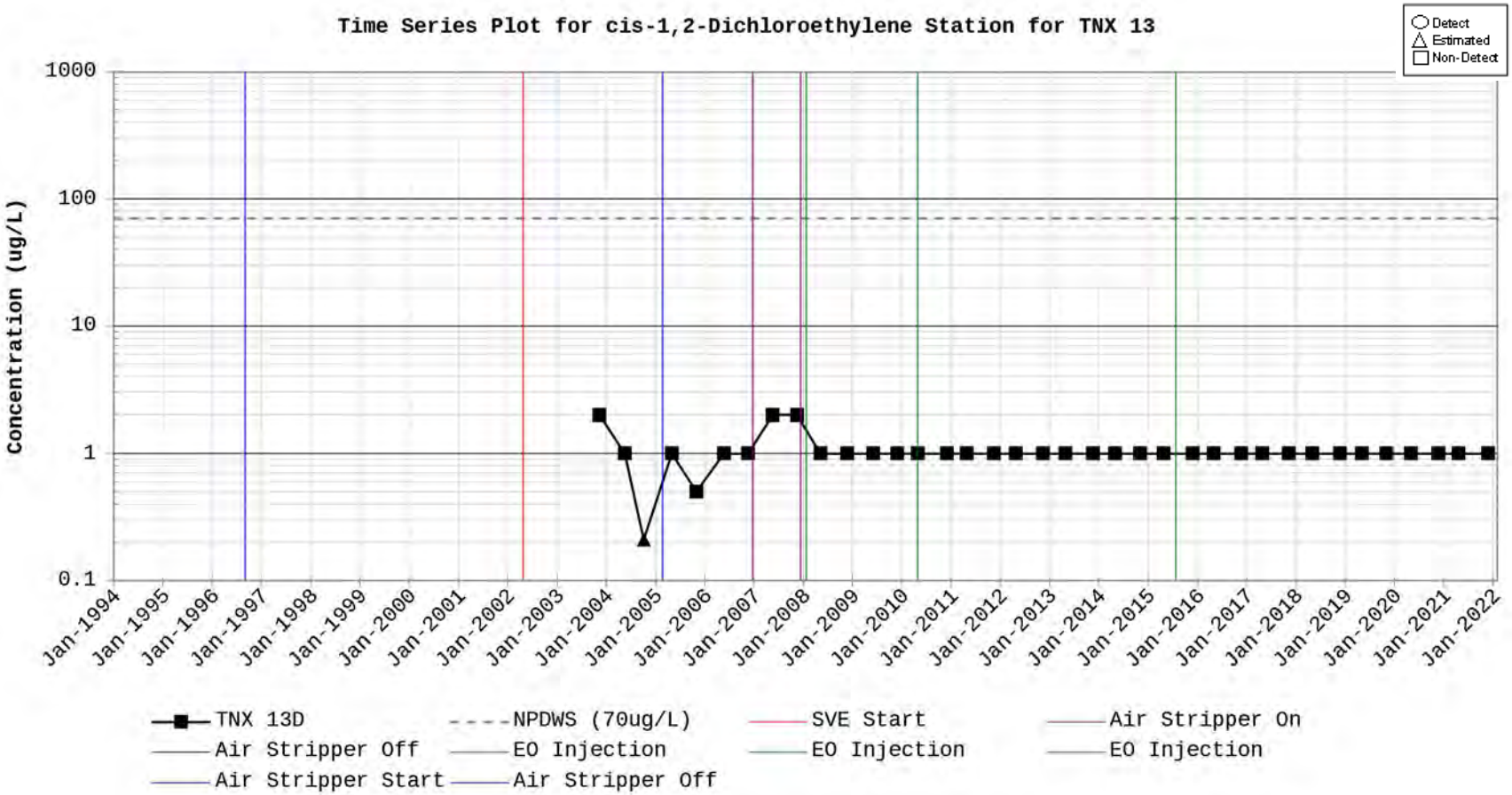

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

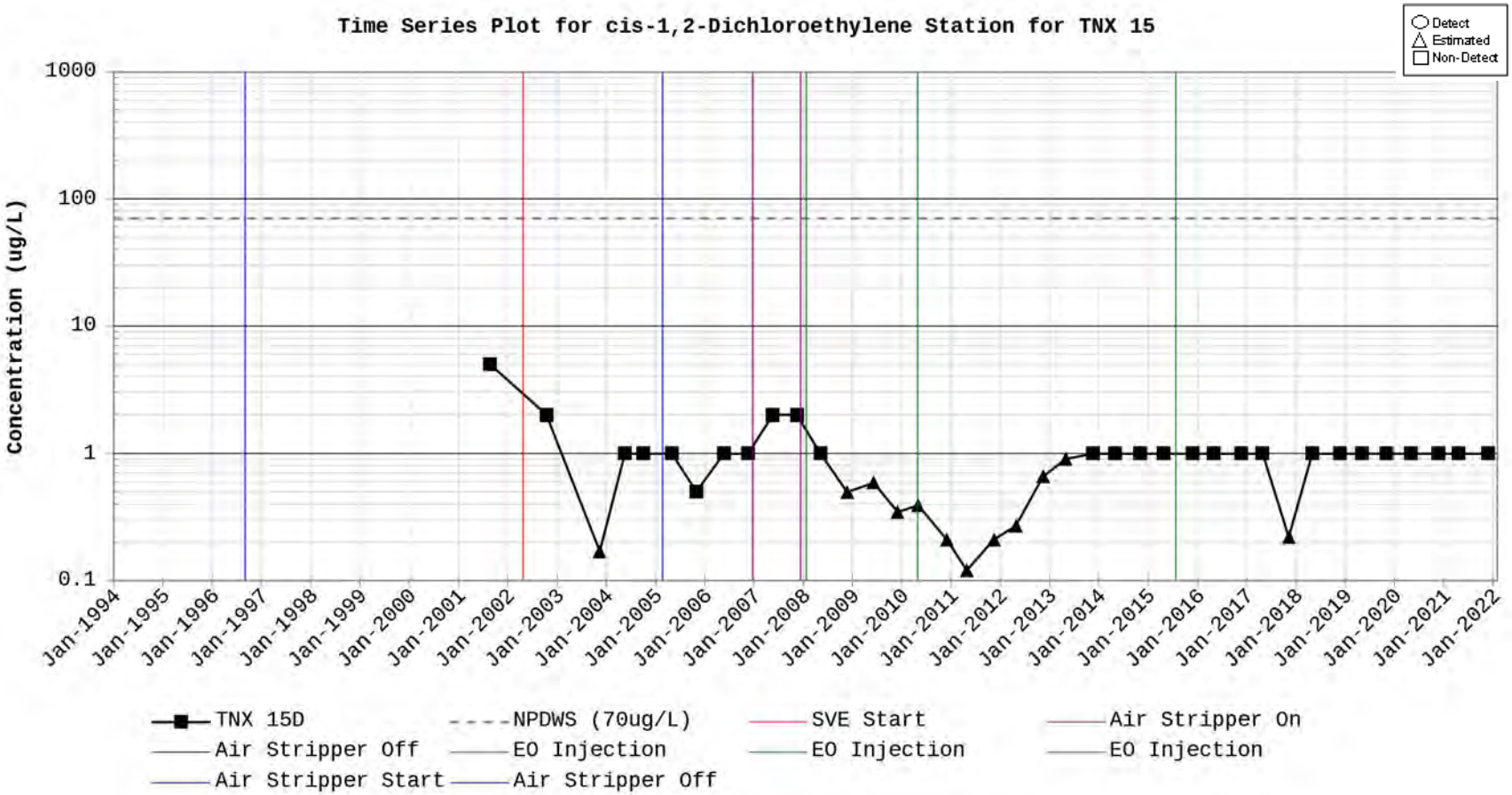

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 8
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

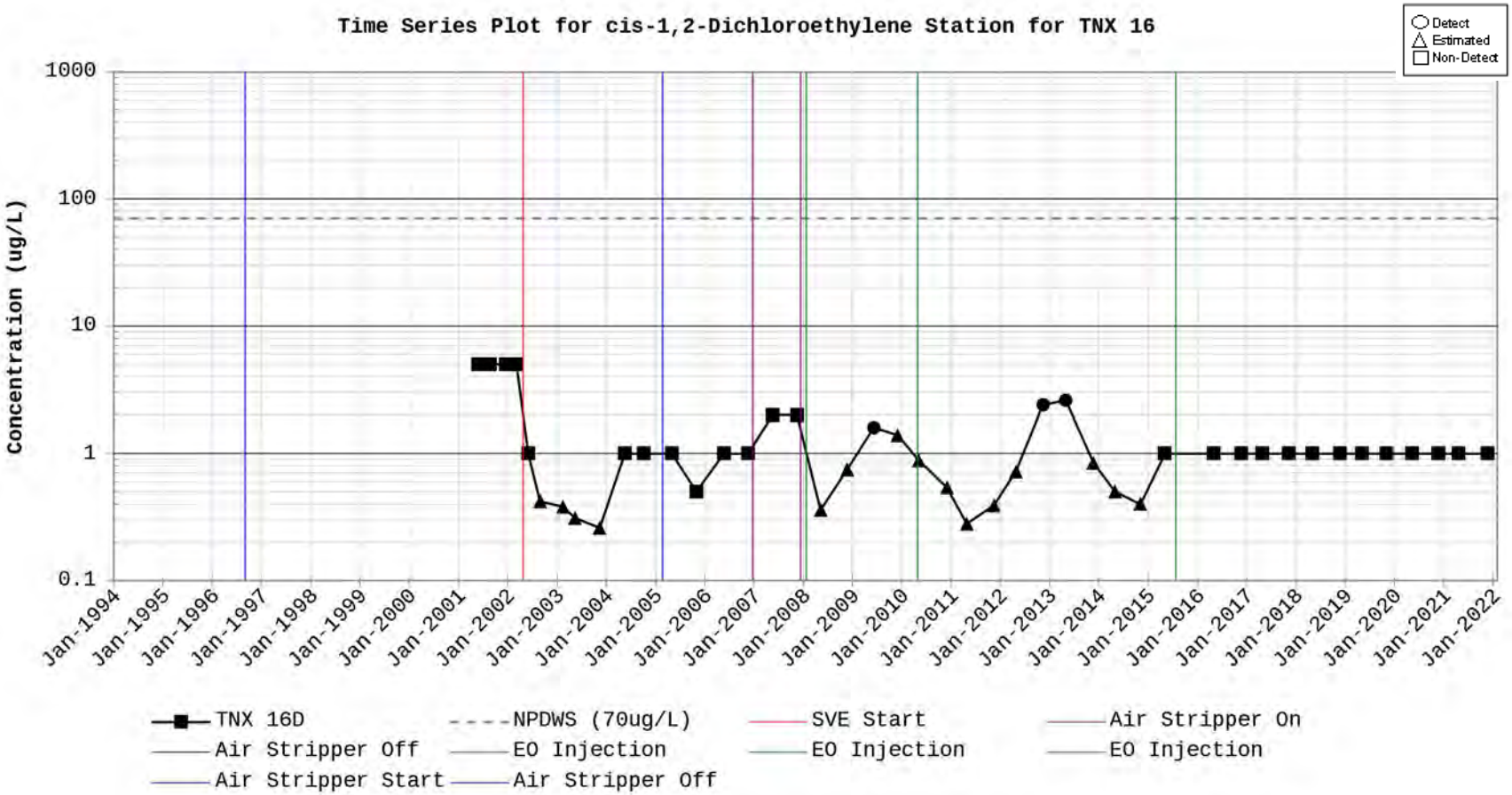

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 9
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 9D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

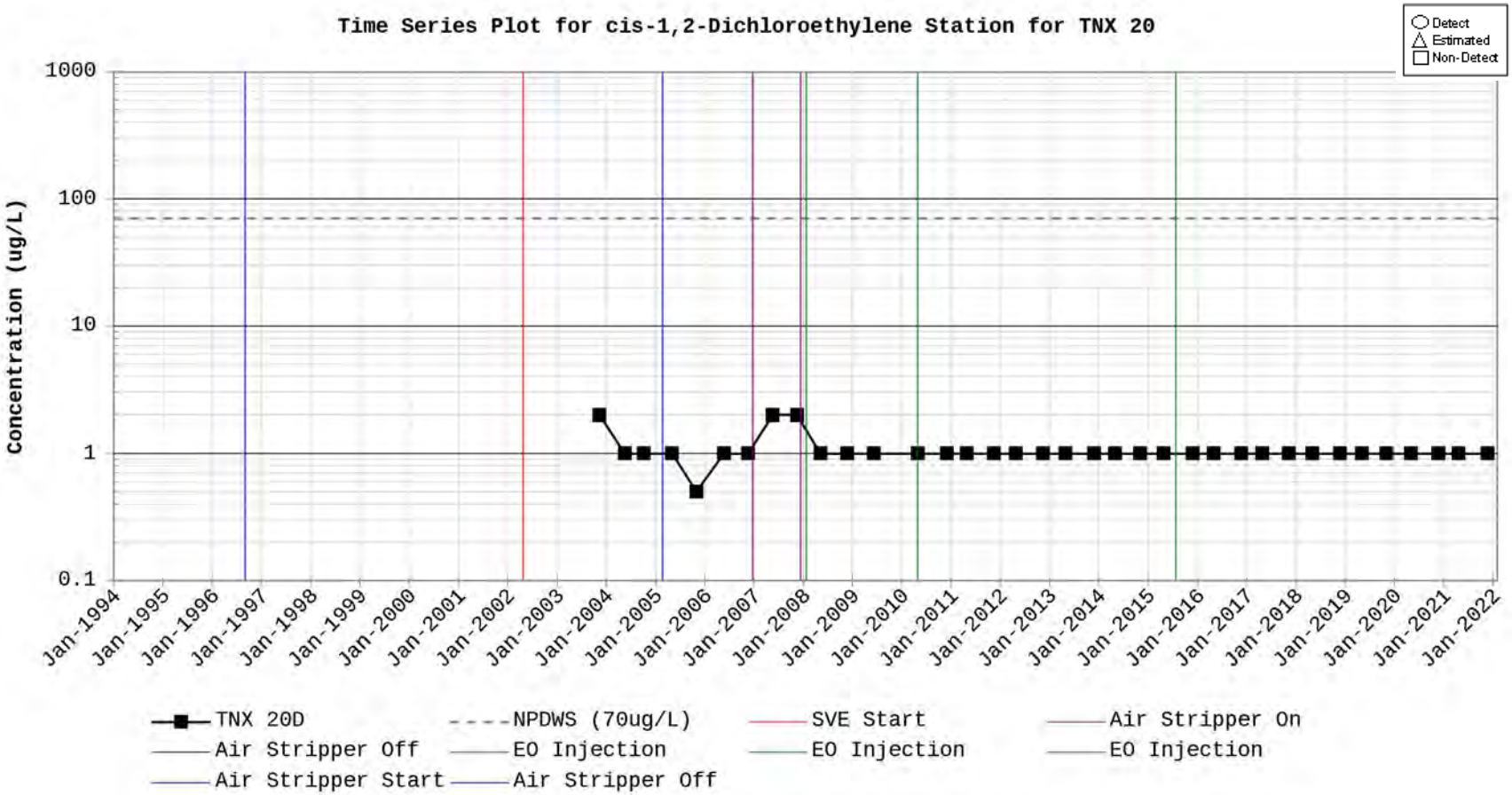

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 11
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

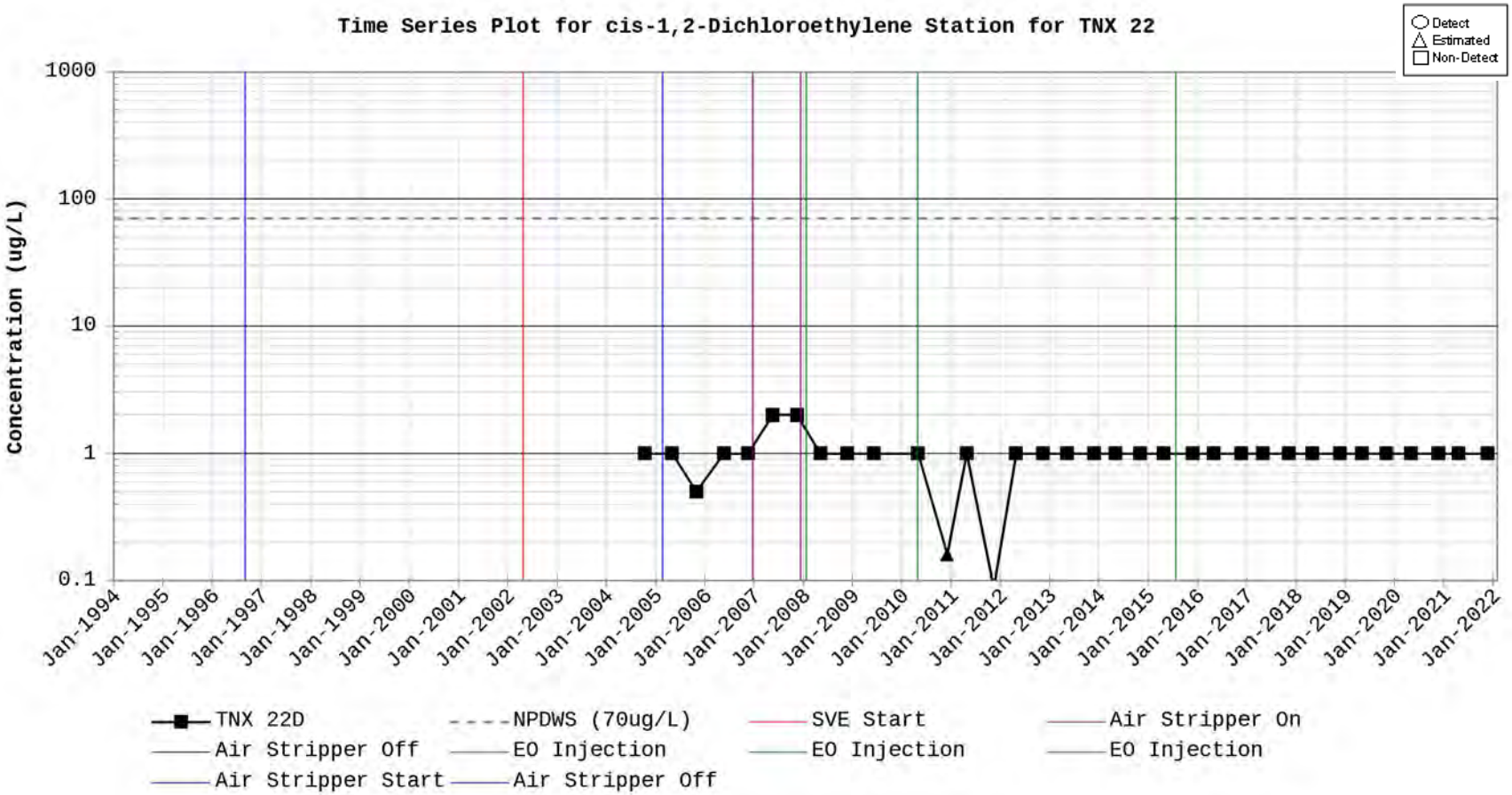

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 12
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 12D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

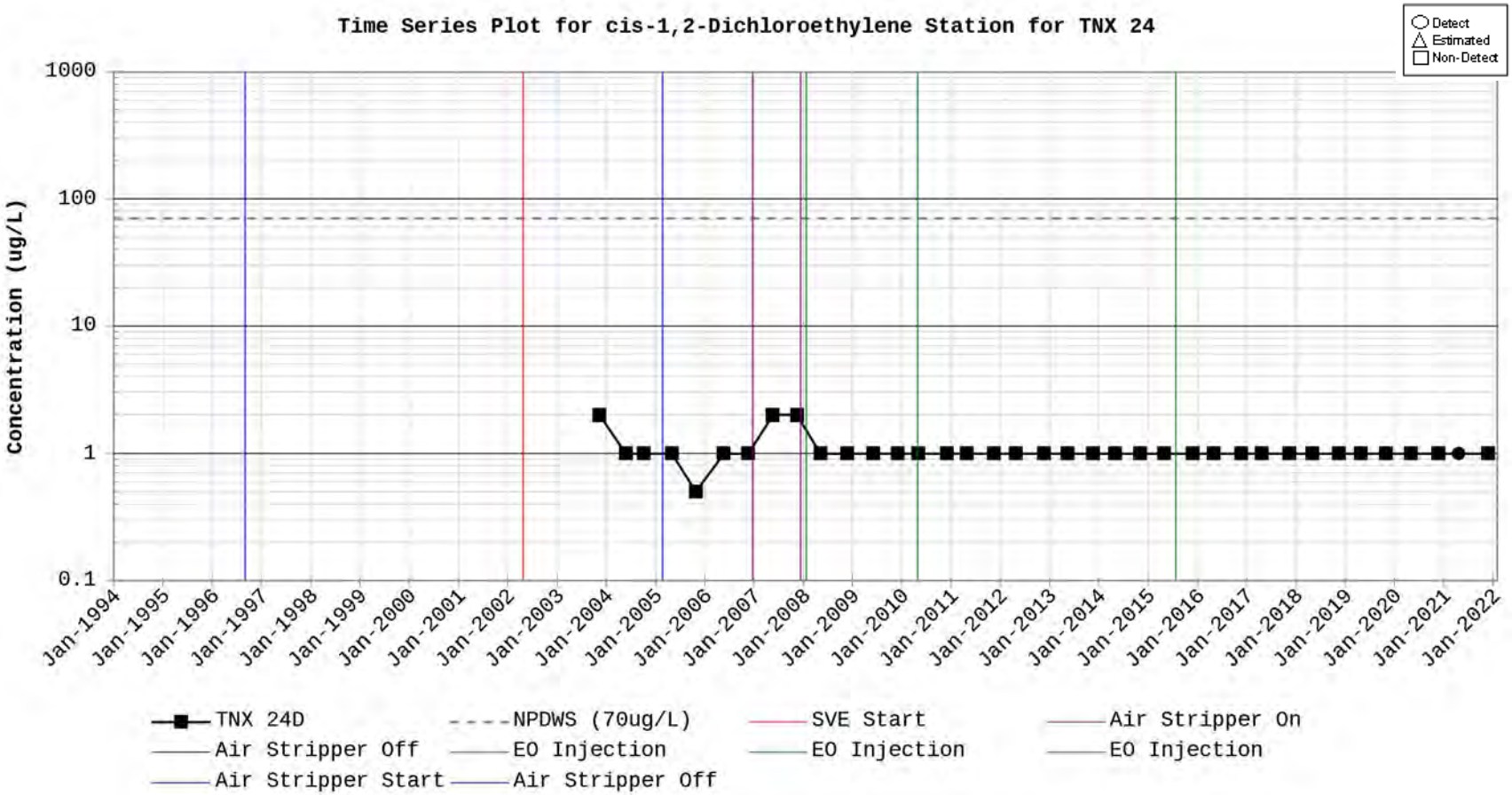

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 13
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

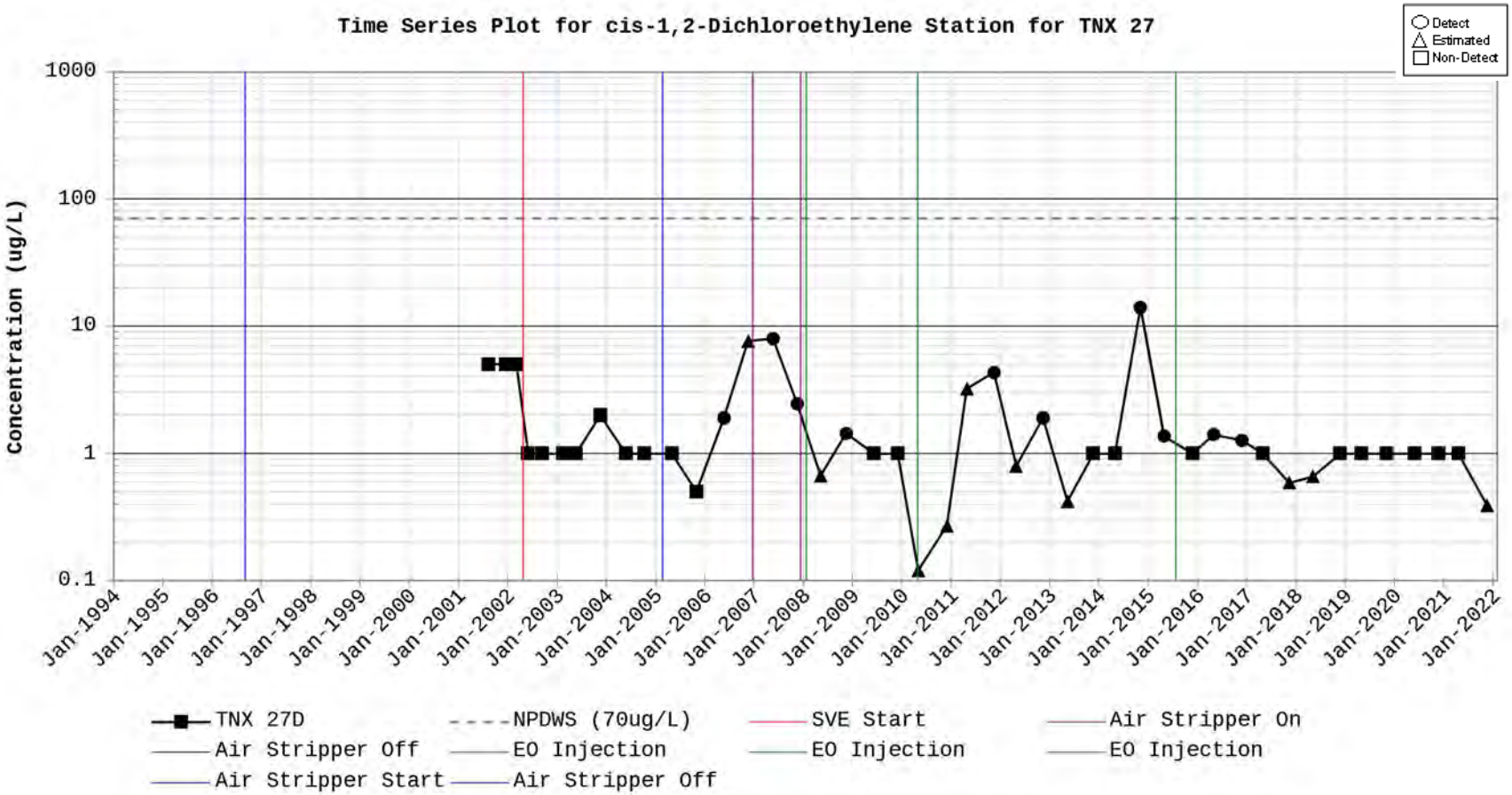

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 15
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 15D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

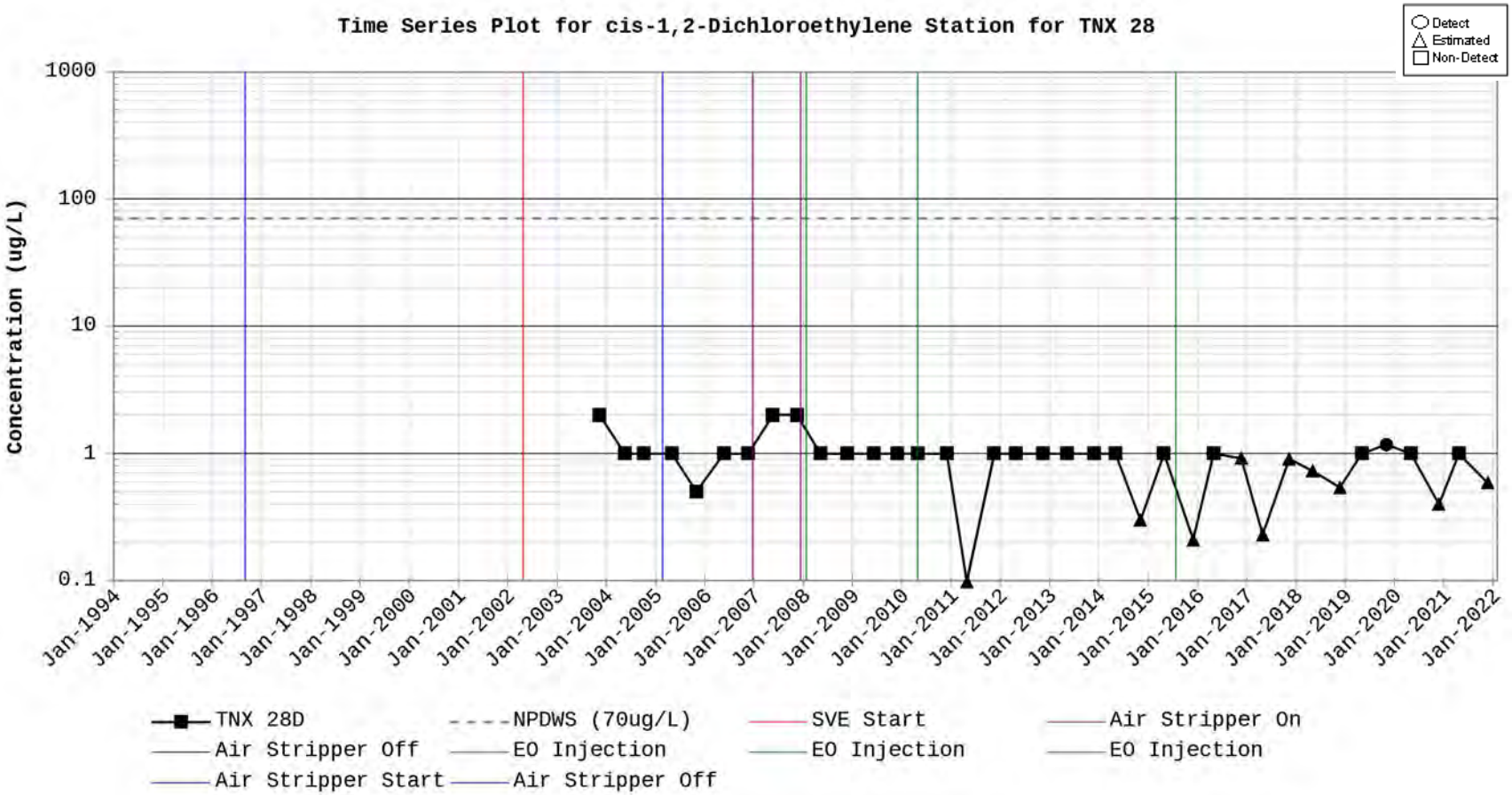

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 16
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 16D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

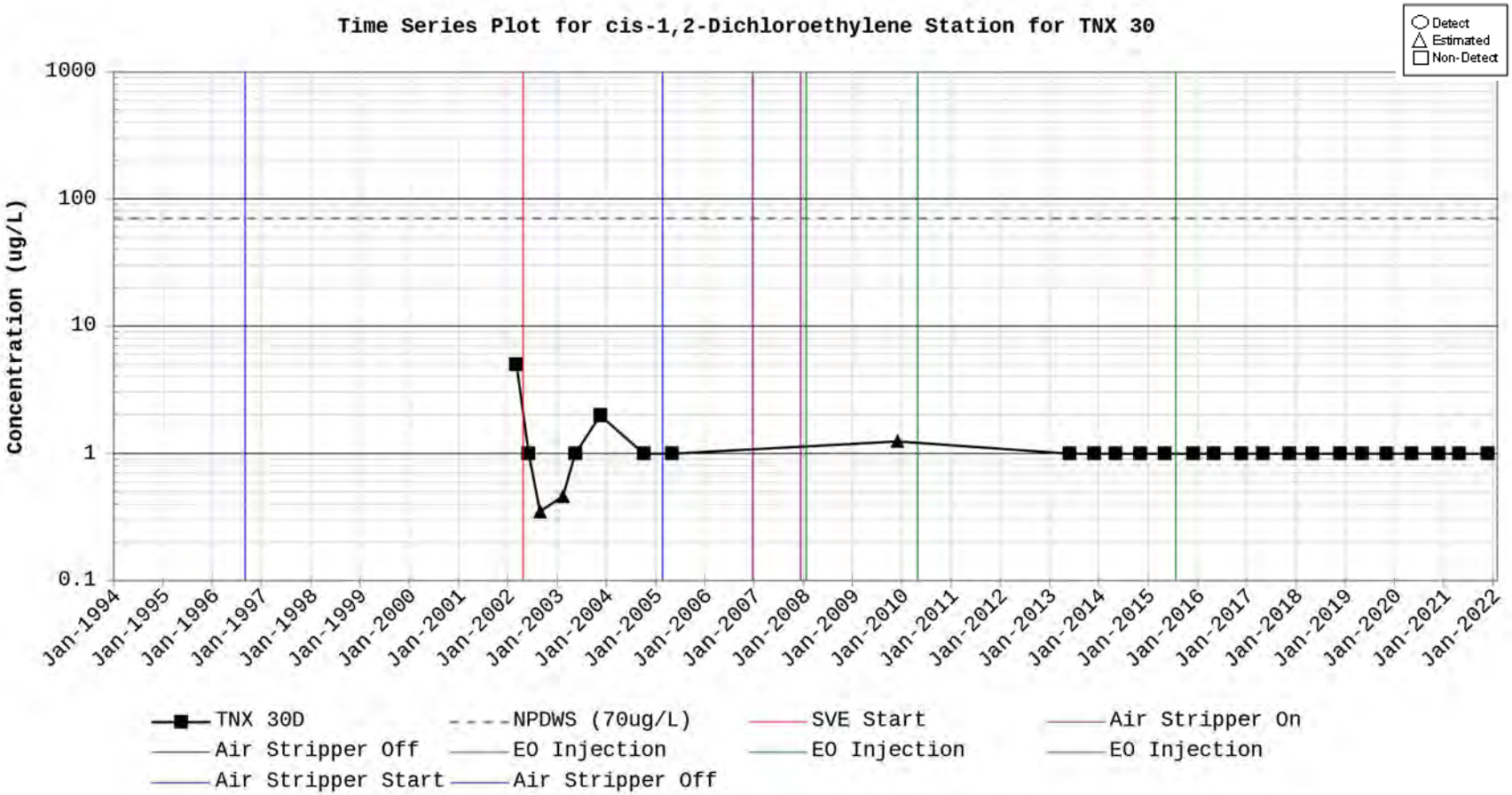

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 20
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 20D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

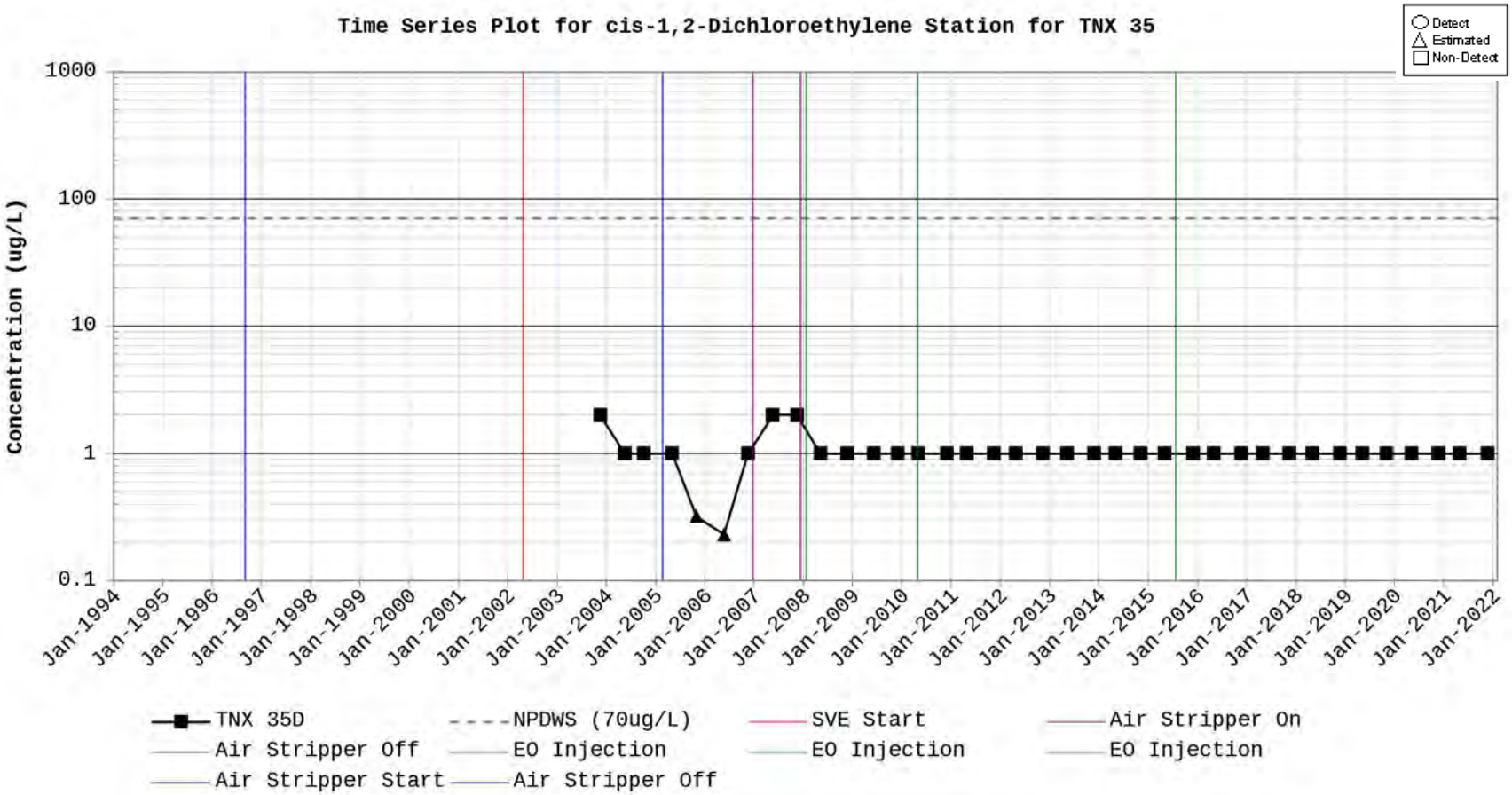

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 22
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 22D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

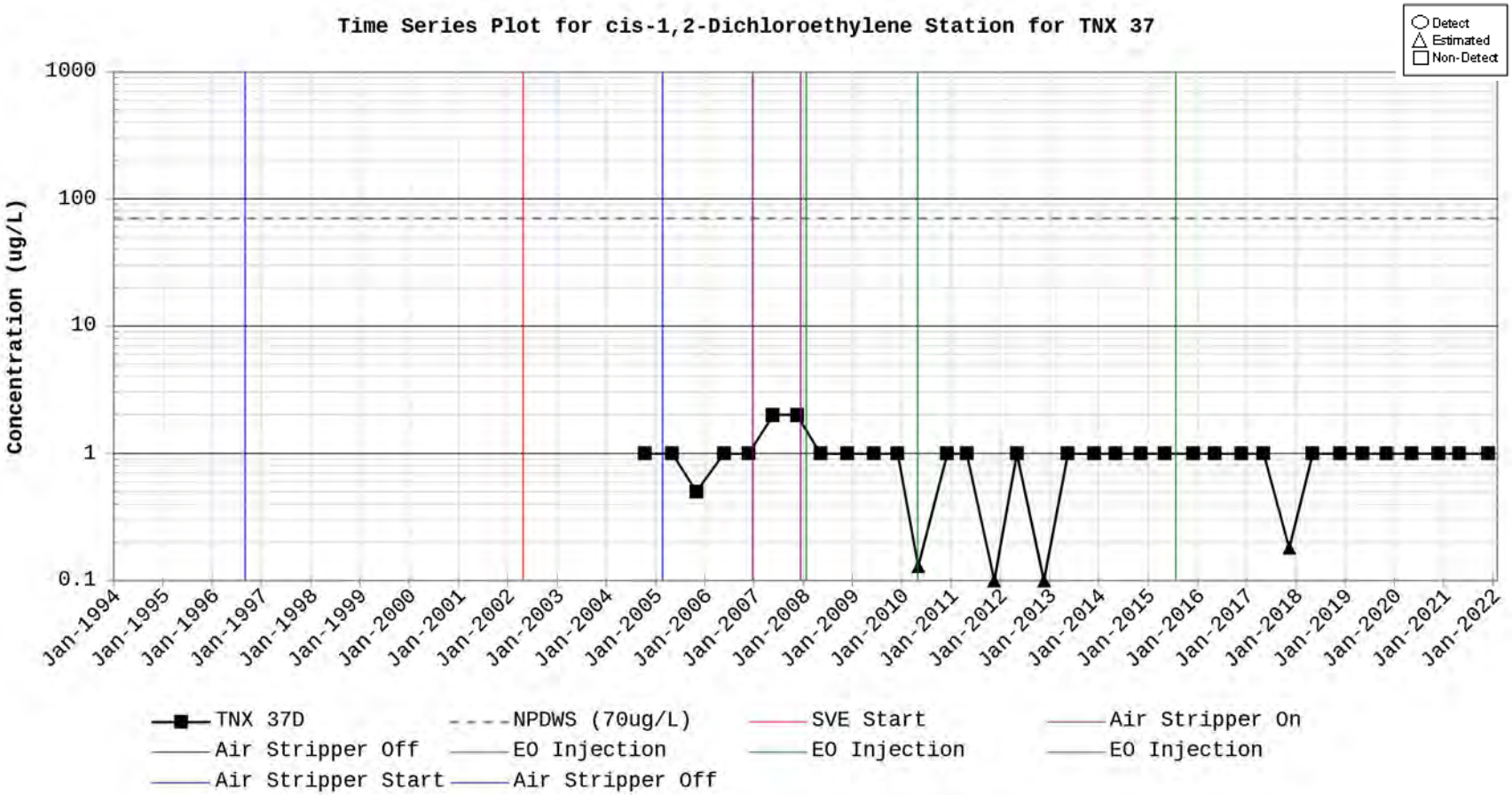

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 24
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 24D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

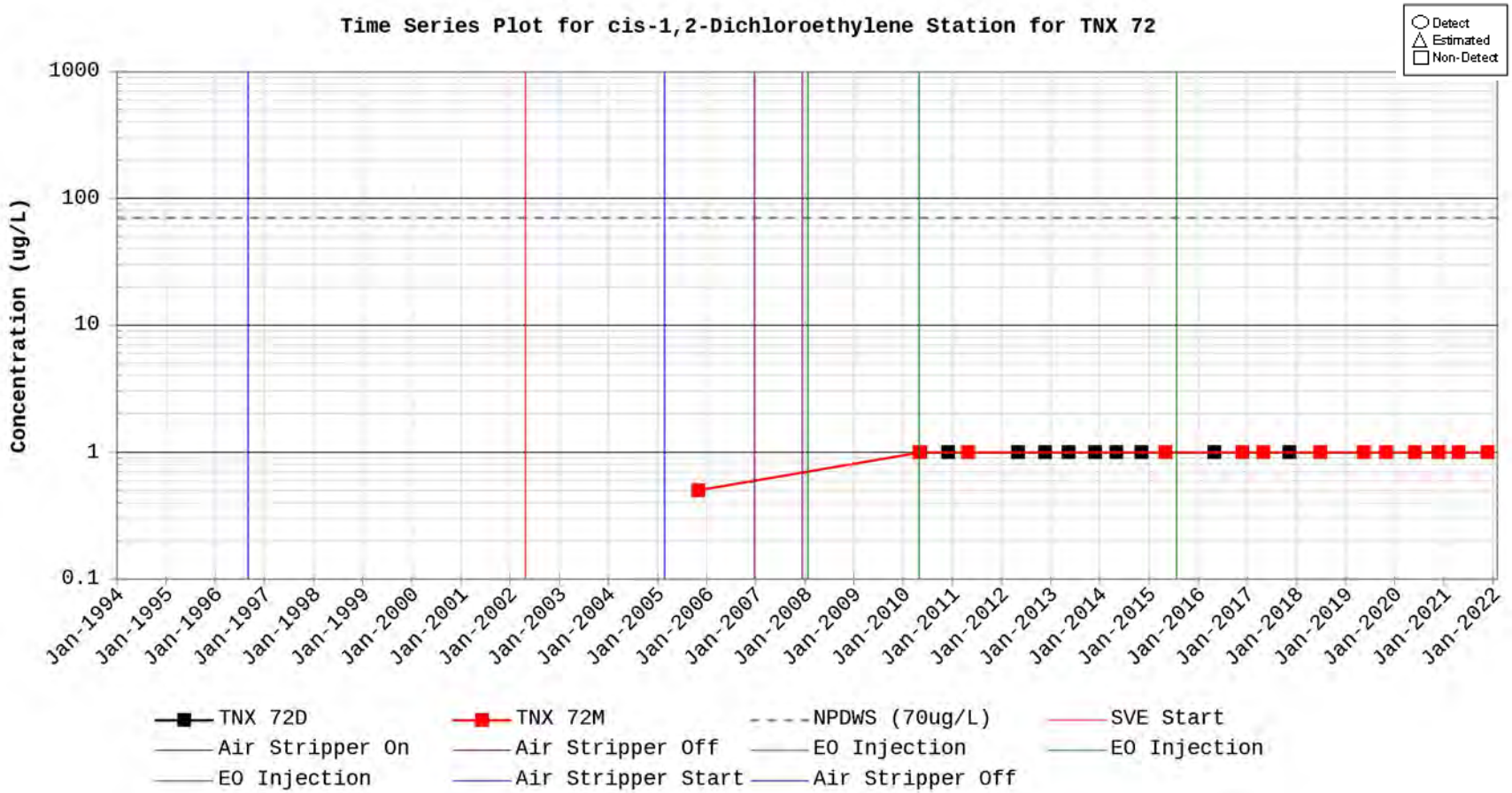

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 27
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

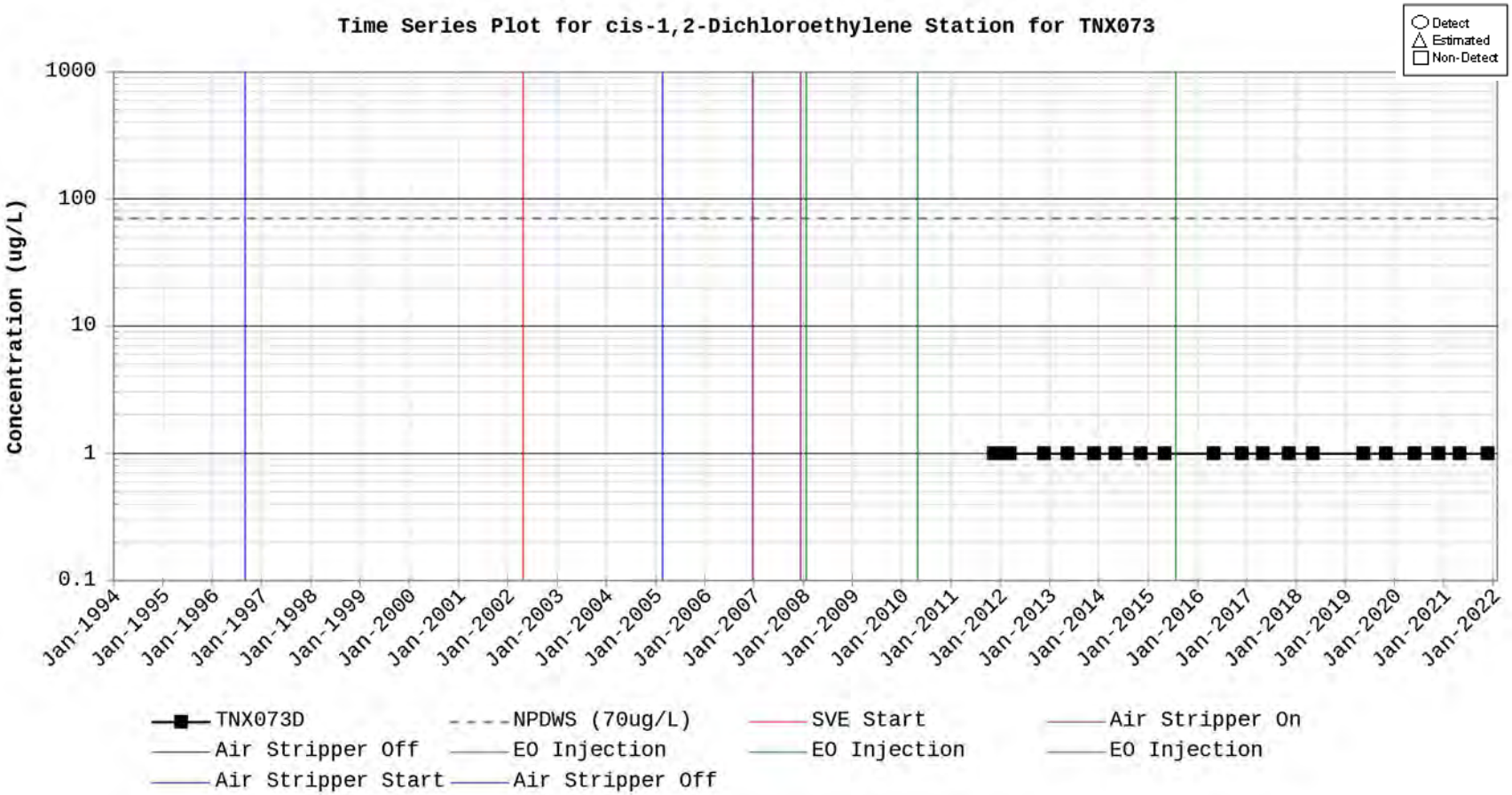

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 28
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

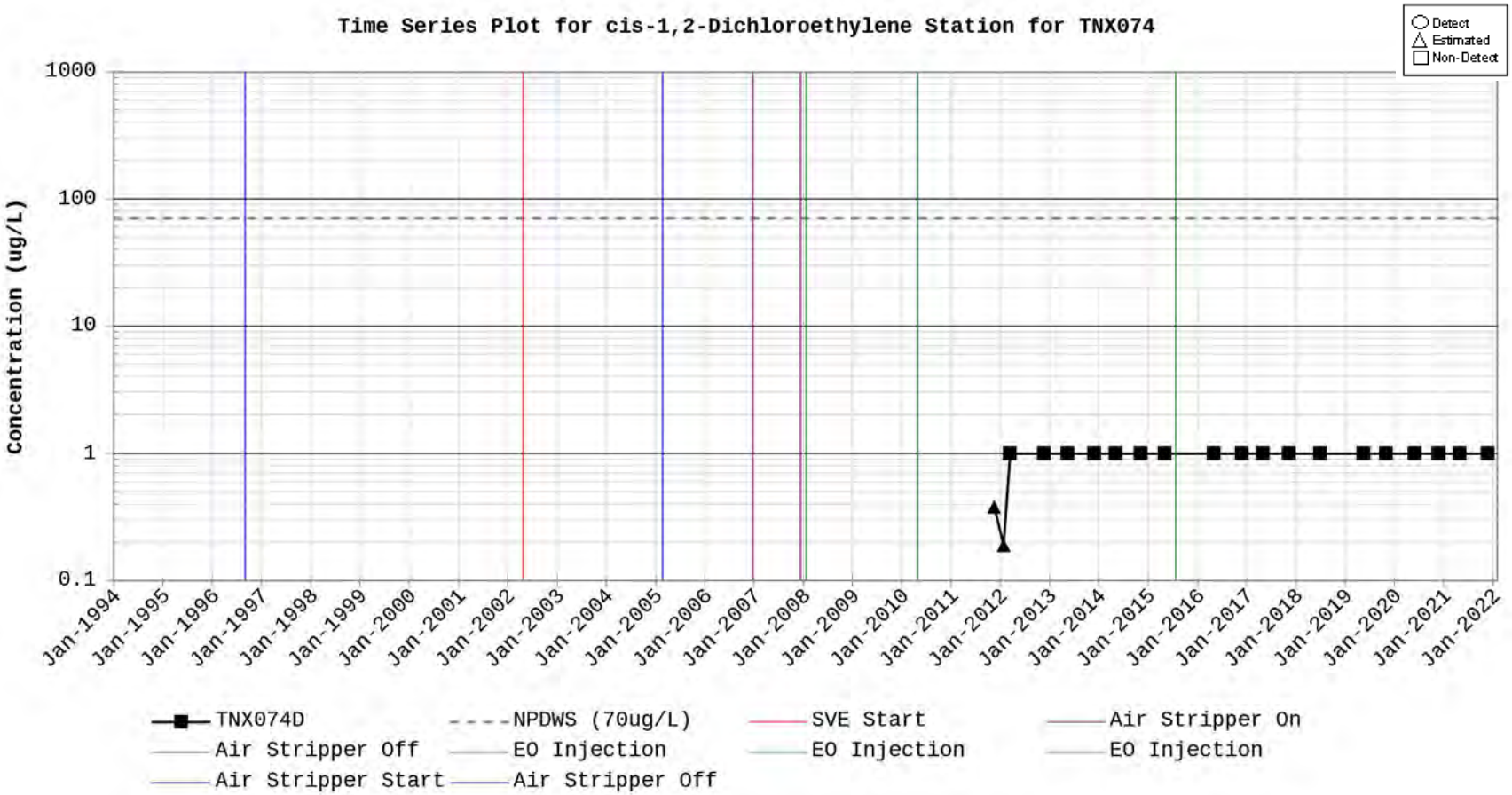

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 30
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

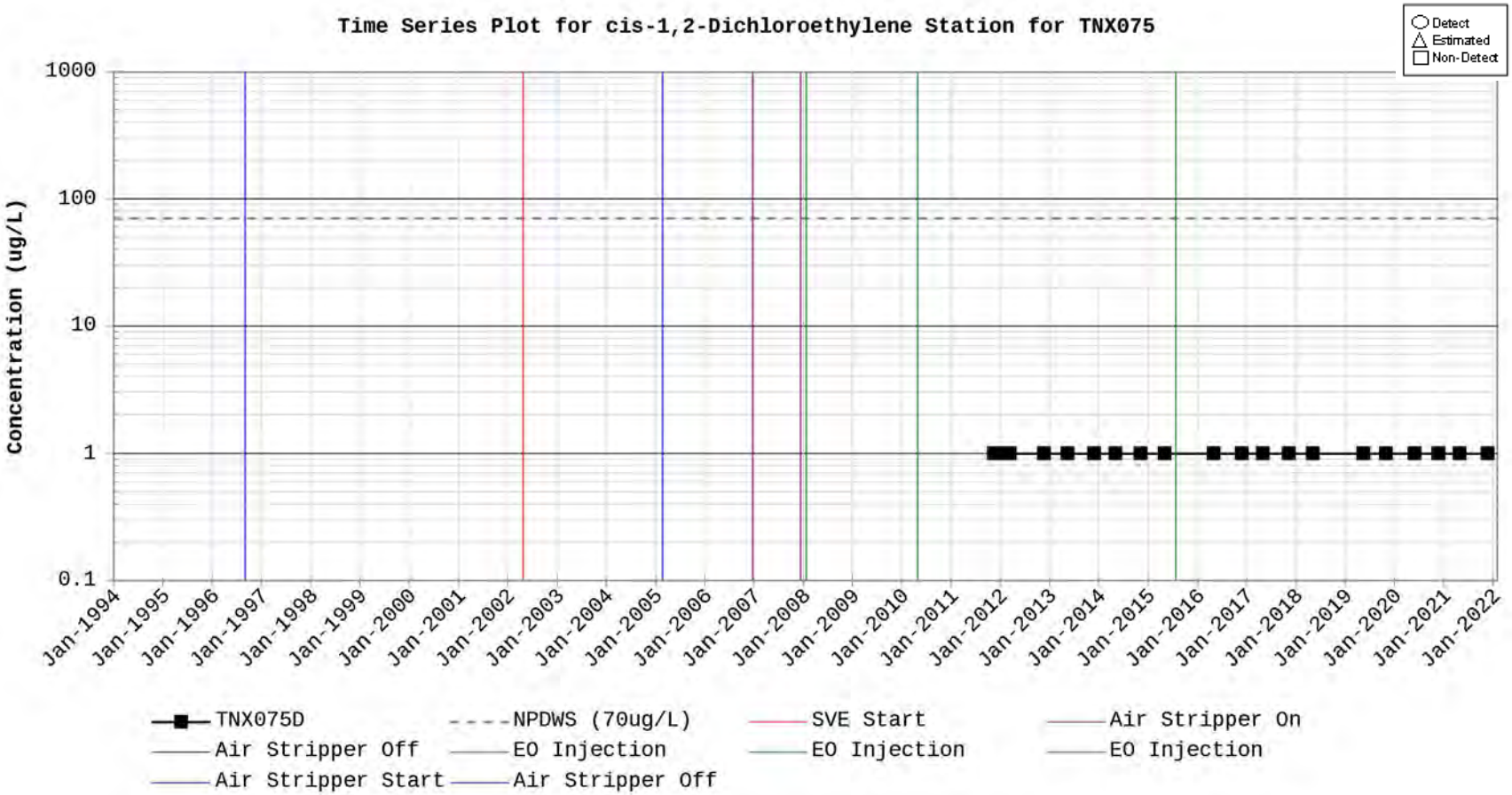

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 35
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

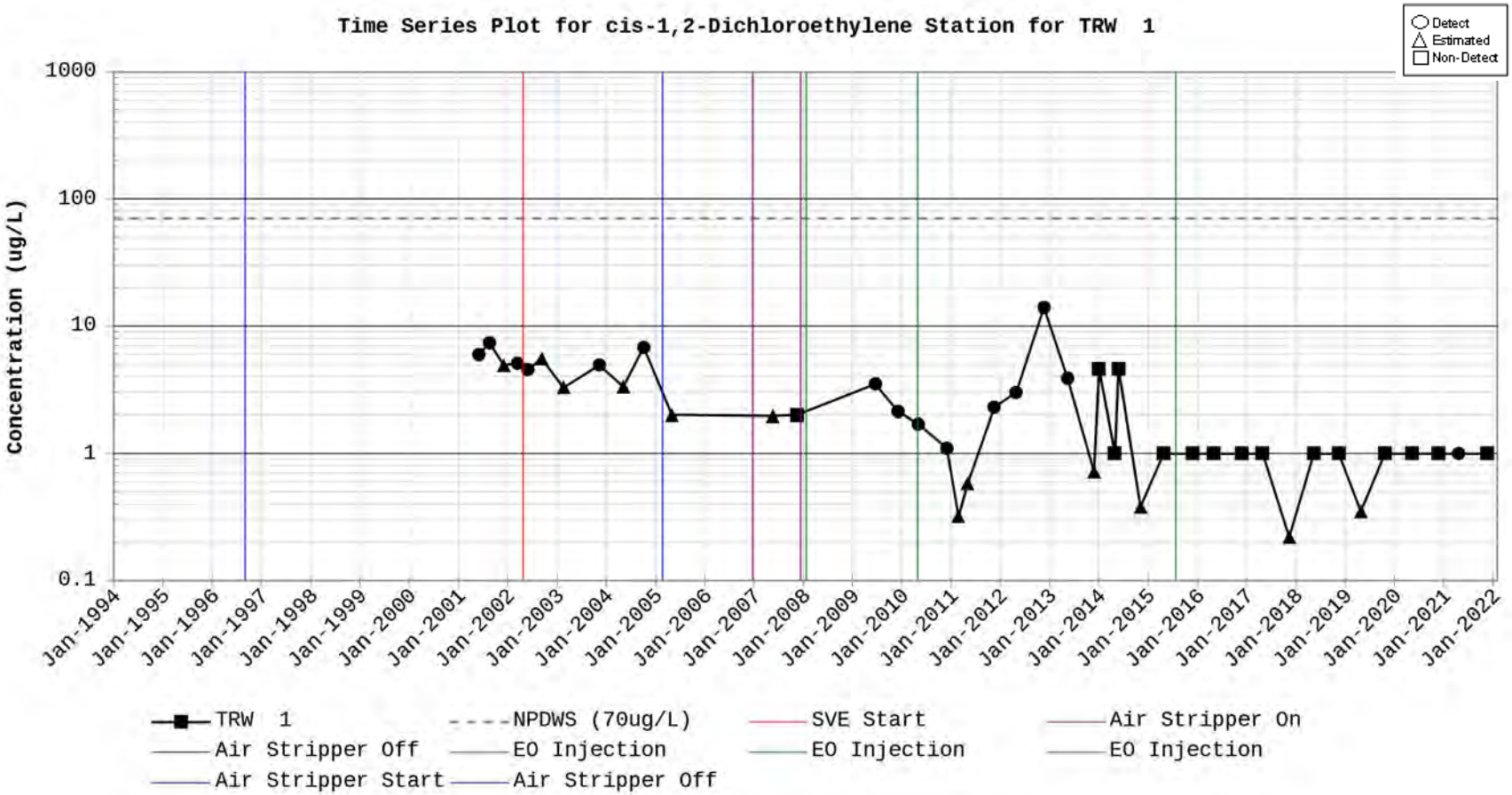

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 37
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

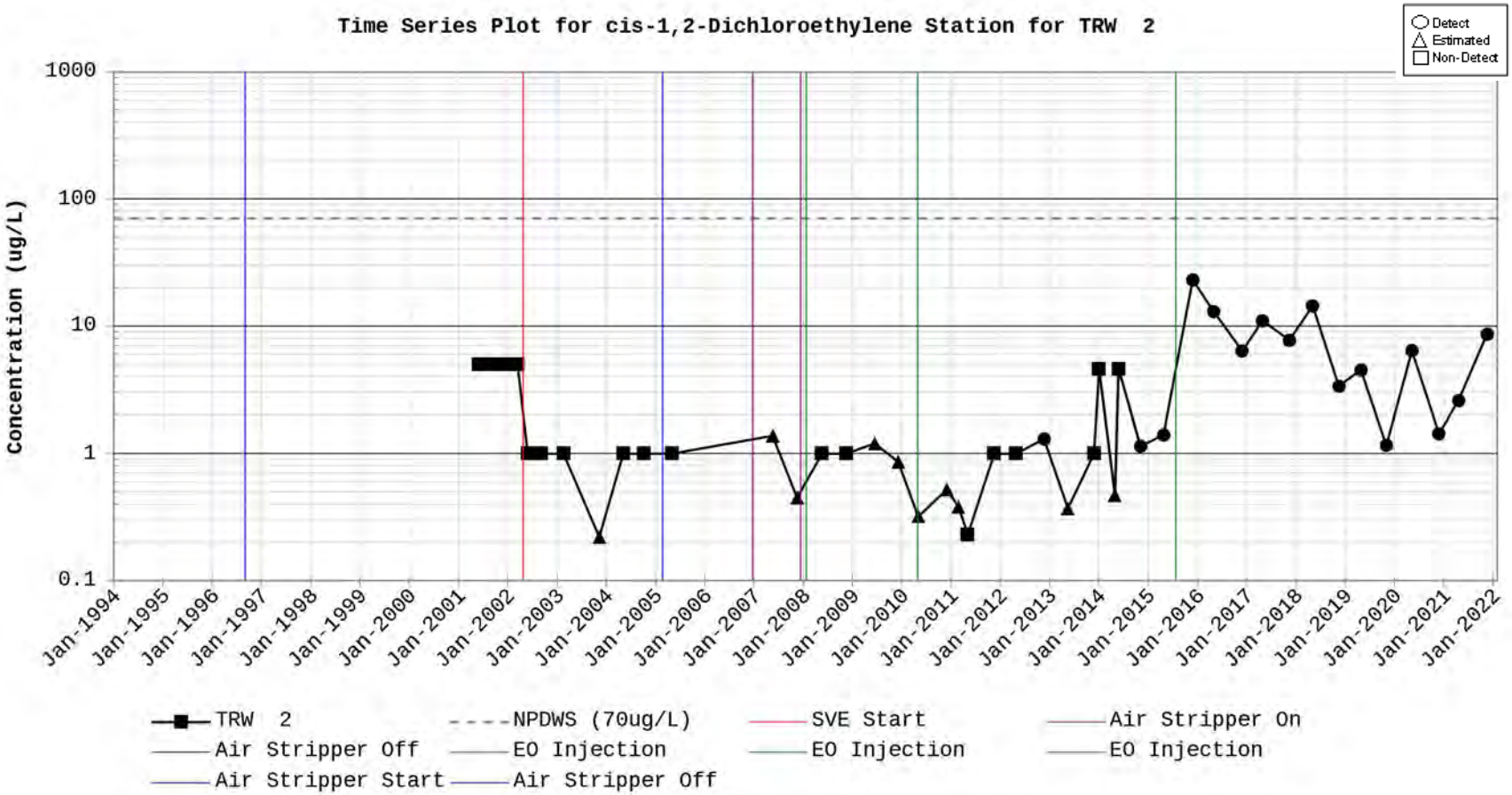

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX 72
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 72D
TNX 72M
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

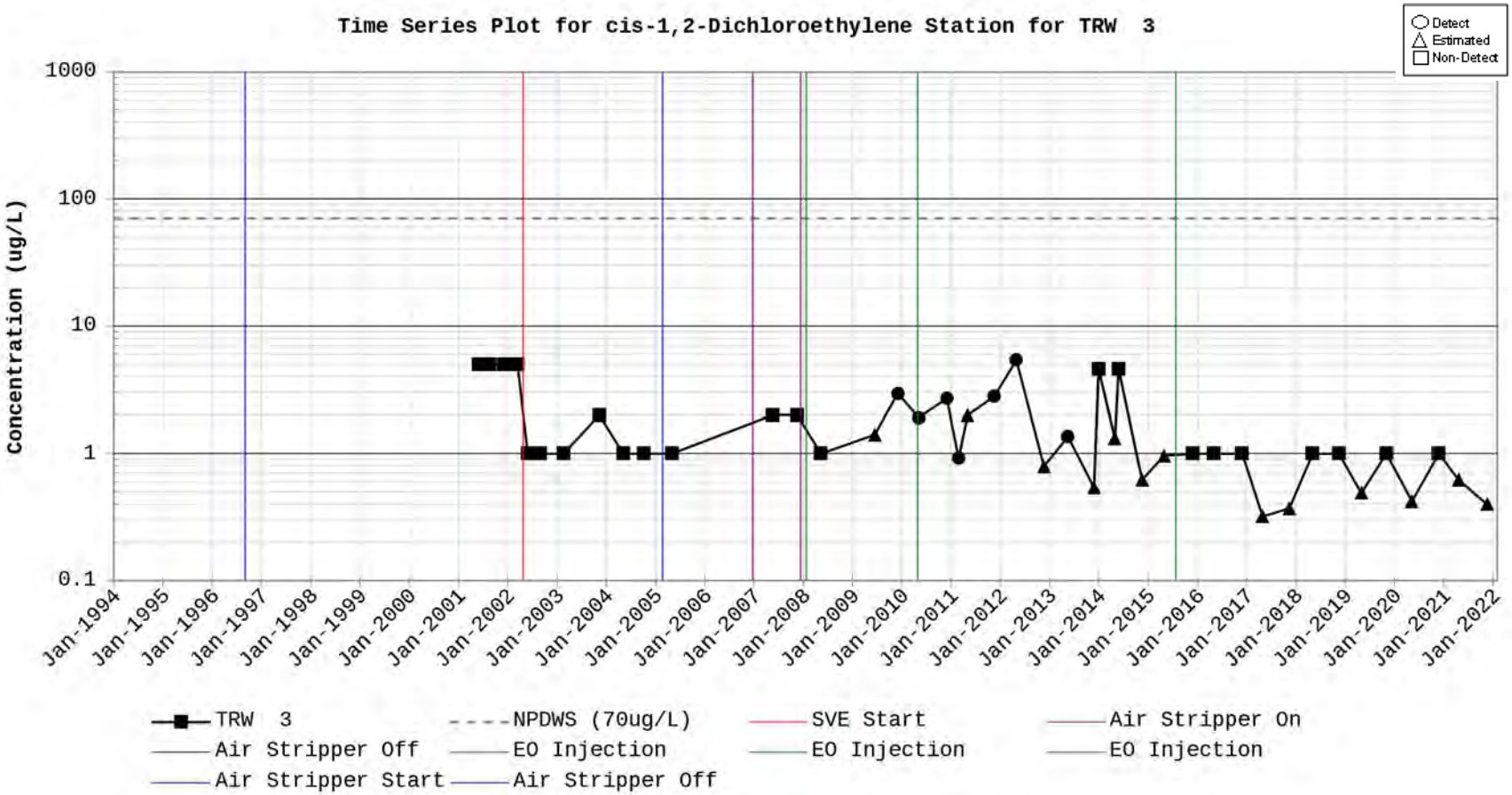

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX073
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

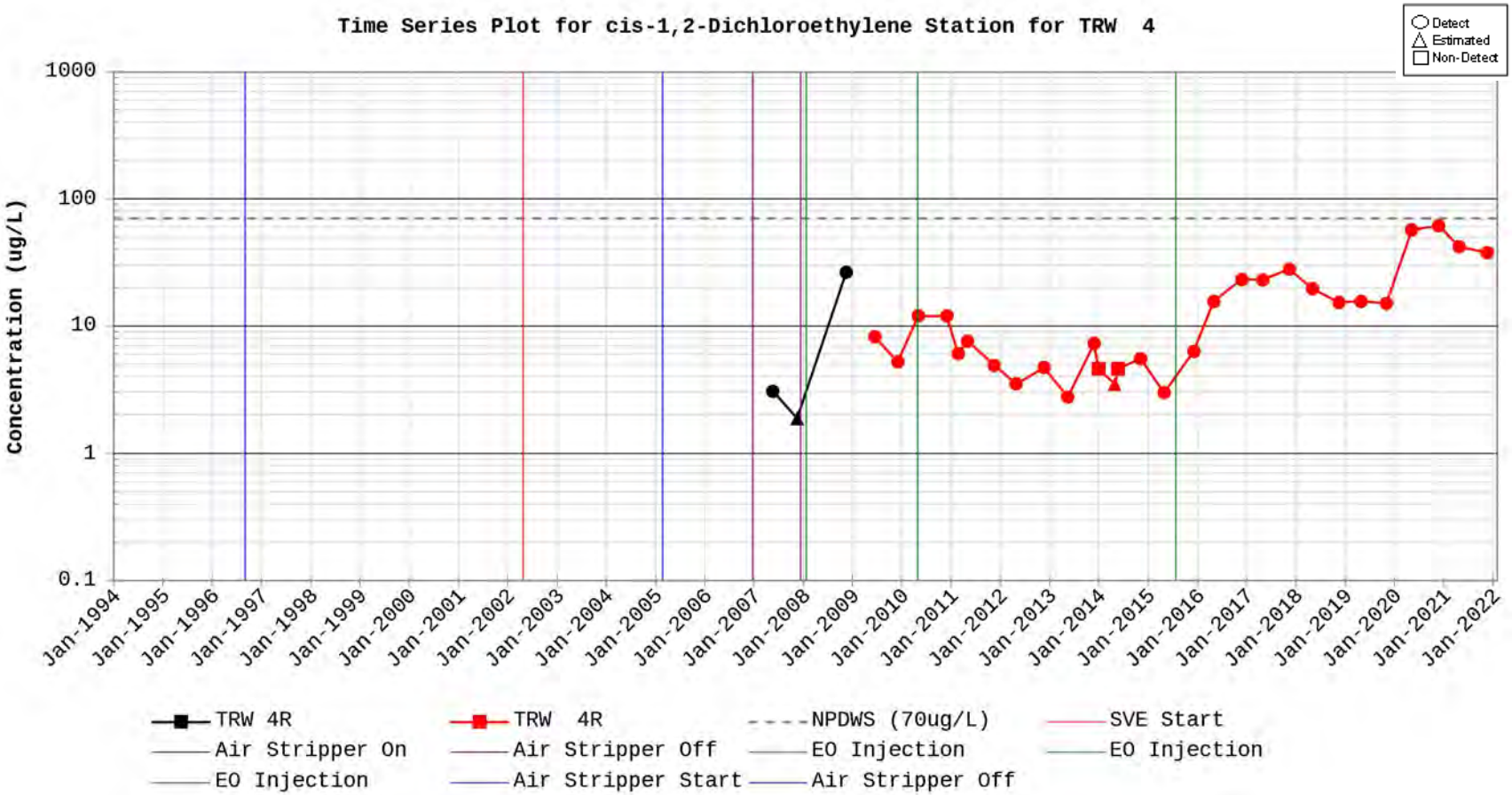

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX074
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

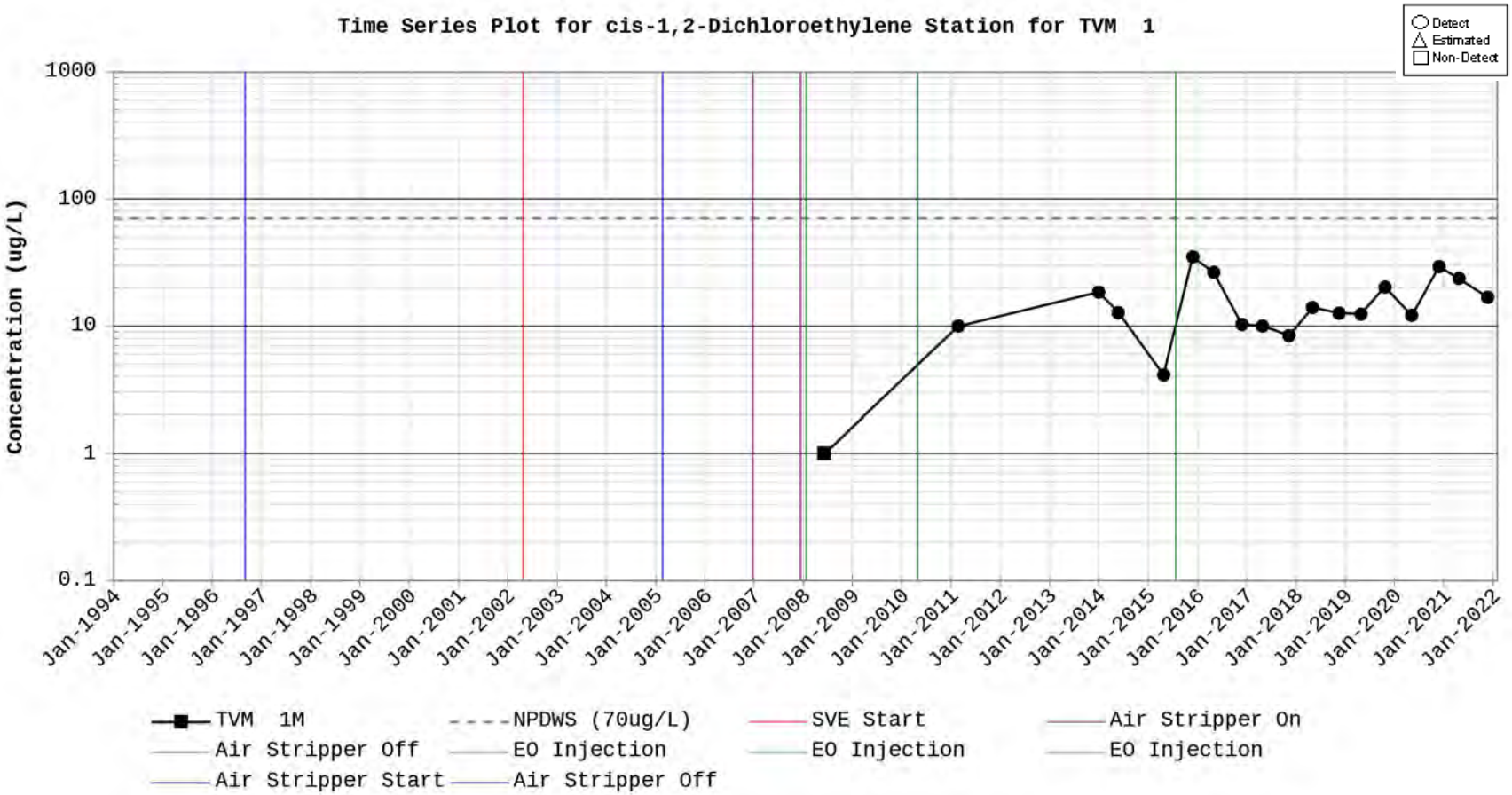

Time Series Plot for cis-1,2-Dichloroethylene Station for TNX075
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX075D
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

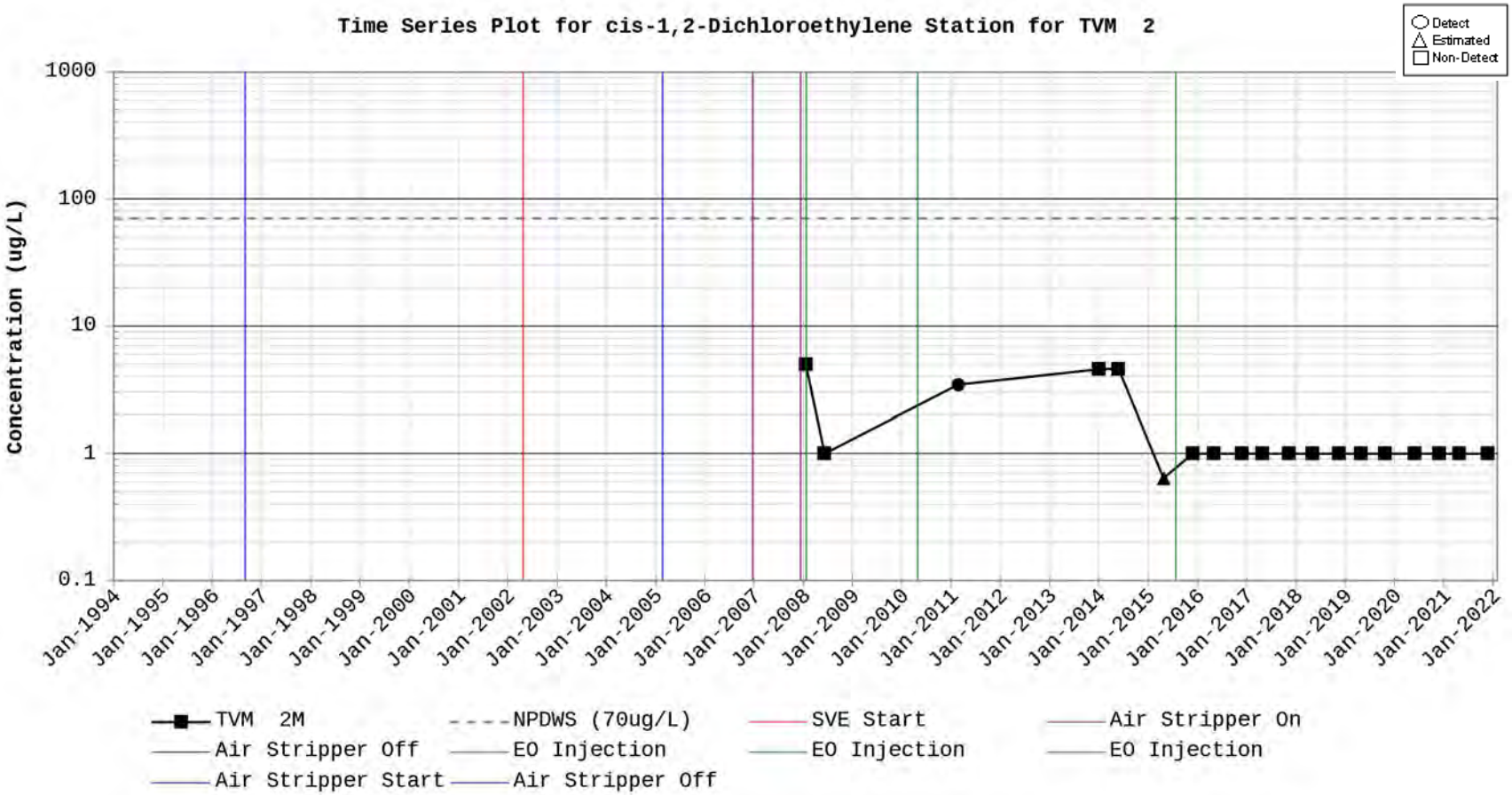

Time Series Plot for cis-1,2-Dichloroethylene Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

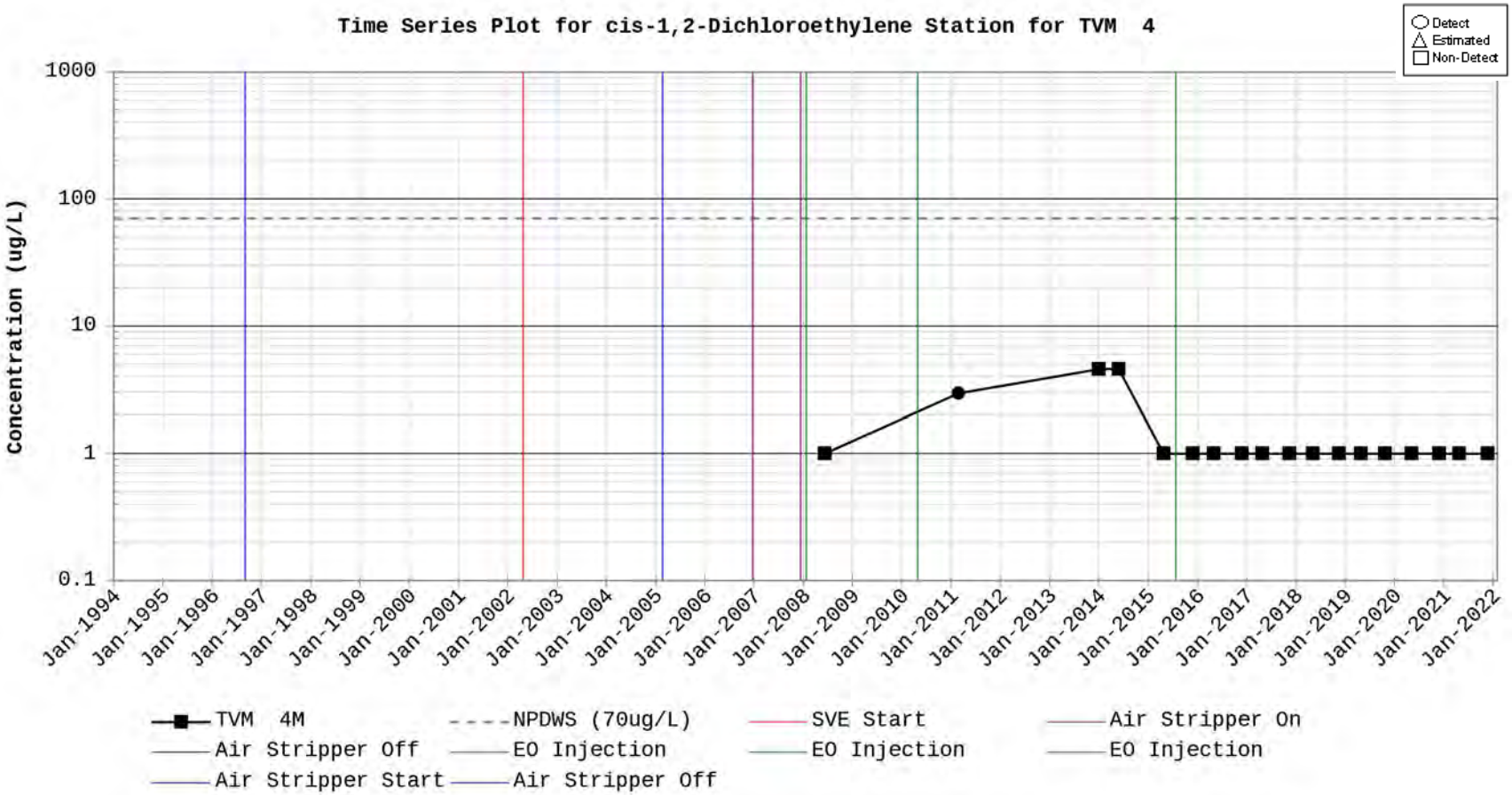

Time Series Plot for cis-1,2-Dichloroethylene Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

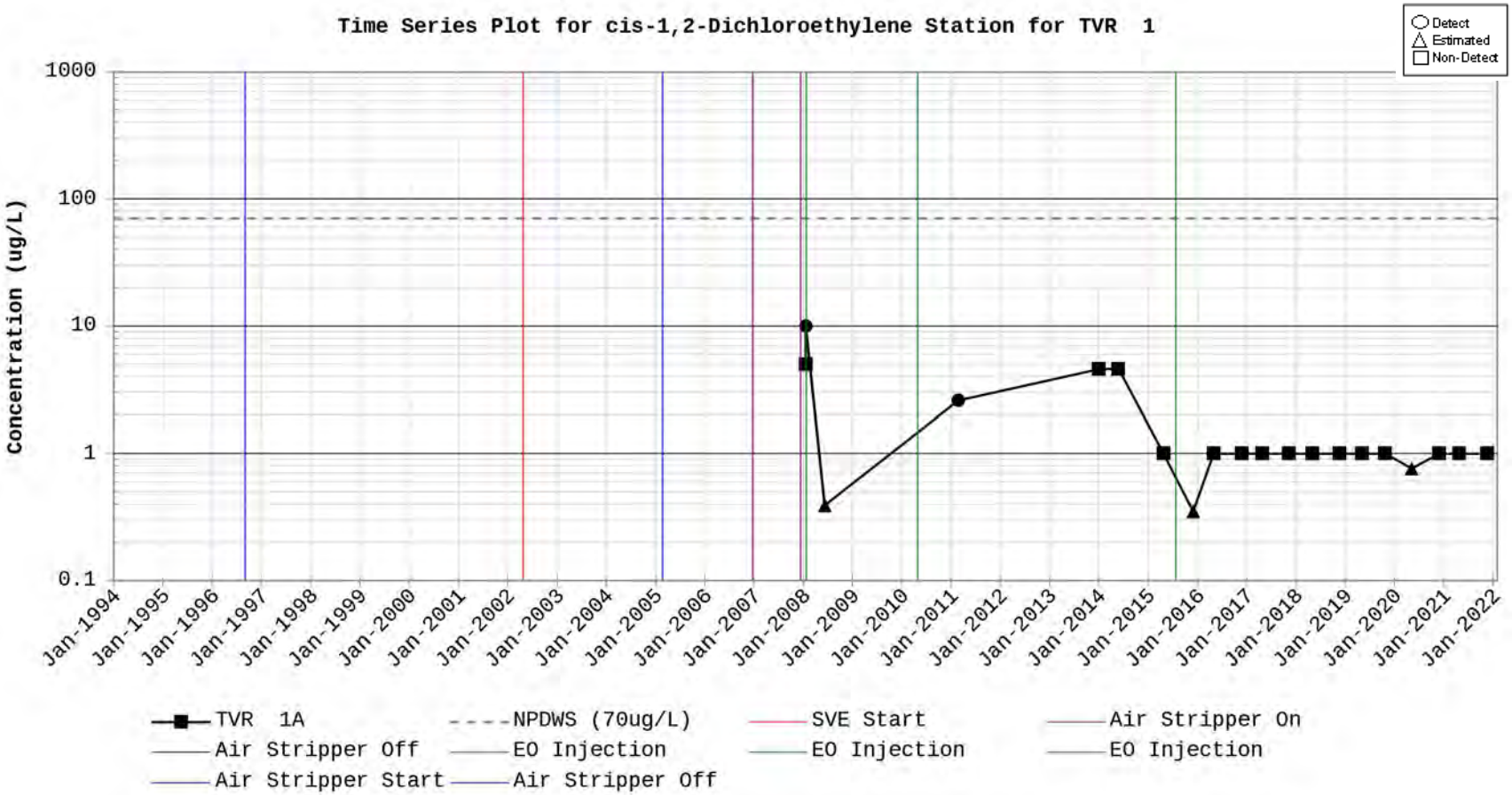

Time Series Plot for cis-1,2-Dichloroethylene Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

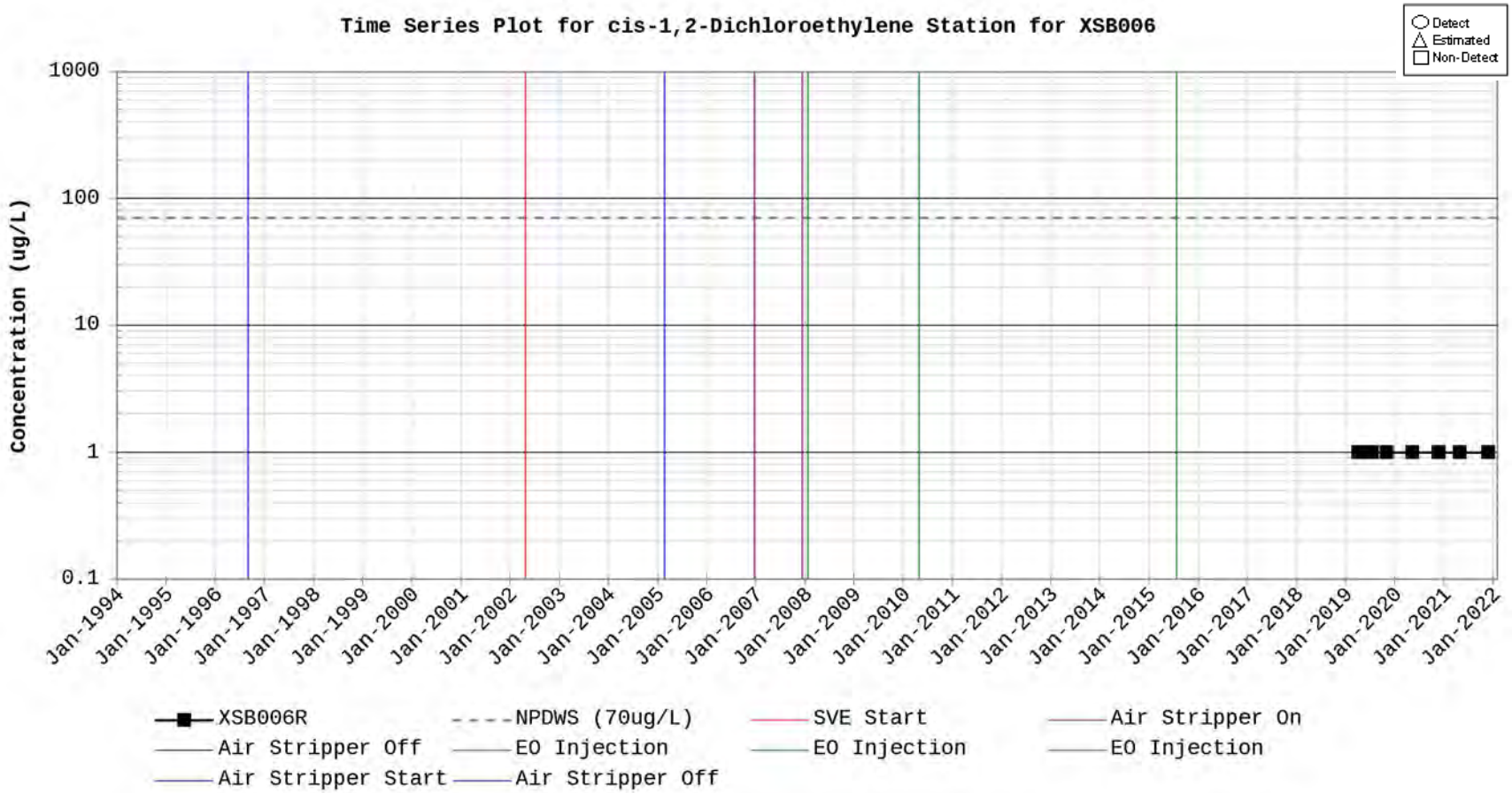

Time Series Plot for cis-1,2-Dichloroethylene Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
TRW 4R
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

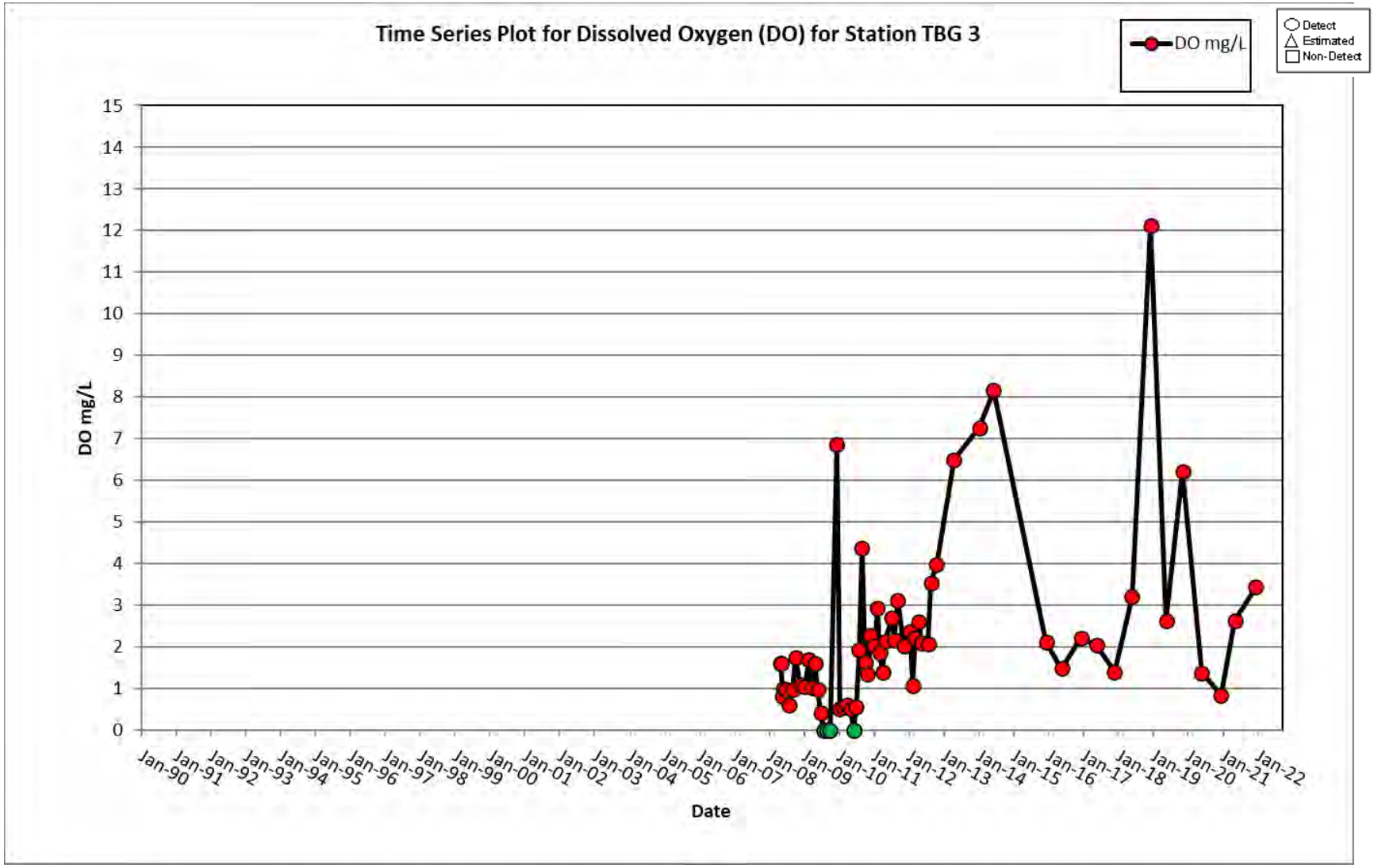

Time Series Plot for cis-1,2-Dichloroethylene Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

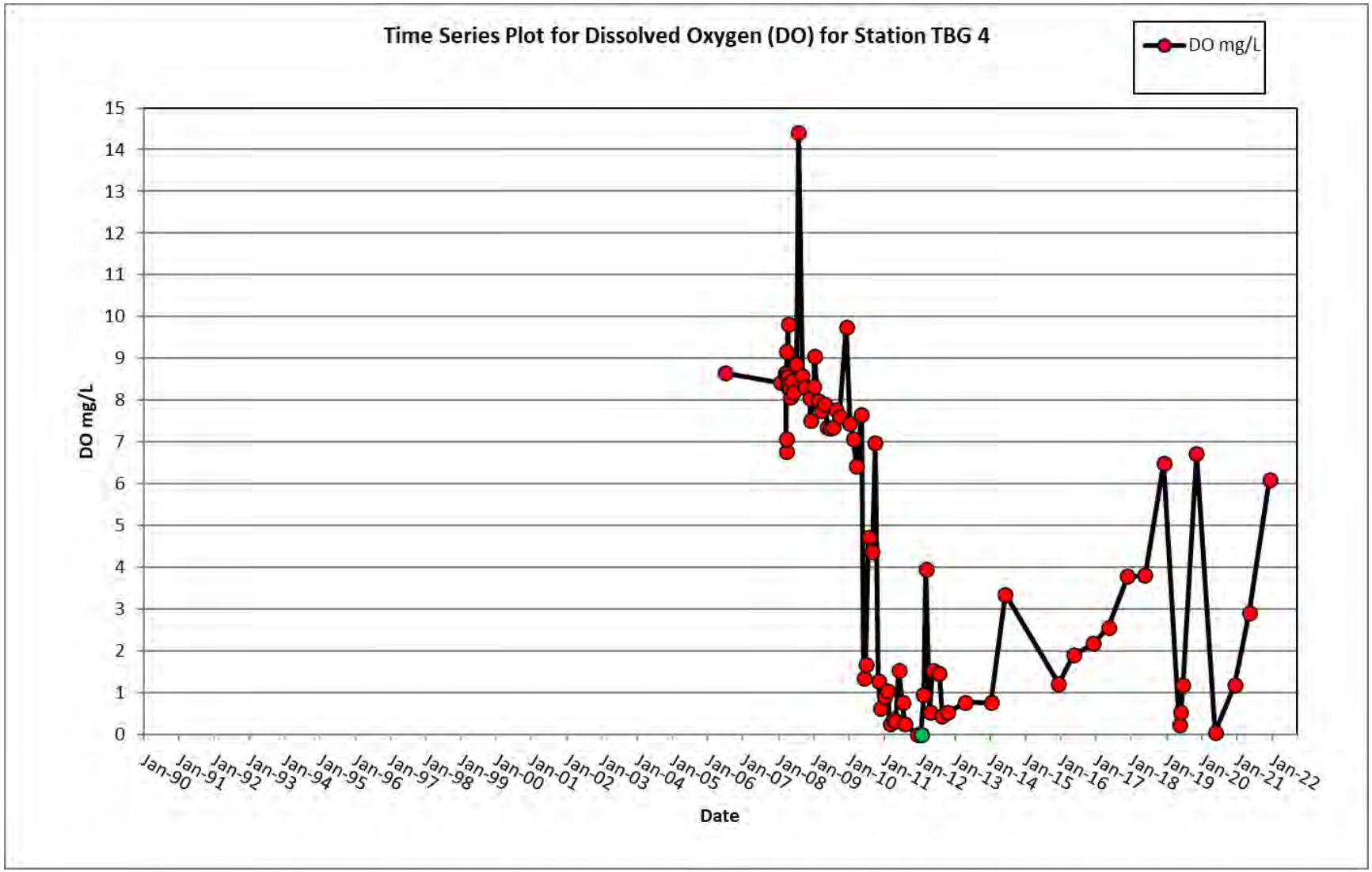

Time Series Plot for cis-1,2-Dichloroethylene Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

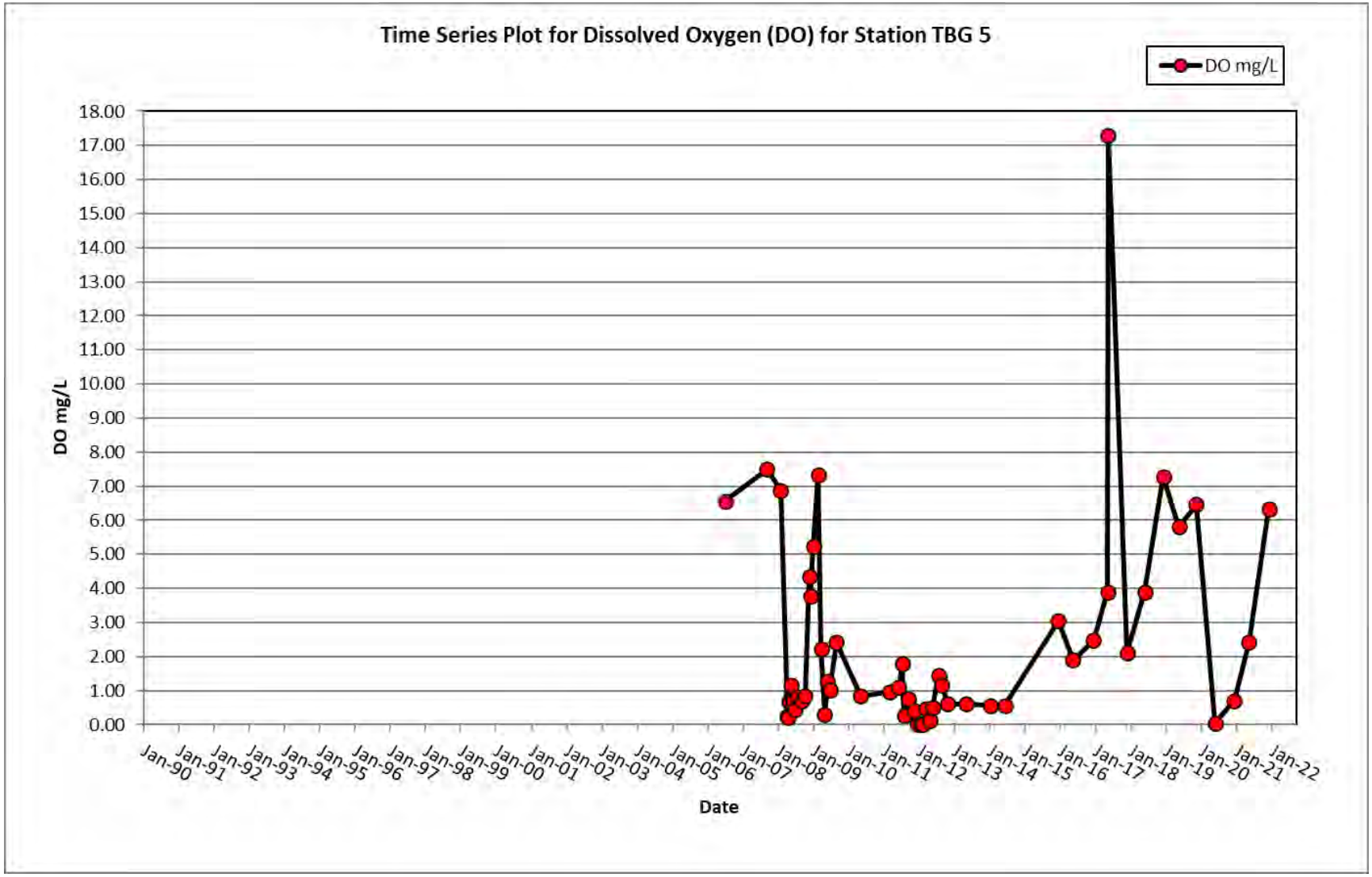

Time Series Plot for cis-1,2-Dichloroethylene Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

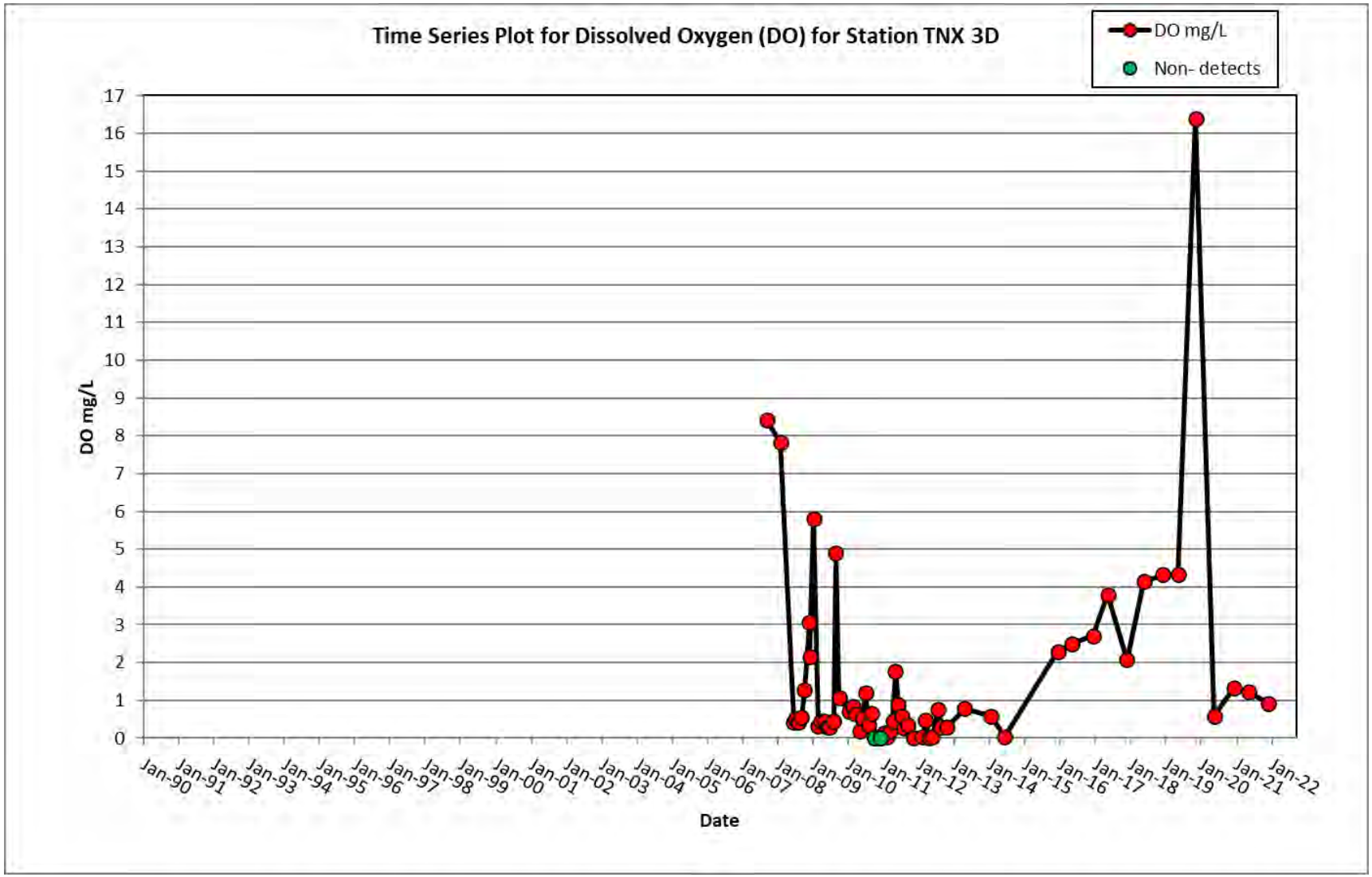

Time Series Plot for cis-1,2-Dichloroethylene Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

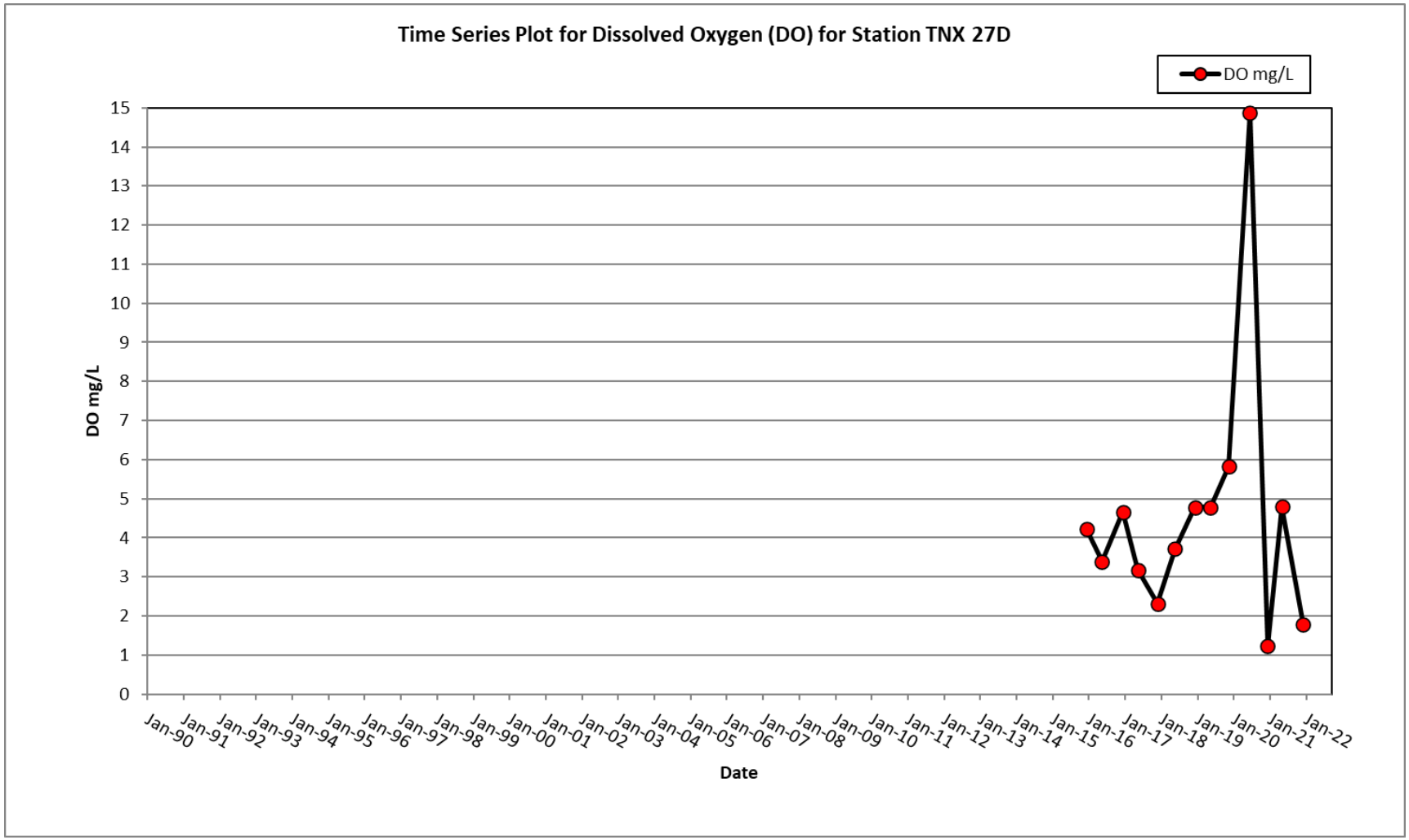

Time Series Plot for cis-1,2-Dichloroethylene Station for XSB006
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
0.1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (70ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

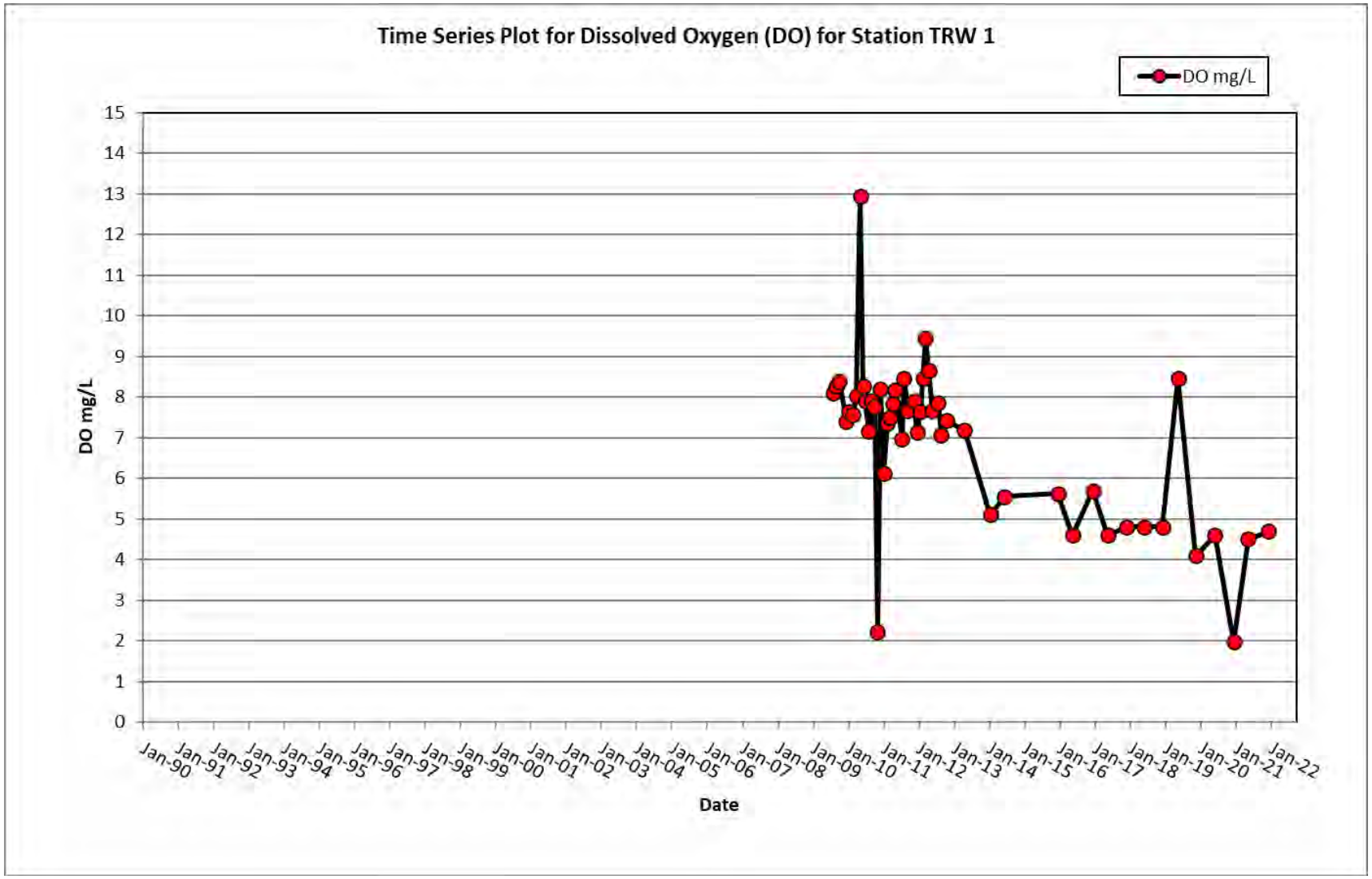

Time Series Plot for Dissolved Oxygen (DO) for Station TBG 3
DO mg/L
Detect
Estimated
Non-Detect
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

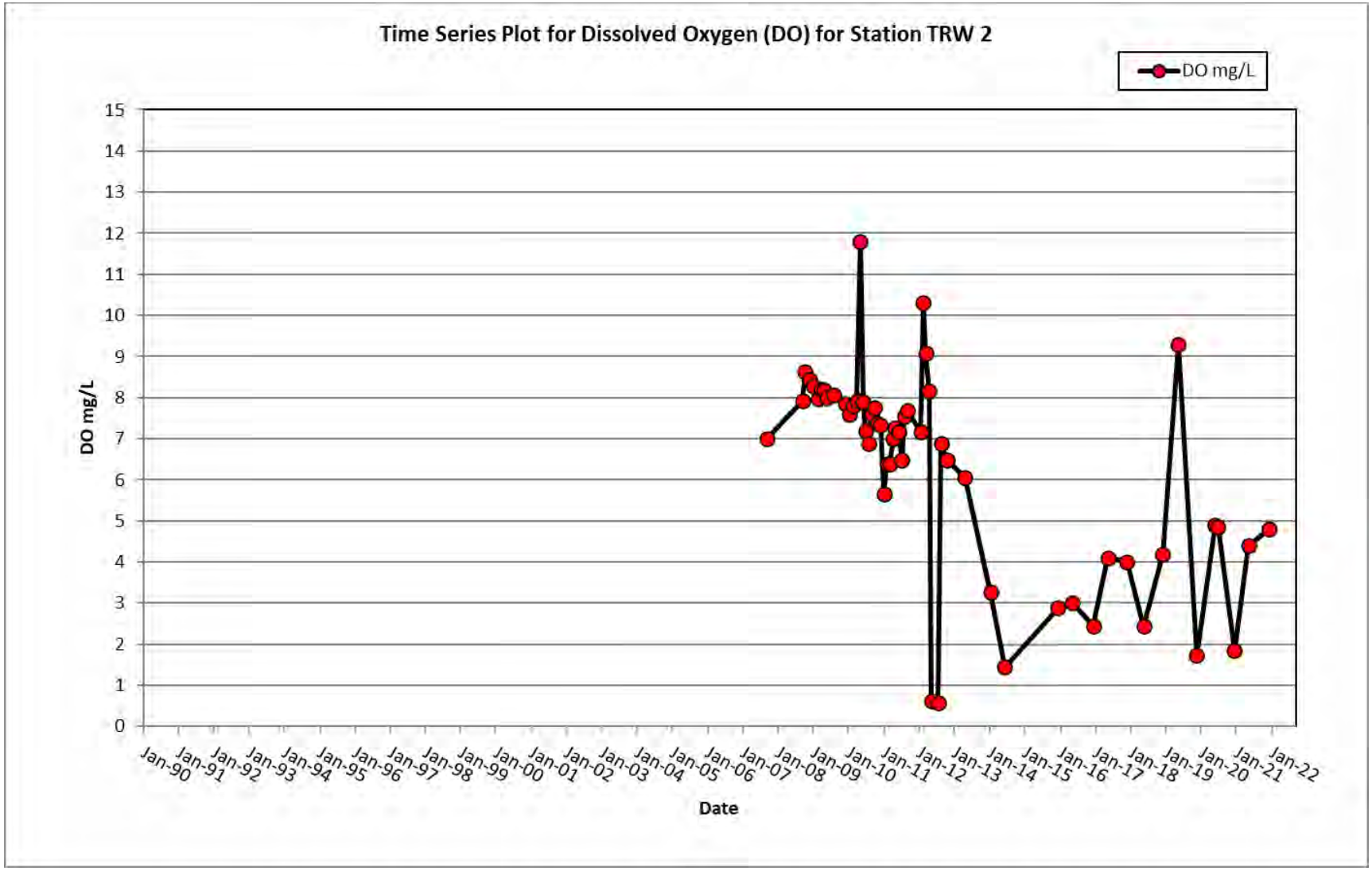

Time Series Plot for Dissolved Oxygen (DO) for Station TBG 4
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

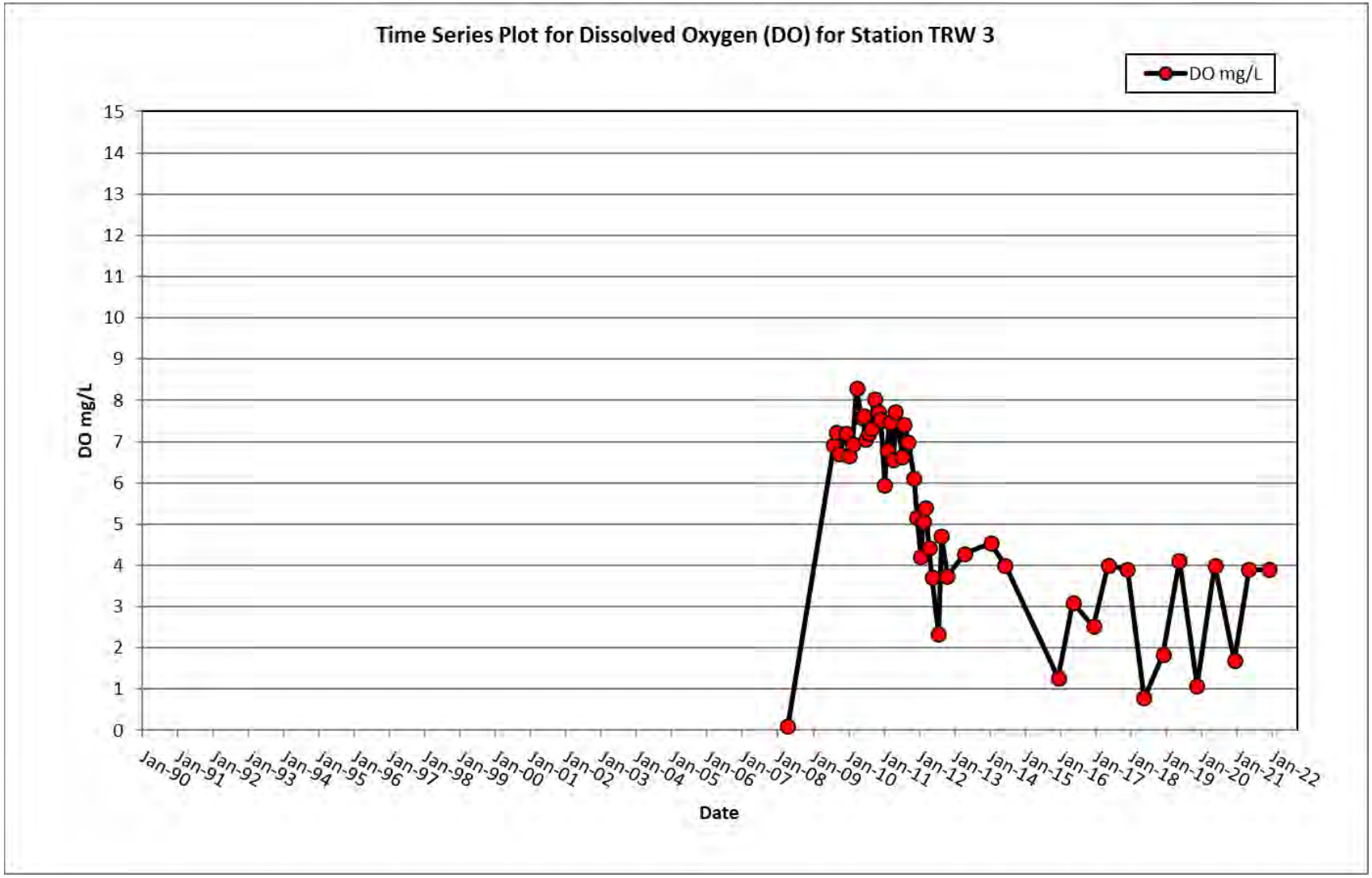

Time Series Plot for Dissolved Oxygen (DO) for Station TBG 5
DO mg/L
DO mg/L
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

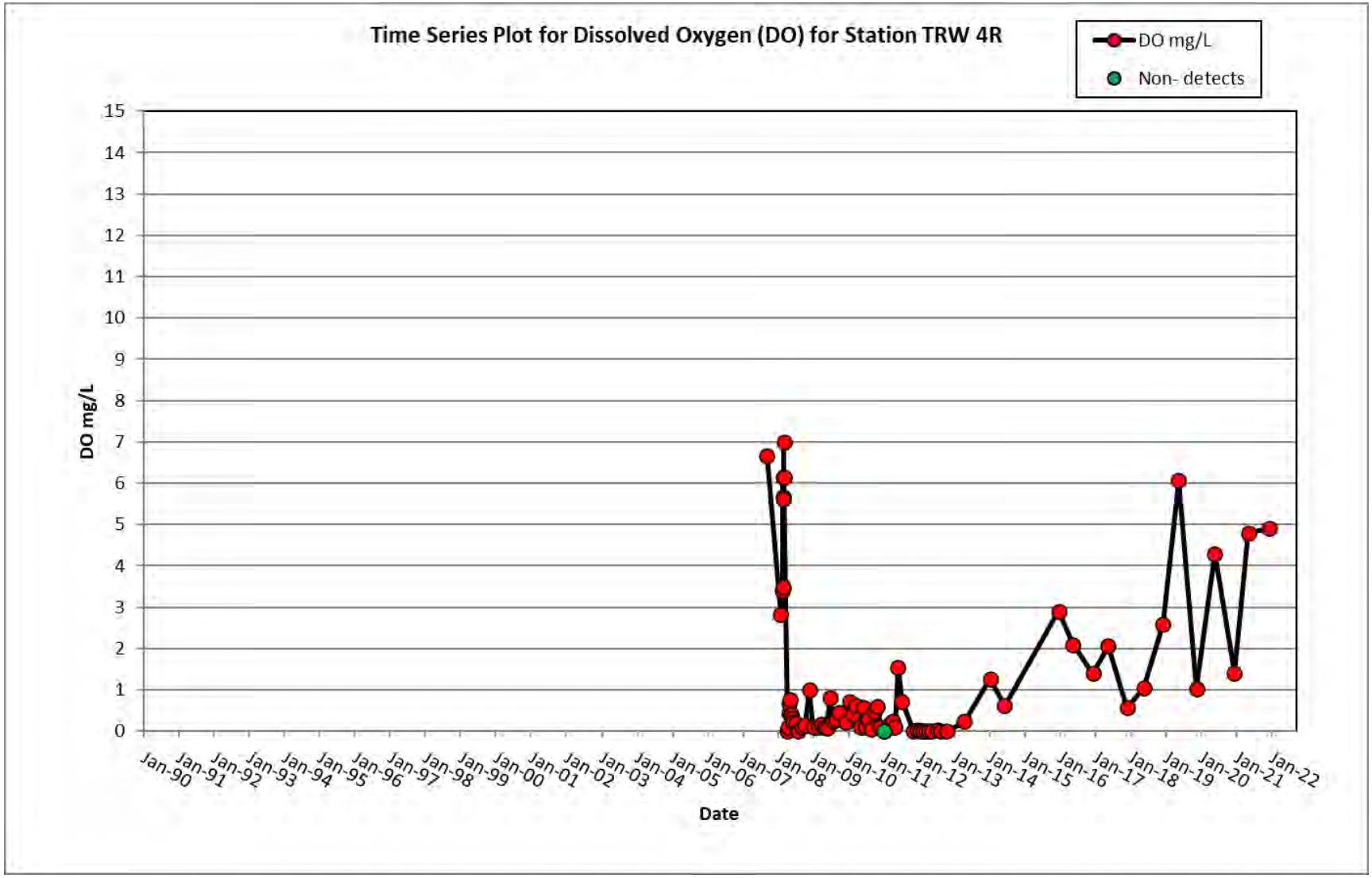

Time Series Plot for Dissolved Oxygen (DO) for Station TNX 3D
DO mg/L
Non- detects
DO mg/L
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

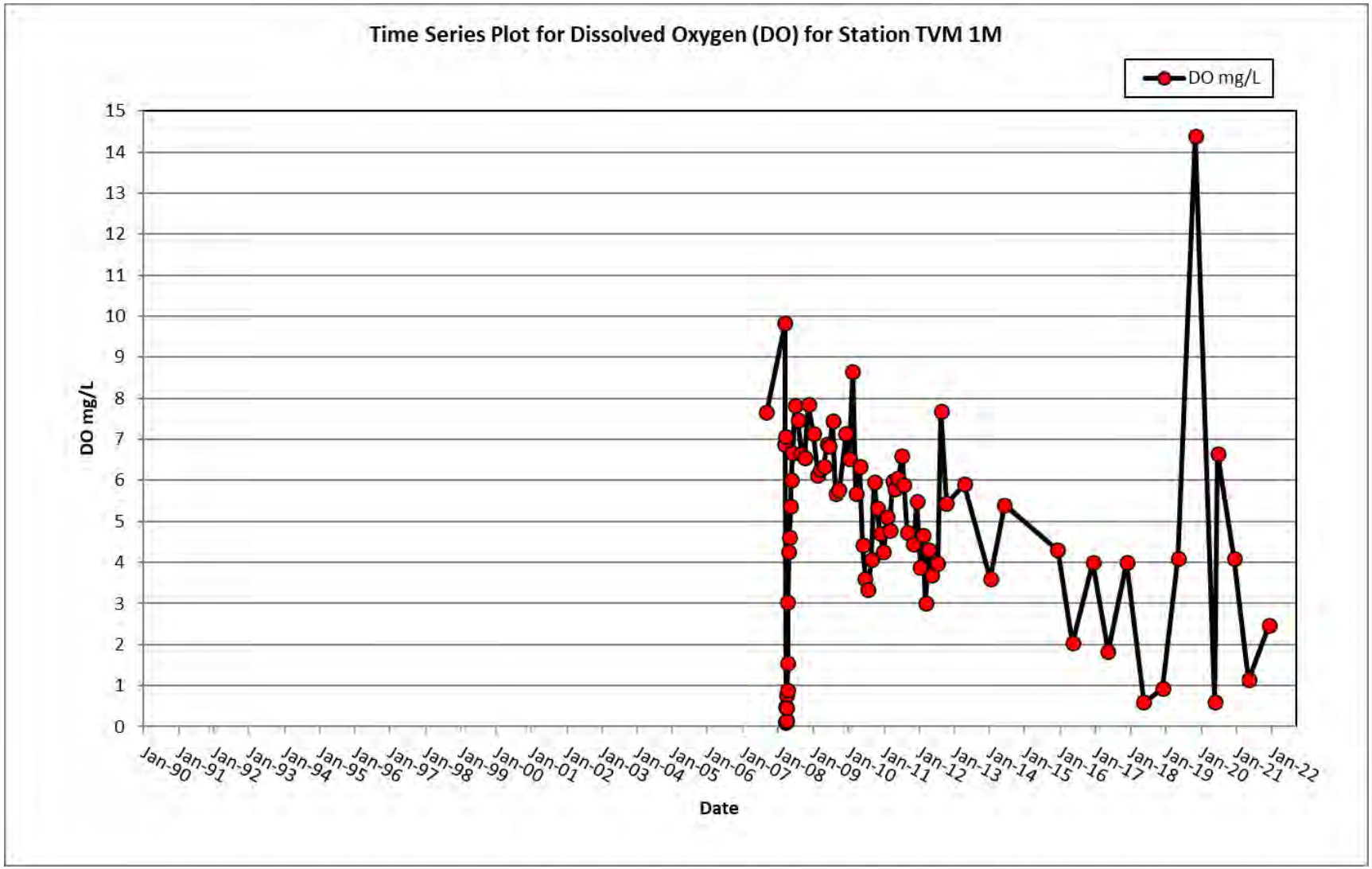

Time Series Plot for Dissolved Oxygen (DO) for Station TNX 27D
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

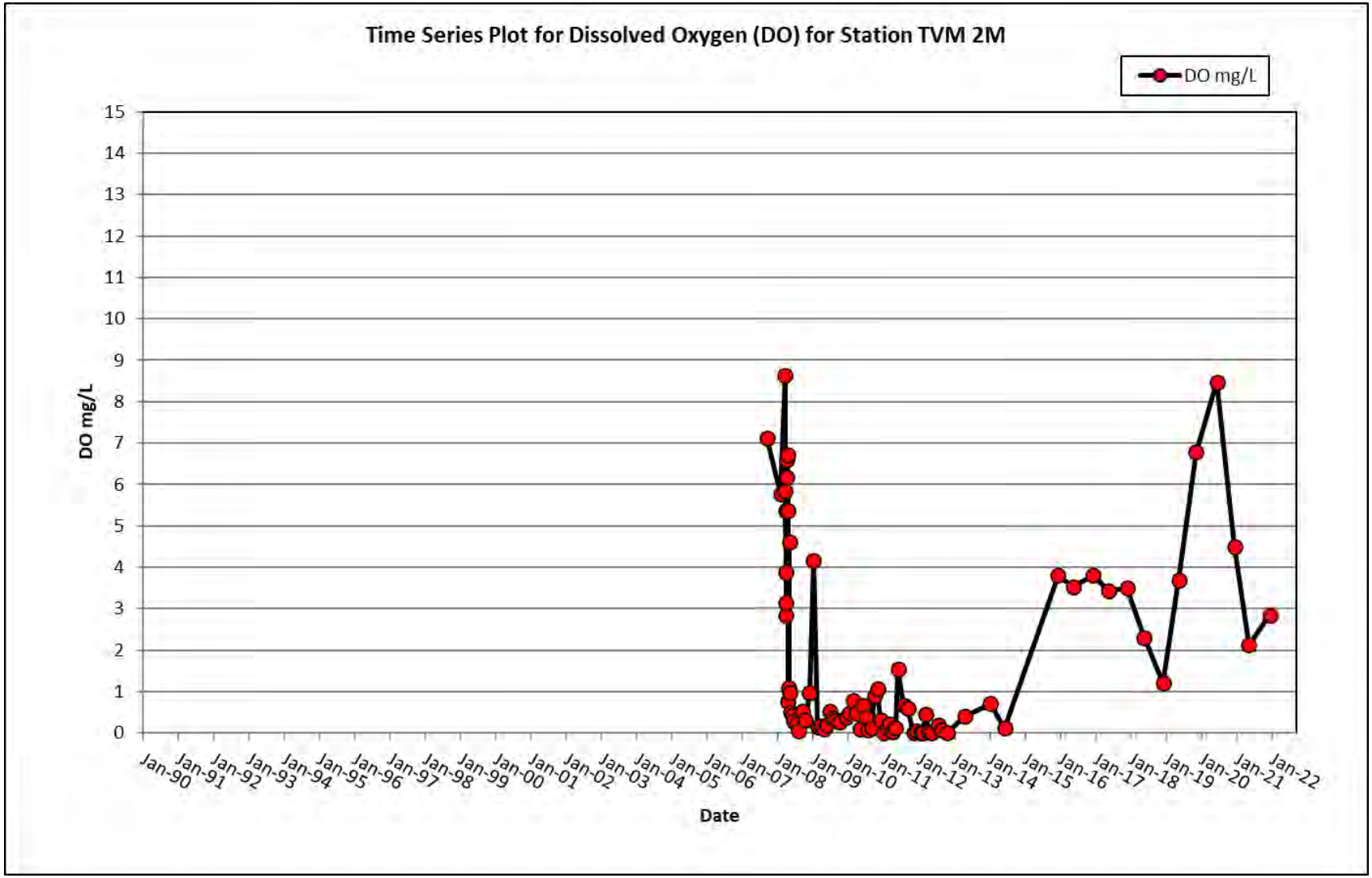

Time Series Plot for Dissolved Oxygen (DO) for Station TRW 1
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

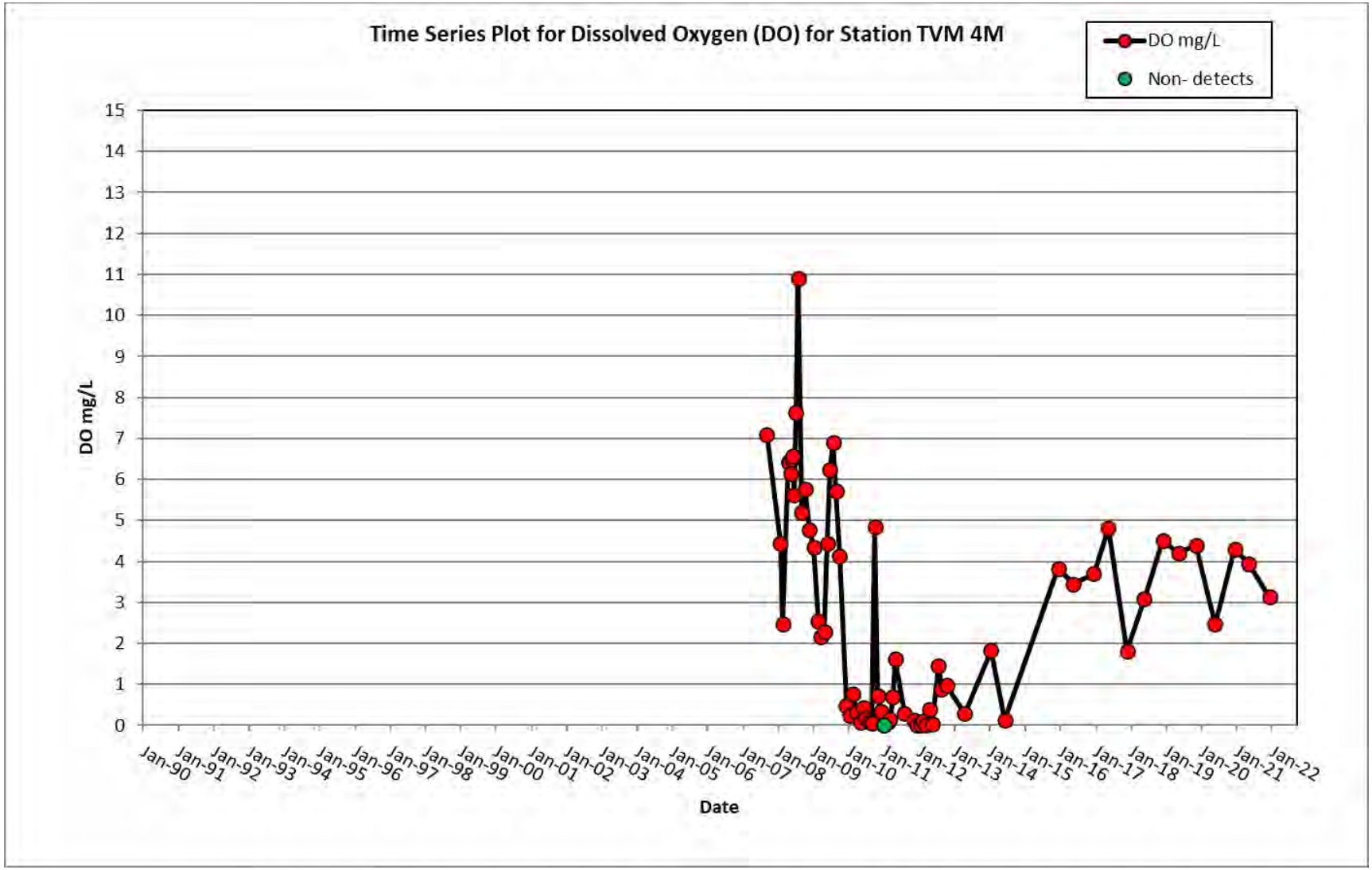

Time Series Plot for Dissolved Oxygen (DO) for Station TRW 2
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

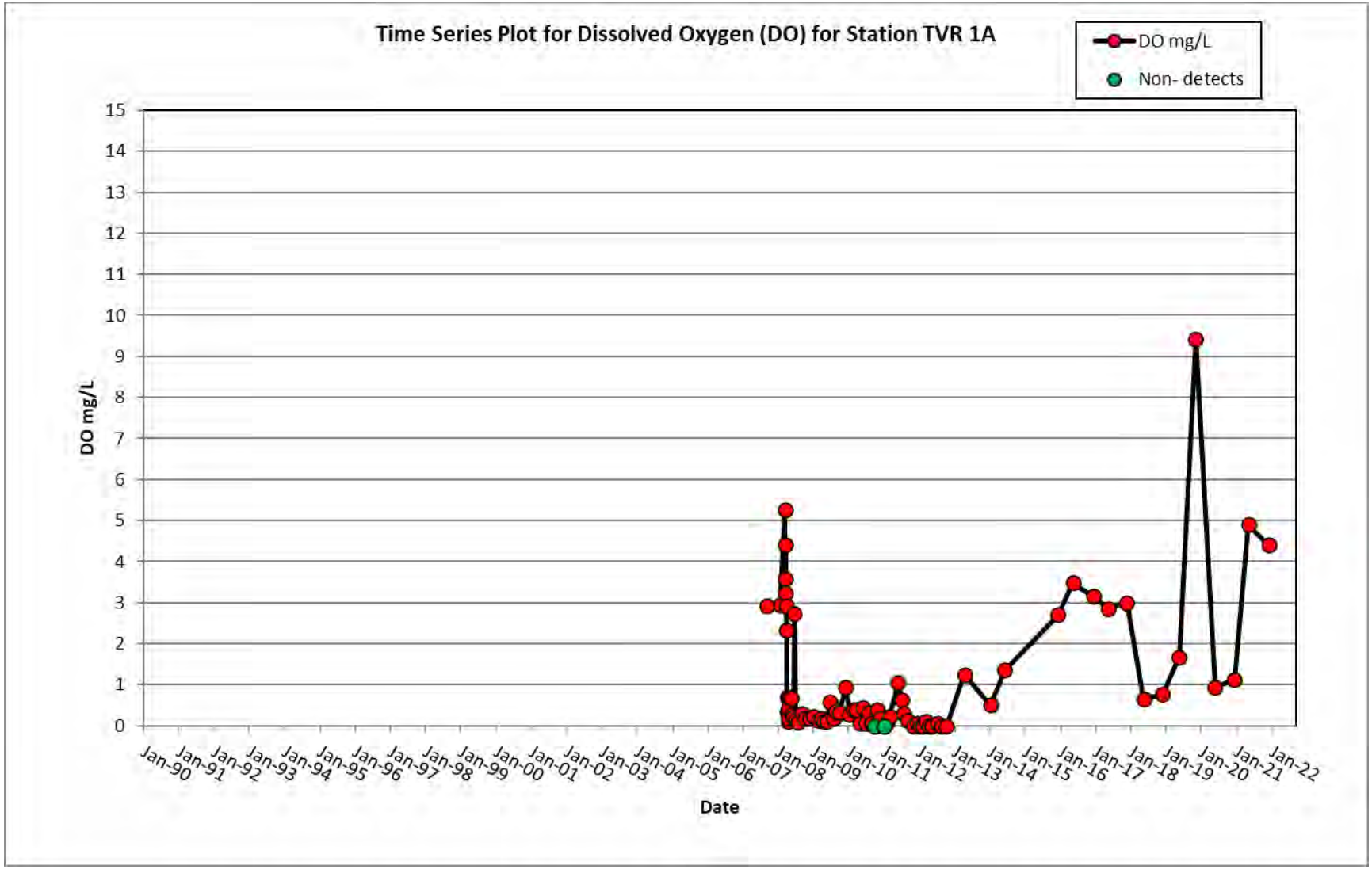

Time Series Plot for Dissolved Oxygen (DO) for Station TRW 3
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

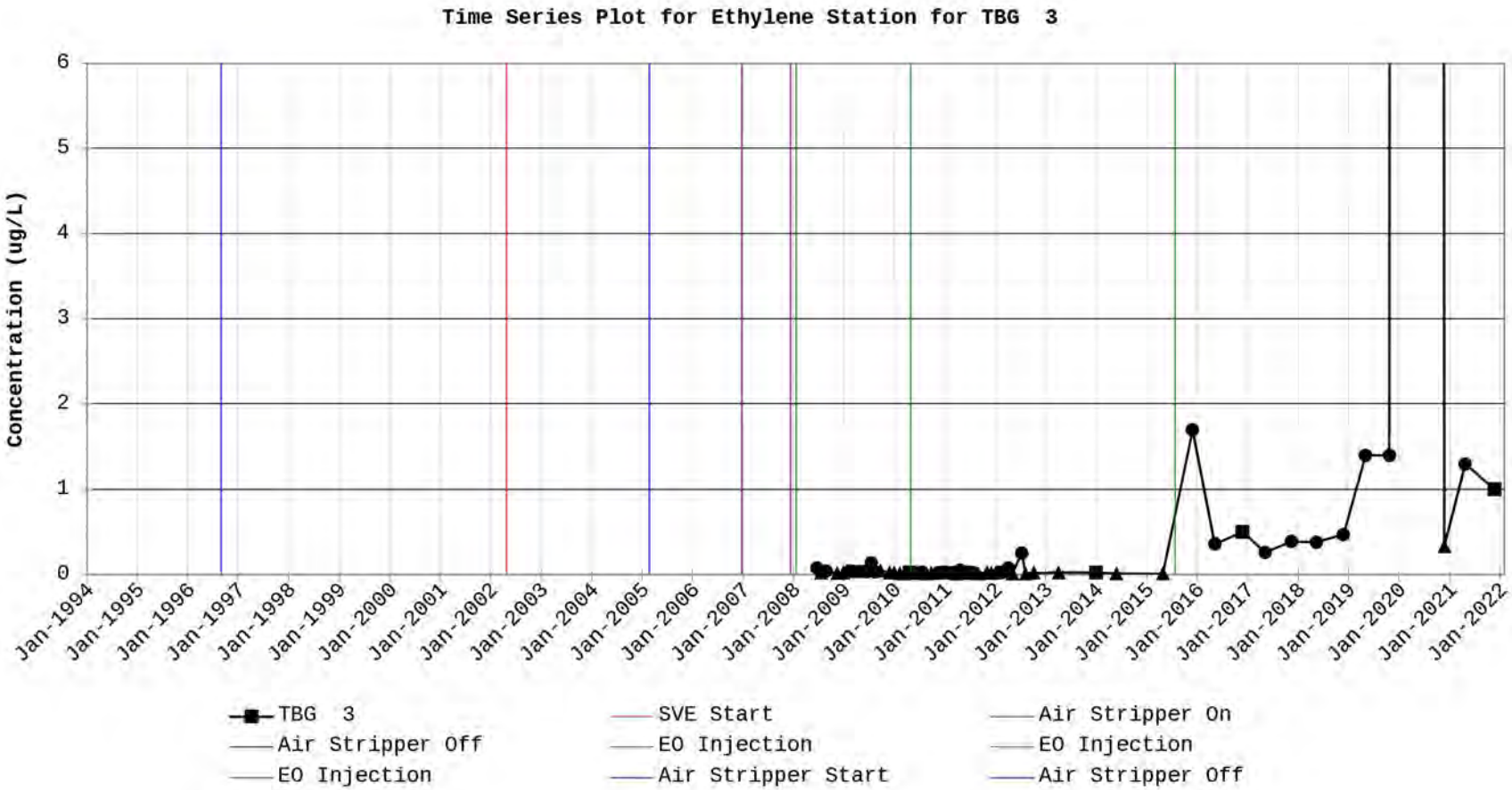

Time Series Plot for Dissolved Oxygen (DO) for Station TRW 4R
DO mg/L
Non- detects
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

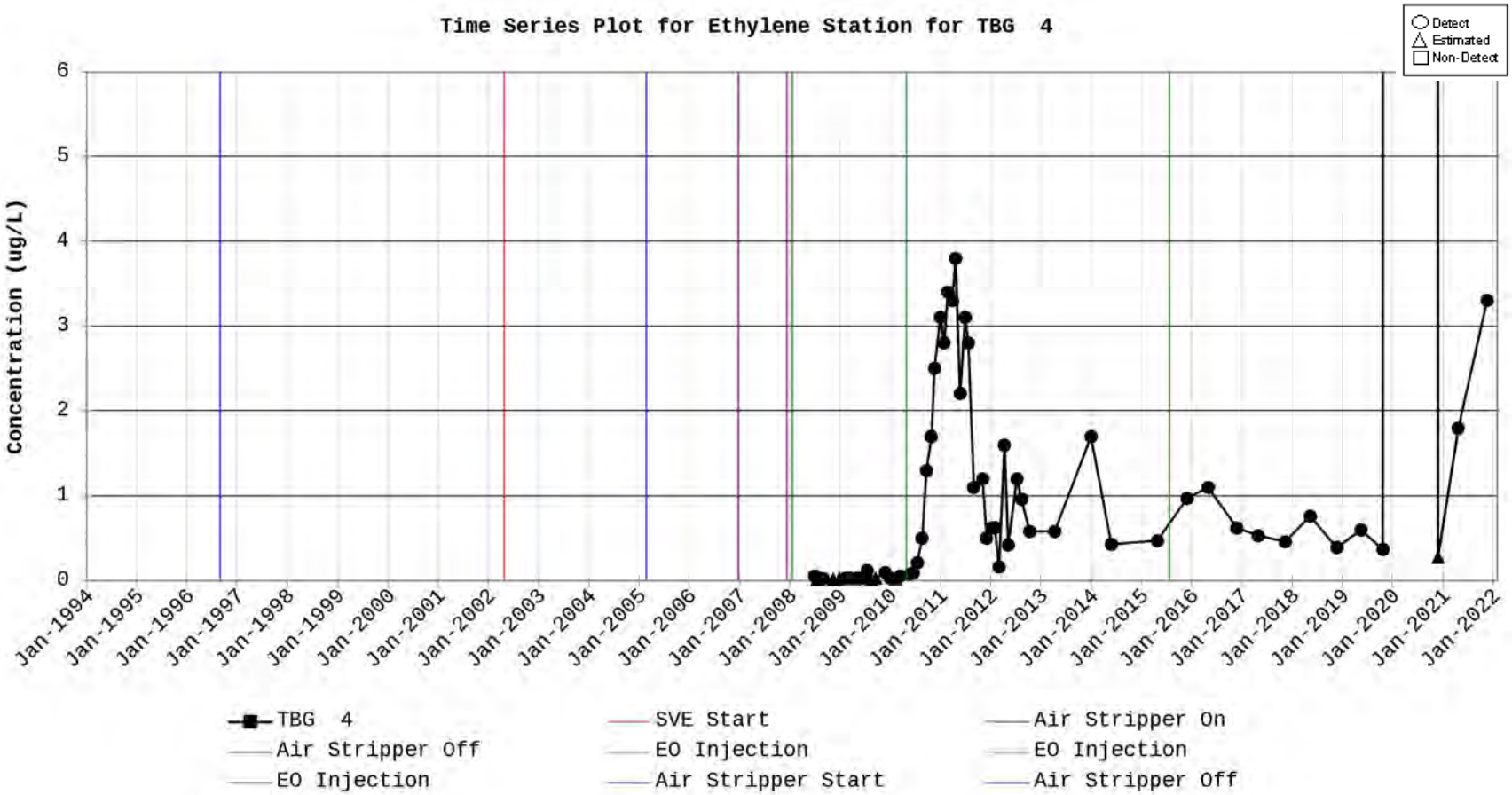

Time Series Plot for Dissolved Oxygen (DO) for Station TVM 1M
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

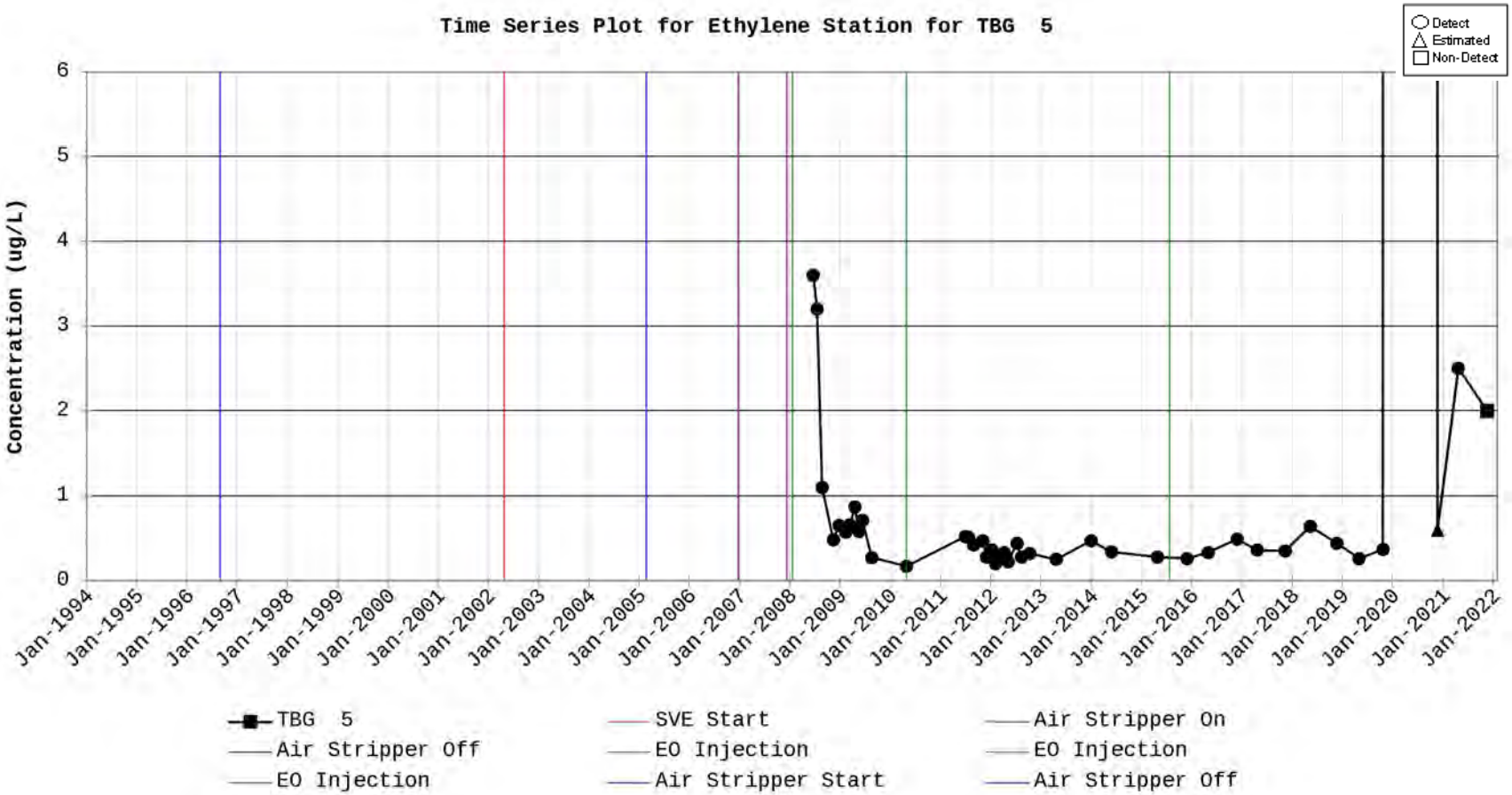

Time Series Plot for Dissolved Oxygen (DO) for Station TVM 2M
DO mg/L
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

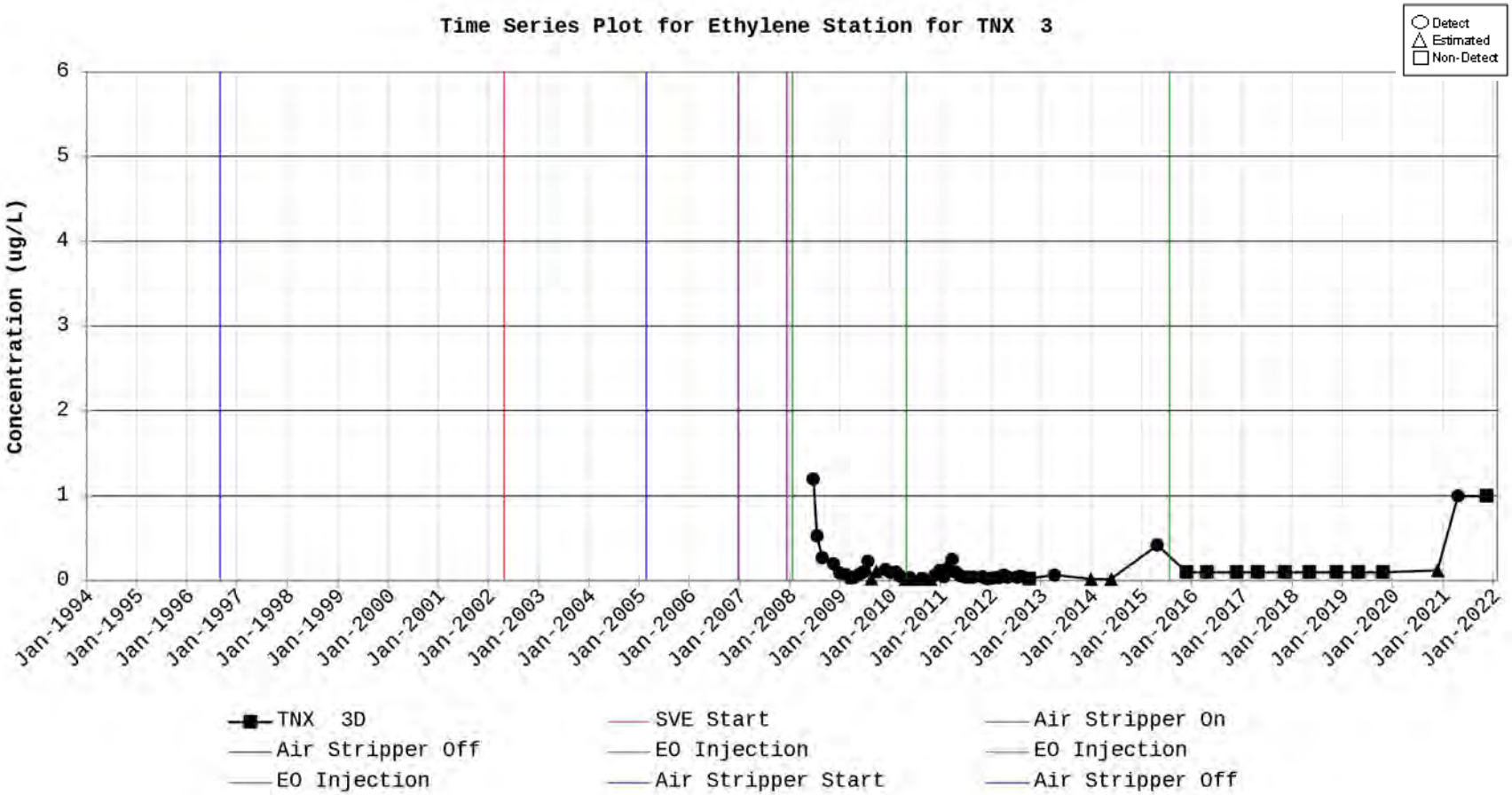

Time Series Plot for Dissolved Oxygen (DO) for Station TVM 4M
DO mg/L
Non- detects
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

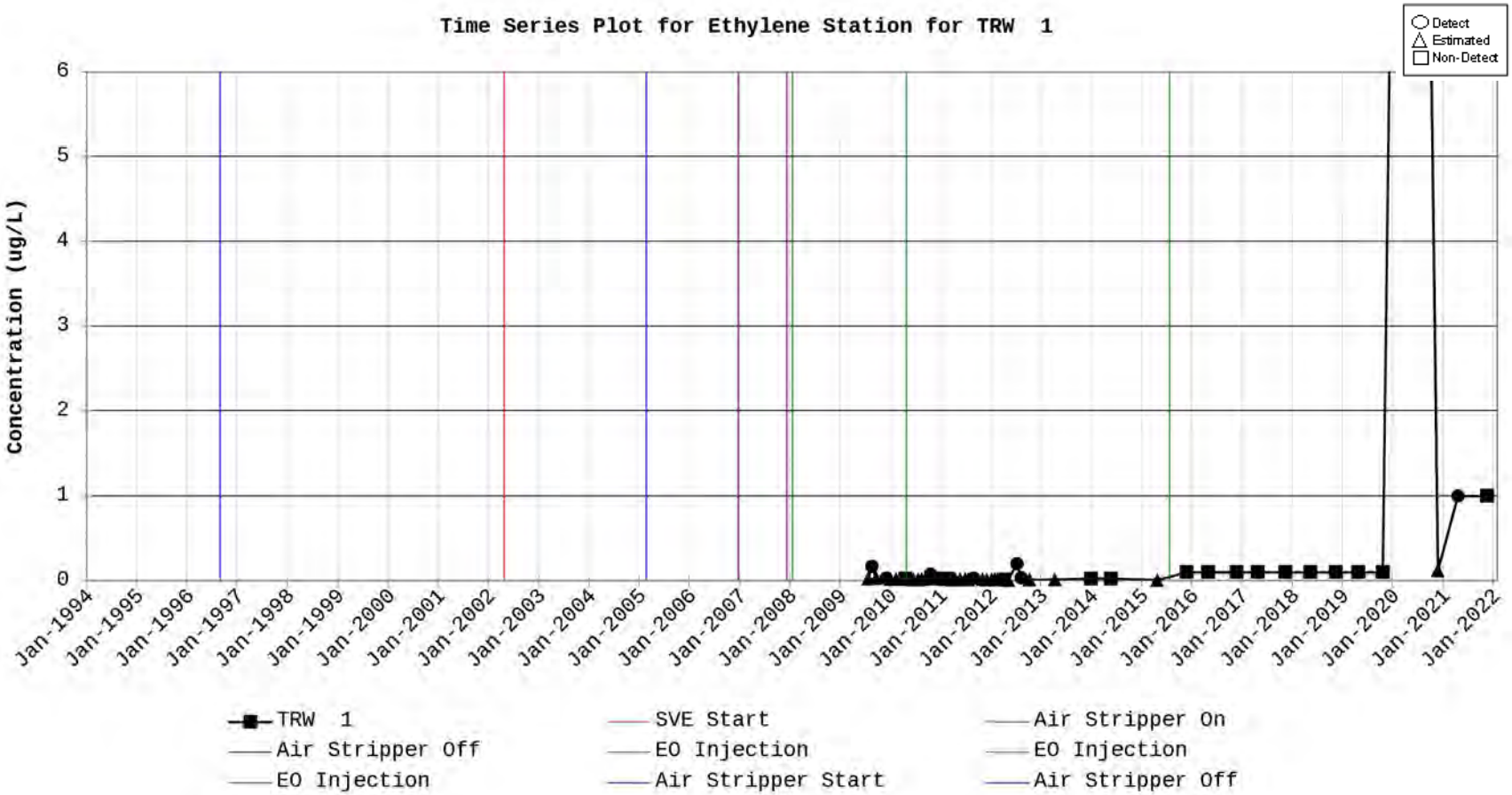

Time Series Plot for Dissolved Oxygen (DO) for Station TVR 1A
DO mg/L
Non- detects
DO mg/L
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

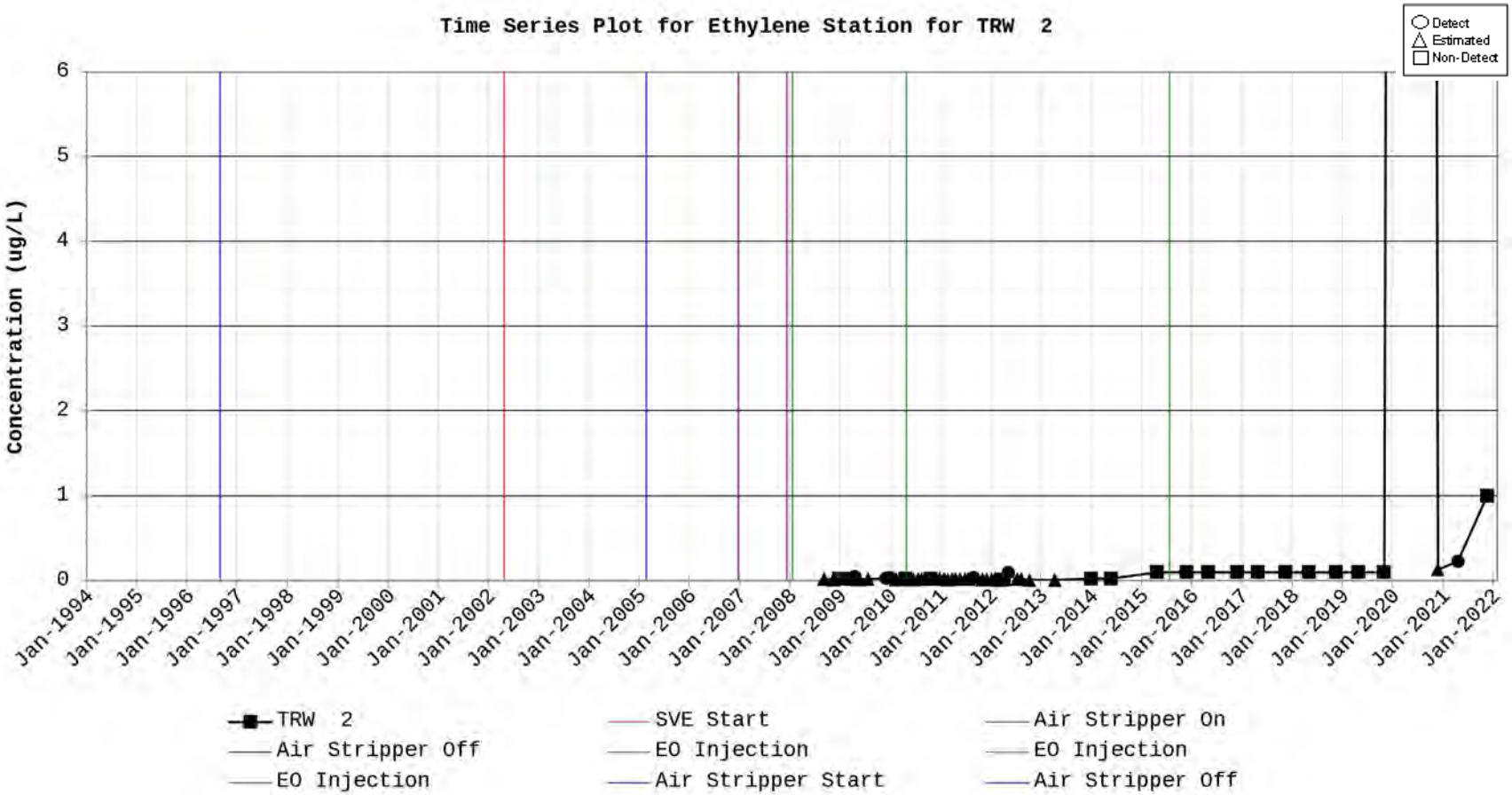

Time Series Plot for Ethylene Station for TBG 3
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

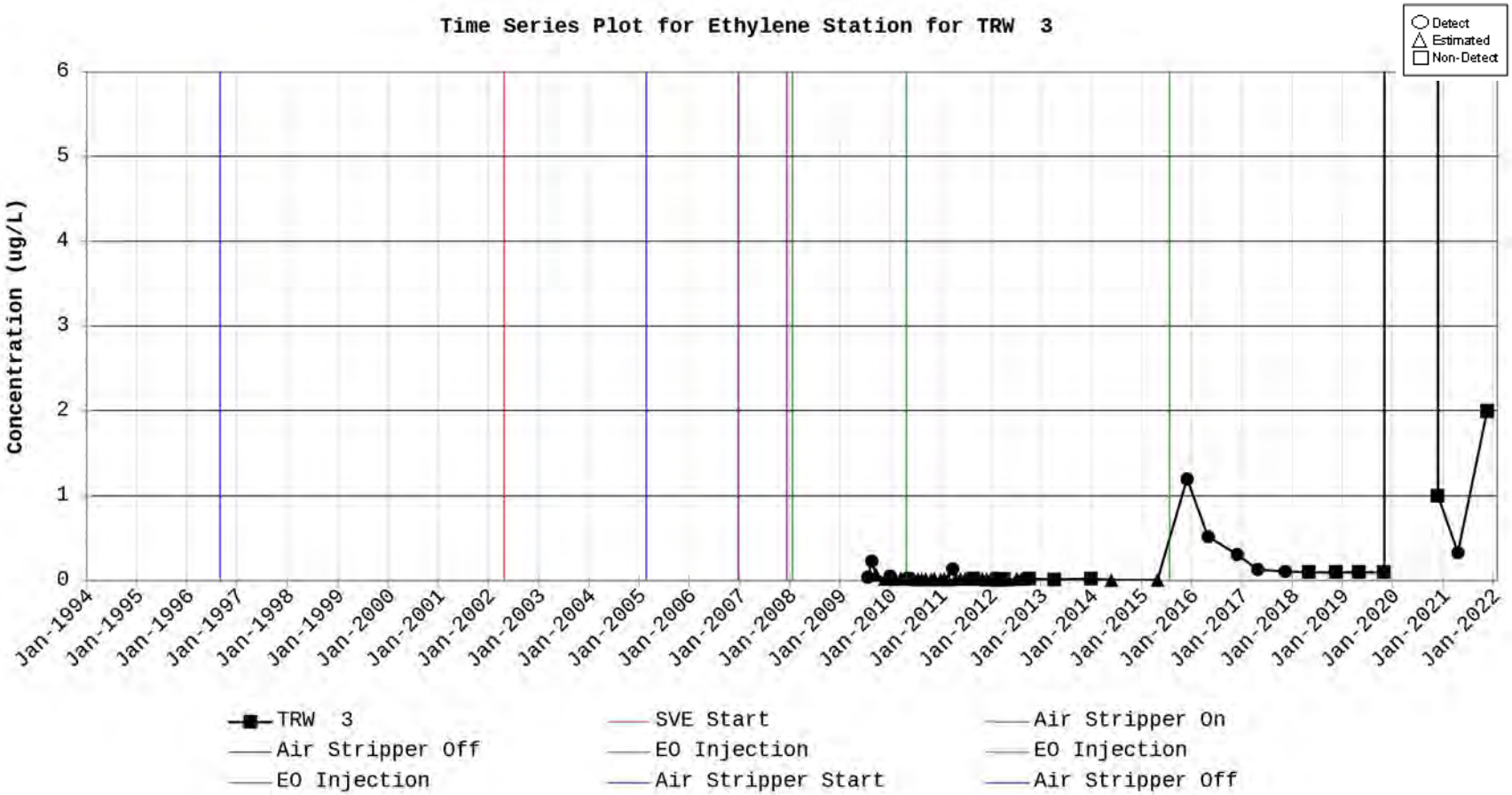

Time Series Plot for Ethylene Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

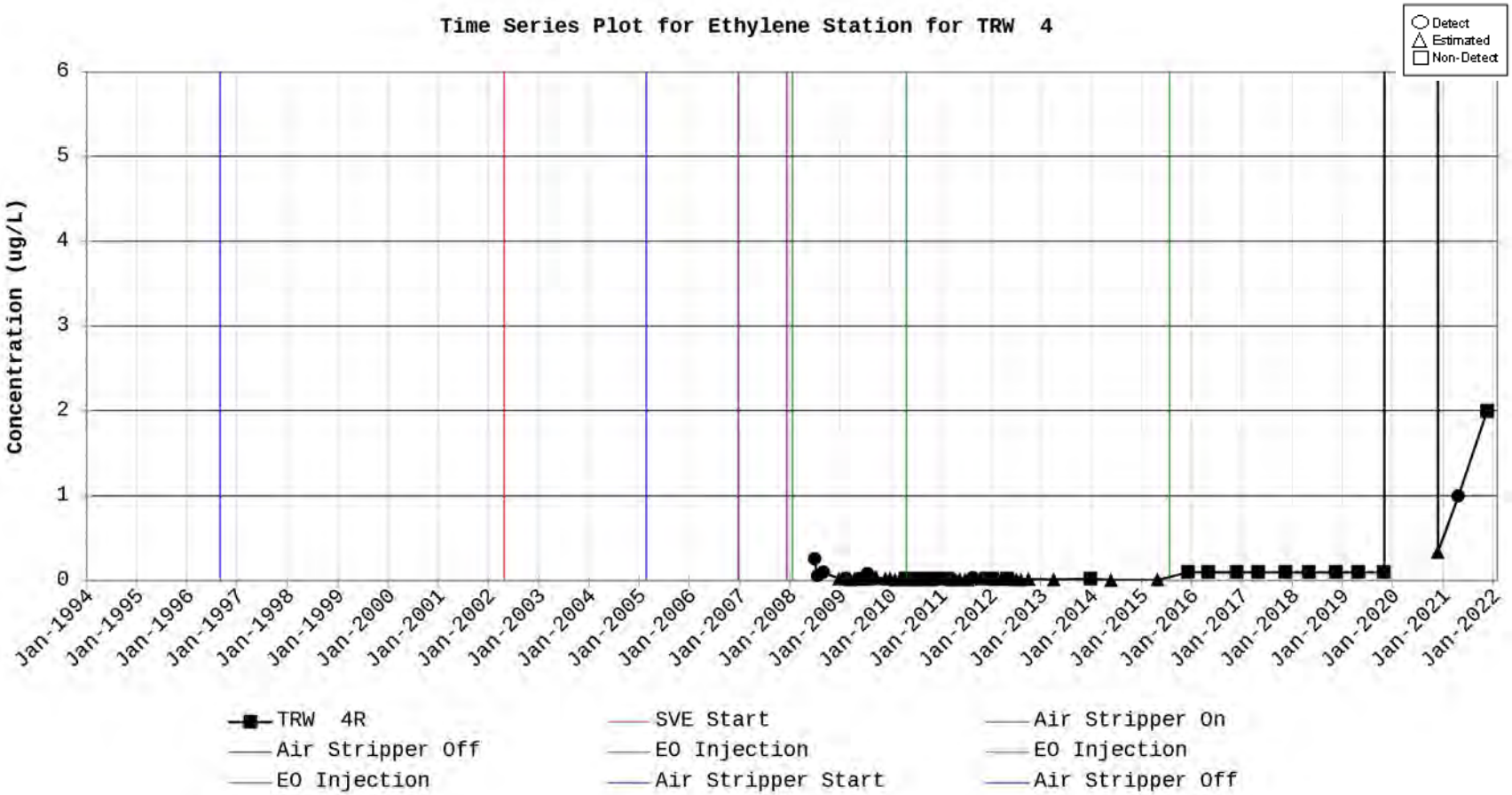

Time Series Plot for Ethylene Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

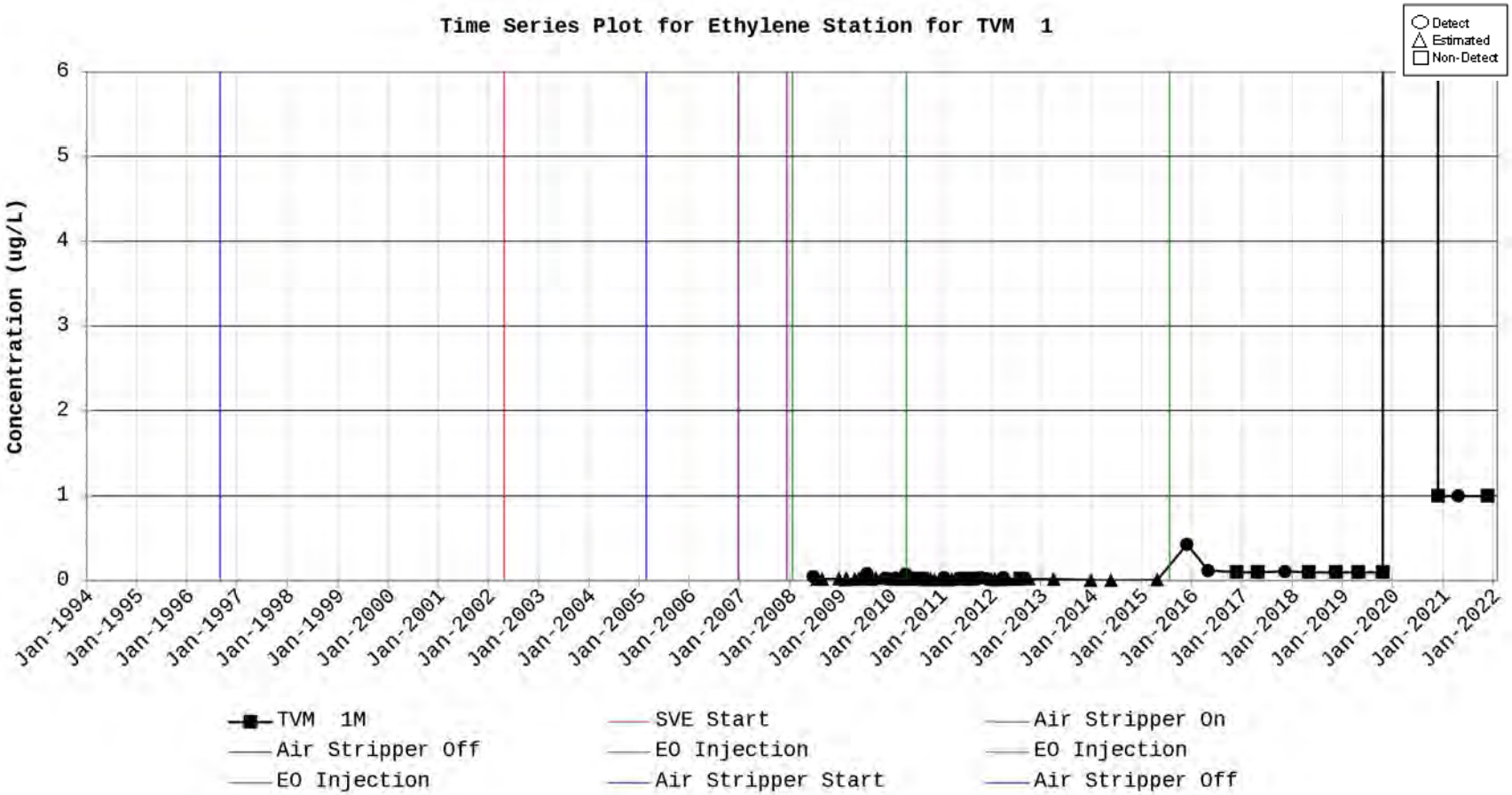

Time Series Plot for Ethylene Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

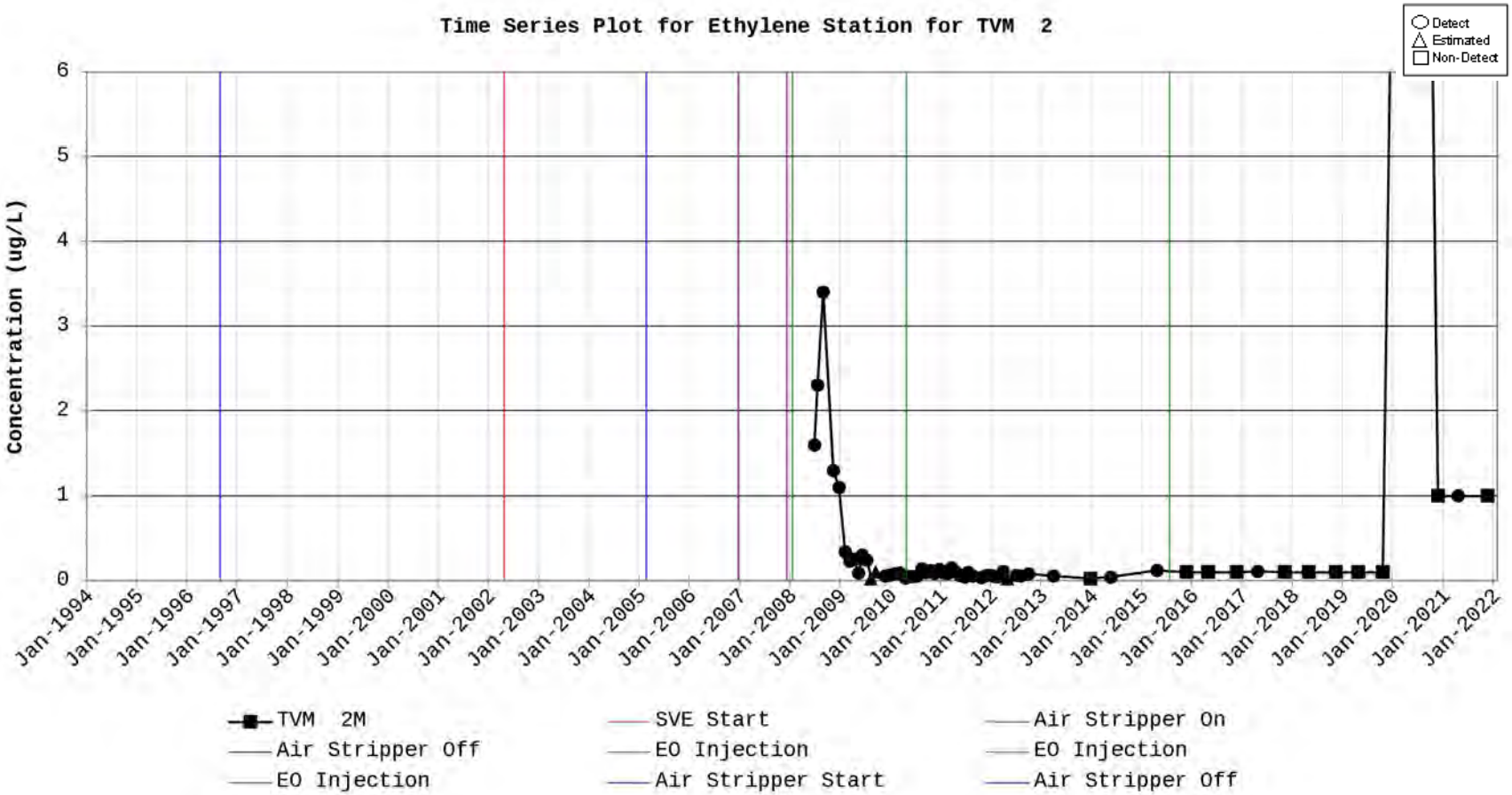

Time Series Plot for Ethylene Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

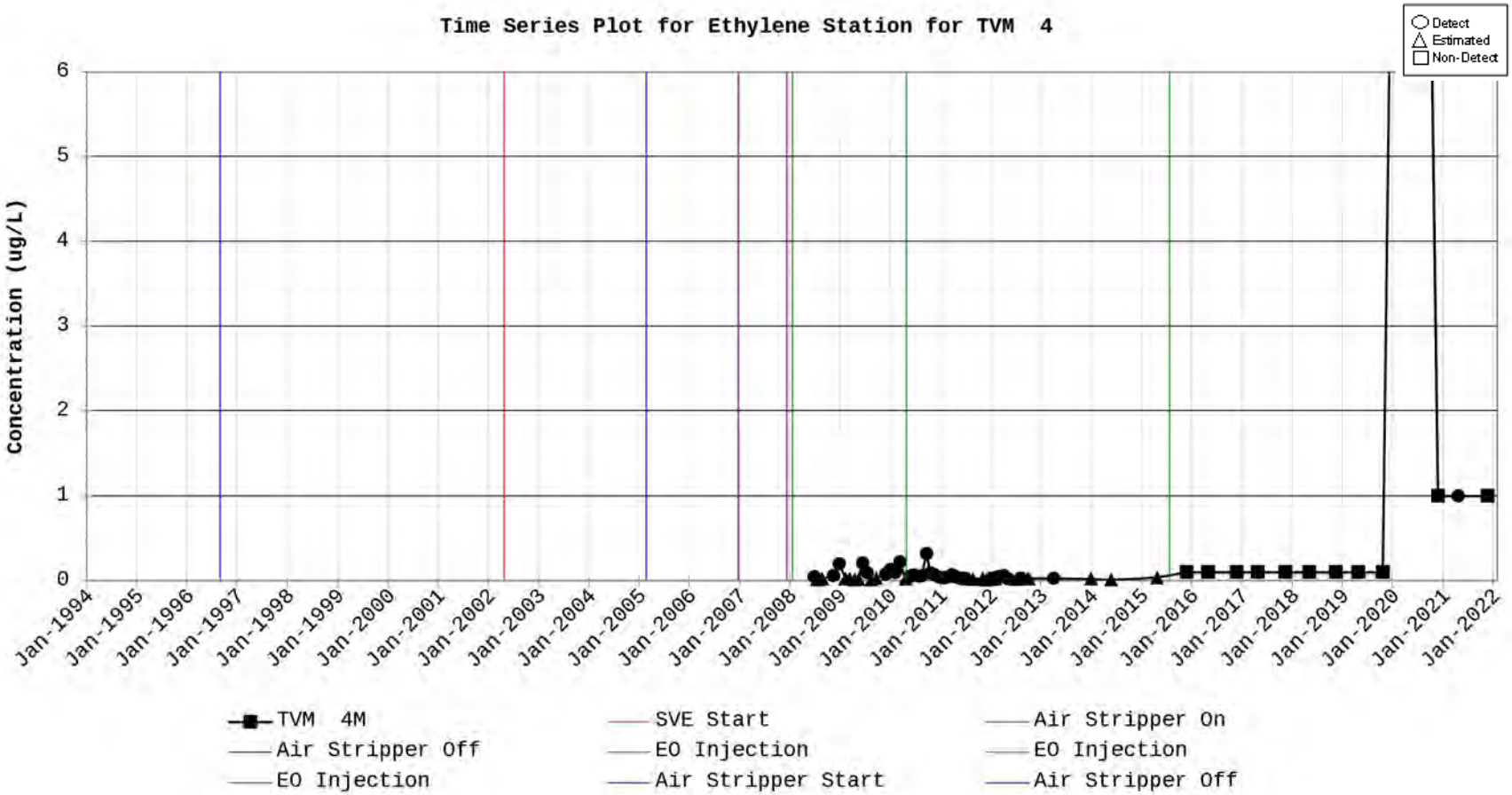

Time Series Plot for Ethylene Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

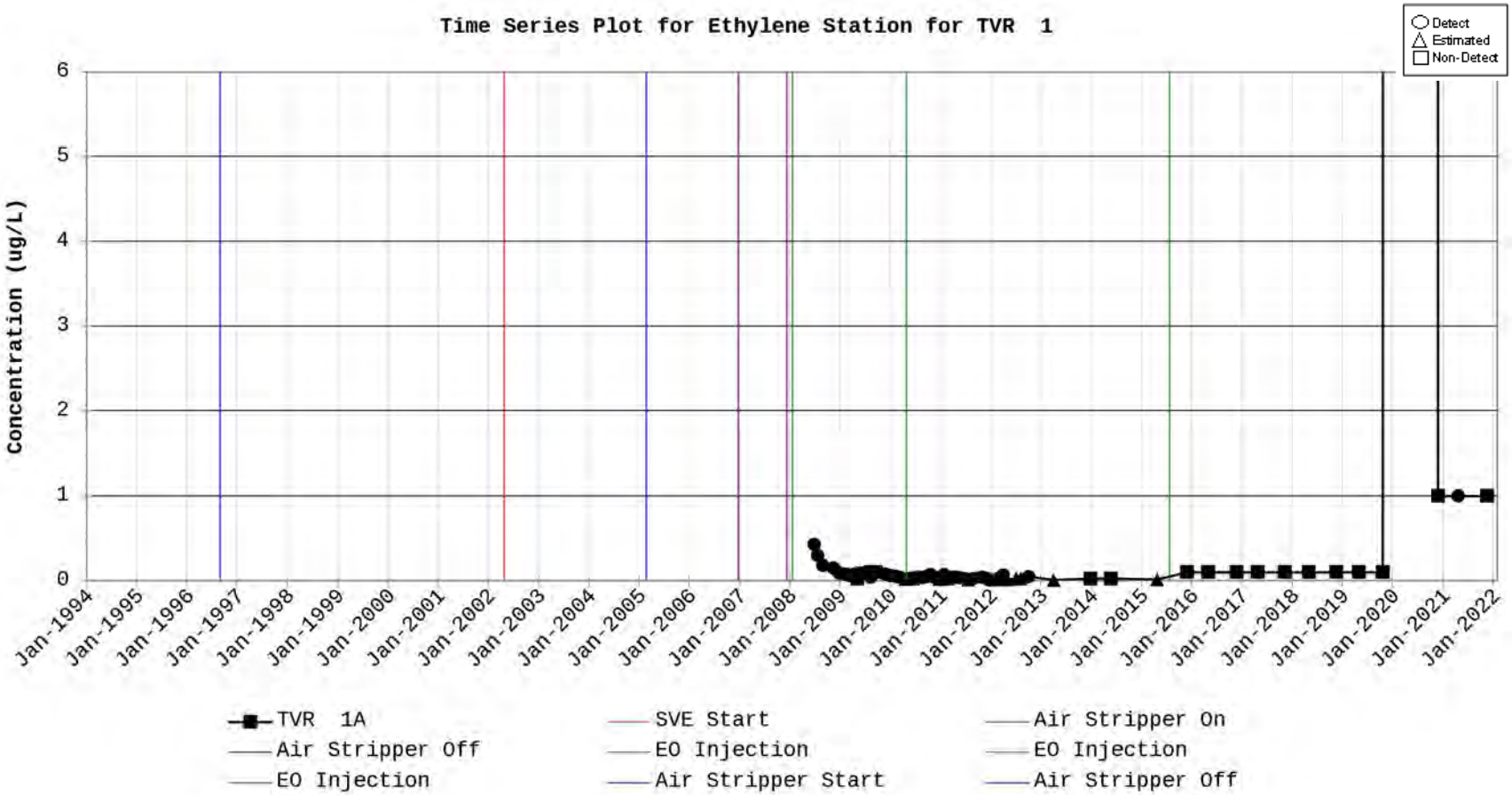

Time Series Plot for Ethylene Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

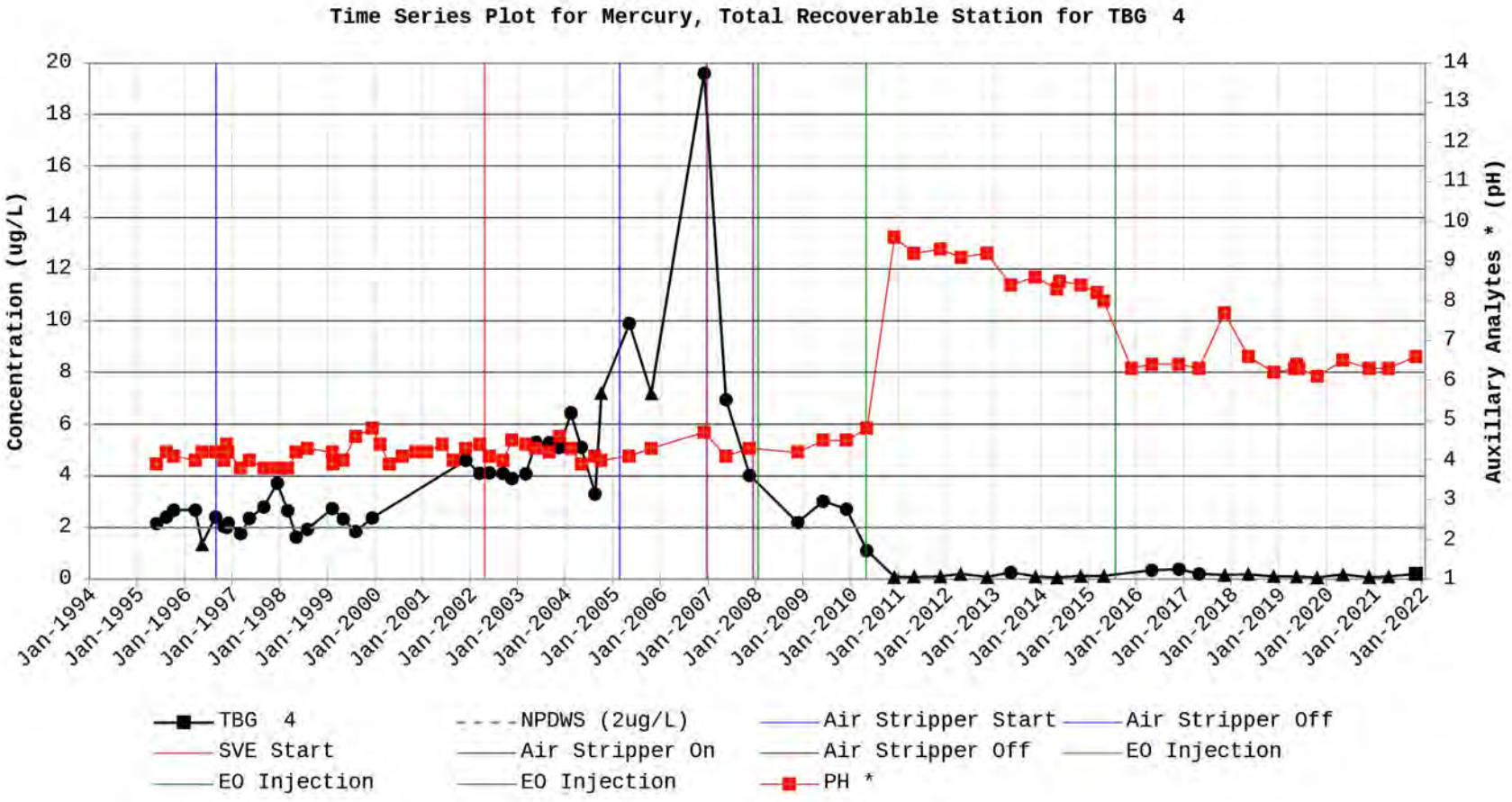

Time Series Plot for Ethylene Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

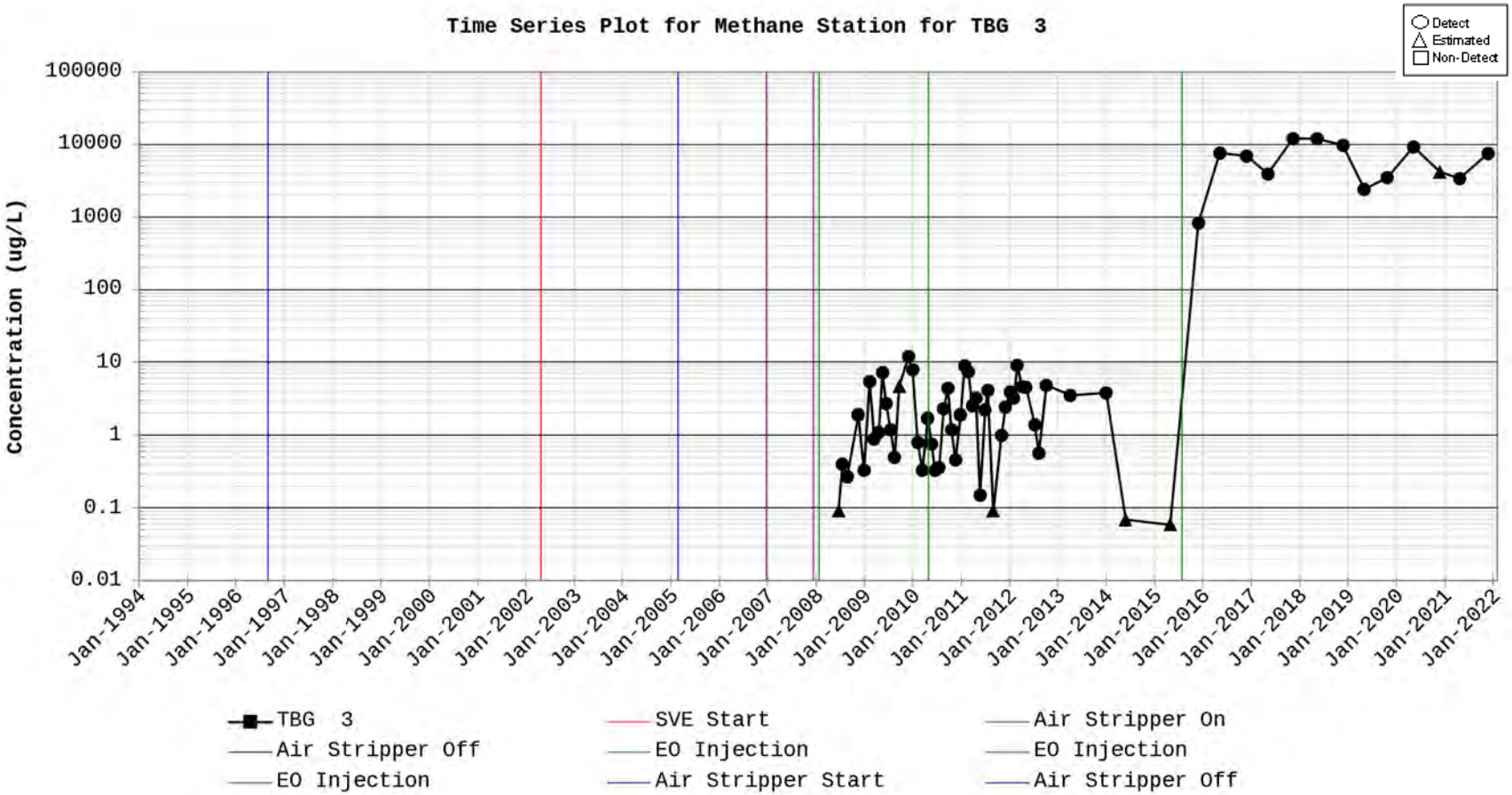

Time Series Plot for Ethylene Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

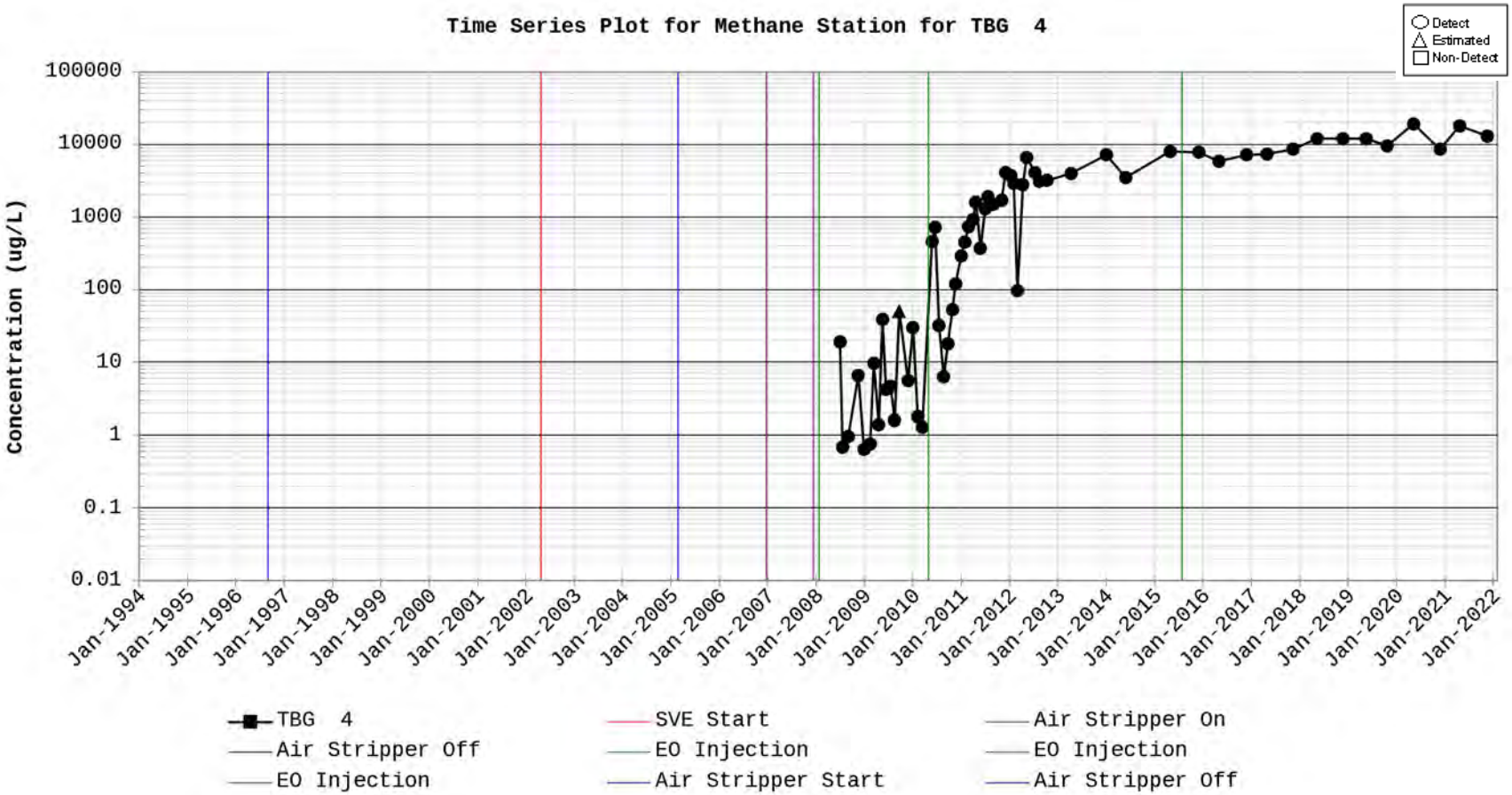

Time Series Plot for Ethylene Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

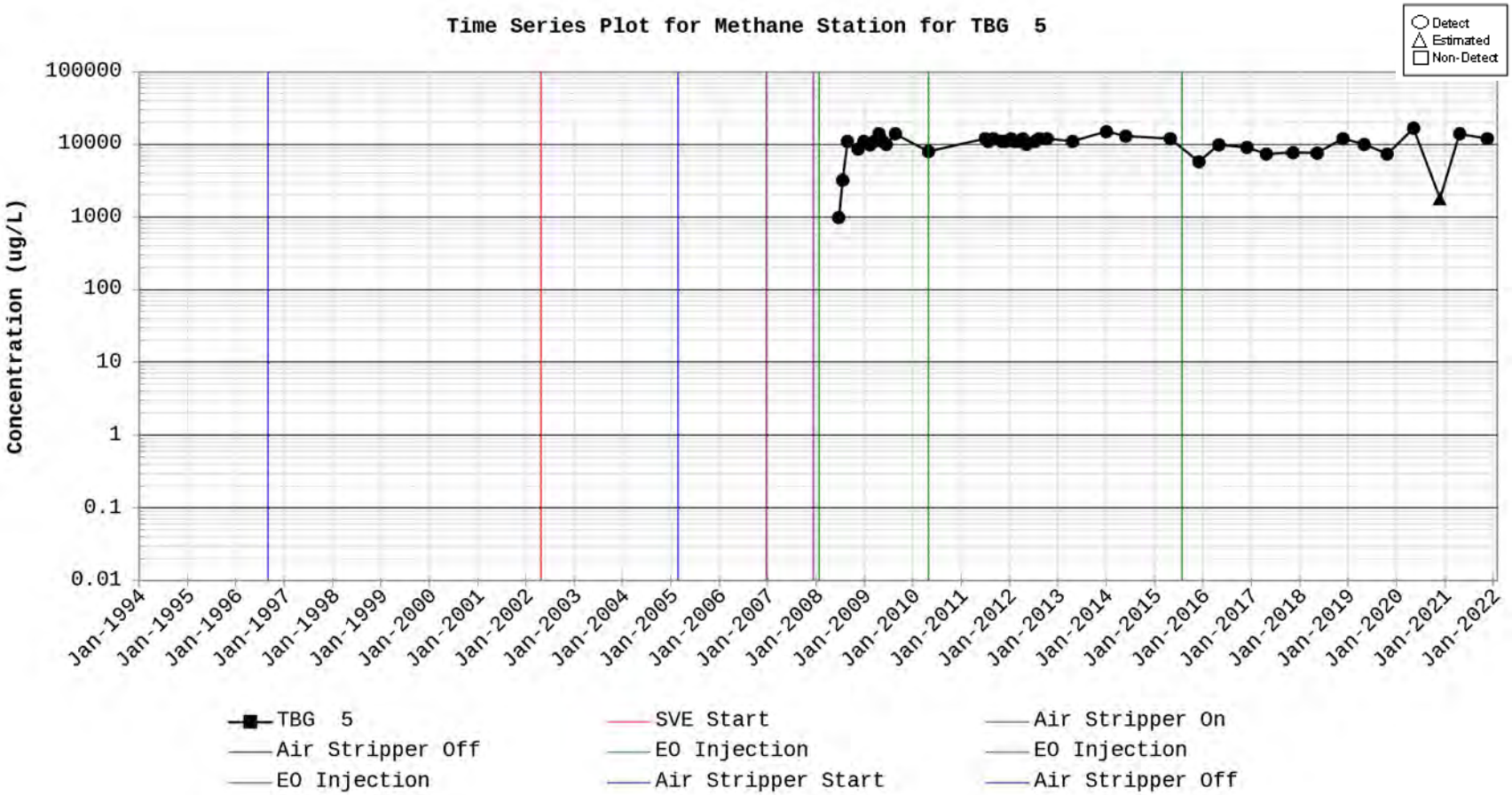

Time Series Plot for Ethylene Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

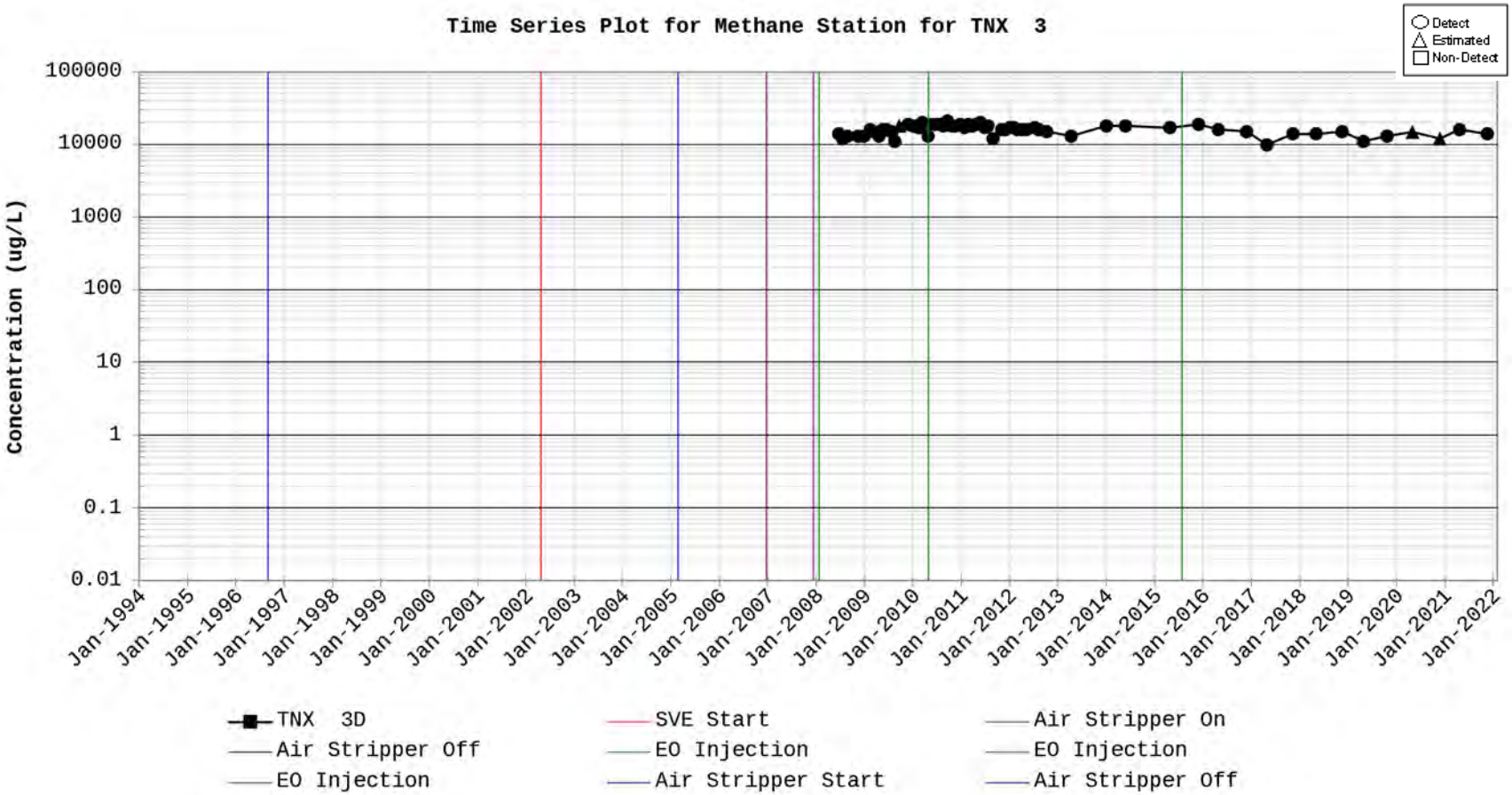

Time Series Plot for Ethylene Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
0
1
2
3
4
5
6
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

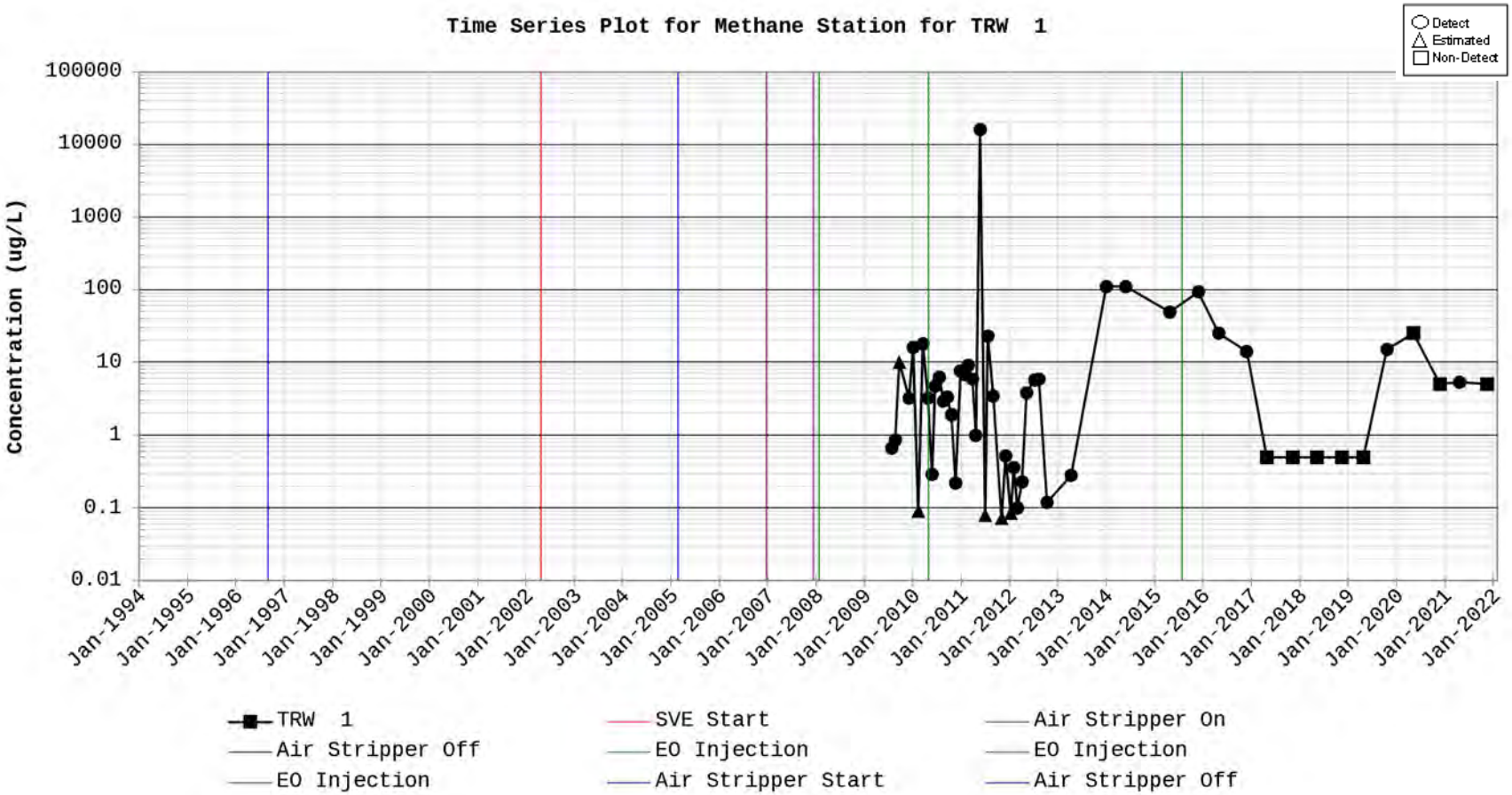

Time Series Plot for Mercury, Total Recoverable Station for TBG 4
Concentration (ug/L)
Auxillary Analytes * (pH)
TBG 4
NPDWS (2ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

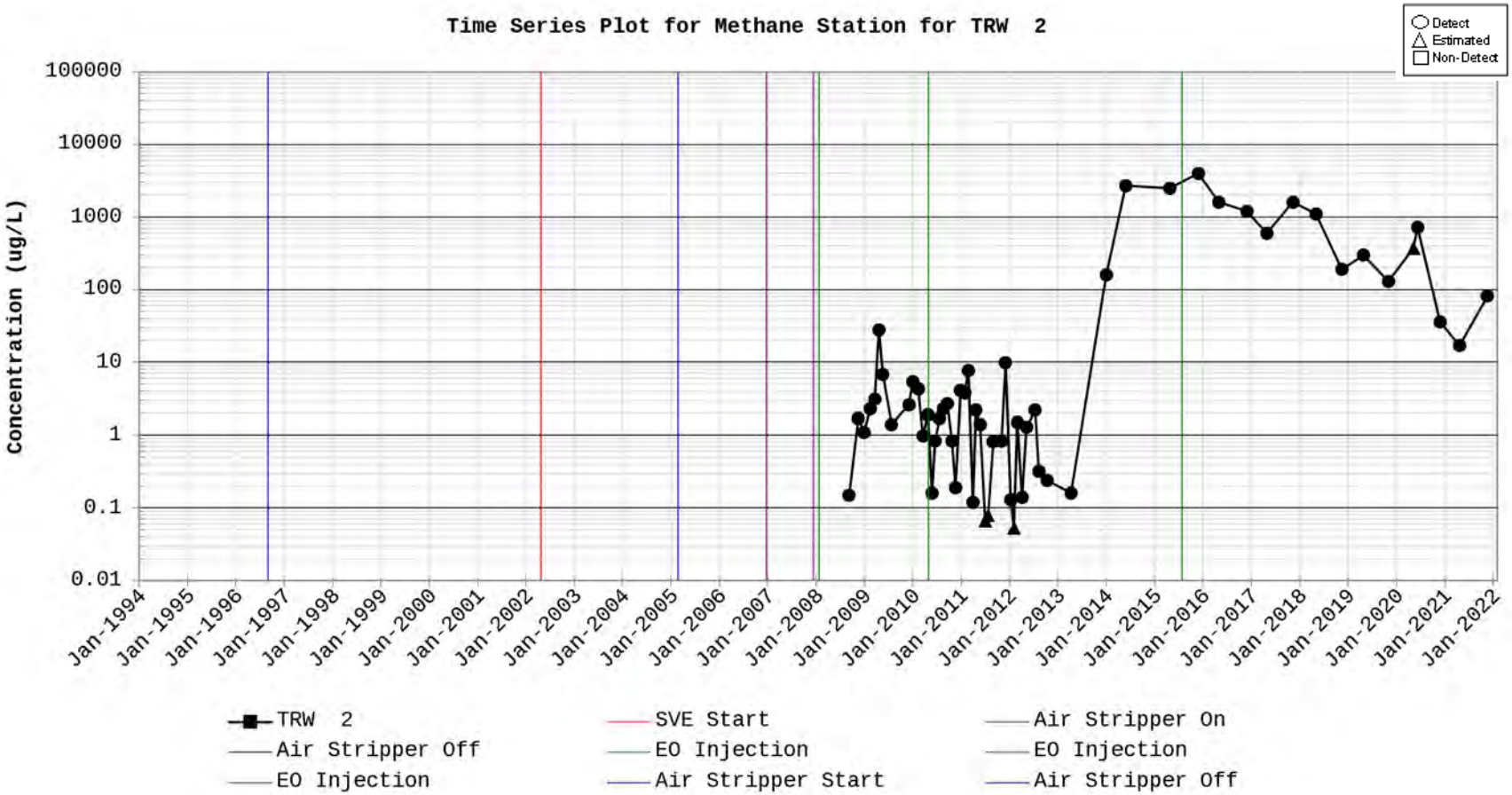

Time Series Plot for Methane Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

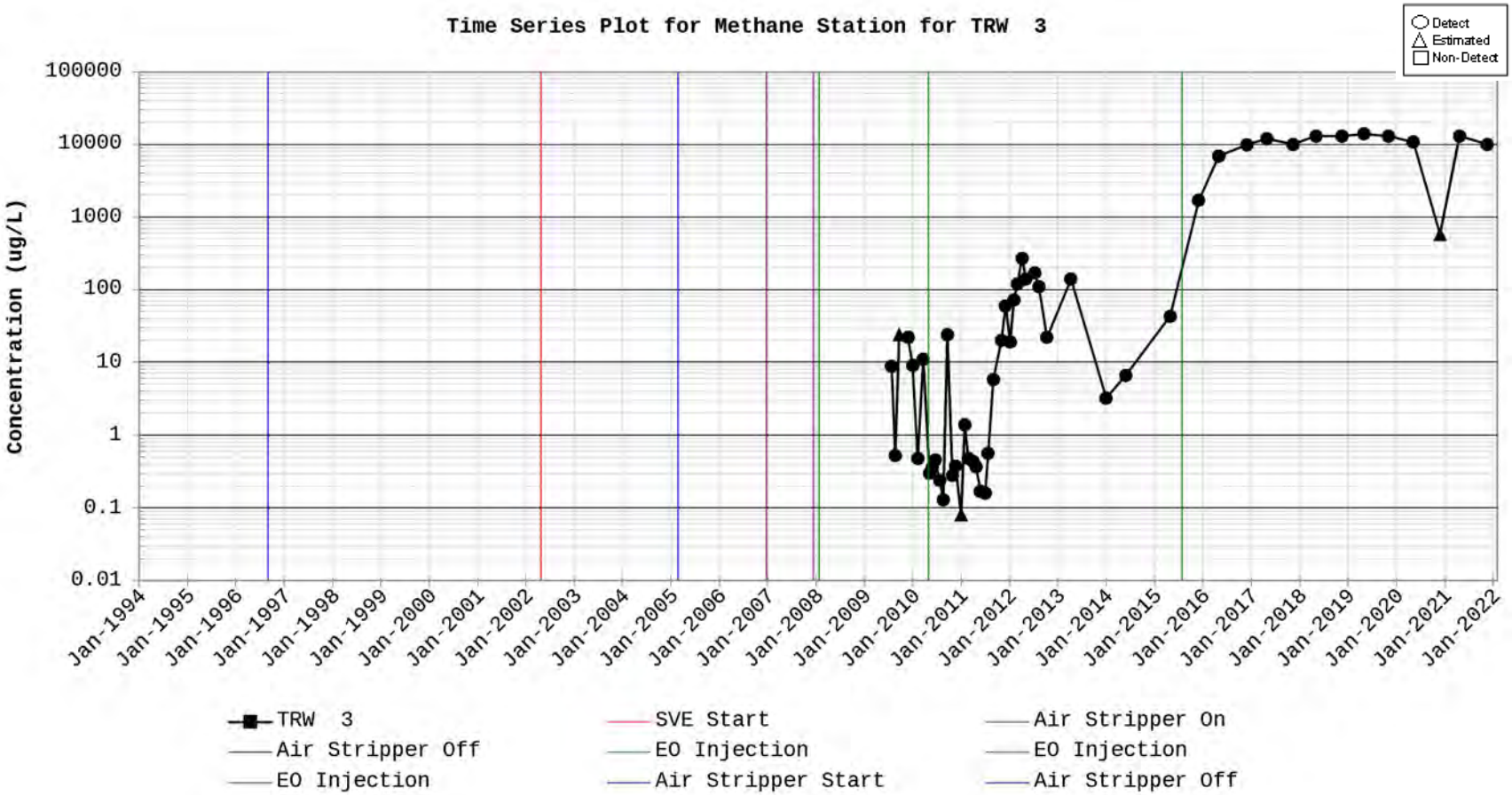

Time Series Plot for Methane Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

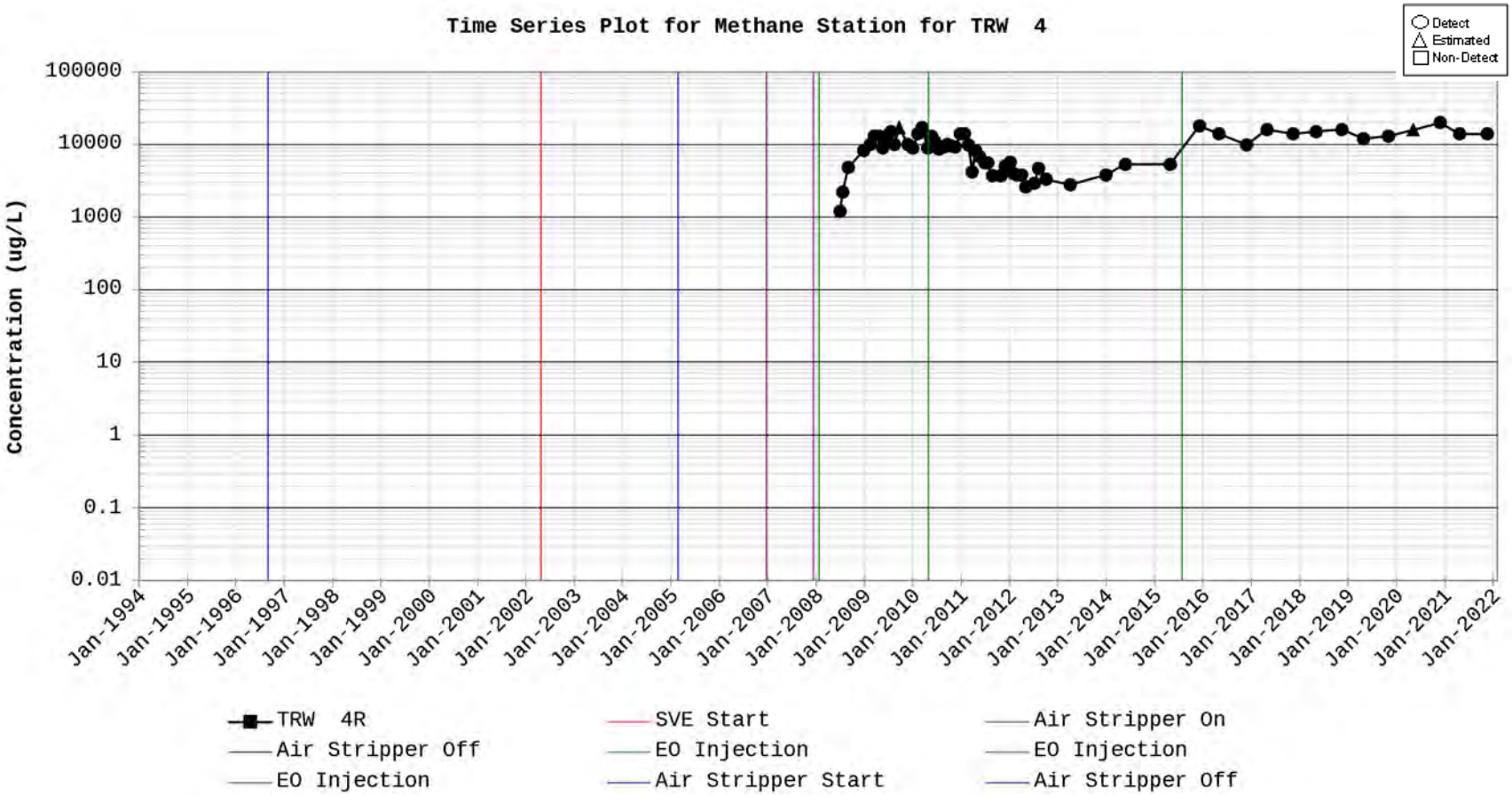

Time Series Plot for Methane Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

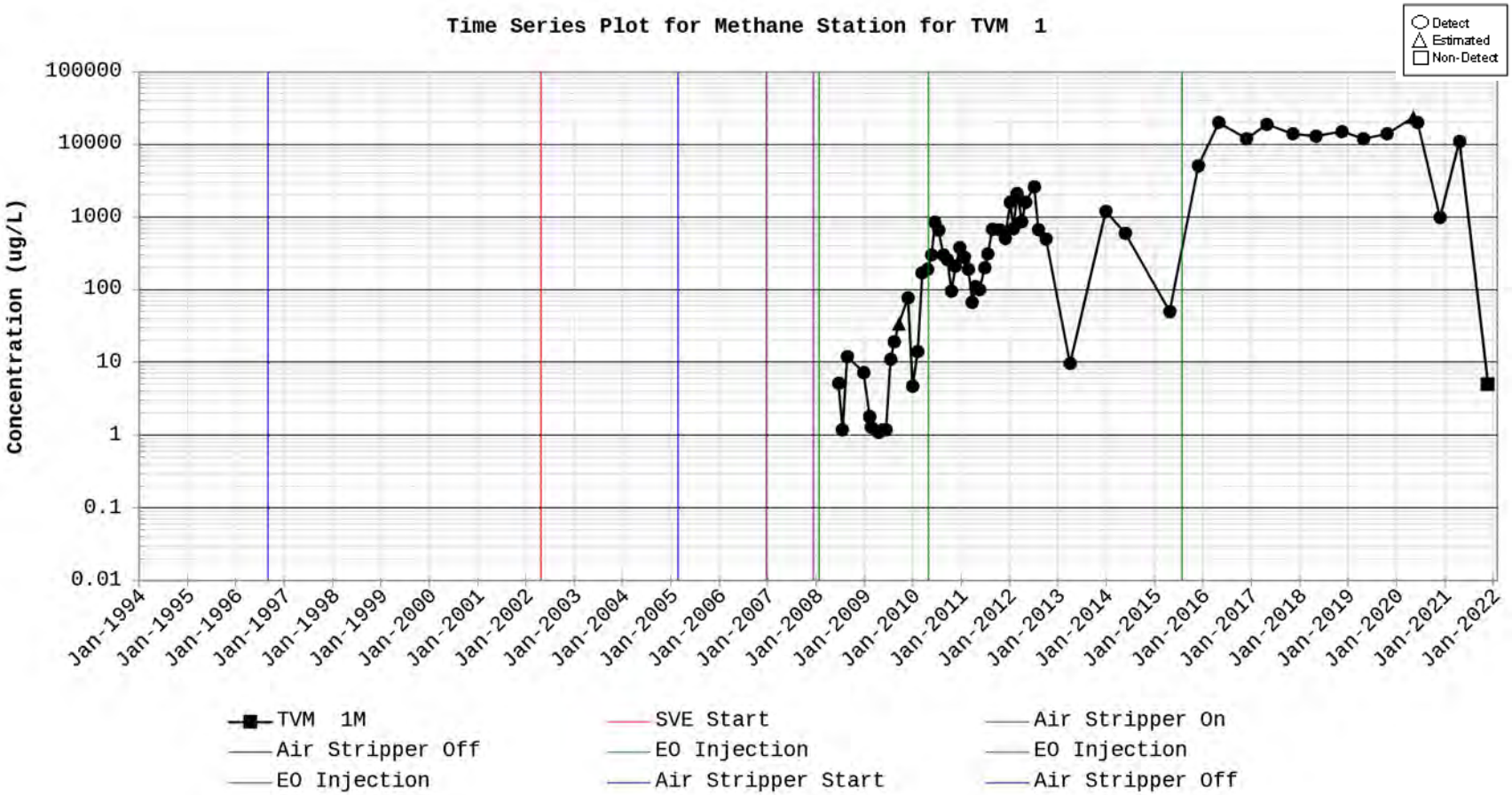

Time Series Plot for Methane Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

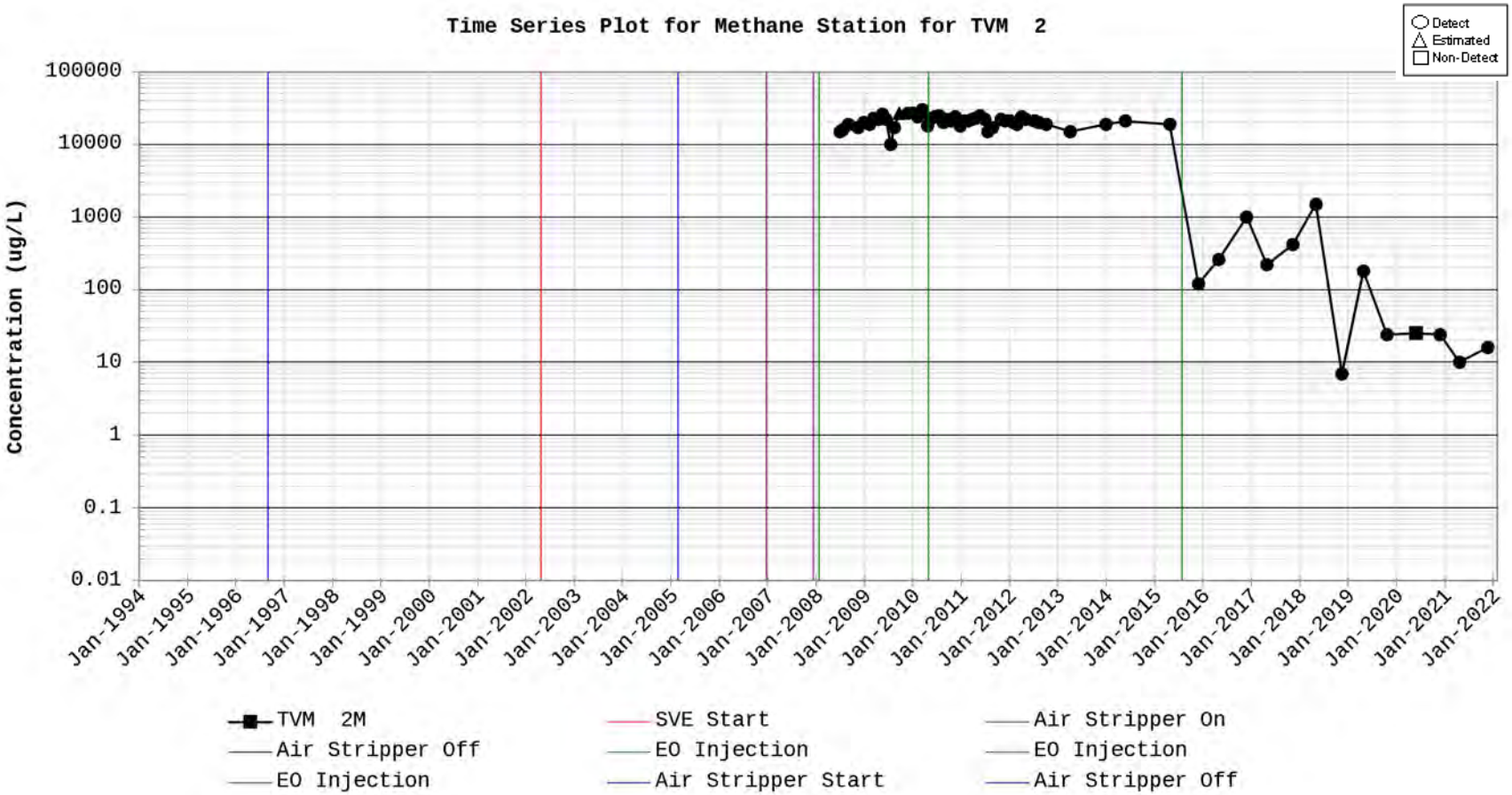

Time Series Plot for Methane Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

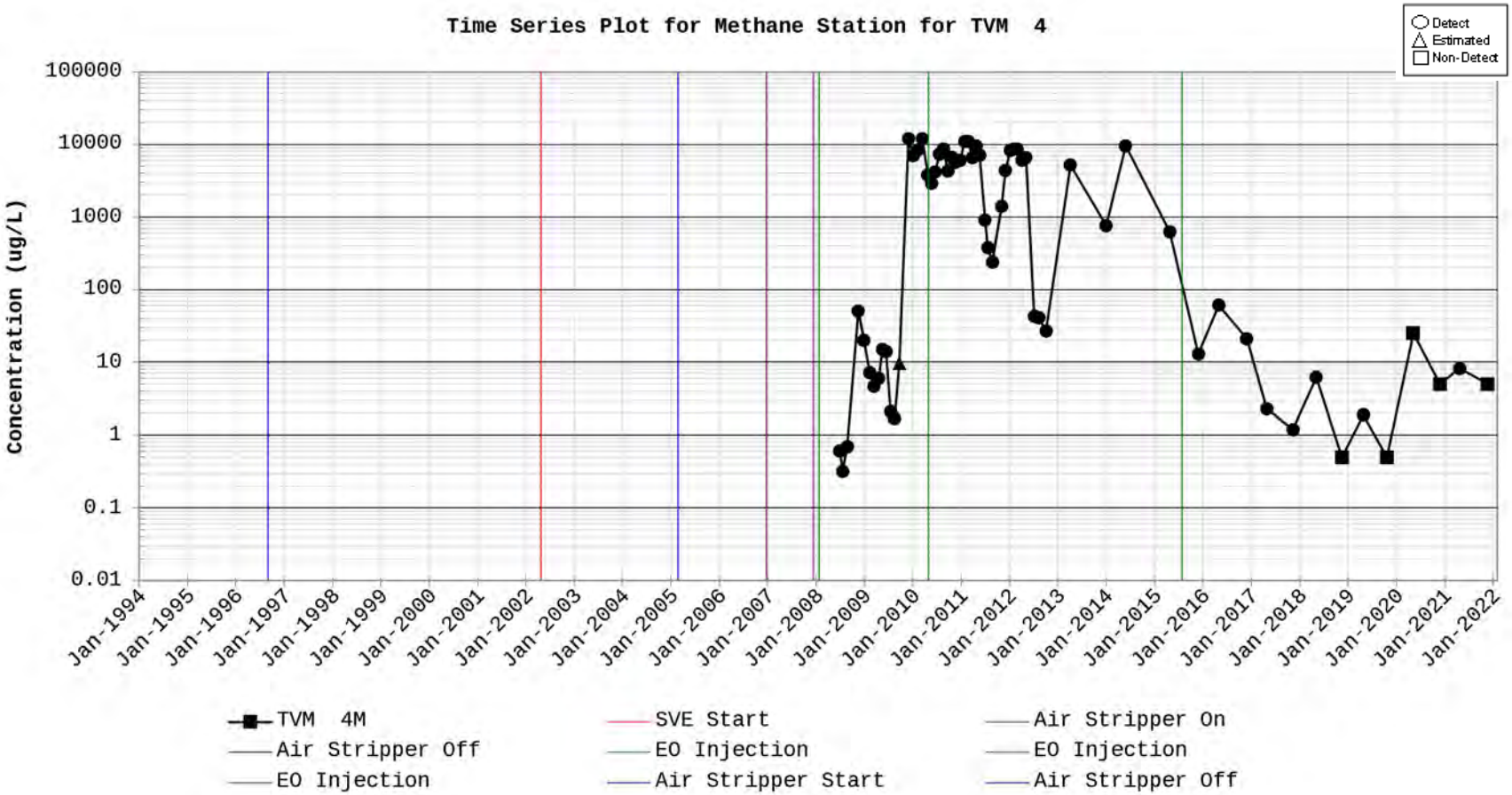

Time Series Plot for Methane Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

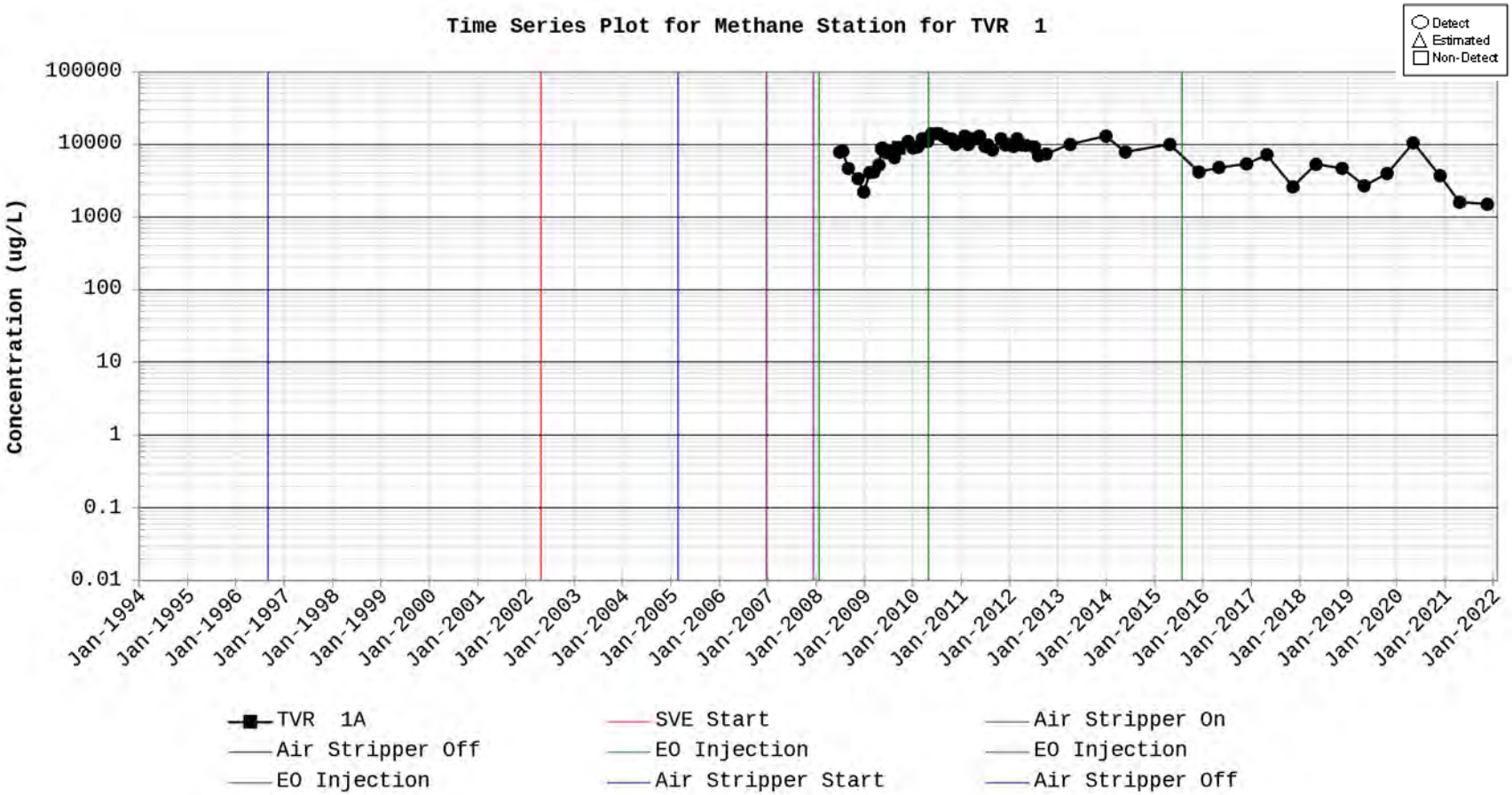

Time Series Plot for Methane Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
Air Stripper Off
EO Injection
SVE Start
EO Injection
Air Stripper Start
Air Stripper On
EO Injection
Air Stripper Off

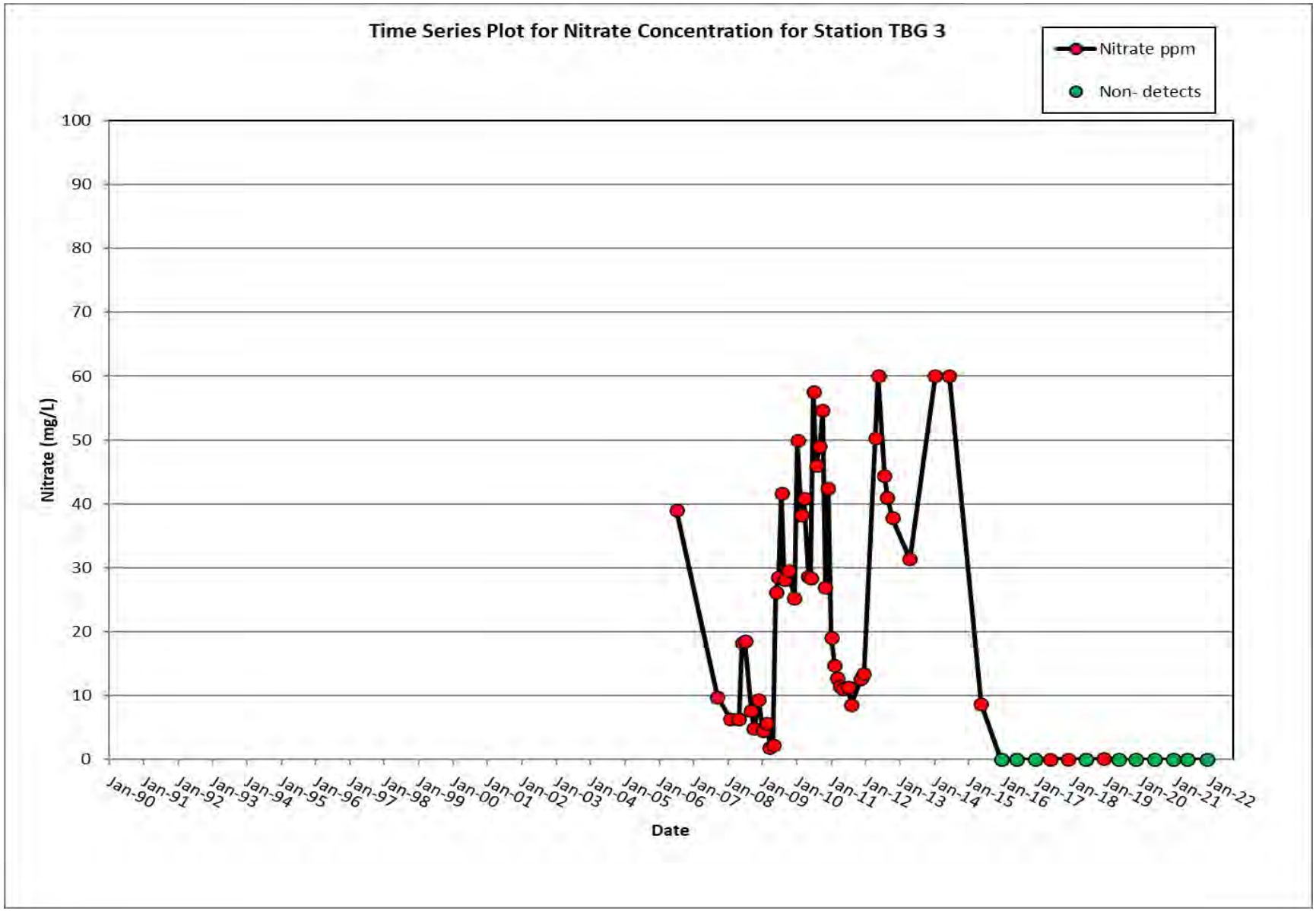

Time Series Plot for Methane Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

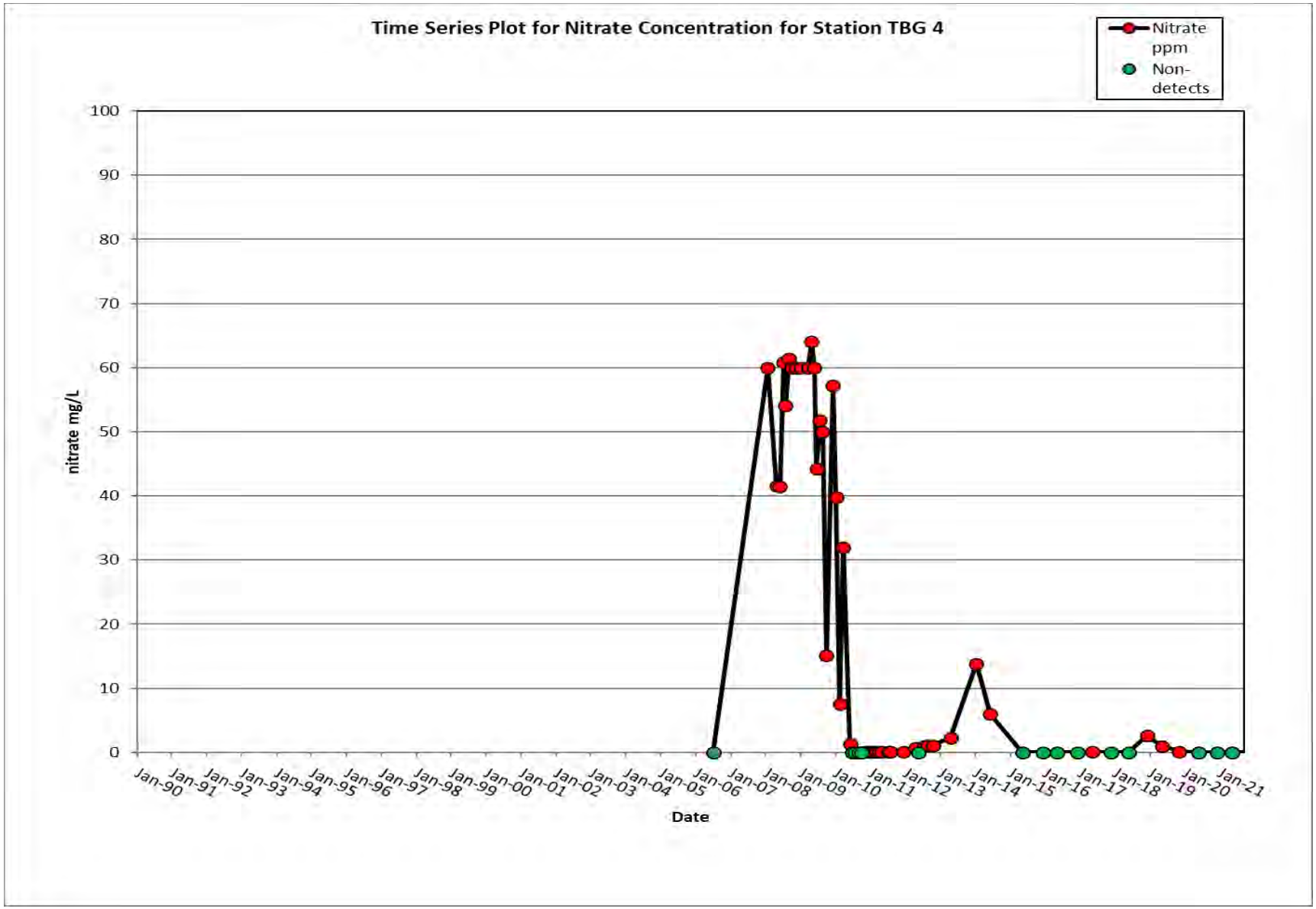

Time Series Plot for Methane Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

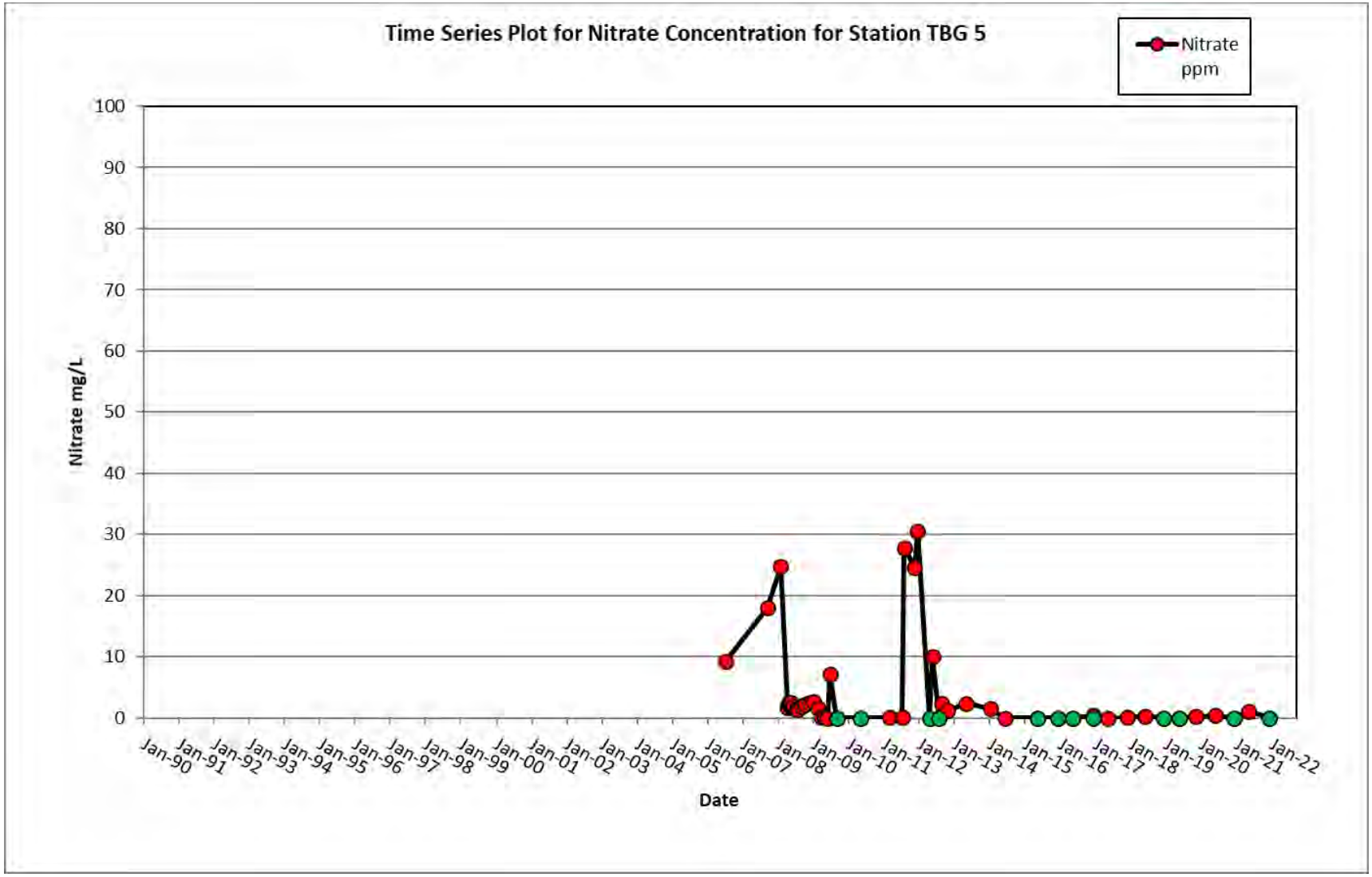

Time Series Plot for Methane Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

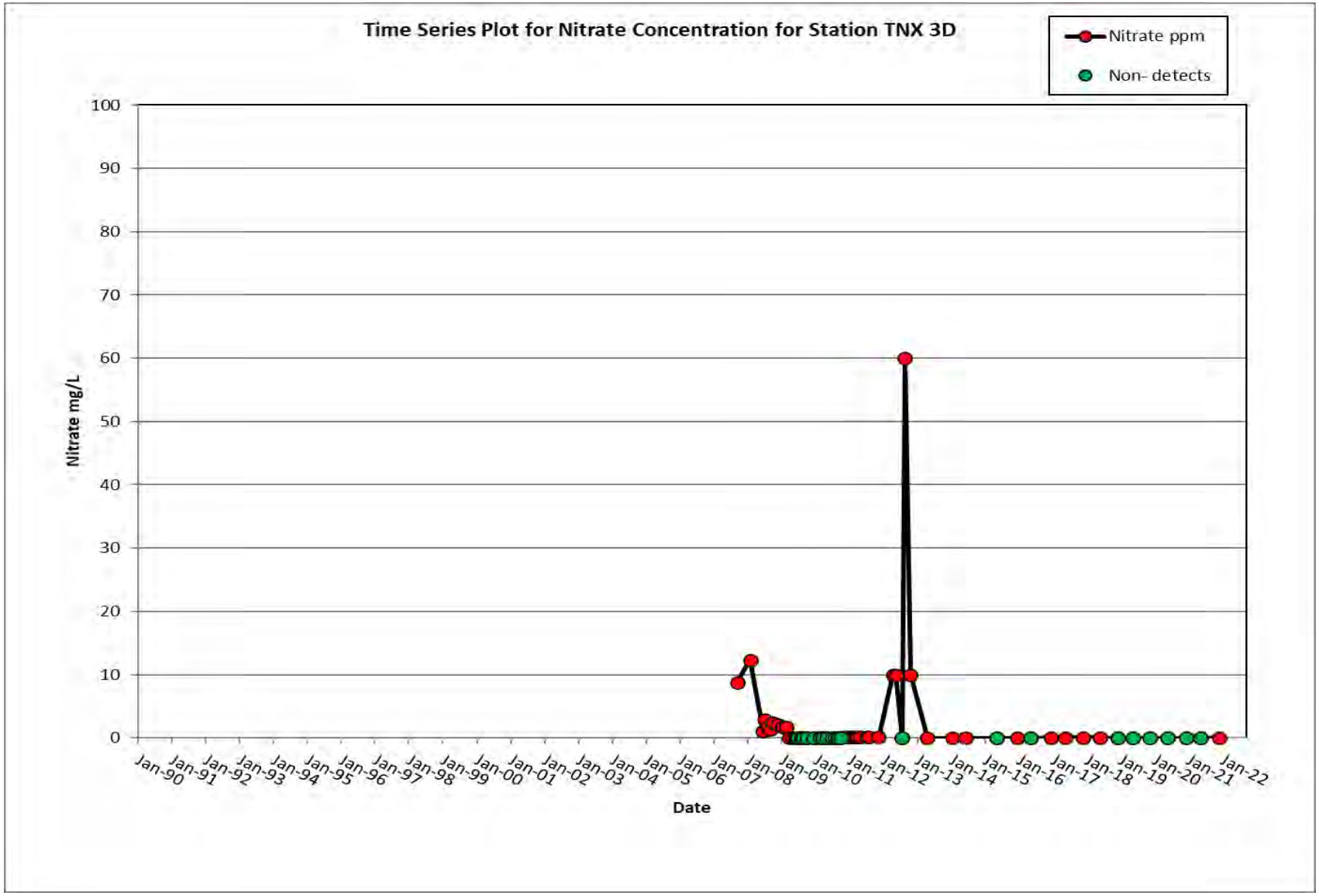

Time Series Plot for Methane Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

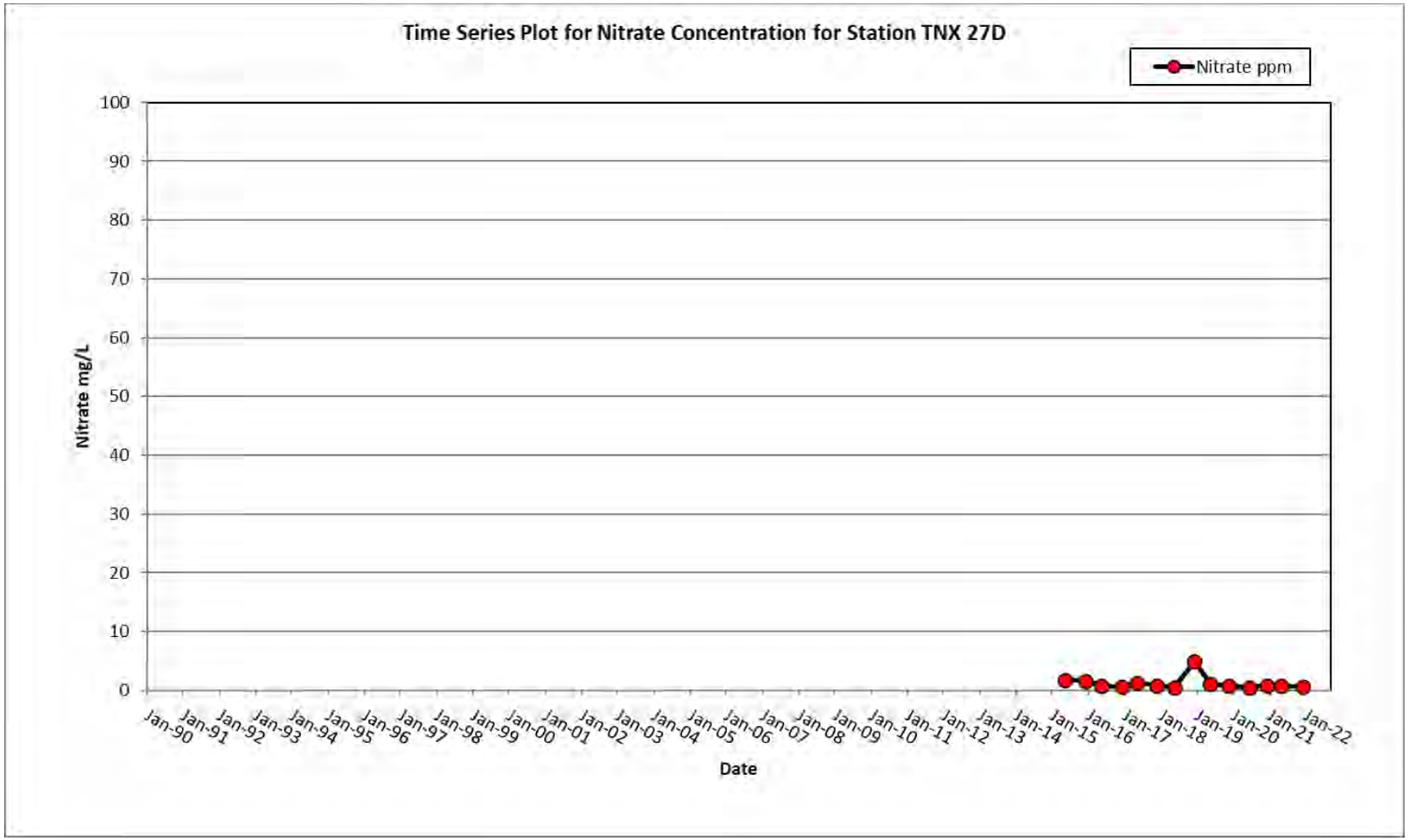

Time Series Plot for Methane Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
100000
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

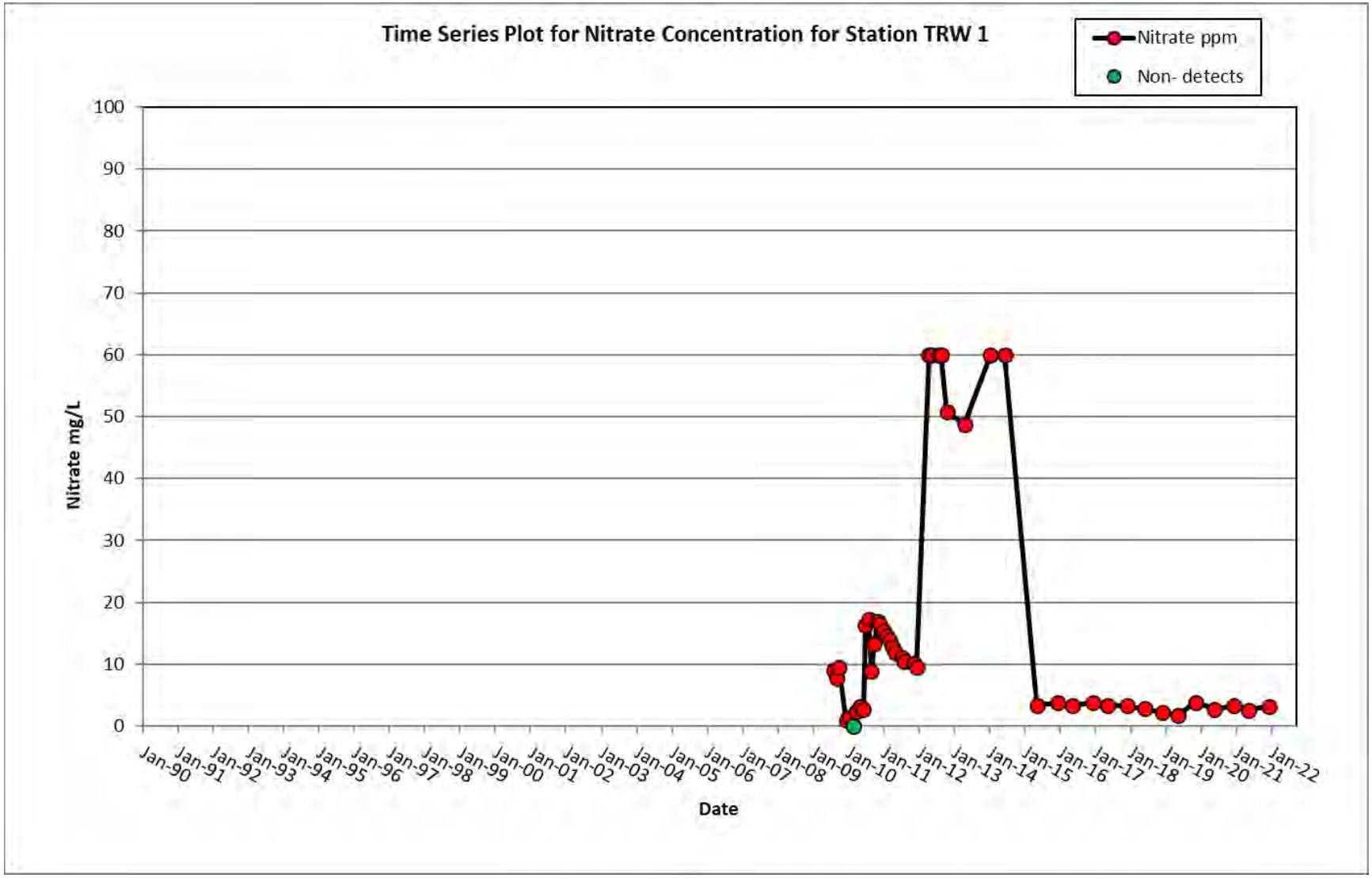

Time Series Plot for Nitrate Concentration for Station TBG 3
Nitrate ppm
Non- detects
Nitrate (mg/L)
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

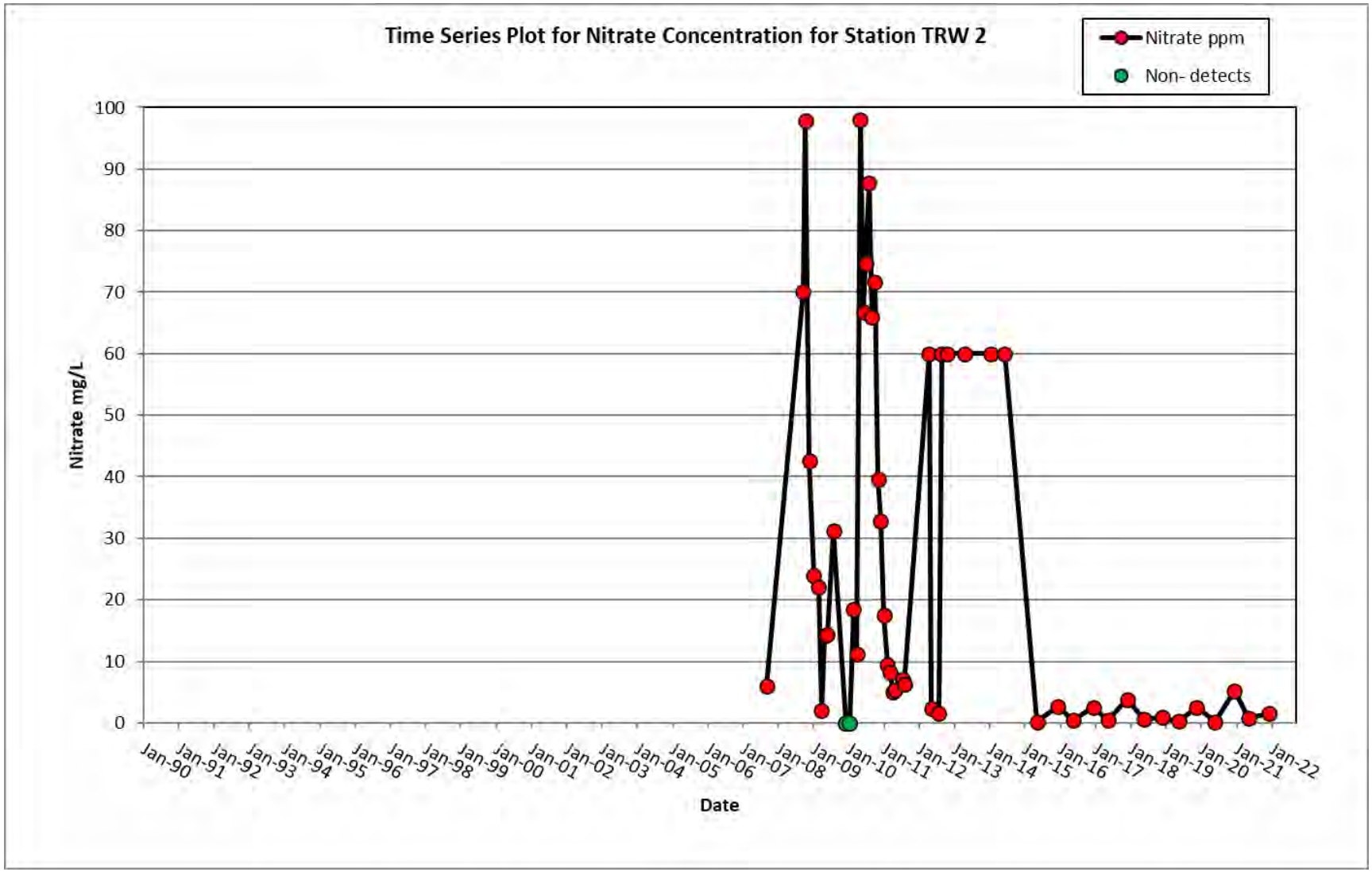

Time Series Plot for Nitrate Concentration for Station TBG 4
Nitrate ppm
Non-detects
nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Date

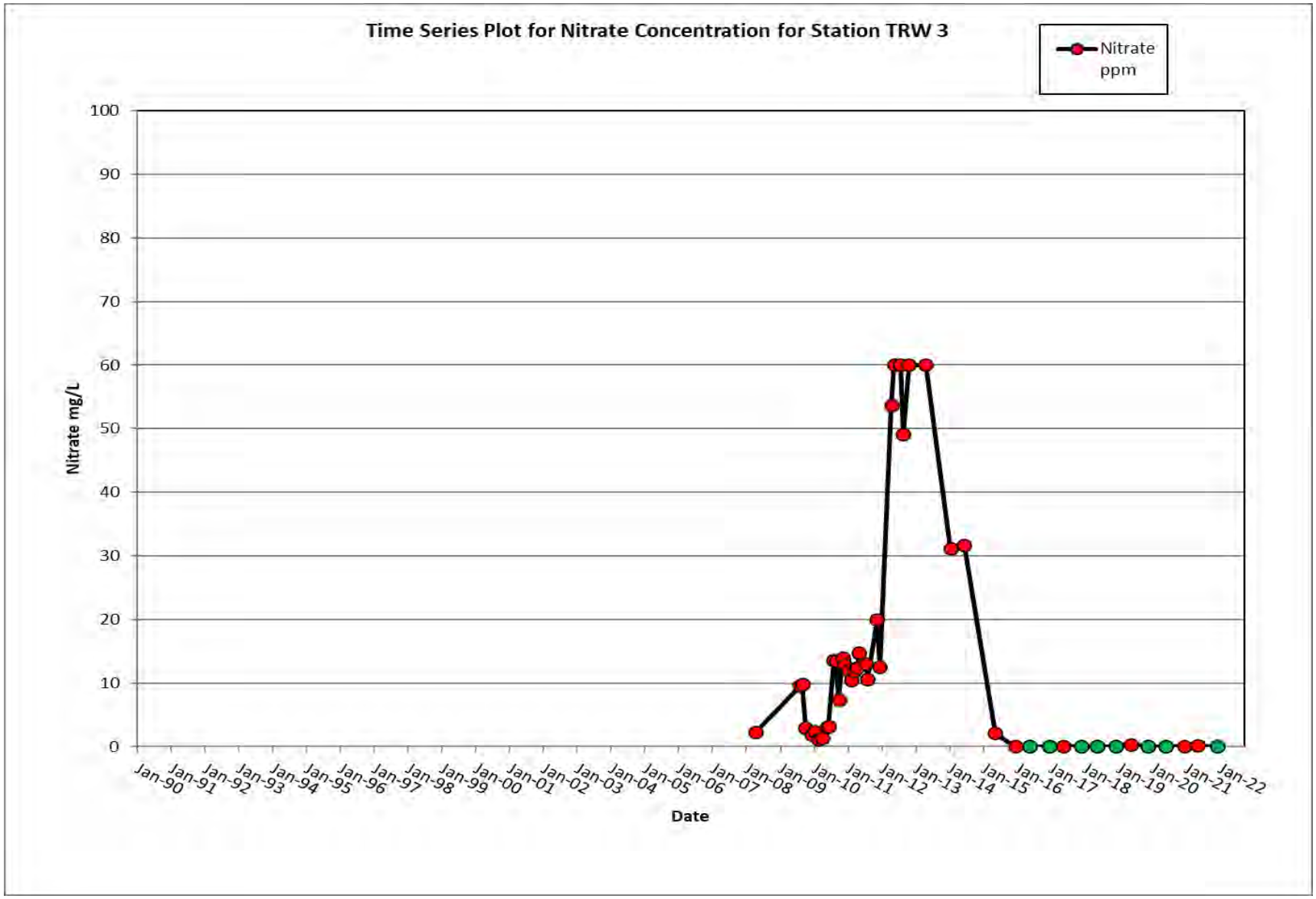

Time Series Plot for Nitrate Concentration for Station TBG 5
Nitrate ppm
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

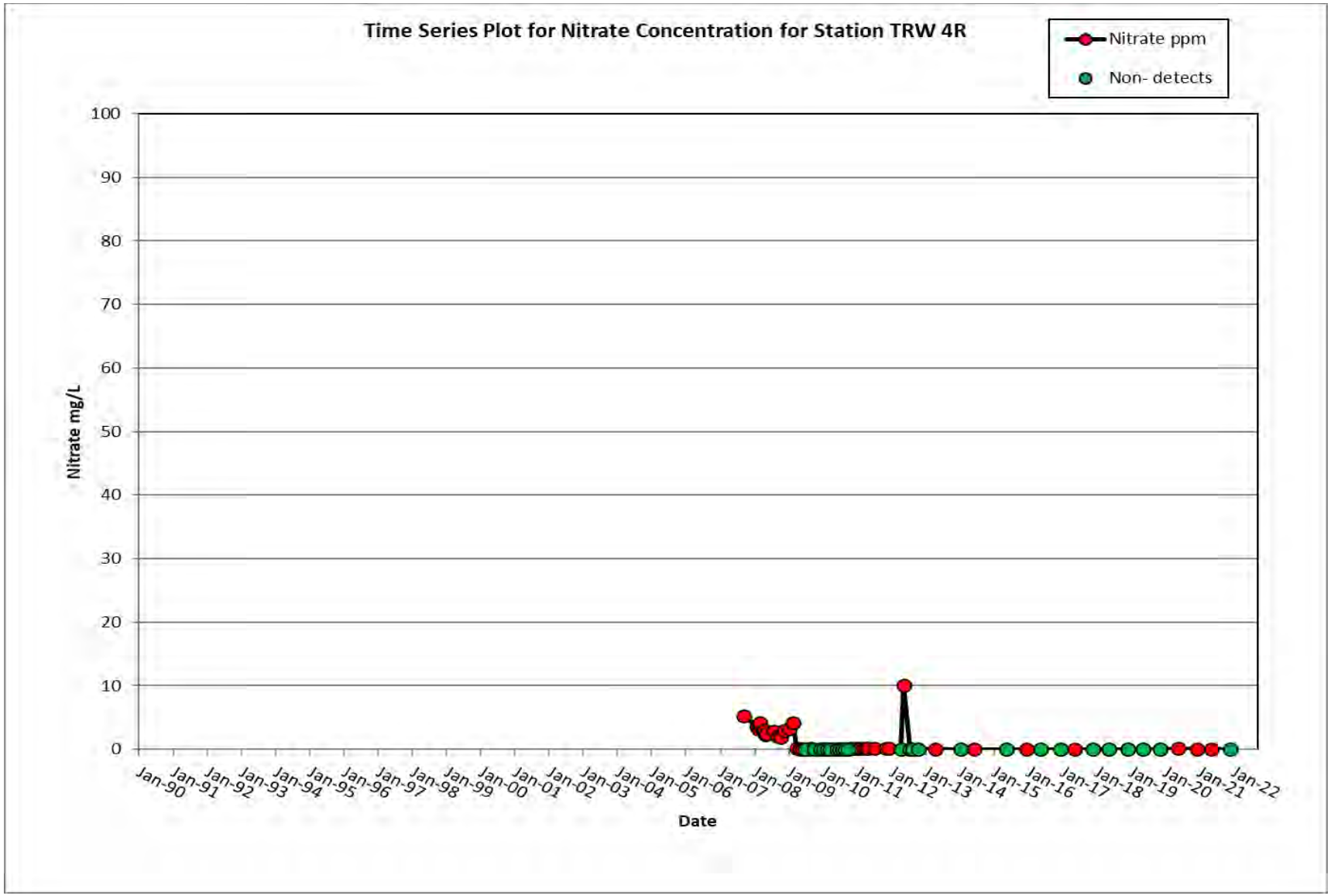

Time Series Plot for Nitrate Concentration for Station TNX 3D
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

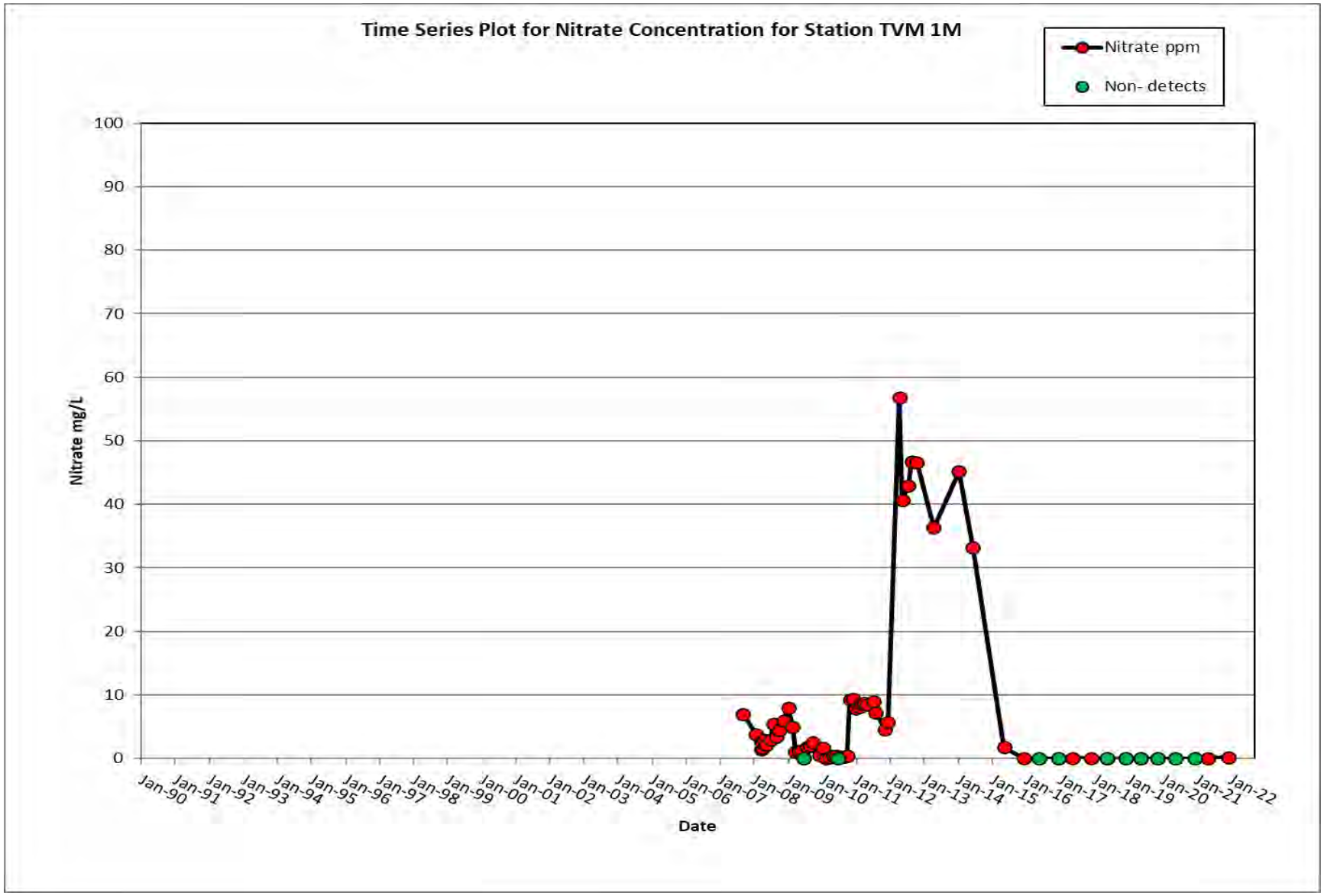

Time Series Plot for Nitrate Concentration for Station TNX 27D
Nitrate ppm
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

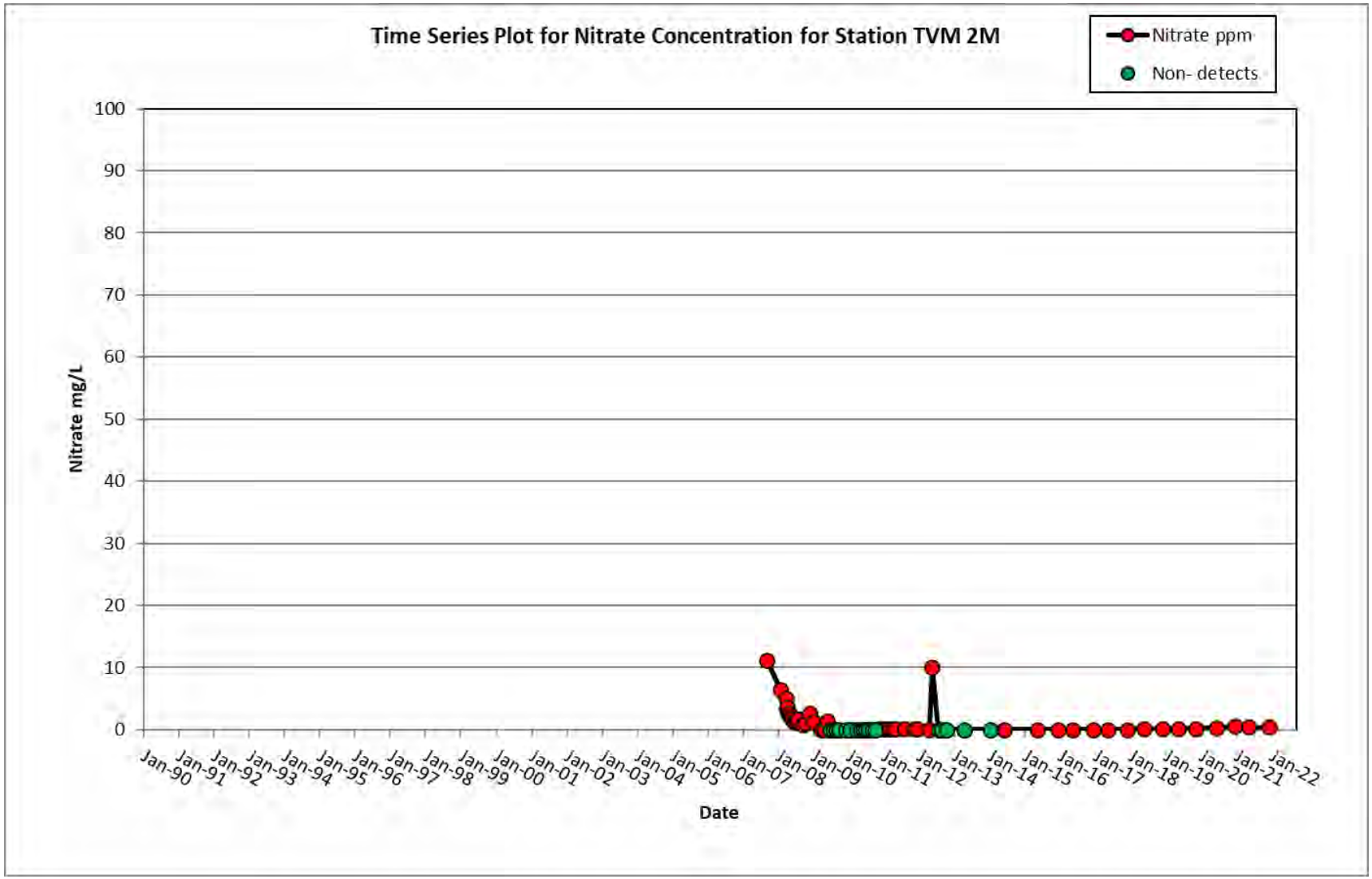

Time Series Plot for Nitrate Concentration for Station TRW 1
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

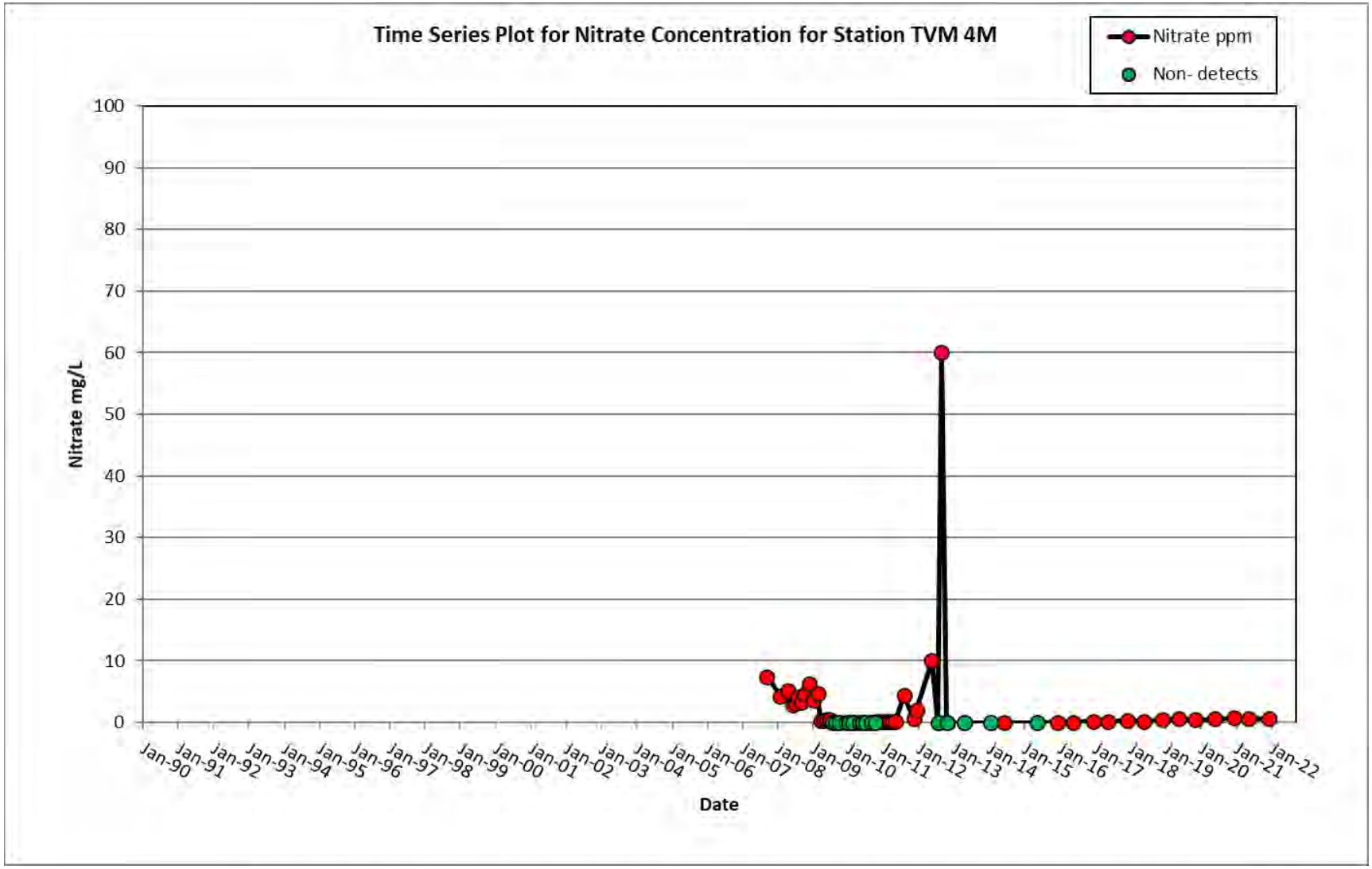

Time Series Plot for Nitrate Concentration for Station TRW 2
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

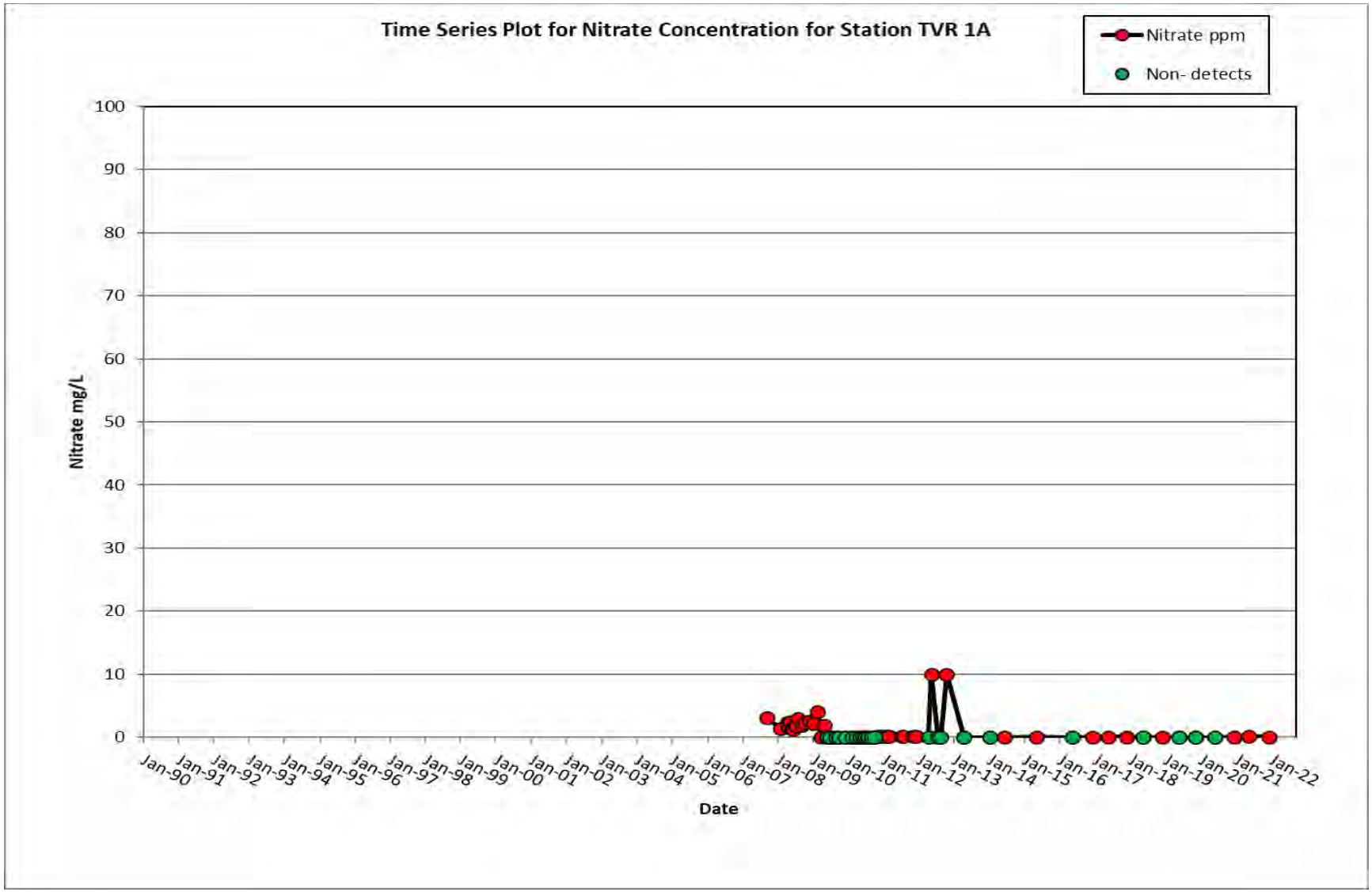

Time Series Plot for Nitrate Concentration for Station TRW 3
Nitrate ppm
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

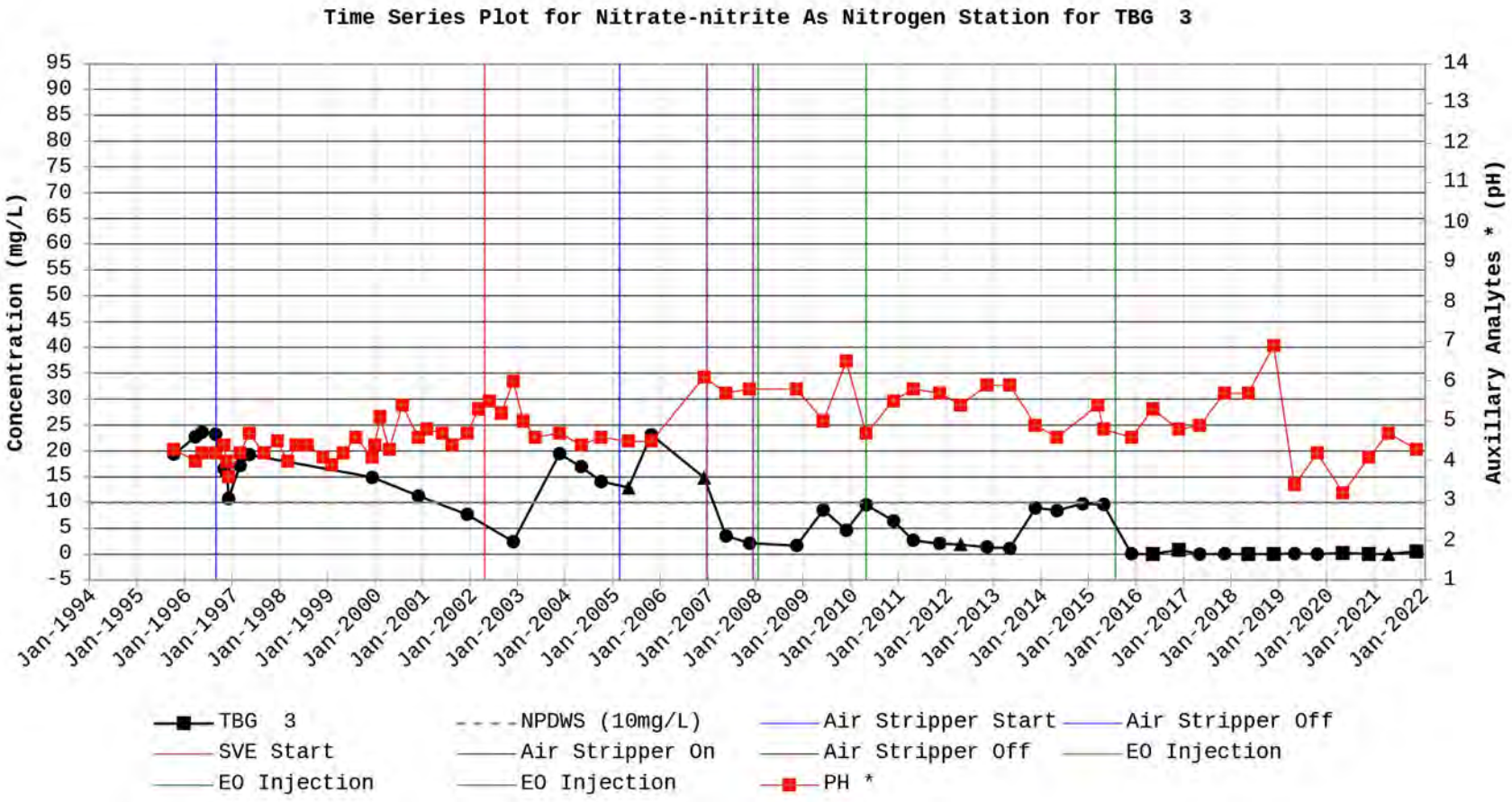

Time Series Plot for Nitrate Concentration for Station TRW 4R
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

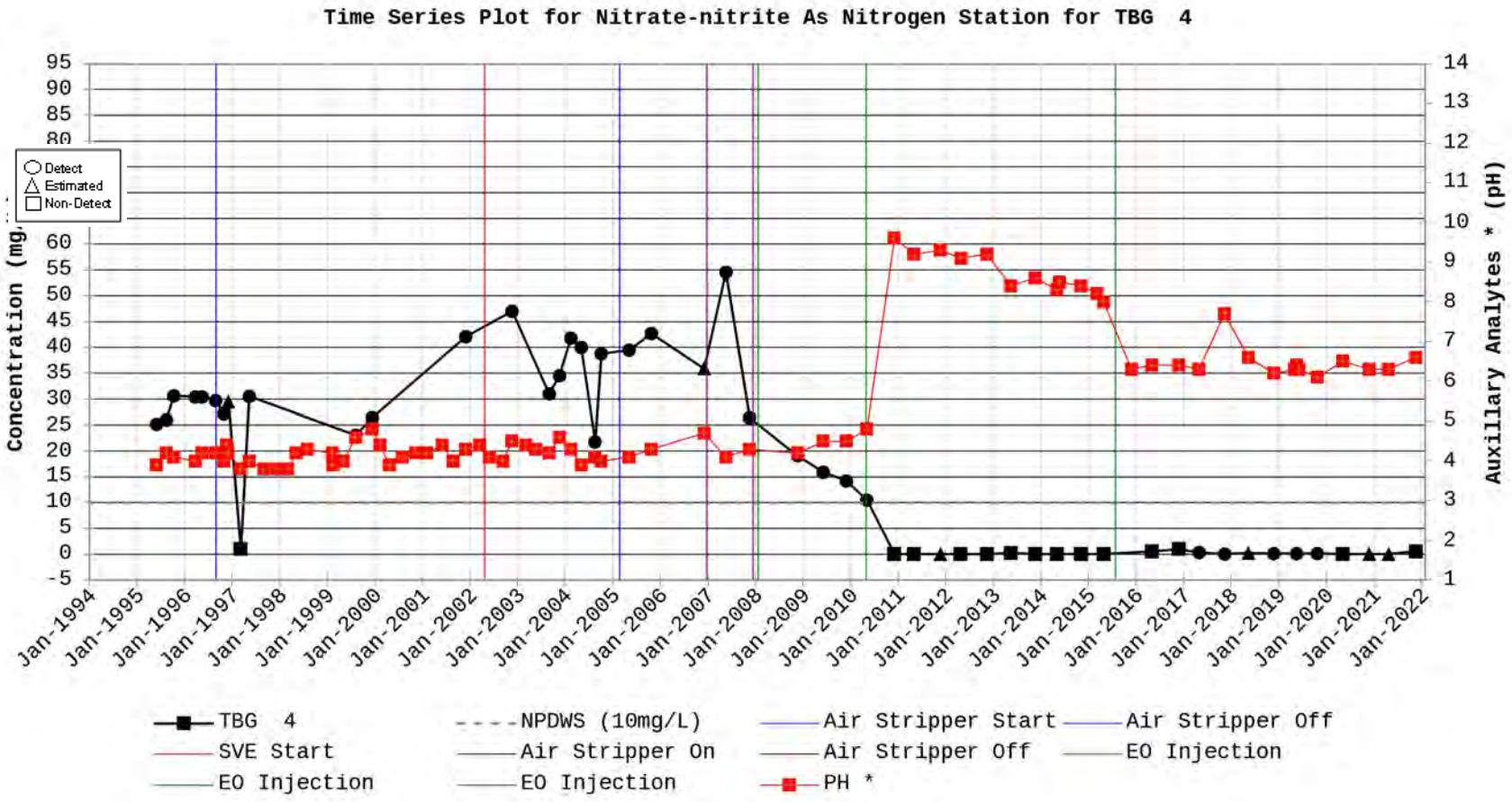

Time Series Plot for Nitrate Concentration for Station TVM 1M
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

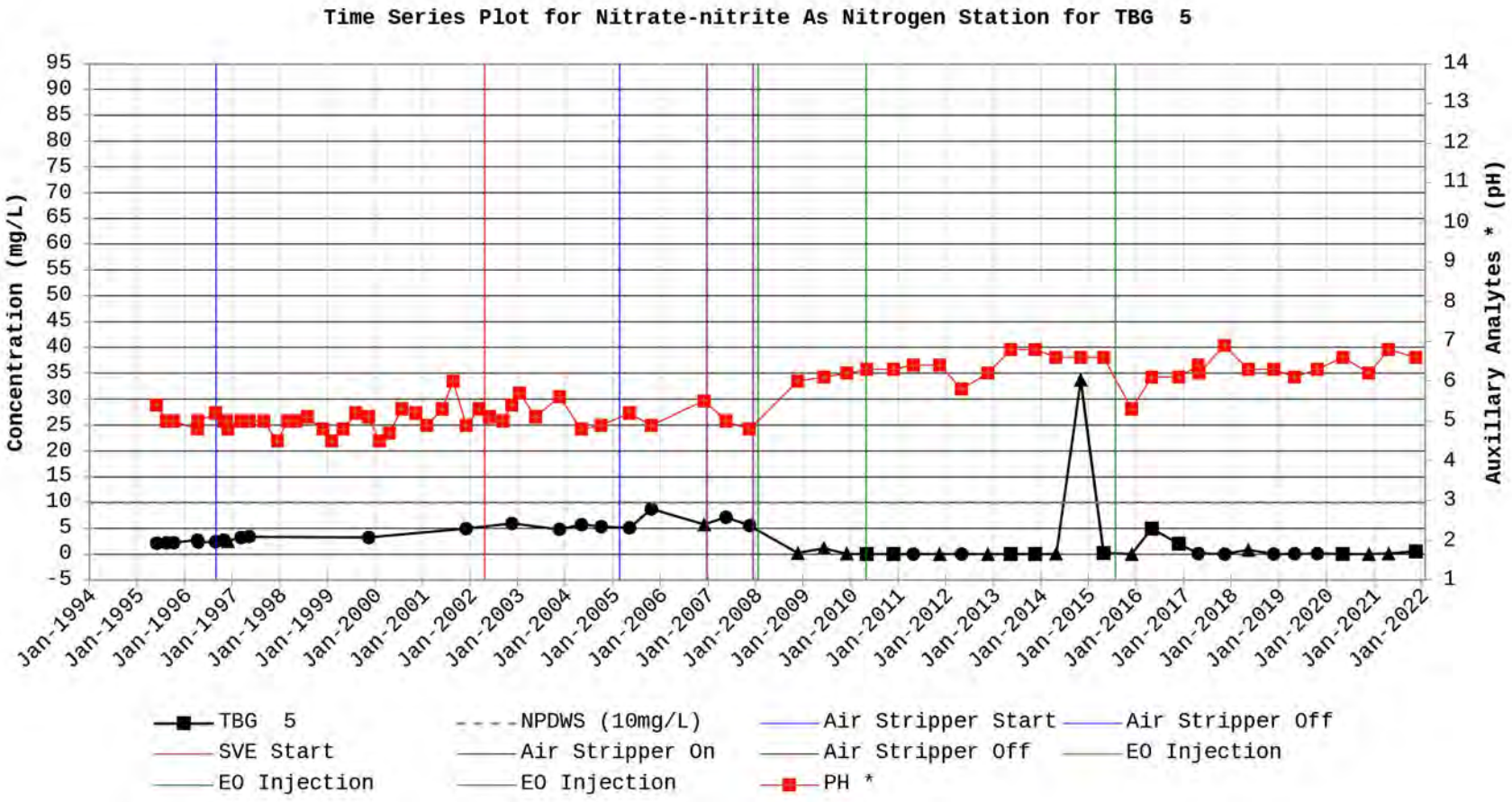

Time Series Plot for Nitrate Concentration for Station TVM 2M
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

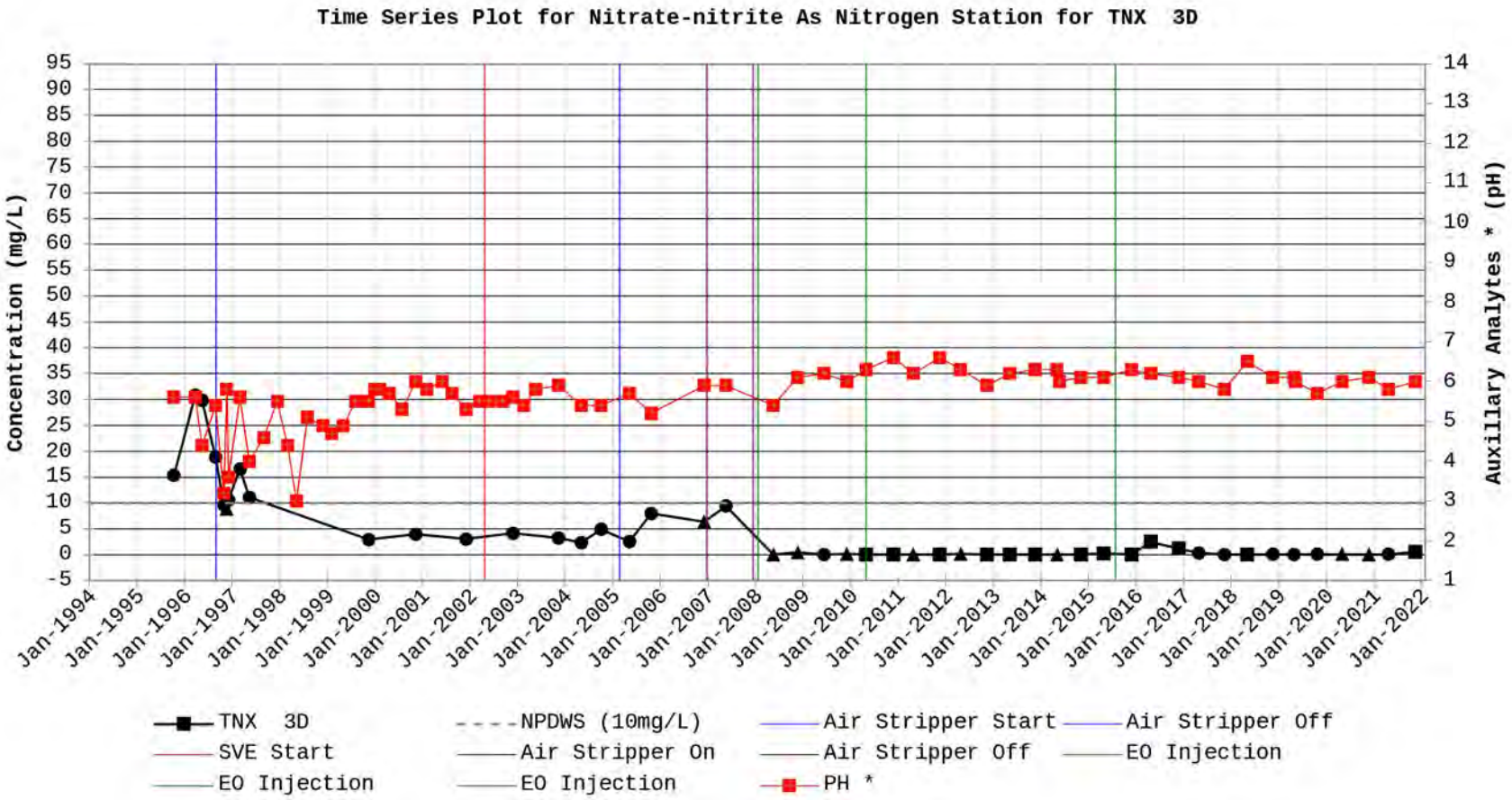

Time Series Plot for Nitrate Concentration for Station TVM 4M
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

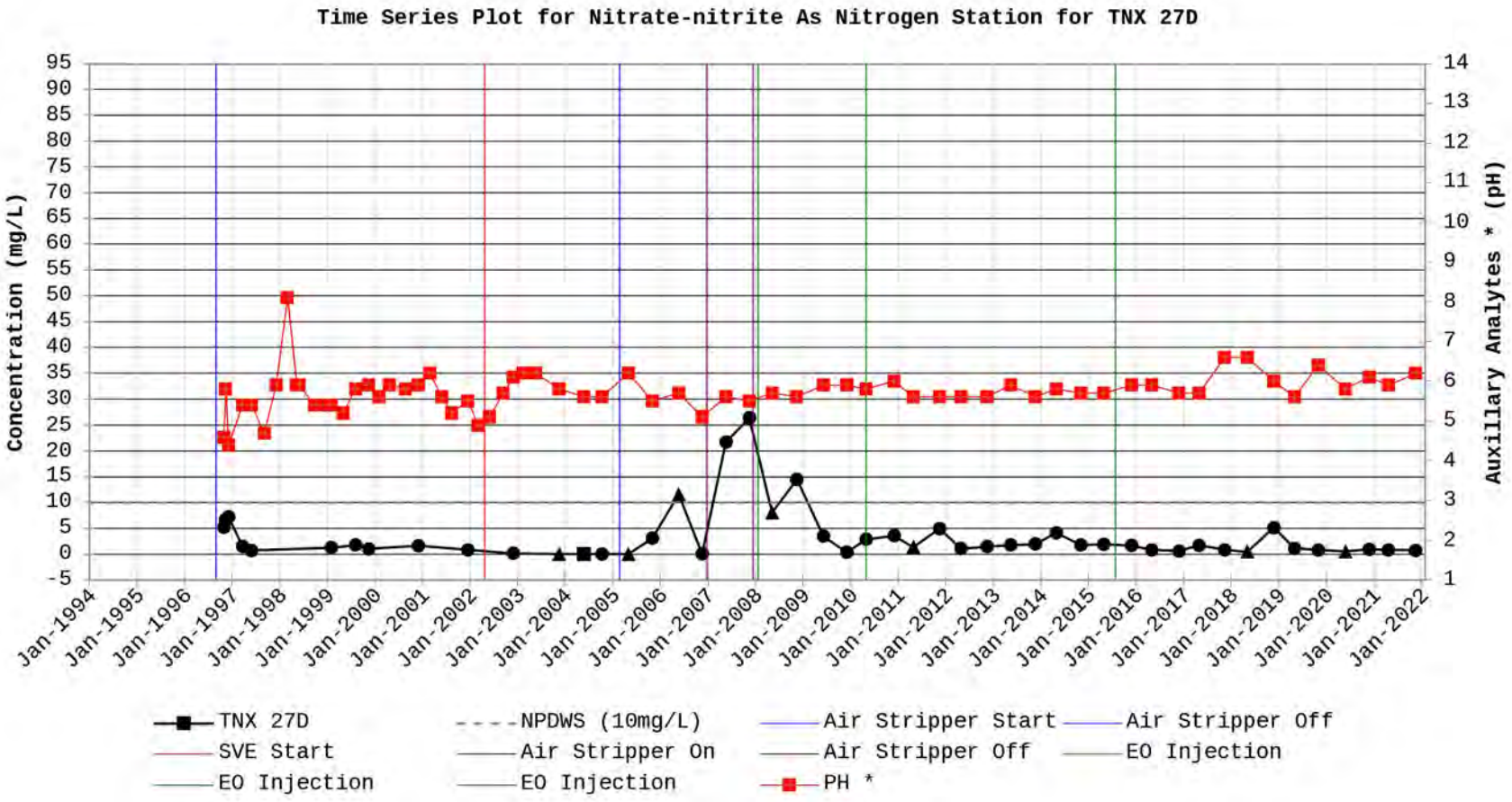

Time Series Plot for Nitrate Concentration for Station TVR 1A
Nitrate ppm
Non- detects
Nitrate mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

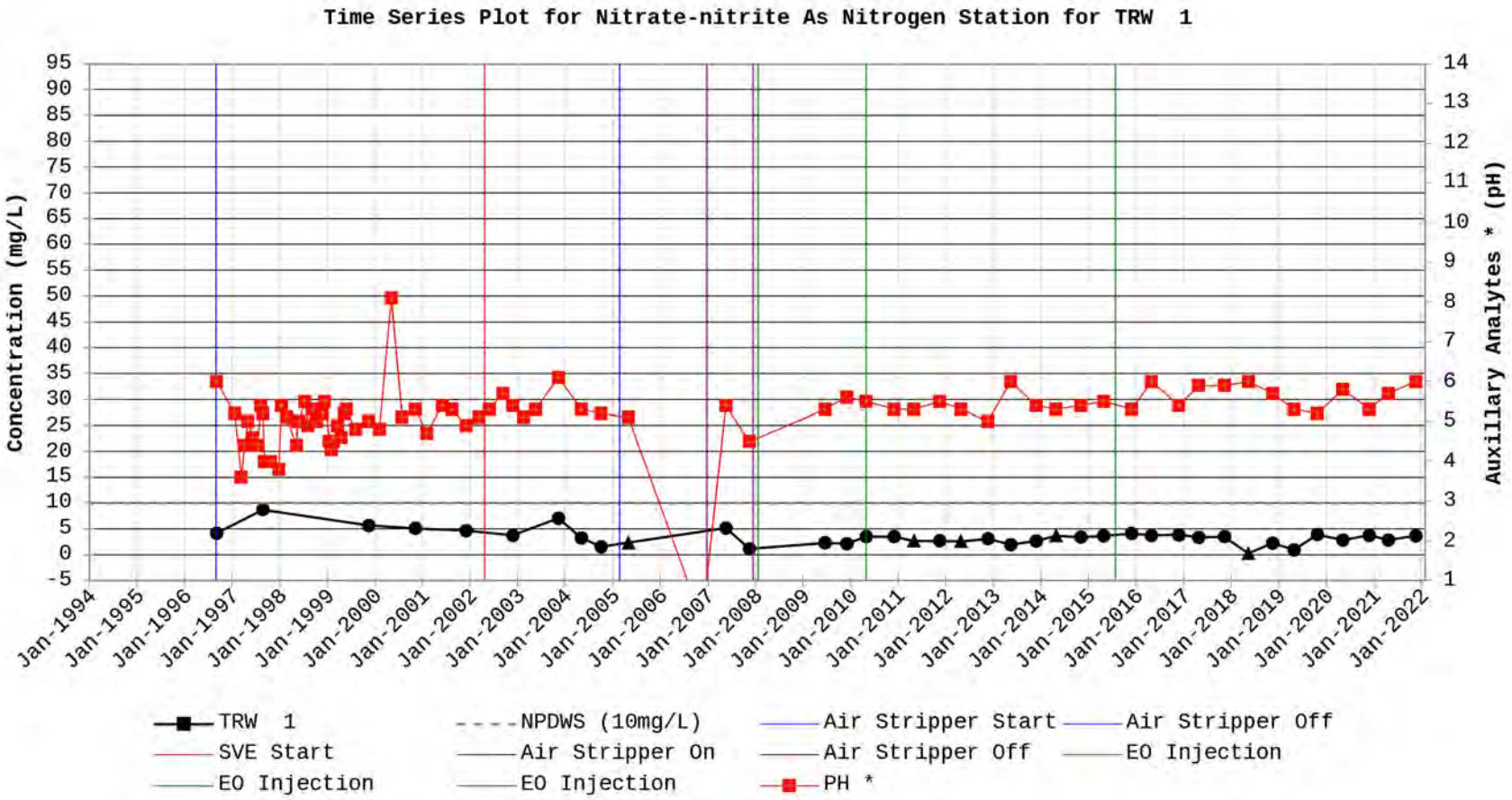

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TBG 3
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

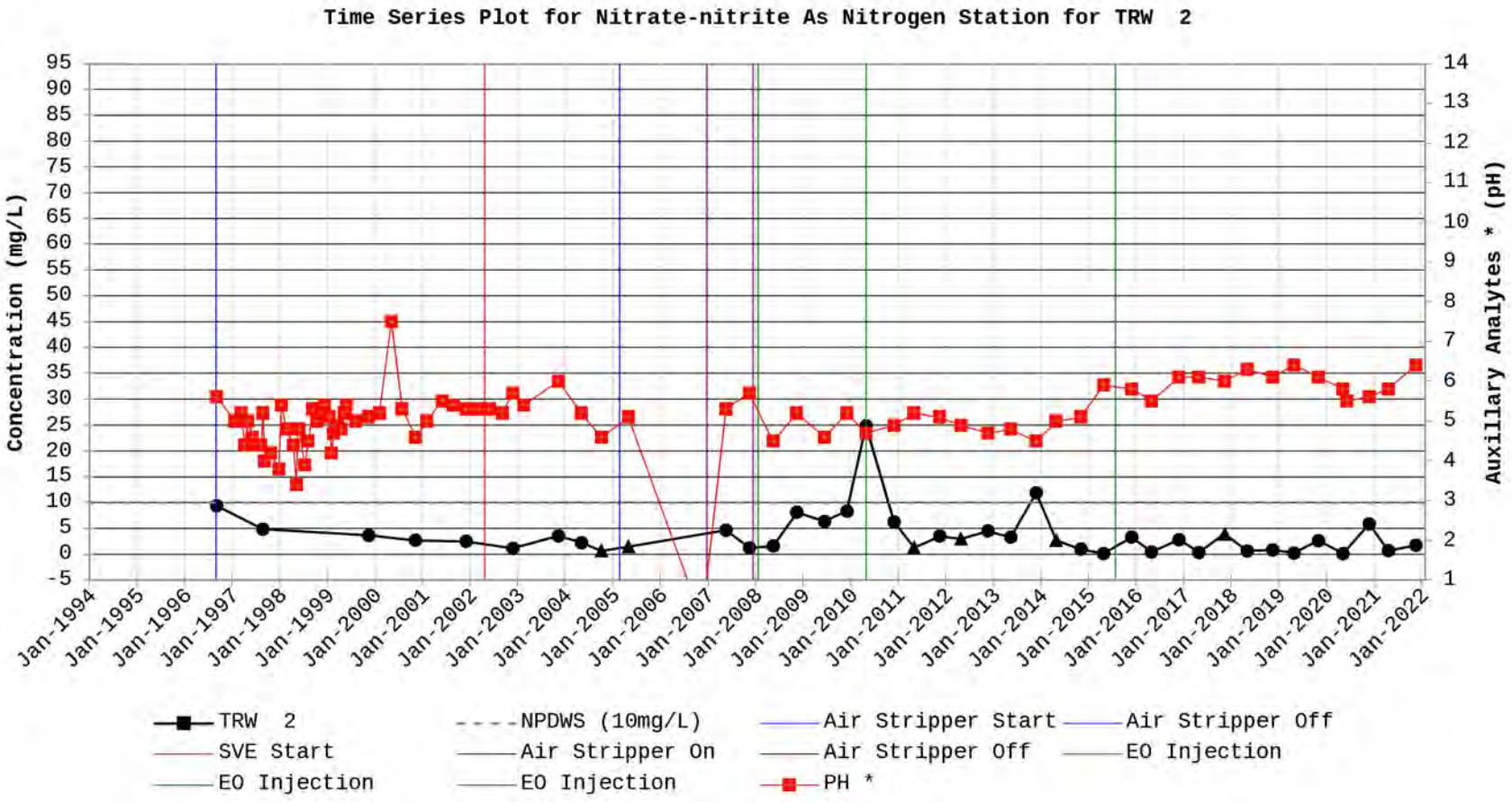

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (mg.
Auxillary Analytes * (pH)
95
90
85
80
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

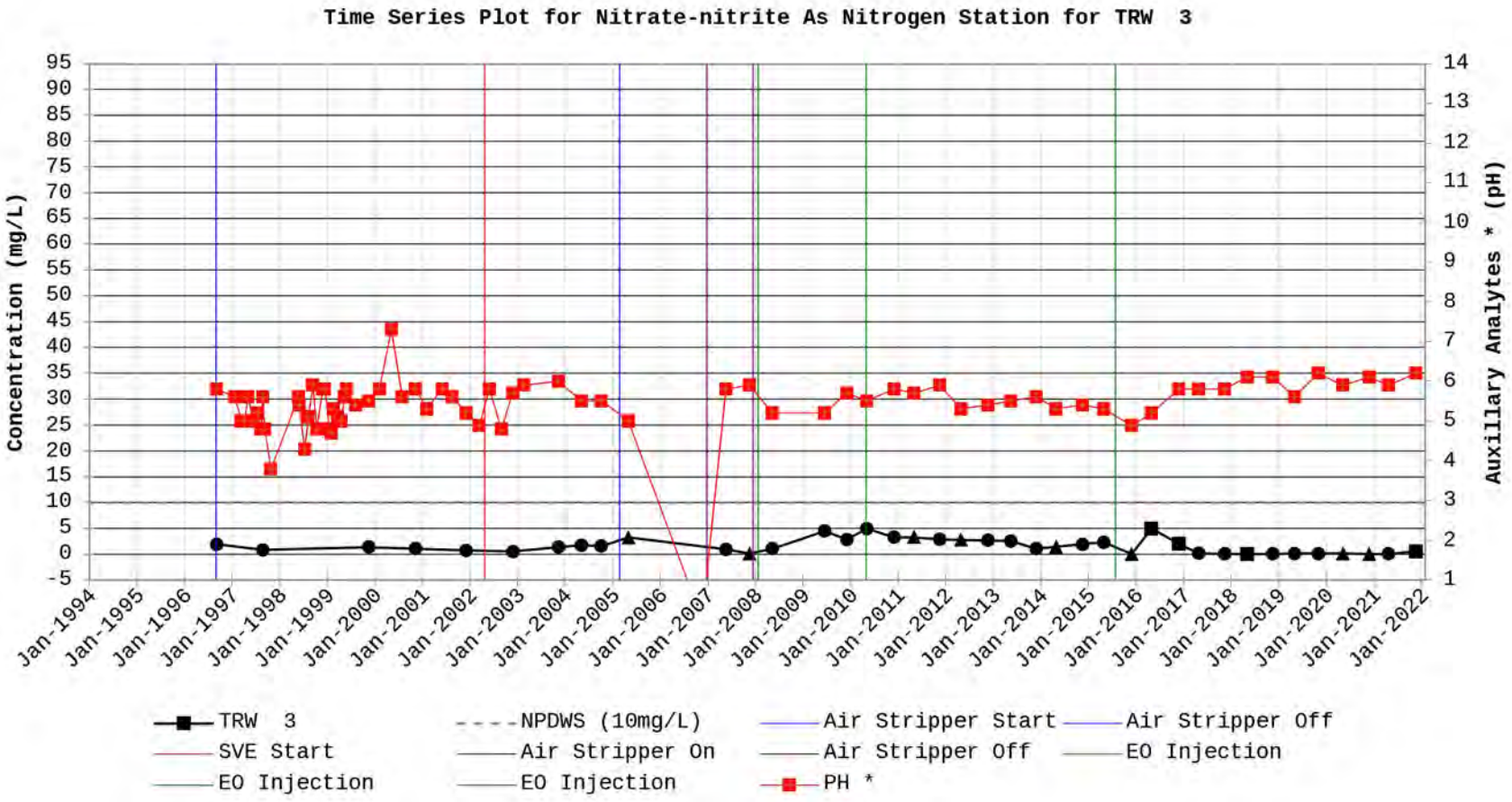

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TBG 5
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

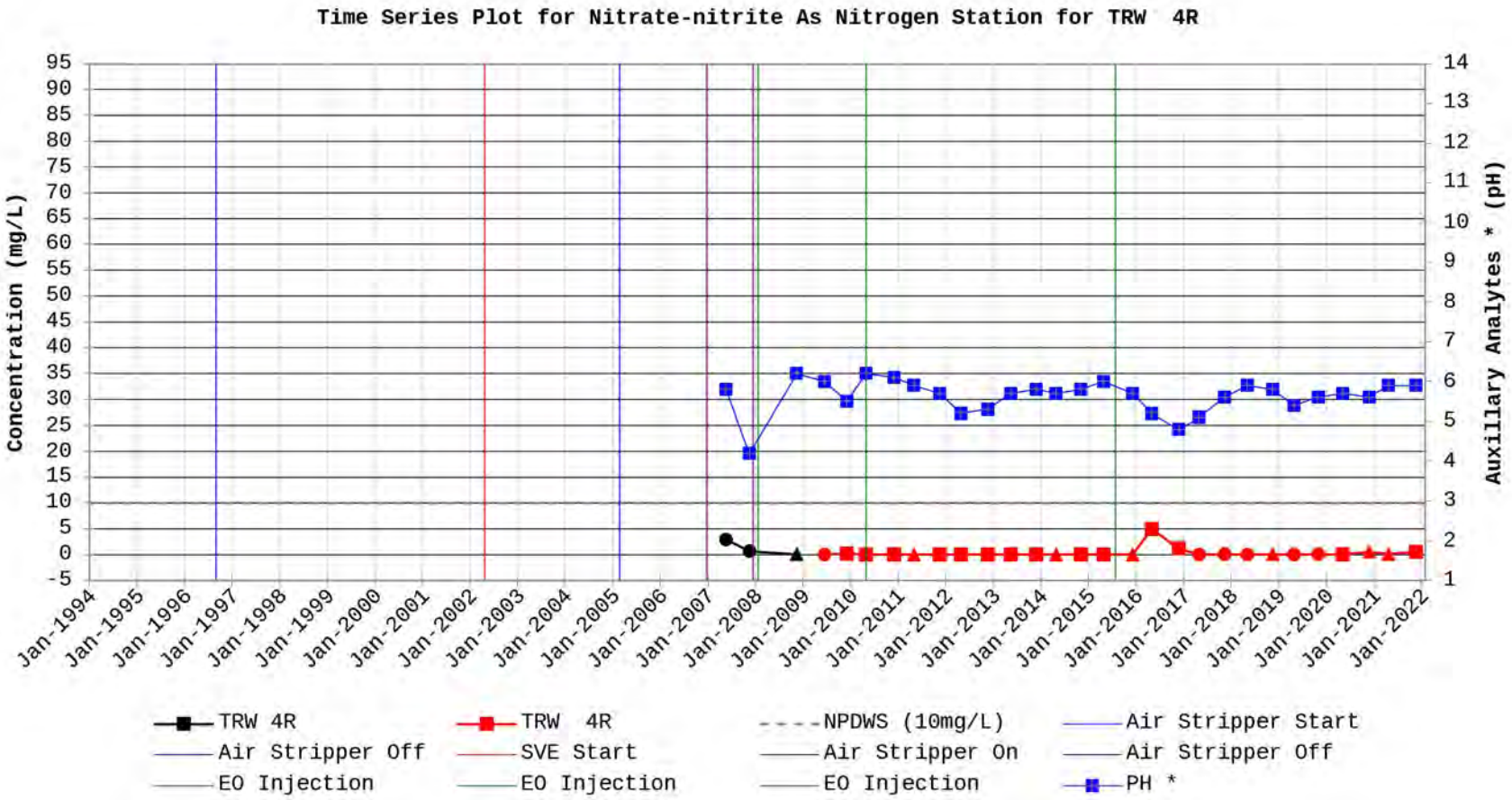

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TNX 3D
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

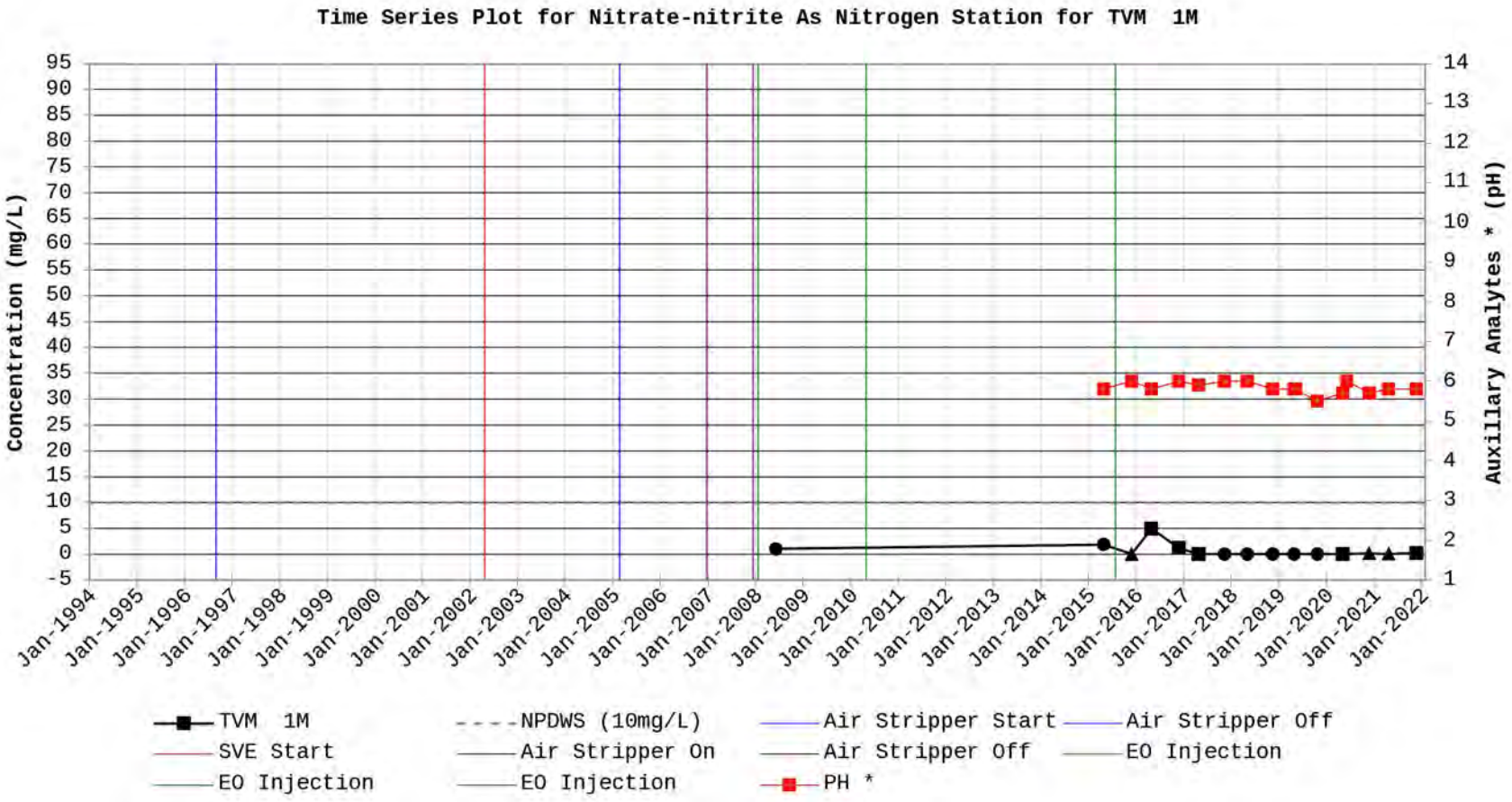

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TNX 27D
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

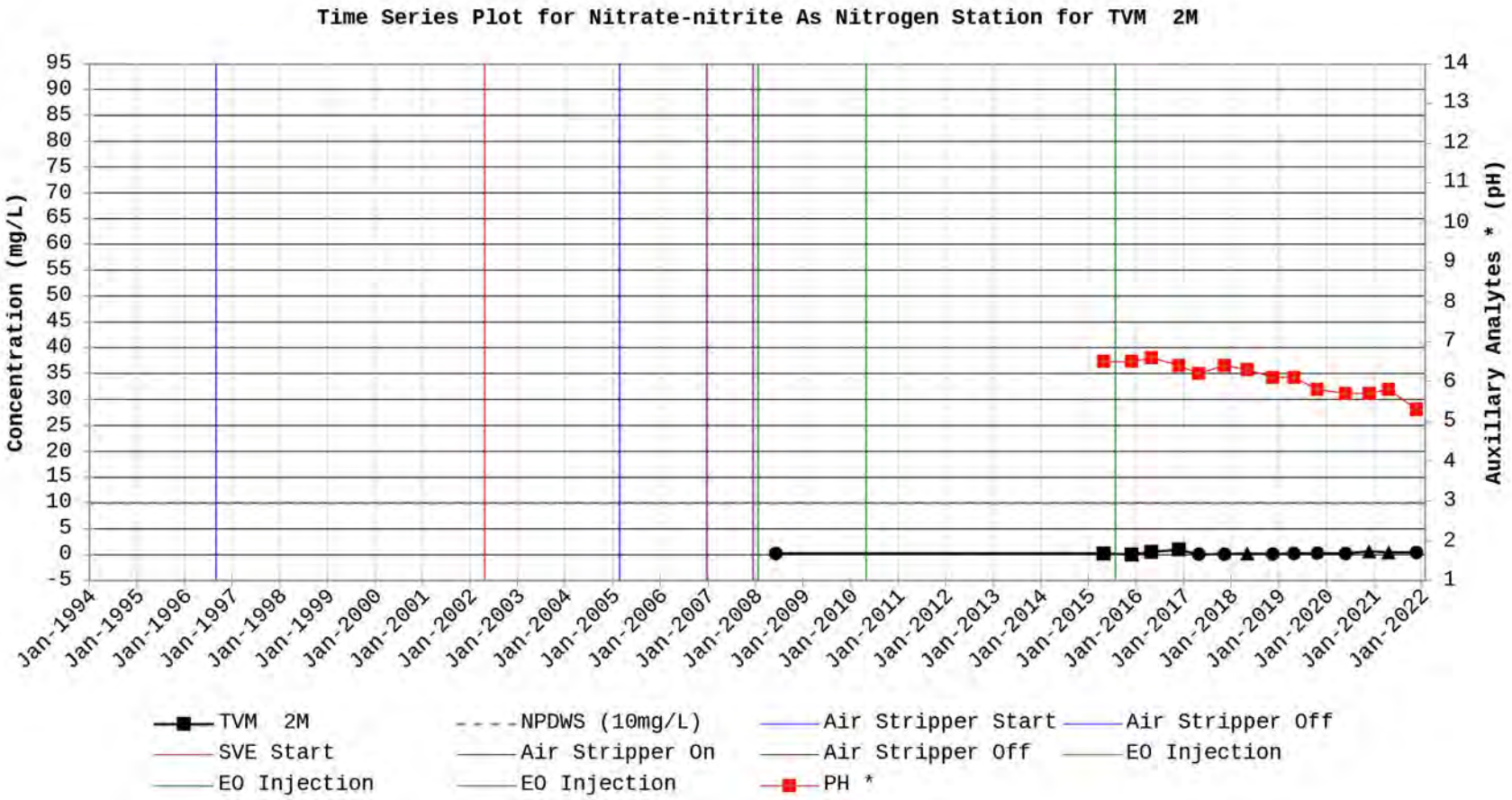

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TRW 1
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

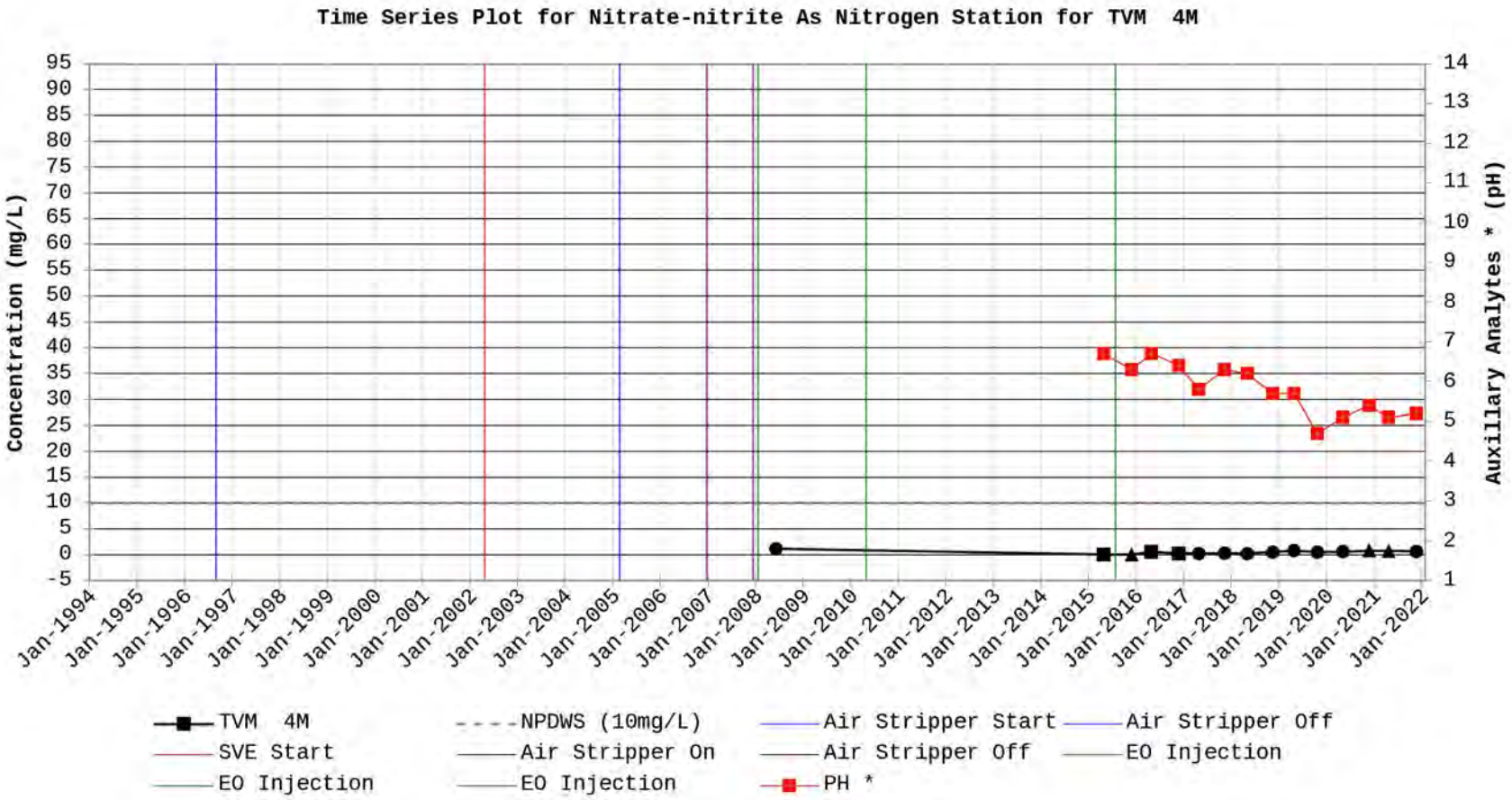

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TRW 2
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

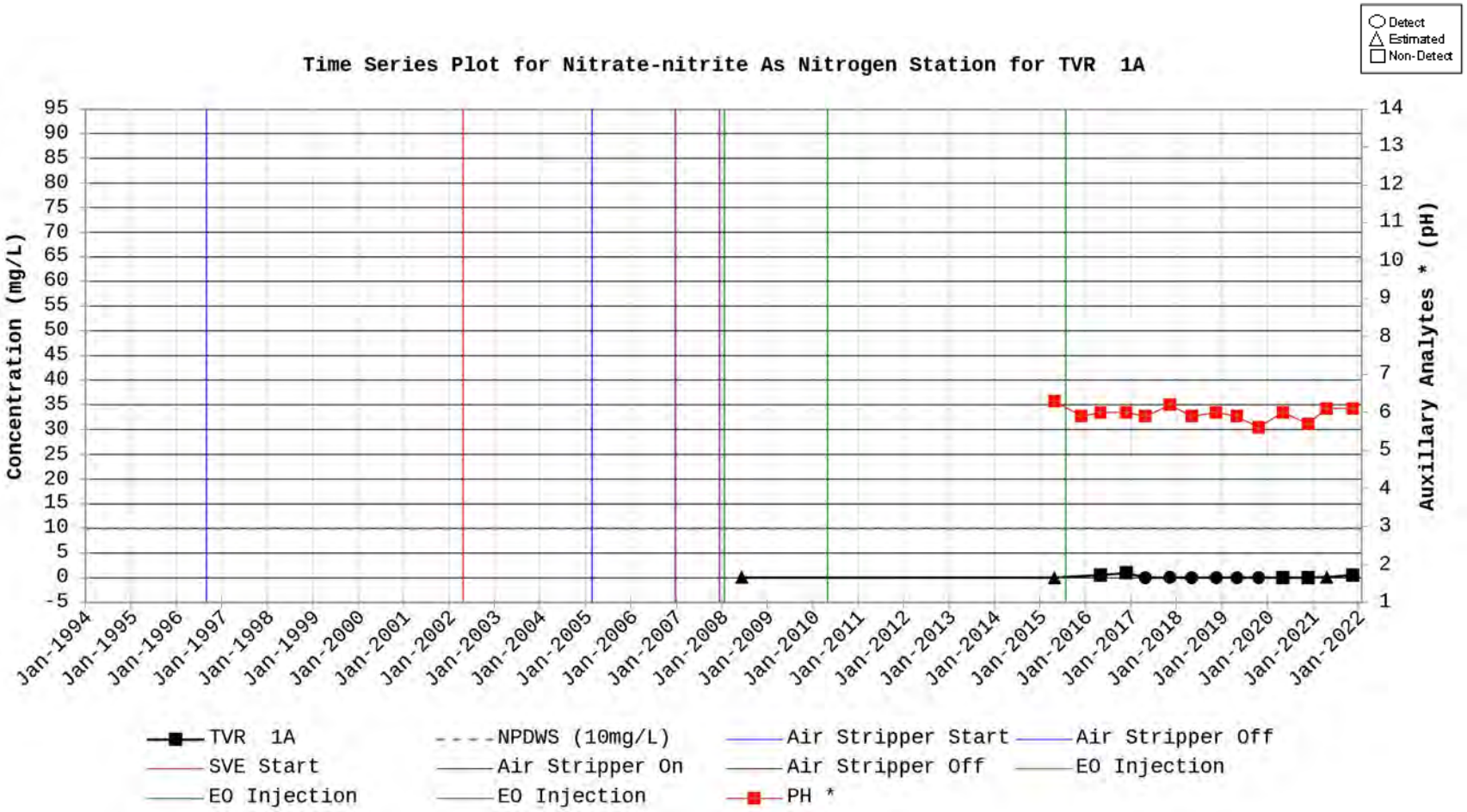

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TRW 3
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

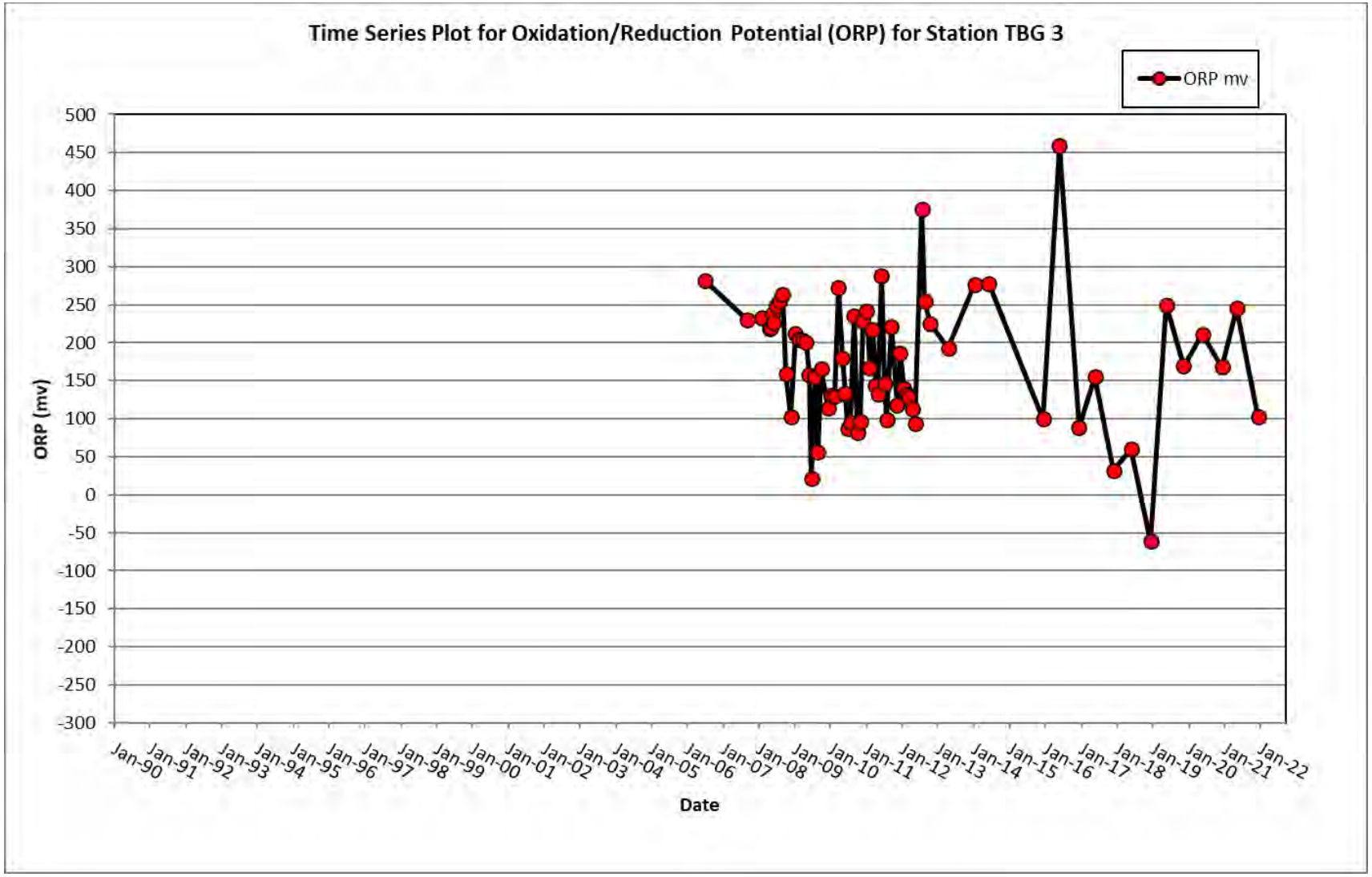

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TRW 4R
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
TRW 4R
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

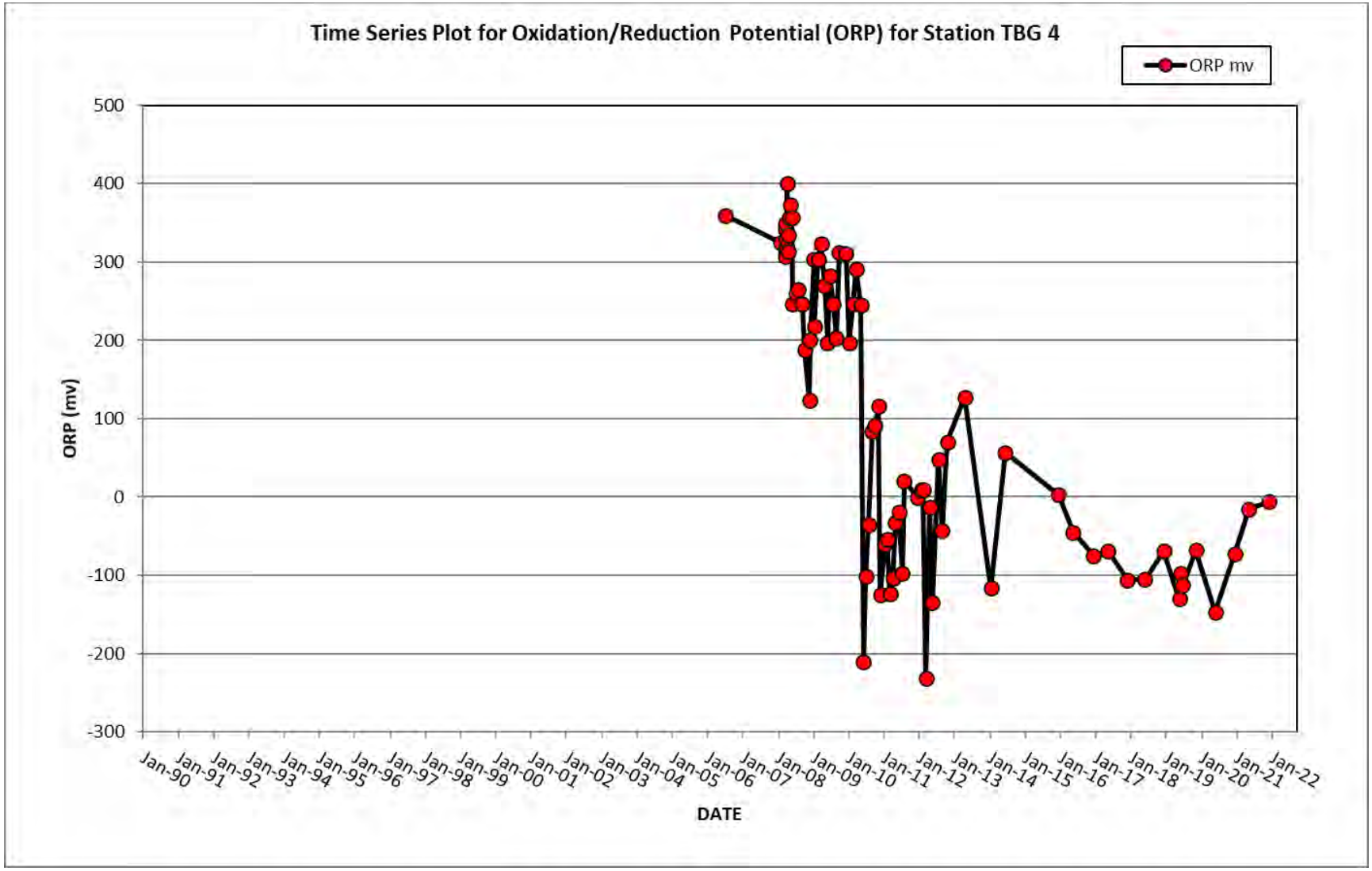

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TVM 1M
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

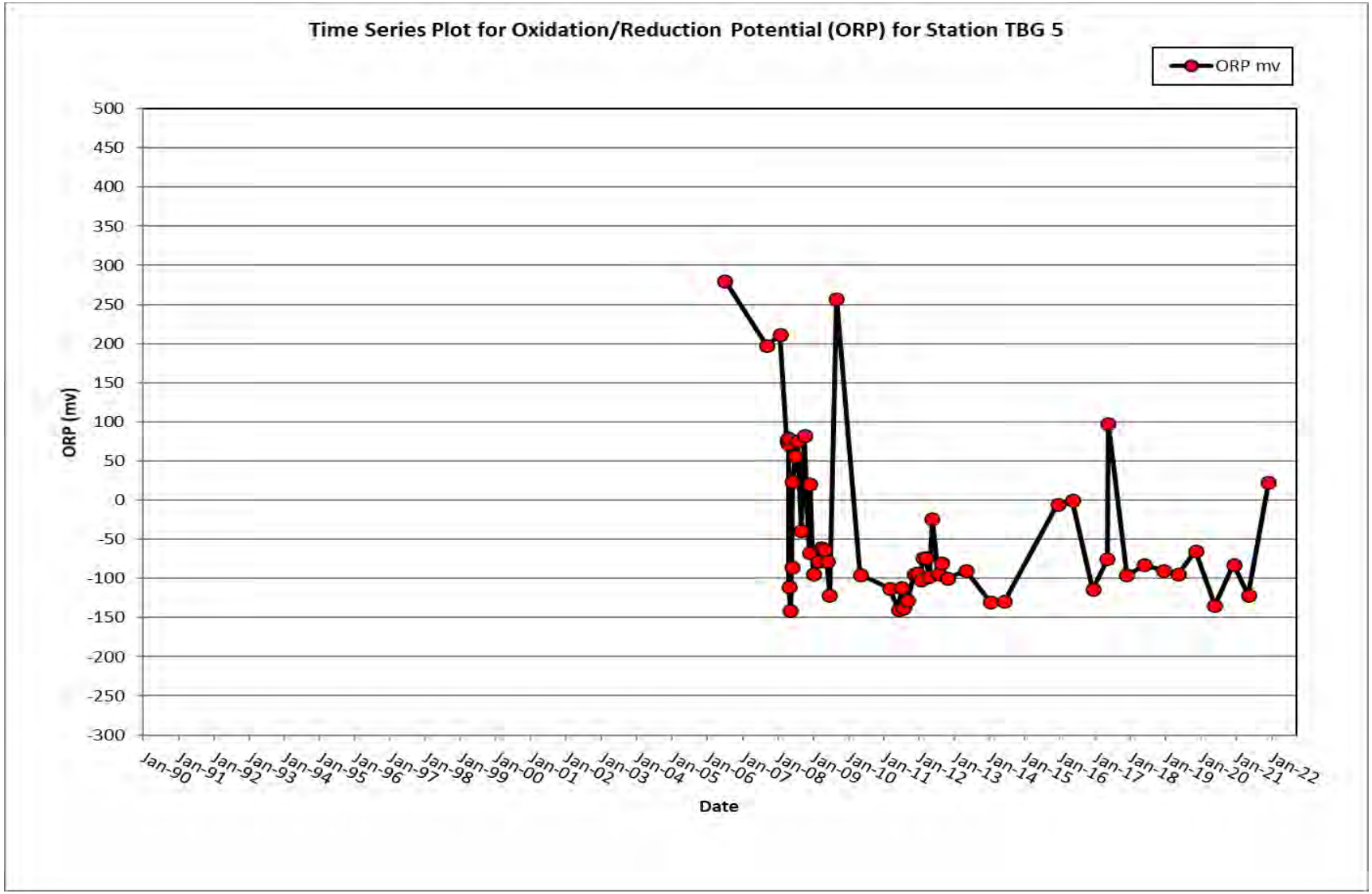

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TVM 2M
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

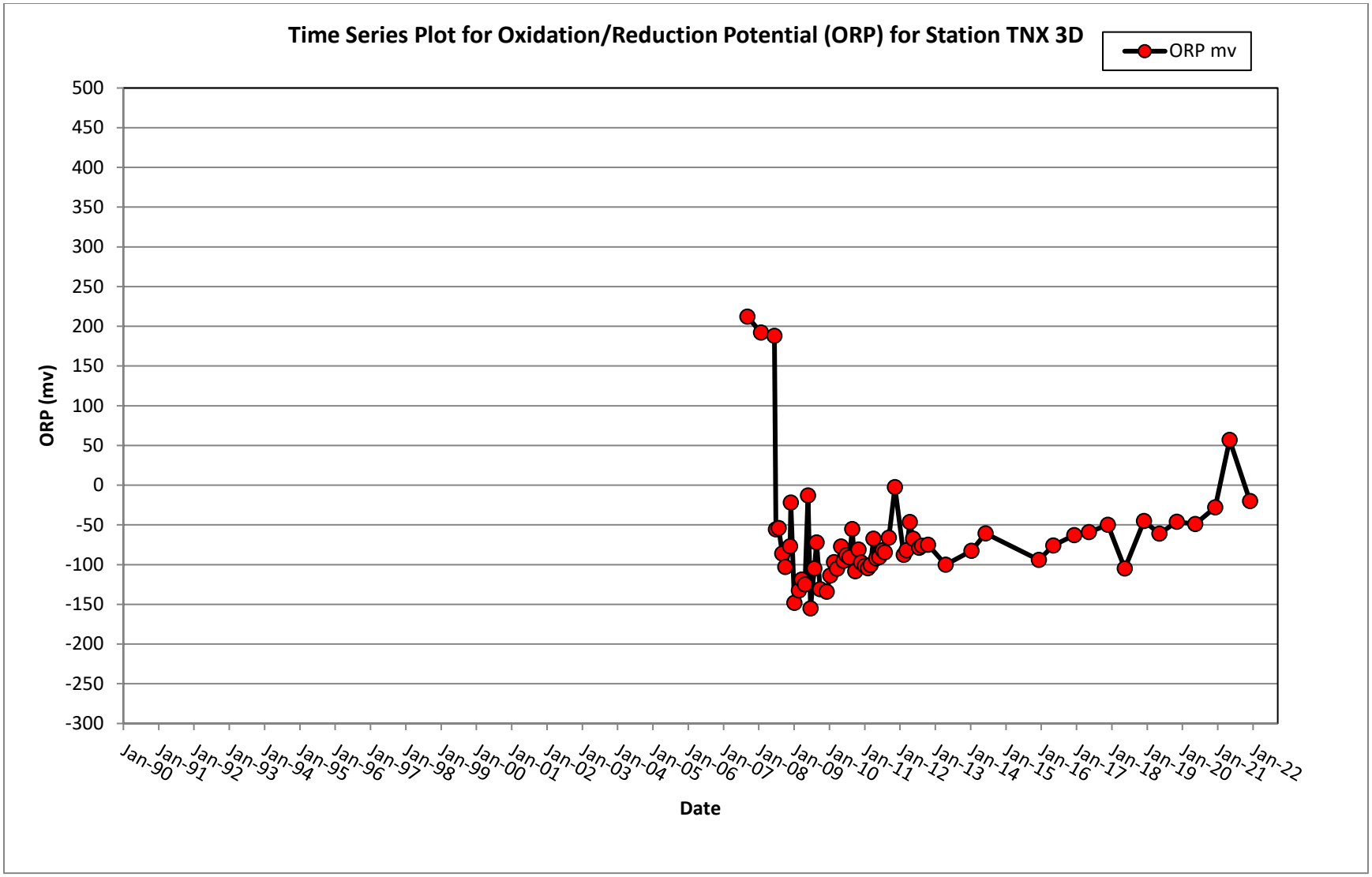

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TVM 4M
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

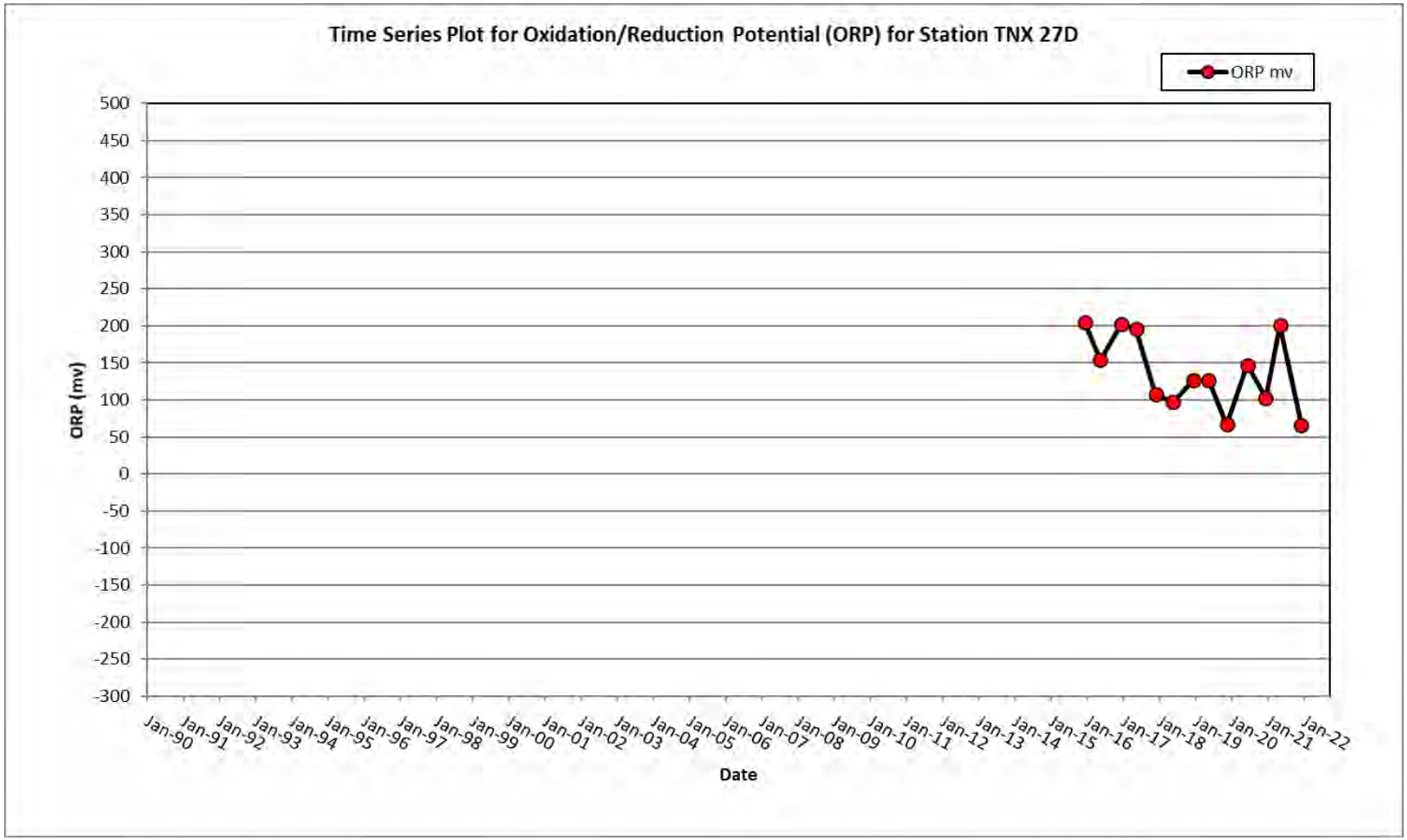

Time Series Plot for Nitrate-nitrite As Nitrogen Station for TVR 1A
Detect
Estimated
Non-Detect
Concentration (mg/L)
Auxillary Analytes * (pH)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
-5
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
NPDWS (10mg/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

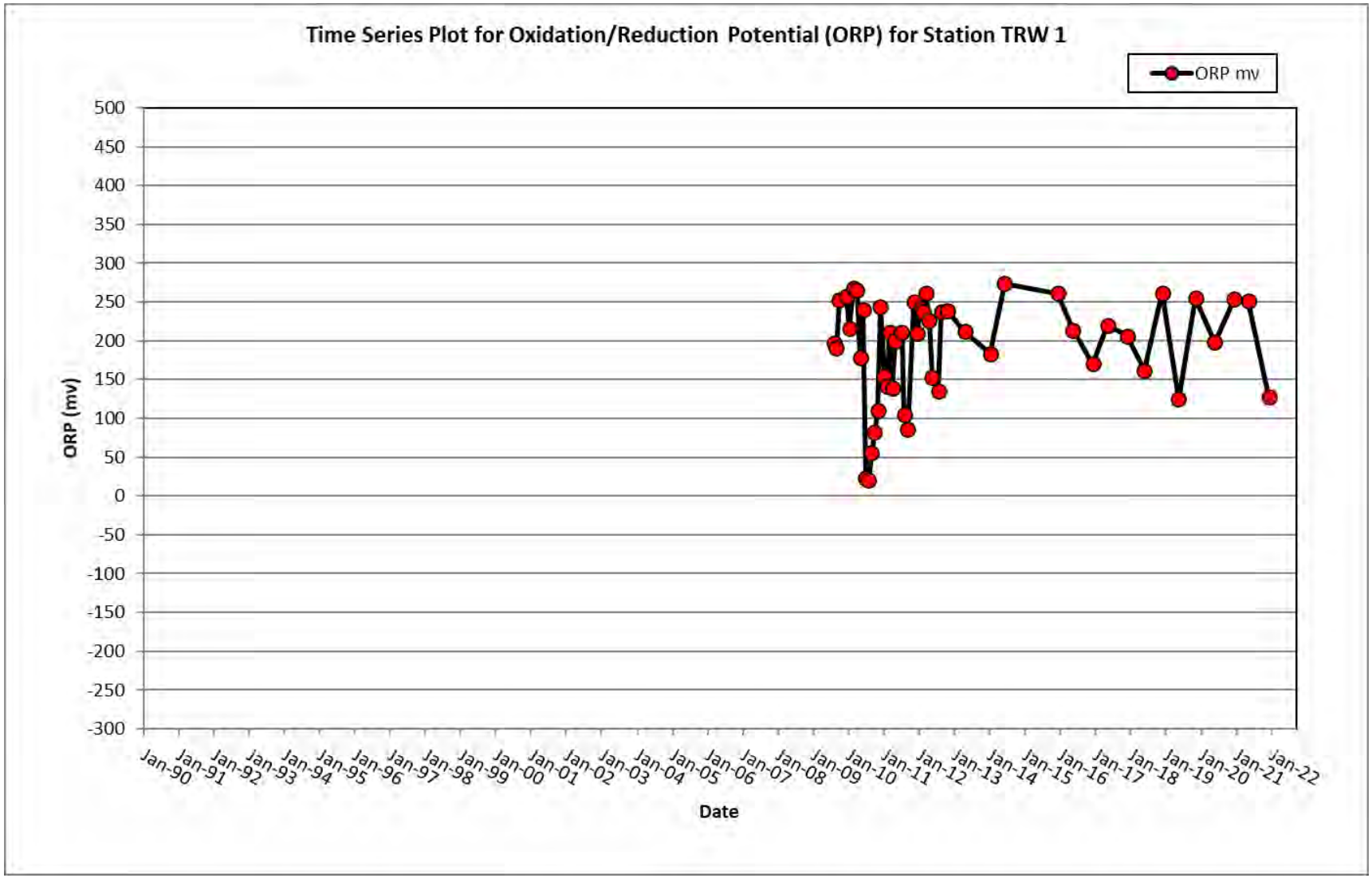

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TBG 3
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

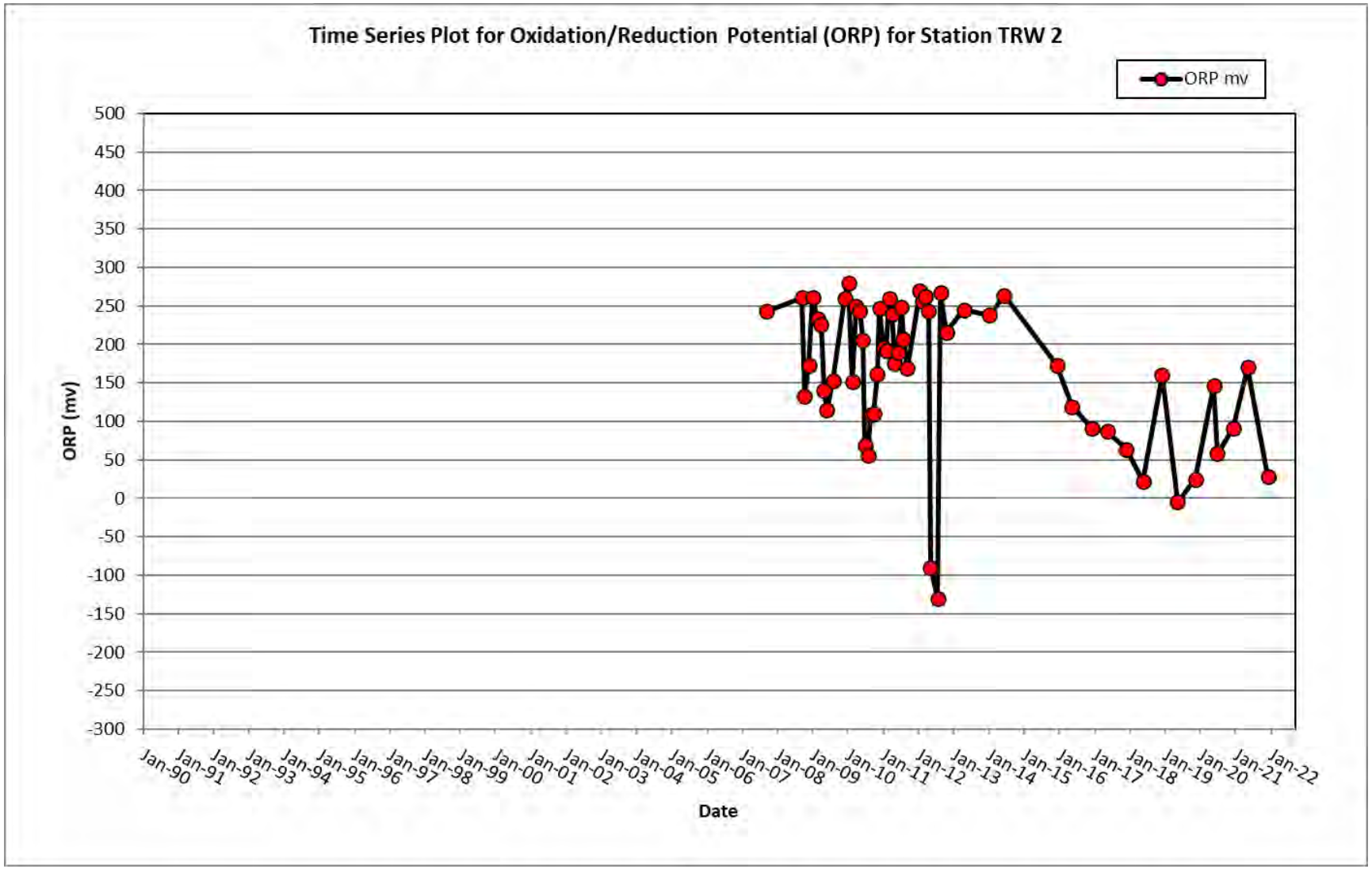

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TBG 4
ORP mv
ORP (mv)
500
400
300
200
100
0
-100
-200
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
DATE

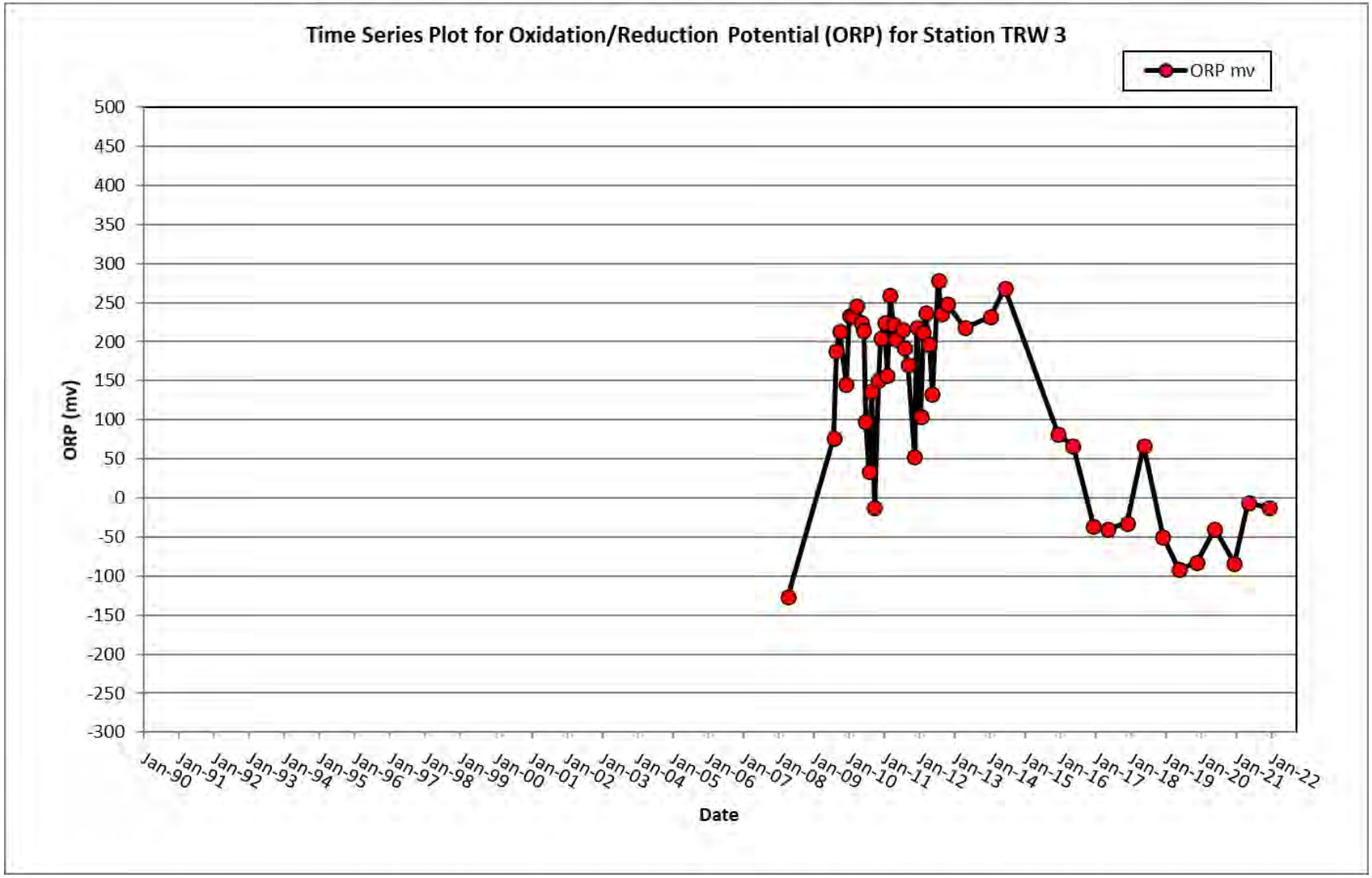

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TBG 5
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

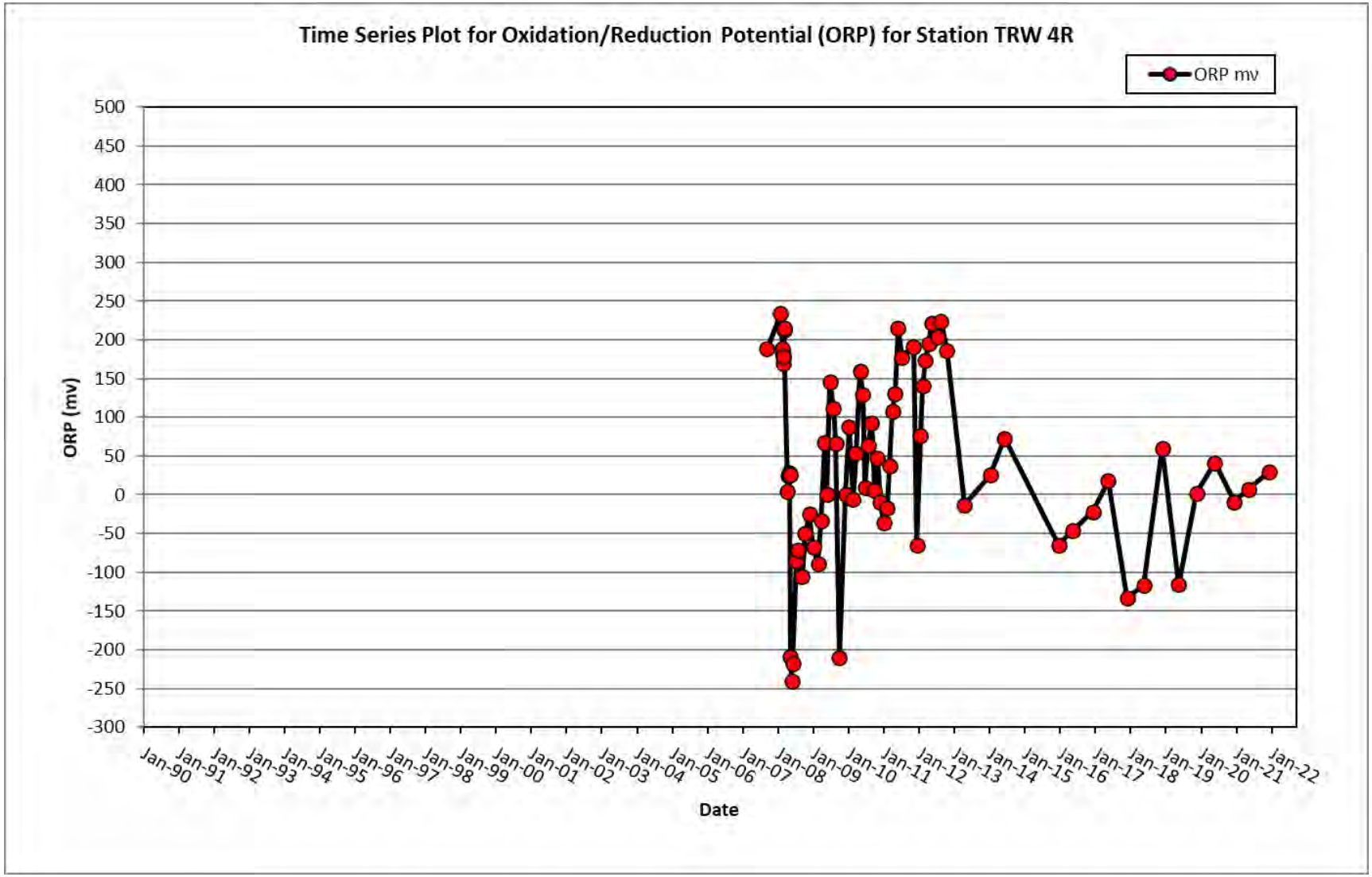

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TNX 3D
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

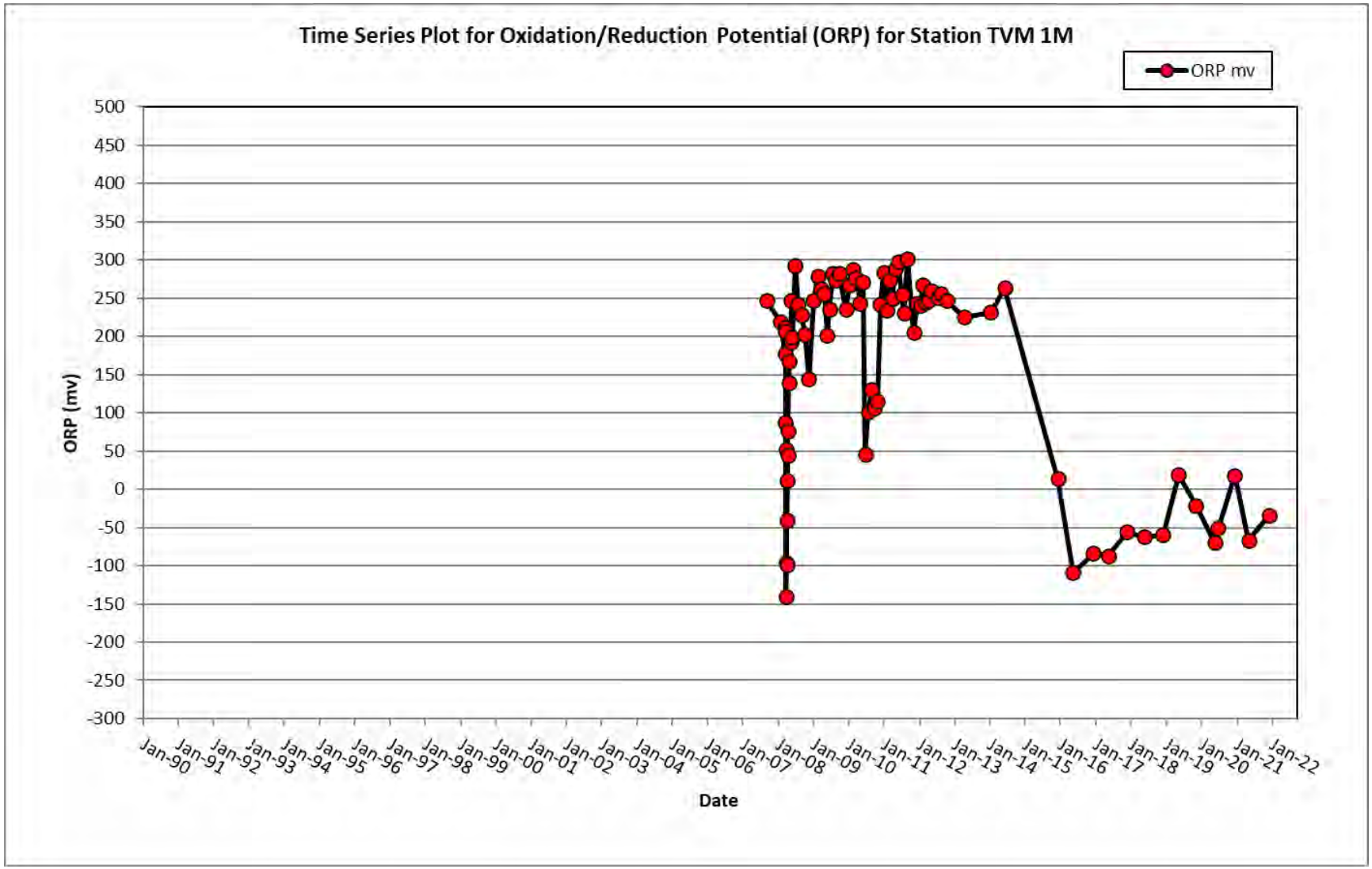

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TNX 27D
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

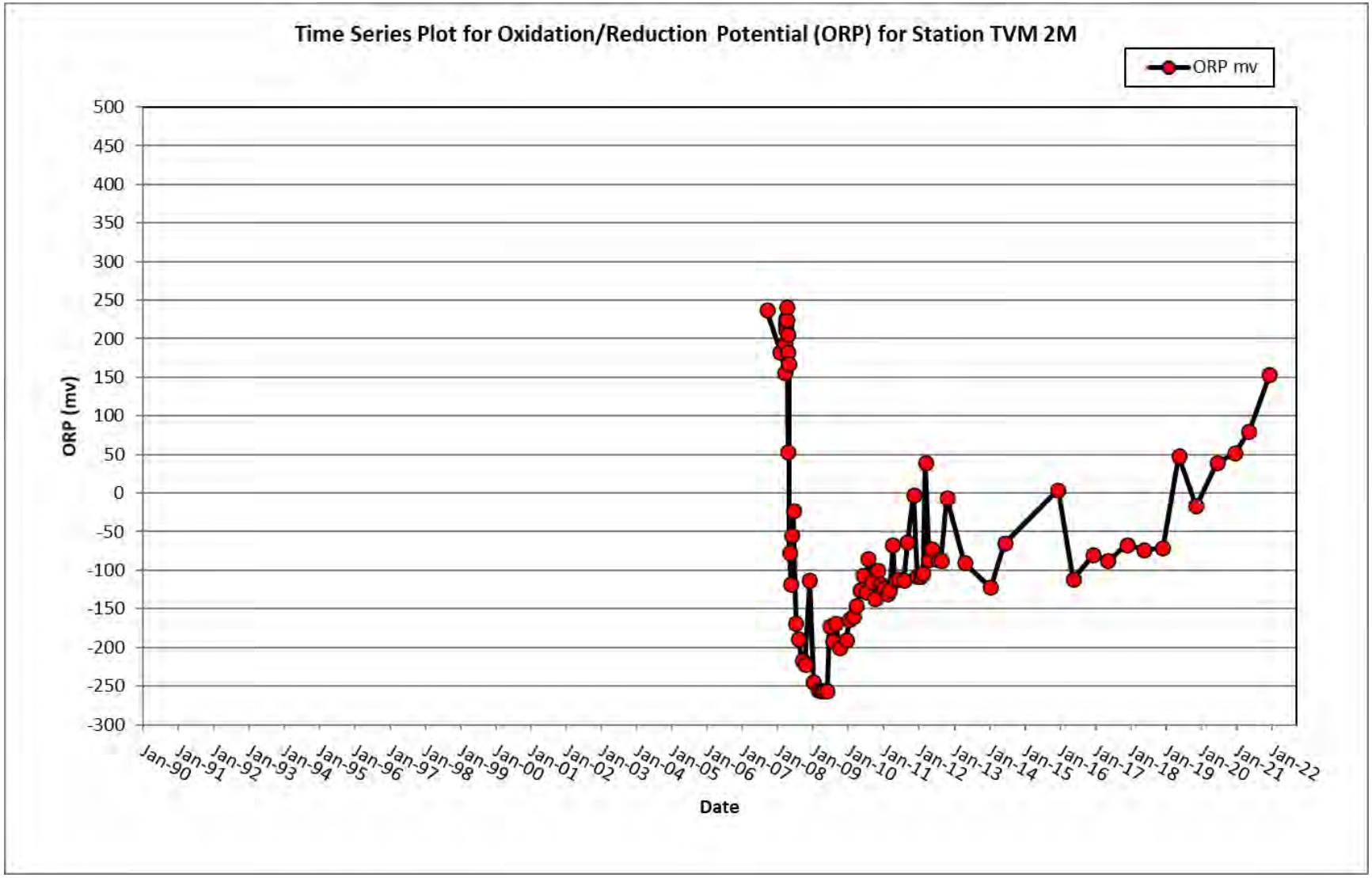

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TRW 1
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

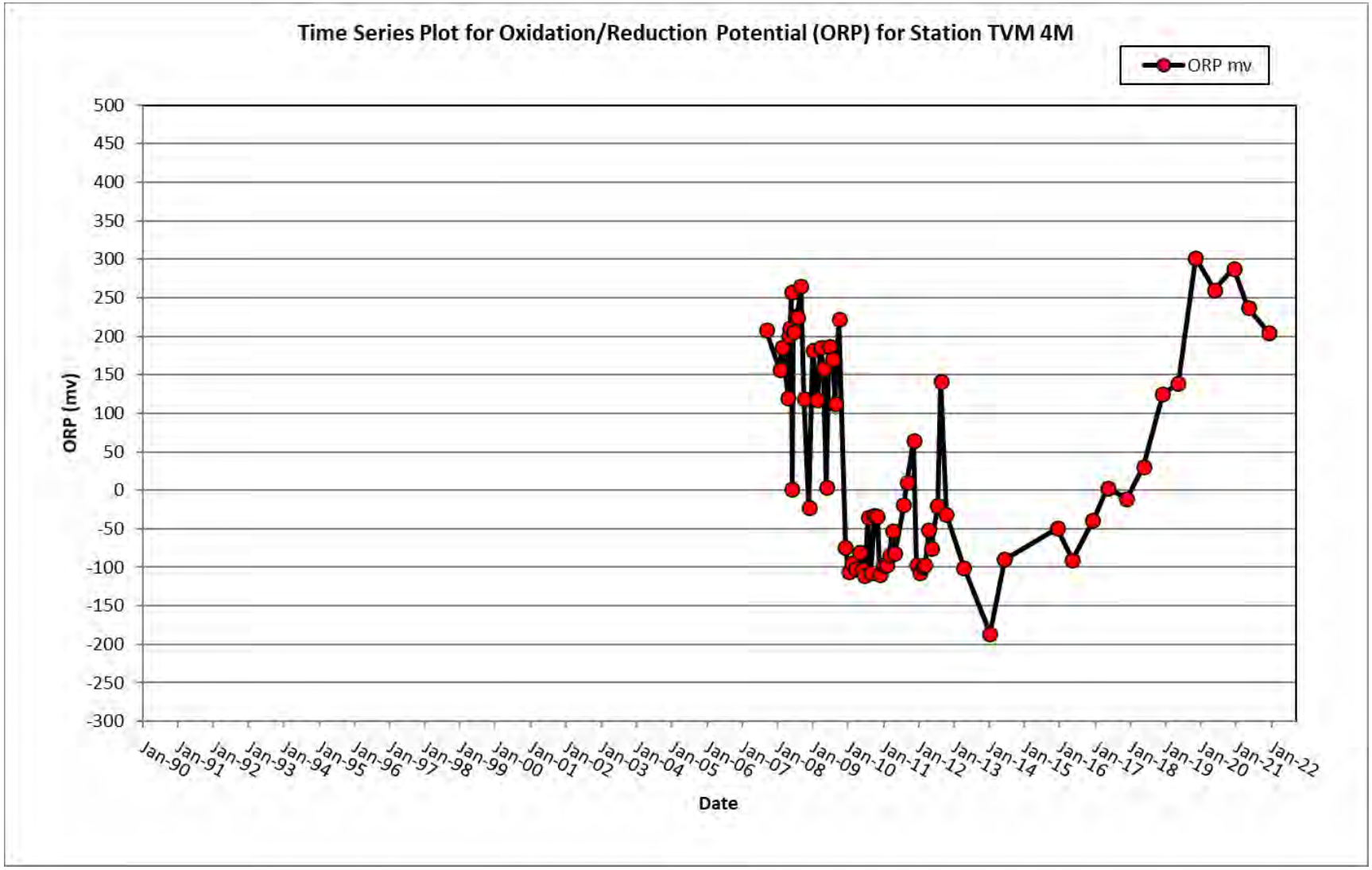

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TRW 2
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

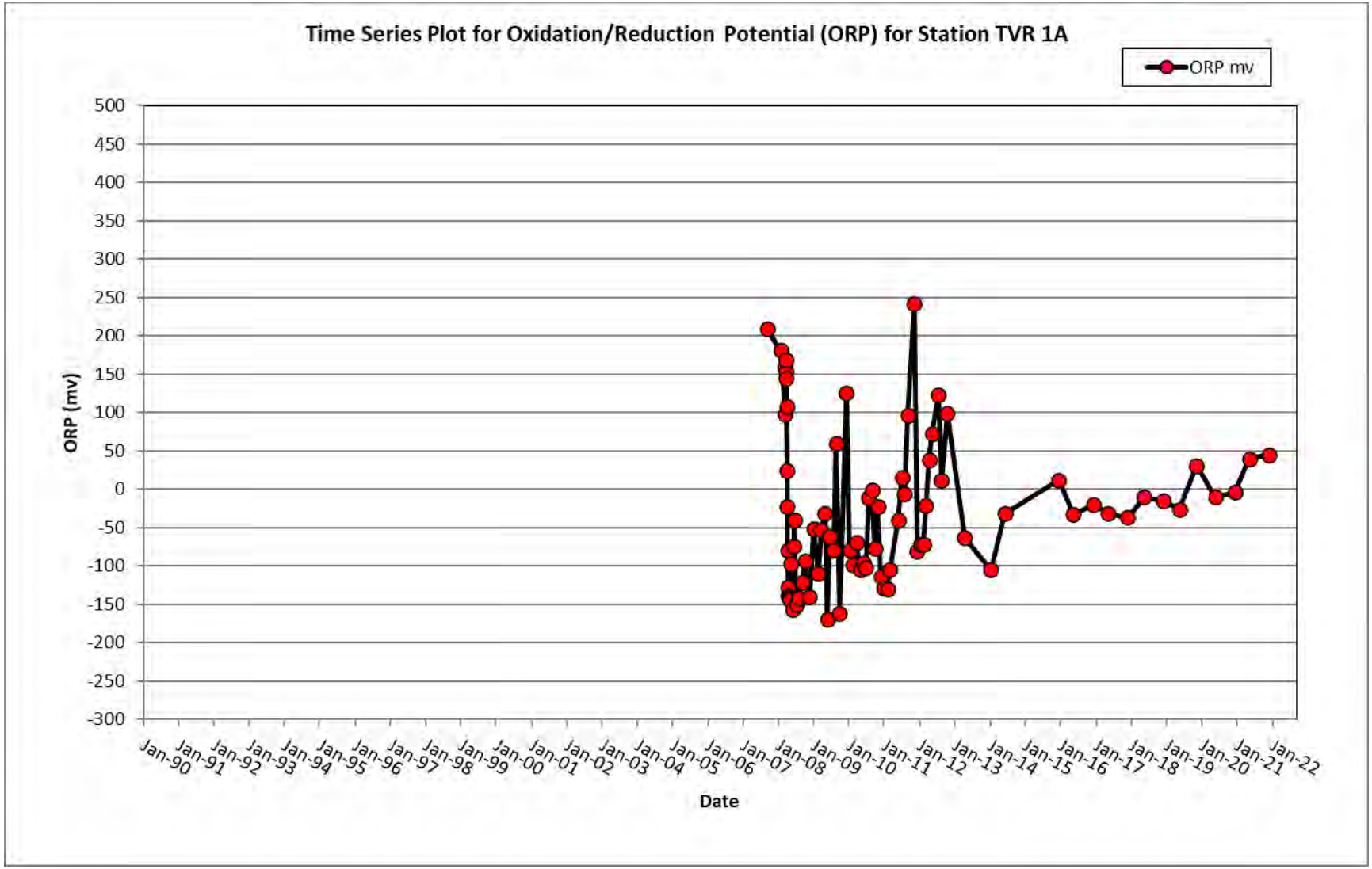

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TRW 3
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

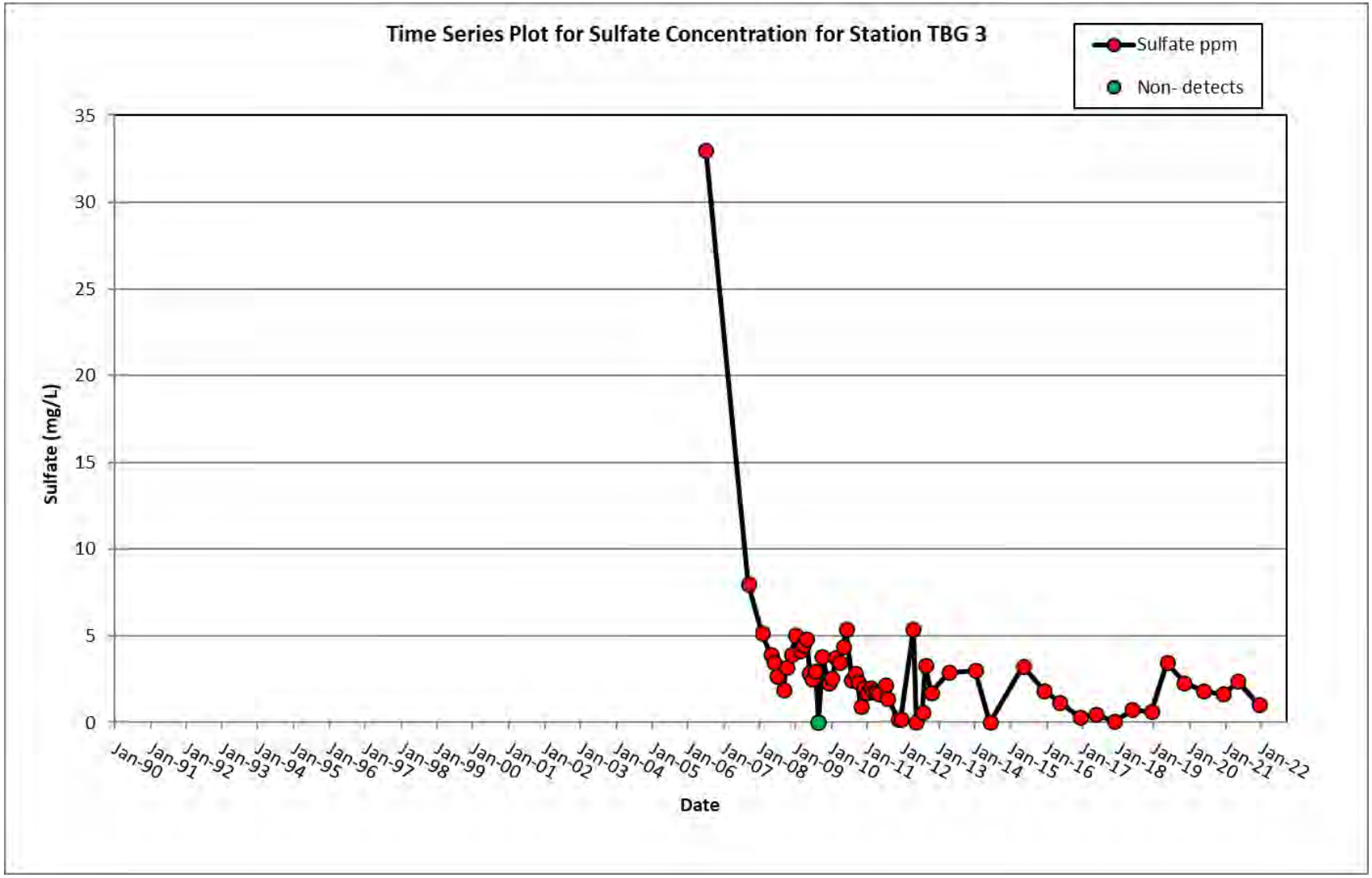

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TRW 4R
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

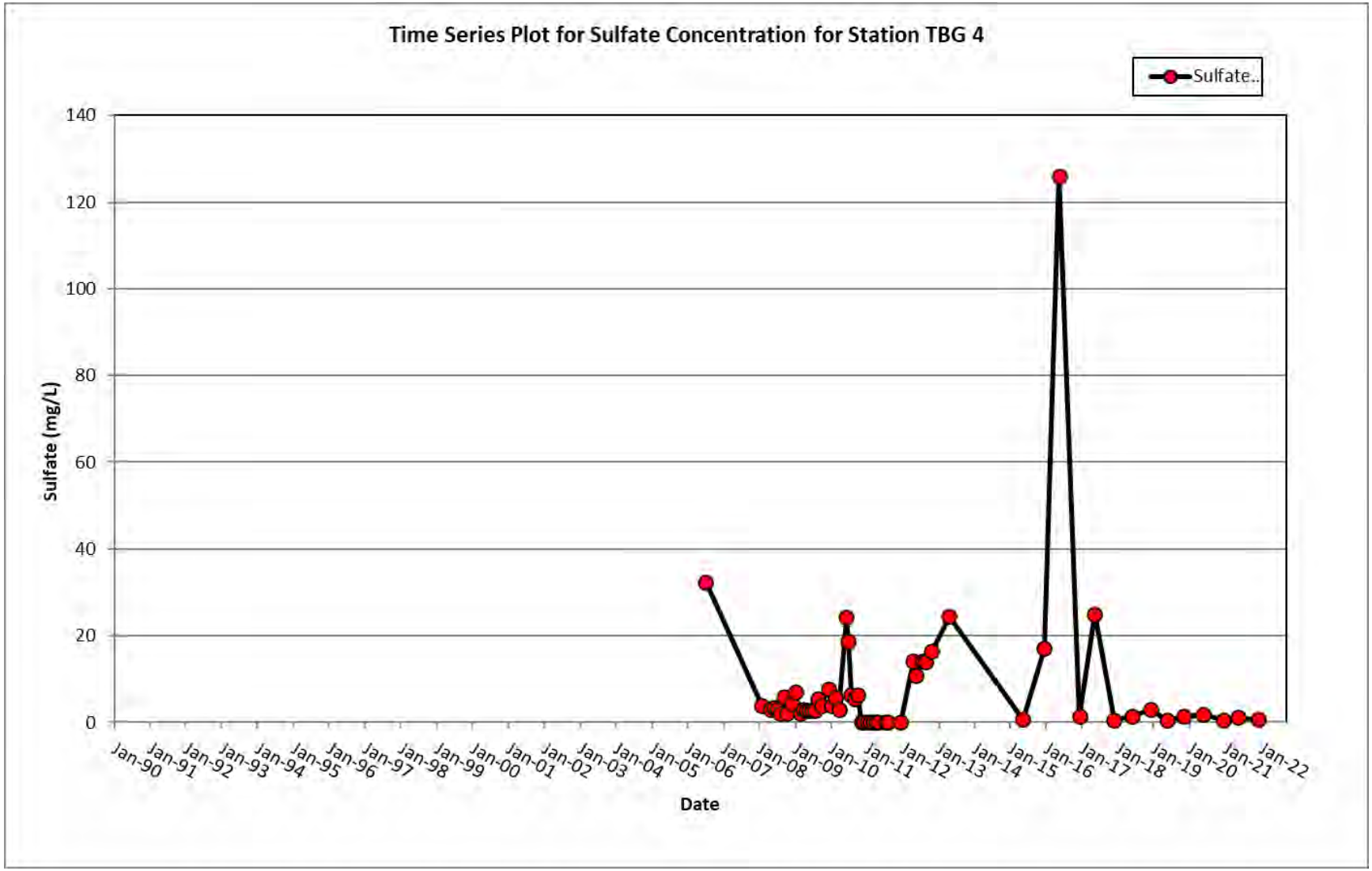

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TVM 1M
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

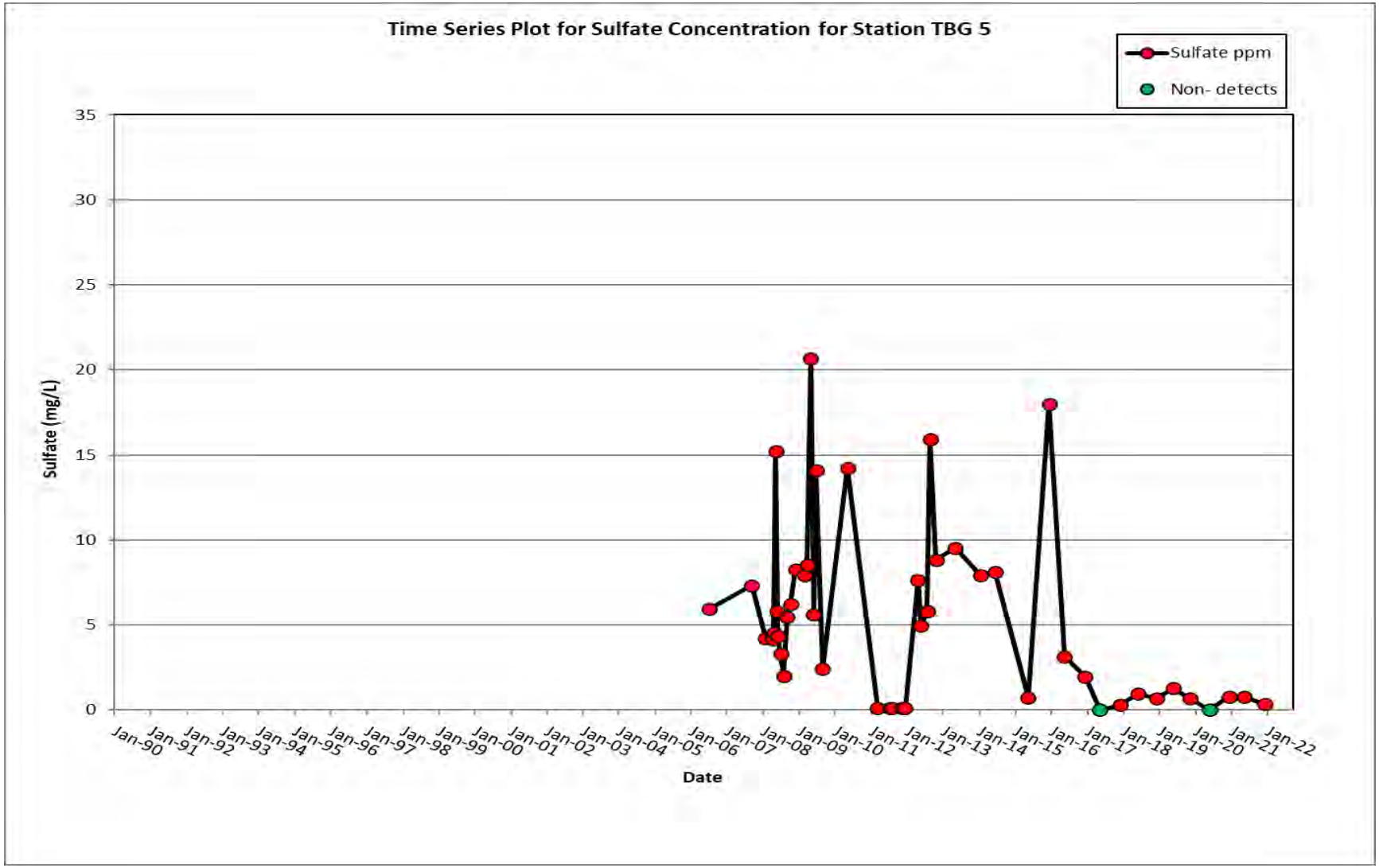

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TVM 2M
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

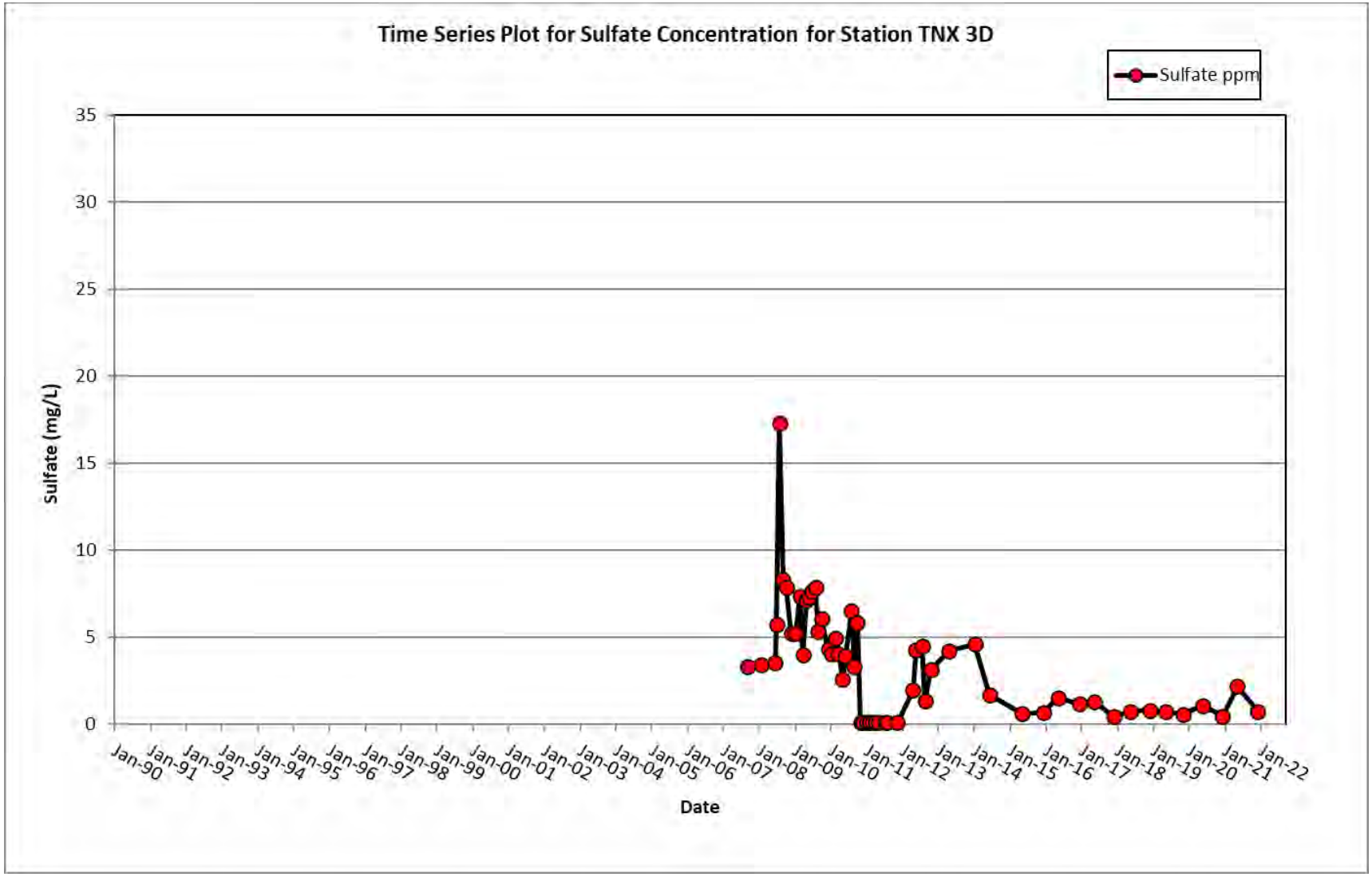

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TVM 4M
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

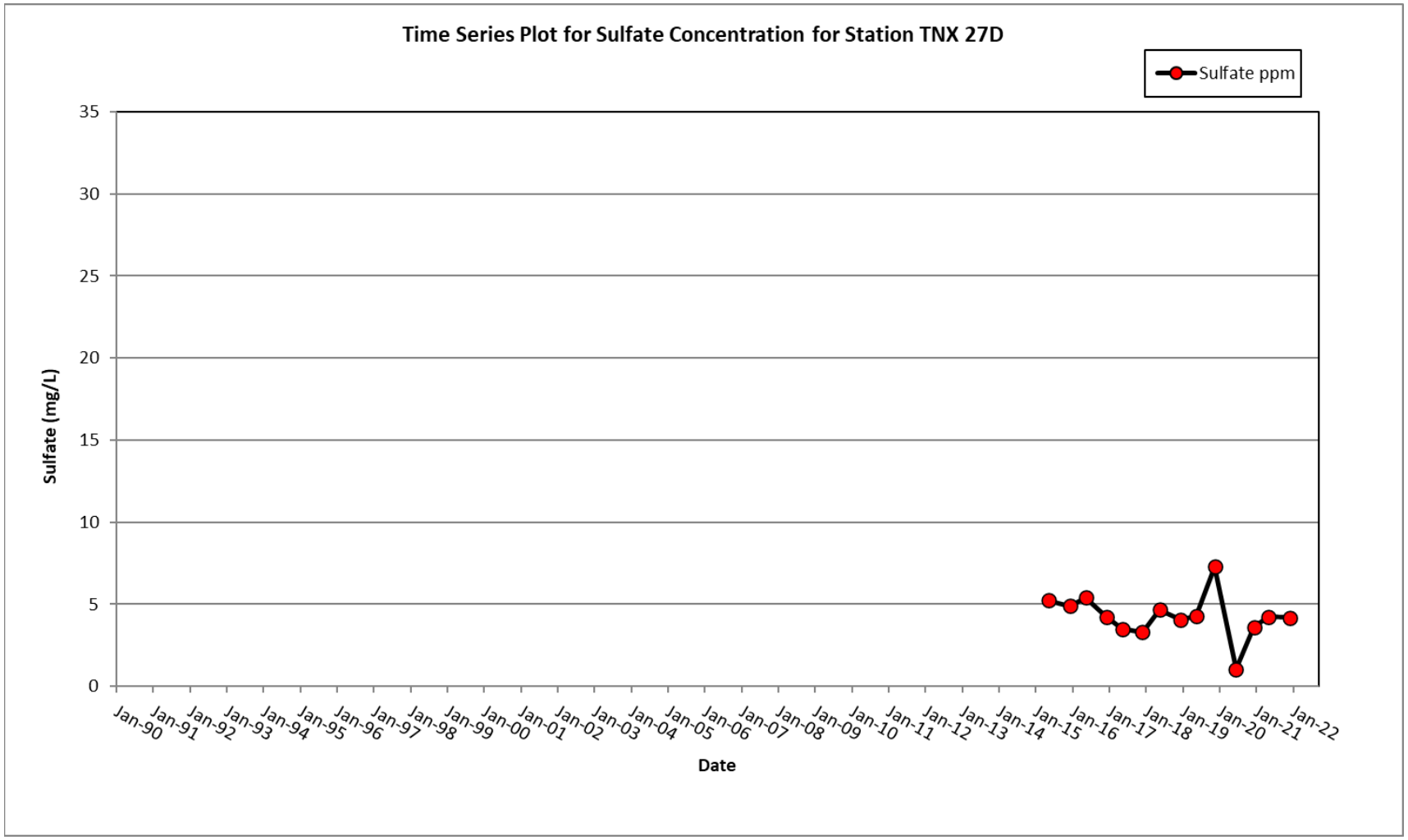

Time Series Plot for Oxidation/Reduction Potential (ORP) for Station TVR 1A
ORP mv
ORP (mv)
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

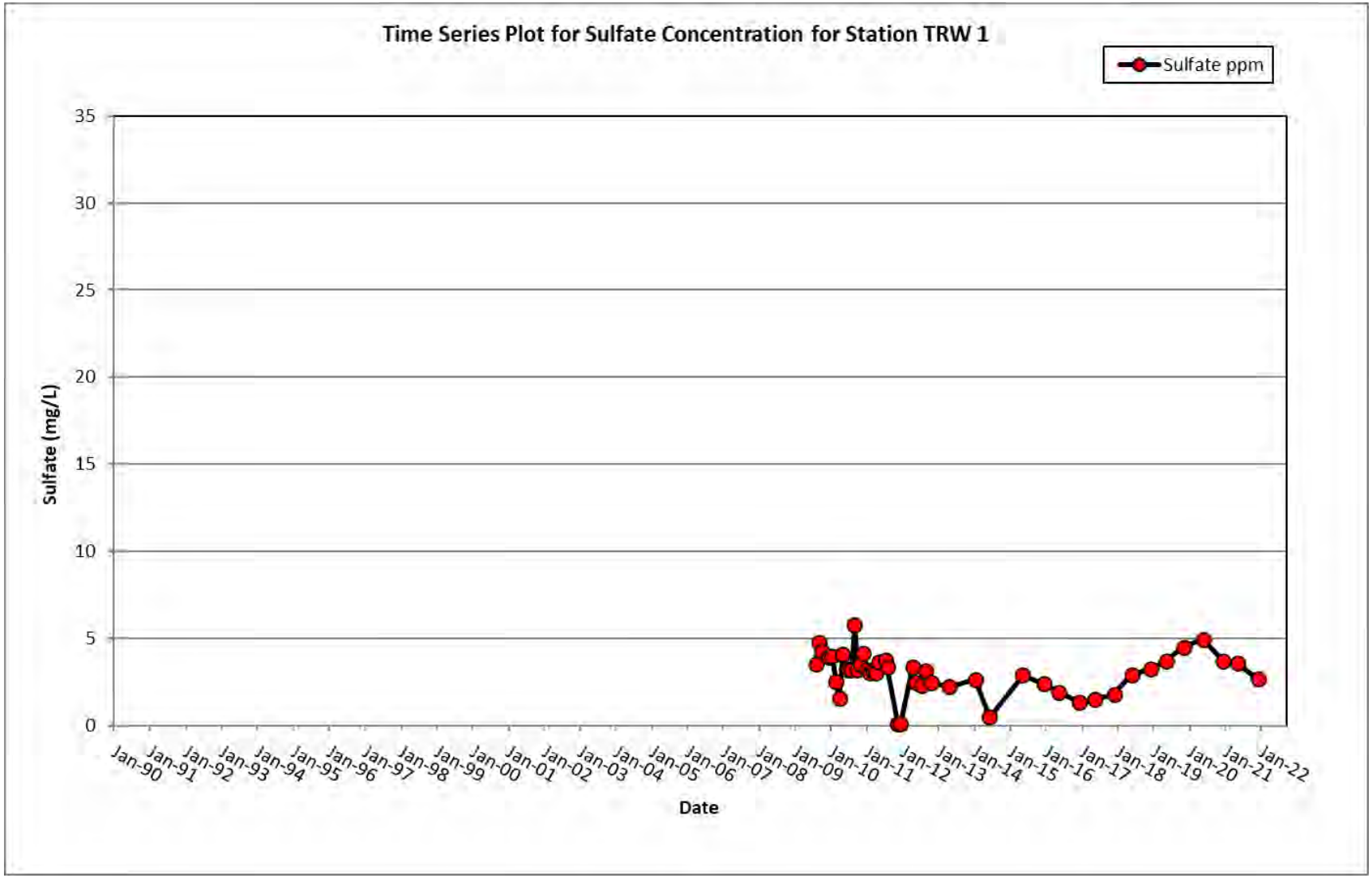

Time Series Plot for Sulfate Concentration for Station TBG 3
Sulfate ppm
Non- detects
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

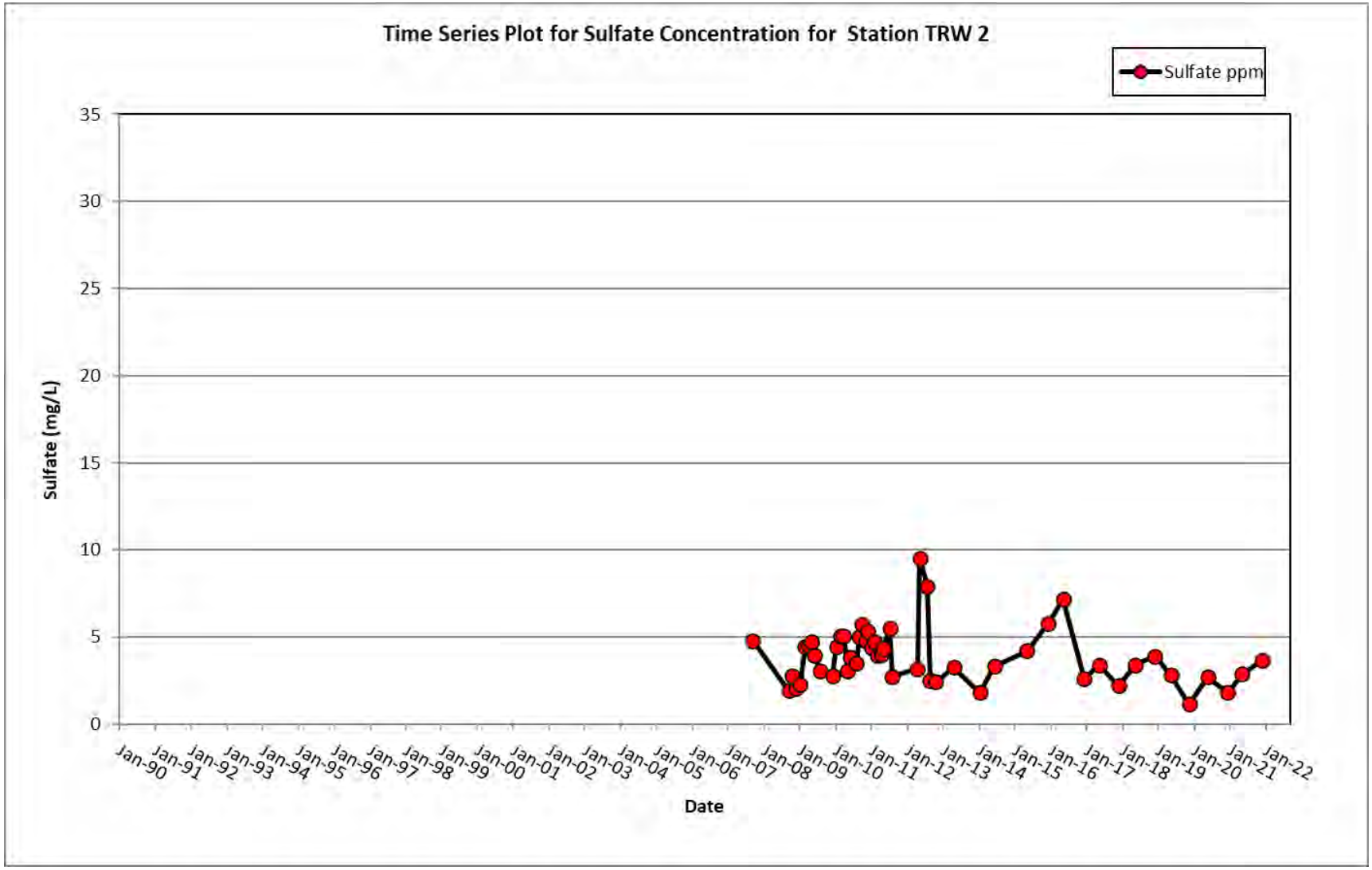

Time Series Plot for Sulfate Concentration for Station TBG 4
Sulfate..
Sulfate (mg/L)
140
120
100
80
60
40
20
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

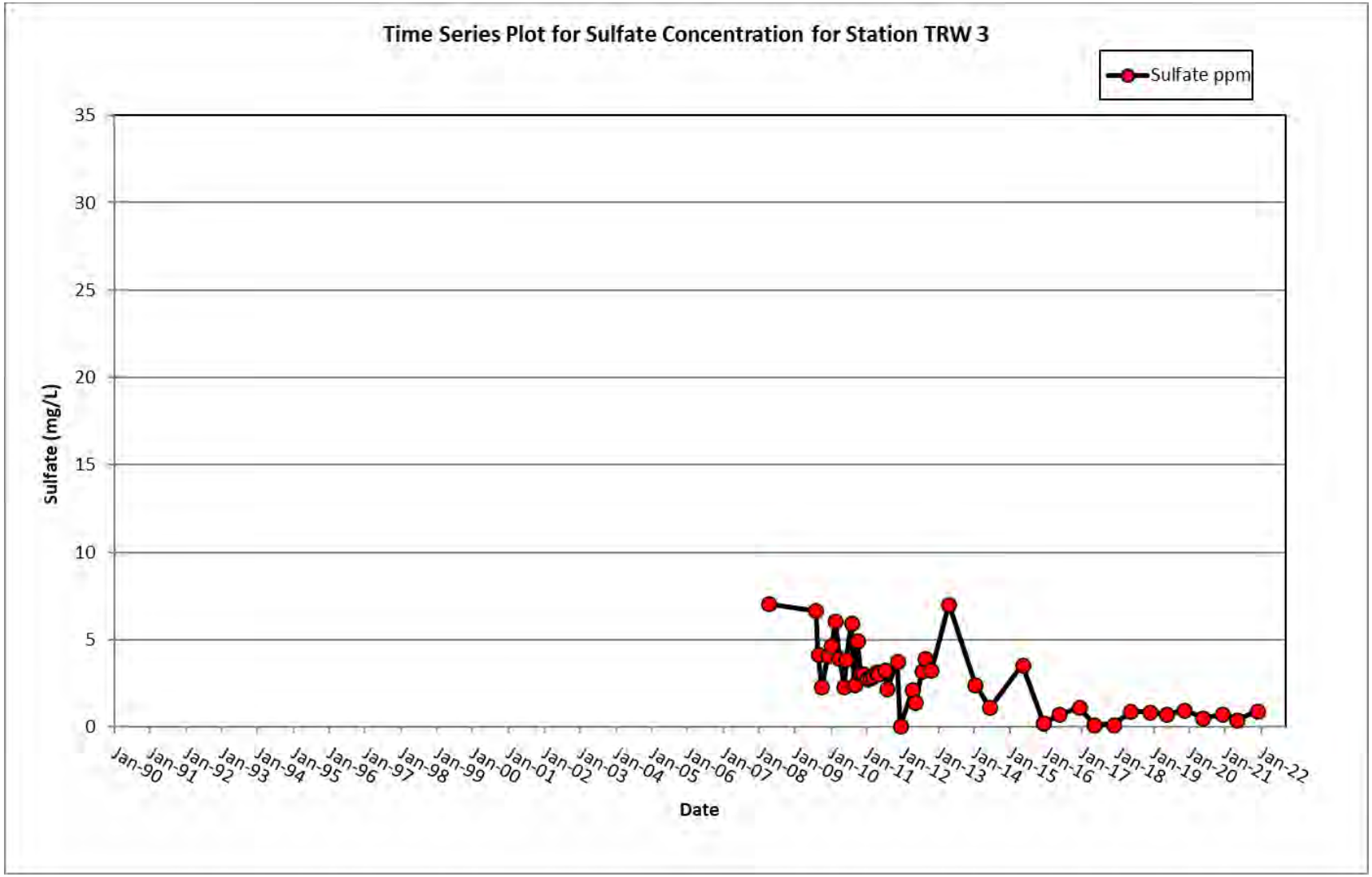

Time Series Plot for Sulfate Concentration for Station TBG 5
Sulfate ppm
Non- detects
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

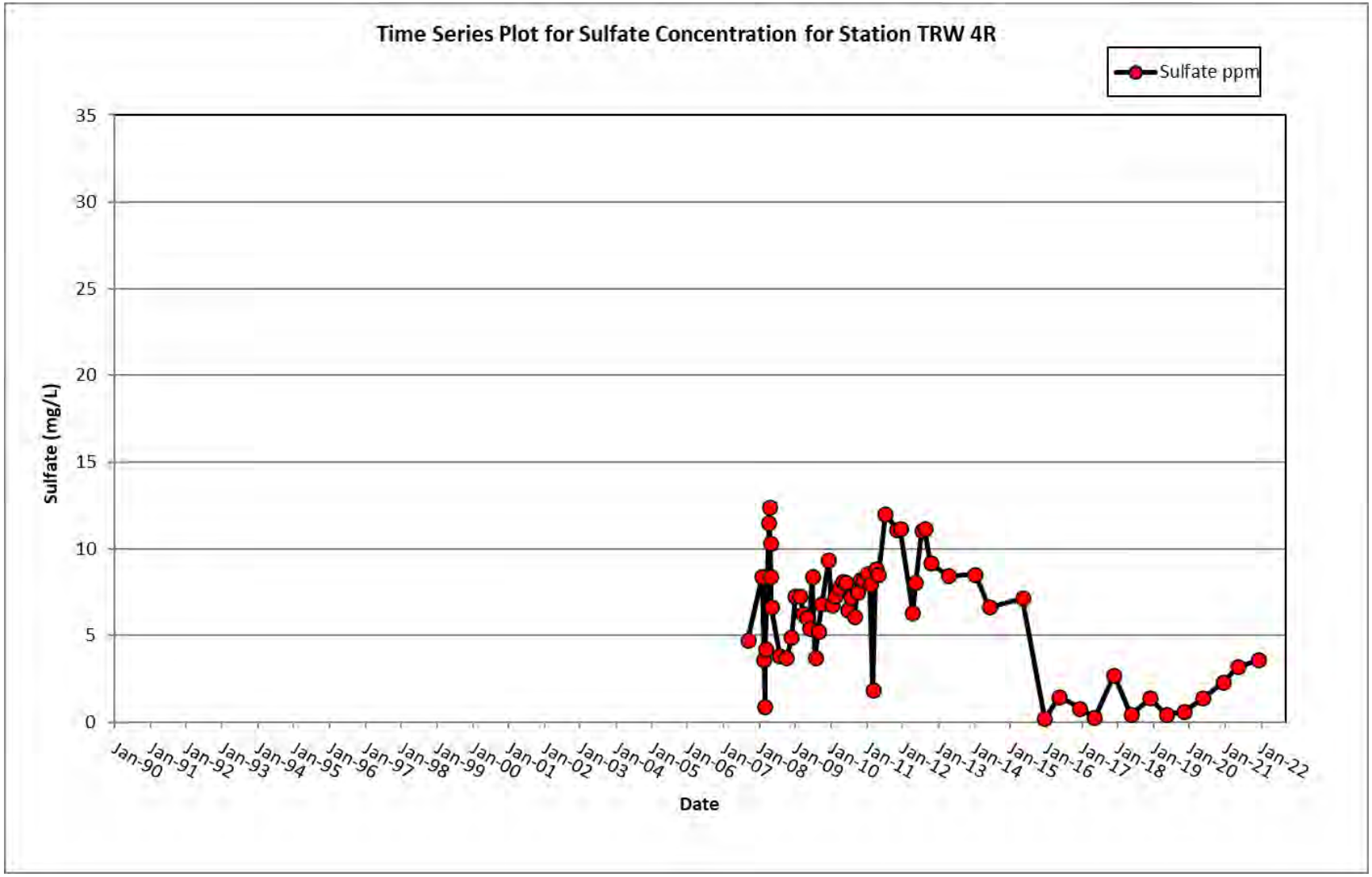

Time Series Plot for Sulfate Concentration for Station TNX 3D
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

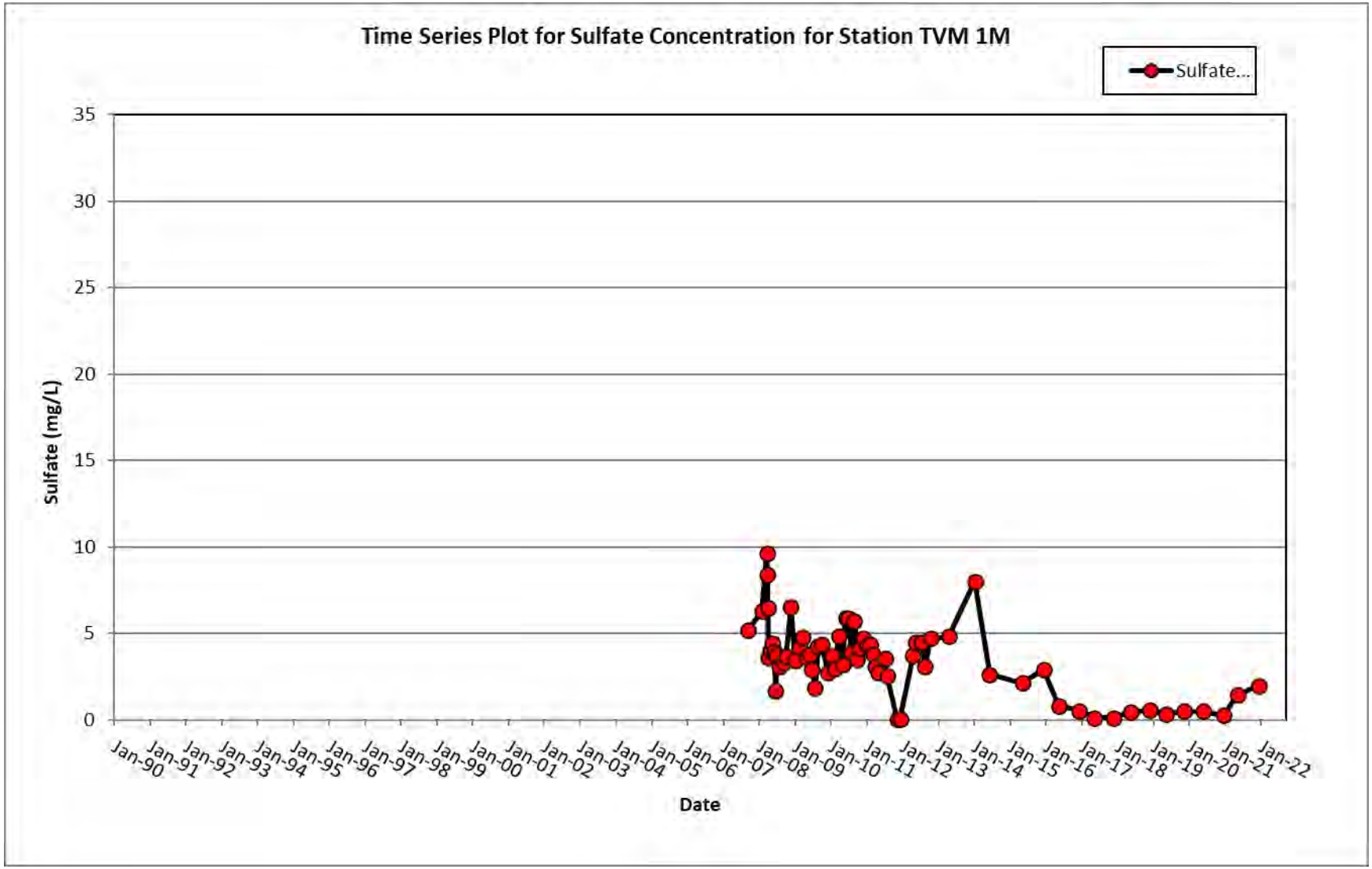

Time Series Plot for Sulfate Concentration for Station TNX 27D
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

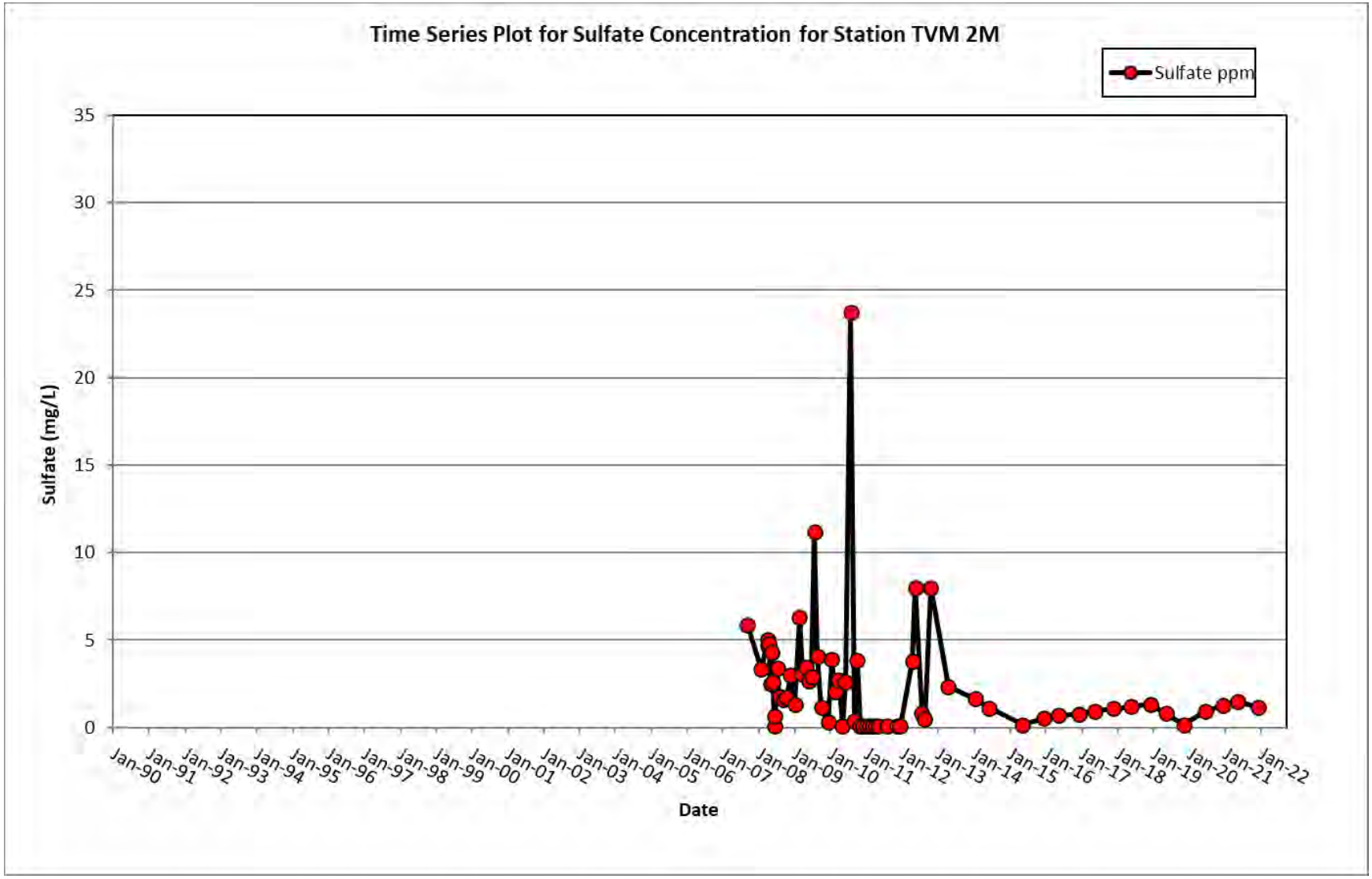

Time Series Plot for Sulfate Concentration for Station TRW 1
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

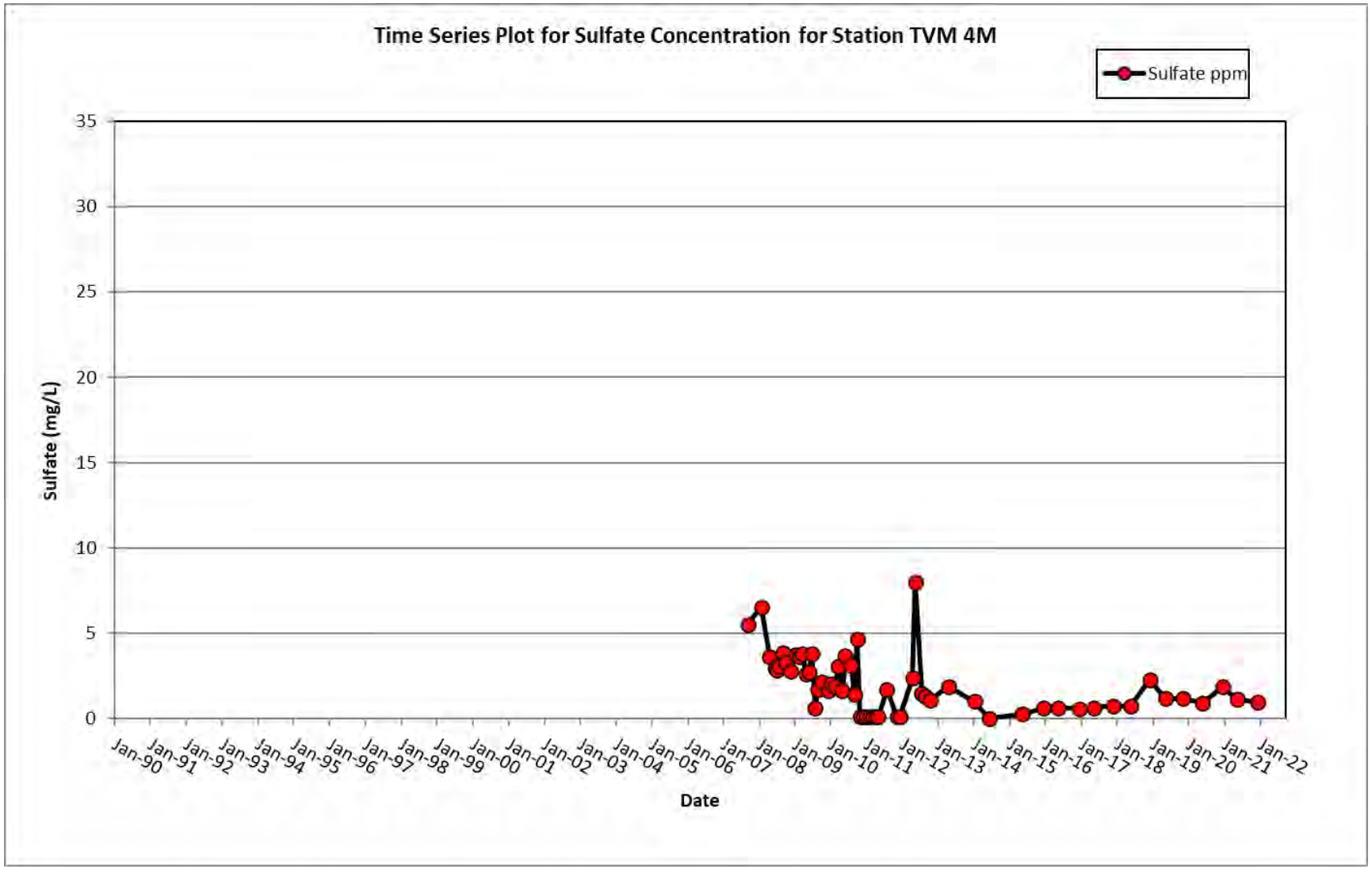

Time Series Plot for Sulfate Concentration for Station TRW 2
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

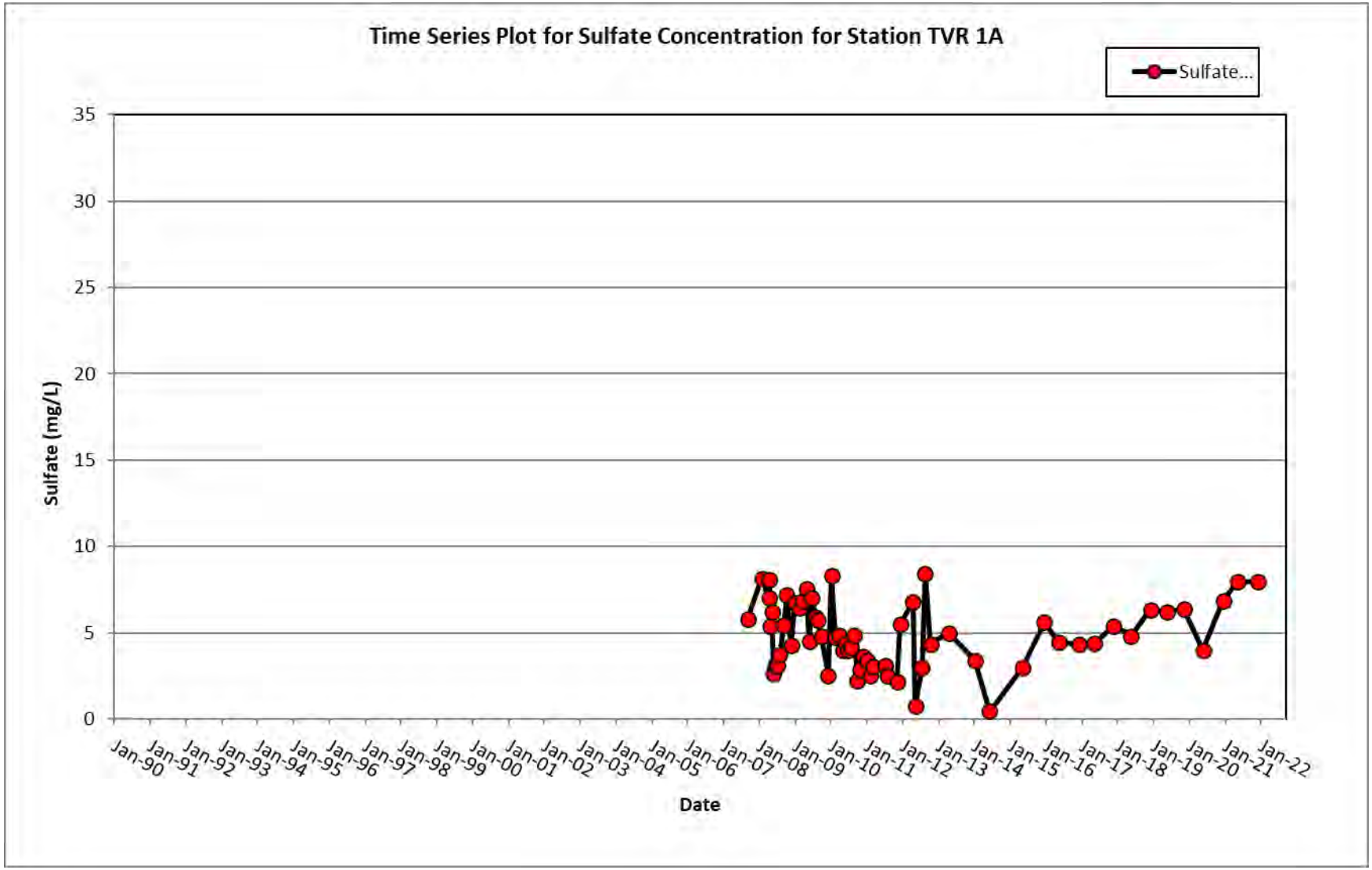

Time Series Plot for Sulfate Concentration for Station TRW 3
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

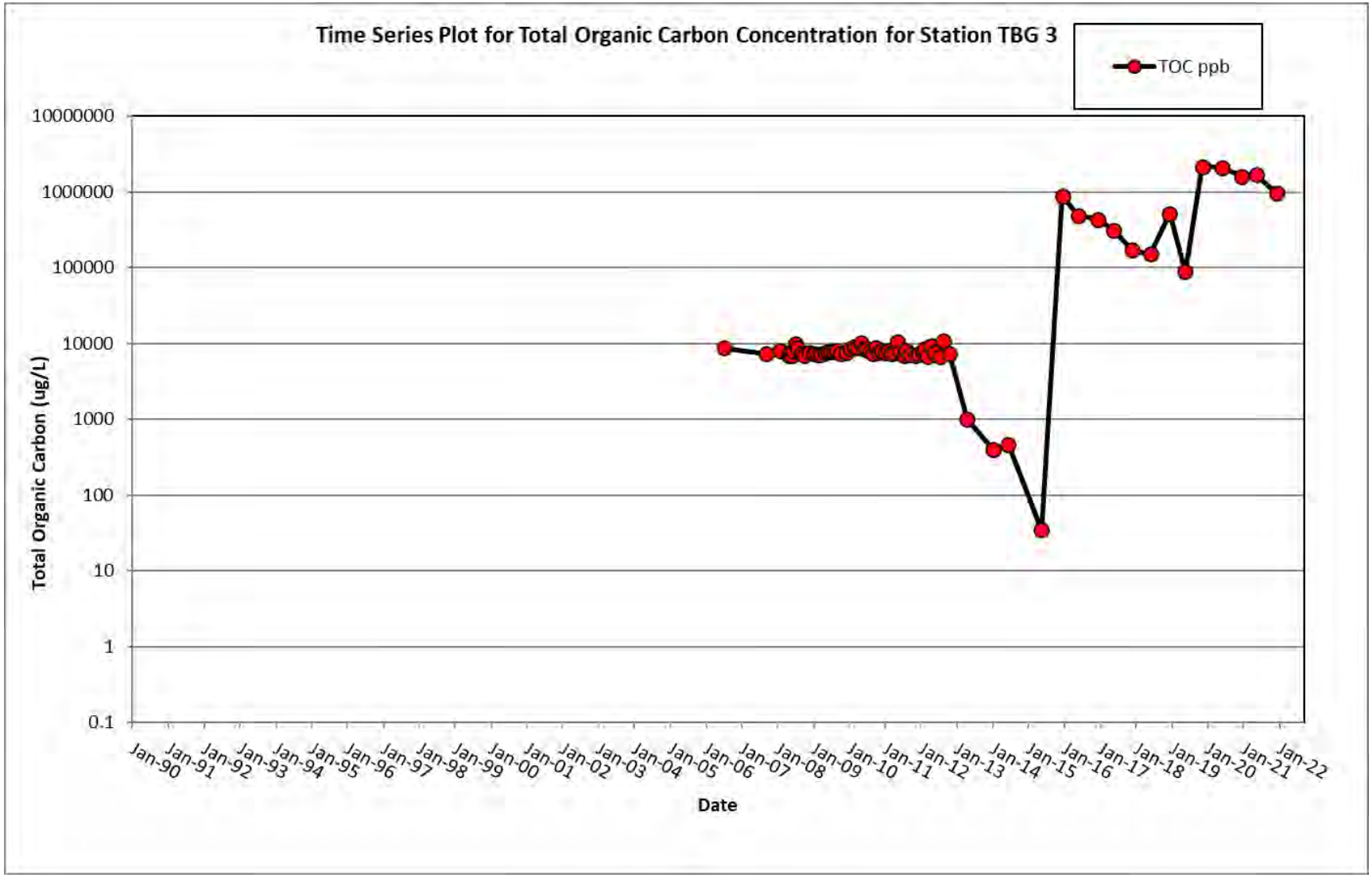

Time Series Plot for Sulfate Concentration for Station TRW 4R
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

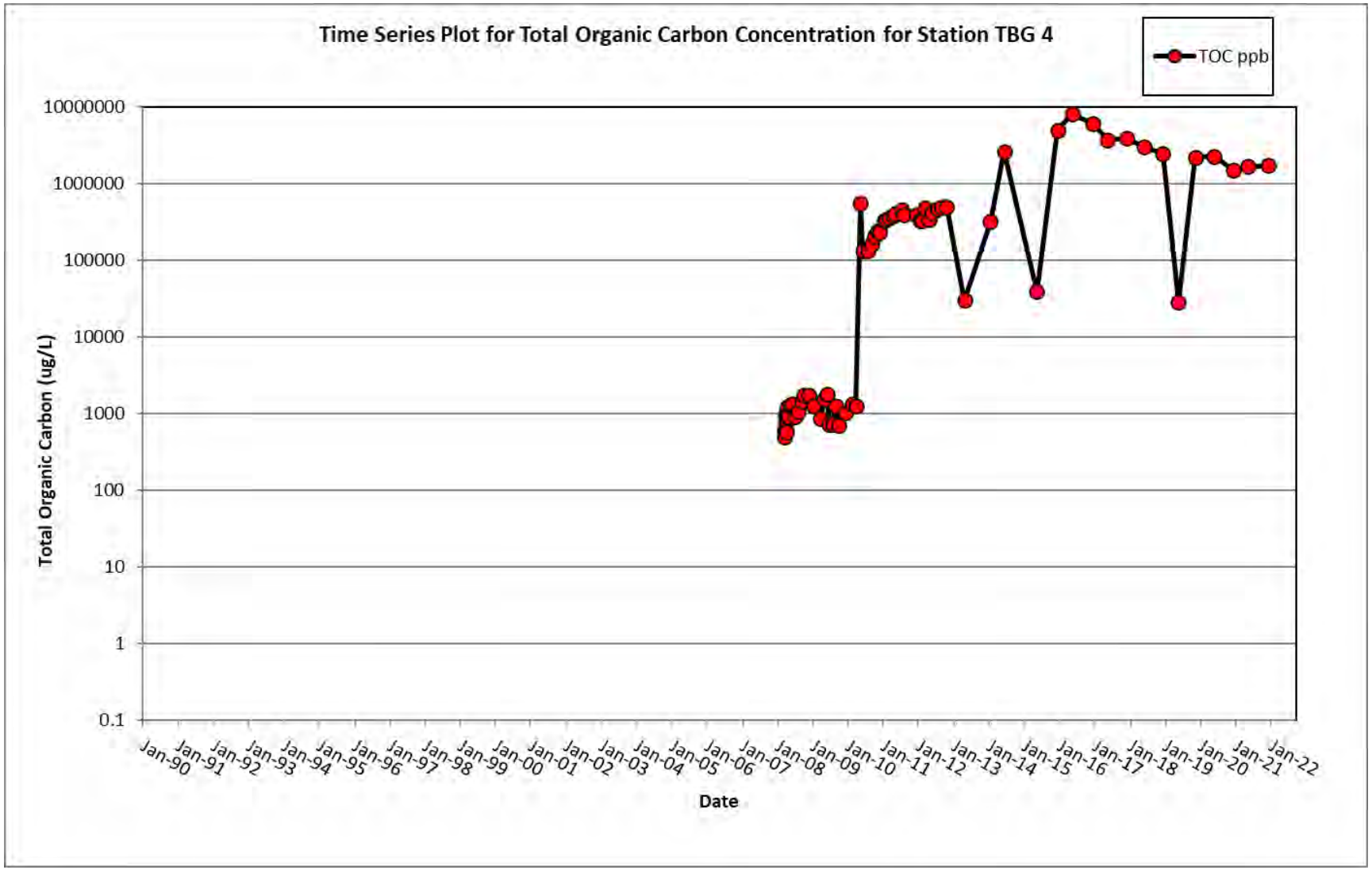

Time Series Plot for Sulfate Concentration for Station TVM 1M
Sulfate...
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

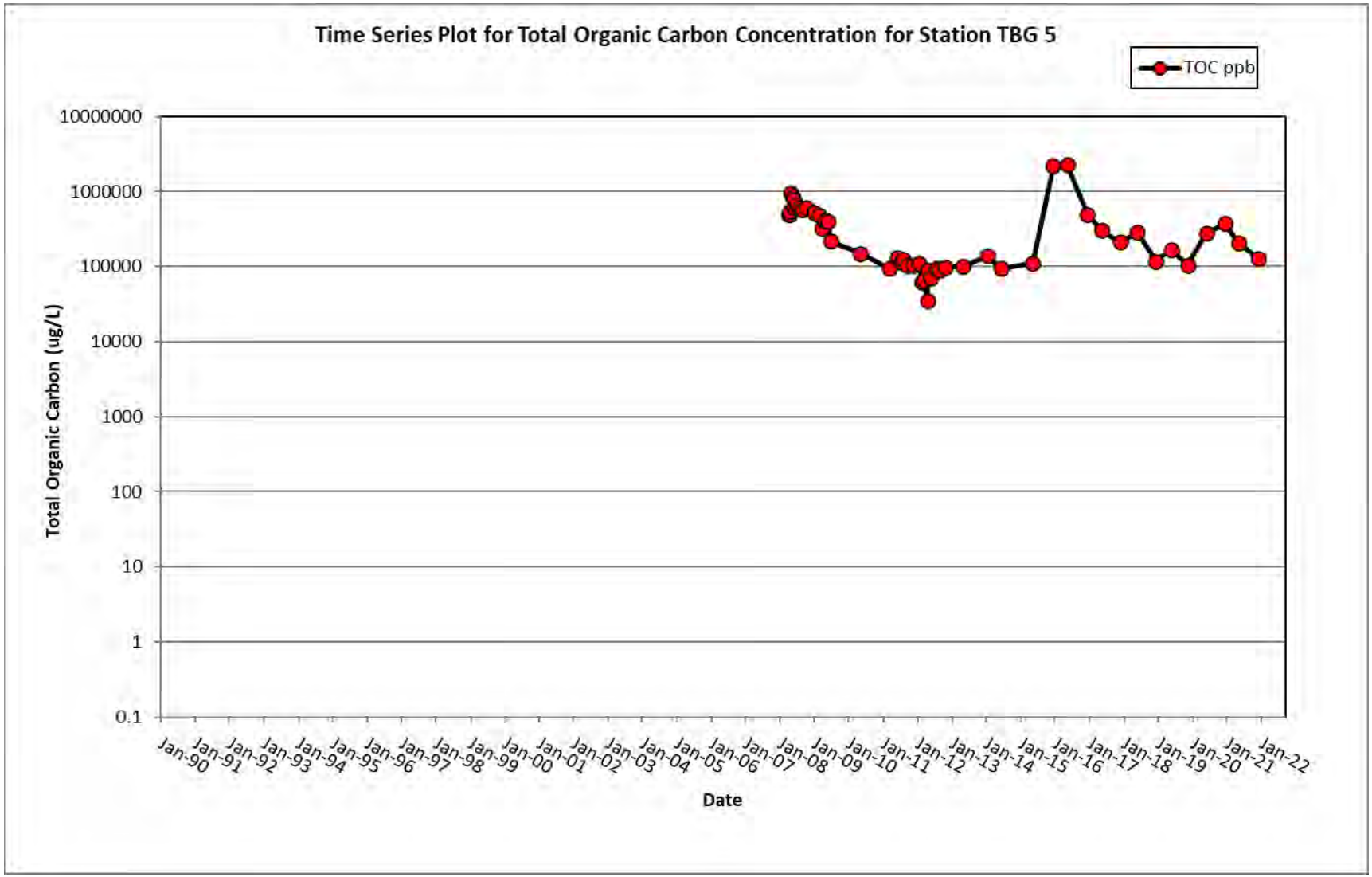

Time Series Plot for Sulfate Concentration for Station TVM 2M
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

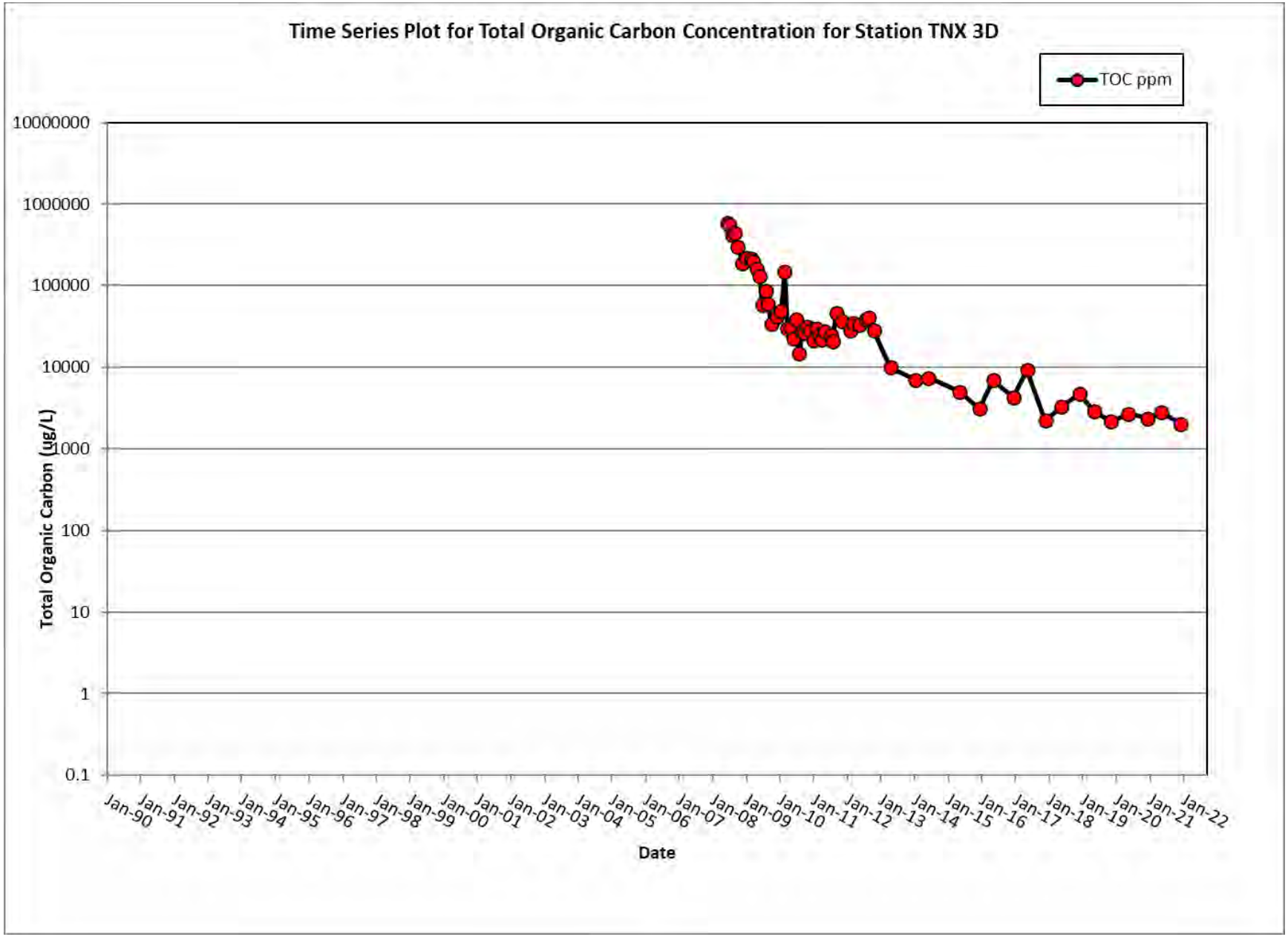

Time Series Plot for Sulfate Concentration for Station TVM 4M
Sulfate ppm
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

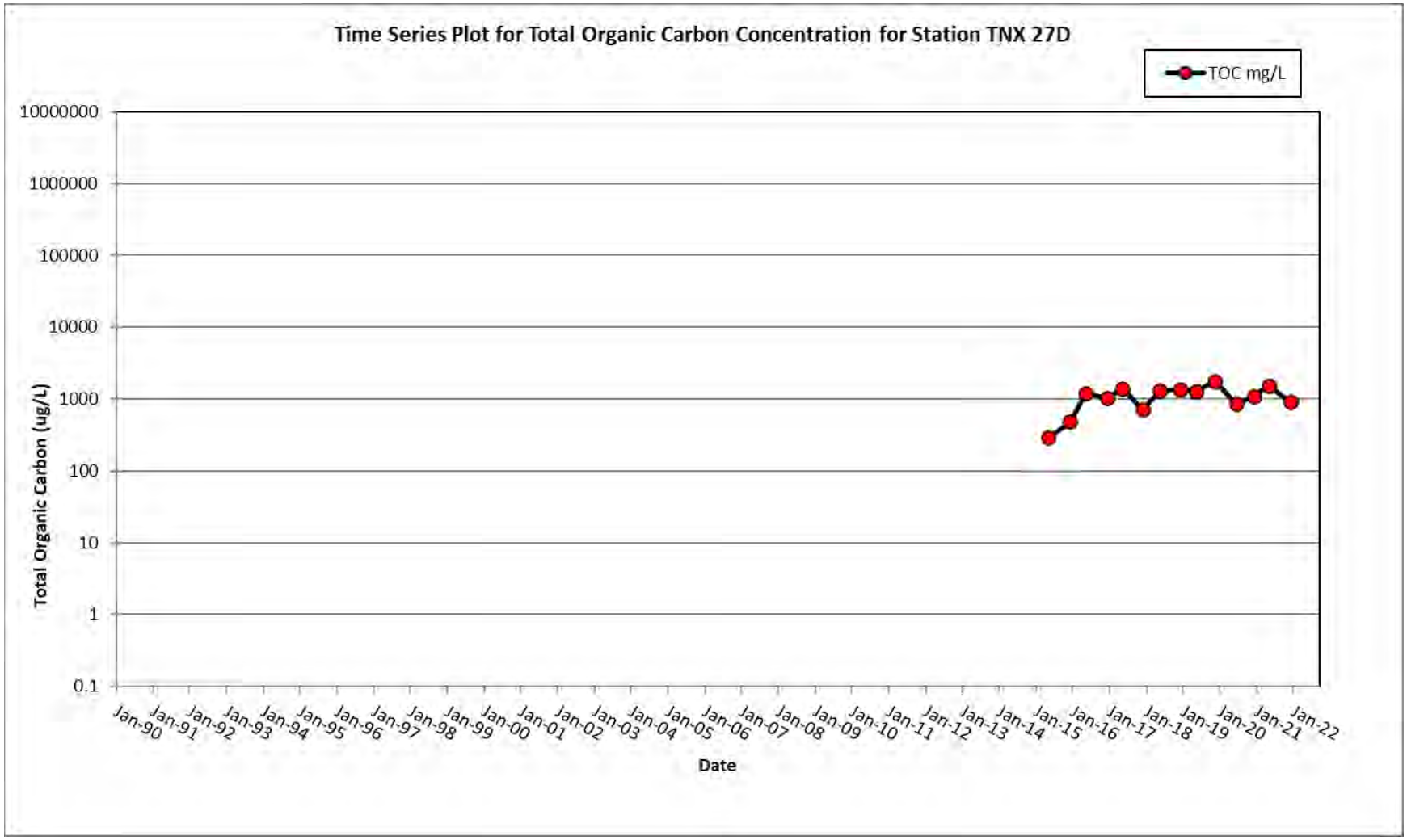

Time Series Plot for Sulfate Concentration for Station TVR 1A
Sulfate...
Sulfate (mg/L)
35
30
25
20
15
10
5
0
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

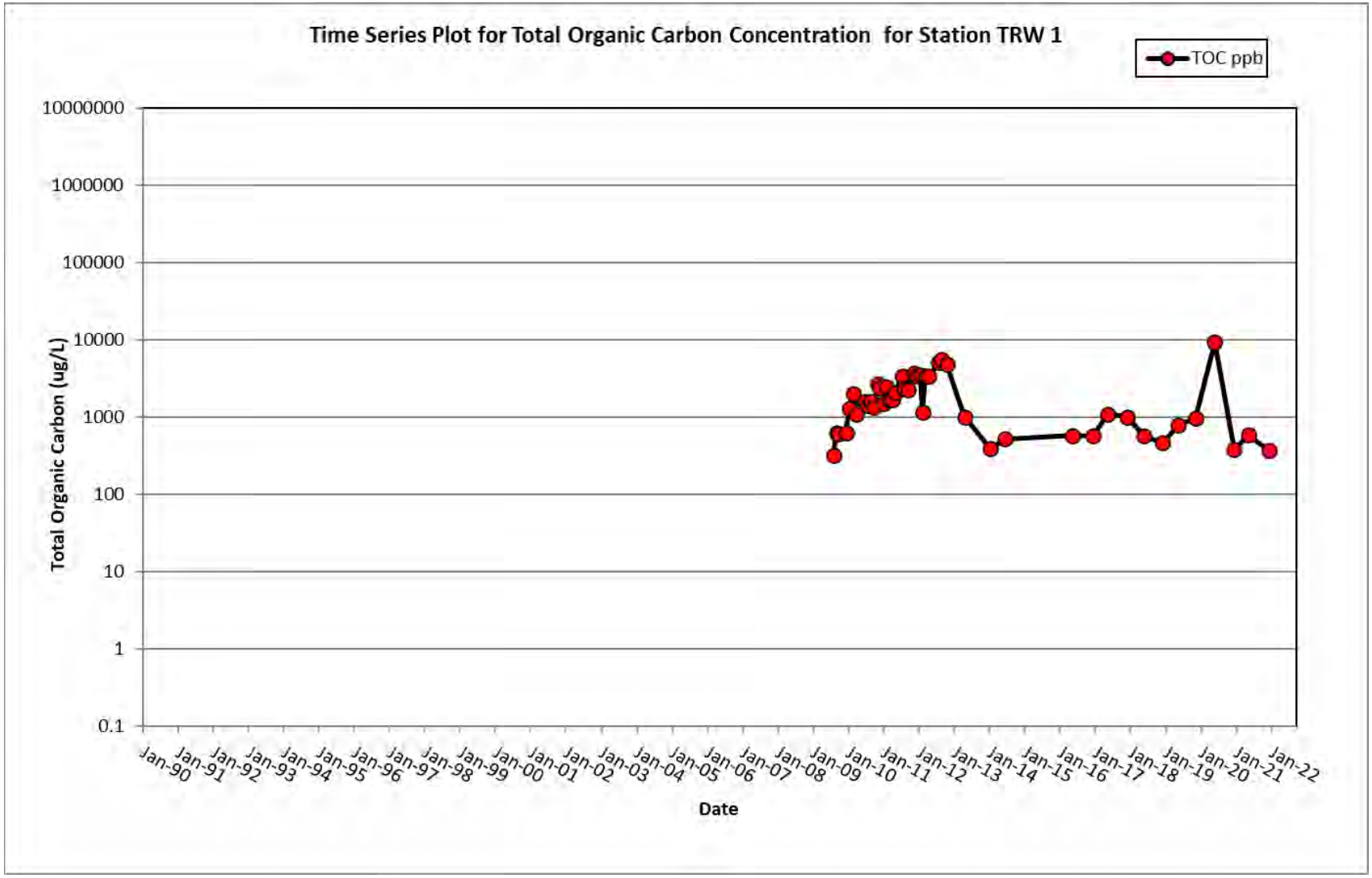

Time Series Plot for Total Organic Carbon Concentration for Station TBG 3
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

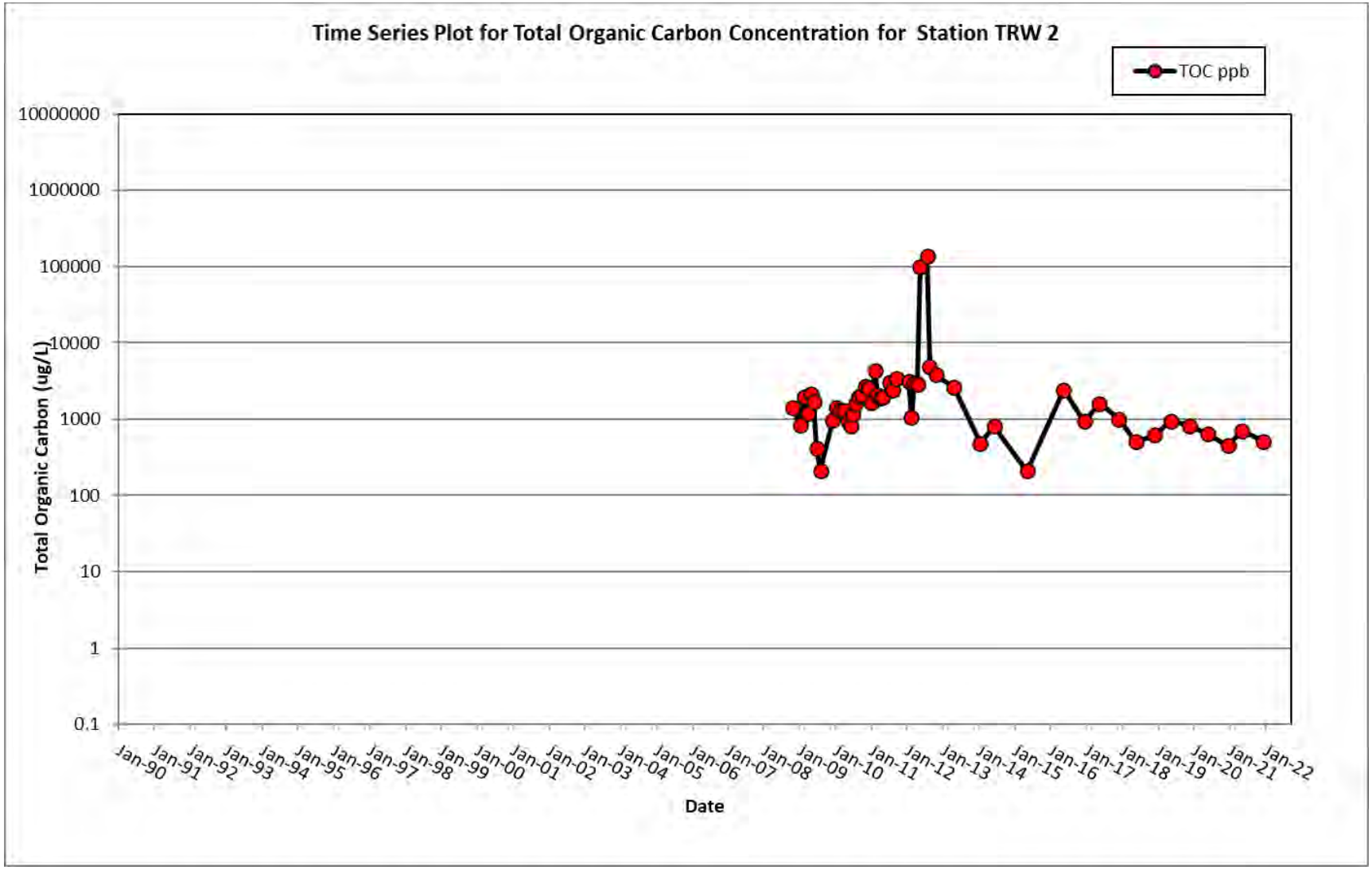

Time Series Plot for Total Organic Carbon Concentration for Station TBG 4
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

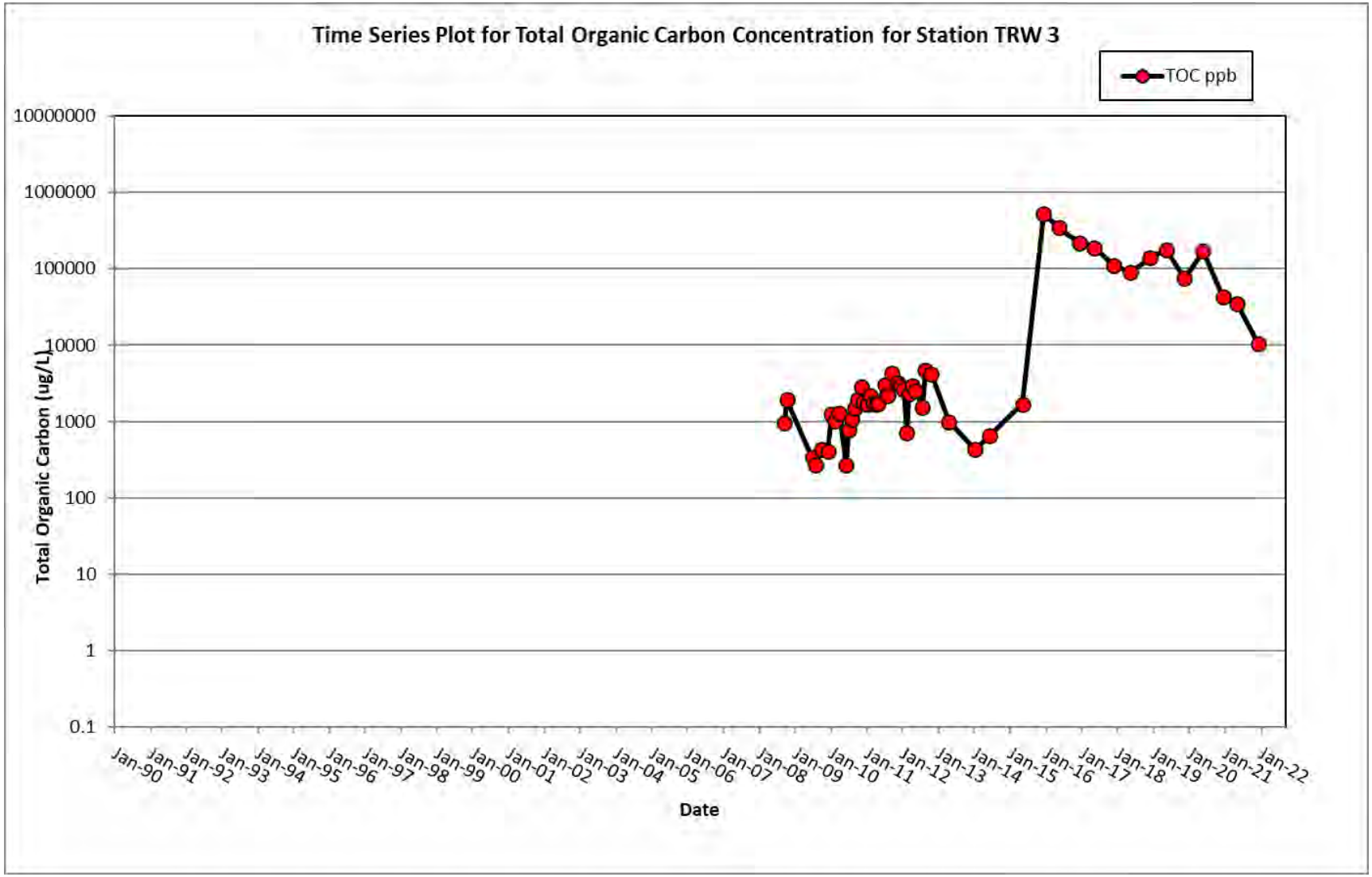

Time Series Plot for Total Organic Carbon Concentration for Station TBG 5
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

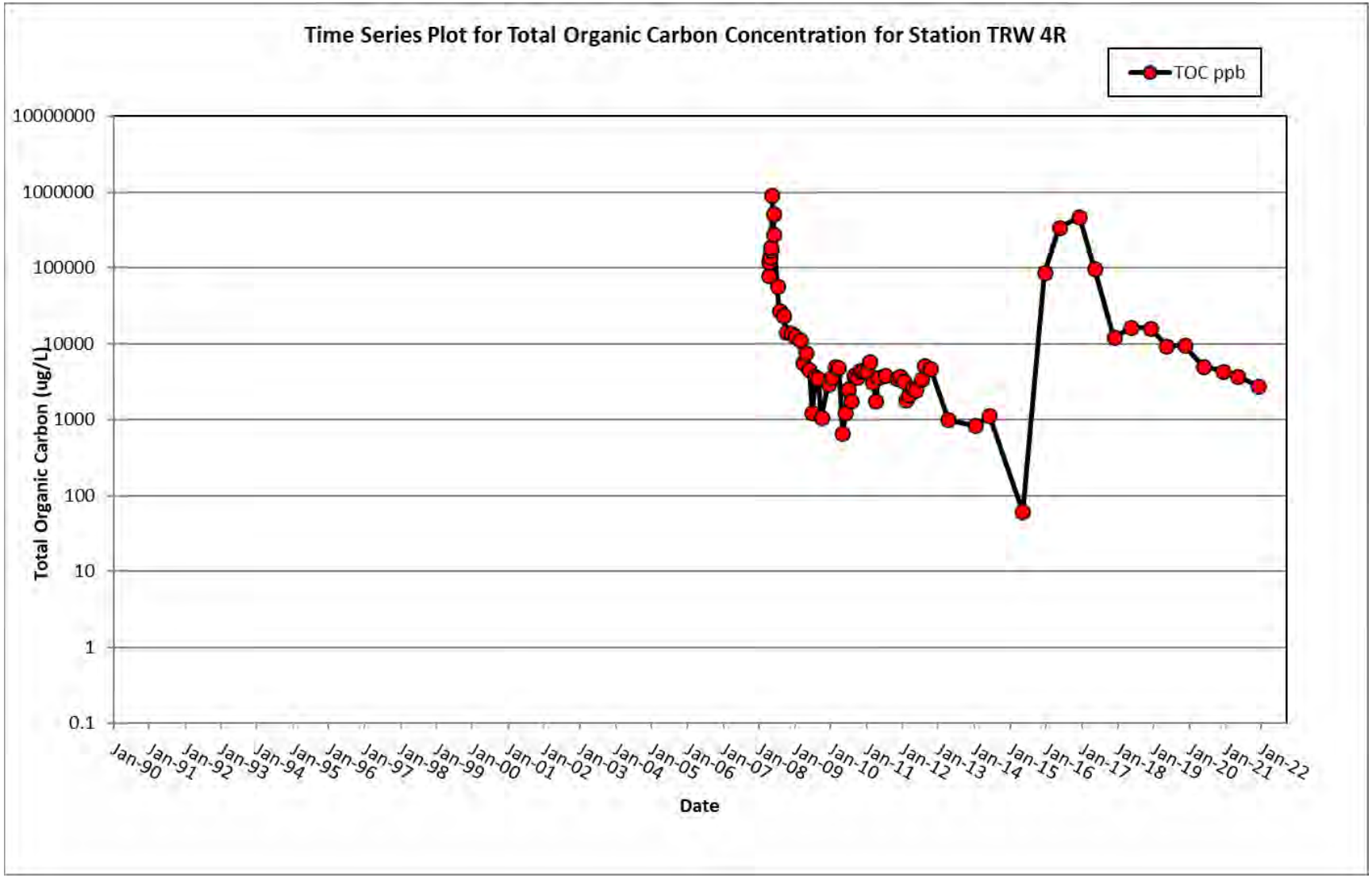

Time Series Plot for Total Organic Carbon Concentration for Station TNX 3D
TOC ppm
10000000
1000000
100000
10000
1000
100
10
1
0.1
Total Organic Carbon (ug/L)
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

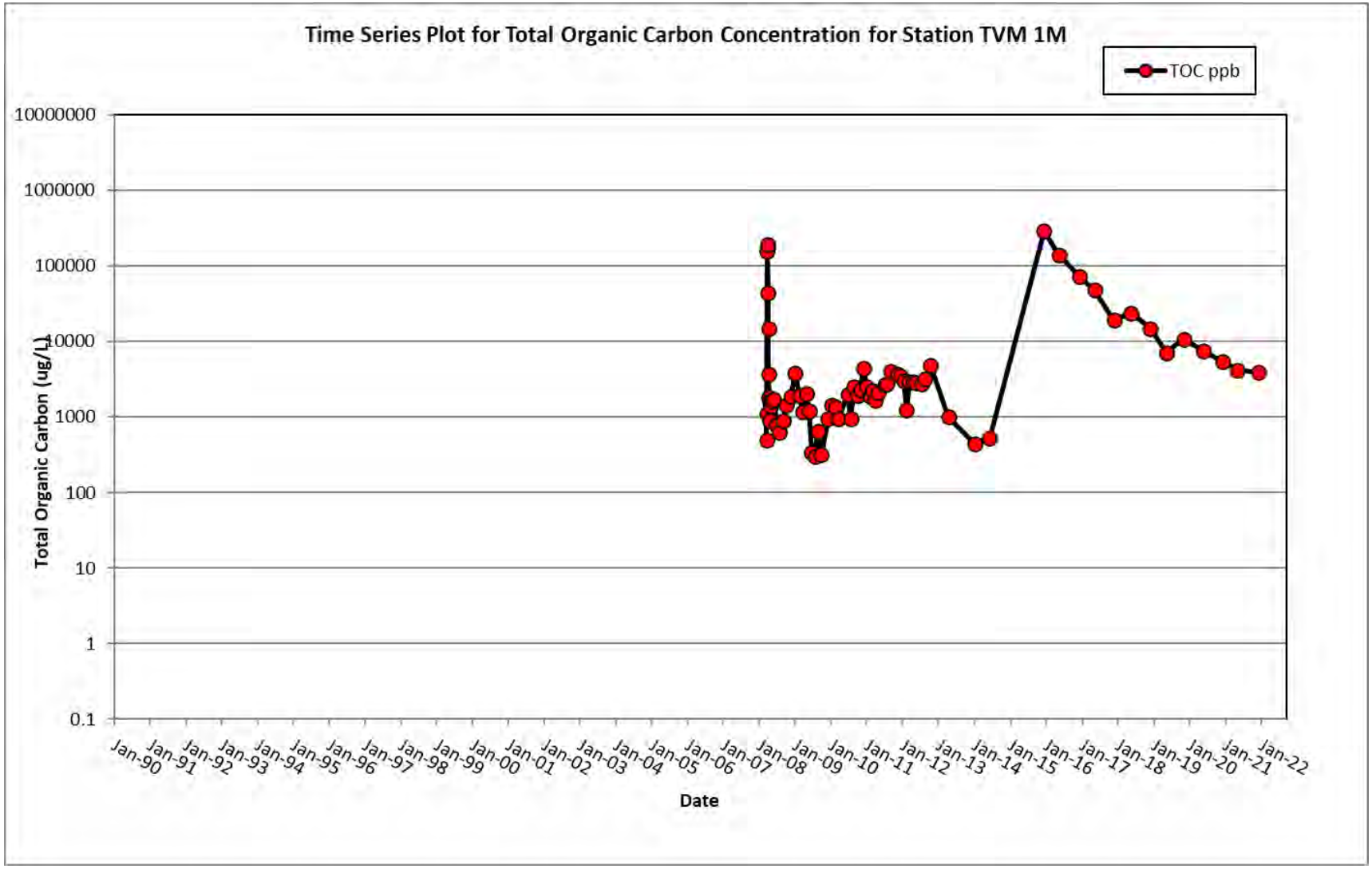

Time Series Plot for Total Organic Carbon Concentration for Station TNX 27D
TOC mg/L
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

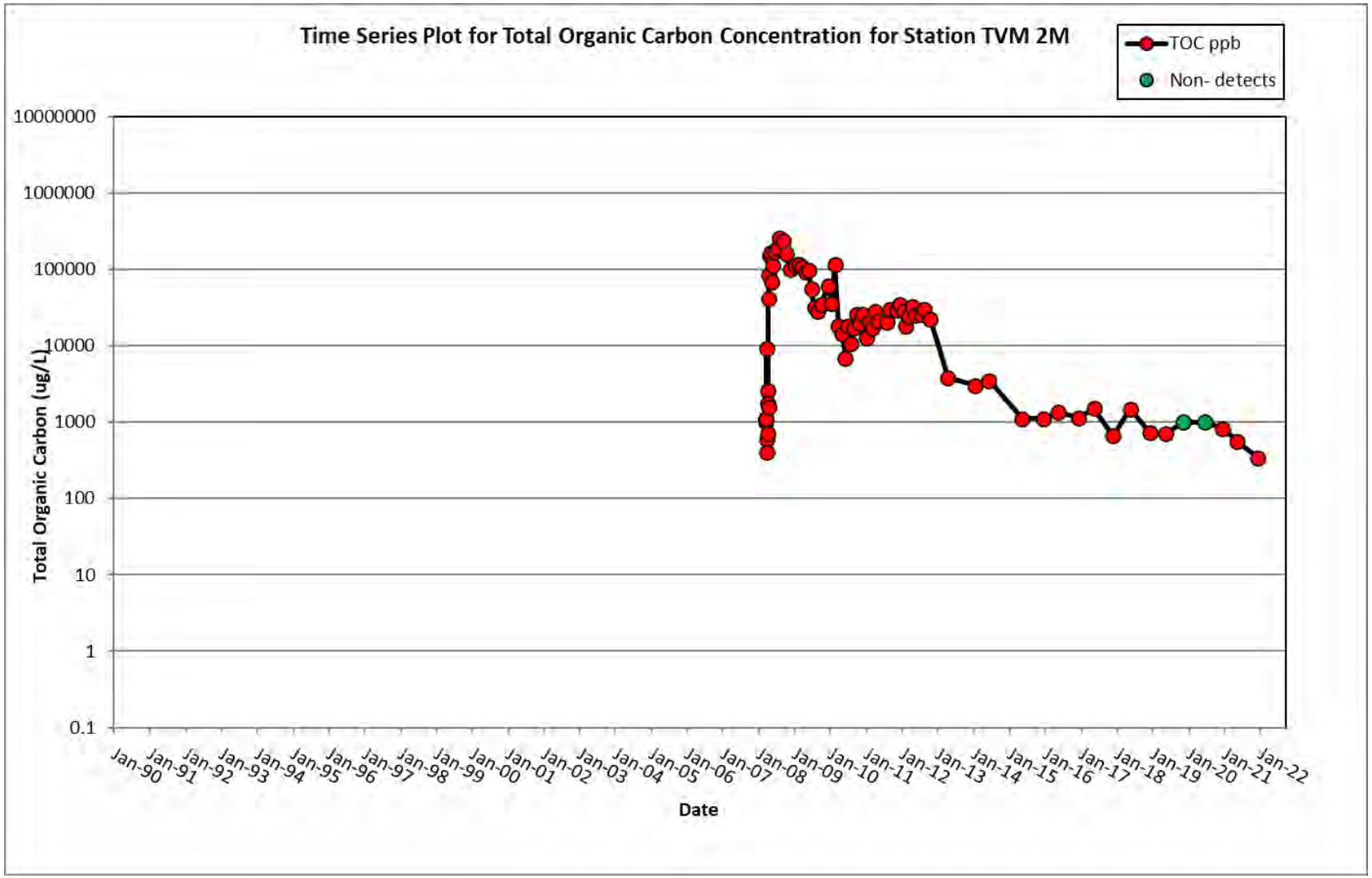

Time Series Plot for Total Organic Carbon Concentration for Station TRW 1
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

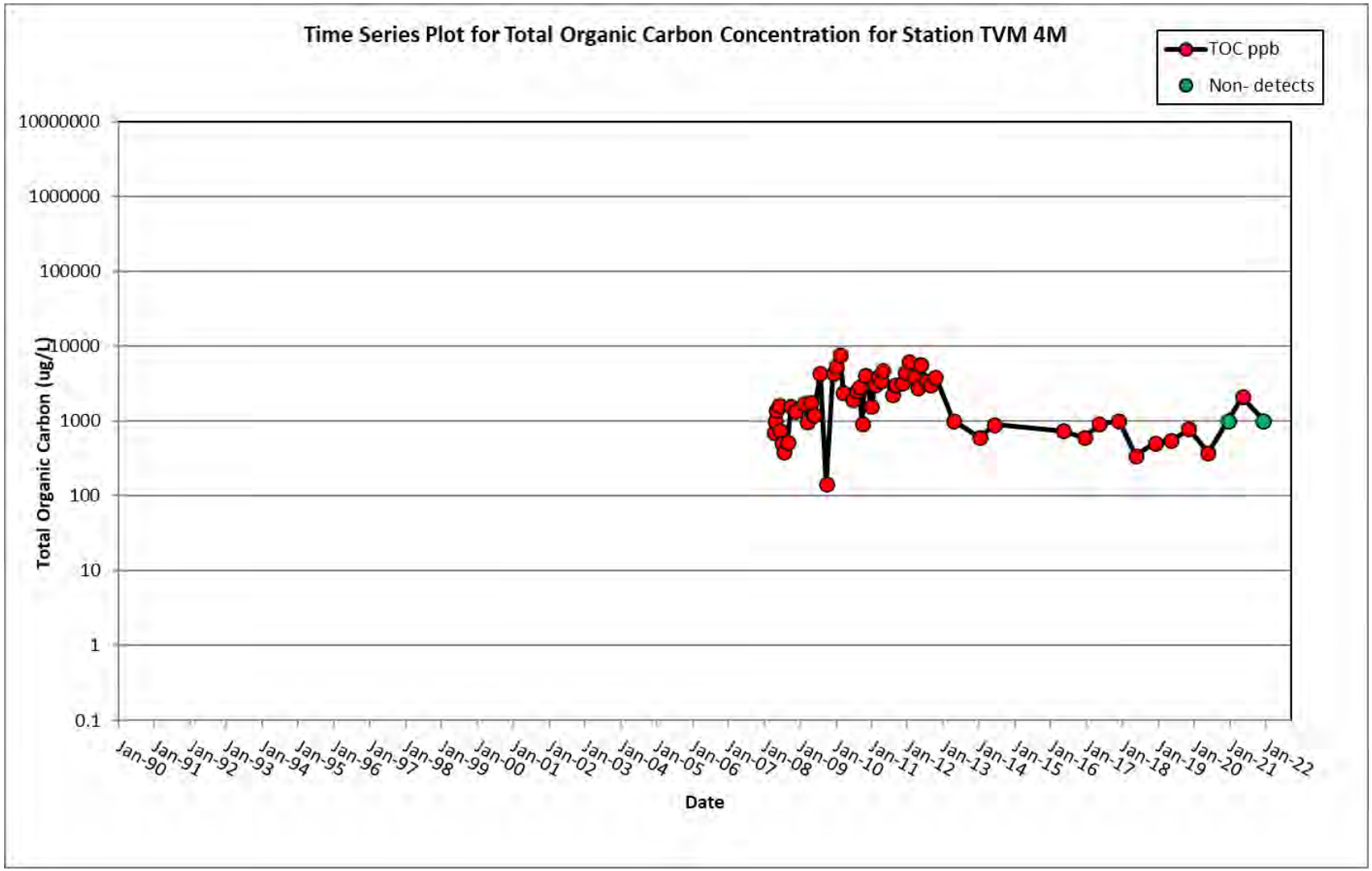

Time Series Plot for Total Organic Carbon Concentration for Station TRW 2
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

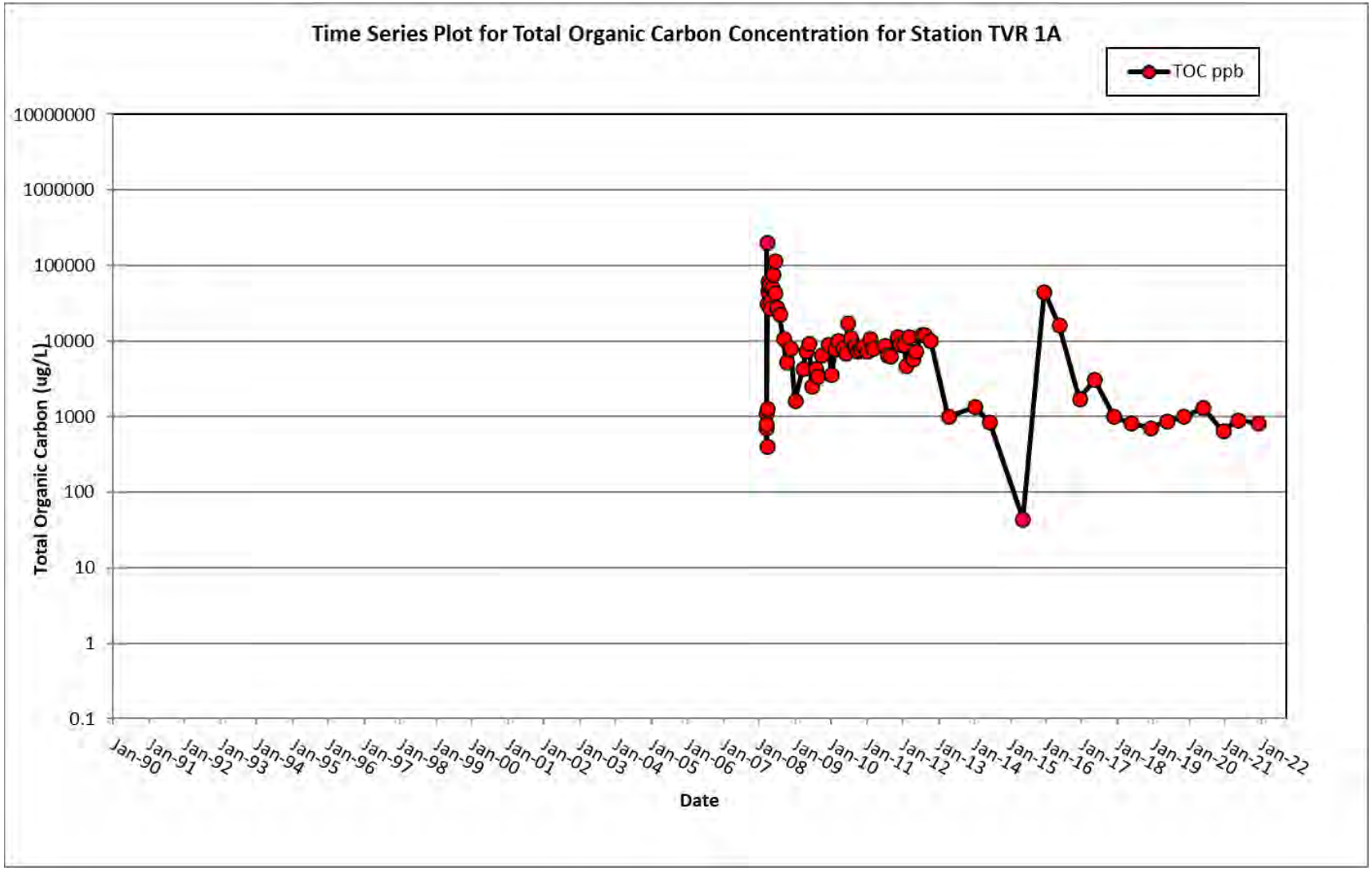

Time Series Plot for Total Organic Carbon Concentration for Station TRW 3
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

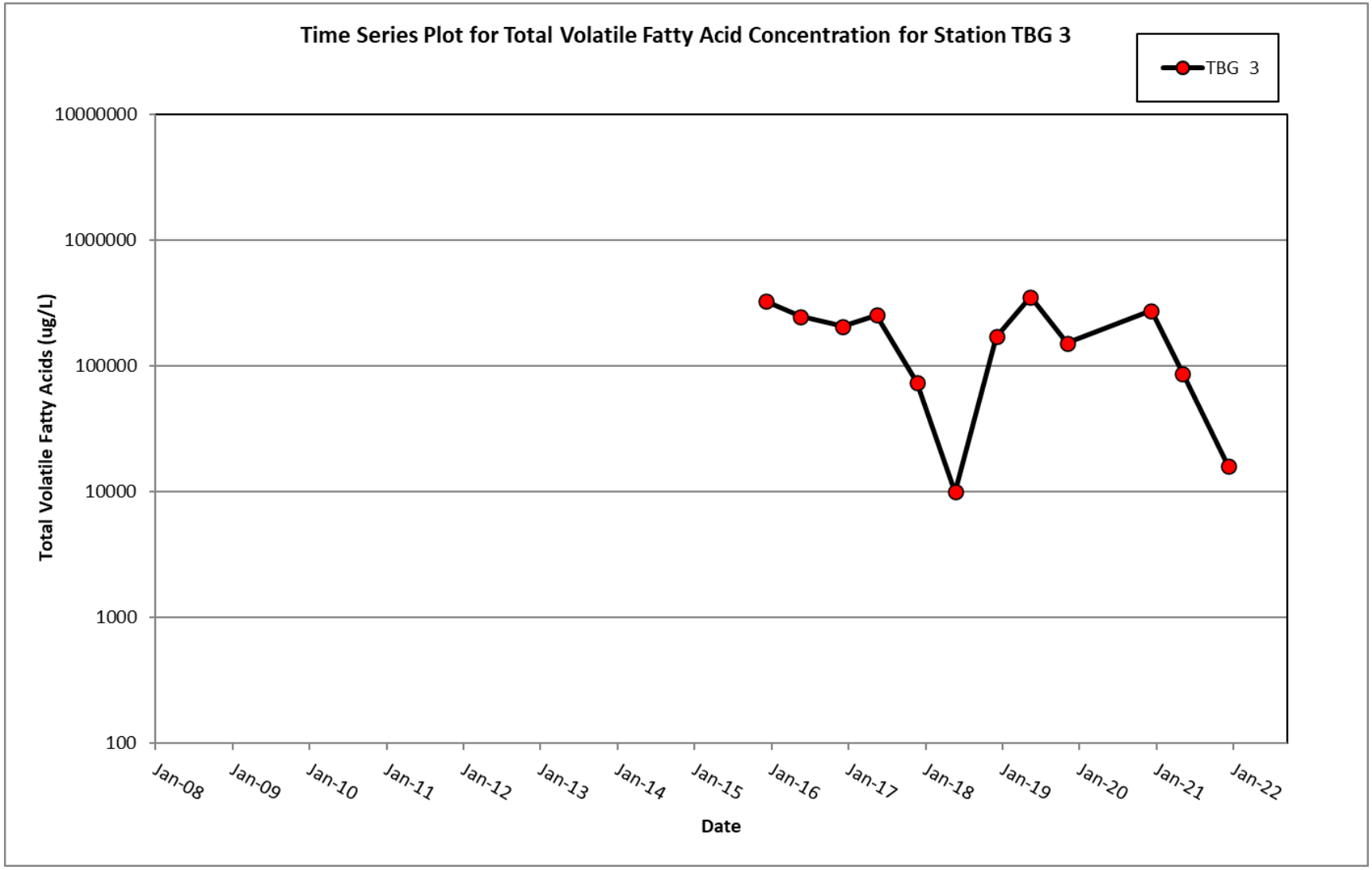

Time Series Plot for Total Organic Carbon Concentration for Station TRW 4R
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

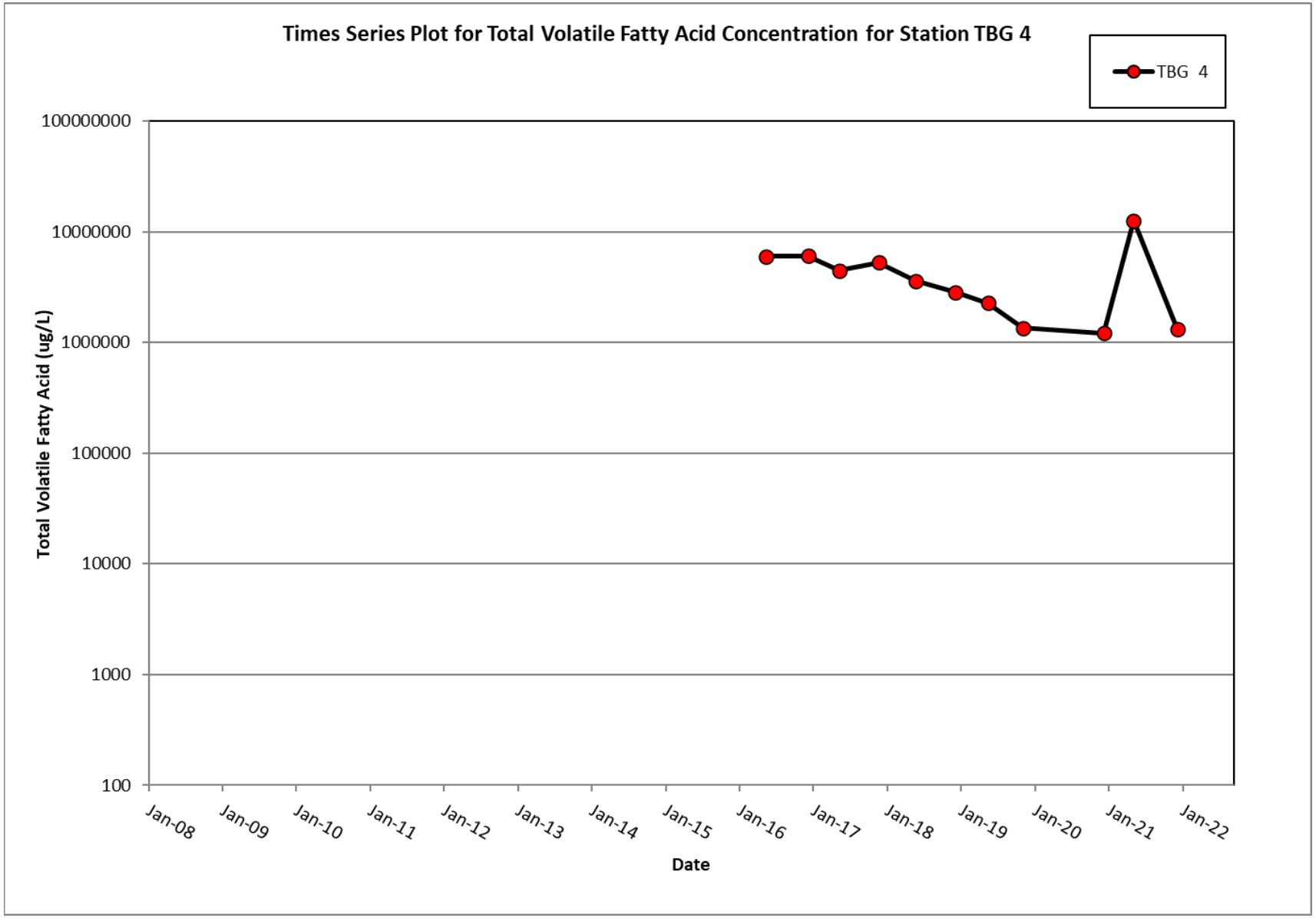

Time Series Plot for Total Organic Carbon Concentration for Station TVM 1M
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

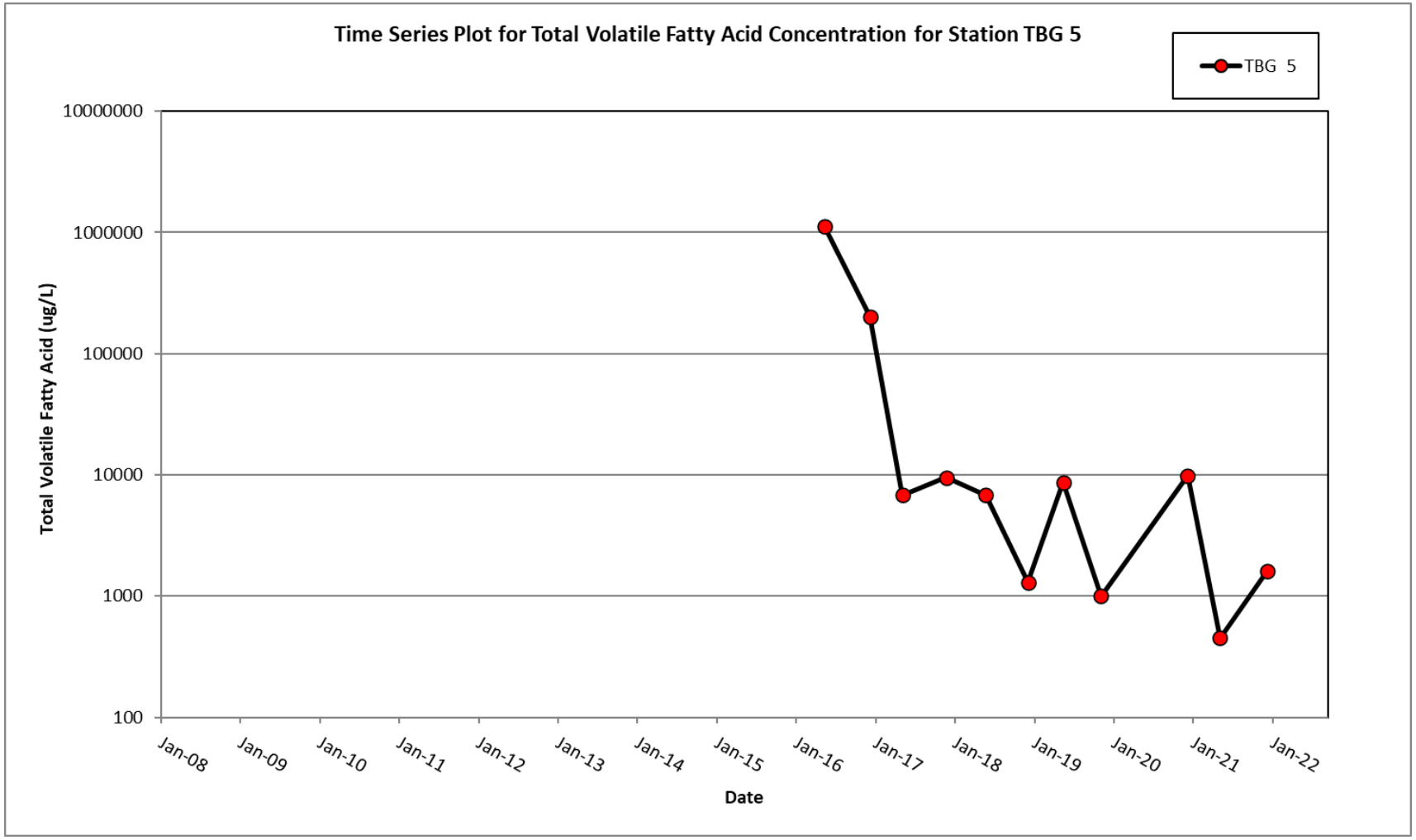

Time Series Plot for Total Organic Carbon Concentration for Station TVM 2M
TOC ppb
Non- detects
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

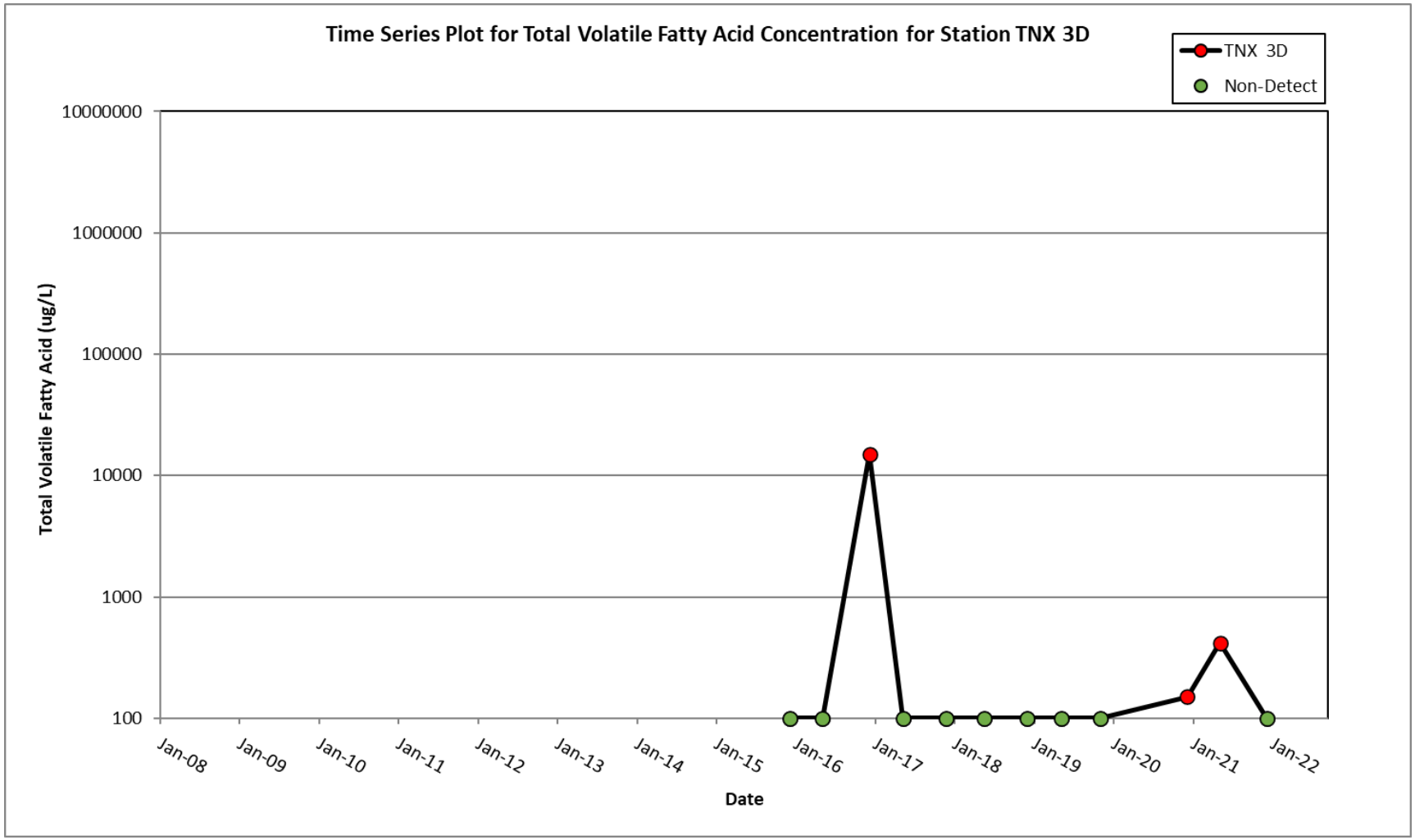

Time Series Plot for Total Organic Carbon Concentration for Station TVM 4M
TOC ppb
Non- detects
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

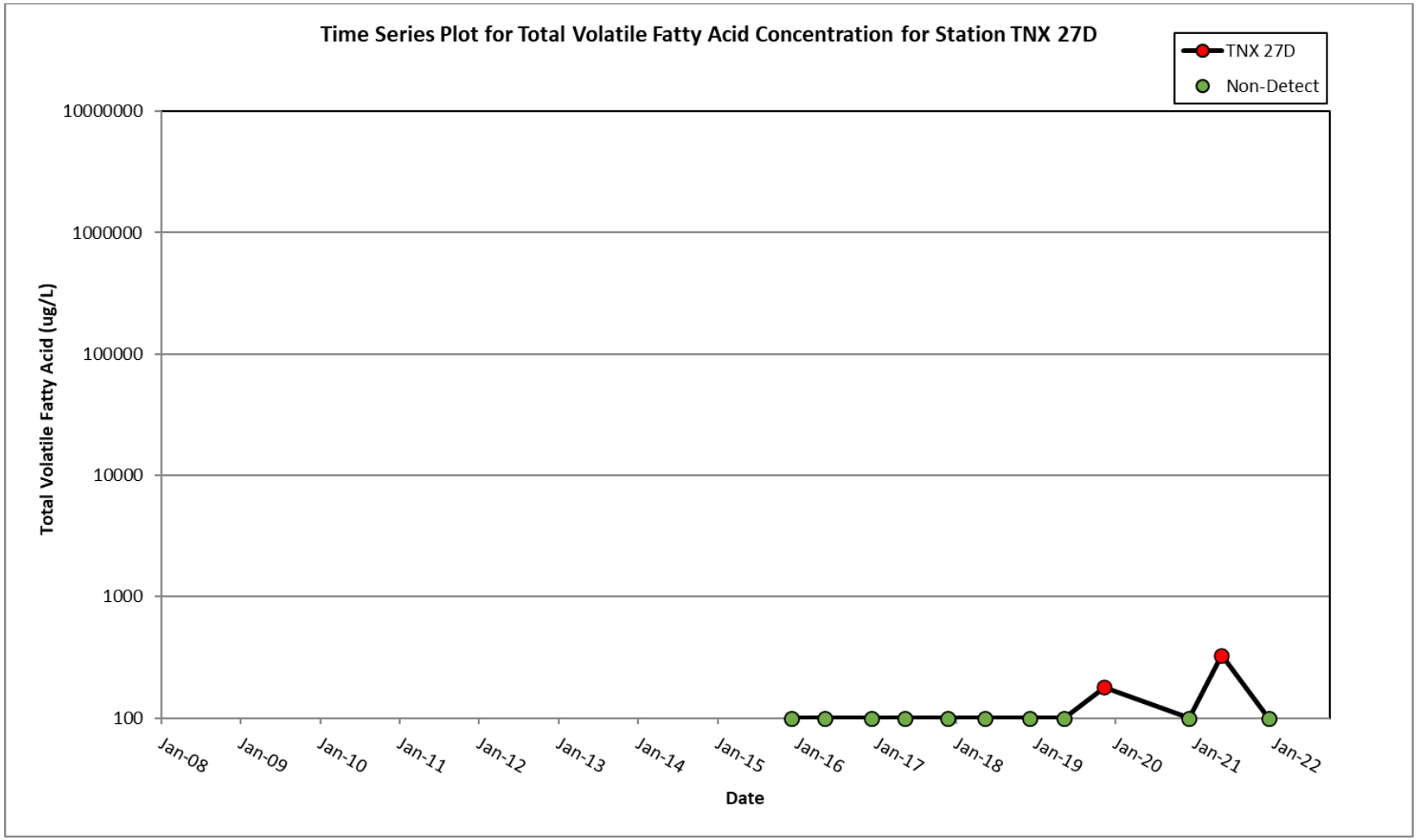

Time Series Plot for Total Organic Carbon Concentration for Station TVR 1A
TOC ppb
Total Organic Carbon (ug/L)
10000000
1000000
100000
10000
1000
100
10
1
0.1
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

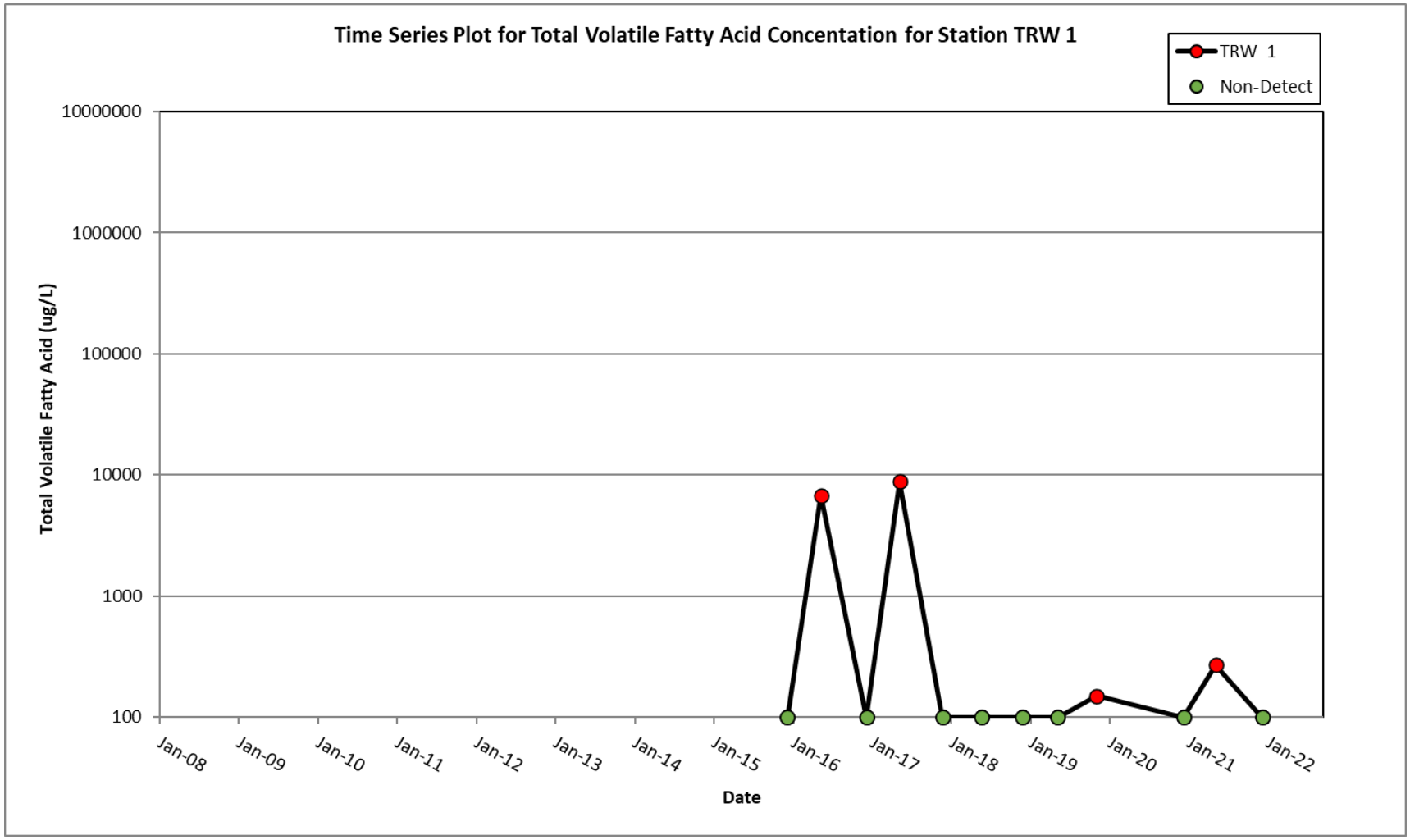

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TBG 3
TBG 3
Total Volatile Fatty Acids (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

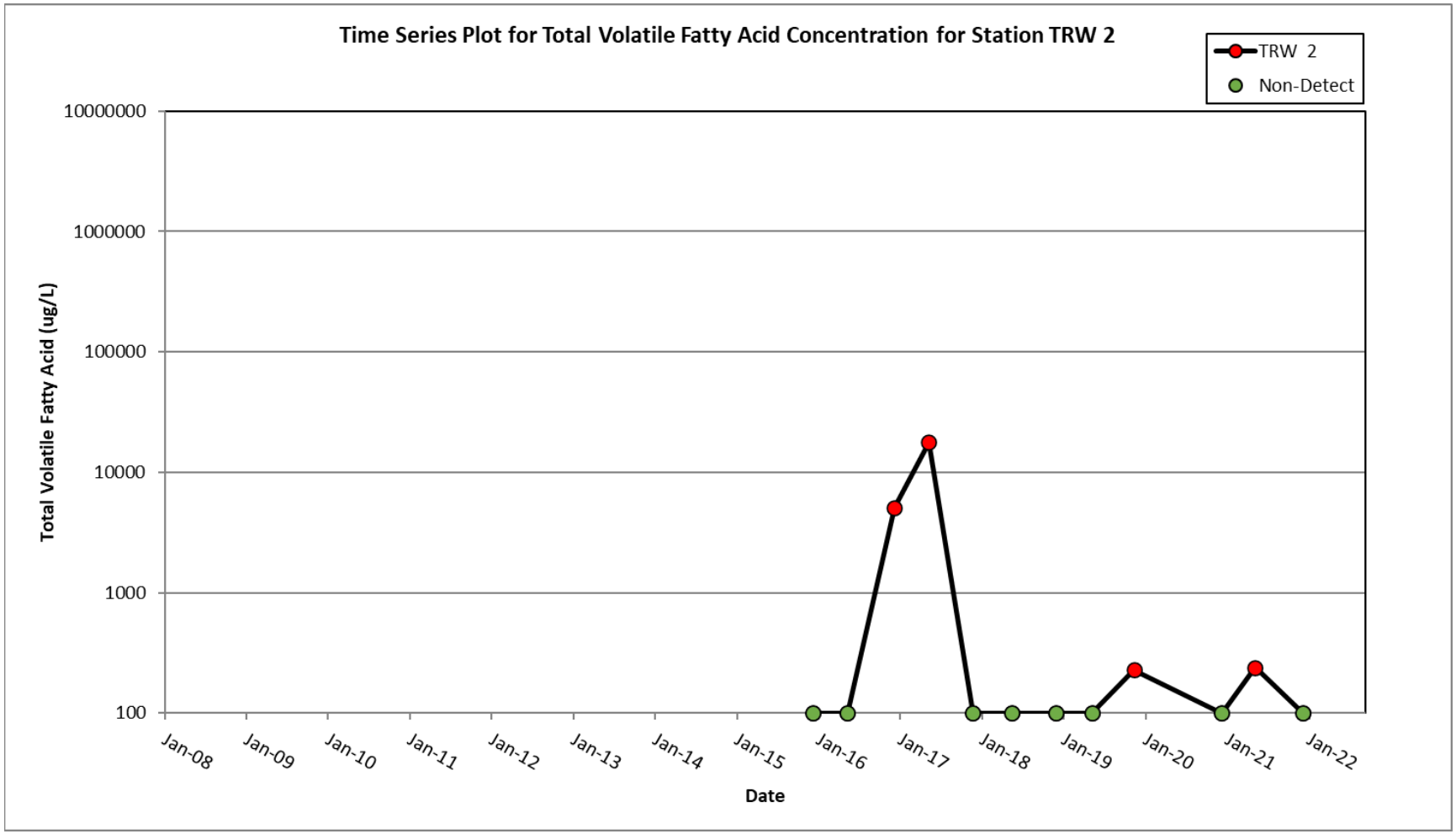

Times Series Plot for Total Volatile Fatty Acid Concentration for Station TBG 4
TBG 4
Total Volatile Fatty Acid (ug/L)
100000000
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

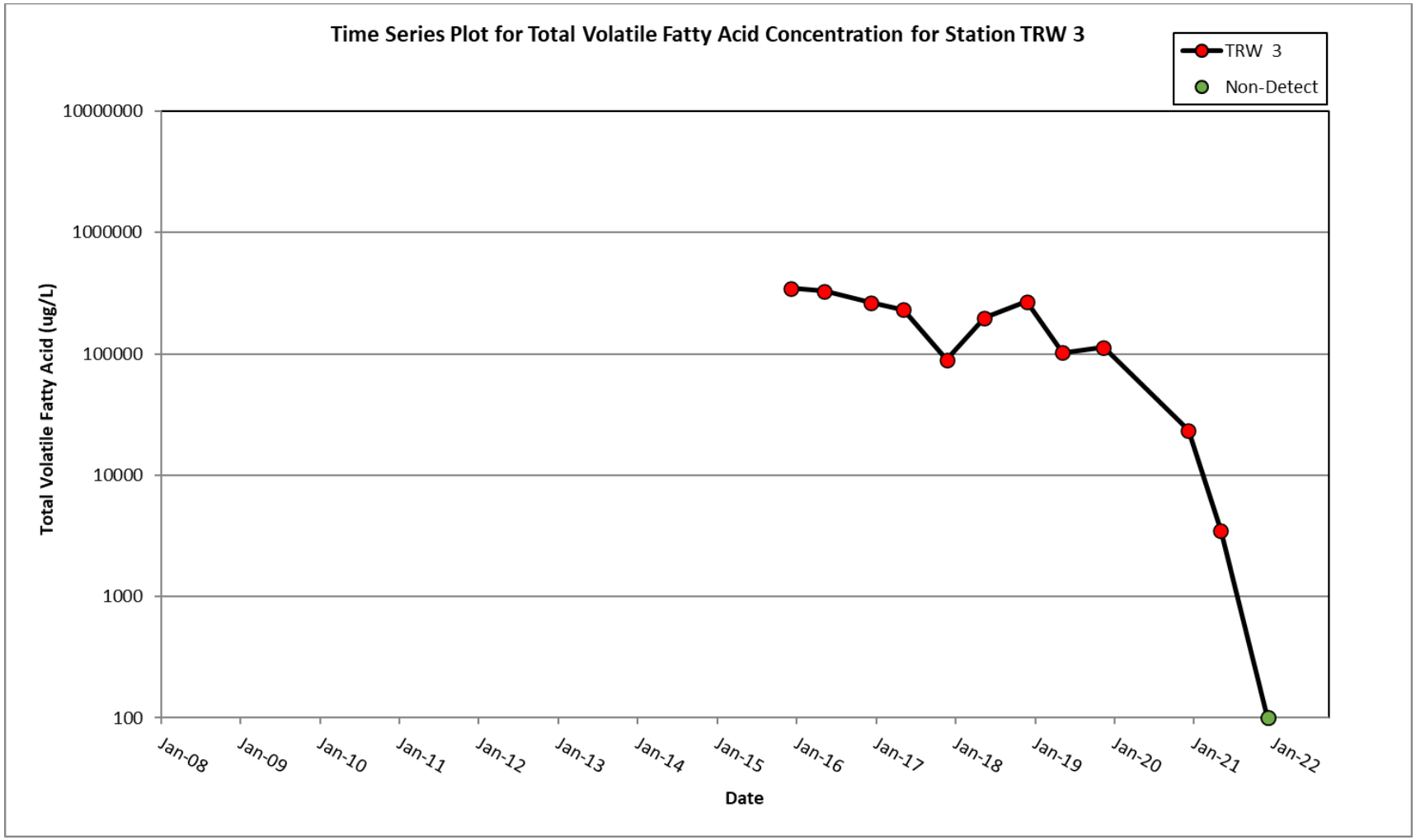

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TBG 5
TBG 5
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

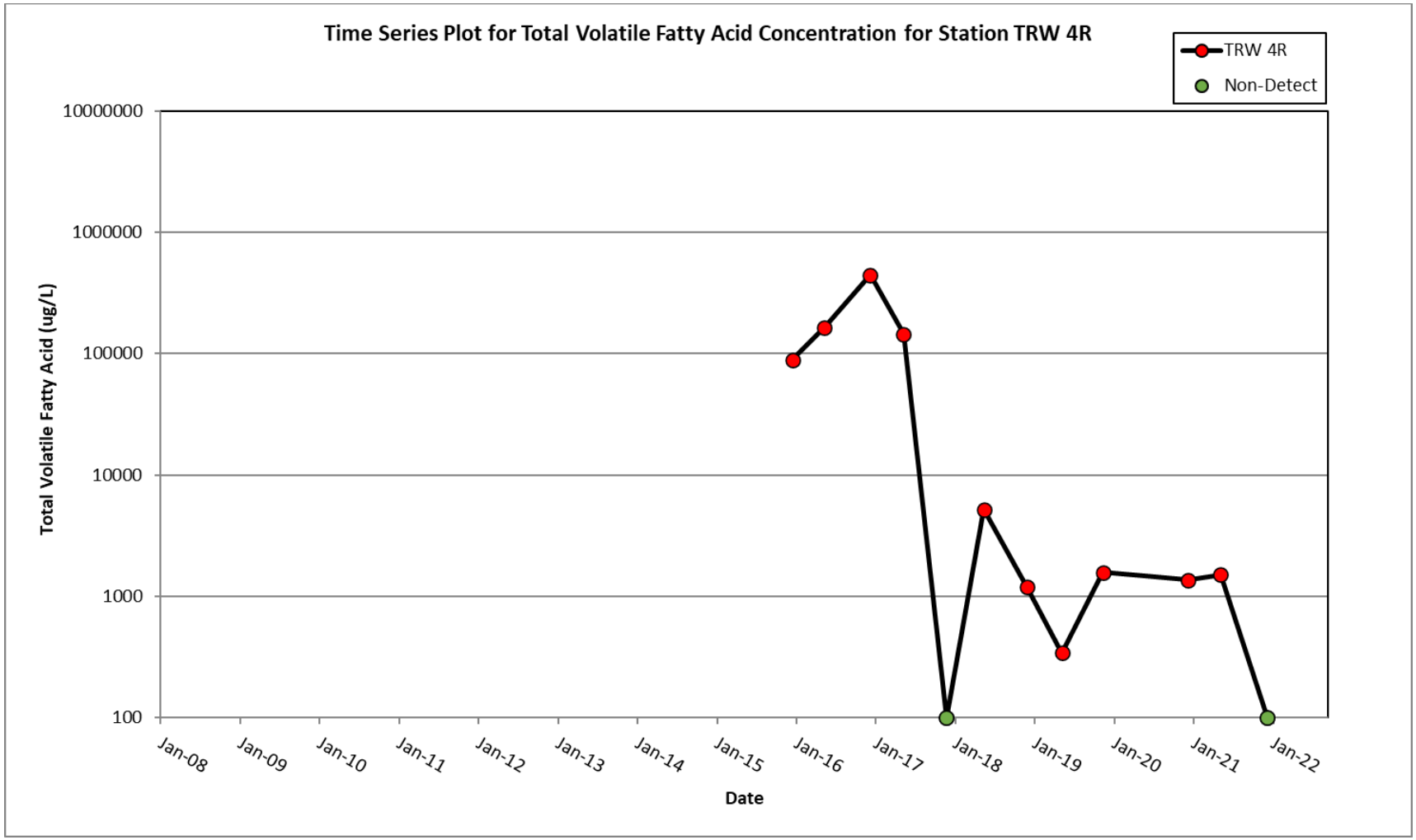

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TNX 3D
TNX 3D
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

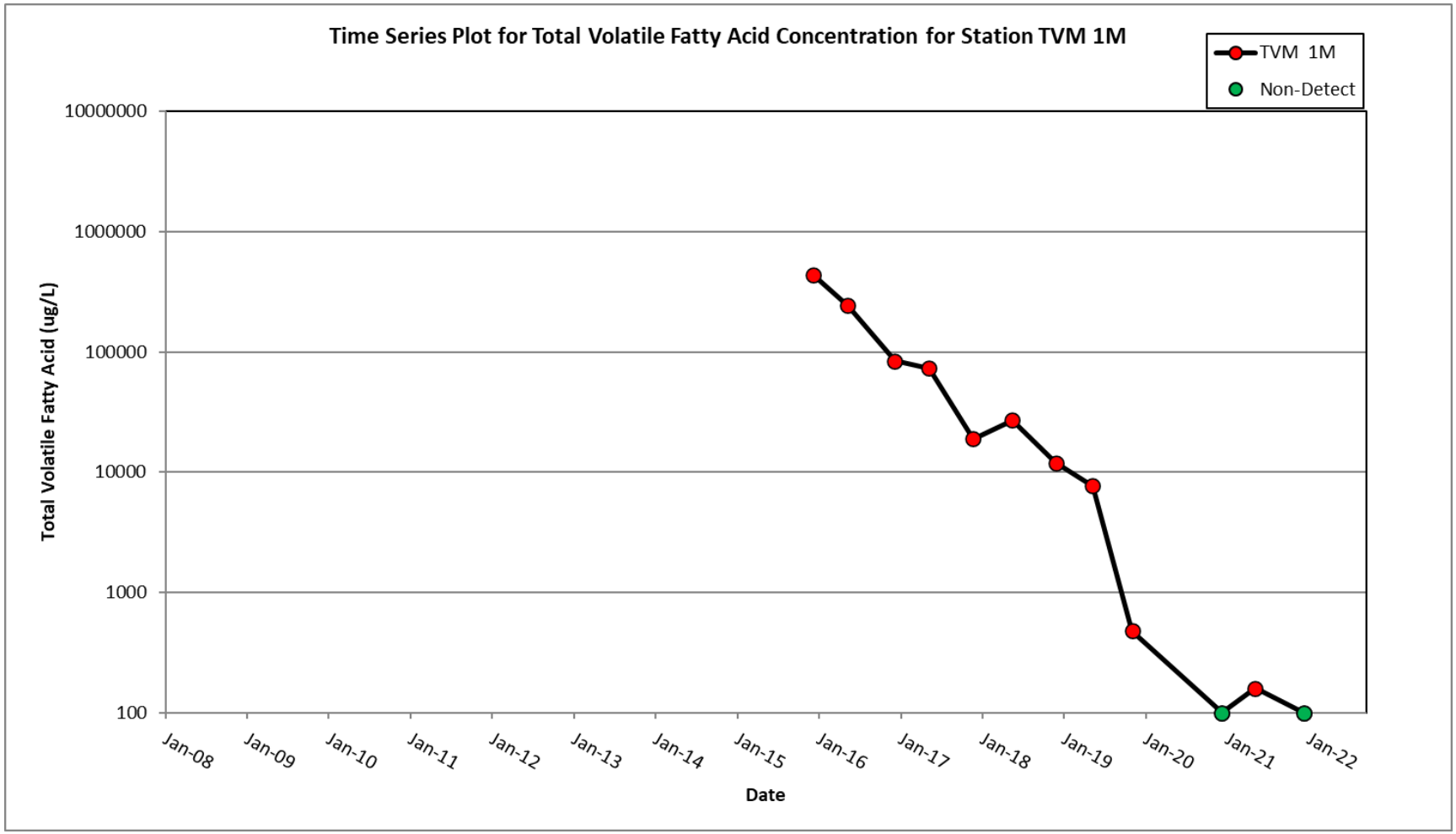

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TNX 27D
TNX 27D
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

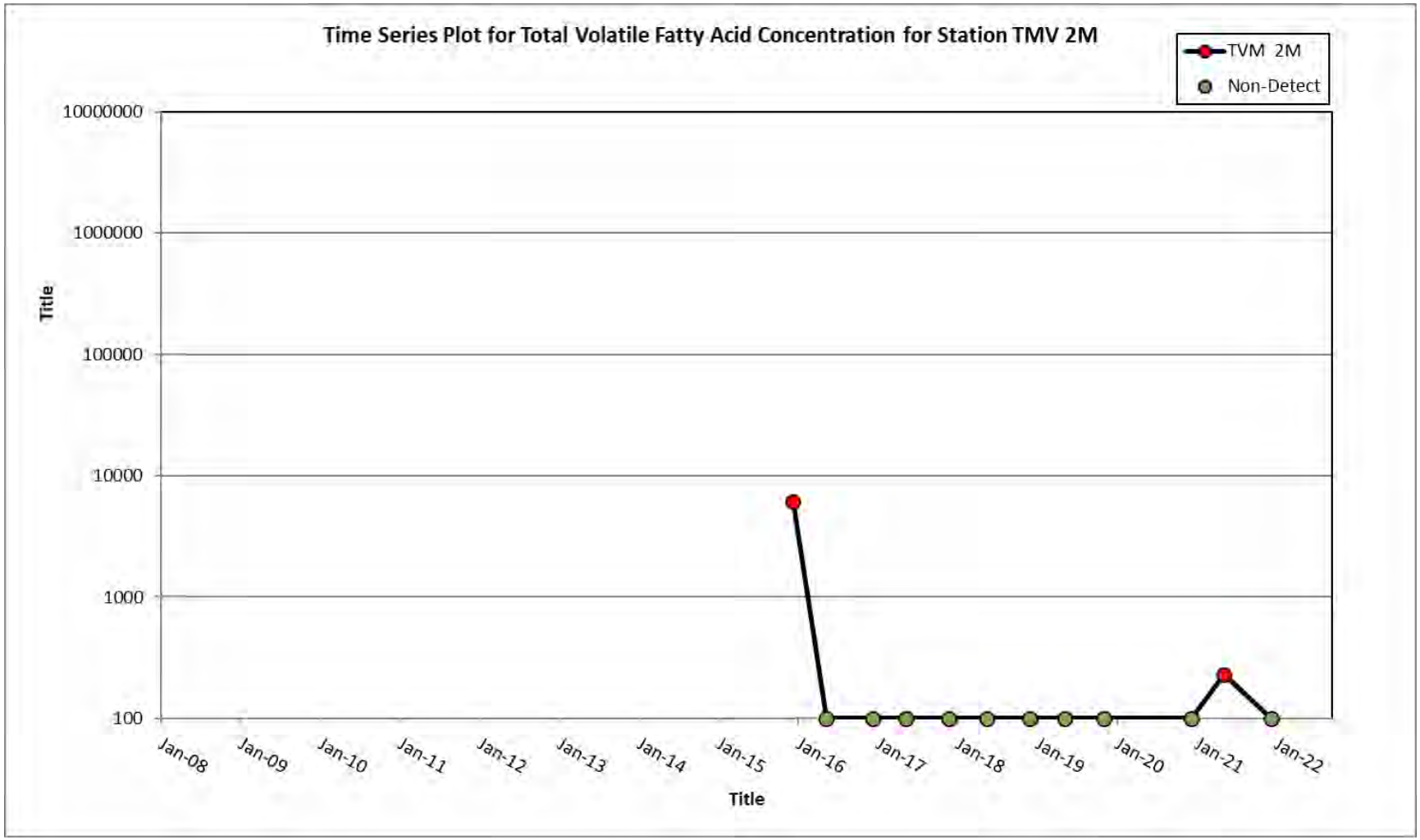

Time Series Plot for Total Volatile Fatty Acid Concentation for Station TRW 1
TRW 1
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

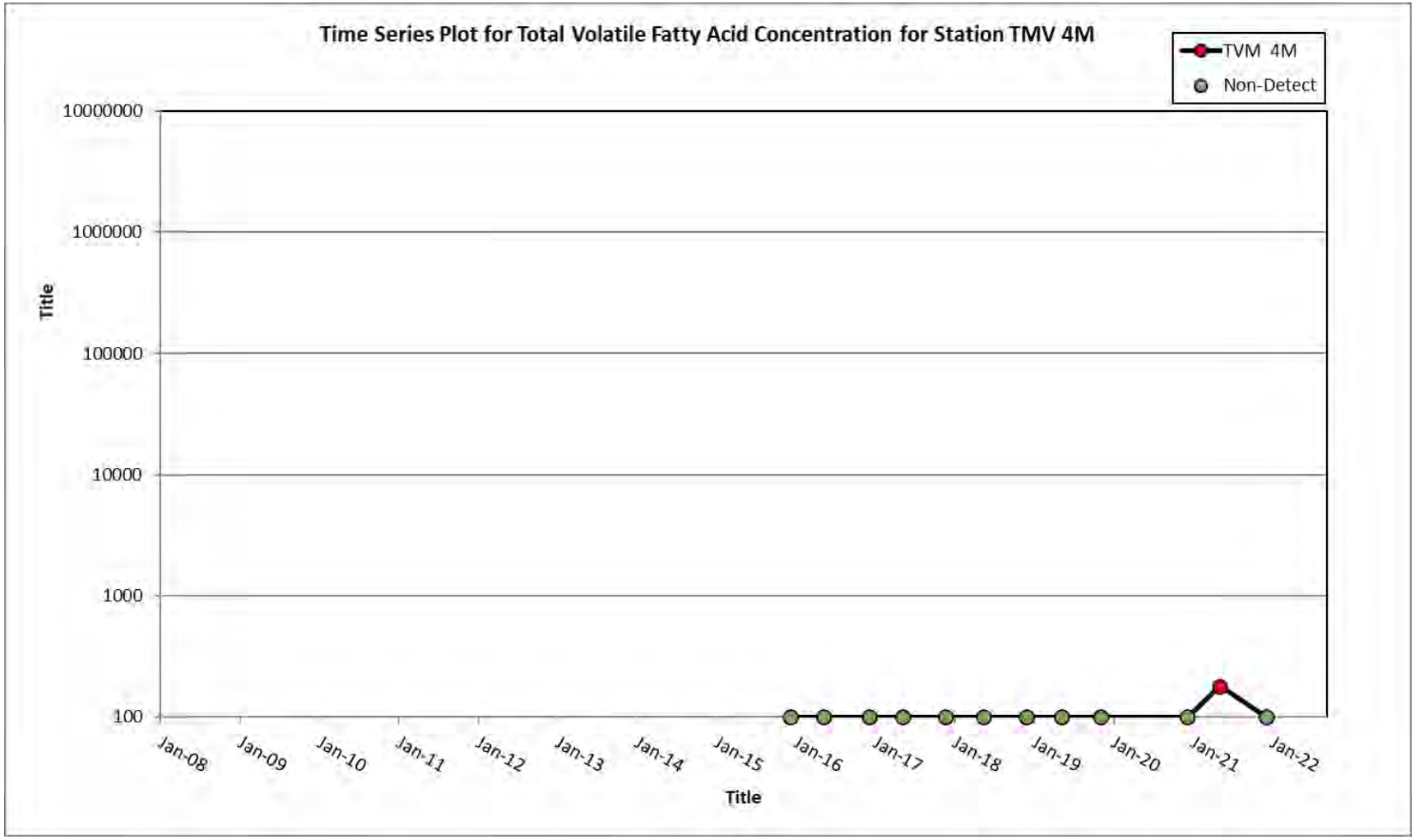

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TRW 2
TRW 2
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

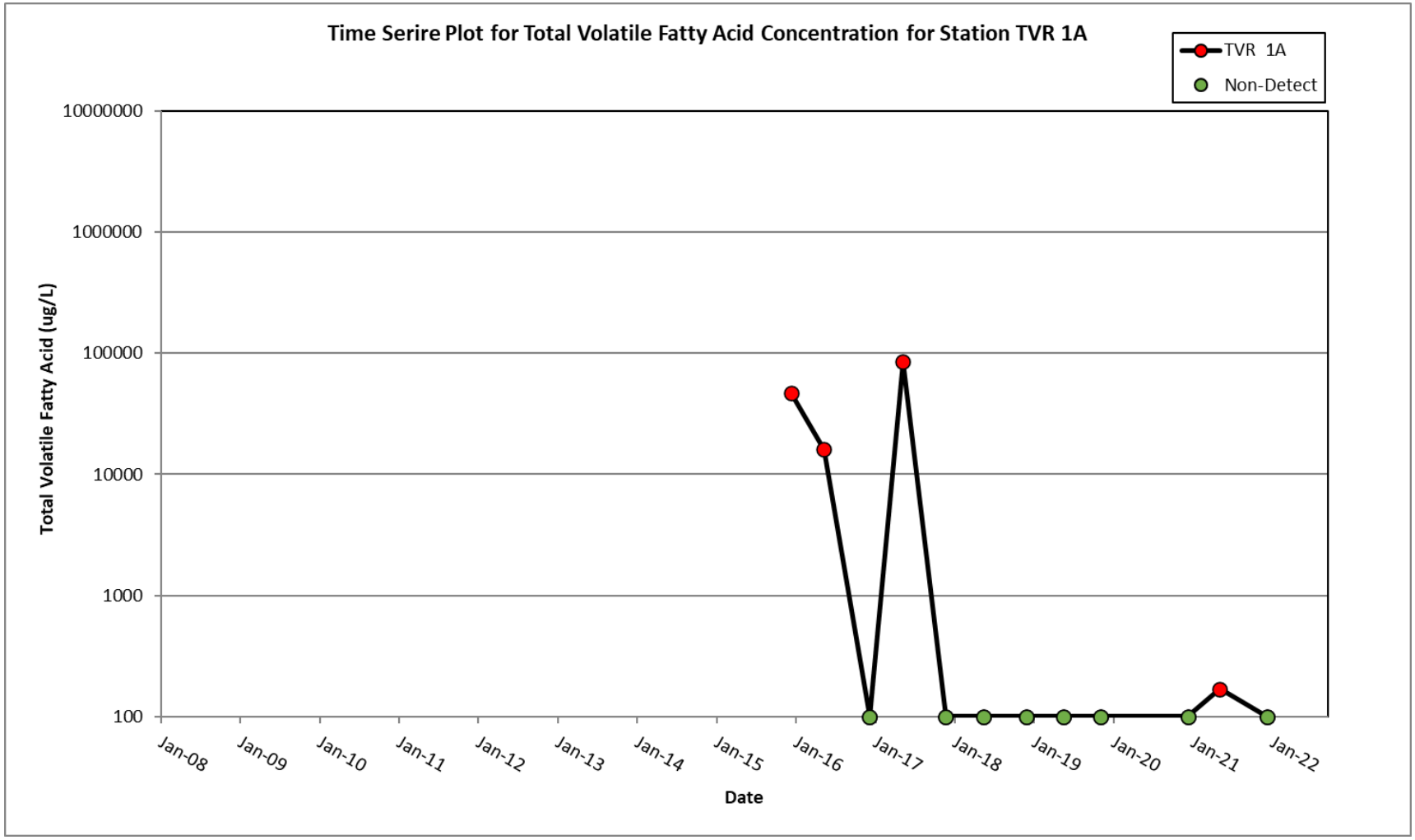

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TRW 3
TRW 3
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

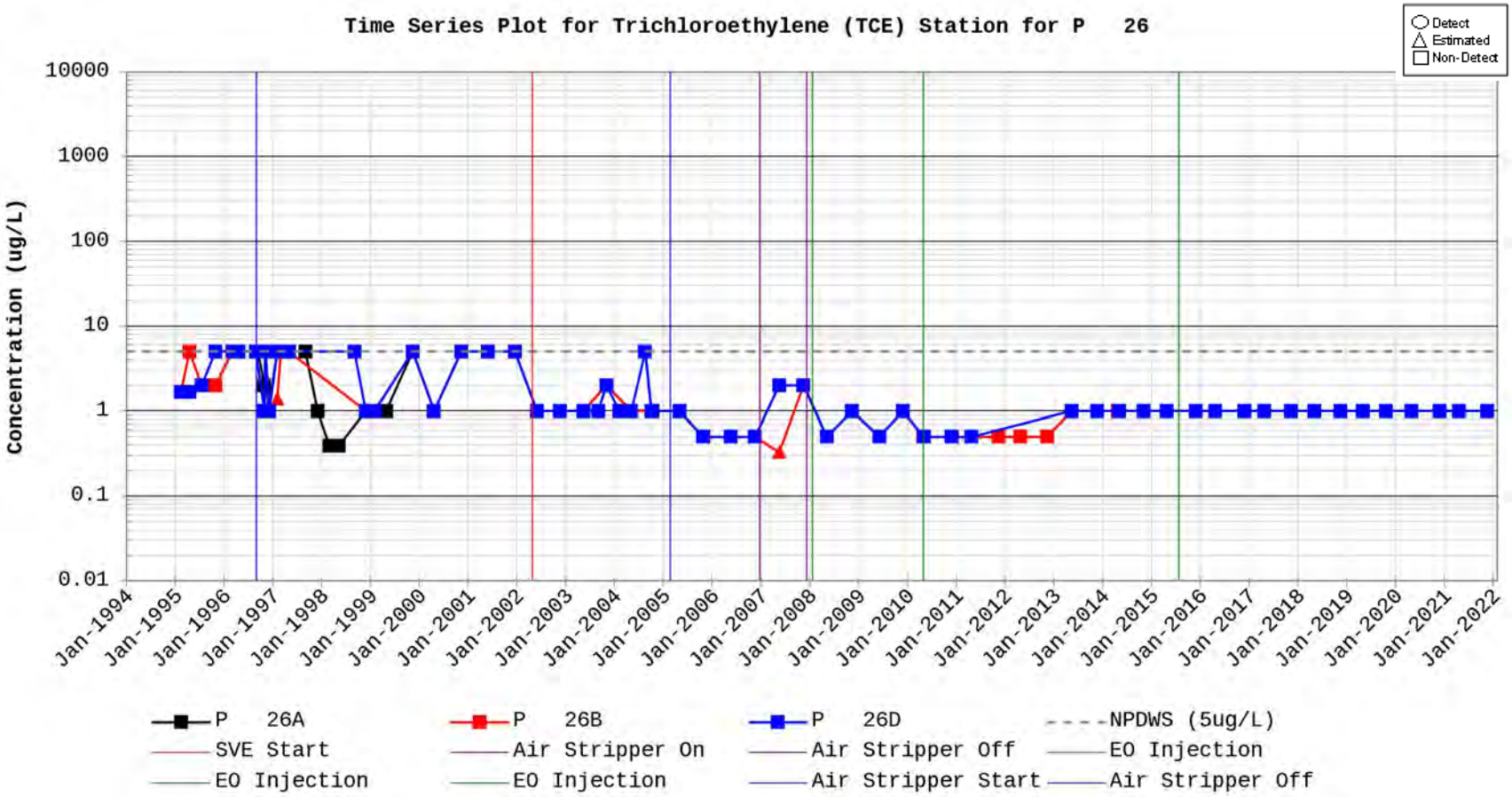

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TRW 4R
TRW 4R
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

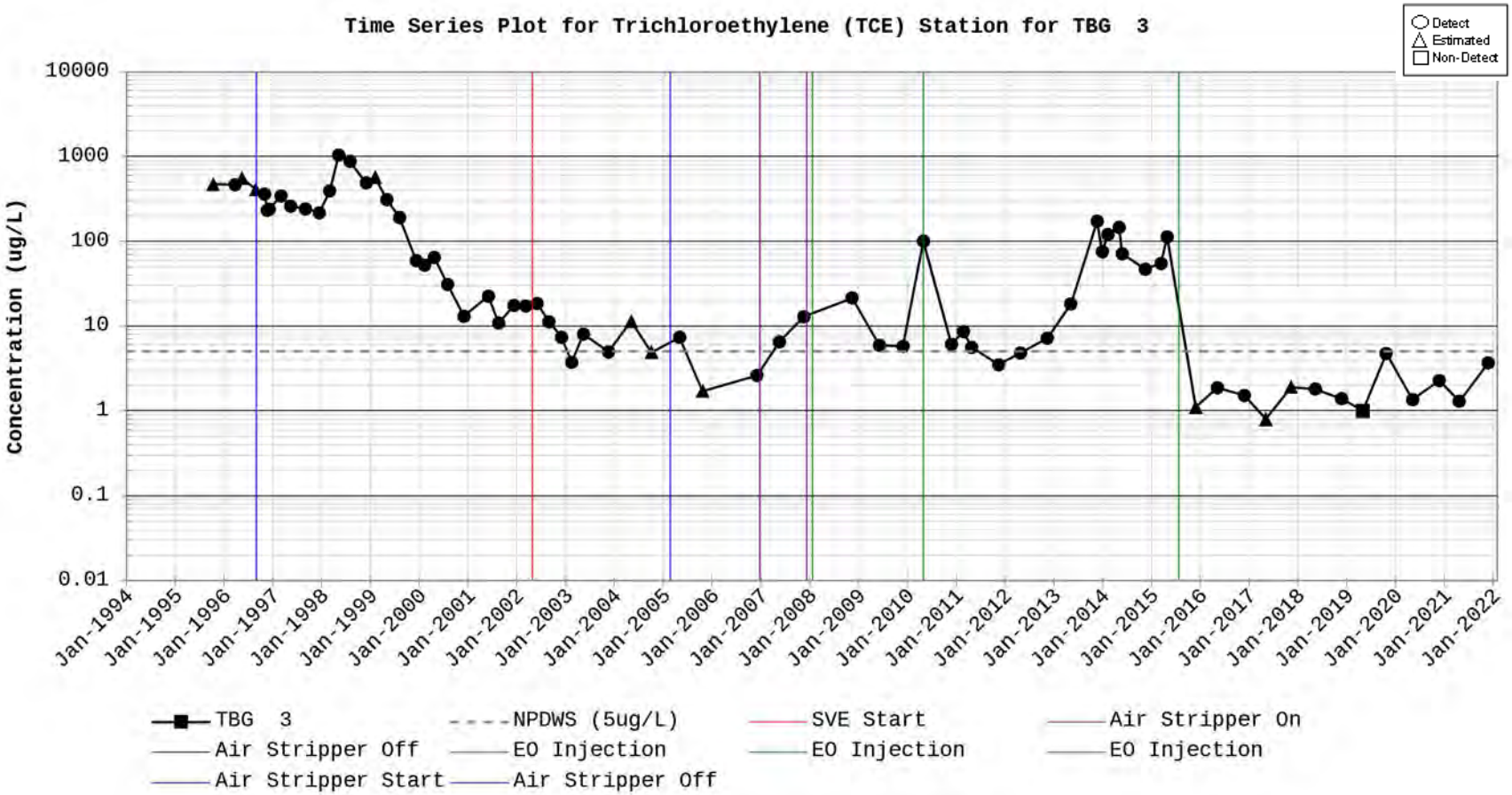

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TVM 1M
TVM 1M
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

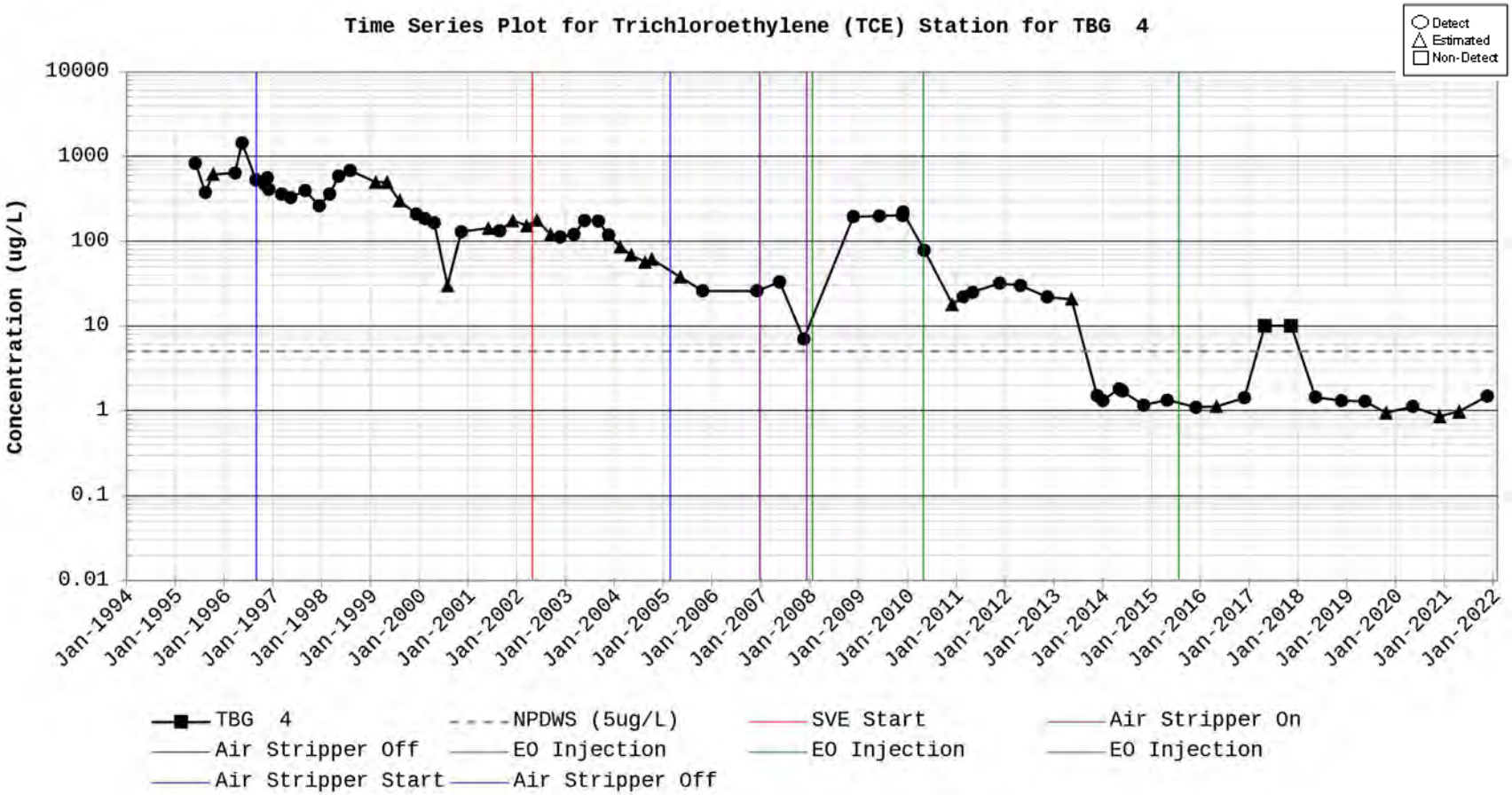

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TMV 2M
TVM 2M
Non-Detect
10000000
1000000
100000
10000
1000
100
Title
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Title

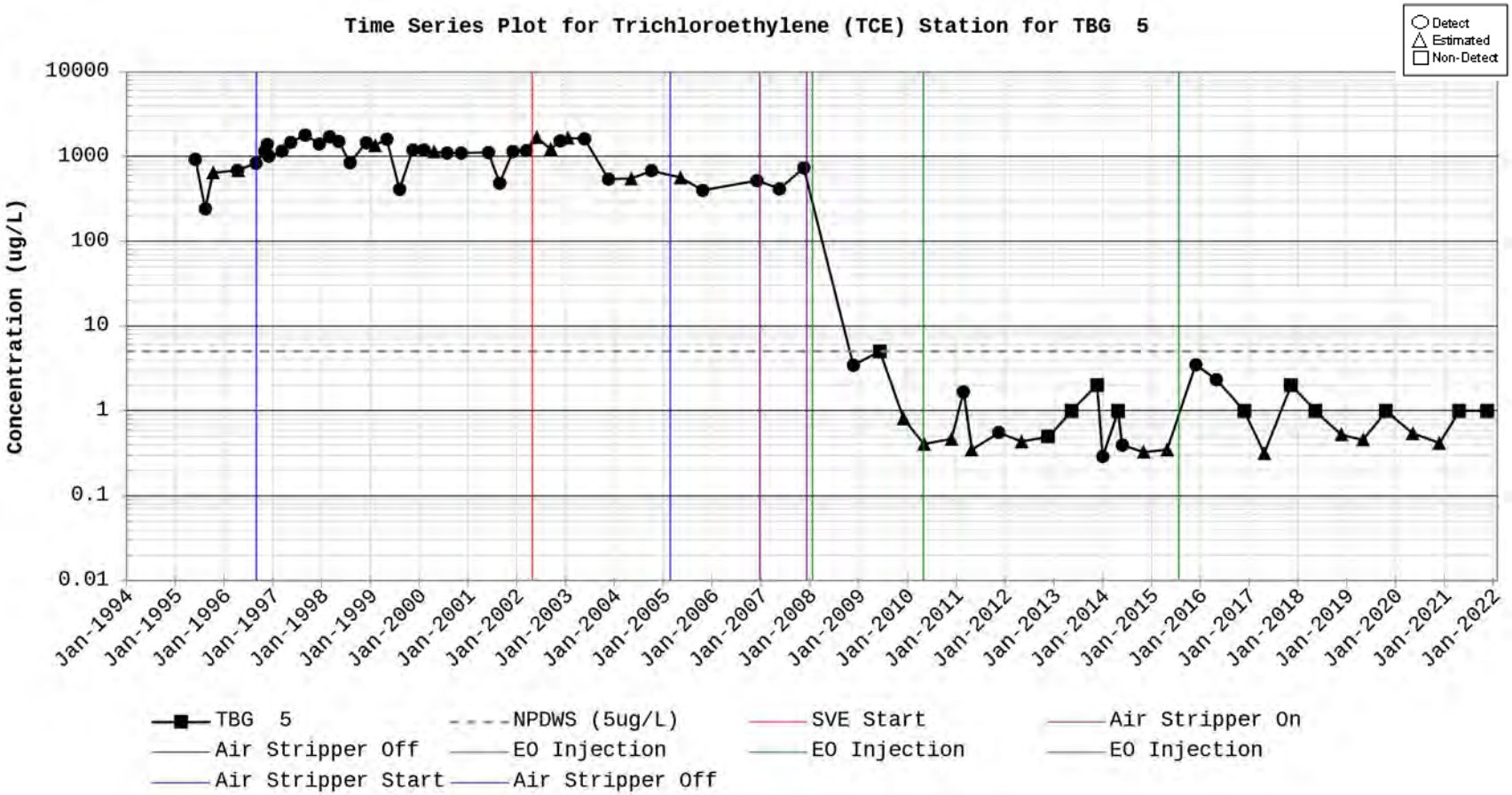

Time Series Plot for Total Volatile Fatty Acid Concentration for Station TMV 4M
TVM 4M
Non-Detect
10000000
1000000
100000
10000
1000
100
Title
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Title

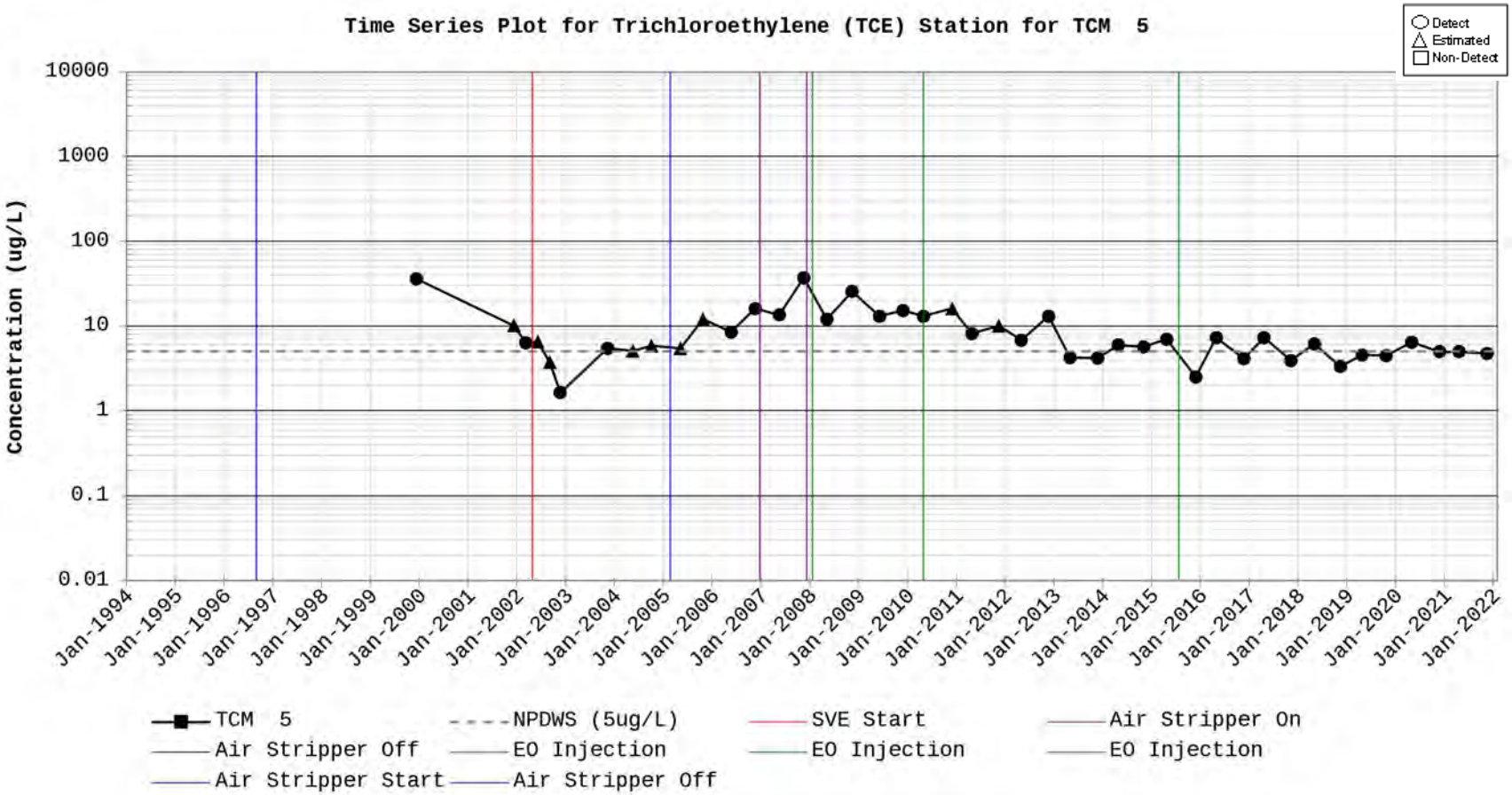

Time Serire Plot for Total Volatile Fatty Acid Concentration for Station TVR 1A
TVR 1A
Non-Detect
Total Volatile Fatty Acid (ug/L)
10000000
1000000
100000
10000
1000
100
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Date

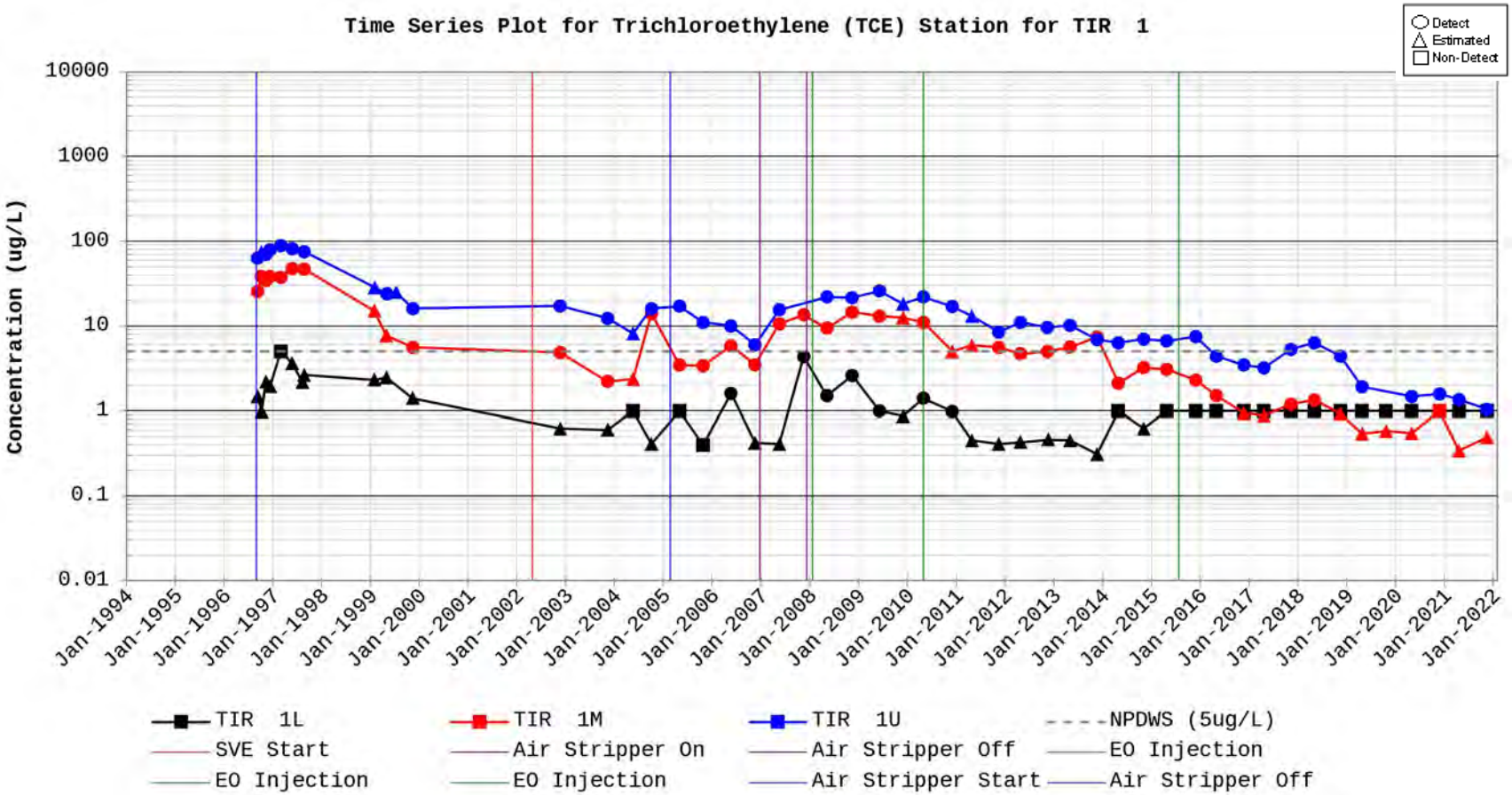

Time Series Plot for Trichloroethylene (TCE) Station for P 26
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
P 26A
P 26B
P 26D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

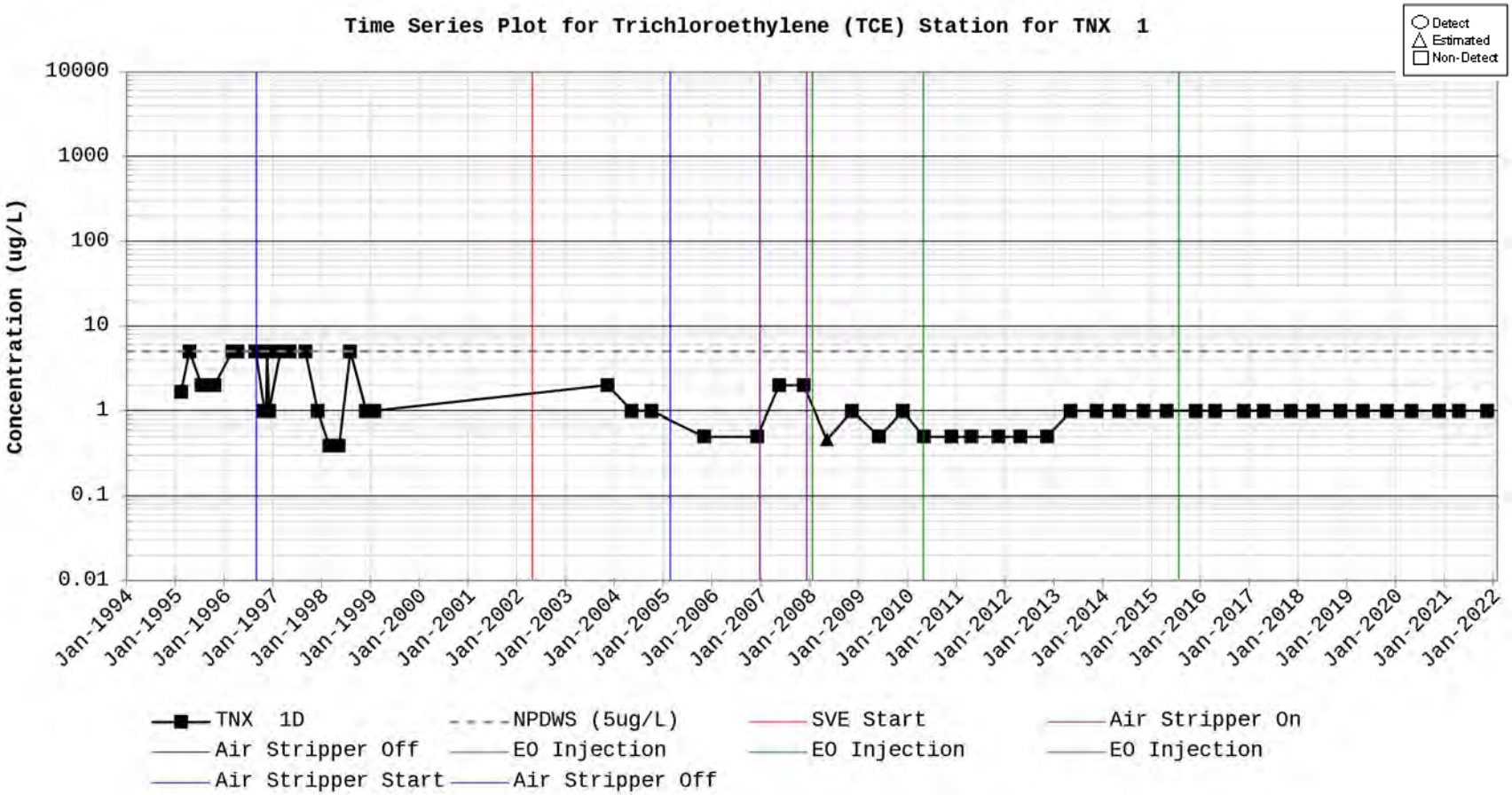

Time Series Plot for Trichloroethylene (TCE) Station for TBG 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

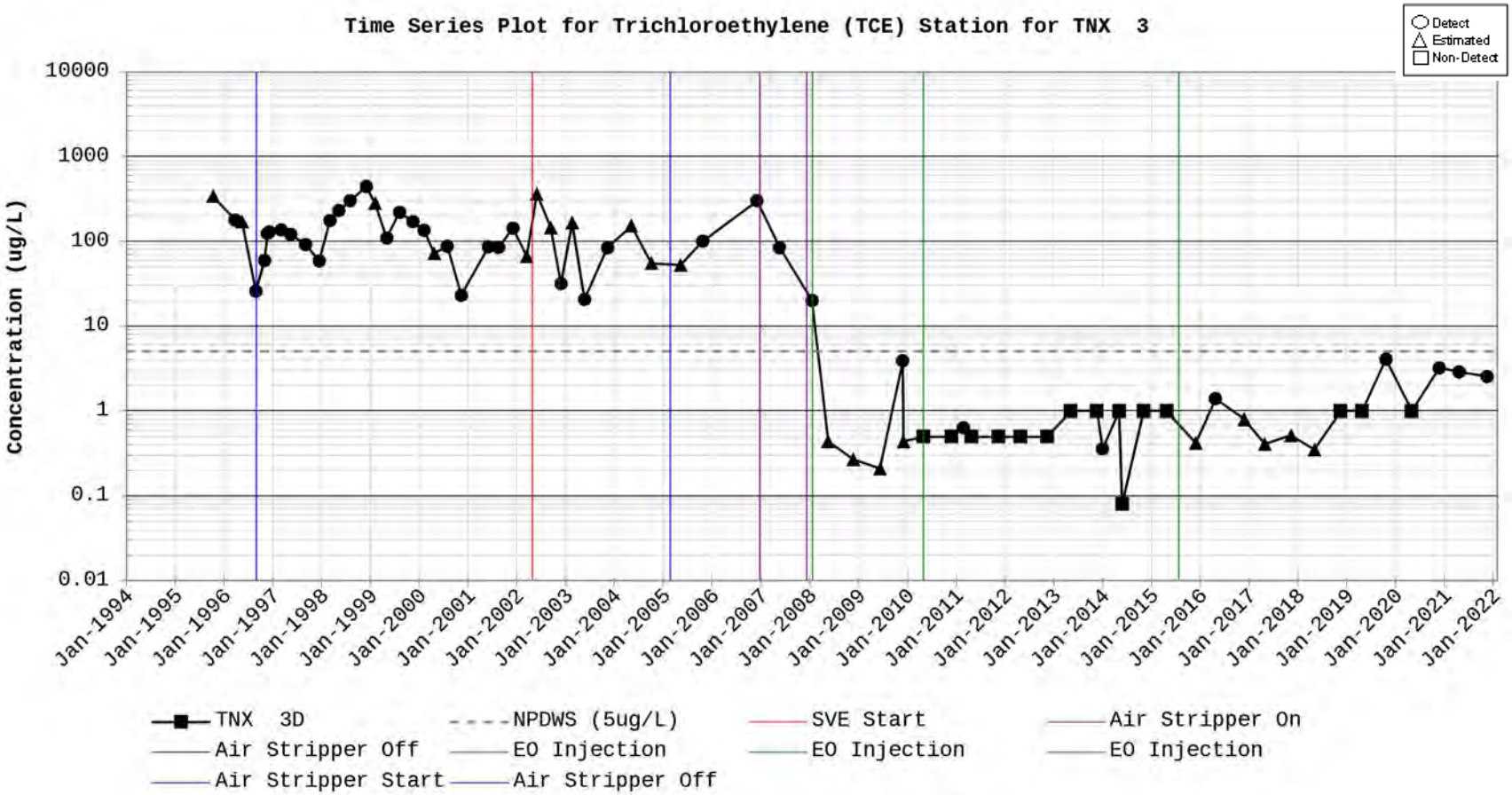

Time Series Plot for Trichloroethylene (TCE) Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

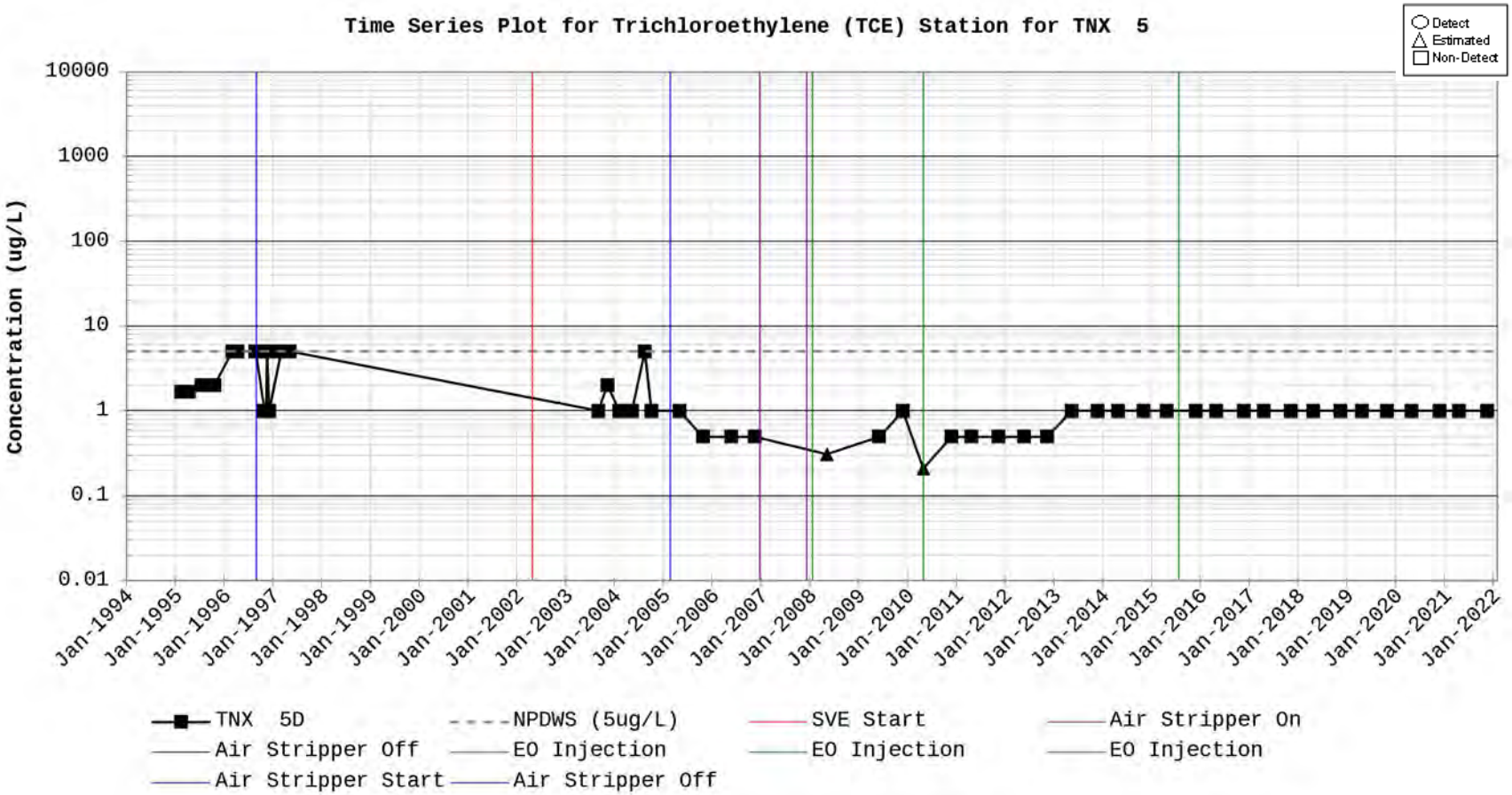

Time Series Plot for Trichloroethylene (TCE) Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

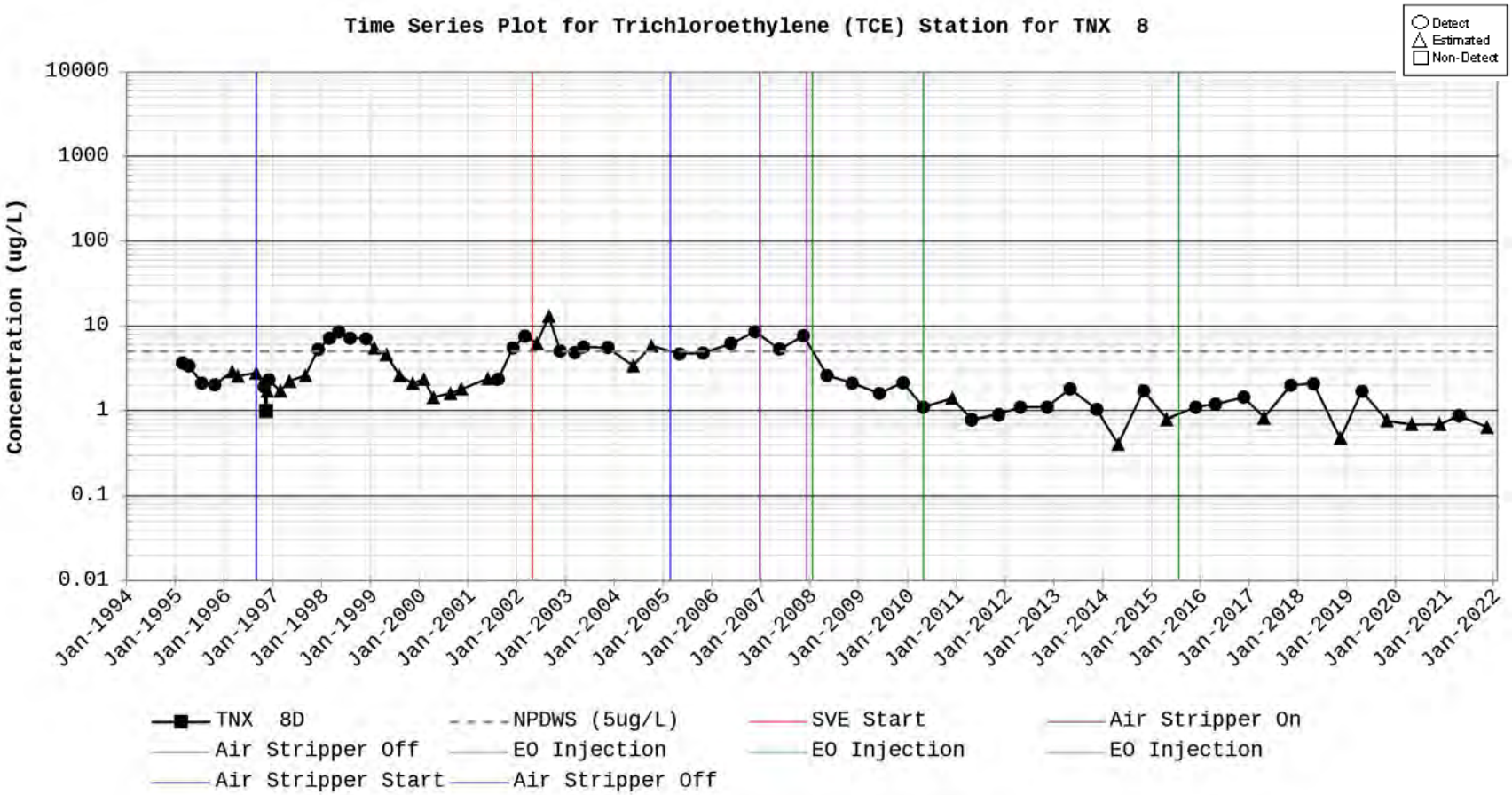

Time Series Plot for Trichloroethylene (TCE) Station for TCM 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

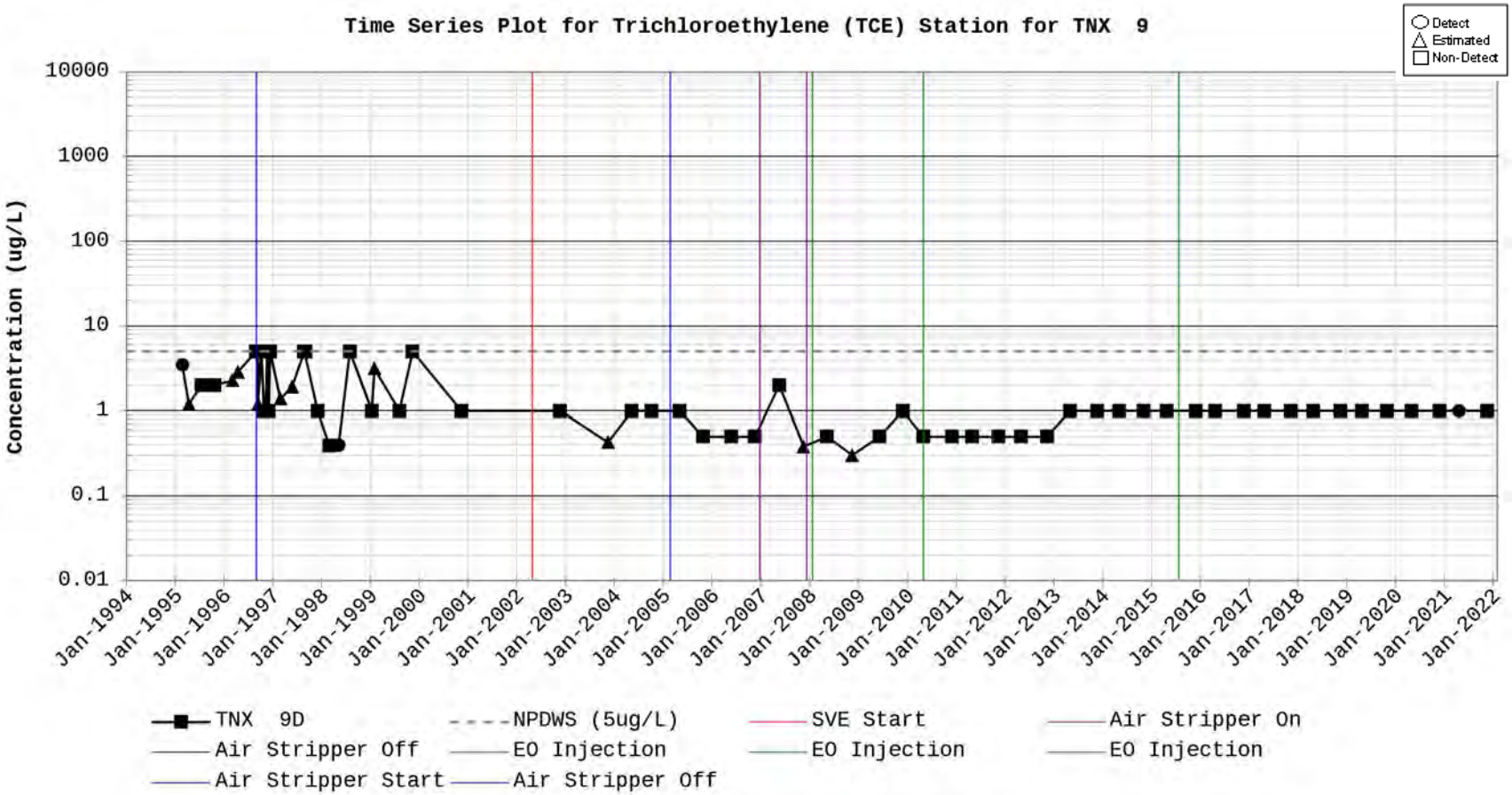

Time Series Plot for Trichloroethylene (TCE) Station for TIR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
TIR 1M
TIR 1U
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

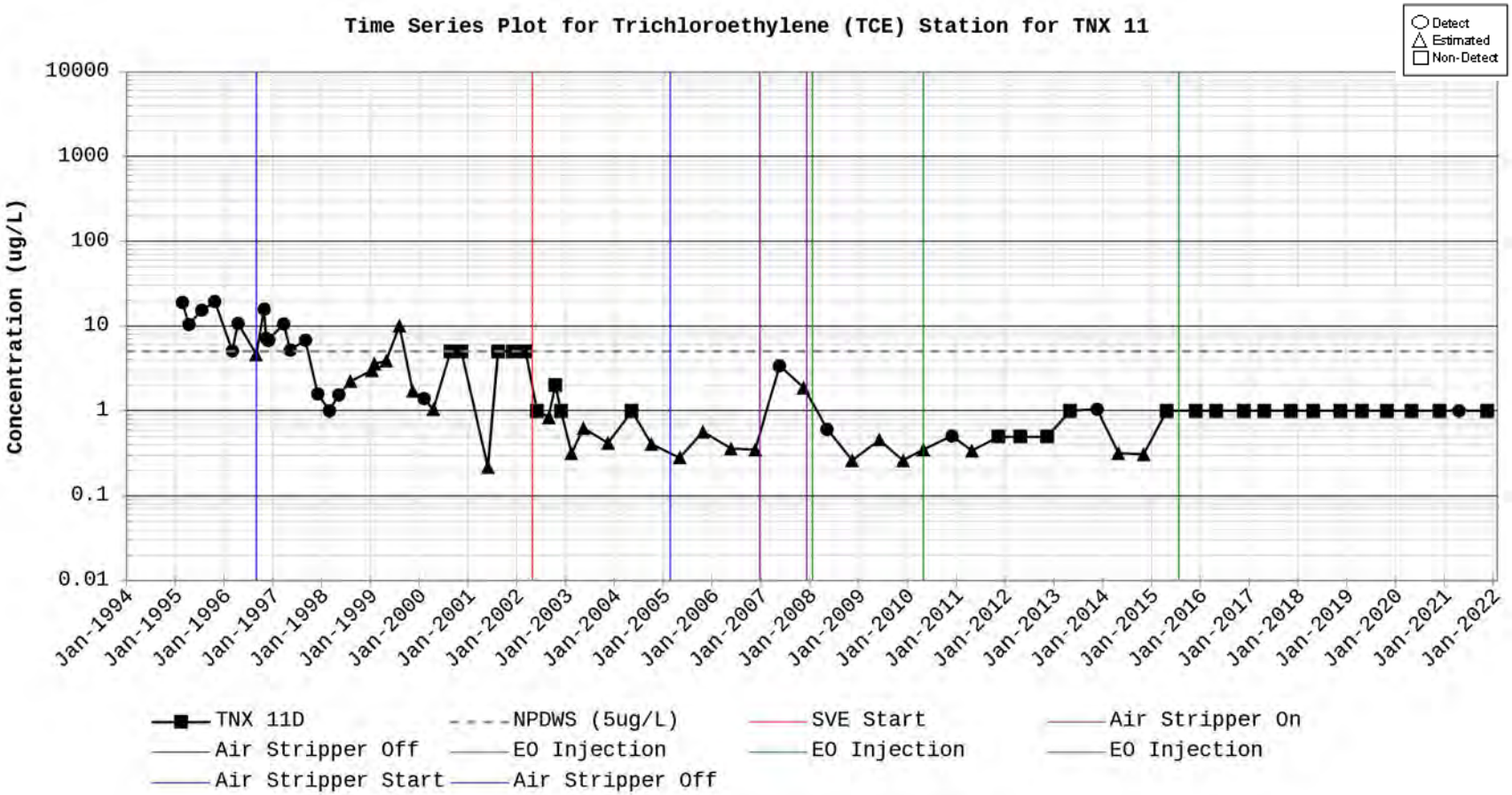

Time Series Plot for Trichloroethylene (TCE) Station for TNX 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 1D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

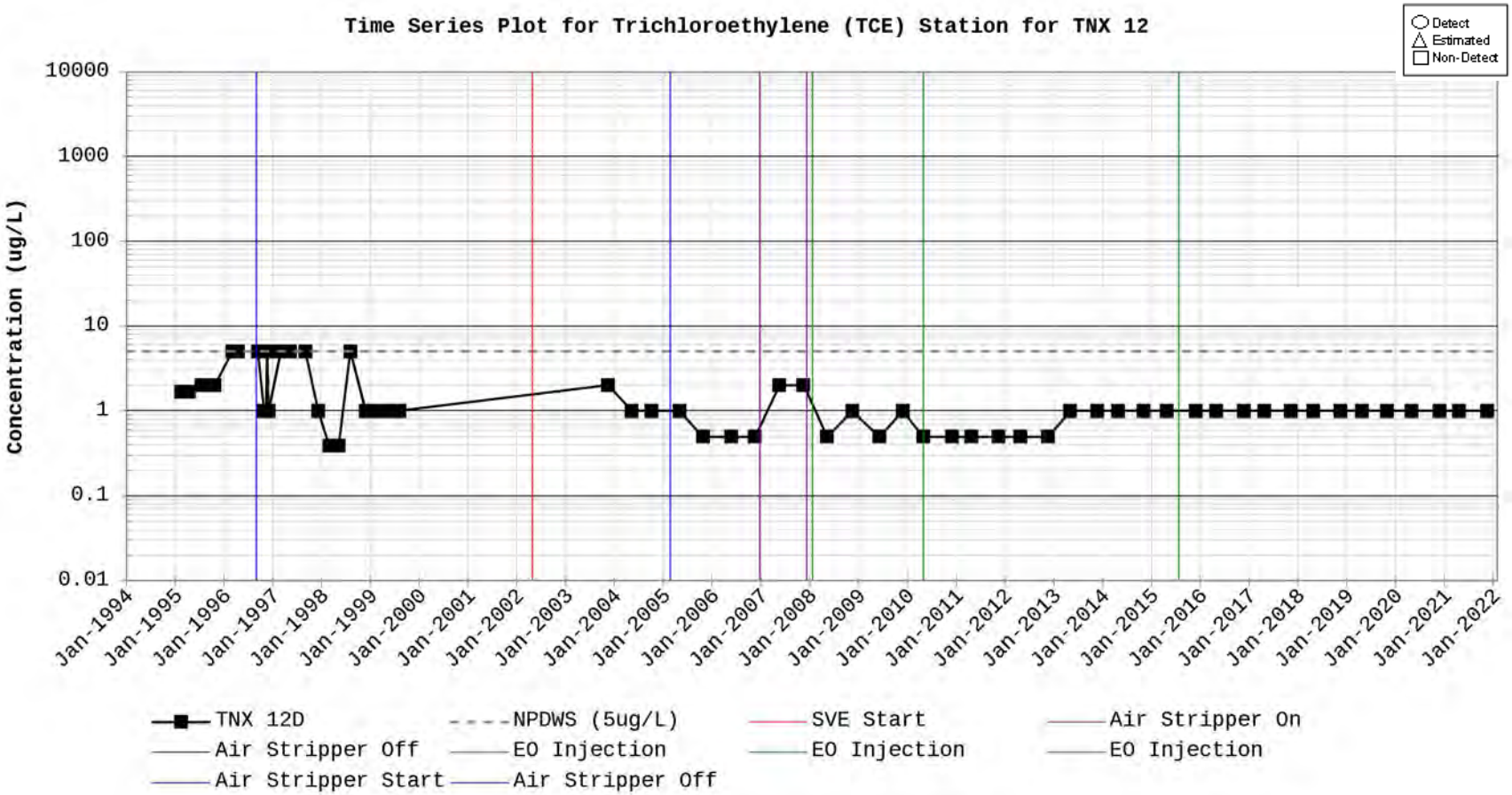

Time Series Plot for Trichloroethylene (TCE) Station for TNX 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

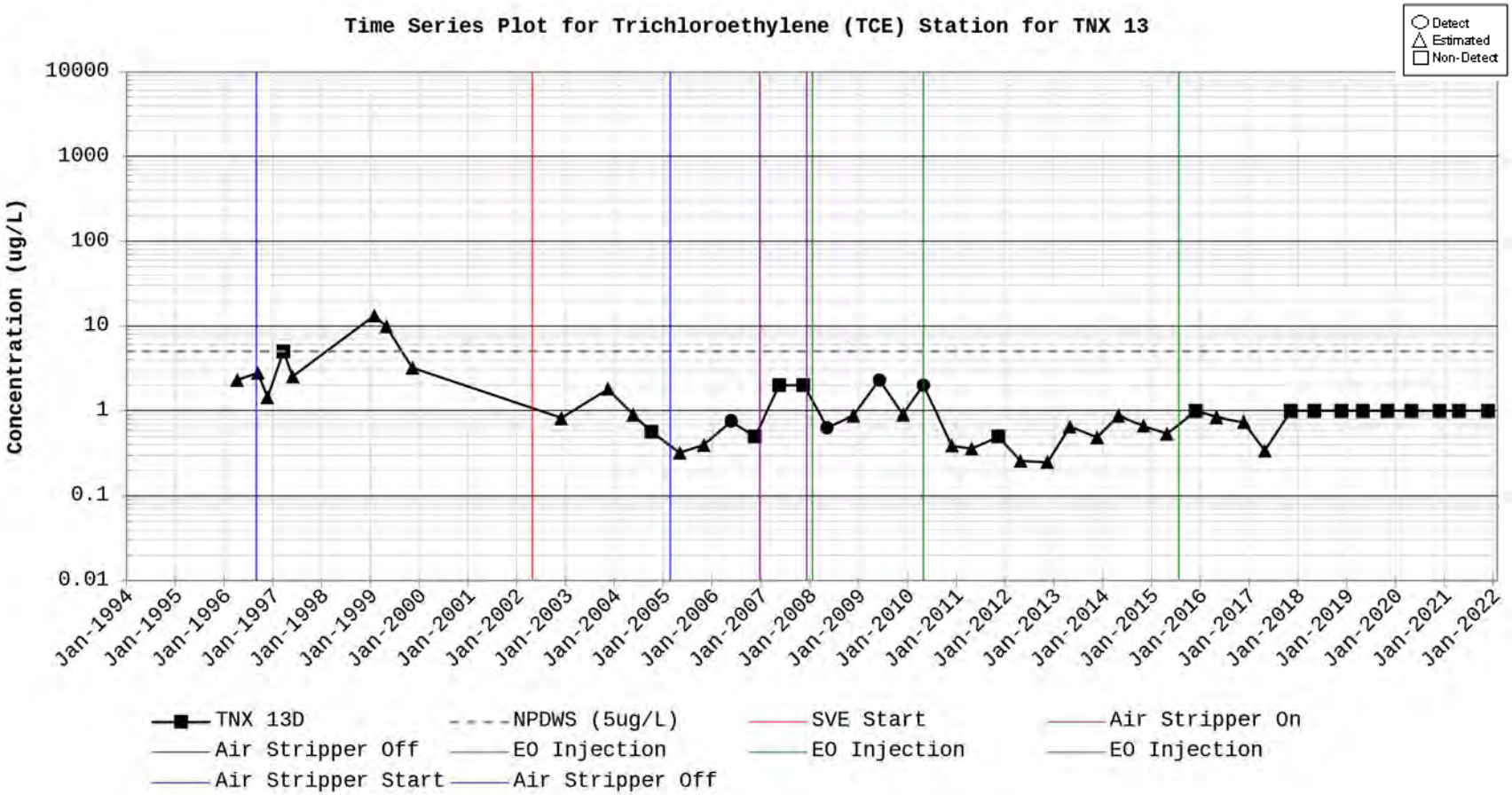

Time Series Plot for Trichloroethylene (TCE) Station for TNX 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 5D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

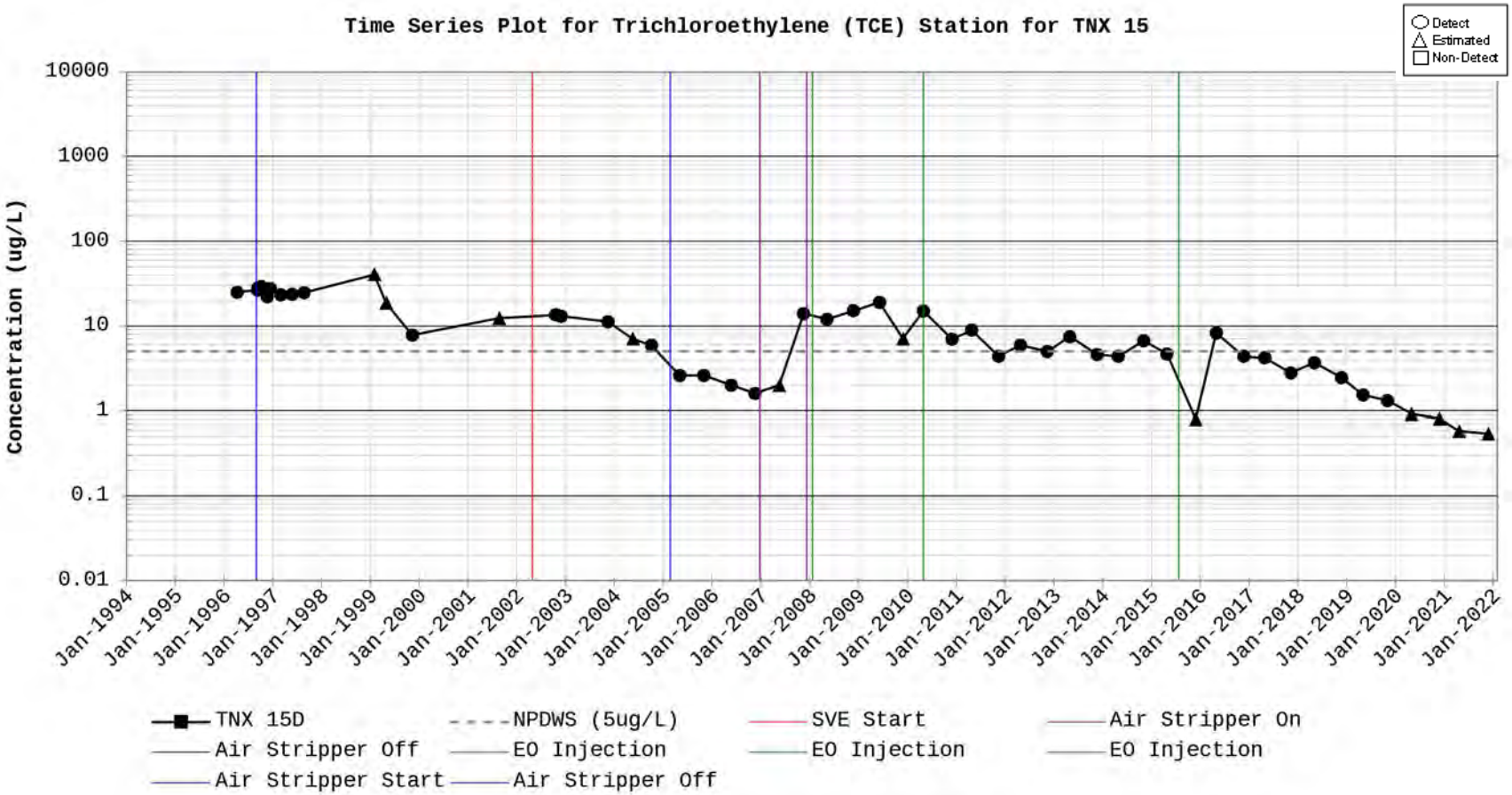

Time Series Plot for Trichloroethylene (TCE) Station for TNX 8
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 8D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

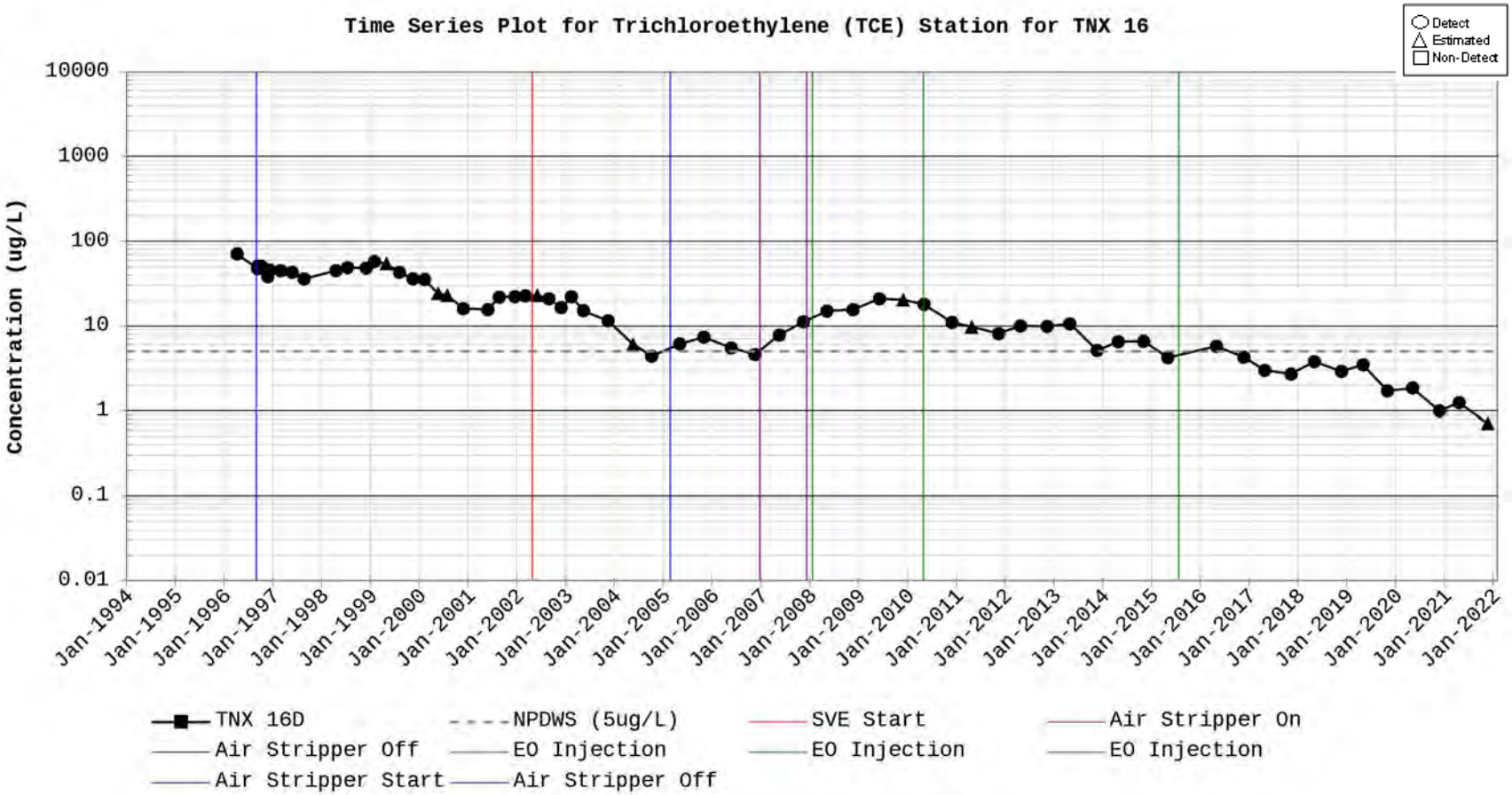

Time Series Plot for Trichloroethylene (TCE) Station for TNX 9
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 9D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

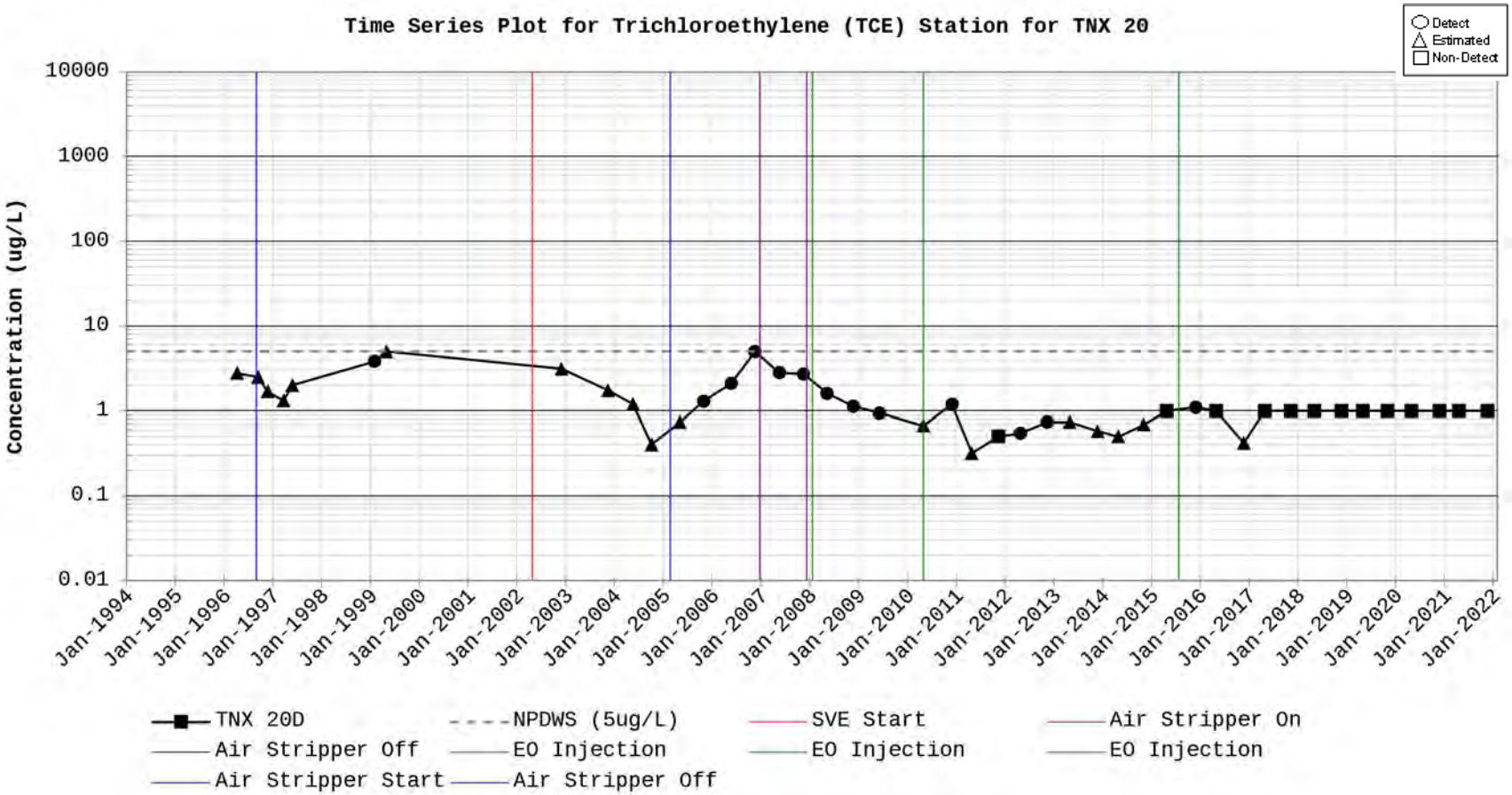

Time Series Plot for Trichloroethylene (TCE) Station for TNX 11
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

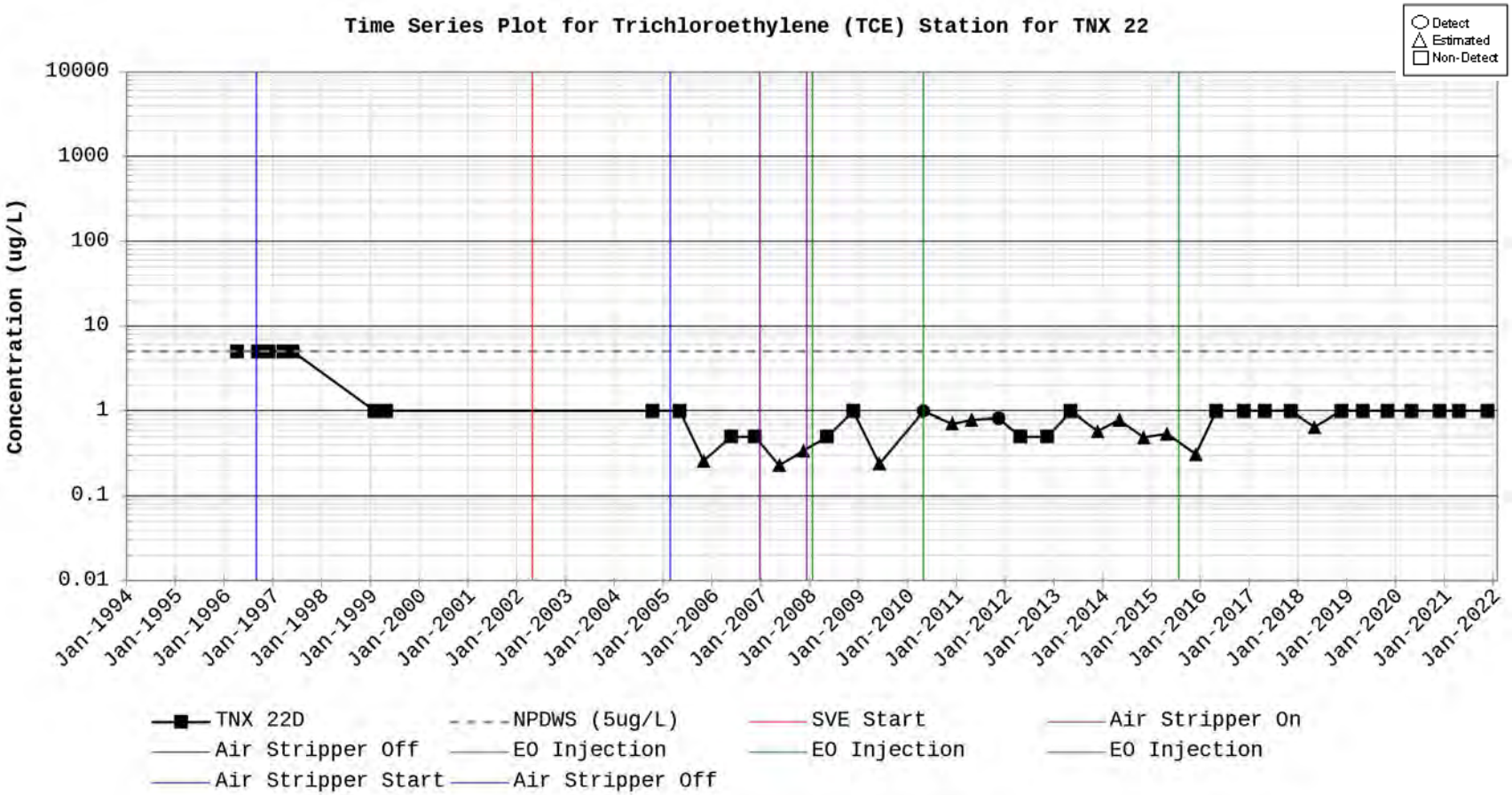

Time Series Plot for Trichloroethylene (TCE) Station for TNX 12
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 12D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

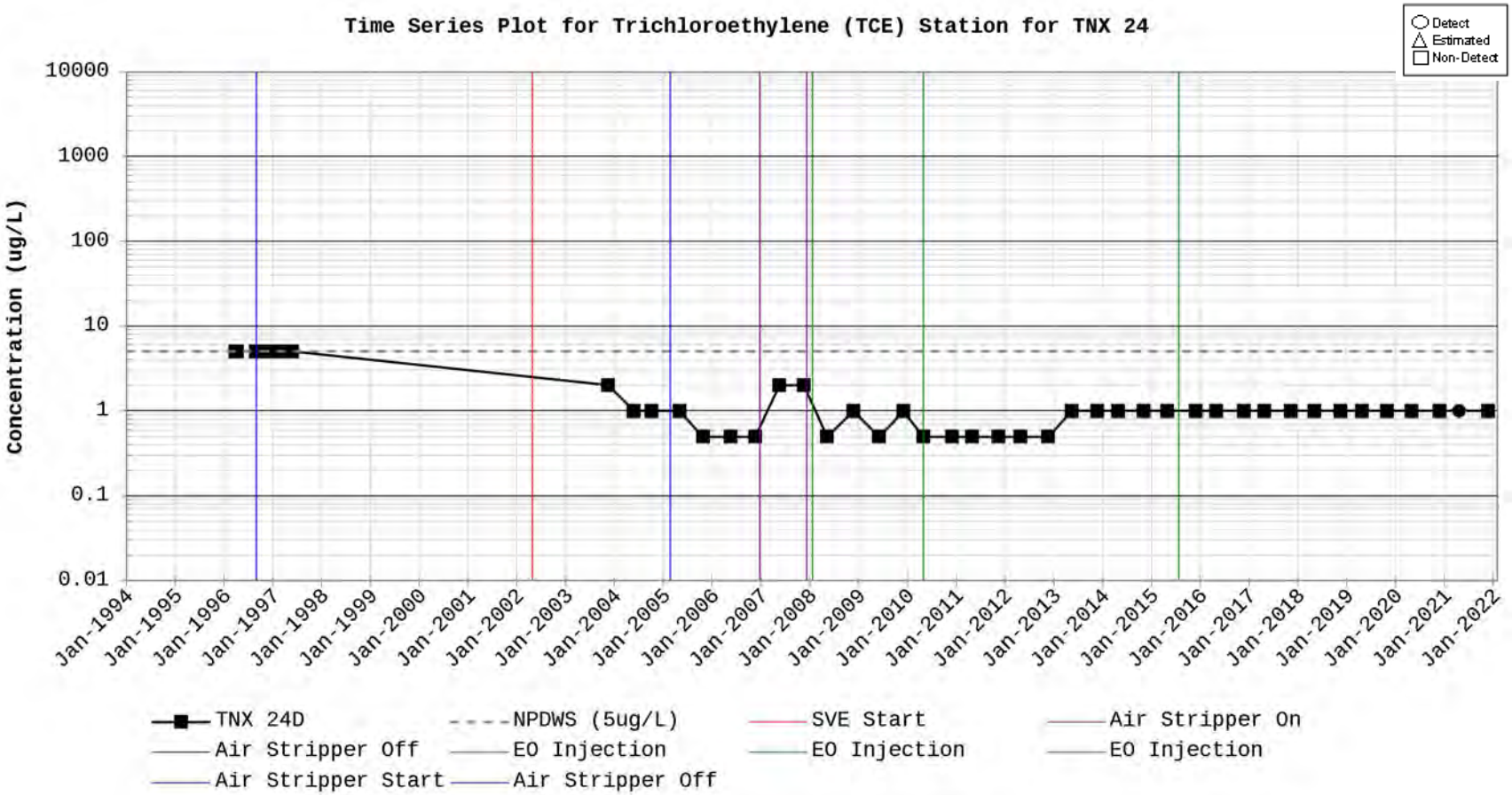

Time Series Plot for Trichloroethylene (TCE) Station for TNX 13
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

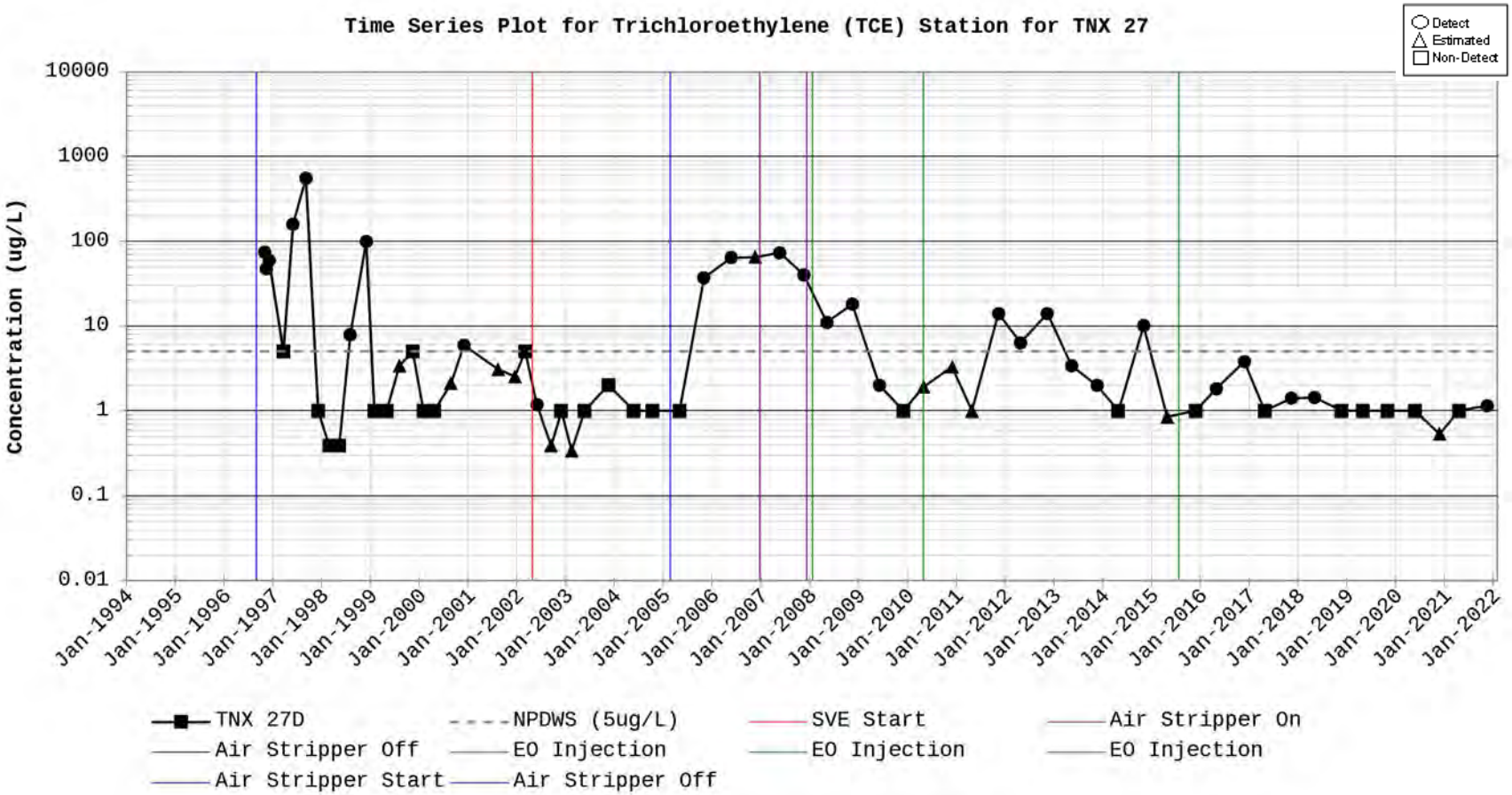

Time Series Plot for Trichloroethylene (TCE) Station for TNX 15
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 15D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

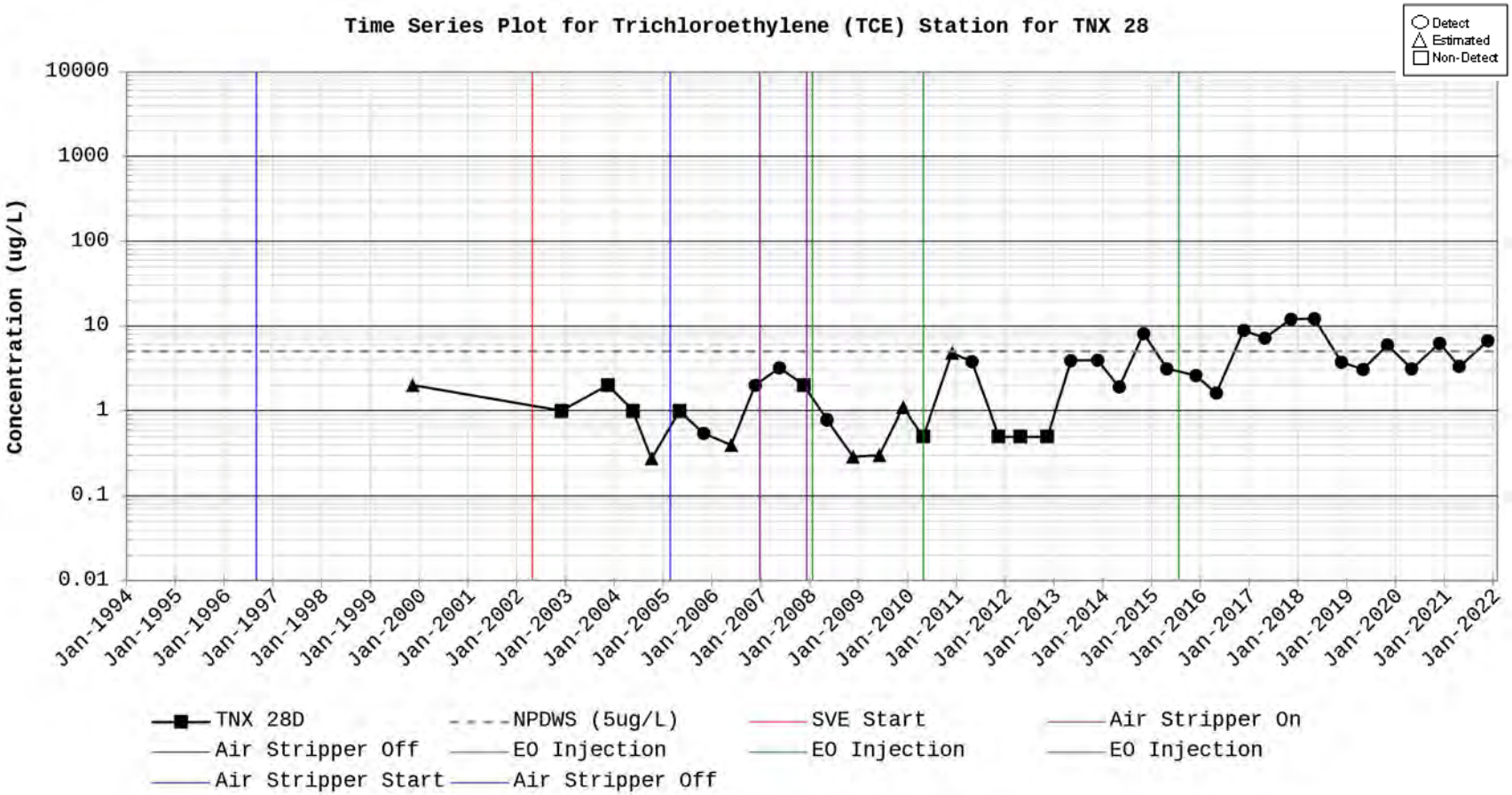

Time Series Plot for Trichloroethylene (TCE) Station for TNX 16
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 16D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

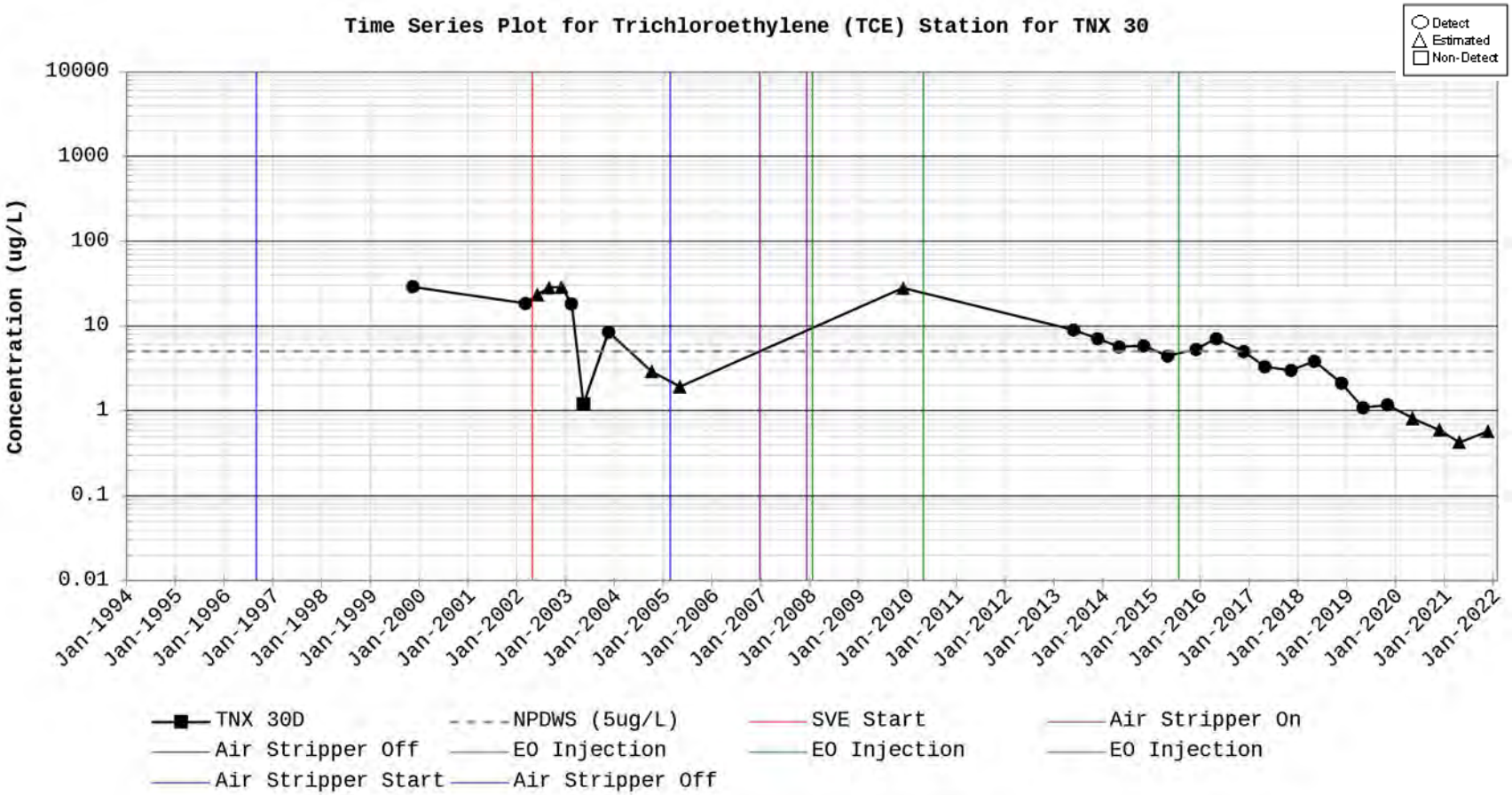

Time Series Plot for Trichloroethylene (TCE) Station for TNX 20
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 20D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

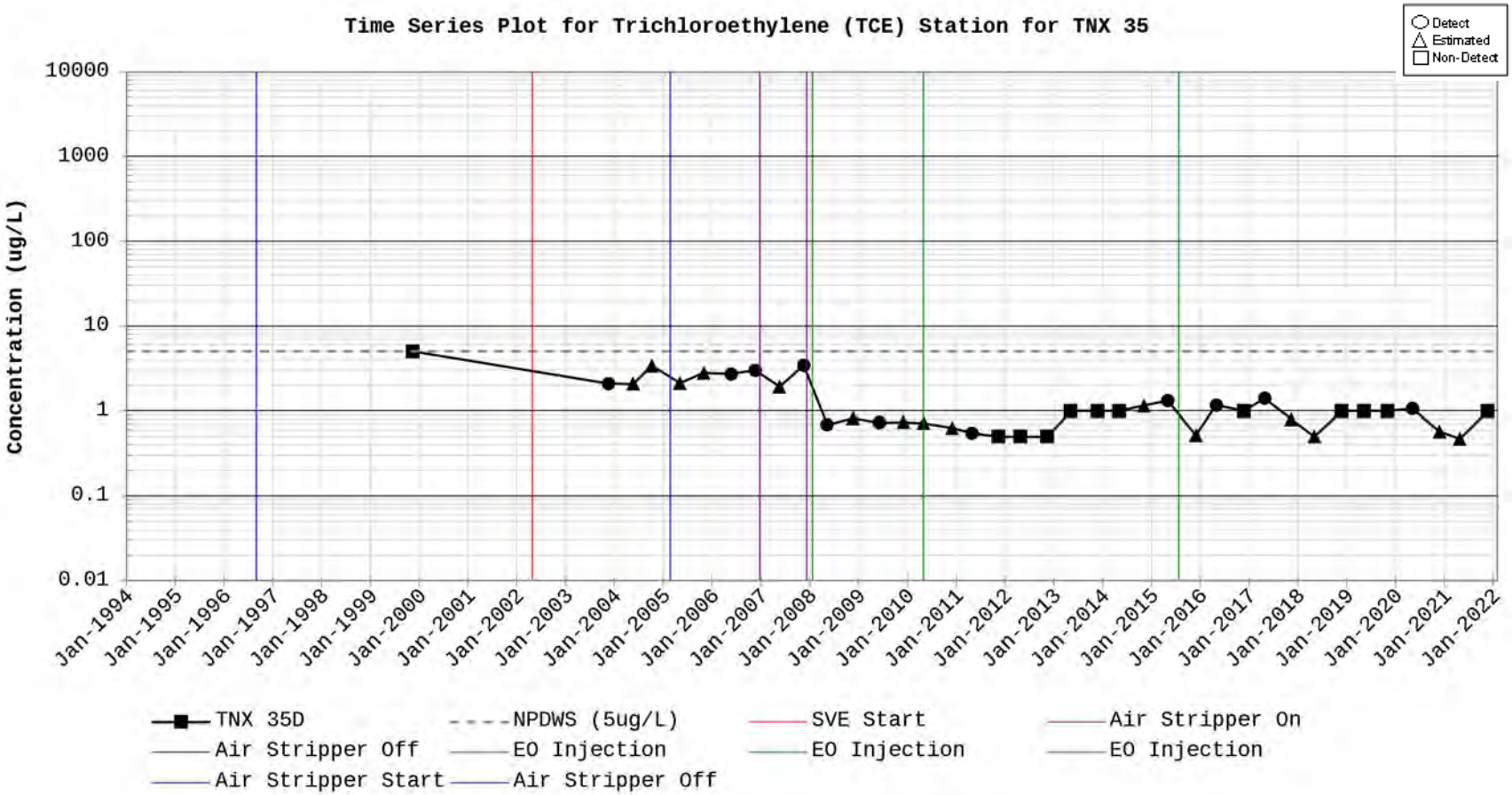

Time Series Plot for Trichloroethylene (TCE) Station for TNX 22
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 22D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

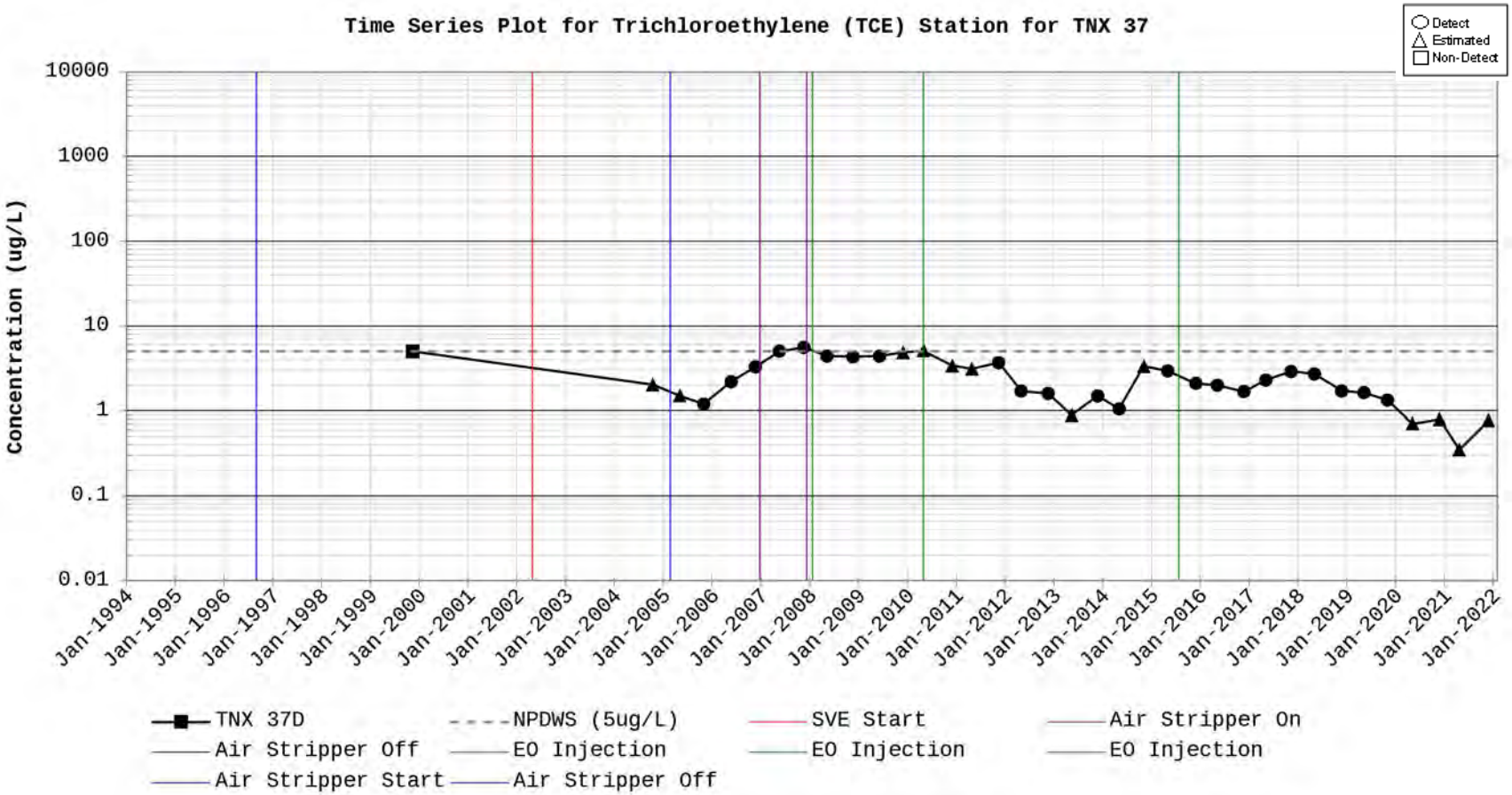

Time Series Plot for Trichloroethylene (TCE) Station for TNX 24
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 24D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

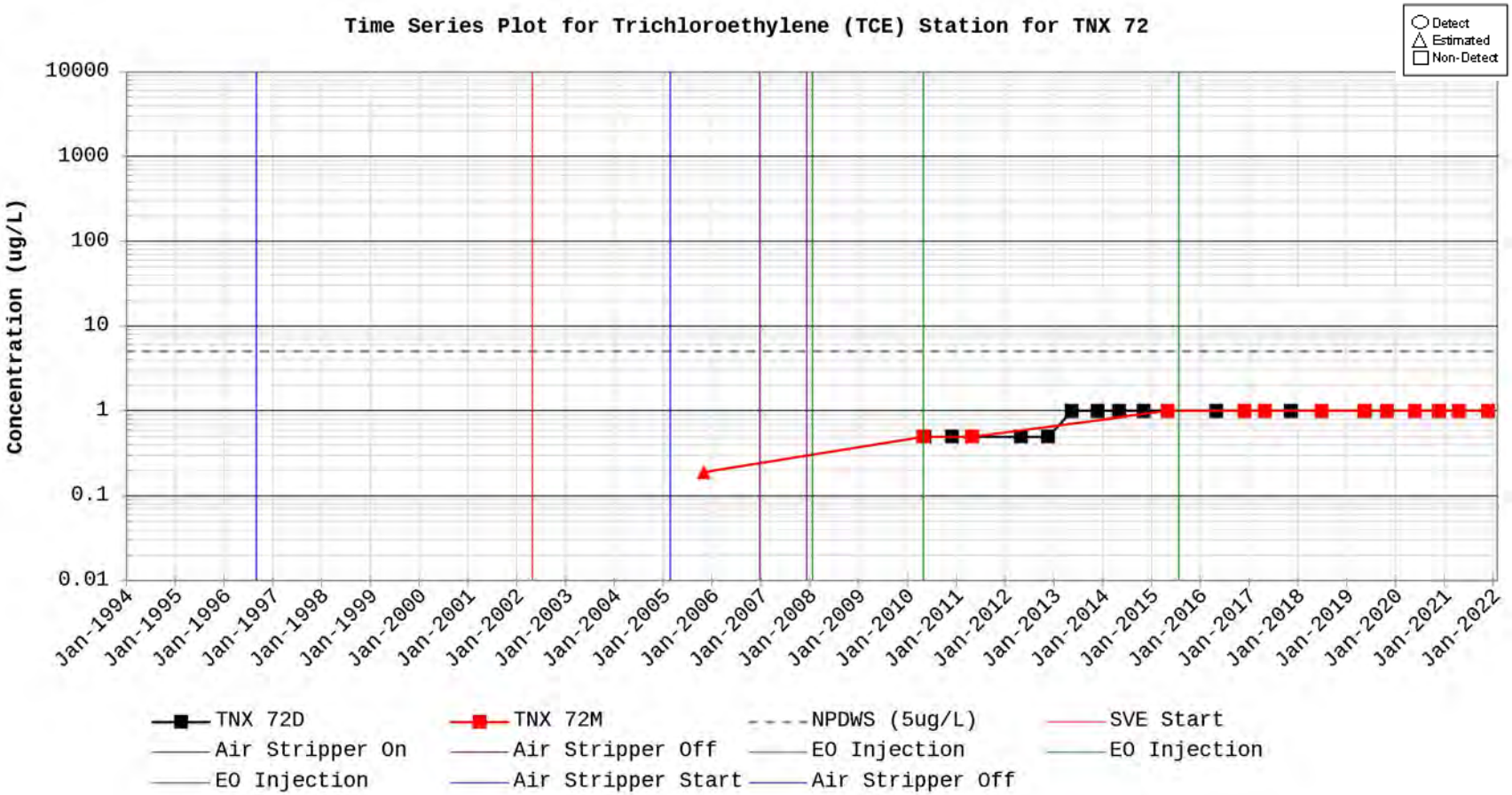

Time Series Plot for Trichloroethylene (TCE) Station for TNX 27
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

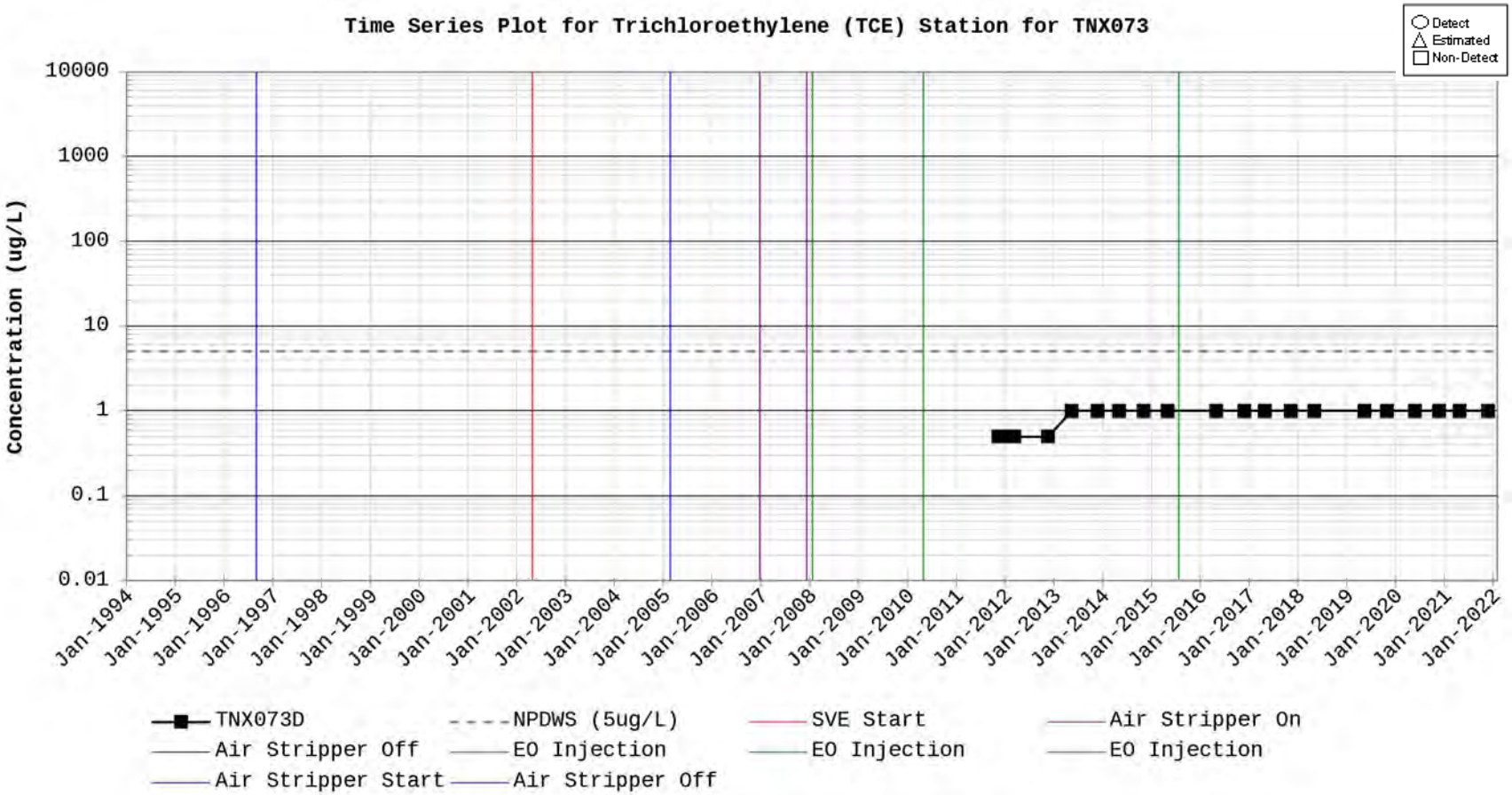

Time Series Plot for Trichloroethylene (TCE) Station for TNX 28
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

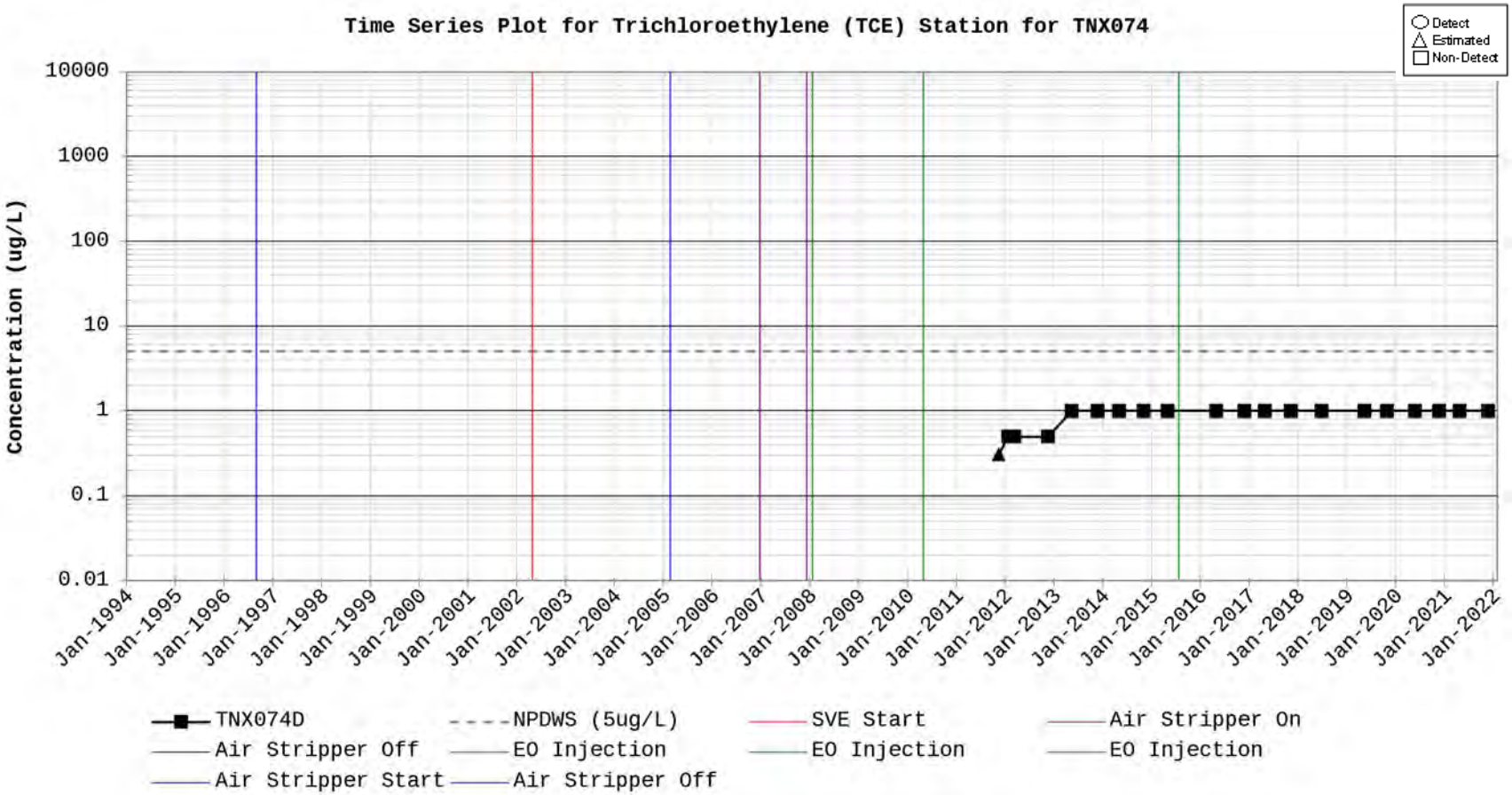

Time Series Plot for Trichloroethylene (TCE) Station for TNX 30
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

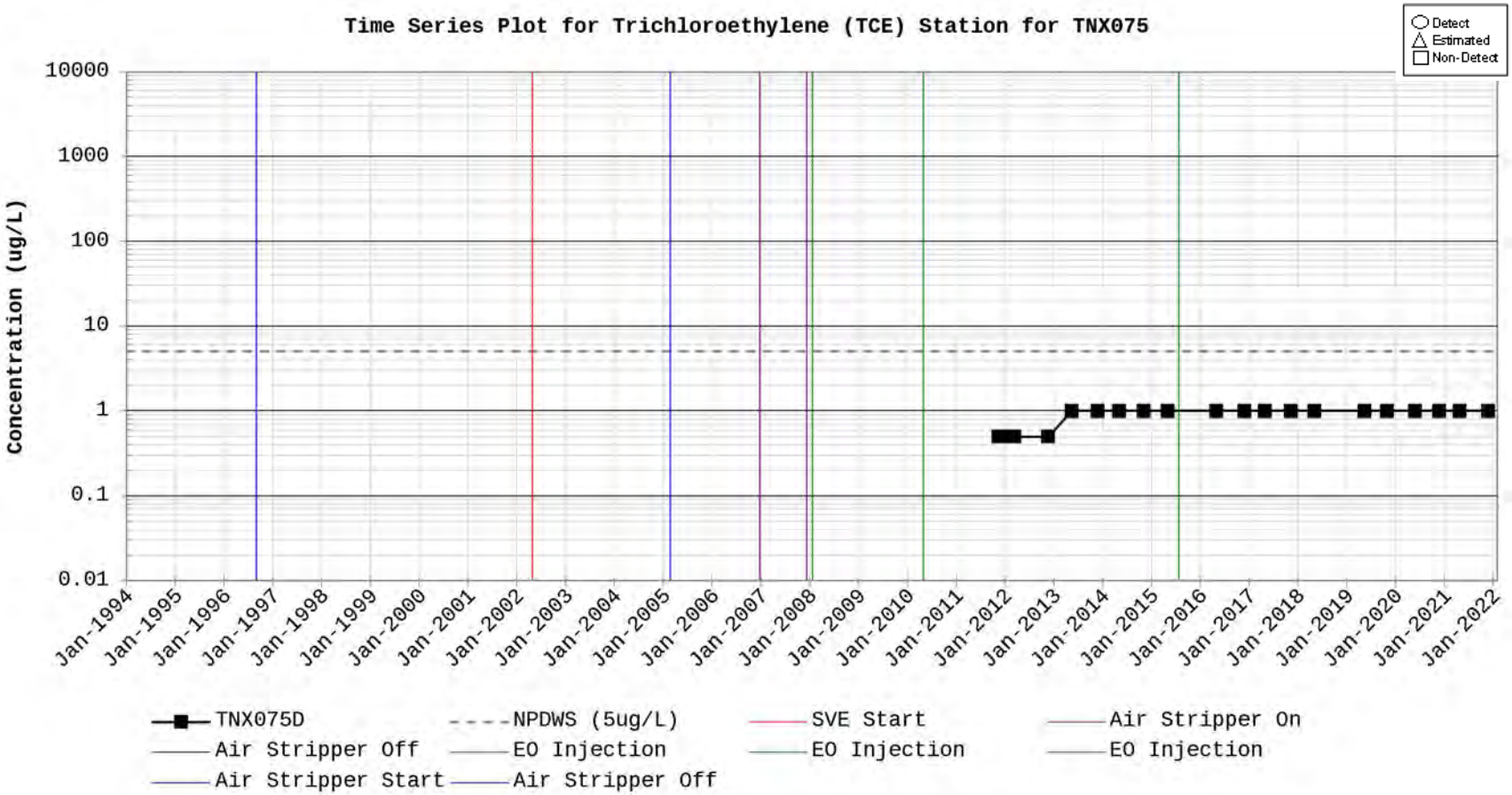

Time Series Plot for Trichloroethylene (TCE) Station for TNX 35
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

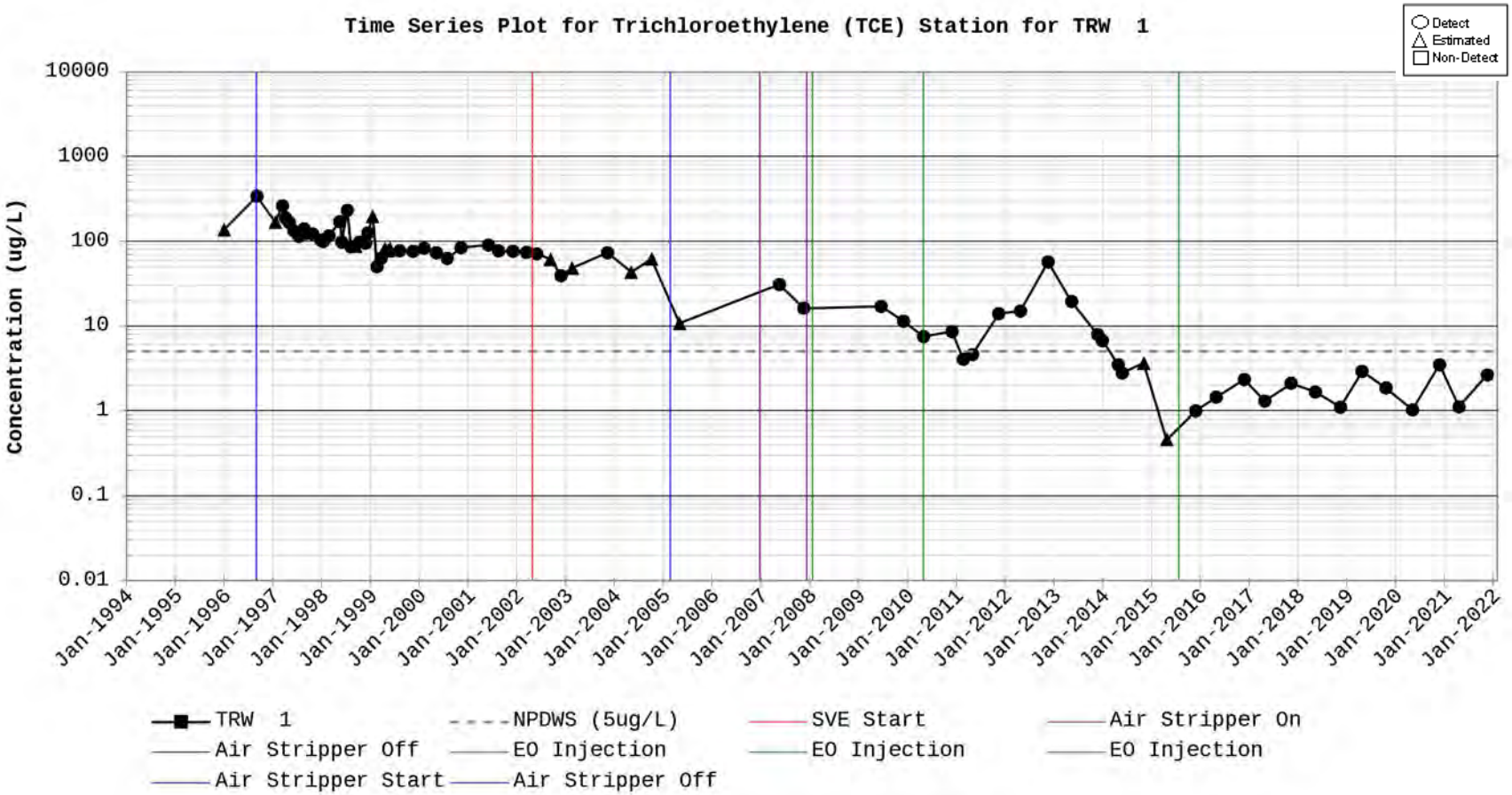

Time Series Plot for Trichloroethylene (TCE) Station for TNX 37
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

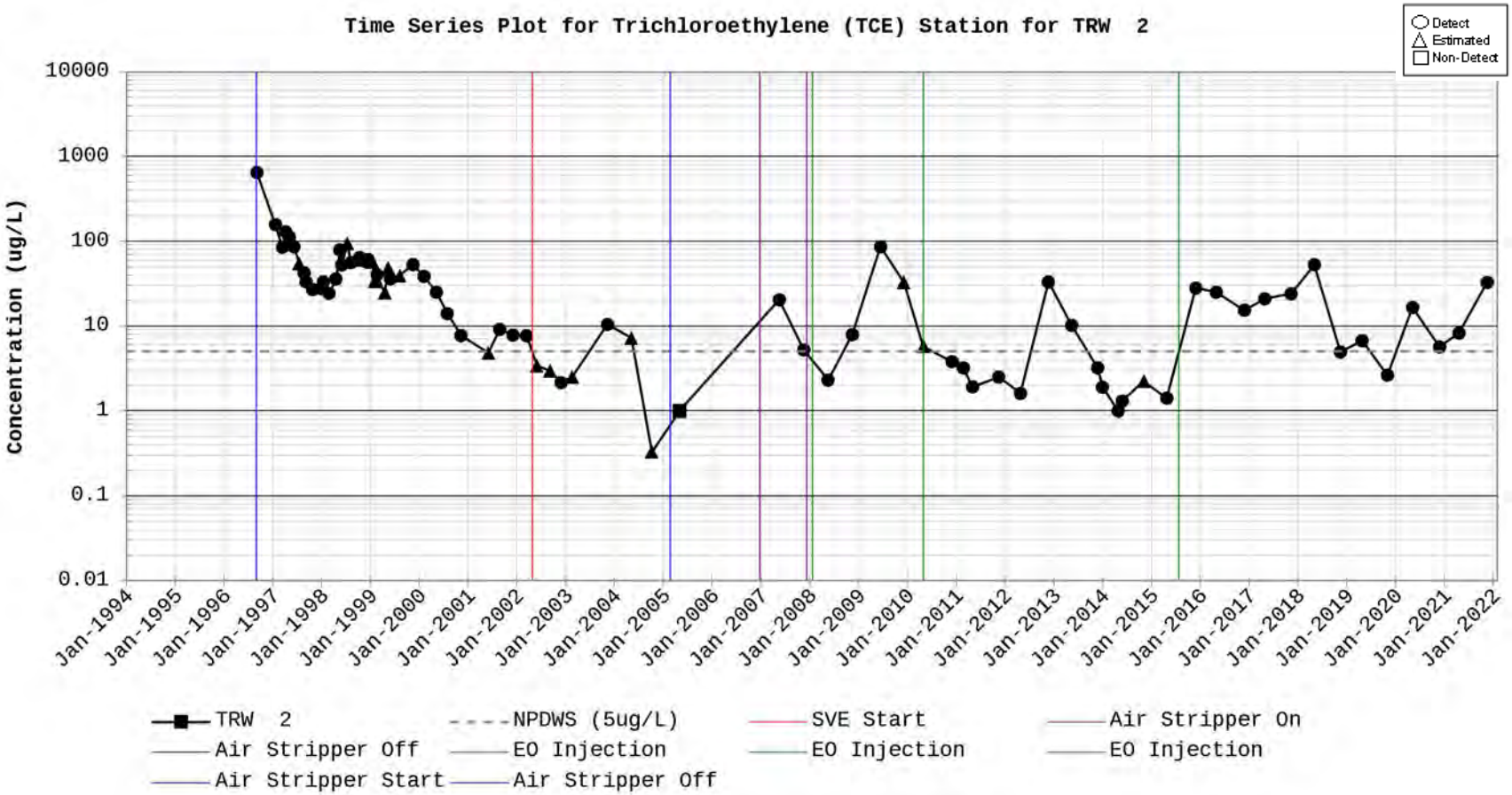

Time Series Plot for Trichloroethylene (TCE) Station for TNX 72
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 72D
TNX 72M
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

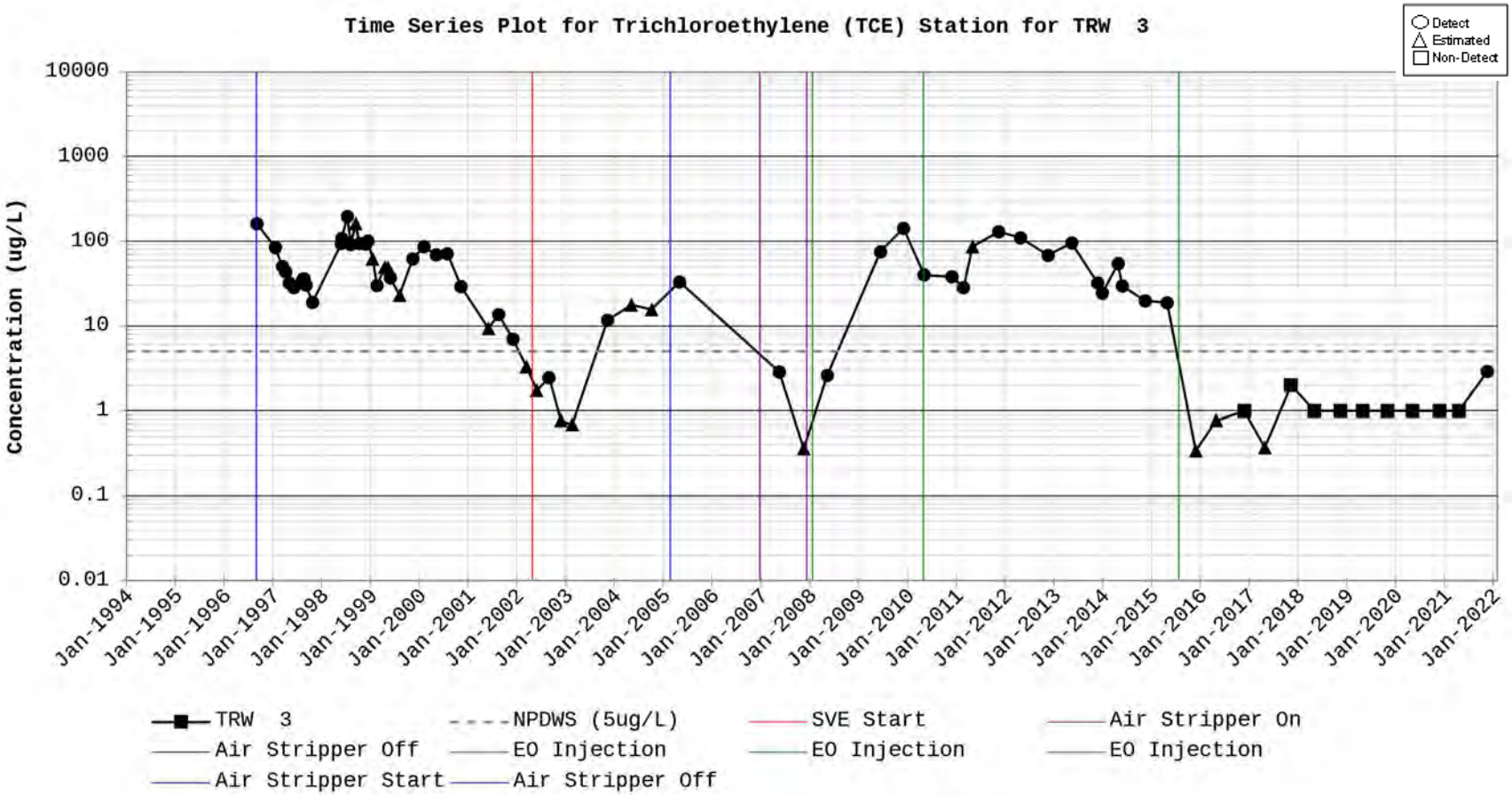

Time Series Plot for Trichloroethylene (TCE) Station for TNX073
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

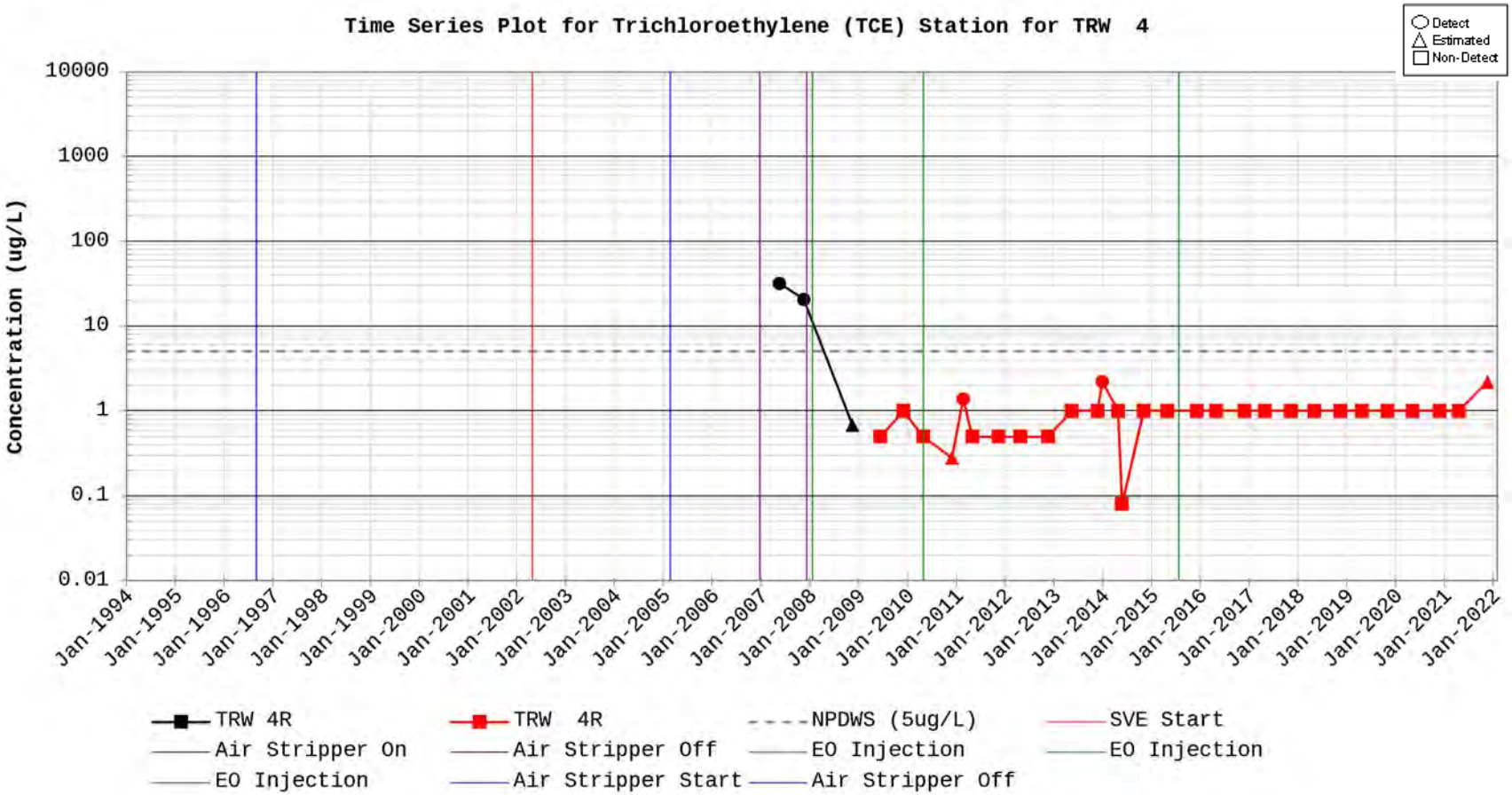

Time Series Plot for Trichloroethylene (TCE) Station for TNX074
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

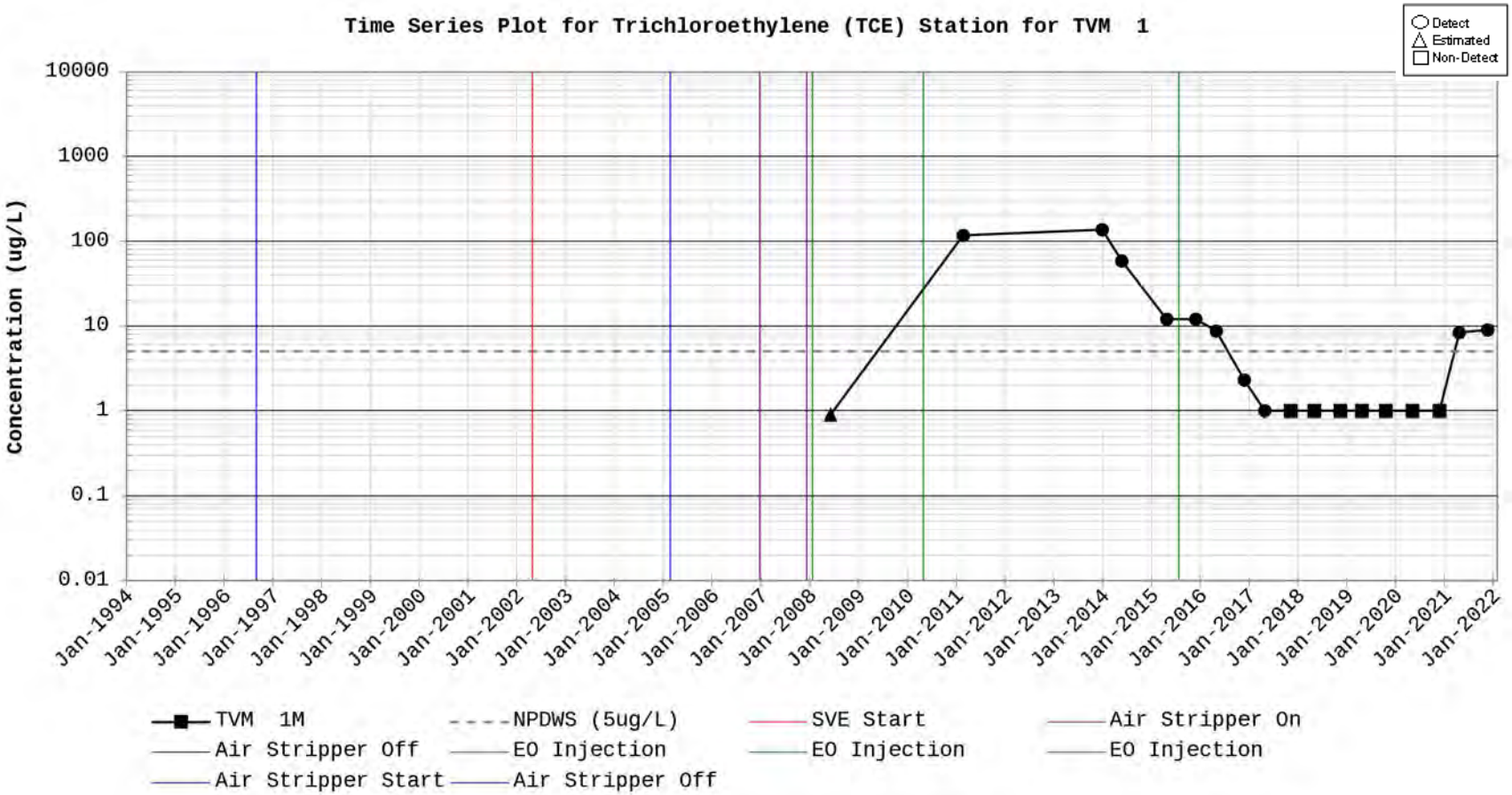

Time Series Plot for Trichloroethylene (TCE) Station for TNX075
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX075D
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

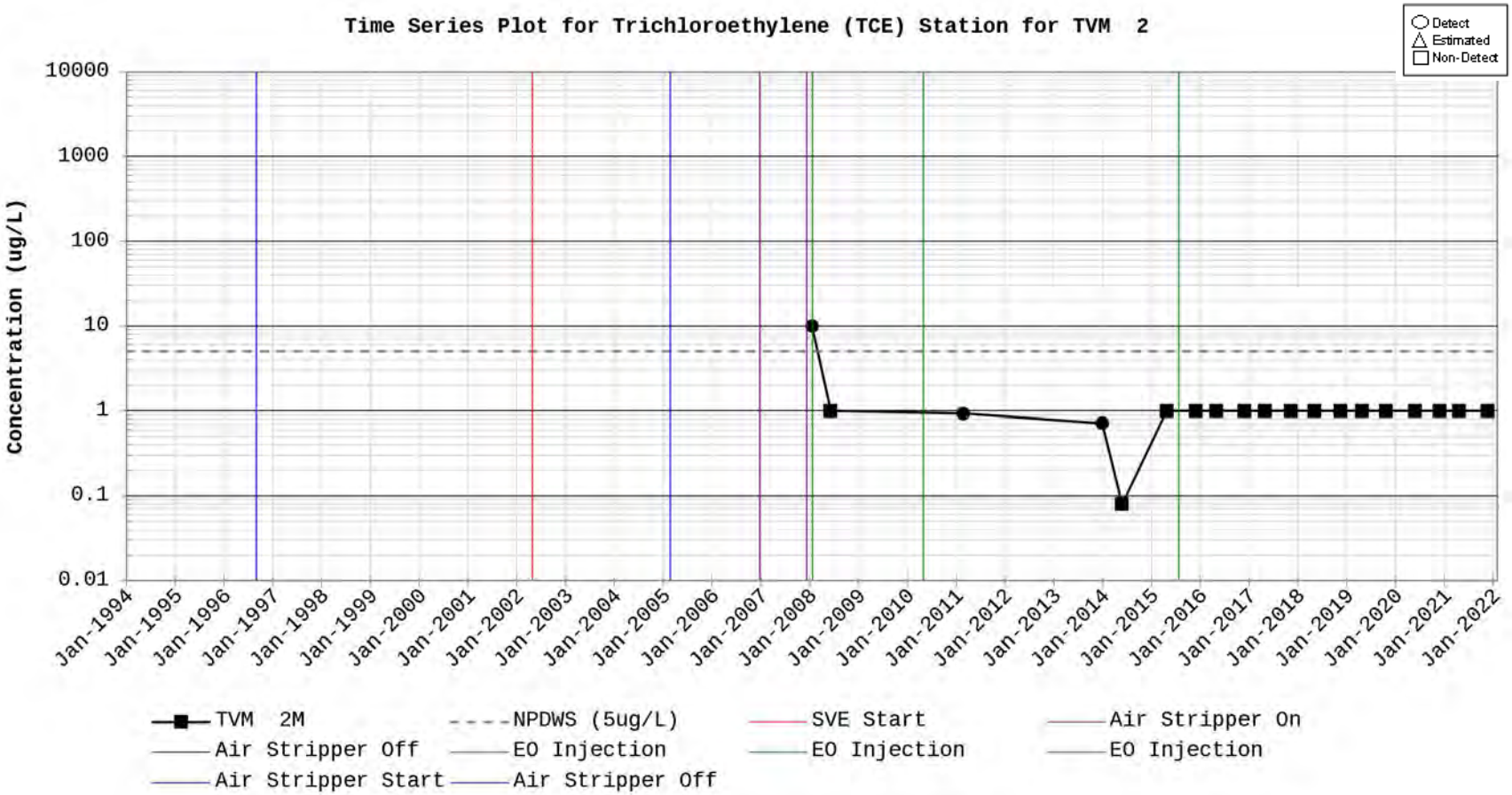

Time Series Plot for Trichloroethylene (TCE) Station for TRW 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 1
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

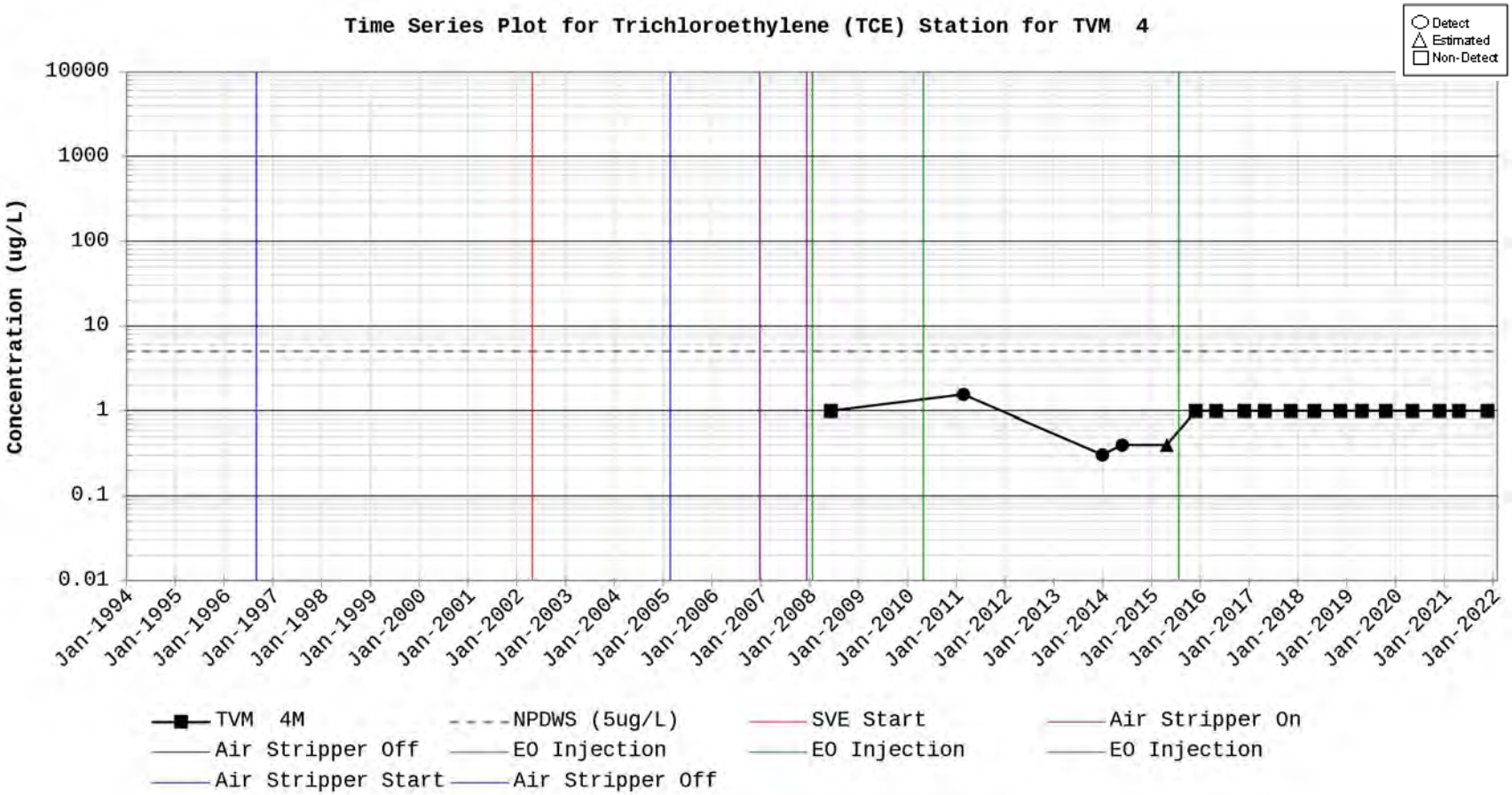

Time Series Plot for Trichloroethylene (TCE) Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

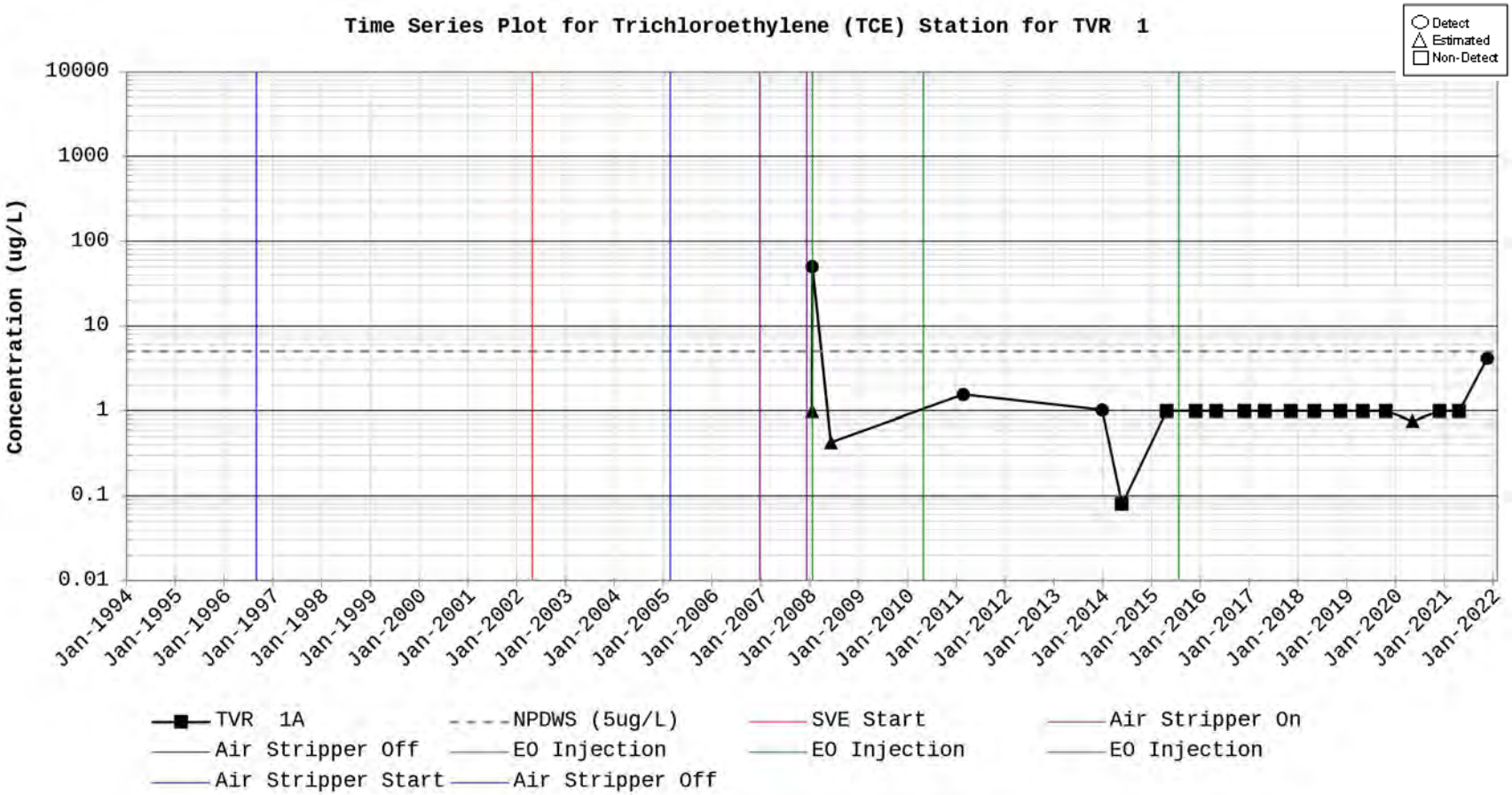

Time Series Plot for Trichloroethylene (TCE) Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

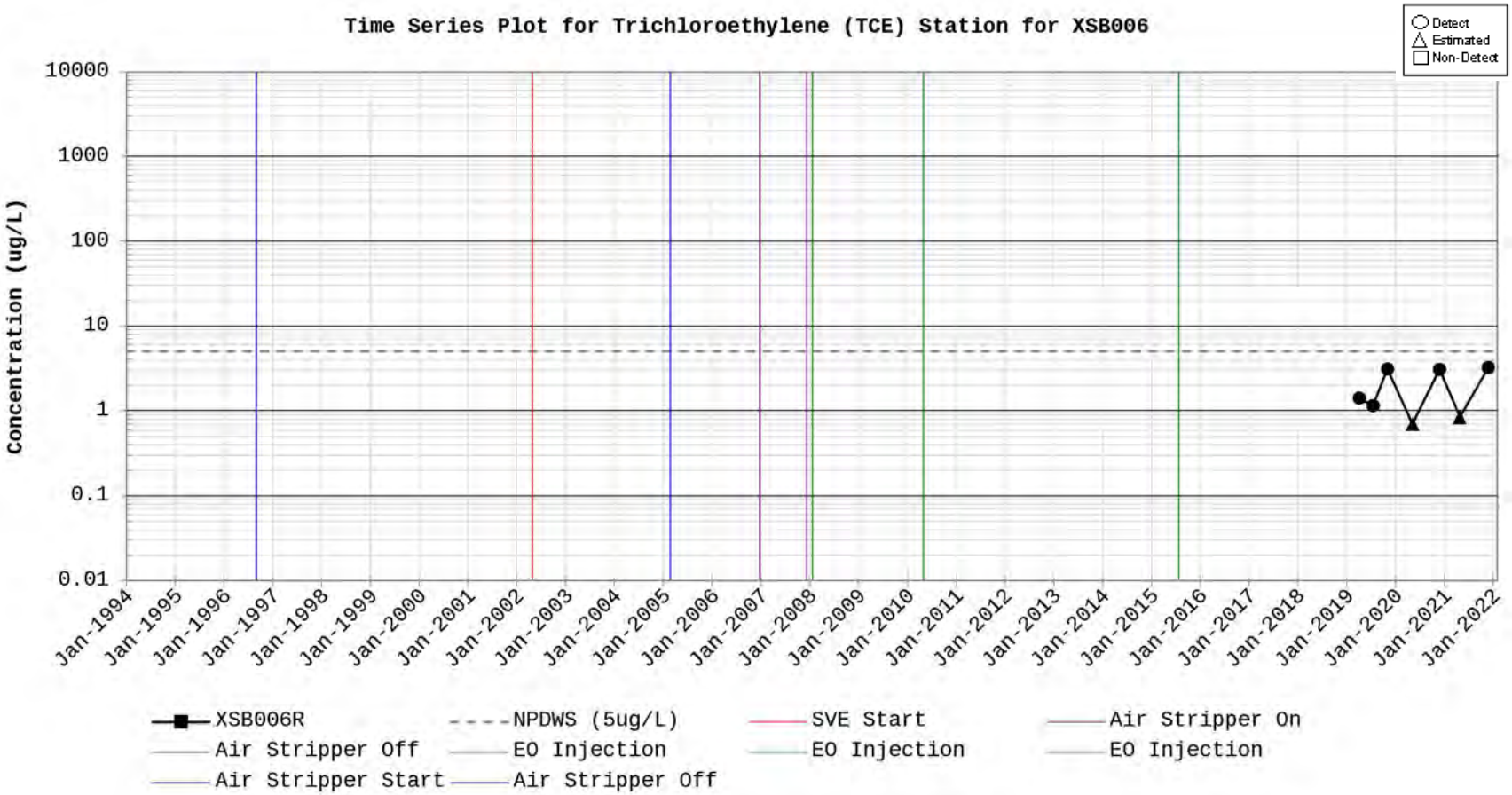

Time Series Plot for Trichloroethylene (TCE) Station for TRW 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 4R
TRW 4R
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

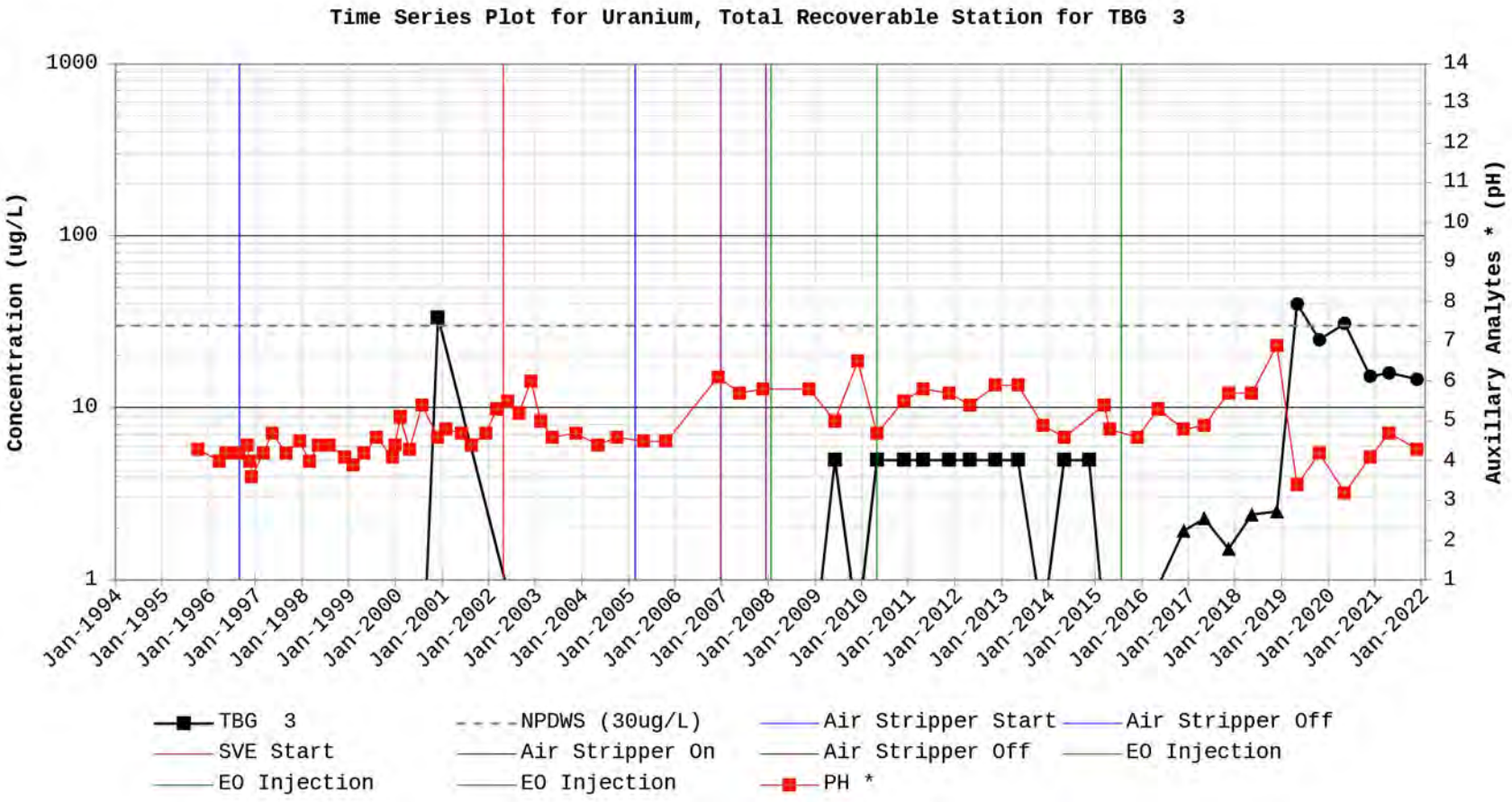

Time Series Plot for Trichloroethylene (TCE) Station for TVM 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 1M
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

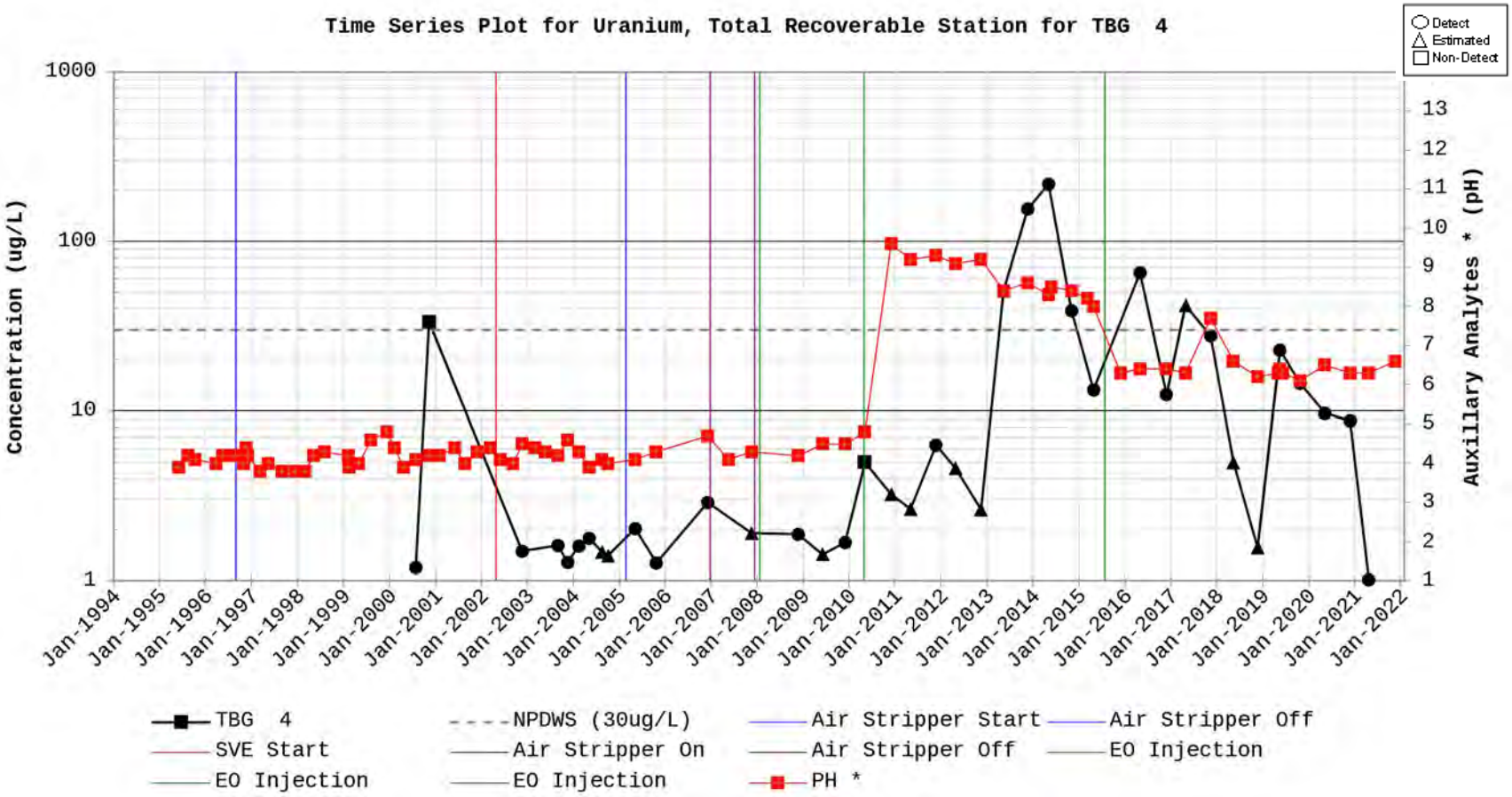

Time Series Plot for Trichloroethylene (TCE) Station for TVM 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 2M
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

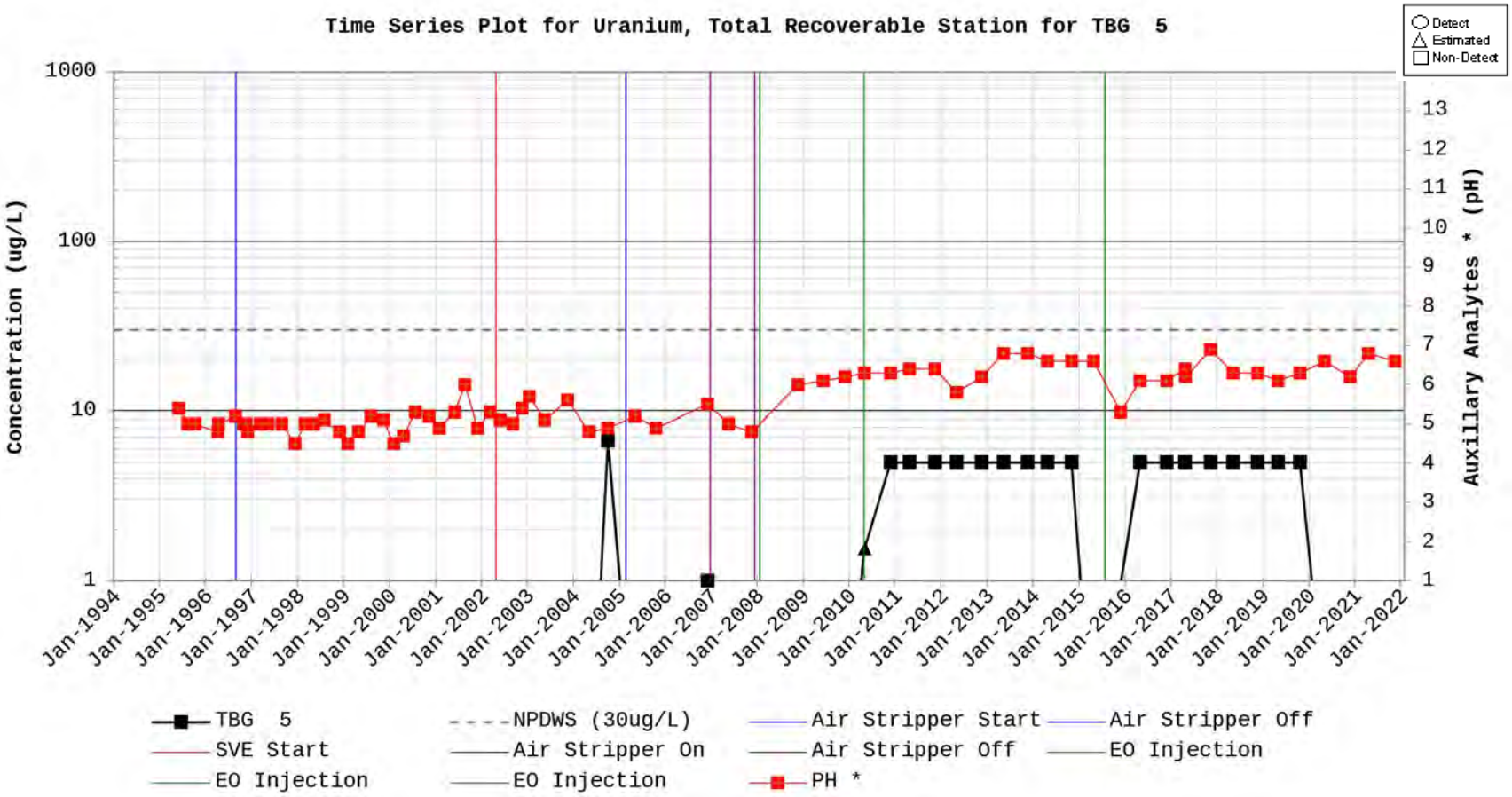

Time Series Plot for Trichloroethylene (TCE) Station for TVM 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVM 4M
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

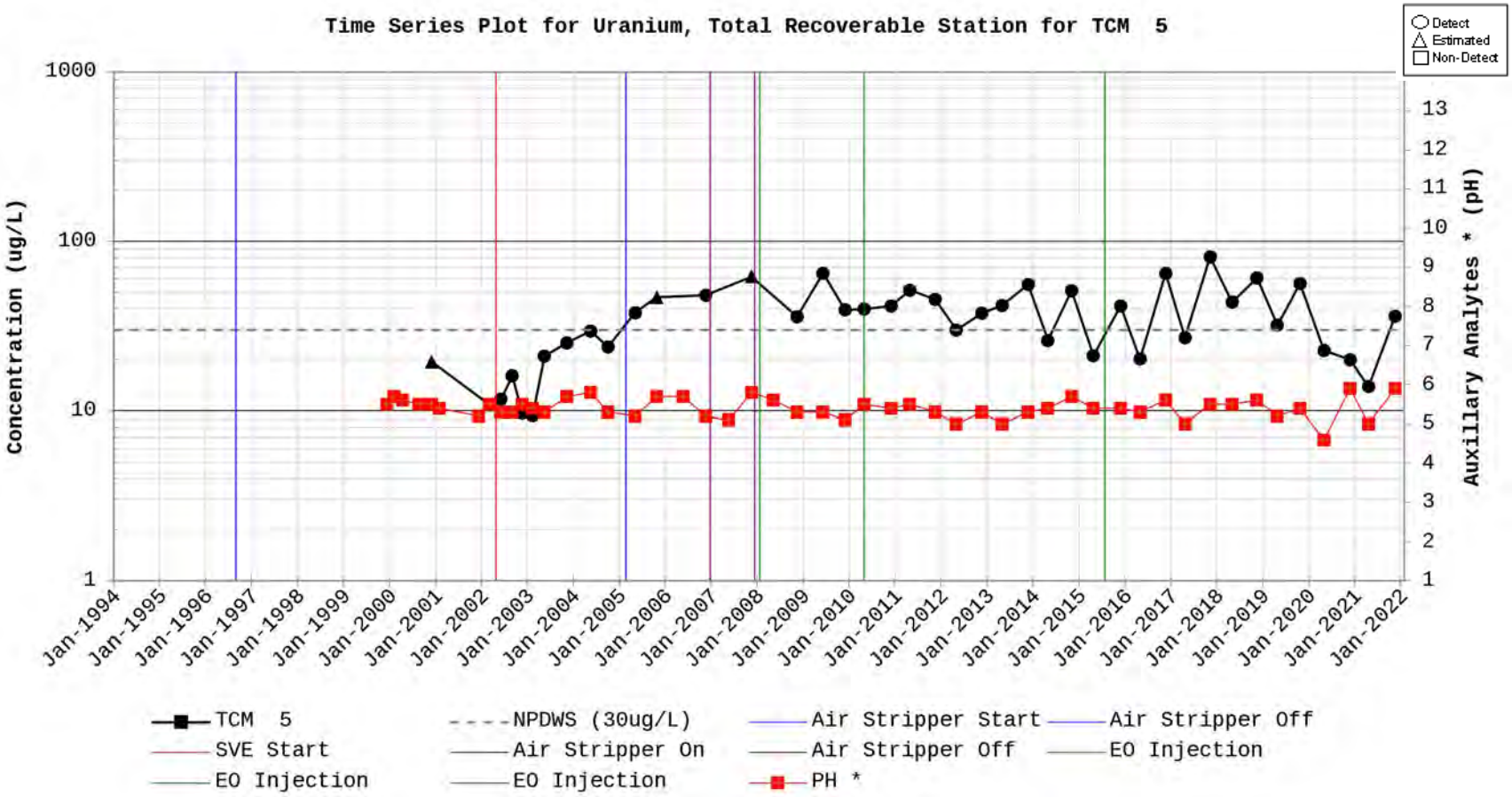

Time Series Plot for Trichloroethylene (TCE) Station for TVR 1
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TVR 1A
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

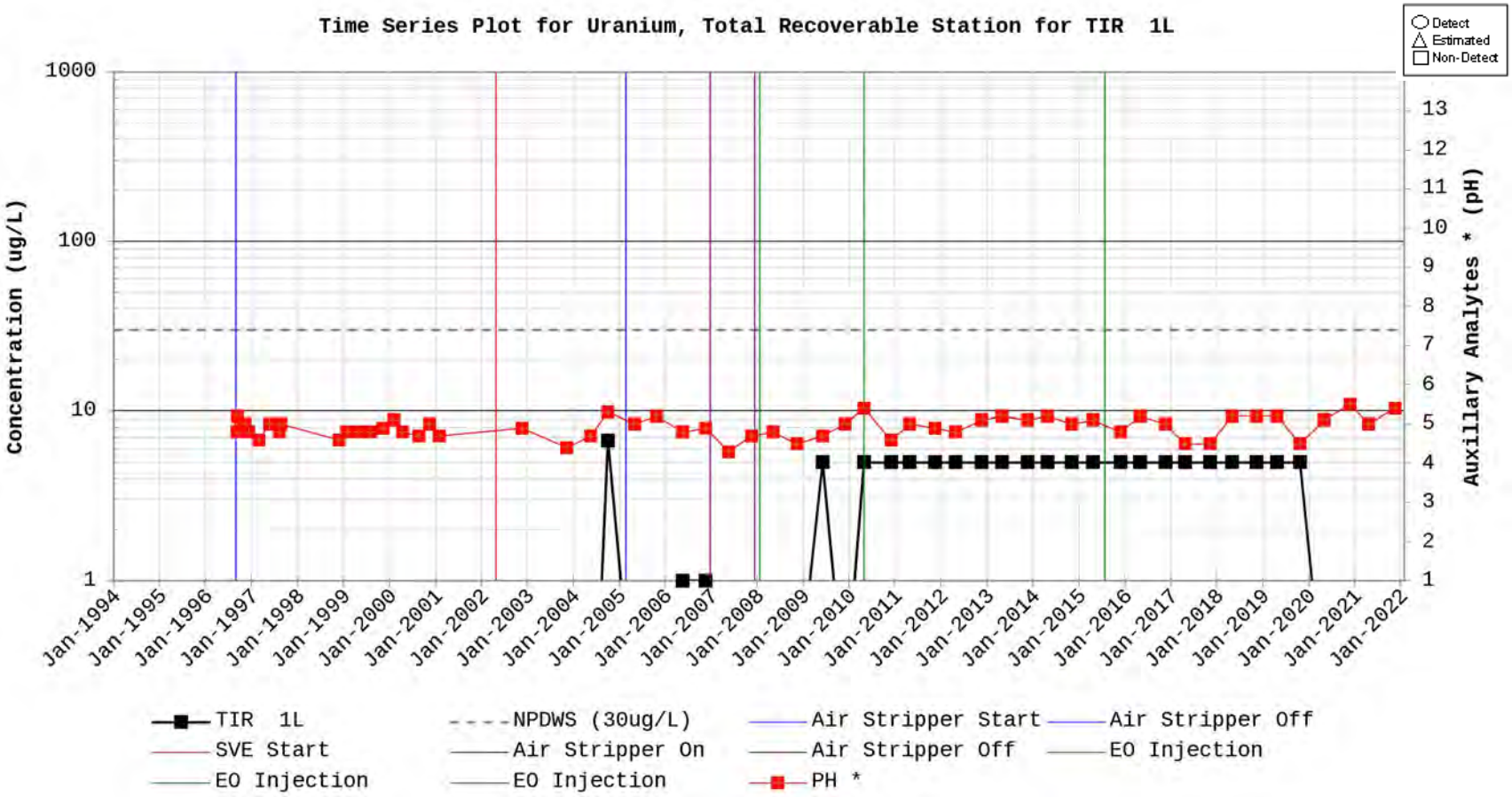

Time Series Plot for Trichloroethylene (TCE) Station for XSB006
Detect
Estimated
Non-Detect
Concentration (ug/L)
10000
1000
100
10
1
0.1
0.01
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (5ug/L)
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
Air Stripper Start
Air Stripper Off

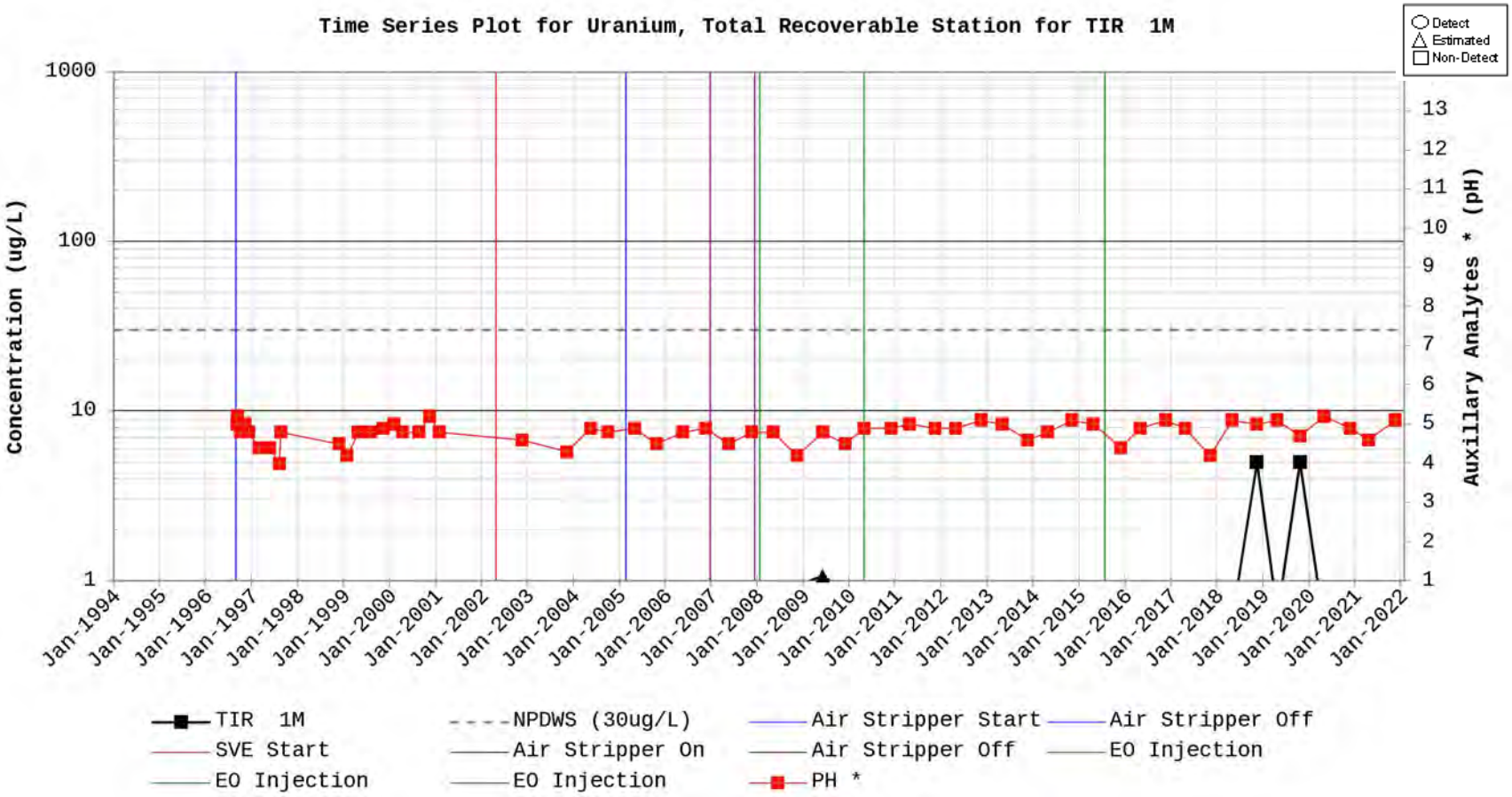

Time Series Plot for Uranium, Total Recoverable Station for TBG 3
Concentration (ug/L)
Auxillary Analytes * (pH)
1000
100
10
1
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 3
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

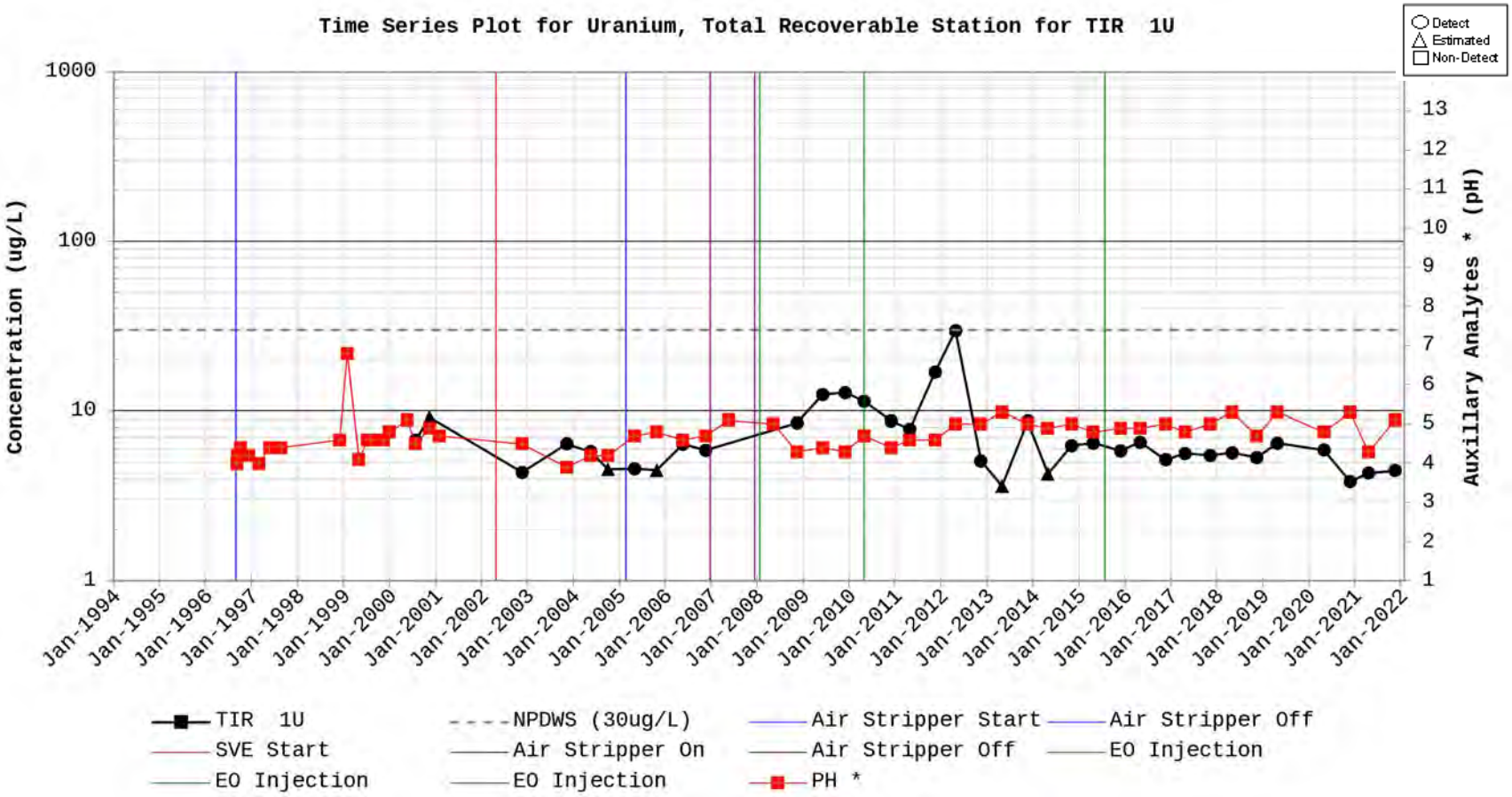

Time Series Plot for Uranium, Total Recoverable Station for TBG 4
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 4
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

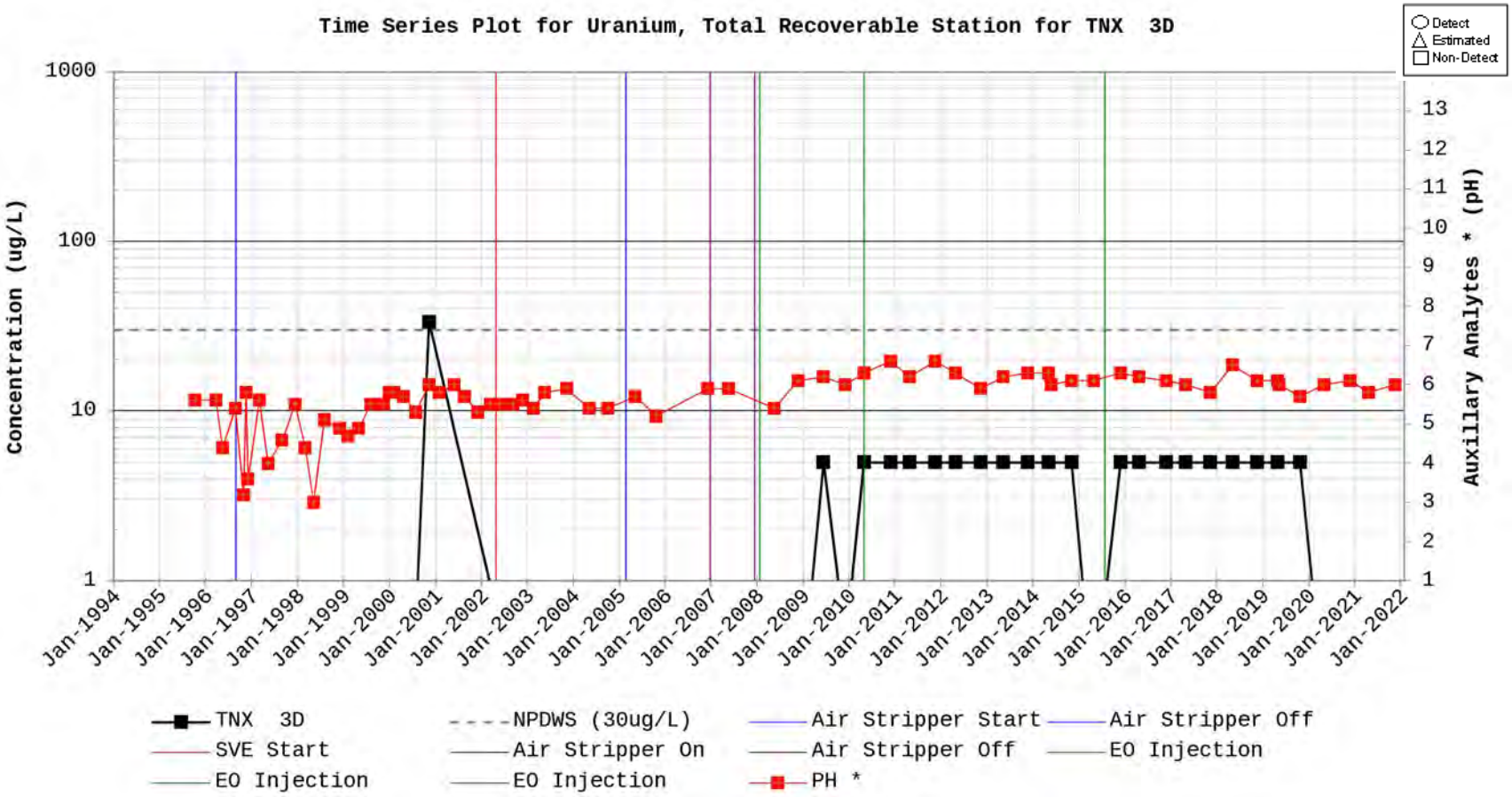

Time Series Plot for Uranium, Total Recoverable Station for TBG 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TBG 5
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

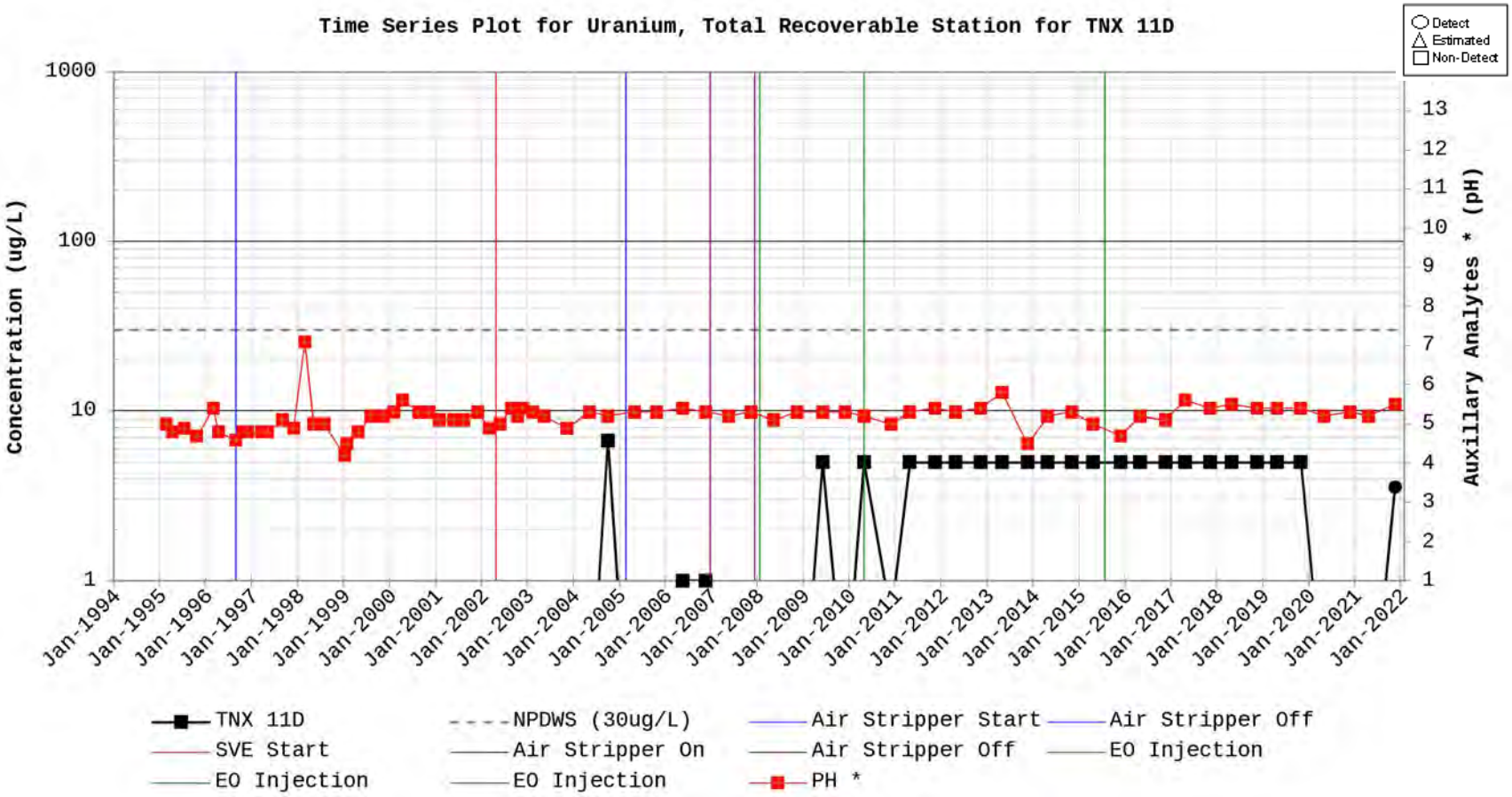

Time Series Plot for Uranium, Total Recoverable Station for TCM 5
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TCM 5
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

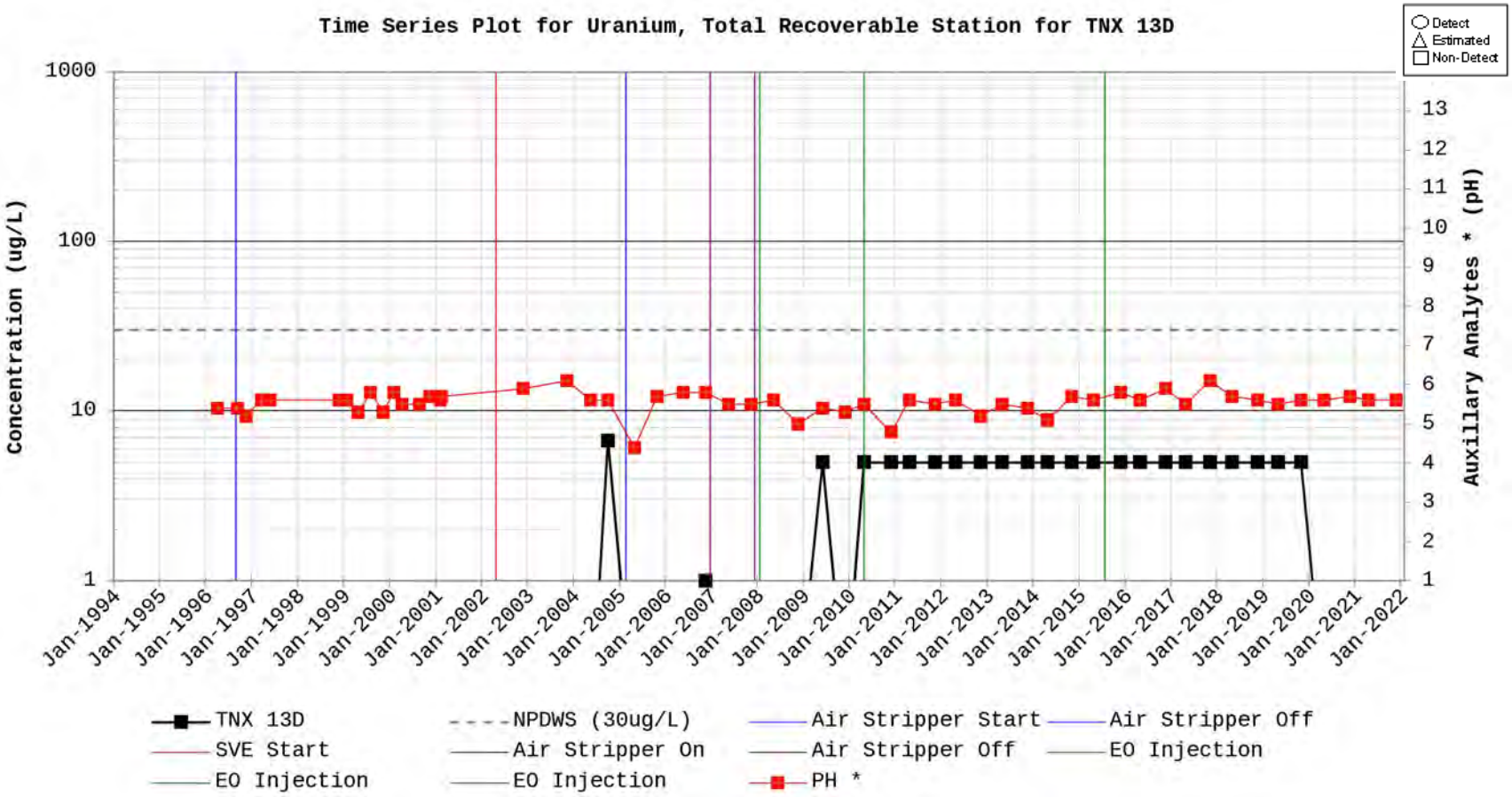

Time Series Plot for Uranium, Total Recoverable Station for TIR 1L
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1L
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

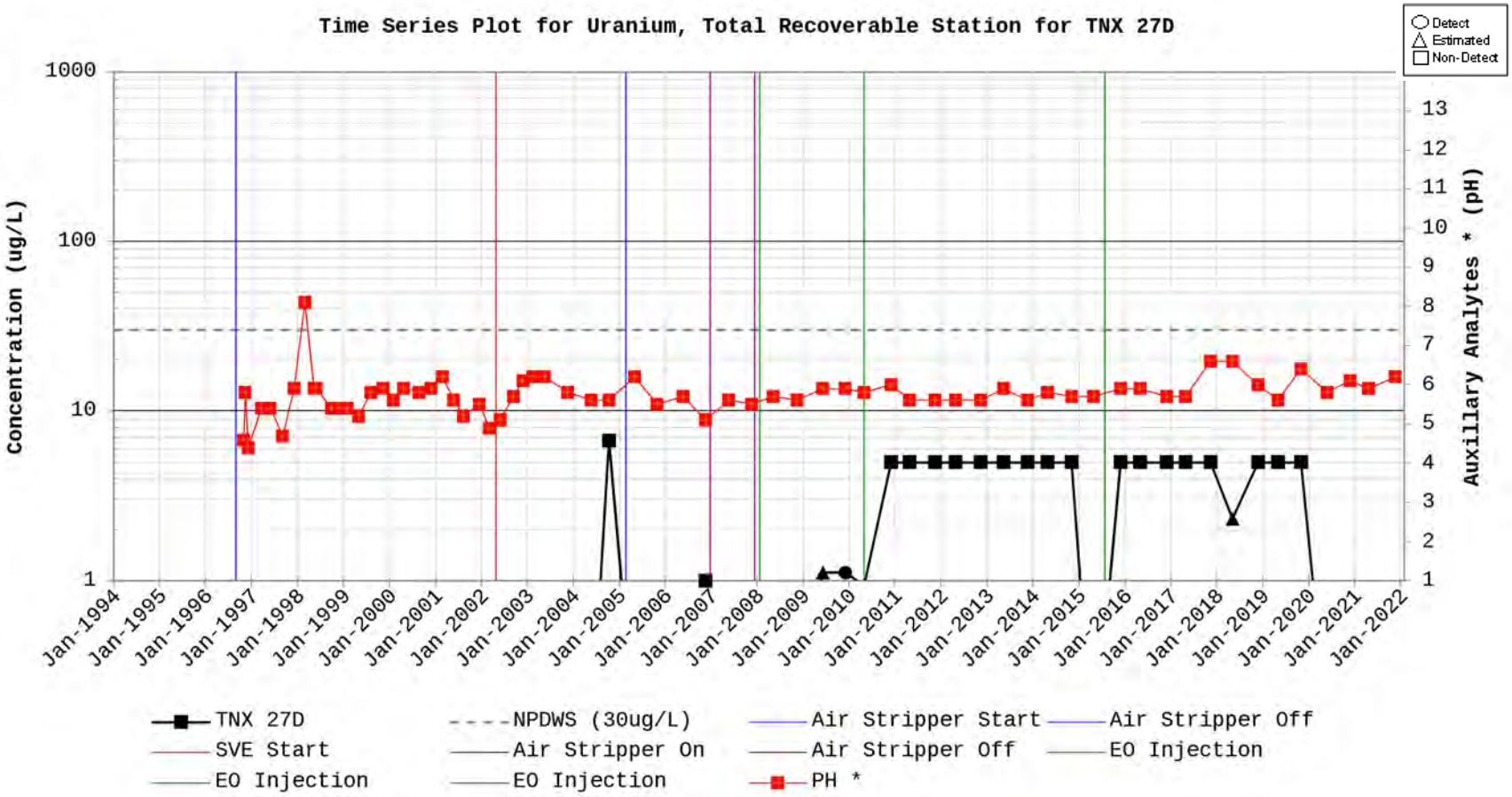

Time Series Plot for Uranium, Total Recoverable Station for TIR 1M
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1M
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

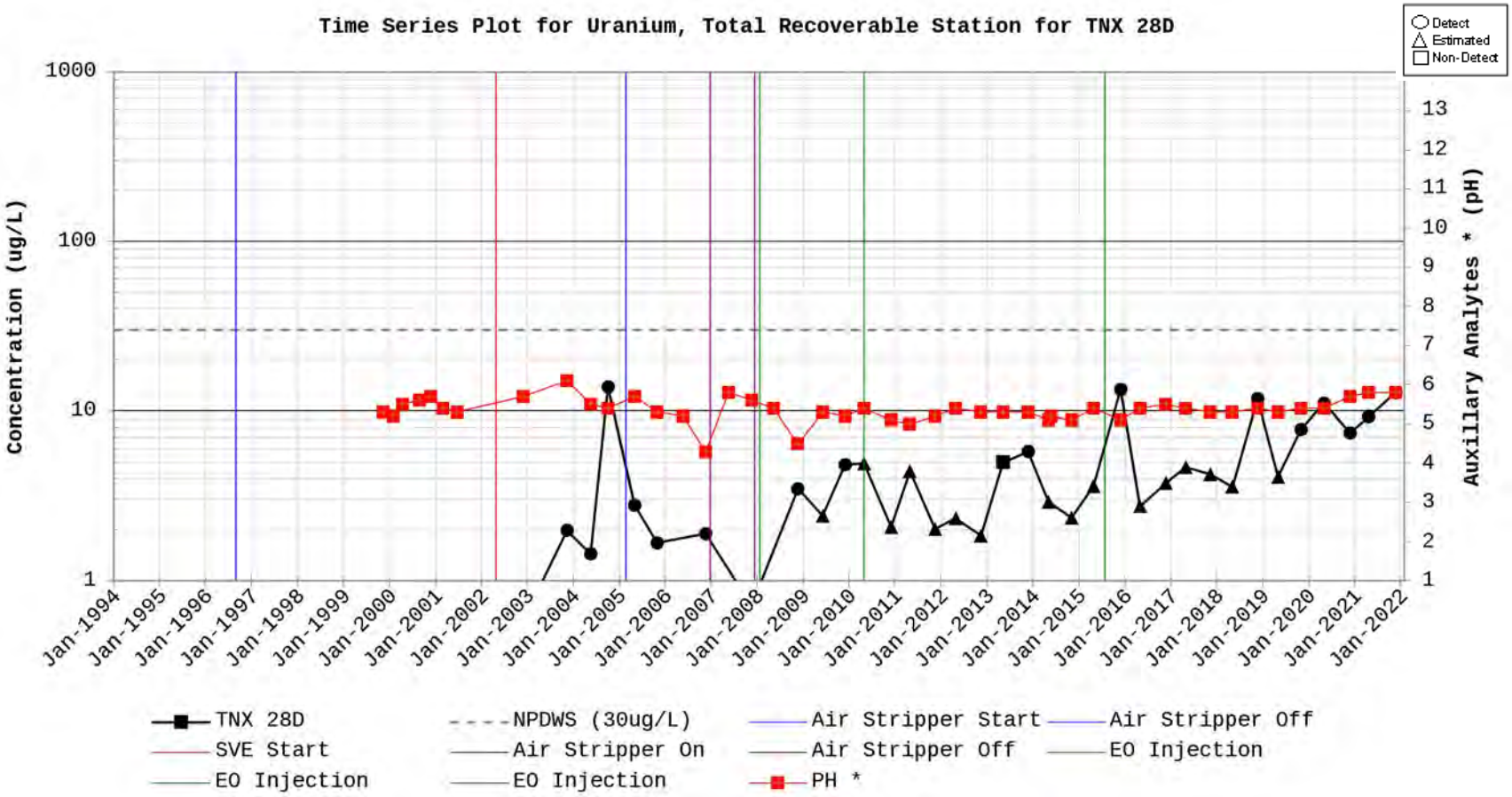

Time Series Plot for Uranium, Total Recoverable Station for TIR 1U
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TIR 1U
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

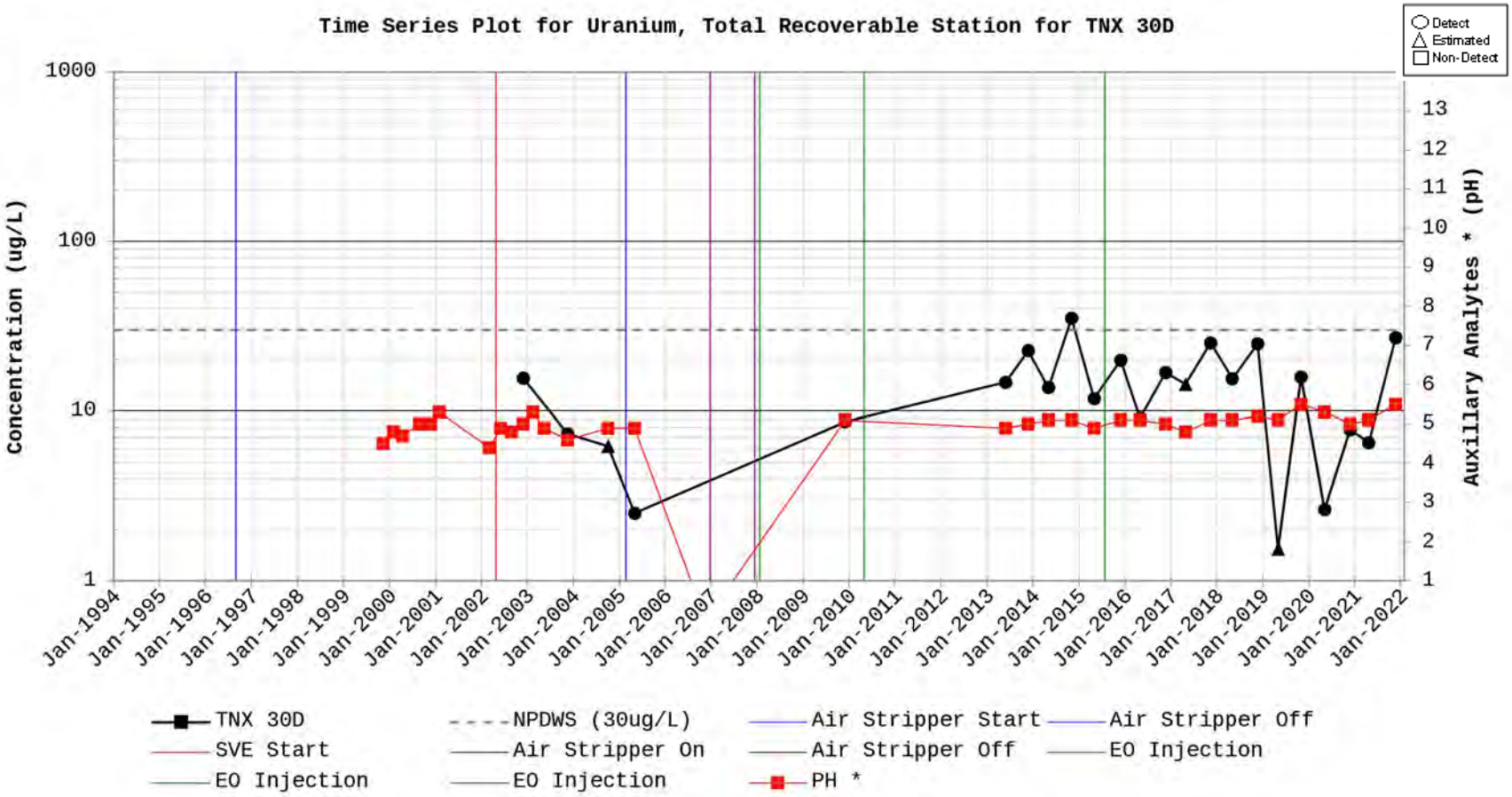

Time Series Plot for Uranium, Total Recoverable Station for TNX 3D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 3D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

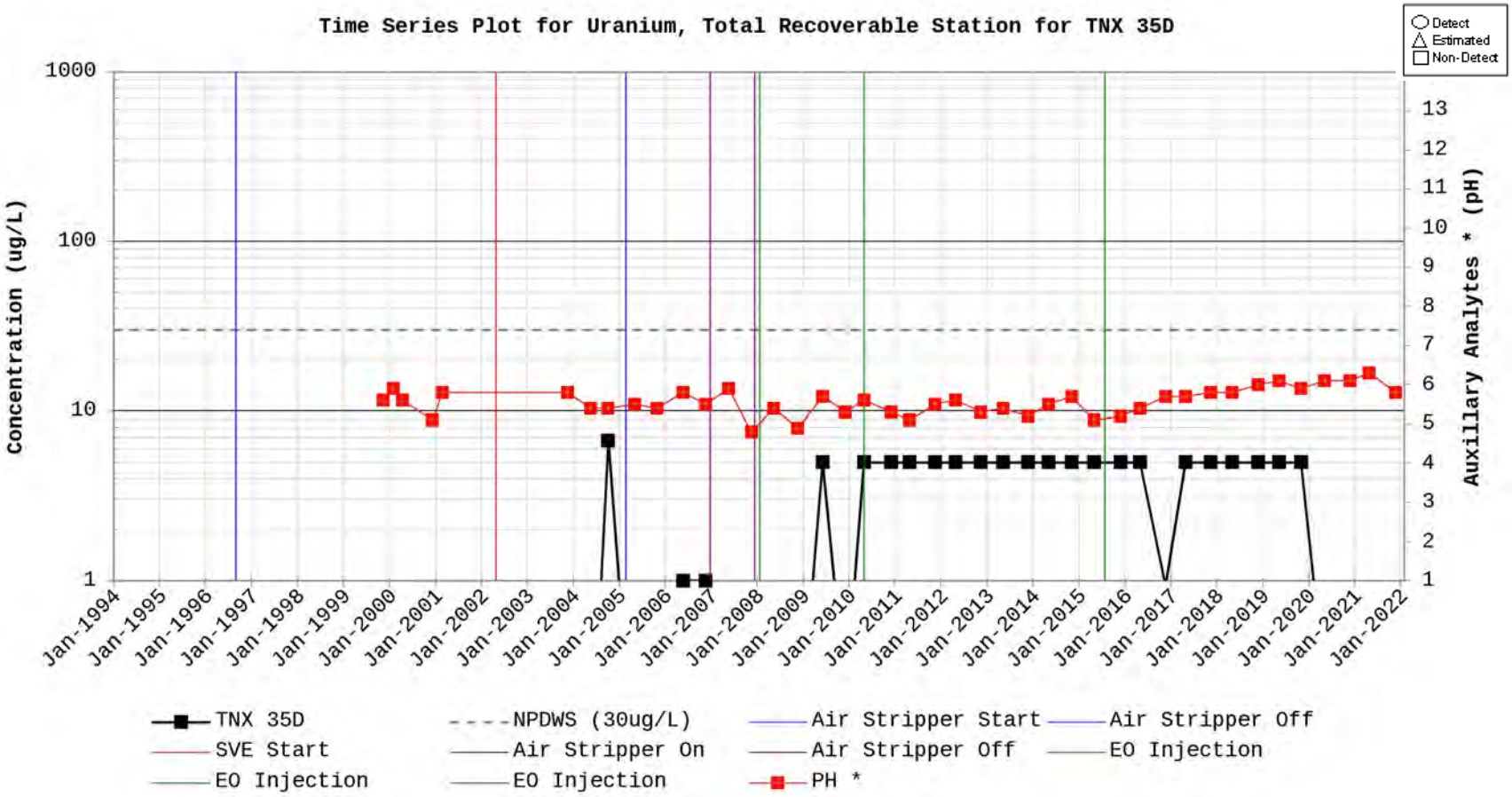

Time Series Plot for Uranium, Total Recoverable Station for TNX 11D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 11D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

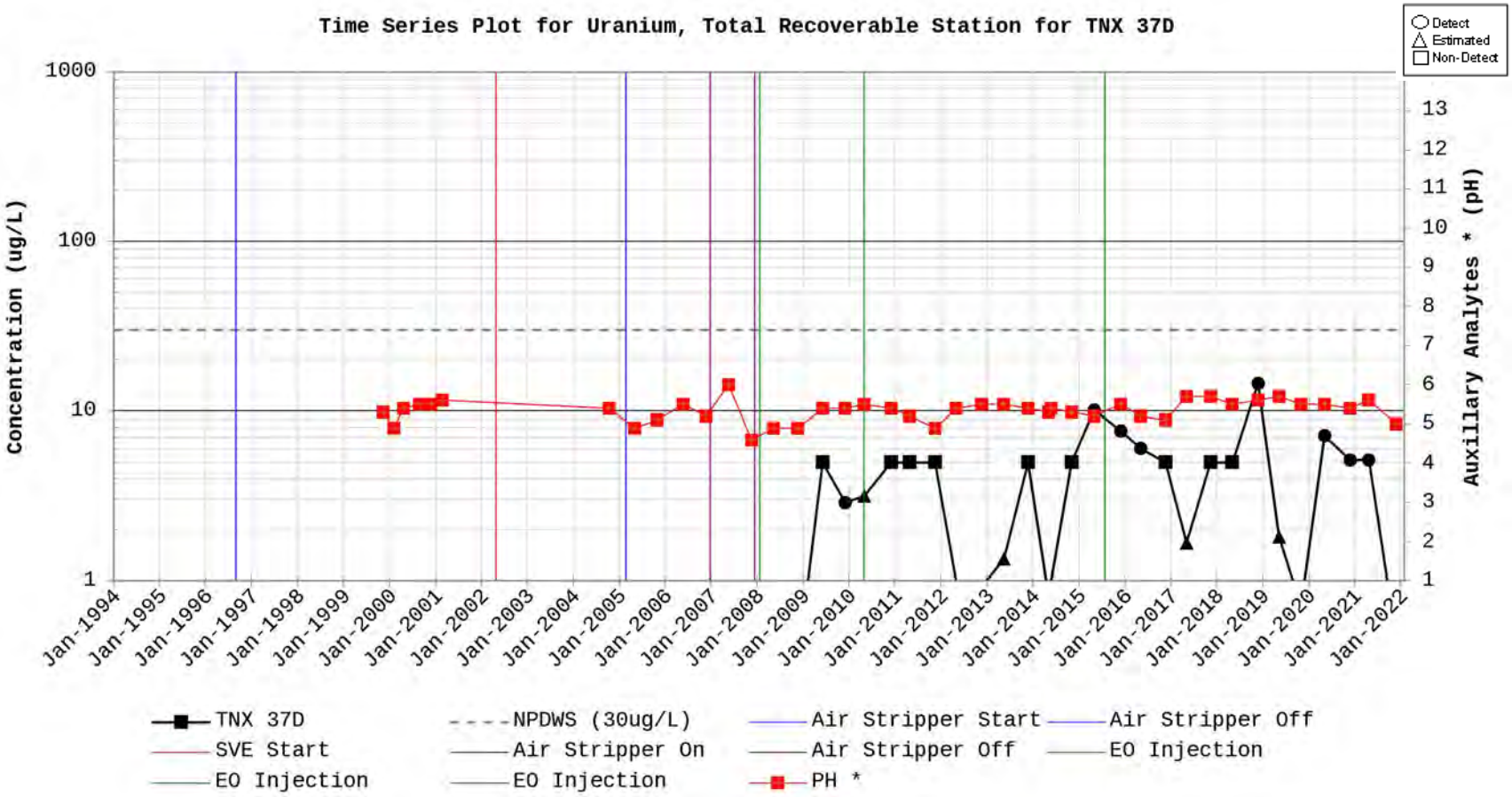

Time Series Plot for Uranium, Total Recoverable Station for TNX 13D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 13D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

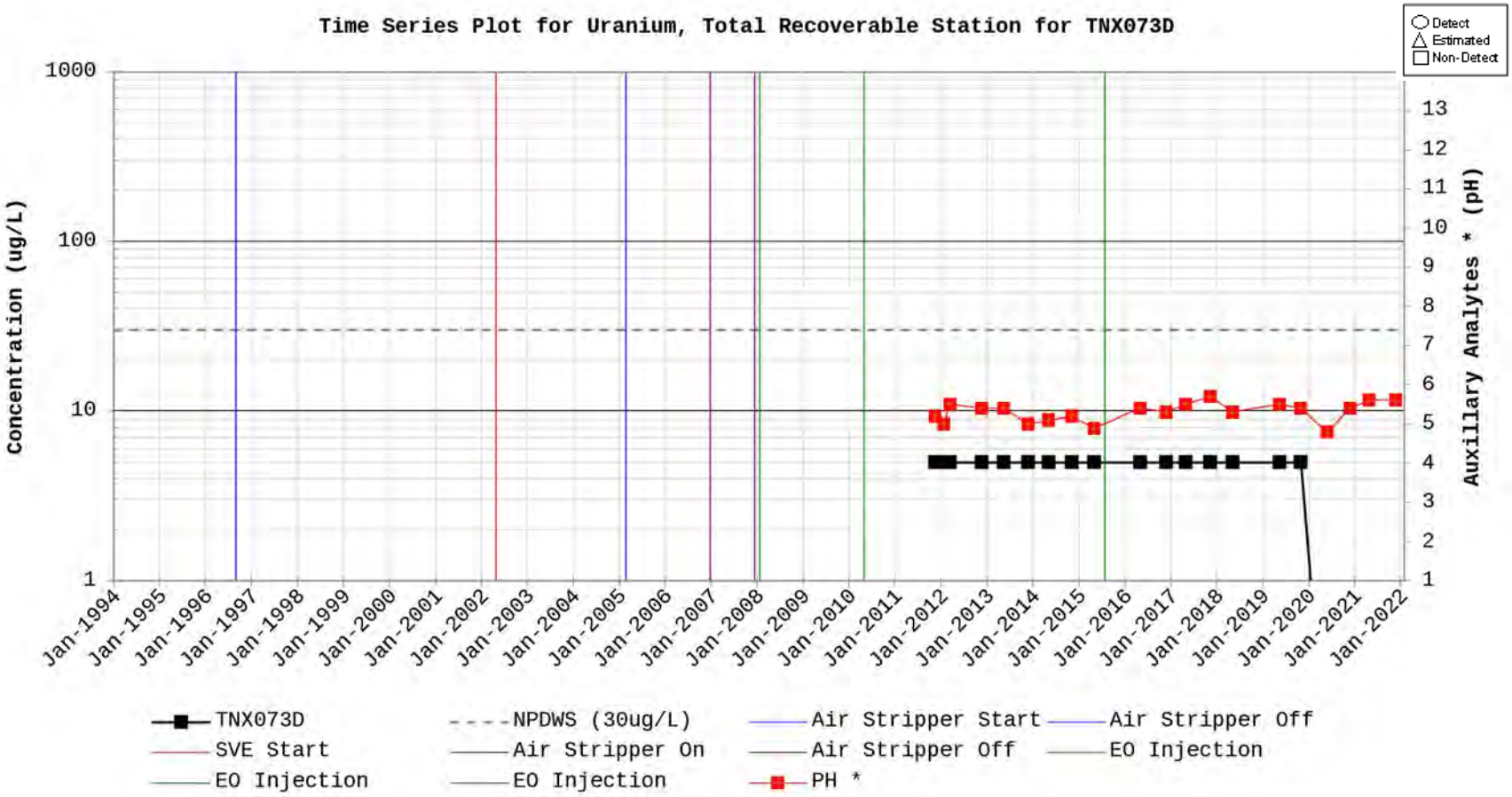

Time Series Plot for Uranium, Total Recoverable Station for TNX 27D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 27D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

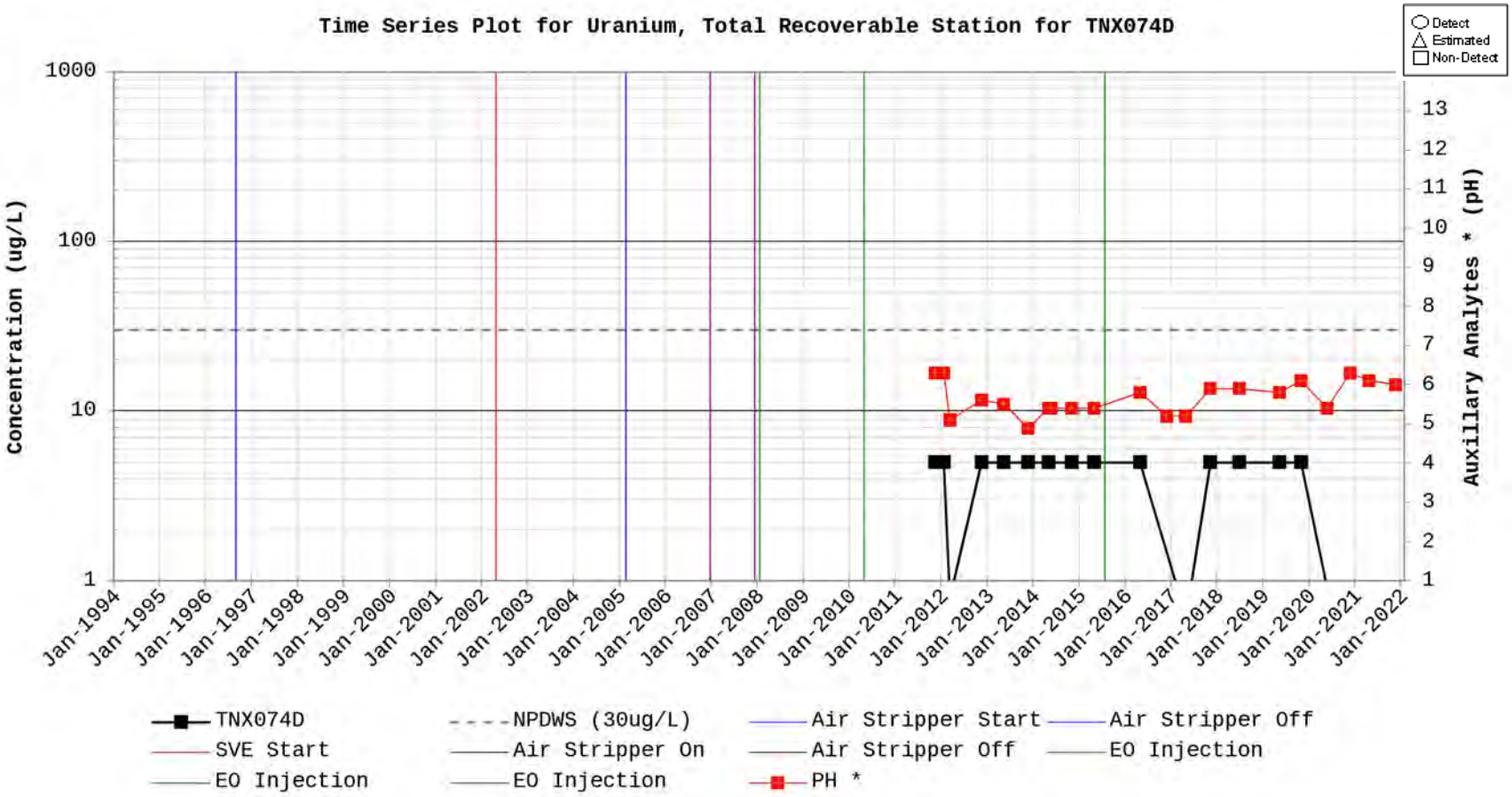

Time Series Plot for Uranium, Total Recoverable Station for TNX 28D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 28D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

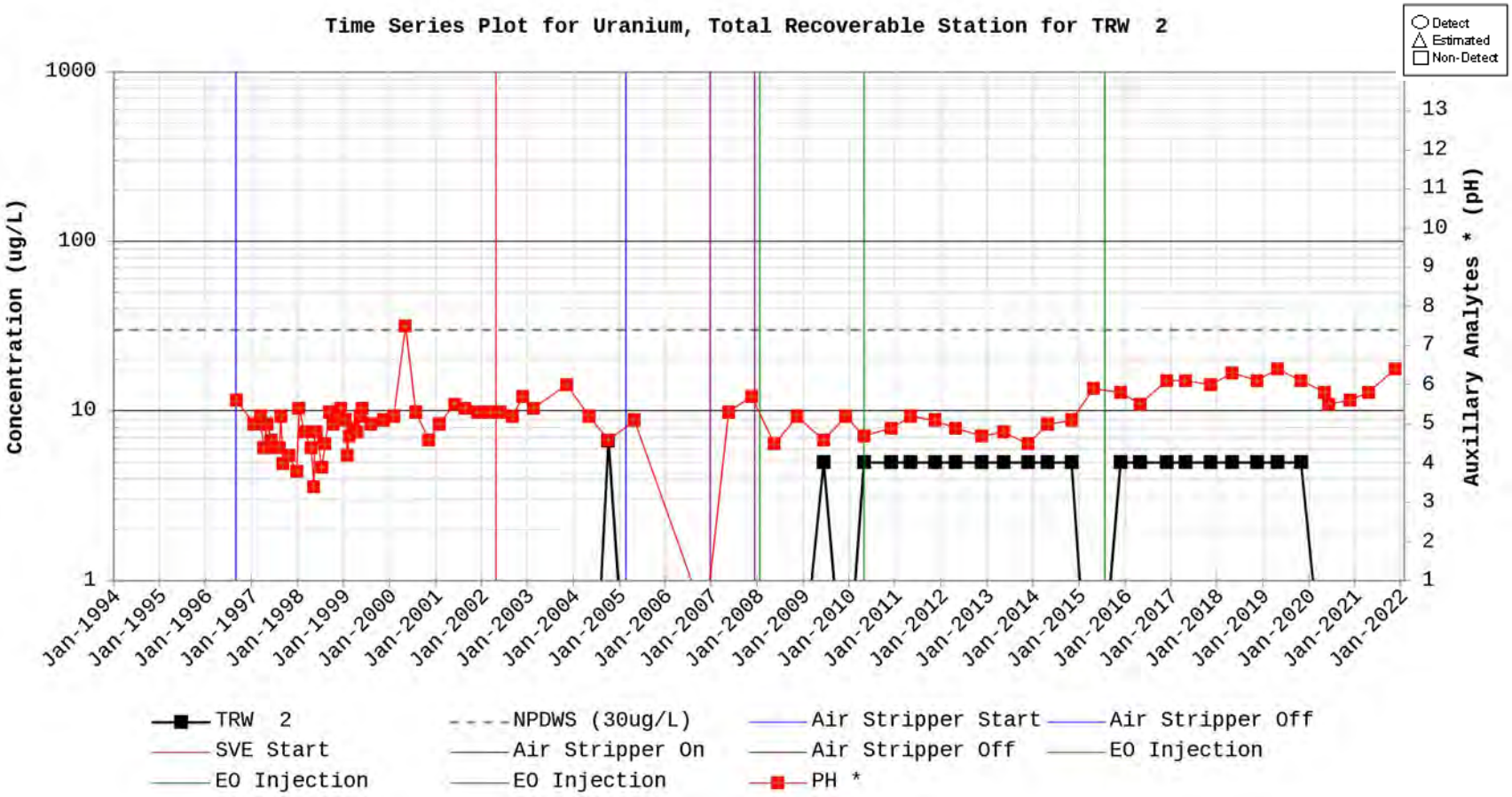

Time Series Plot for Uranium, Total Recoverable Station for TNX 30D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 30D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

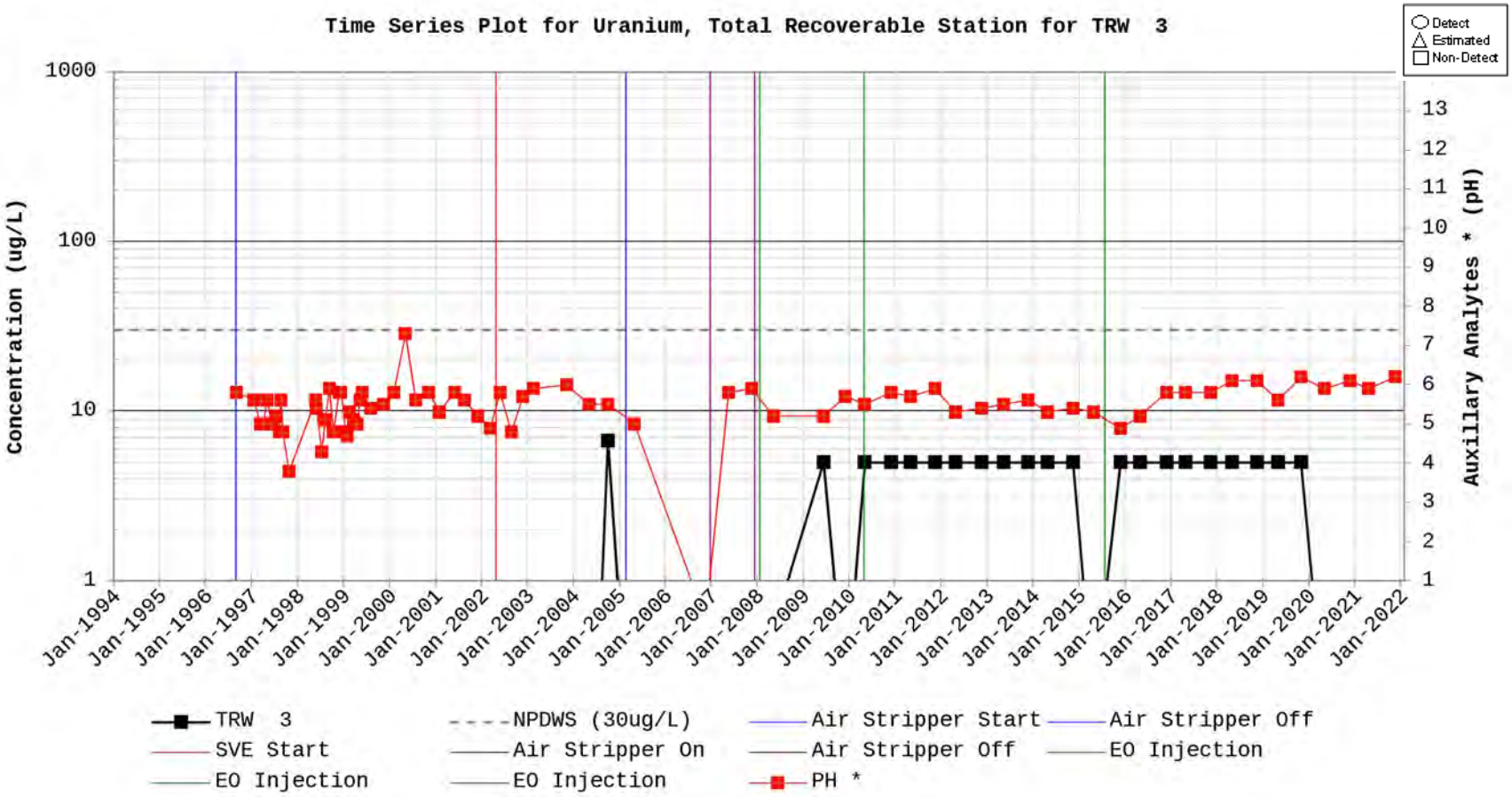

Time Series Plot for Uranium, Total Recoverable Station for TNX 35D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 35D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

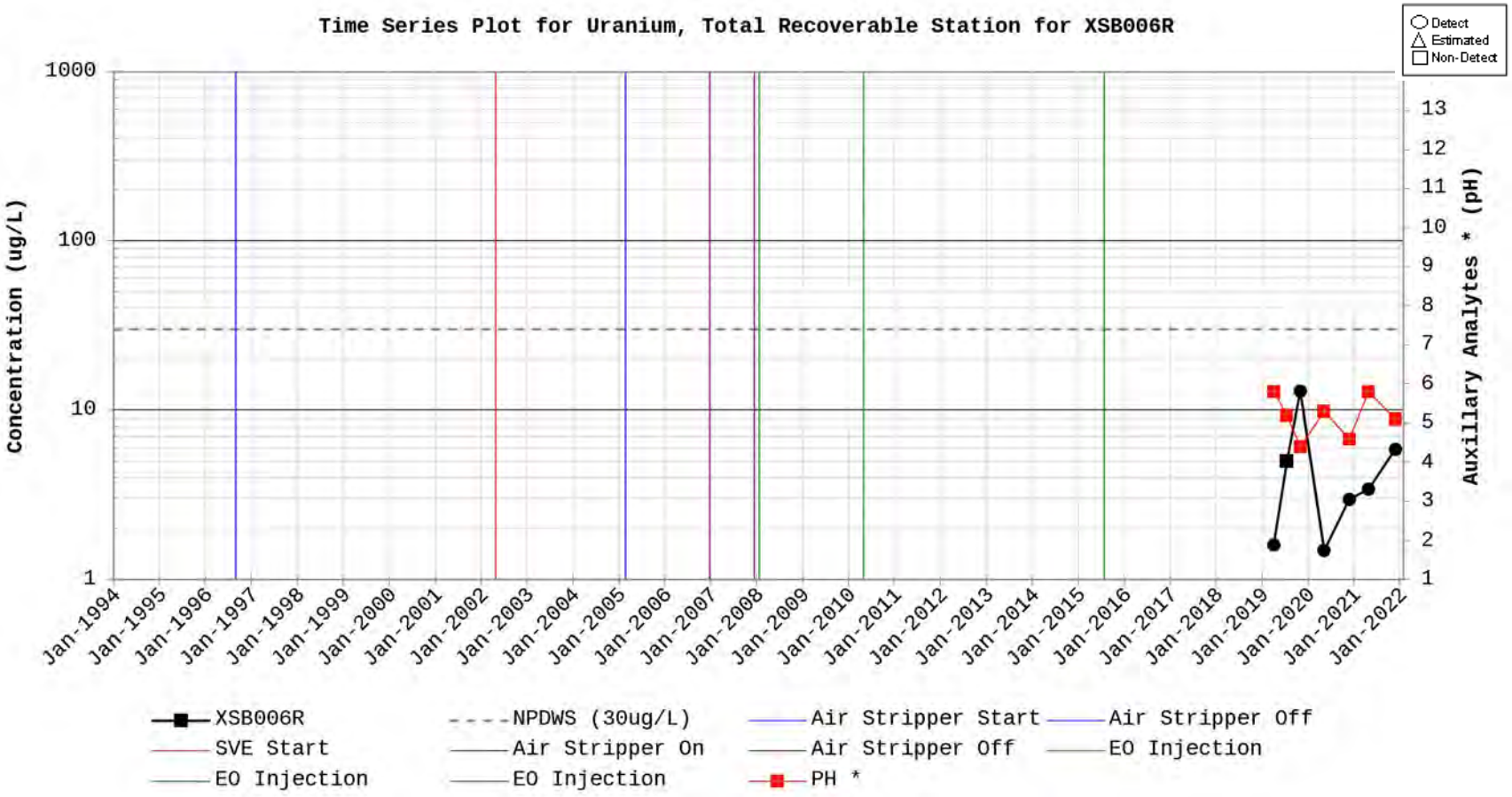

Time Series Plot for Uranium, Total Recoverable Station for TNX 37D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX 37D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *


Time Series Plot for Uranium, Total Recoverable Station for TNX073D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX073D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *


Time Series Plot for Uranium, Total Recoverable Station for TNX074D
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TNX074D
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *


Time Series Plot for Uranium, Total Recoverable Station for TRW 2
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 2
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *


Time Series Plot for Uranium, Total Recoverable Station for TRW 3
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
TRW 3
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *


Time Series Plot for Uranium, Total Recoverable Station for XSB006R
Detect
Estimated
Non-Detect
Concentration (ug/L)
1000
100
10
1
Auxillary Analytes * (pH)
13
12
11
10
9
8
7
6
5
4
3
2
1
Jan-1994
Jan-1995
Jan-1996
Jan-1997
Jan-1998
Jan-1999
Jan-2000
Jan-2001
Jan-2002
Jan-2003
Jan-2004
Jan-2005
Jan-2006
Jan-2007
Jan-2008
Jan-2009
Jan-2010
Jan-2011
Jan-2012
Jan-2013
Jan-2014
Jan-2015
Jan-2016
Jan-2017
Jan-2018
Jan-2019
Jan-2020
Jan-2021
Jan-2022
XSB006R
NPDWS (30ug/L)
Air Stripper Start
Air Stripper Off
SVE Start
Air Stripper On
Air Stripper Off
EO Injection
EO Injection
EO Injection
PH *

This page intentionally left blank.

APPENDIX F

Proposal to Evaluate the Soil Vapor Extraction Wells at the TNX Operable Unit

This page intentionally left blank.

1.0 INTRODUCTION

Soil vapor extraction (SVE) has successfully removed volatile organic compound (VOC) mass from the vadose zone sediments beneath the TNX Operable Unit (OU) main source area and the TNX Burying Ground (TBG). As mass have been removed from the system, mass removal rates from the five MicroBlowers™ have continued to decline with time. An evaluation of the system is needed to determine the following:

- VOC concentrations and mass removal rates at each SVE well;
- Evaluate the location of residual VOC mass in the vadose zone;
- Optimize SVE wells to maximize future mass removal; and
- Establish criteria for SVE system shutdown.

A meeting with the USEPA, SCDHEC, and DOE (Core Team) was conducted on May 26, 2022 to present a proposal to evaluate SVE at the TNX OU. The conclusions of the meeting were that the proposal needed additional sampling of all SVE wells before, during, and after the evaluation, and a summary of the proposal submitted in this *2021 Annual Comprehensive TNX Area Groundwater Monitoring and Remedial Action Effectiveness Interim Report*.

2.0 BACKGROUND

TNX OU has three source units (i.e., TBG, Old TNX Seepage Basin, and the New TNX Seepage Basin) that had previously introduced hazardous and radioactive waste into the subsurface resulting in groundwater contamination. Remediation at the TNX OU was initially focused on removing VOCs from the groundwater with a series of extraction wells, the T-1 Air Stripper, and a recirculation well. Soil and soil vapor samples collected during the installation of the recirculation well and associated monitoring wells identified VOC contamination in the vadose zone or unsaturated sediments beneath the TBG source unit. After the recirculation well was determined to not be a viable remediation option for the TNX OU, the recirculation well and monitoring wells were utilized to test the viability of

SVE. Two phases of SVE testing were completed with the general conclusion that SVE was a viable remediation option for removing VOC mass from the vadose zone and reducing the migration of VOC mass into the groundwater (WSRC 1997d and WSRC 1999b). SVE was added as an Explanation of Significant Difference (ESD) to the Interim Record of Decision (ROD) in 2003.

To support SVE as a remedial action, 12 additional SVE wells were installed with screen zones targeting two permeable zones at approximately 30-40 ft below ground surface (bgs) and 45-55 ft bgs (WSRC 2001a). Figure F-1 is a map of the current SVE well network. SVE began in 2002 with a portable SVE unit (SVEU) and continued operation until the end of 2004. During the first two years of operation with the portable SVEU, multiple tests were conducted to understand the most effective configuration of SVE wells to maximize mass removal, including low flow scenarios to test the viability of MicroBlowers™. A MicroBlower™ is a SVEU connected to an individual SVE wells that is powered by solar energy and a series of batteries. The MicroBlowers™ remain in operation and are rotated between SVE wells every 2-3 years. Mass removal rates measured at the portable SVEU declined sharply during the first two years of operation and it was concluded that there was not enough mass remaining in the vadose zone to warrant an active SVEU (WSRC 2004b). Instead, five MicroBlowers™ would be rotated around the 20 SVE wells. In 2007, after the T-Area Operable Unit cap had been constructed, the five MicroBlowers™ became operational. Mass removal rates continue to decline since MicroBlowers™ became operational in 2007 (Figure F-2).

In 2013, a second ESD to the ROD documented the removal of the extraction wells and the T-1 Air Stripper from operation and replaced it with the injection of edible oil (EO). The EO was deployed in the deep vadose zone, capillary fringe, and within in the aquifer to help sequester and degrade the remaining VOCs under the TBG source area. The EO has been very successful at degrading mass in the treatment area, including reducing mass from the capillary fringe that was known for causing spikes in TCE concentration during higher water table elevations. TCE at most monitoring wells within the EO treatment zone have declined to concentrations less than the maximum contamination level (< 5 µg/L).

3.0 PROPOSAL

Since operation of the MicroBlowers™ started, annual mass removal rates have steadily declined. Declining mass removal is an indication that VOC mass in the vadose zone has declined significantly. An evaluation of the SVE well network is needed to identify the location of the residual mass in the vadose zone, determine if the placement of MicroBlowers™ can be limited to an optimized well network, and establish criteria for the eventual shutdown of the MicroBlowers™. The evaluation will focus on collecting soil vapor samples from individual SVE wells before and after a period of shutdown. The evaluation will include the following activities:

- Initial sampling event of individual SVE wells using a vacuum pump;
- Shutdown period for three months;
- Second sampling event of individual SVE wells using a vacuum pump;
- High frequency sampling of individual SVE wells while connected to a MicroBlower™; and
- Final sampling event of individual SVE wells using a vacuum pump.

The initial, second, and final sampling events conducted at all SVE wells will be done using a portable vacuum unit and a carbon dioxide (CO_2) meter. The portable vacuum unit applies a vacuum to the SVE well pulling subsurface vapor to the surface so a sample can be collected. The CO_2 meter will allow the sampler to verify that the vapor is from the subsurface because subsurface vapor has a significantly higher CO_2 concentration (1,000-10,000 ppmv) than atmospheric air (200-300 ppmv). Verifying that the CO_2 concentration is higher than atmospheric is a good indication that the vacuum pump has a good seal on the well head and all vapor being collected is from the vadose zone. Each sampling event will provide a snapshot of VOC concentrations in the vadose zone. Table F-1 provides a list of VOCs that will be analyzed for during all sampling. The initial sampling event should provide a background of VOC concentrations with the MicroBlowers™ operating.

The second sampling event should provide an indication of how much rebound in VOC concentration has occurred after the three-month period of shutdown. The final sampling event will help observe how VOC concentrations changed after the high frequency sampling has concluded.

During the shutdown period, all SVE wells will be capped and the five MicroBlowers™ will not be operated. The shutdown will allow residual VOC mass to volatilize and diffuse into the pore space of the vadose zone sediments. The shutdown period of three months is adequate time for VOC mass to volatilize and for a change in VOC concentration to be observed between the initial and second sampling events.

The high frequency sampling will be conducted at select groups of SVE wells until all SVE wells have been sampled. During the sampling, each well will be connected to an operating MicroBlower™ and sampled daily for the first week and then weekly for three consecutive weeks. Once sampling is complete, the MicroBlowers™ will be rotated to a new well group until sampling has been completed at all SVE wells. The well groups are defined in Table F-2 and shown on Figure F-3. The well groups were selected to be laterally and vertically isolated from surrounding SVE wells, so the effects of operating the MicroBlower™ does not influence the VOC concentrations of the wells being sampled. Grouping the wells also expedites the high frequency sampling process reducing its duration from 20 months to 8 months. Results from the high frequency sampling event will help to determine if residual VOC mass is present within the zone of capture of each SVE well. Similar to the second sampling event, TCE concentrations should initially rebound or spike, and wells is close proximity to residual mass will have sustained TCE concentrations whereas wells with limited residual mass in their proximity will have declining TCE concentrations.

Results of the evaluation will be utilized to calculate a mass removal rate using the VOC concentrations and the flow rate collected during the high frequency sampling. The mass removal rates for each SVE well will be used to likely group the SVE wells into high, medium, and low producers. The group of high producers represent wells with residual

mass present in their zone of capture, medium producers represent wells that have residual mass present but in low concentrations, and low producers are SVE wells that are not in the immediate proximity of residual mass. Grouping the wells will allow SRS to optimize the SVE well network, reducing the number of wells that the MicroBlowers™ are connected to while maximizing mass removal rates. From these groupings SRS will establish a set of criteria that will be used to remove SVE wells from operation and eventually shutdown SVE at the TNX OU. Based on the testing results, as appropriate, shutdown criteria would recommend continued operation with the MicroBlowers™ at the high producers, BaroBall only operation at the medium producers, and permanent capping or abandonment at the low producers.

The results of the evaluation will be summarized in TNX annual report while the evaluation is ongoing. After the evaluation is complete, a stand-alone report will be produced documenting all results and conclusions. A proposed schedule of events is provided in Table F-3.

4.0 SUMMARY

Based on diminishing mass removal rates from the five MicroBlowers™ currently operating at the TNX OU, SRS plans to conduct an evaluation of the SVE system. The evaluation will include a series of sampling events and a period of shutdown to determine the mass removal rates at each SVE well. The results will help identify the location of the residual mass in the vadose zone, determine if the placement of MicroBlowers™ can be limited to an optimized well network, and establish criteria for the eventual shutdown of the MicroBlowers™. Results of the evaluation will be summarized in TNX annual reports and provided in a final white paper report.

This page intentionally left blank.

Table F–1. List of VOCs Analyzed during the SVE Evaluation

Analyte Name
1,1,1-TRICHLOROETHANE
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE
1,1-DICHLOROETHYLENE
CARBON TETRACHLORIDE
CHLOROFORM
CIS-1,2-DICHLOROETHYLENE
TETRACHLOROETHYLENE (PCE)
TOLUENE
TRANS-1,2-DICHLOROETHYLENE
TRICHLOROETHYLENE (TCE)
TRICHLOROFLUOROMETHANE
CHLOROETHENE (VINYL CHLORIDE)

Table F–2. High Frequency Sampling Well Groups

SVE Evaluation Group	Well Name	Screen Top (ft bgs)	Screen Bottom (ft bgs)	Ground Elevation (ft msl)
1	TVX004 U	22.05	37.05	153.05
1	TVM 3V	42.01	44.01	159.01
1	TVX002 L	44.38	64.38	156.64
2	TVX007 U	29.04	39.04	158.85
2	TVM 1V	42.08	44.08	157.28
3	TVX002 U	26.85	36.85	156.52
3	TVX004 L	43.85	55.85	152.95
3	TVX006 L	47.69	62.69	155.18
3	TVM 2V	42.79	44.79	159.39
4	TVX005 U	27.76	42.76	155.2
4	TVM 4V	43.65	44.65	158.87
5	TVX006 U	37.84	52.84	155.19
5	TVX003 L	41.8	56.8	154.1
5	TVX007 L	43.54	58.54	159
6	TVX005 L	46.92	56.92	155.16
6	TVM 3U	47.6	57.6	158.9
7	TVX 1L	40.89	55.89	153.15
7	TVM 2U	47.53	57.53	159.53
8	TVM 1U	38.12	48.12	157.7
8	TVM 4U	47.87	57.89	158.87

Table F–3. Proposed Schedule of SVE Evaluation Activities

TNX SVE Evaluation Schedule	FY24						FY2025												FY2026												FY27		
	CY2024						CY2025												CY2026														
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D			
Initial Sampling Event of All SVE Wells		X																															
Shutdown All SVE Wells			X	X	X																												
Second Sampling Event of All SVE Wells						X																											
High Frequency Sampling of SVE Wells (Groups)							X	X	X	X	X	X	X	X																			
Final Sampling Event of All SVE Wells															X																		
Summarize SVE Evaluation Results in Annual Report														X												X							
Submit Final White Paper																										X							

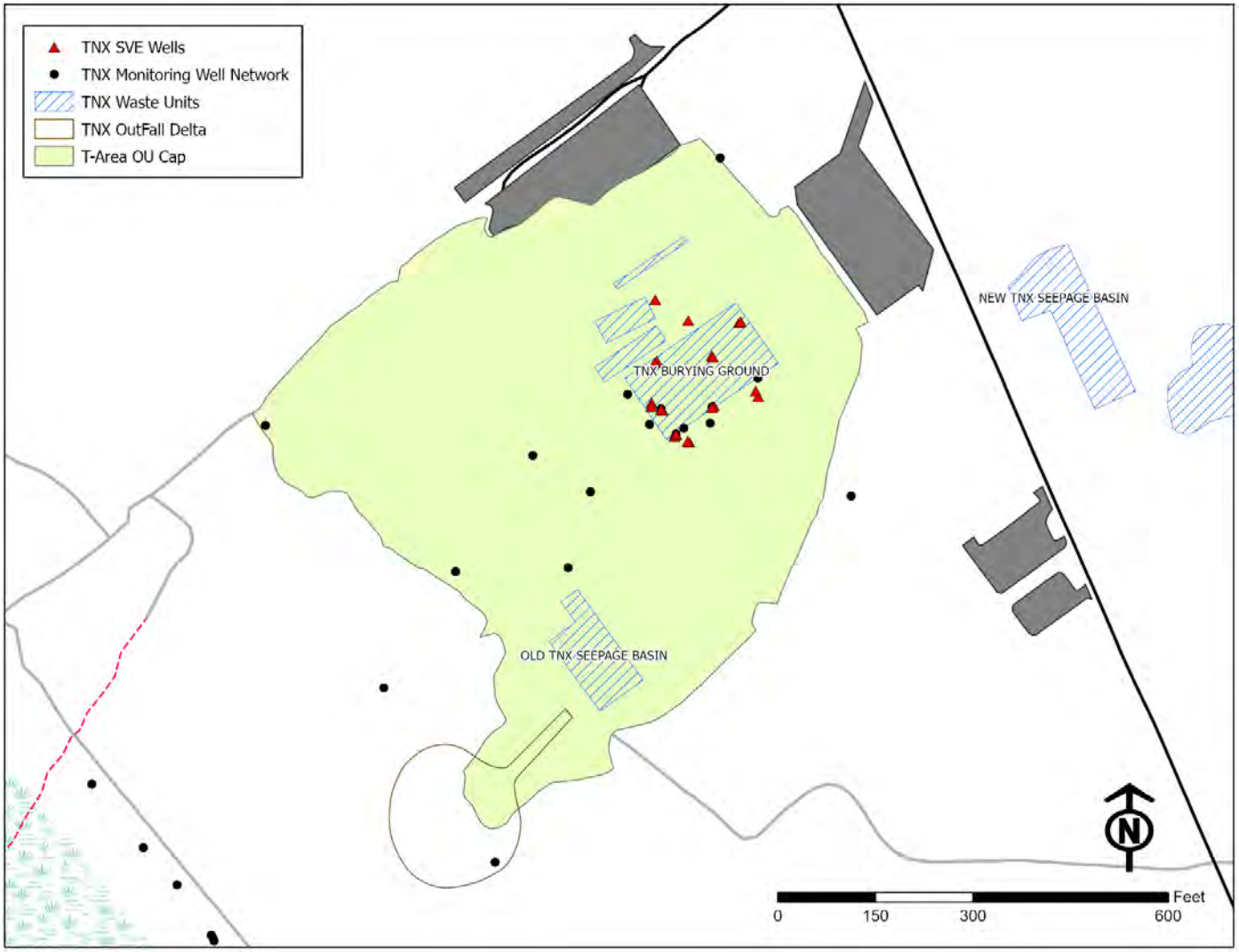


Figure F-1. TNX SVE Well Network

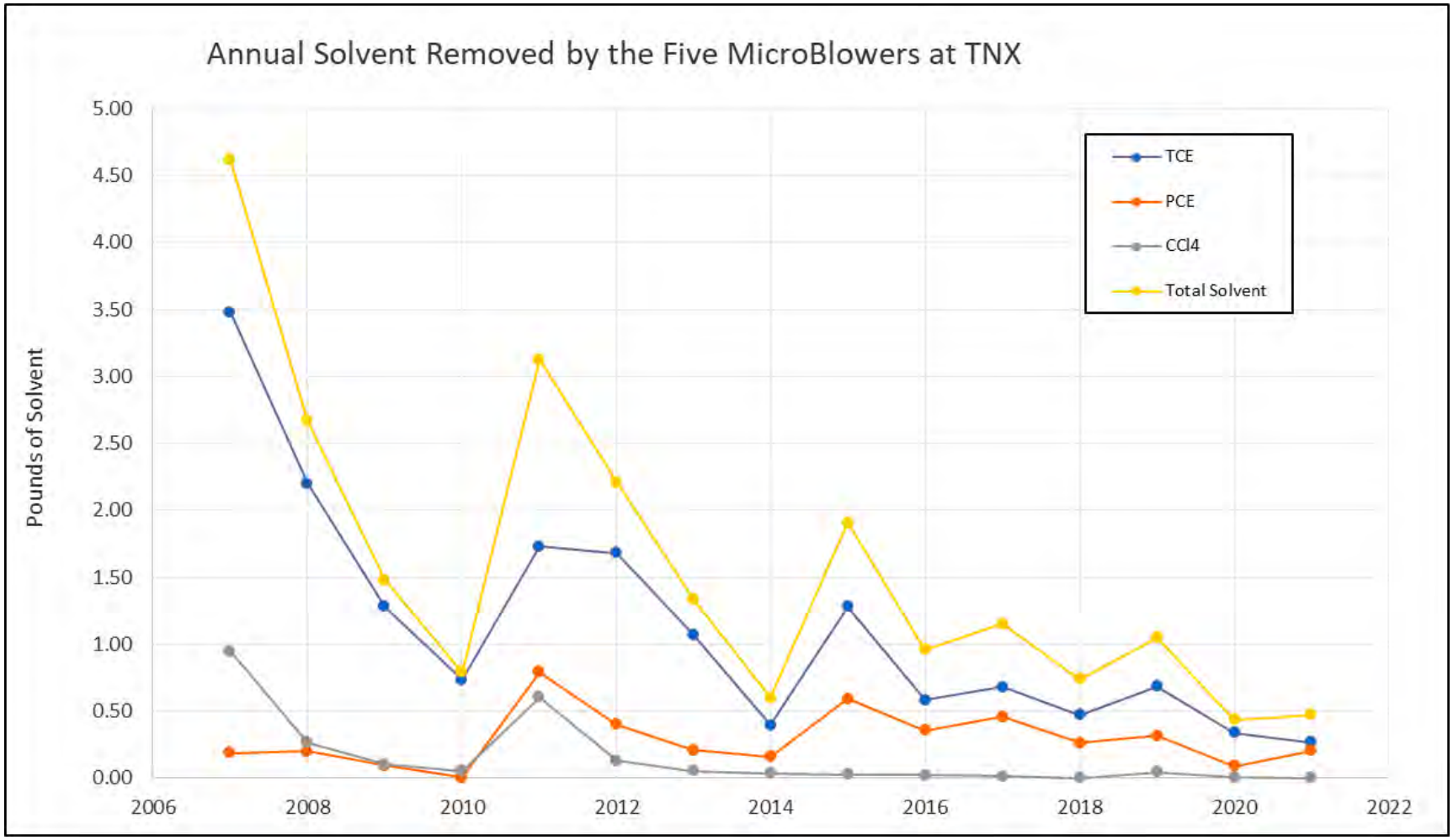


Figure F-2. Annual SVE Mass Removal History at the TNX Area OU.

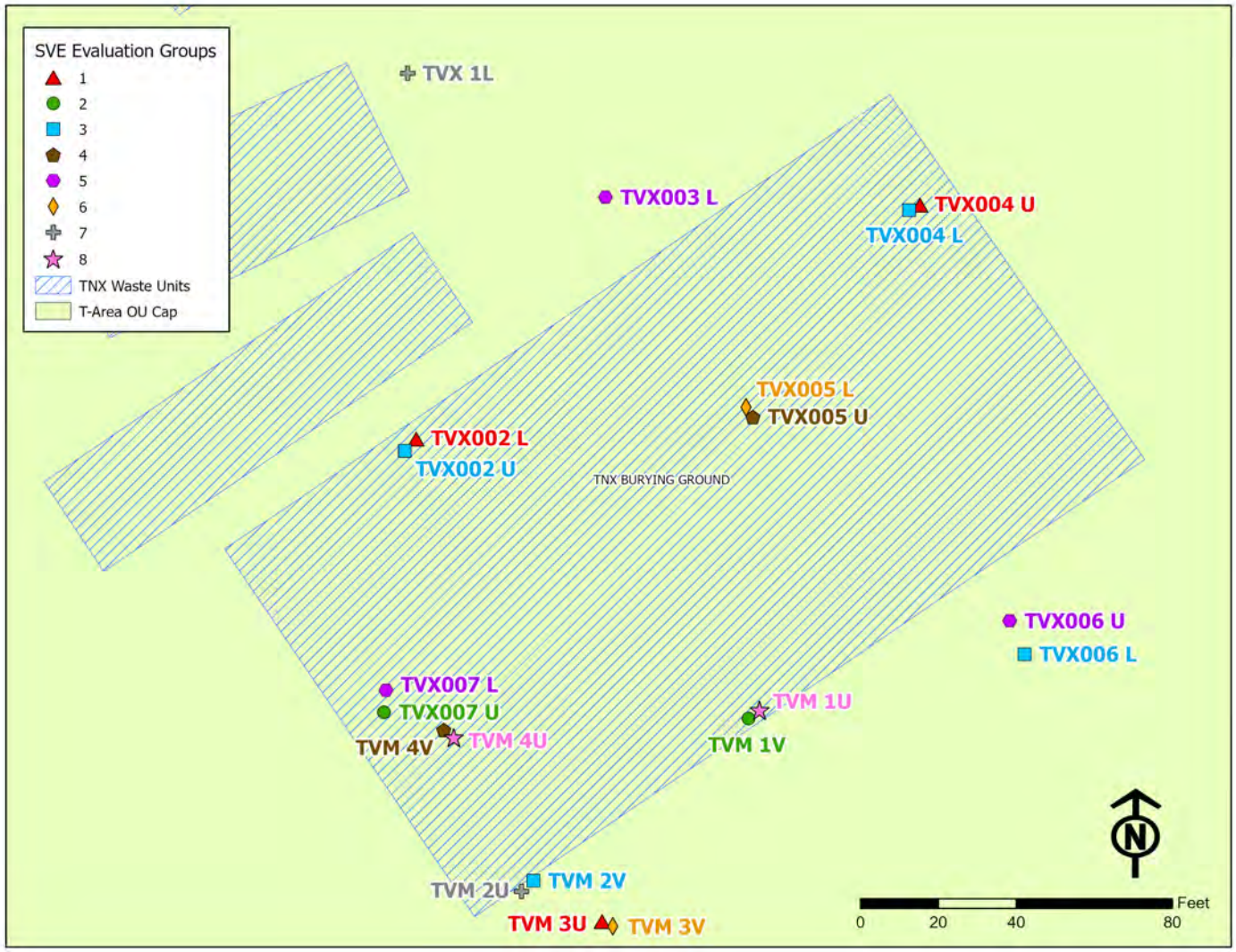


Figure F-3. Location of the High Frequency Sampling Well Groups.