April 2024 Routine Sampling Report and Remediation Performance Update

IBM Gun Club- Former Burn Pit Area
#C704044
Union, New York

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SANBORN HEAD

NYS Professional Engineer Certification
April 2024 Routine Sampling Report and Remediation Performance Update
Former IBM Gun Club – Former Burn Pit Area
Union, New York
NYSDEC Site No. C704044

I, David Shea, certify that I am currently a NYS registered professional engineer and that this Sampling Report and Remediation Performance Update was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER "Technical Guidance for Site Investigation and Remediation" (DER-10).

Date: July 26, 2024

Name: David Shea

NYS P.E. License No. 70026

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1.0 INTRODUCTION

This report summarizes the scope and results of required remedy performance monitoring conducted in April 2024 on behalf of the IBM Corporation (IBM) by Sanborn, Head Engineering, P.C. (Sanborn Head). Groundwater monitoring was conducted in general accordance with the procedures described in Appendix J of the Site Management Plan (SMP).[1] The routine data reporting portions of this report have been prepared consistent with the Monitoring Reporting Requirements described in Section 3.6 of the SMP. This report is subject to the limitations outlined in Appendix A.

Additionally, this report summarizes the results of voluntary investigations and measures completed by IBM to further evaluate remediation performance, including supplemental groundwater sampling that is beyond the requirements of the SMP, and presents an updated mass discharge assessment across the former property boundary that will be used to evaluate remedy performance on an ongoing basis.

The purpose of the above-described voluntary measures was: to further evaluate remediation performance of the enhanced biological degradation (EBD) injection approach that has been implemented at the site pursuant to the requirements of the SMP since 2014; to assess the effects of the May 2023 injection; and to collect data to inform a forthcoming 10-year remedy review (due in 2025). Routine monitoring data continue to support that degradation of chlorinated volatile organic compounds (CVOCs) is occurring and that the short- and long-term remedial goals are generally being met.

2.0 APRIL 2024 GROUNDWATER MONITORING

Groundwater sampling was completed from April 8 to 11, 2024. This sampling event included the groundwater monitoring required by the SMP and additional voluntary sampling / analysis as further described below. The April 2024 sampling event was the third round of groundwater sampling following IBM's enhanced injection approach that was completed in May 2023.

The scope of work included:

- Groundwater elevation monitoring;
- Water quality sampling and laboratory analysis associated with the performance monitoring program;
- Water quality field parameter screening; and
- Supplemental sampling and analyses beyond the scope of the SMP requirements to support evaluation of the May 2023 injection and remediation progress in the context of CVOC mass discharge downgradient of the D-line of injection wells.

Figure 1 depicts IBM's injection well and monitoring location network. This report focuses on the results from the monitoring locations required in the SMP as well as voluntary monitoring of 13 additional monitoring wells and 17 injection wells that were installed in 2022. These

[1] Site Management Plan – April 2016 Revision, Brownfield Cleanup Program, IBM Gun Club – Former Burn Pit area, Union, New York, NYSDEC Site #C704044, BCA Index #B7-0661004-05, prepared on behalf of IBM by Sanborn, Head & Associates, Inc., April 25, 2016.

monitoring points have been included in the sampling program since April 2023. A discussion of the pre-injection versus post-injection (April 2023 versus August 2023) characterization can be found in the August 2023 Sampling Report.[2] Section 3 of this report focuses on the April 2024 mass discharge results in relative to pre-injection mass discharge and an ongoing assessment of seasonal variation.

2.1 Groundwater Elevation Survey

On April 9, 2024, the depths to water in monitoring wells and injection boreholes were gauged in accordance with procedures described in Appendix J of the SMP. Based on the depth-to-water data and survey information, groundwater elevations were calculated for each location. Depth-to-water measurements and groundwater elevations are summarized in Table 1. Inferred groundwater elevation contours, incorporating both the typical routine monitoring locations and the recently installed monitoring and injection wells, are shown on Figure 2.

Groundwater levels in April 2024 were on average 0.85 feet, and up to 3.47 feet, higher than those recorded in November 2023, which is consistent with wet spring weather and snowmelt. According to the National Oceanic and Atmospheric Administration (NOAA), the nearby Binghamton area received approximately 4.7 inches of precipitation in March 2024, which is higher than normal by 1.65 inches.[3] April 2024 water levels were also on average 1.66 feet, and up to 7 feet, higher than April 2023 water levels.

In the week preceding sampling, the Binghamton area received approximately 1.71 inches of precipitation. Rainfall and the associated increased infiltration may produce oxygenated conditions less conducive to biodegradation. As shown on Figure 2, groundwater contours and expected flow direction are generally consistent with historical monitoring and interpretation.

2.2 Water Quality Sampling

The scope of sampling as originally outlined in the SMP is included as Table 2. The scope was modified as follows:

- Samples were collected for laboratory geochemical analysis (i.e., total iron, ferrous iron, nitrate, sulfate, and sulfide) instead of in-situ field geochemical testing to improve field time efficiency;
- As noted above, 30 recently (2022) installed monitoring and injection locations were added to the sampling scope, in addition to existing injection well A-13; and
- Due to a reaction between the sampling matrix (presence of the buffered amendment) and the sample bottle preservatives (acids), 10 samples for VOC analysis were collected in unpreserved VOA vials and shipped overnight to the analytical laboratories; and

[2] August 2023 Routine Sampling Report and Remedial Performance Update, Former IBM Gun Club- Former Burn Pit Area, Union, New York, NYSDEC Site #C704044, prepared on behalf of IBM by Sanborn, Head Engineering, P.C., November 17, 2023

[3] Binghamton Greater AP, NY US station No. WBAN: 04725. Downloaded from NOAA Local Climatological Data Center on June 25, 2024.

- Samples were collected and submitted for laboratory analysis for quantitative polymerase chain reaction (qPCR) and compound specific isotope analysis (CSIA) at an expanded list of locations as outlined in the 2021 Optimization Report.

Exhibit 1 below summarizes the sampling methods used during the April monitoring event. The quality assurance/quality control (QA/QC) samples collected for VOC analysis are summarized in Exhibit 2. Samples (including QA/QC samples) submitted for off-site laboratory analysis are tabulated in Exhibit 3. Laboratory and field analytical results are summarized in Table 3.

Exhibit 1 Summary of Sampling Methods

Sample Method	Number of Locations Sampled
Modified Low-Flow	46
Submerged Container (surface water)	5
Passive Diffusion Bag	3

Exhibit 2 Summary of QA/QC Samples for VOC Analysis

Total Sample Locations	54
Duplicate Samples	6
Matrix Spikes	3
Matrix Spike Duplicates	3
Field Blanks	3
Equipment Blanks	1
Trip Blanks	6

Exhibit 3 Summary of Analytical Type (includes QA/QC analyses)

Sample Type – Off-Site Laboratory	Laboratory	Number of Samples
VOCs	Eurofins	76
Total Organic Carbon	Eurofins	48
Geochemical Analyses	Eurofins	27
Volatile Fatty Acids	Pace	33
Light Gases (Ethane, Ethene, and Methane)	Pace	33
qPCR (Microbial census) & CSIA	Microbial Insights	18

Equipment Calibration

Exhibit 4 below summarizes the field instruments utilized during field sampling. The instruments were calibrated each morning, and a calibration check was performed at the end of each day. Daily calibration forms are kept on file and are available upon request.

Exhibit 4 Summary of Field Instrumentation

INSTRUMENT	FIELD PARAMETER
YSI Water Quality Parameter Probe	Temperature, pH, Specific Conductance, Dissolved Oxygen, and Oxidation-reduction Potential

HACH 2100Q Turbidimeter	Turbidity
Heron Dipper-T	Groundwater level

3.0 APRIL 2024 GROUNDWATER QUALITY RESULTS

This section presents a discussion of groundwater quality results for April 2024 in the context of post-injection monitoring, inclusive of the recently installed monitoring and injection wells. These results were compared to the results from November 2023, which constituted the second round following the May 2023 injection. As stated above, a discussion of the pre-injection baseline (April 2023), the May 2023 injection, and August 2023 results are provided in the August 2023 Sampling Report.

A summary of the groundwater quality data and inferences for April 2024 is presented on Figure 2. Figure 3 is an interactive PDF that presents the geochemical data used to assess amendment delivery and response (click on the gray buttons at the upper right to view the various parameters). Appendix B includes time-series charts of key geochemical and CVOC results. Field sampling records and analytical laboratory reports are kept on file and available upon request.

3.1 Geochemical Conditions

Enhanced biochemical degradation of CVOCs in groundwater is being monitored by: 1) tracking changes in concentration of trichloroethene (TCE), the predominant parent compound, 2) tracking the presence of breakdown products of TCE, including the terminal breakdown products ethene and ethane, 3) tracking the presence of geochemical conditions favorable to biochemical degradation by reductive dechlorination, and 4) supplemental analysis (CSIA/qPCR]) to inform the mechanisms and rates for degradation.

The field and laboratory data for April 2024 reflect conditions approximately ten months after injection of edible oil amendment (i.e., EVO, an electron donor to facilitate degradation). The results are from samples collected in higher-than-average seasonal water level conditions, as described in Section 2.1 above, as well as in lower groundwater temperatures typical of an early spring sampling event.

Geochemical conditions generally remain within ranges that are favorable for reductive dechlorination over most of the primary source rock/area as defined in the last report.[4] Further details are provided below.

Total Organic Carbon

Total organic carbon (TOC) in groundwater greater than 4 milligrams per liter (mg/L) is considered conducive to reductive dechlorination, while a concentration greater than 100 mg/L is the target for injection wells in order to provide an ongoing short-term source of carbon, and approximately 1,000 mg/L to provide a long-term source of carbon. Similar to November 2023

[4] November 2023 Routine Sampling Report and Remedial Performance Update, Former IBM Gun Club- Former Burn Pit Area, Union, New York, NYSDEC Site #C704044, prepared on behalf of IBM by Sanborn, Head Engineering, P.C., February 9, 2024

monitoring, TOC samples were collected from supplemental locations including the more recently installed C-line and D-line wells, the existing A-13 injection well, and each of the shallow intervals at the four nested well locations (BP-42AS through BP-45AS). Of the forty-eight (48) TOC samples collected, twenty-two (22) samples were from injection wells.

In April 2024, TOC concentrations in the favorable range were present throughout the monitoring area. TOC concentrations greater than 1,000 mg/L were measured at 10 out of 22 injection boreholes subjected to sampling that had actively been injected into in May 2023. A TOC level greater than 1,000 mg/L was also present at BP-34A, which is located within the injection zone of influence. BP-35A and BP-36A, locations further downgradient, continued to exhibit a TOC concentration at least an order of magnitude greater than the 4 mg/L threshold. As noted in the August 2023 sampling report, BP-35A and BP-36A, located between the A/C and B/D injection lines, typically have not exhibited TOC concentration responses to injection events. These locations continued to exhibit favorable TOC concentrations of 190 mg/L and 110 mg/L in April 2024, an increase on average from November 2023.

TOC concentrations across the nested well transect (BP-42A through BP-45A) at the former property boundary reached the 4 mg/L threshold at one location (BP-43AS at 5.4 mg/L), as compared to two locations in November 2023. The November 2023 round was the first time TOC was analyzed at the shallow nested wells and the intermediate well BP-43AI.

Overall, TOC concentrations across the site decreased compared to November 2023, consistent with consumption of carbon amendment following the May 2023 injection. However, overall levels generally remain conducive to reductive dechlorination, with 80% of locations (both monitoring and injection wells) exhibiting concentrations greater than 4 mg/L. In addition, TOC concentrations across the primary source rock and in particular near the injection lines are largely greater than 100 mg/L with several greater than 1,000 ug/L suggesting that an additional injection at this time is not warranted.

pH

pH in the range of 6.0 to 8.0 standard units (s.u.) is most conducive to reductive dechlorination, while levels as low as 5 s.u. are not ideal, but tolerable.

Overall, pH levels in April 2024 were observed to be on average slightly higher than November 2023 levels. pH levels in the injection wells ranged from 5.10 to 6.68 s.u. in April 2024, compared to 5.04 to 6.75 s.u. in November 2023. Overall, the average pH in injection wells increased slightly to 6.06 s.u. in April 2024, compared to 5.81 s.u. in November 2023, to within the most conducive range.

April 2024 sampling marks the first-time post-injection that the average pH level in the injection wells was within the most conducive range for reductive dechlorination. Nested and routine monitoring well samples continue to be within the 6.0 to 8.0 s.u. ideal range, apart from BP-34A (5.6 s.u.) which is within the injection zone of influence.

Monitoring of pH will continue during the next sampling round in August 2024 to assess if pH levels continue to increase or stabilize within the ideal range.

Dissolved Oxygen (DO)

DO concentrations below 2 mg/L are most conducive to reductive dechlorination. DO concentrations below 2 mg/L were observed at most of the sampled wells during the April 2024 monitoring event, with an average of 1.45 mg/L. Overall, DO concentrations were generally improved (lower) than November 2023 monitoring levels in routinely sampled monitoring wells despite the increased precipitation prior to the April 2024 event.

DO concentrations at the new injection wells (C-1 through C-11, D-1 through D-6) generally increased since November 2023, though most concentrations remain below the 2 mg/L threshold, with a maximum DO concentration of 3.2 mg/L (C-4). A similar increase was observed in the nested wells downgradient and south of the property boundary (BP-42A through BP-45A), also with most concentrations remaining below the DO threshold. One sample in this interval exhibited a condition where reductive dehalogenation is less likely (BP-45AS, 6.62 mg/L). We note that other parameters, including the presence of secondary and terminal breakdown products in this well indicate degradation is occurring.

Among the DO concentrations recorded in April 2024, BP-45AS is the only location indicative of unfavorable conditions (greater than 5 mg/L). The remaining concentrations were either below the 2 mg/L threshold (indicative of conditions conducive to reductive dechlorination) or between 2 and 5 mg/L (indicative of marginally conducive conditions), 72% and 28%, respectively.

The presence of DO concentrations unfavorable to reductive dechlorination does not rule out the possibility of biodegradation of cis-1,2-dichloroethene and vinyl chloride by aerobic microbes.

Oxidation Reduction Potential (ORP)

DO and ORP levels are key indicators of aquifer redox conditions. ORP readings below -100 millivolts (mV) are recognized to be most conducive to reductive dechlorination, while readings between 50 and -100 mV are moderately supportive of the reductive pathway. Each of the recently installed injection wells and nested monitoring wells were monitored for ORP in April 2024, as shown on Figure 3. Overall, ORP values continued to exhibit mostly negative ORP readings in April 2024 following the May 2023 injection, indicating a continuing stabilization to redox conditions that are conducive to reductive dechlorination.

Average ORP values in the recently installed injection wells saw a slight decrease between November 2023 (-54 mV) and April 2024 (-67 mV). All ORP readings in the new injection wells were negative, an improvement from November 2023, which saw positive ORP readings in C-2, C-3, and D-1. As previously reported, the least favorable pre-injection ORP values in the C-line were present at the eastern end of this injection well line, perhaps indicating a lack of amendment delivery in the area from past injections.

ORP readings in the downgradient nested well locations generally varied from levels not conducive to levels indicating moderate to high support of the dechlorination pathway across monitoring intervals. The depth variability exhibited in November 2023 continued in April 2024, however the most variability was observed in the deepest intervals (15 to 20 ft bgs), exhibiting a range of -142.9 mV to 110.1 mV, while the intermediate (10 to 15 ft bgs) and shallow (5 to 10 ft bgs) intervals saw a range of 24.8 mV to 94.3 mV. We note that the most improved VOC concentration compared to pre-injection levels (increased ethene/ethane and decreased TCE concentrations) are observed at BP-42AS and BP-43AS, locations with lower ORP values than average along this transect.

As discussed in the August 2023 sampling report, ongoing assessment of site redox conditions is being tracked by inferring ORP isopleths, with the intermediate depth nested well intervals (10-15 ft bgs) used in interpolating the ORP contours shown on Figure 2, as they best match the depth of the other monitoring points to the north. The ORP contours show widespread coverage of ORP values less than 50 mV across the primary source area. The area understood to be most conducive to reductive dechlorination at <-100 mV decreased somewhat from November 2023 to April 2024, mostly between the two injection areas and south to BP-39A. However, we note that the contraction of the area <-100 mV is primarily based on the results of BP-36A, BP-41A, and BP-39A. ORP values are near the -100 mV threshold at these locations, with ORP values of -60.5 mV, -94.8 mV, and -61.2 mV, respectively.

3.2 CVOC Results

Time series plots depicting CVOC concentrations and other compounds in groundwater on a molar fraction basis are included as Appendix B. CVOC concentrations observed in April 2024 monitoring are depicted as pie charts on Figure 2, which includes samples from recently installed injection and nested monitoring wells. In comparison to November 2023, April 2024 TCE levels generally exhibited decreasing or stable concentrations in most wells. Total CVOC concentrations were slightly higher at some locations in April compared to pre-injection concentrations. As further described below, increases in overall CVOC concentrations are primarily due to increases in breakdown products, indicating an increase in degradation since the May 2023 injection, which is an encouraging sign of the success of the remedy. Positive effects of the injection are observed as far south as BP-39A. We note these continued favorable responses to the injection occurred over the colder months, where historically there has been a decrease in evidence of microbial activity inferred to be attributable to colder groundwater temperatures.

For routine monitoring locations, other CVOC observations include:

- At BP-35A, located between the C- and B-line of injection wells, TCE concentrations decreased to historically low concentrations between November 2023 and April 2024. At the same time, historically high concentrations of terminal breakdown products were observed. Ethene and ethane concentrations have increased by 3 orders of magnitude since the May 2023 injection. We note generally favorable geochemical conditions were also present and showed improvement from August 2023. Similar TCE decreases and daughter product increases were observed throughout the monitoring area, including BP-6A

(historically the location with the highest TCE concentration), and BP-5A (downgradient to the north) and BP-31A (downgradient/side gradient to the south);
- At BP-9A, total CVOC concentrations decreased in April 2024 compared to November. We note that slightly elevated reporting limits (<25 µg/l) were observed for TCE and vinyl chloride (VC) due to matrix interference issues during laboratory analysis. However, favorable and improving geochemical conditions were also present, including near historical low ORP values and increased pH;
- TCE in BP-39A, located downgradient across the former property line, continued to decrease compared to pre-injection concentrations. Historically low TCE concentrations and historically high terminal breakdown product concentrations were observed in April 2023 sampling results.

For the injection and monitoring wells installed in 2022, time series plots are included in Appendix B, and sample data are summarized in Table 3. In general, there was variability in both concentration and molar proportion across the C- and D- line transects, not unexpected due to the variability of the fractured bedrock environment. In general, reductions of both overall CVOC concentration and the proportion of TCE were observed across the C- and D-line injection wells in post-injection monitoring. Notably, the D line injection wells, located downgradient of the main injection area, saw a decrease in TCE concentrations from November 2023 in every location, except for D-5, where TCE was already not detected above the reporting limit. Other CVOC observations include:
- As previously reported, relatively higher concentrations were observed in pre-injection monitoring at both the eastern and western end of the C-line, possibly indicating lack of amendment delivery from previous injections in these areas. Both total CVOCs and TCE concentrations continued to show improvement in April 2024, especially on the western end where secondary and terminal breakdown products are now the predominant species on a molar basis;
- Proportions of TCE in April 2024 remained elevated at C-9 and C-10 relative to other injection wells in this injection line. TCE was not detected further east at C-11;
- cis-1,2-dichloroethene (cDCE) was the most prevalent CVOC in the six D-line injection wells in April 2024, compared to three of six locations exhibiting 50% or more TCE on a molar basis before the May 2023 injection. The highest proportion of TCE was present in D-6, but the proportion has decreased from 79% to 38% in post-injection monitoring. The relative proportion switched from majority TCE to majority cDCE in April 2024 monitoring compared to previous monitoring results, which suggests reductive dechlorination is occurring in this area.

For the nested wells along the former property boundary, the shallowest depths (screened 5-10 ft bgs) exhibited relatively higher TCE concentrations compared to the intermediate and deep wells, which is consistent with previous results.

Actual TCE concentrations decreased notably from November 2023 to April 2024, with historically low TCE concentrations observed in the shallow intervals at the BP-42A and BP-43A clusters and concentrations decreasing or stable at all other transect locations and depths,

except for BP-43AD and BP-45AS, where TCE increased slightly within the same order of magnitude. The relative proportion of cDCE increased over that of TCE at BP-42AS and BP-43AS for the first time in April 2024, while the molar percentage of TCE dropped from around 90% to 50% in the shallow interval at the other two locations.

Intermediate (screened 10-15 ft bgs) and deep (screened 15-20 ft bgs) intervals also continued to exhibit similar TCE concentrations to each other and to the November 2023 results. Variability in response to the injection across the depth intervals is likely due to the heterogenous bedrock environment and relative lack of vertical connectedness. At the same time, injection response within each depth interval is noticeably consistent. More time and additional monitoring are needed to assess longer-term trends.

3.3 qPCR Results

The results of the qPCR census and CSIA are presented in Table 4. Figure 4 is an interactive PDF presenting the qPCR results (click on the gray buttons at the upper right to view the various parameters) for the April 2024 monitoring event. The qPCR includes the population of *dehalococcoides* (DHC), and their associated functional genes that are known to be responsible for reductive dechlorination of TCE (tceA), DCE+VC (vcrA), and VC (bvcaA). A summary of the qPCR results is presented below:

- **DHC -** DHC are bacteria that are known to be important for reductive dechlorination. Concentrations higher than the threshold of $1x10^4$ cells/mL, recognized to be conducive to reductive dechlorination, were observed in April 2024 at BP-6A, BP-35A, C-2, and D-2, an improvement from only BP-6A and BP-35A in November 2023. Notably, BP-35A is a well that historically has not been directly affected by previous injections. C-2 exhibited a level of $3.10x10^5$ cells/mL, the highest recorded DHC level throughout routine monitoring. Elevated concentrations close to the threshold were realized at all remaining routinely monitored locations in April, excluding B-7 and BP-43AS.

- **DHC Functional genes** – In general, the presence of functional genes confirms reductive dechlorination of each compound is occurring. However, the absence of functional genes does not necessarily mean that reductive dechlorination is not occurring; rather, it means that it was not measurable based on this line of evidence.
  - ***tceA (TCE functional gene)*** – Eleven locations exhibited the presence of tceA functional genes (down from thirteen in November 2023 and up from nine in August 2023). Notably, tceA gene counts increased within the sampled nested well locations from November 2023, including an increase from non-detect in BP-43AS.
  - ***vcrA (DCE+VC functional gene)*** – In April 2024, vcrA was generally detected at higher concentrations relative to the November 2023 monitoring event and at levels that are suggestive of moderate to strong support of reductive dechlorination of DCE and VC. vcrA genes were detected in each location sampled in April 2024 (an improvement from multiple non-detects in November 2023), with six locations exhibiting levels that indicate strong support of reductive dechlorination (greater than 1×10^3 cells/mL) and

the remaining locations at levels that indicate moderate support (present at less than 1 x 10^3 cells/mL).

- ***bvcaA (VC functional gene)*** – Following the May 2023 injection, bvcaA was detected at one location, the injection well D-1 in August 2023; however, it was not detected at any monitored location in November 2023. In April 2024, bvcaA was once again not detected in any sampled location. The limited presence of bvcaA suggests there is limited evidence from this analysis for reductive dechlorination of VC via this pathway. We note that this finding is not consistent with the results from the vcrA results, which suggest that VC is being degraded. Additionally, this is not consistent with the documented presence of ethene/ethane, which is produced when VC is degraded.

3.4 CSIA Results

The results of the CSIA are presented in Table 4. The CSIA results for TCE, cDCE, and VC from the last three post-injection sampling rounds are presented in Figures 5A to 5C, respectively. The three sampling rounds represent continuous monitoring of post-injection conditions. These data are fit with a linear regression. In general, a trend of less negative numbers moving from high concentration areas to low concentration areas (i.e., from right to left as plotted on the Figure 5 charts), which creates a negative linear regression, suggests evidence of reductive dechlorination. Limited to no slope suggests other attenuation mechanisms (e.g., dilution, dispersion, sorption, volatilization) are responsible for the decrease in concentrations. Linear regressions of CSIA data for TCE, DCE, and VC from samples collected in the last three sampling events were all negative, with the exception of DCE in November 2023, suggesting reductive dechlorination is occurring overall.

The slope of the linear regression for both TCE and VC in April 2024 is slightly less negative compared to August and November 2023; however, the negative trends continue to suggest attenuation via reductive dechlorination. The cDCE trendline for April 2024 data returned to a negative slope similar to that of August 2023, providing additional evidence of reductive dechlorination through the isotope analysis that was not exhibited in November 2023.

Overall, the post-injection CSIA results for the three compounds indicate degradation is being maintained across most of the plume. We will continue to assess the results of each monitoring round, with the next round scheduled to take place in August 2024.

4.0 MASS DISCHARGE ASSESSMENT

The SMP established an overall goal of limiting mass flux out of the area of primary source rock (see Figure 2), and in particular, across the former Site boundary. Mass flux is the rate of a solute mass moving through a vertical plane, usually a portion of the plume cross section, expressed as mass/time/area (e.g., grams/day/meter^2). Mass discharge is an integrated mass flux estimate across a defined plane and is therefore expressed in mass/time (e.g., grams/day). Mass discharge has been the metric used to evaluate remedial performance at the Site and will continue to be used going forward.

As described in the March 2023 Interim Data Report and shown on Figures 1 and 2, BP-42A through BP-45A were constructed with a fiber optic active-distributed temperature sensing (A-DTS) cable to measure temperature at discrete intervals along the full length of an optical fiber with near continuous recording of temperature through space and time. Developed and implemented by the Morwick G360 Groundwater Research Institute (MG360), the A-DTS method involves heating two copper conductors that are part of the cable and measuring the thermal response to detect hydraulically active zones in a borehole sealed with an impermeable flexible liner (FLUTe^{TM}), to limit vertical flow within the borehole. The technique measures the heat transfer rate from the composite fiber optic cable to the rock matrix. An apparent increase in this rate correlates with zones where active groundwater flow occurs through the rock matrix and/or in discrete fractures. Along with thermal property testing of the rock core and modeling, temperature variations can be converted to groundwater flow rates.

MG360 conducted a test of the A-DTS system under seasonally high-water conditions in April 2024 to complement two previous tests, both conducted prior to the May 2023 injection, in October 2022 (seasonally low water) and April 2023 (seasonally high water). Figure C.1 in Appendix C includes a data montage of the results / interpretations of flow zones from October 2022, April 2023, and April 2024. Details of MG360's methods and interpretations of the results / active flow zones were detailed in the August 2023 sampling report. As shown in Appendix C, flow rates in April 2024 were between those recorded in October 2022 (highest flow) and April 2023 (lowest flow).

Groundwater flow determined from A-DTS testing was used to calculate TCE and CVOC mass discharge along the BP-42A to BP-45A transect. This estimated method uses simultaneous measurements of contaminant concentrations from the nested wells, and hydraulic information from A-DTS to calculate groundwater flow, which is in turn used to calculate mass flux (expressed as mass/time/area) at various depths along this transect. This was done by defining a grid across the plume cross section with appropriate sampling grid spacing. Mass discharge was calculated for each grid cell and then all mass discharges were summed across the grid/cross section to yield the total contaminant mass discharge (i.e., the total mass of a contaminant moving through a transect per unit time). Additional information on mass discharge estimation can be found in the 2023 August Sampling Report.

Exhibit 6 summarizes the TCE and CVOC mass discharge across the BP-42A to BP-45A transect for each recent round where A-DTS tests were conducted. Post-injection mass discharged is shaded.

Exhibit 6 Summary of Mass Discharge (MD)

MD TCE (g/d)			MD Total CVOCs (g/d)			Proportion of flux due to TCE		
Pre-Injection		Post-Injection	Pre-Injection		Post-Injection	Pre-Injection		Post-Injection
22-Oct	23-Apr	24-Apr	22-Oct	23-Apr	24-Apr	22-Oct	23-Apr	24-Apr
0.7	0.2	0.2	0.9	0.3	0.6	78%	67%	33%

Mass discharge rates of both TCE and total CVOCs saw a decrease from October 2022 pre-injection values. This is partially attributable to lower flows observed under seasonally high-water level conditions and partially attributable to a decrease in concentrations following the May 2023 injection. Comparing April 2023 to April 2024, TCE mass discharge is unchanged and overall CVOC mass discharge is increased. This is consistent with incrementally higher flows in 2024 compared to 2023 and with the marginal increase in total CVOC concentrations due to increases in secondary breakdown products discussed in Section 3.2 above. Notably TCE mass discharge was unchanged even with increased flows consistent with the overall decrease in the prevalence of TCE in groundwater. The proportion of mass discharge attributable to TCE decreased from over 70% pre-injection to 33% in the most recent monitoring. Total mass discharge and the proportion attributable to TCE are shown visually along the transect in Figure C.2 in Appendix C.

As shown on Figure 6, comparatively greater mass discharge was observed through the upper portion of bedrock (approximately 1368-1363 ft asl) both before and after the May 2023 injection. Approximately 90% of the total CVOC mass discharge occurs in this shallow bedrock interval. This result coincides with elevated TCE and CVOC concentrations that are observed within the shallowest nested well (BP-42AS through BP-45AS). Higher mass discharge through the shallow bedrock also corresponds to relatively higher VOC concentrations in rock observed in the CORE^{DFN} sampling results, as described in the April 2023 sampling report[5] . In addition, this elevation includes the upper portion of fractured bedrock, which is often characterized by relatively high occurrence of fractures.

Changes in the speciation of CVOCs present are apparent in the relative decrease of TCE mass discharge across the shallowest intervals, particularly at the western end of the transect, because of the May 2023 injection. As discussed above, total CVOC mass discharge is somewhat higher in April 2024, and Figure 6 illustrates that the increased discharge is focused on the shallowest flow intervals, consistent with higher water levels observed in April 2024 compared to April 2023. We note that the apparent increase in total CVOC mass discharge is still below pre-injection levels and due to the increased presence of breakdown products attributable to increased rates of degradation following the injection.

5.0 CLOSING AND NEXT STEPS

This report serves to communicate the results of the April 2024 sampling event and the on-going monitoring, including mass discharge, as part of recent remedy optimization and progress tracking work completed at the IBM Gun Club site.

As previously reported, the May 2023 injection event was successful in achieving order of magnitude increases in the volume and concentration of reagent delivered to the subsurface compared to previous rounds. This has resulted in improvements to geochemical conditions that are favorable to degradation of CVOCs. These improvements have had a favorable impact on CVOC concentration reductions, but particularly reduction of parent CVOCs to their primary,

[5] April 2023 Routine Sampling Report and Remedial Performance Update, Former IBM Gun Club- Former Burn Pit Area, Union, New York, NYSDEC Site #C704044, prepared on behalf of IBM by Sanborn, Head Engineering, P.C., August 19, 2023

secondary, and terminal breakdown products. TCE concentration reduction and the maintenance of favorable geochemical conditions across much of the primary source area were sustained over the colder winter months, where historically a reduction of degradation activity was observed. Based on the above observations, plus continued elevated TOC concentrations, we do not recommend another injection at this time.

Mass discharge will continue to be monitored going-forward as a useful means of evaluating remedial performance. Understanding seasonal mass discharge fluctuations will be important to understanding overall longer-term flux trends. In addition, on-going monitoring and evaluation of mass discharge will continue as a means of making decisions about the injection approach and frequency. Because most of the mass discharge is present in the upper portion of fractured bedrock, this zone is of particular importance for long-term performance. IBM plans to schedule injections during times of high water to help deliver amendment to the upper fractured zone where CVOC concentrations and mass discharge is substantially greater than in lower zones.

On-going monitoring and completion of voluntary tasks will be, or are being conducted, and generally include the following:

- Groundwater sampling in August 2024 at existing and recently installed monitoring wells with laboratory analysis for VOCs, TOC, geochemical parameters, VFAs, light gasses, qPCR, and CSIA;
- Ongoing assessment of CVOC mass discharge via the A-DTS method detailed in the report above for continued tracking of CVOC mass discharge across the former property boundary; and
- Re-installation of the ORP sensors as permanently installed backfilled monitoring locations.

The above-described monitoring results will be included in the next routine monitoring report.

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Tables

Table 1
Summary of April 2024 Water Level Data
Routine Sampling Report
IBM Gun Club - Former Burn Pit Area
Union, New York

Well Location	Reference Elevation (ft amsl)	Depth to Water (ft Ref. Pt.)	Equivalent Potentiometric Elevation (ft amsl)
A-1	1391.11	4.16	1386.95
A-2	1390.68	3.17	1387.51
A-3	1392.74	6.58	1386.16
A-4	1397.56	6.08	1391.48
A-5	1397.40	5.08	1392.32
A-6	1397.86	5.12	1392.74
A-7	1397.28	2.57	1394.71
A-8	1396.81	3.71	1393.10
A-9	1396.47	1.04	1395.43
A-10	1396.06	2.05	1394.01
A-11	1395.73	12.77	1382.96
A-12	1395.59	5.86	1389.73
A-13	1394.25	12.60	1381.65
A-14	1394.61	5.20	1389.41
A-15	1393.47	8.20	1385.27
A-16	1398.14	10.15	1387.99
A-17	1395.48	10.38	1385.10
B-1	1385.26	6.73	1378.53
B-2	1384.71	6.98	1377.73
B-3	1385.48	4.30	1381.18
B-4	1385.03	5.37	1379.66
B-5	1383.99	3.03	1380.96
B-6	1384.48	5.14	1379.34
B-7	1385.33	7.69	1377.64
B-8	1384.90	1.92	1382.98
B-9	1385.21	10.17	1375.04
B-10	1384.69	3.82	1380.87
B-11	1384.40	4.12	1380.28
B-12	1383.87	4.24	1379.63
B-13	1384.50	3.92	1380.58
BP-1A	1395.67	11.05	1384.62
BP-2A	1396.89	9.21	1387.68
BP-4A	1391.96	7.34	1384.62
BP-5A	1391.09	12.04	1379.05
BP-6A	1393.95	11.60	1382.35
BP-7A	1388.89	10.04	1378.85
BP-8A	1384.53	10.83	1373.70
BP-9A	1379.17	10.24	1368.93
BP-10A	1381.74	11.32	1370.42
BP-11A	1384.80	12.16	1372.64
BP-12A	1386.64	12.95	1373.69
BP-13A	1398.89	10.59	1388.30
BP-14A	1379.46	28.51	1350.95
BP-15A	1388.32	15.35	1372.97

Table 1
Summary of April 2024 Water Level Data
Routine Sampling Report
IBM Gun Club - Former Burn Pit Area
Union, New York

Well Location	Reference Elevation (ft amsl)	Depth to Water (ft Ref. Pt.)	Equivalent Potentiometric Elevation (ft amsl)
BP-16A	1389.69	10.08	1379.61
BP-17A	1376.30	9.62	1366.68
BP-18A	1386.54	14.52	1372.02
BP-19A	1309.40	20.16	1289.24
BP-20A	1274.60	6.19	1268.41
BP-21A	1244.29	4.92	1239.37
BP-22A	1242.90	5.68	1237.22
BP-23A	1333.39	10.44	1322.95
BP-24A	1338.73	11.87	1326.86
BP-25A	1301.92	2.58	1299.34
BP-26A	1336.96	9.35	1327.61
BP-27A	1299.96	1.01	1298.95
BP-30A	1336.20	11.40	1324.80
BP-31A	1369.63	10.24	1359.39
BP-32A	1389.58	7.26	1382.32
BP-34A	1392.55	8.31	1384.24
BP-35A	1391.75	11.02	1380.73
BP-36A	1383.68	10.68	1373.00
BP-37A	1389.92	6.92	1383.00
BP-38A	1375.10	9.06	1366.04
BP-39A	1370.17	7.59	1362.58
BP-41A	1373.43	9.63	1363.80
BP-42AS	1375.53	6.30	1369.23
BP-42AI	1375.25	9.96	1365.29
BP-42AD	1375.84	11.57	1364.27
BP-43AS	1376.71	7.84	1368.87
BP-43AI	1376.18	11.05	1365.13
BP-43AD	1376.56	11.76	1364.80
BP-44AS	1376.26	7.29	1368.97
BP-44AI	1375.98	10.15	1365.83
BP-44AD	1376.10	11.59	1364.51
BP-45AS	1377.95	10.66	1367.29
BP-45AI	1377.38	10.61	1366.77
BP-45AD	1377.84	11.86	1365.98
C-1	1390.73	3.17	1387.56
C-2	1391.63	7.43	1384.20
C-3	1392.70	8.81	1383.89
C-4	1393.39	6.19	1387.20
C-5	1393.84	6.12	1387.72
C-6	1394.65	6.92	1387.73
C-7	1395.47	7.77	1387.70
C-8	1396.34	7.22	1389.12
C-9	1397.13	7.54	1389.59
C-10	1398.76	7.49	1391.27

Table 1
Summary of April 2024 Water Level Data
Routine Sampling Report
IBM Gun Club - Former Burn Pit Area
Union, New York

Well Location	Reference Elevation (ft amsl)	Depth to Water (ft Ref. Pt.)	Equivalent Potentiometric Elevation (ft amsl)
C-11	1397.40	7.48	1389.92
D-1	1379.42	5.66	1373.76
D-2	1379.60	4.74	1374.86
D-3	1379.97	2.73	1377.24
D-4	1380.04	5.41	1374.63
D-5	1380.16	5.11	1375.05
D-6	1380.90	5.32	1375.58
GC-2A	1383.32	11.58	1371.74
IB-1	1392.20	4.68	1387.52
IB-2	1393.47	6.00	1387.47
IB-3	1393.07	8.94	1384.13
IB-4	1393.78	5.57	1388.21
IB-5	1393.88	8.73	1385.15
IB-6	1393.05	5.45	1387.60
IB-7	1393.23	5.45	1387.78
IB-8	1393.43	6.87	1386.56
IB-9	1393.62	5.98	1387.64

Notes:

1. This table summarizes depth to water measurements and calculated water table elevations recorded during the April performance monitoring round on April 8, 2024 to April 11, 2024. Measurements were collected relative to the marked reference point at each location using a Heron Dipper T or Bosch Laser Measurer water level meter.

2. Abbreviations:
ft amsl = feet above mean sea level
ft Ref. Pt. = feet below well reference point.

Table 2
Scope of Routine and Supplemental Monitoring Program
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Monitoring Type	Monitoring Location	Monitoring Location Type	Analytical Laboratory							Field Screening
			VOCs	Light Gasses	TOC	VFAs	Geochem (Iron, Ferrous Iron, Nitrate, Sulfate, Sulfide)	qPCR	CSIA	Water Quality Parameters
Annual Summer Comprehensive Round (In addition to locations listed below)	BP-7A	Monitoring Well	x							x
	BP-8A	Monitoring Well	x							x
	BP-10A	Monitoring Well	x							x
	BP-11A	Monitoring Well	x							x
	BP-12A	Monitoring Well	x							x
	BP-14A	Monitoring Well	x							x
	BP-16A	Monitoring Well	x							x
	BP-17A	Monitoring Well	x							x
	BP-18A	Monitoring Well	x							x
	BP-19A	Monitoring Well	x							x
	BP-20A	Monitoring Well	x							x
	BP-21A	Monitoring Well	x							x
	BP-22A	Monitoring Well	x							x
	BP-23A	Monitoring Well	x							x
	BP-24A	Monitoring Well	x							x
	BP-25A	Monitoring Well	x							x
	BP-26A	Monitoring Well	x							x
	BP-27A	Monitoring Well	x							x
	BP-30A	Monitoring Well	x							x
	BP-32A	Monitoring Well	x							x
	GC-2A	Monitoring Well	x							x
	GC-1, P-1	Multi-Depth	x							x
	GC-1, P-8	Multi-Depth	x							x
	BP-12D, P1	Multi-Depth	x							x
	BP-12D, P7	Multi-Depth	x							x
	BP-13D, P1	Multi-Depth	x							x
	BP-13D, P5	Multi-Depth	x							x
	BP-15D, P1	Multi-Depth	x							x
	BP-15D, P5	Multi-Depth	x							x
Routine Spring, Summer and Fall monitoring	IB-7	Injection Borehole	x	x	x	x				
	A-13	Injection Borehole	x	x	x	x	x	x	x	x
	B-4	Injection Borehole	x	x	x	x				
	B-7	Injection Borehole	x	x	x	x	x	x	x	x
	B-9	Injection Borehole	x	x	x	x				
	C-1	Injection Borehole	x		x					x
	C-2	Injection Borehole	x	x	x	x	x	x	x	x
	C-3	Injection Borehole	x		x					x
	C-4	Injection Borehole	x		x					x
	C-5	Injection Borehole	x	x	x	x	x	x	x	x
	C-6	Injection Borehole	x		x					x
	C-7	Injection Borehole	x		x					x
	C-8	Injection Borehole	x		x					x
	C-9	Injection Borehole	x		x					x
	C-10	Injection Borehole	x		x					x
	C-11	Injection Borehole	x		x					x
	D-1	Injection Borehole	x		x					x
	D-2	Injection Borehole	x	x	x	x	x	x	x	x
	D-3	Injection Borehole	x		x					x
	D-4	Injection Borehole	x	x	x	x	x	x	x	x
	D-5	Injection Borehole	x		x					x
	D-6	Injection Borehole	x		x					x
	BP-1A	Monitoring Well	x	x	x	x	x			x
	BP-2A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-4A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-5A	Monitoring Well	x	x	x	x	x			x
	BP-6A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-9A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-13A	Monitoring Well	x	x	x	x	x			x
	BP-31A	Monitoring Well	x	x	x	x	x			x
	BP-34A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-35A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-36A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-37A	Monitoring Well	x	x	x	x	x			x
	BP-38A	Monitoring Well	x	x	x	x	x			x
	BP-39A	Monitoring Well	x	x	x	x	x	x	x	x
	BP-41A	Monitoring Well	x	x	x	x	x			x
	BP-42AS	Monitoring Well	x	x	x	x	x	x	x	x
	BP-42AI	Monitoring Well	x							x
	BP-42AD	Monitoring Well	x							x
	BP-43AS	Monitoring Well	x	x	x	x	x	x	x	x
	BP-43AI	Monitoring Well	x	x	x	x	x			x
	BP-43AD	Monitoring Well	x	x	x	x	x			x
	BP-44AS	Monitoring Well	x	x	x	x	x			x
	BP-44AI	Monitoring Well	x							x
	BP-44AD	Monitoring Well	x							x
	BP-45AS	Monitoring Well	x	x	x	x	x			x
	BP-45AI	Monitoring Well	x							x
	BP-45AD	Monitoring Well	x							x
	111	Seep/spring	x							x
	112	Seep/spring	x							x
	113	Seep/spring	x							x
	118	Seep/spring	x							x
	119	Seep/spring	x							x

Notes:
1. This table is intended to summarize the programs of routine and performance monitoring for remedy operations at the IBM Gun Club - Former Burn Pit Area. Additional monitoring points may be sampled based on field observations.

2. Sample method:
"Low Flow" indicates samples will be collected by bladder pump using low flow techniques.
"PDBs" indicates that the well has sufficient water column to sample with passive diffusion bags - if conditions are observed to be different than anticipated, sampling will proceed using low flow techniques.
"Nitrogen purge" indicates that sample will be collected by purging the multi-level port with nitrogen (multi-level systems only).
"Surface water" samples will be collected using a clean glass vial.

3. Analytical laboratory samples:
"VOCs" indicates volatile organic compounds.
"Light gasses" includes methane, ethene and ethane.
"TOC" indicates total organic carbon.
"VFAs" indicates volatile fatty acids.
"qPCR" indicates quantitative polymerase chain reaction analysis (DNA-based analysis to quantify specific microorganisms and functional genes responsible for biodegradation)
"CSIA" indicates compound-specific isotope analysis (ratio of stable carbon isotopes in TCE, cDCE, and VC)

4. " Water quality parameters" indicates screening during well purging and water quality sampling by multi-parameter probes, e.g. by YSI® 556 multi-Probe meter or similar and HACH® turbidity meter or similar (low flow, multi-level system, bailer, and surface water sampling) or by water quality parameter sounding (PDB sampling). The water quality parameters may include temperature, specific conductance, oxidation-reduction potential, dissolved oxygen, pH, and turbidity. In addition surface water samples will include water clarity descriptors (transparency, translucence, or opaqueness, and color).

TABLE 3
SUMMARY OF NOVEMBER 2023 & APRIL 2024 GROUNDWATER RESULTS
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analyte Name	Unit	BP-1A	BP-1A	BP-2A	BP-2A	BP-4A	BP-4A	BP-4A	BP-4A	BP-5A	BP-5A	BP-6A	BP-6A	BP-9A	BP-9A	BP-13A	BP-13A	BP-31A	BP-31A	BP-31A	BP-31A	BP-32A	BP-34A	BP-34A	BP-34A	BP-34A	BP-35A	BP-35A	BP-35A	BP-35A	BP-36A	BP-36A	BP-36A	BP-36A
		Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	PDB	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow
		S	S	S	S	S	FD	S	FD	S	S	S	S	S	S	S	S	S	FD	S	FD	S	S	FD	S	FD	S	FD	S	FD	S	FD	S	FD
		11/01/23	04/10/24	11/01/23	04/10/24	11/01/23	11/01/23	04/09/24	04/09/24	11/01/23	04/10/24	11/01/23	04/10/24	10/31/23	04/09/24	10/31/23	04/10/24	10/31/23	10/31/23	04/11/24	04/11/24	08/09/23	10/31/23	10/31/23	04/09/24	04/09/24	10/31/23	10/31/23	04/09/24	04/09/24	10/31/23	10/31/23	04/09/24	04/09/24
VOLATILE ORGANIC COMPOUNDS (VOCs)																																		
Trichloroethene (TCE)	ug/L	**25**	**33**	**2.0**	**15**	**5.3 J**	**4.8 J**	<25	<25	**33**	**34**	**700**	**15,000**	**8.0 J**	<25	**3.5**	**5.1**	**1.7**	**1.6**	**5.7**	**5.5**	**0.24 J**	**1,900**	**1,800**	**1,700**	**1,600**	**13 J**	**33**	**4.1**	**3.8**	**29 J**	**33 J**	**230**	**240**
Dichloroethene (cis-1,2-)	ug/L	**250**	**210**	**110**	**29**	**130**	**130**	**5.6 J**	**6.4 J**	**39**	**34**	**42,000**	**92,000**	**59**	**4.2 J**	**0.18 J**	**0.34 J**	**0.23 J**	**0.23 J**	**3.2**	**3.1**	<0.50	**20,000**	**22,000**	**30,000**	**25,000**	**6,900**	**6,400**	**110**	**110**	**8,600**	**8,700**	**3,700**	**3,700**
Dichloroethene (trans-1,2-)	ug/L	**2.9**	**2.0 J**	**0.58**	**0.17 J**	<25	<25	<25	<25	**0.60 J**	**0.81 J**	**110 J**	**150 J**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	**130 J**	**87 J**	**19 J**	**20 J**	**14**	**14**	**27 J**	**30 J**	**18 J**	**22 J**
Dichloroethene (1,1-)	ug/L	**0.75 J**	**0.56 J**	**0.13 J**	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	**240 J**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	**58 J**	**54 J**	**5.1 J**	**5.3 J**	**0.18 J**	**0.17 J**	**13 J**	**13 J**	<50	<50
Tetrachloroethene (PCE)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	**0.71**	**0.70**	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Vinyl chloride	ug/L	**35**	**30**	**8.3**	**2.6**	**24 J**	**23 J**	<25	<25	<2.5	**10**	**16,000**	**3,400**	<50	<25	<0.50	<0.50	<0.50	<0.50	**0.46 J**	**0.41 J**	<0.50	**1,100**	**1,100**	**3,100**	**3,400**	**770**	**770**	**71**	**70**	**1,400**	**1,400**	**640**	**640**
LIGHT GASSES																																		
Ethane	ug/L	**1.6 J**	**1.0 J**	<5.0	<5.0	**20**	**25**	<250	<250	<5.0	<5.0	**2.4 J**	**13**	**39**	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	**13**	–	**26**	**–**	**1.7 J**	**1.8 J**	**9.3**	**9.4**	**37**	–	**110**	**–**
Ethene	ug/L	**1.5 J**	<5.0	<5.0	**0.86 J**	**42**	**50**	<250	<250	<5.0	**1.5 J**	**850**	**580**	**18**	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	**200**	–	**3,800**	**–**	**88**	**89**	**1,300**	**1,400**	**500**	–	**380**	**–**
Methane	ug/L	**180**	**15**	**930**	**640**	**13,000**	**17,000**	**33,000**	**13,000**	**19**	**5.1 J**	**280**	**1,600**	**8,000**	**14,000**	**8.7 J**	<10	<10	<10	**260**	**330**	–	**1,500**	–	**2,800**	**–**	**3,200**	**3,200**	**9,200**	**8,600**	**7,700**	–	**9,900**	**–**
MOLAR CONCENTRATION																																		
Trichloroethene (TCE)	µmol/l	0.19	0.25	0.015	0.11	0.040	0.037	ND	ND	0.25	0.26	5.3	110	0.061	ND	0.027	0.039	0.013	0.012	0.043	0.042	0.0018	14	14	13	12	0.099	0.25	0.031	0.029	0.22	0.25	1.8	1.8
Dichloroethene (cis-1,2-)	µmol/l	2.6	2.2	1.1	0.30	1.3	1.3	0.058	0.066	0.40	0.35	430	950	0.61	0.043	0.0019	0.0035	0.0024	0.0024	0.033	0.032	ND	210	230	310	258	71	66	1.1	1.1	89	90	38	38
Dichloroethene (trans-1,2-)	µmol/l	0.030	0.021	0.0060	0.0018	ND	ND	ND	ND	0.0062	0.0084	1.1	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	0.90	0.20	0.21	0.14	0.14	0.28	0.31	0.19	0.23
Dichloroethene (1,1-)	µmol/l	0.0077	0.0058	0.0013	ND	ND	ND	ND	ND	ND	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.60	0.56	0.053	0.055	0.0019	0.0018	0.13	0.13	ND	ND
Tetrachloroethene (PCE)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0043	0.0042	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µmol/l	0.56	0.48	0.13	0.042	0.38	0.37	ND	ND	ND	0.16	260	54	ND	ND	ND	ND	ND	ND	0.0074	0.0066	ND	18	18	50	54	12	12	1.1	1.1	22	22	10	10
Ethane	µmol/l	0.053	0.033	ND	ND	0.66	0.84	ND	ND	ND	ND	0.080	0.43	1.3	ND	ND	ND	ND	ND	ND	ND	–	0.42	–	0.87	–	0.057	0.060	0.31	0.31	1.2	–	3.5	–
Ethene	µmol/l	0.053	ND	ND	0.031	1.5	1.8	ND	ND	ND	0.053	30	21	0.65	ND	ND	ND	ND	ND	ND	ND	–	7.0	–	130	–	3.1	3.2	47	49	18	–	14	–
Total	µmol/l	3.5	3.0	1.3	0.49	3.9	4.4	0.058	0.066	0.66	0.83	730	1,100	2.6	0.043	0.028	0.042	0.015	0.015	0.088	0.085	0.0018	250	260	510	330	87	82	50	52	130	110	68	50
MOLAR PERCENTAGE																																		
TCE	%	5.5	8.5	1.2	23	1.0	0.84	ND	ND	38	31	0.73	10	2.3	ND	93	92	85	84	49	49	100	5.8	5.3	2.5	3.7	0.11	0.31	0.062	0.056	0.17	0.23	2.6	3.6
DCEs	%	75	74	89	62	34	31	100	100	62	43	59	83	23	100	6.5	8.3	15	16	37	38	ND	84	88	61	79	82	81	2.6	2.5	69	82	57	76
VC	%	16	16	10	8.5	9.8	8.4	ND	ND	ND	19	36	4.8	ND	ND	ND	ND	ND	ND	8.4	7.8	ND	7.0	6.8	9.7	16	14	15	2.3	2.2	17	20	15	20
Ethane+Ethene	%	3.1	1.1	ND	6.3	55	60	ND	ND	ND	6.4	4.2	1.8	75	ND	ND	ND	ND	ND	ND	ND	–	2.9	–	27	–	3.7	3.9	95	95	14.5	–	25	–
VOLATILE FATTY ACIDS																																		
Acetic Acid	mg/L	**1.3 J**	<5.0	<0.50	<2.5	**490**	**430**	**63**	**64**	**0.73 J**	<5.0	<100	<25	**1,100**	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**1,500**	–	**780**	**–**	**88**	**82**	**280**	**270**	**130**	–	**140**	**–**
Butyric Acid	mg/L	<5.0	<5.0	<0.50	<2.5	**42 J**	**45 J**	**17**	**17**	<2.5	<5.0	<100	<25	**230**	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**150**	–	**95**	**–**	**7.3**	**6.9**	**15**	**14**	**14**	–	**15**	**–**
Formic acid	mg/L	<5.0	<5.0	<0.50	<2.5	<100	<50	**5.9**	**6.1**	<2.5	<5.0	<100	<25	**13 J**	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**16 J**	–	**15**	**–**	**0.78 J**	**0.77 J**	**3.4 J**	**3.2 J**	<10	–	**1.2 J**	**–**
Hexanoic Acid	mg/L	<5.0	<5.0	<0.50	<2.5	<100	<50	**8.5**	**8.8**	<2.5	<5.0	<100	<25	<100	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	<100	–	**19**	**–**	<5.0	**0.68 J**	<5.0	<5.0	**5.1 J**	–	<5.0	**–**
Hexanoic Acid (i-)	mg/L	<5.0	<5.0	<0.50	<2.5	<100	<50	<5.0	<5.0	<2.5	<5.0	<100	<25	<100	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	<100	–	<5.0	**–**	<5.0	<5.0	<5.0	<5.0	<10	–	<5.0	**–**
Lactic Acid	mg/L	**1.4 J**	**2.6 J**	**1.7**	**1.8 J**	<100	<50	**1.9 J**	**1.8 J**	**1.0 J**	**2.1 J**	<100	**10 J**	**12 J**	**2.2 J**	**0.54**	**1.4 J**	**1.0**	**0.99**	**1.2**	**1.3**	–	<100	–	<5.0	**–**	**1.1 J**	**1.2 J**	**2.0 J**	**1.8 J**	**1.5 J**	–	**2.8 J**	**–**
Pentanoic Acid	mg/L	<5.0	<5.0	<0.50	<2.5	**13 J**	**12 J**	**4.2 J**	**4.2 J**	<2.5	<5.0	<100	<25	**21 J**	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**85 J**	–	**72**	**–**	<5.0	<5.0	<5.0	<5.0	<10	–	<5.0	**–**
Pentanoic Acid (i-)	mg/L	<5.0	<5.0	<0.50	<2.5	<100	<50	**2.7 J**	**2.9 J**	<2.5	<5.0	<100	<25	<100	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**15 J**	–	**19**	**–**	<5.0	<5.0	**2.1 J**	**1.9 J**	<10	–	<5.0	**–**
Propionic Acid	mg/L	<5.0	<5.0	<0.50	**0.41 J**	<100	**82**	**17**	**17**	<2.5	<5.0	<100	<25	**270**	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**1,200**	–	**350**	**–**	**9.3**	**8.8**	**20**	**19**	**6.3 J**	–	**4.4 J**	**–**
Pyruvic Acid	mg/L	<5.0	<5.0	<0.50	<2.5	<100	**11 J**	**4.3 J**	**4.4 J**	<2.5	<5.0	<100	<25	**17 J**	<5.0	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	–	**18 J**	–	**31**	**–**	**0.79 J**	**0.75 J**	**2.6 J**	**2.3 J**	<10	–	<5.0	**–**
ADDITIONAL VOLATILE ORGANIC COMPOUNDS (VOCs)																																		
Acetone	ug/L	<10	<25	**3.2 J**	<5.0	**110 J**	**110 J**	**430**	**420**	<25	<25	<2500	<2500	<500	**79 J**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**17**	<2500	<2500	<2500	<2500	<250	<250	**23**	**28**	<500	<500	<500	<500
Benzene	ug/L	**0.52 J**	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	**73 J**	**82 J**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	**0.66**	**0.66**	<50	<50	<50	<50
Bromodichloromethane	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Butanone (2-) (MEK)	ug/L	<10	<25	<5.0	<5.0	<250	<250	<250	<250	<25	<25	<2500	<2500	<500	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**1.5 J**	<2500	<2500	<2500	<2500	<250	<250	<5.0	<5.0	<500	<500	<500	<500
Carbon disulfide	ug/L	<2.0	<5.0	<1.0	<1.0	<50	<50	<50	<50	<5.0	<5.0	<500	<500	<100	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**0.15 J**	<500	<500	<500	<500	<50	<50	<1.0	<1.0	<100	<100	<100	<100
Carbon tetrachloride	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	**0.46 J**	**0.59**	<0.50	<0.50	**0.16 J**	**0.15 J**	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Chloroethane	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Chloroform (Trichloromethane)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	**350**	**570**	<50	<25	**0.12 J**	**0.18 J**	**0.17 J**	**0.16 J**	**0.66**	**0.63**	<0.50	**50 J**	**50 J**	**58 J**	**55 J**	<25	<25	**0.44 J**	**0.41 J**	**75**	**77**	**45 J**	**44 J**
Chloromethane	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Cyclohexane	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	**0.18 J**	**0.17 J**	<50	<50	<50	<50
Dibromochloromethane	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Dichloroethane (1,2-)	ug/L	**2.0**	**2.0 J**	**0.11 J**	<0.50	<25	<25	<25	<25	**5.1**	**4.3**	**36 J**	**47 J**	<50	<25	<0.50	<0.50	<0.50	**0.074 J**	**0.18 J**	**0.16 J**	<0.50	<250	<250	**39 J**	<250	**4.0 J**	**3.9 J**	**1.8**	**1.8**	**17 J**	**17 J**	**13 J**	**15 J**
Ethylbenzene	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	**110 J**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Hexanone (2-)	ug/L	<10	<25	<5.0	<5.0	<250	<250	<250	<250	<25	<25	<2500	<2500	<500	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2500	<2500	<2500	<2500	<250	<250	<5.0	<5.0	<500	<500	<500	<500
Isopropylbenzene (Cumene)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Methylcyclohexane	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	**0.28 J**	**0.27 J**	<50	<50	**12 J**	**11 J**
Methylene Chloride (Dichloromethane)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Toluene	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	**130 J**	**470**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	**0.73**	**0.73**	<50	<50	<50	<50
Trichlorobenzene (1,2,4-)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Trichloroethane (1,1,2-)	ug/L	**0.16 J**	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	<250	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Xylene (m,p-)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	**310**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	<0.50	<0.50	<50	<50	<50	<50
Xylene (o-)	ug/L	<1.0	<2.5	<0.50	<0.50	<25	<25	<25	<25	<2.5	<2.5	<250	**240 J**	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<250	<250	<250	<250	<25	<25	**0.45 J**	**0.44 J**	<50	<50	<50	<50
OTHER LABORATORY DATA																																		
Total Organic Carbon	mg/L	**17**	**19**	**6.2**	**3.5**	**350**	**350**	**100**	**110**	**19**	**21**	**270**	**180**	**290**	**27**	**4.4**	**1.8**	**0.68 J**	**0.68 J**	**1.0**	**0.87 J**	–	**2,800**	–	**1,100**	**–**	**72**	**73**	**190**	**190**	**140**	**170**	**110**	**110**
WATER QUALITY PROBE DATA																																		
Temperature	C	**9.4**	**9.7**	**11**	**7.2**	**10**	–	**12**	–	**9.6**	**9.8**	**10**	**10**	**10**	**13**	**11**	**9.0**	**9.1**	–	**8.9**	–	**12**	**11**	–	**11**	–	**11**	–	**8.9**	–	**11**	–	**8.2**	–
Specific Conductance	uS/cm	**2,800**	**2,300**	**1,300**	**490**	**1,000**	–	**690**	–	**1,700**	**1,600**	**8,300**	**4,100**	**880**	**1,300**	**60**	**110**	**430**	–	**340**	–	**110**	**4,400**	–	**2,600**	–	**1,400**	–	**1,700**	–	**960**	–	**980**	–
pH	SU	**7.0**	**7.0**	**6.6**	**6.4**	**5.5**	–	**6.4**	–	**7.0**	**6.7**	**6.8**	**7.0**	**5.7**	**6.8**	**5.5**	**6.1**	**7.5**	–	**6.9**	–	**5.7**	**5.3**	–	**5.6**	–	**6.8**	–	**7.0**	–	**6.5**	–	**6.7**	–
Oxidation/Reduction Potential	mV	**-38**	**17**	**-120**	**-10**	**4.9**	–	**-49**	–	**120**	**26**	**-120**	**-100**	**-93**	**-100**	**100**	**170**	**94**	–	**190**	–	**35**	**-25**	–	**-25**	–	**-100**	–	**-130**	–	**-140**	–	**-61**	–
Dissolved Oxygen	mg/L	**0.87**	**0.24**	**0.38**	**0.16**	**0.58**	–	**0.20**	–	**5.6**	**0.51**	**0.24**	**0.40**	**0.39**	**4.9**	**1.4**	**2.5**	**9.2**	–	**3.1**	–	**3.7**	**2.8**	–	**0.81**	–	**2.5**	–	**0.88**	–	**0.37**	–	**0.49**	–
Turbidity	NTU	**0.47**	**4.6**	**1.4**	**1.4**	**150**	–	**130**	–	**2.7**	**1.9**	**3.1**	**1.4**	**>1,000**	**61**	**4.2**	**6.9**	**9.3**	–	**1.7**	–	–	**>1,000**	–	**>1,000**	–	**5.3**	–	**5.9**	–	**>1,000**	–	**7.9**	–
GEOCHEMISTRY																																		
Iron	mg/L	**0.38**	**0.79**	**13**	**2.0**	**13**	–	**7.4**	**–**	<0.20	**0.085 J**	**9.7**	**3.9**	**9.0**	**4.5**	**0.31**	**0.14 J**	<0.20	–	<0.20	**–**	–	**110**	–	**63**	**–**	**7.5**	–	**22**	**–**	**14**	–	**9.7**	**–**
Iron - Ferrous	mg/L	**0.56**	**0.34**	**25**	**2.1**	**24**	–	**6.6**	**–**	<5.0	<0.10	**16**	**4.5**	**18**	**4.7**	**0.067 J**	<0.10	<0.10	–	<0.10	**–**	–	**210**	–	**69**	**–**	**18**	–	**24**	**–**	**30**	–	**11**	**–**
Nitrate	mg/L	<0.55	<0.55	<0.55	<0.55	<0.55	–	<0.55	**–**	**1.0**	<0.55	<1.1	<1.1	<0.55	<0.55	<0.55	**0.28 J**	<0.55	–	<0.55	**–**	–	<0.55	–	<0.55	**–**	<0.55	–	<0.55	–	<0.55	–	<0.55	**–**
Sulfate	mg/L	**200**	**170**	**50**	**11**	<7.5	–	<7.5	**–**	**340**	**490**	**1,500**	**850**	**3.3 J**	<7.5	**4.9 J**	**9.0**	**24**	–	**17**	**–**	–	**10**	–	<7.5	**–**	<7.5	–	<7.5	**–**	<7.5	–	**3.0 J**	**–**
Sulfide	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	–	<2.0	**–**	**1.2 J**	<2.0	<2.0	<2.0	<4.0	<2.0	**0.71 J**	<2.0	<2.0	–	<2.0	**–**	–	<8.0	–	<2.0	**–**	<2.0	–	<2.0	**–**	<2.0	–	<2.0	**–**

TABLE 3
SUMMARY OF NOVEMBER 2023 & APRIL 2024 GROUNDWATER RESULTS
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analyte Name	Unit	BP-37A	BP-37A	BP-38A	BP-38A	BP-38A	BP-38A	BP-39A	BP-39A	BP-41A	BP-41A	BP-42AS	BP-42AS	BP-42AI	BP-42AI	BP-42AD	BP-42AD	BP-43AS	BP-43AS	BP-43AI	BP-43AI	BP-43AD	BP-43AD	BP-44AS	BP-44AS	BP-44AI	BP-44AI	BP-44AD	BP-44AD	BP-45AS	BP-45AS	BP-45AI	BP-45AI
		Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow
		S	S	S	FD	S	FD	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		11/01/23	04/10/24	10/31/23	10/31/23	04/11/24	04/11/24	10/31/23	04/09/24	10/31/23	04/10/24	10/31/23	04/10/24	10/31/23	04/10/24	10/31/23	04/10/24	10/31/23	04/10/24	10/31/23	04/10/24	10/31/23	04/10/24	10/31/23	04/11/24	10/31/23	04/11/24	10/31/23	04/11/24	11/01/23	04/11/24	10/31/23	04/11/24
VOLATILE ORGANIC COMPOUNDS (VOCs)																																	
Trichloroethene (TCE)	ug/L	**1.5**	**0.79**	<25	<25	<25	<25	**5.1**	**1.3**	**51**	**99**	**120**	**2.7**	**0.59**	**0.36 J**	**0.57**	**0.51**	**690**	**92**	**6.9**	**2.5**	**0.16 J**	**0.25 J**	**650**	**610**	**0.98**	**0.63**	**0.37 J**	**0.21 J**	**47**	**53**	**0.46 J**	**0.32 J**
Dichloroethene (cis-1,2-)	ug/L	**6.9**	**3.5**	**210**	**190**	<25	<25	**20**	**3.1**	**150**	**290**	**76**	**130**	<0.50	<0.50	**28**	**10**	**130**	**320**	**1.1**	**0.43 J**	**1.4**	**0.48 J**	**220**	**440**	**0.74**	**0.31 J**	**0.56**	**0.27 J**	**51**	**38**	**0.38 J**	**0.10 J**
Dichloroethene (trans-1,2-)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	**0.74 J**	**0.24 J**	**0.59 J**	<0.50	<0.50	**0.22 J**	**0.15 J**	**0.39 J**	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	**2.2 J**	<0.50	<0.50	<0.50	<0.50	**0.11 J**	**0.16 J**	<0.50	<0.50
Dichloroethene (1,1-)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	**0.56 J**	**0.28 J**	**0.30 J**	<0.50	<0.50	<0.50	<0.50	**1.2**	**1.0 J**	<0.50	<0.50	<0.50	<0.50	<5.0	**1.5 J**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene (PCE)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	ug/L	**0.11 J**	**0.35 J**	**12 J**	**11 J**	**8.8 J**	**8.9 J**	**18**	**2.0**	**14**	**9.9**	**3.2**	**8.6**	<0.50	<0.50	**1.9**	**2.6**	**23**	**17**	**0.15 J**	**0.24 J**	**0.11 J**	<0.50	**2.5 J**	**14**	<0.50	<0.50	**0.24 J**	<0.50	**0.12 J**	**2.1**	<0.50	<0.50
LIGHT GASSES																																	
Ethane	ug/L	**1.1 J**	**5.6**	**5.4**	–	**13**	–	**3.9 J**	**4.4 J**	**7.6**	**5.8**	<5.0	**2.1 J**	–	–	–	–	**16**	**18**	<5.0	**1.1 J**	<5.0	<5.0	<5.0	**15**	–	–	–	–	<5.0	**1.0 J**	–	–
Ethene	ug/L	<5.0	<5.0	**4.3 J**	–	**28**	–	**8.4**	**2.2 J**	<5.0	**2.2 J**	**1.7 J**	**3.8 J**	–	–	–	–	**150**	**240**	<5.0	<5.0	<5.0	<5.0	<5.0	**110**	–	–	–	–	<5.0	**1.1 J**	–	–
Methane	ug/L	**6,300**	**7,400**	**14,000**	–	**13,000**	–	**5,600**	**3,700**	**2,600**	**1,400**	**260**	**2,600**	–	–	–	–	**2,400**	**5,000**	**25**	**1,800**	**68**	<10	**32**	**5,000**	–	–	–	–	**5.3 J**	**200**	–	–
MOLAR CONCENTRATION																																	
Trichloroethene (TCE)	µmol/l	0.011	0.0060	ND	ND	ND	ND	0.039	0.0099	0.39	0.75	0.91	0.021	0.0045	0.0027	0.0043	0.0039	5.3	0.70	0.053	0.019	0.0012	0.0019	4.9	4.6	0.0075	0.0048	0.0028	0.0016	0.36	0.40	0.0035	0.0024
Dichloroethene (cis-1,2-)	µmol/l	0.071	0.036	2.2	2.0	ND	ND	0.21	0.032	1.5	3.0	0.78	1.3	ND	ND	0.29	0.10	1.3	3.3	0.011	0.0044	0.014	0.0050	2.3	4.5	0.0076	0.0032	0.0058	0.0028	0.53	0.39	0.0039	0.0010
Dichloroethene (trans-1,2-)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0076	0.0025	0.0061	ND	ND	0.0023	0.0015	0.0040	ND	ND	ND	ND	ND	ND	0.023	ND	ND	ND	ND	0.0011	0.0017	ND	ND
Dichloroethene (1,1-)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0058	0.0029	0.0031	ND	ND	ND	ND	0.012	0.010	ND	ND	ND	ND	ND	0.015	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µmol/l	0.0018	0.0056	0.19	0.18	0.14	0.14	0.29	0.032	0.22	0.16	0.051	0.14	ND	ND	0.030	0.042	0.37	0.27	0.0024	0.0038	0.0018	ND	0.040	0.22	ND	ND	0.0038	ND	0.0019	0.034	ND	ND
Ethane	µmol/l	0.037	0.19	0.18	–	0.42	–	0.13	0.15	0.25	0.19	ND	0.070	–	–	–	–	0.53	0.61	ND	0.037	ND	ND	ND	0.49	–	–	–	–	ND	0.033	–	–
Ethene	µmol/l	ND	ND	0.15	–	1.0	–	0.30	0.078	ND	0.078	0.061	0.14	–	–	–	–	5.5	8.7	ND	ND	ND	ND	ND	3.7	–	–	–	–	ND	0.039	–	–
Total	µmol/l	0.12	0.23	2.7	2.1	1.6	0.14	0.96	0.30	2.4	4.2	1.8	1.7	0.0045	0.0027	0.33	0.15	13	14	0.066	0.064	0.017	0.0069	7.3	14	0.015	0.0080	0.012	0.0044	0.89	0.90	0.0074	0.0035
MOLAR PERCENTAGE																																	
TCE	%	9.4	2.6	ND	ND	ND	ND	4.0	3.3	16	18	50	1.2	100	100	1.3	2.6	41	5.2	79	30	7.0	28	68	34	49	60	23	36	40	45	47	70
DCEs	%	59	15	80	92	ND	ND	21	11	64	72	44	79	0	ND	89	70	10	24	17	6.9	83	72	31	33	51	40	46	64	59	44	53	30
VC	%	1.5	2.4	7.1	8.2	9.0	100	30	11	9.3	3.8	2.8	8.0	ND	ND	9.3	28	2.8	2.0	3.6	6.0	10	ND	0.55	1.6	ND	ND	31	ND	0.22	3.7	ND	ND
Ethane+Ethene	%	30	80	12	–	91	–	45	75	10	6.5	3.3	12	–	–	–	–	46	68	ND	57	ND	ND	ND	31	–	–	–	–	ND	8.0	–	–
VOLATILE FATTY ACIDS																																	
Acetic Acid	mg/L	**58**	<5.0	**130**	–	**54**	–	**16**	**6.6**	**13**	**0.16 J**	<2.5	<0.50	–	–	–	–	**1.5 J**	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	**0.87**	<0.50	–	–
Butyric Acid	mg/L	<5.0	<5.0	**5.7 J**	–	<10	–	**0.81 J**	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	**0.12 J**	<0.50	–	–
Formic acid	mg/L	<5.0	<5.0	**1.6 J**	–	<10	–	<2.5	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<0.50	<0.50	–	–
Hexanoic Acid	mg/L	<5.0	<5.0	<10	–	<10	–	<2.5	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	**0.33 J**	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<0.50	<0.50	–	–
Hexanoic Acid (i-)	mg/L	<5.0	<5.0	<10	–	<10	–	<2.5	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<0.50	<0.50	–	–
Lactic Acid	mg/L	<5.0	**1.6 J**	**1.3 J**	–	**4.0 J**	–	**1.1 J**	**1.7 J**	**1.2 J**	**0.81**	**0.84 J**	**0.77**	–	–	–	–	**0.93 J**	**0.84**	**1.2 J**	**1.2**	**0.89 J**	**0.94**	**0.82 J**	**0.87**	–	–	–	–	**0.58**	**0.77**	–	–
Pentanoic Acid	mg/L	<5.0	<5.0	<10	–	<10	–	<2.5	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<0.50	<0.50	–	–
Pentanoic Acid (i-)	mg/L	<5.0	<5.0	<10	–	<10	–	<2.5	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<0.50	<0.50	–	–
Propionic Acid	mg/L	**1.0 J**	<5.0	**23**	–	**3.0 J**	–	**0.36 J**	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	**0.38 J**	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	**0.52**	<0.50	–	–
Pyruvic Acid	mg/L	<5.0	<5.0	<10	–	<10	–	<2.5	<5.0	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	<2.5	<0.50	–	–	–	–	<0.50	<0.50	–	–
ADDITIONAL VOLATILE ORGANIC COMPOUNDS (VOCs)																																	
Acetone	ug/L	**7.8**	<5.0	**51 J**	<250	**86 J**	**86 J**	<25	**2.7 J**	**20 J**	**10**	**5.8 J**	<10	<5.0	<5.0	**18**	**2.1 J**	**12**	<50	<5.0	<5.0	<5.0	<5.0	<50	<50	<5.0	<5.0	<5.0	<5.0	**2.1 J**	**1.6 J**	<5.0	<5.0
Benzene	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	**0.39 J**	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	**0.57 J**	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	**0.22 J**	**0.14 J**	<0.50	<0.50
Butanone (2-) (MEK)	ug/L	<5.0	<5.0	<250	<250	<250	<250	<25	<5.0	<25	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon disulfide	ug/L	<1.0	<1.0	<50	<50	<50	<50	<5.0	<1.0	<5.0	<2.0	<2.0	<2.0	**0.19 J**	<1.0	<1.0	**0.15 J**	<2.0	<10	<1.0	<1.0	**0.14 J**	<1.0	<10	<10	<1.0	<1.0	**0.12 J**	<1.0	**0.21 J**	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	**0.27 J**	**0.82 J**	<1.0	<0.50	<0.50	<0.50	<0.50	**8.0**	**1.4 J**	<0.50	<0.50	<0.50	<0.50	**6.0**	**5.4**	<0.50	<0.50	<0.50	<0.50	**0.23 J**	**0.33 J**	<0.50	<0.50
Chloroethane	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform (Trichloromethane)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	**3.3**	**5.0**	**16**	**0.24 J**	<0.50	<0.50	<0.50	<0.50	**37**	**15**	<0.50	<0.50	<0.50	<0.50	**17**	**12**	<0.50	<0.50	<0.50	<0.50	**16**	**3.7**	<0.50	<0.50
Chloromethane	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	**0.15 J**	<0.50	<0.50	<0.50
Cyclohexane	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	**0.16 J**	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloroethane (1,2-)	ug/L	**0.39 J**	**0.30 J**	<25	<25	<25	<25	<2.5	<0.50	**1.5 J**	**2.6**	**2.3**	**3.0**	<0.50	<0.50	**0.21 J**	**0.11 J**	**16**	**13**	<0.50	<0.50	<0.50	<0.50	<5.0	**1.7 J**	<0.50	<0.50	<0.50	<0.50	<0.50	**0.14 J**	<0.50	<0.50
Ethylbenzene	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexanone (2-)	ug/L	<5.0	<5.0	<250	<250	<250	<250	<25	<5.0	<25	<10	<10	<10	<5.0	<5.0	<5.0	<5.0	<10	<50	<5.0	<5.0	<5.0	<5.0	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isopropylbenzene (Cumene)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylcyclohexane	ug/L	<0.50	**0.20 J**	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	**0.32 J**	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride (Dichloromethane)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	**0.45 J**	**4.1 J**	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	**0.12 J**	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorobenzene (1,2,4-)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethane (1,1,2-)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	**0.22 J**	**0.22 J**	<1.0	<0.50	<0.50	<0.50	<0.50	**0.61 J**	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	**0.089 J**	<0.50	<0.50
Xylene (m,p-)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	**0.52 J**	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Xylene (o-)	ug/L	<0.50	<0.50	<25	<25	<25	<25	<2.5	<0.50	<2.5	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
OTHER LABORATORY DATA																																	
Total Organic Carbon	mg/L	**34**	**3.5**	**120**	**120**	**38**	**39**	**22**	**7.6**	**22**	**7.6**	**11**	**3.8**	–	–	–	–	**27**	**5.4**	**1.8**	**1.4**	**3.0**	**2.0**	**3.7**	**2.7**	–	–	–	–	**2.7**	**1.7**	–	–
WATER QUALITY PROBE DATA																																	
Temperature	C	**9.6**	**9.3**	**8.6**	–	**9.5**	–	**9.1**	**6.7**	**11**	**9.6**	**10**	**9.5**	**11**	**9.5**	**11**	**9.7**	**12**	**9.0**	**12**	**9.7**	**11**	**9.9**	**12**	**8.3**	**11**	**9.0**	**11**	**9.9**	**12**	**9.0**	**11**	**11**
Specific Conductance	uS/cm	**890**	**830**	**810**	–	**510**	–	**420**	**1,800**	**650**	**270**	**470**	**500**	**670**	**730**	**610**	**700**	**370**	**440**	**610**	**640**	**590**	**590**	**320**	**360**	**520**	**590**	**580**	**620**	**450**	**370**	**450**	**480**
pH	SU	**6.7**	**7.0**	**6.4**	–	**6.6**	–	**6.4**	**6.3**	**6.5**	**6.2**	**6.9**	**6.9**	**7.2**	**7.3**	**7.2**	**7.3**	**6.4**	**6.7**	**7.5**	**7.6**	**7.3**	**7.5**	**6.4**	**6.3**	**7.3**	**7.6**	**7.1**	**7.4**	**6.2**	**6.6**	**7.4**	**7.6**
Oxidation/Reduction Potential	mV	**-140**	**-100**	**-26**	–	**-71.0**	–	**-110**	**-61**	**-130**	**-95**	**-130**	**34**	**-75**	**87**	**-130**	**-140**	**-27**	**25**	**-140**	**38**	**-120**	**110**	**90**	**56**	**-61**	**61**	**-130**	**-8.4**	**-11**	**94**	**-93**	**84**
Dissolved Oxygen	mg/L	**0.73**	**0.23**	**1.9**	–	**0.30**	–	**3.5**	**0.68**	**0.48**	**0.21**	**0.24**	**1.2**	**0.14**	**0.58**	**0.49**	**0.24**	**0.16**	**1.9**	**0.18**	**0.42**	**0.21**	**3.4**	**4.3**	**0.48**	**0.17**	**3.8**	**0.12**	**0.24**	**2.3**	**6.6**	**0.18**	**3.1**
Turbidity	NTU	**4.4**	**13**	**71**	–	**25**	–	**2.3**	**0.62**	**9.2**	**3.1**	**1.8**	**14**	**0.60**	**1.4**	**9.7**	**3.2**	**0.84**	**18**	**0.77**	**2.6**	**3.2**	**3.9**	**0.49**	**7.6**	**1.3**	**2.1**	**0.38**	**14**	**2.3**	**1.3**	**0.41**	**0.84**
GEOCHEMISTRY																																	
Iron	mg/L	**9.3**	**5.6**	**34**	–	**0.11 J**	–	**11**	**10**	**3.5**	**2.6**	**2.3**	**1.3**	–	–	–	–	**0.33**	**2.3**	**0.088 J**	<0.20	**0.54**	<0.20	<0.20	**1.1**	–	–	–	–	<0.20	<0.20	–	–
Iron - Ferrous	mg/L	**16**	**5.2**	**73**	–	**12**	–	**22**	**11**	**6.9**	**2.6**	**0.98**	**0.51**	–	–	–	–	**1.0**	**0.87**	**0.22**	<0.10	**1.2**	<0.10	<0.10	**0.55**	–	–	–	–	**0.14**	<0.10	–	–
Nitrate	mg/L	<0.55	<0.55	<0.55	–	<0.55	–	<0.55	<0.55	<0.55	<0.55	<0.55	<0.11	–	–	–	–	<0.55	<0.55	<0.55	<0.55	<0.55	**0.80**	<0.55	<0.55	–	–	–	–	<0.55	<0.55	–	–
Sulfate	mg/L	<7.5	**4.5 J**	<7.5	–	<7.5	–	<7.5	<7.5	**3.7 J**	**5.7 J**	**19**	**1.4 J**	–	–	–	–	**35**	**23**	**26**	**19**	**33**	**37**	**22**	**15**	–	–	–	–	**18**	**11**	–	–
Sulfide	mg/L	<2.0	<2.0	<2.0	–	<2.0	–	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	–	–	–	–	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	–	–	–	–	<2.0	<2.0	–	–

TABLE 3
SUMMARY OF NOVEMBER 2023 & APRIL 2024 GROUNDWATER RESULTS
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analyte Name	Unit	BP-45AD	BP-45AD	IB-7	IB-7	A-13	A-13	B-4	B-4	B-7	B-7	B-9	B-9	C-1	C-1	C-2	C-2	C-3	C-3	C-4	C-4	C-5	C-5	C-6	C-6	C-7	C-7	C-8	C-8	C-9	C-9	C-10	C-10
		Low Flow	Low Flow	PDB	PDB	Low Flow	Low Flow	PDB	PDB	Low Flow	Low Flow	PDB	PDB	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow
		S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		10/31/23	04/11/24	11/01/23	04/09/24	11/01/23	04/10/24	11/01/23	04/09/24	10/31/23	04/10/24	11/01/23	04/09/24	11/01/23	04/11/24	11/01/23	04/10/24	11/02/23	04/11/24	11/02/23	04/11/24	11/01/23	04/10/24	11/02/23	04/11/24	11/02/23	04/11/24	11/02/23	04/11/24	11/02/23	04/11/24	11/02/23	04/11/24
VOLATILE ORGANIC COMPOUNDS (VOCs)																																	
Trichloroethene (TCE)	ug/L	<0.50	<0.50	<25	<25	<25	**2.9 J**	<50	<50	<50	**7.4 J**	**18 J**	**23 J**	<25	<10	**990**	**150**	**430**	**520**	**27**	<250	**4.9 J**	<100	**5.0 J**	<25	**11 J**	**21 J**	<50	<25	**150 J**	**91 J**	<250	**76**
Dichloroethene (cis-1,2-)	ug/L	<0.50	<0.50	**5.5 J**	**8.2 J**	**1,700**	**730**	**12 J**	**12 J**	**50**	**50**	**190**	**210**	**17 J**	**3.4 J**	**1,000**	**1,500**	**2,000**	**7,100**	**4,000**	**2,100**	**1,200**	**880**	**100**	**120**	**170**	**120**	**130**	**34**	**150 J**	**44 J**	**40 J**	**99**
Dichloroethene (trans-1,2-)	ug/L	<0.50	<0.50	<25	<25	<25	**4.5 J**	<50	<50	<50	<25	<50	<50	<25	<10	<50	**36 J**	<50	<500	**5.6 J**	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Dichloroethene (1,1-)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	**9.2 J**	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Tetrachloroethene (PCE)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Vinyl chloride	ug/L	<0.50	<0.50	<25	<25	**260**	**200**	<50	<50	<50	<25	**43 J**	**47 J**	<25	<10	**32 J**	**1,200**	**60**	**120 J**	**100**	**120 J**	**42**	**120**	**7.5 J**	**11 J**	**8.0 J**	<25	**12 J**	**8.7 J**	<250	<250	<250	<50
LIGHT GASSES																																	
Ethane	ug/L	–	–	<5.0	**59 J**	**12**	**31**	<250	**8.1**	**29**	**41**	**17**	**58 J**	–	–	**1.7 J**	**11**	–	–	–	–	**1.9 J**	<5.0	–	–	–	–	–	–	–	–	–	–
Ethene	ug/L	–	–	**2.0 J**	**480**	**280**	**420**	<250	**2.0 J**	**130**	**110**	**320**	**110 J**	–	–	**7.2**	**3,400**	–	–	–	–	**3.7 J**	**18**	–	–	–	–	–	–	–	–	–	–
Methane	ug/L	–	–	**3,700**	**12,000**	**2,200**	**6,400**	**9,900**	**14,000**	**13,000**	**15,000**	**9,900**	**310 J**	–	–	**100**	**8,300**	–	–	–	–	**1,900**	**13,000**	–	–	–	–	–	–	–	–	–	–
MOLAR CONCENTRATION																																	
Trichloroethene (TCE)	µmol/l	ND	ND	ND	ND	ND	0.022	ND	ND	ND	0.056	0.14	0.18	ND	ND	7.5	1.1	3.3	4.0	0.21	ND	0.037	ND	0.038	ND	0.084	0.16	ND	ND	1.1	0.69	ND	0.58
Dichloroethene (cis-1,2-)	µmol/l	ND	ND	0.057	0.085	18	7.5	0.12	0.12	0.52	0.52	2.0	2.2	0.18	0.035	10	15	21	73	41	22	12	9.1	1.0	1.2	1.8	1.2	1.3	0.35	1.5	0.45	0.41	1.0
Dichloroethene (trans-1,2-)	µmol/l	ND	ND	ND	ND	ND	0.046	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37	ND	ND	0.058	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloroethene (1,1-)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.095	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µmol/l	ND	ND	ND	ND	4.2	3.2	ND	ND	ND	ND	0.69	0.75	ND	ND	0.51	19	0.96	1.9	1.6	1.9	0.67	1.9	0.12	0.18	0.13	ND	0.19	0.14	ND	ND	ND	ND
Ethane	µmol/l	–	–	ND	1.9	0.40	1.0	ND	0.27	0.97	1.4	0.56	1.9	–	–	0.057	0.36	–	–	–	–	0.063	ND	–	–	–	–	–	–	–	–	–	–
Ethene	µmol/l	–	–	0.071	17	10	15	ND	0.071	4.6	4.0	11	3.8	–	–	0.26	120	–	–	–	–	0.13	0.65	–	–	–	–	–	–	–	–	–	–
Total	µmol/l	ND	ND	0.13	19	32	27	0.12	0.46	6.1	5.9	15	8.8	0.18	0.035	19	160	25	79	43	24	13	12	1.2	1.4	2.0	1.4	1.5	0.49	2.7	1.1	0.41	1.6
MOLAR PERCENTAGE																																	
TCE	%	ND	ND	ND	ND	ND	0.082	ND	ND	ND	0.95	0.94	2.0	ND	ND	40	0.72	13	5.0	0.48	ND	0.28	ND	3.2	ND	4.3	11	ND	ND	42	60	ND	36
DCEs	%	ND	ND	44	0.44	54	28	100	27	8.5	8.7	13	25	100	100	55	10	83	93	96	92	93	78	87	88	89	89	87	72	58	40	100	64
VC	%	ND	ND	ND	ND	13	12	ND	ND	ND	ND	4.7	8.5	ND	ND	2.7	12	3.9	2.4	3.7	8.1	5.1	16	10	12	6.5	ND	13	28	ND	ND	ND	ND
Ethane+Ethene	%	–	–	56	100	33	60	ND	73	92	90	81	65	–	–	1.7	77	–	–	–	–	1.5	5.5	–	–	–	–	–	–	–	–	–	–
VOLATILE FATTY ACIDS																																	
Acetic Acid	mg/L	–	–	**3,500**	**50**	**41**	**18 J**	**4,700**	**5,000**	**430**	**420**	**530**	**540**	–	–	**2,100**	**620**	–	–	–	–	**770**	**390**	–	–	–	–	–	–	–	–	–	–
Butyric Acid	mg/L	–	–	**400**	**22 J**	**1.1 J**	**1.1**	**440**	**590**	**330**	**320**	**480**	**520**	–	–	**230 J**	**80**	–	–	–	–	**75 J**	**22**	–	–	–	–	–	–	–	–	–	–
Formic acid	mg/L	–	–	<250	**35**	<5.0	**0.41 J**	**41 J**	**80 J**	<100	<100	<250	<250	–	–	<250	**17 J**	–	–	–	–	**12 J**	**7.2**	–	–	–	–	–	–	–	–	–	–
Hexanoic Acid	mg/L	–	–	<250	<25	<5.0	<0.50	<250	**39**	**30 J**	**86**	<250	**60**	–	–	<250	**40**	–	–	–	–	<100	<5.0	–	–	–	–	–	–	–	–	–	–
Hexanoic Acid (i-)	mg/L	–	–	<250	<25	<5.0	<0.50	<250	**11 J**	<100	<10	<250	<25	–	–	<250	<25	–	–	–	–	<100	<5.0	–	–	–	–	–	–	–	–	–	–
Lactic Acid	mg/L	–	–	<250	**7.4 J**	**1.2 J**	**1.4**	<250	<25	<100	**3.6 J**	<250	**8.1 J**	–	–	<250	**6.6 J**	–	–	–	–	<100	**1.9 J**	–	–	–	–	–	–	–	–	–	–
Pentanoic Acid	mg/L	–	–	**96 J**	<25	<5.0	**0.27 J**	**270**	**530**	**160**	**240**	**210 J**	**360**	–	–	**160 J**	**76**	–	–	–	–	**55 J**	**6.4**	–	–	–	–	–	–	–	–	–	–
Pentanoic Acid (i-)	mg/L	–	–	<250	**45**	<5.0	**0.21 J**	<250	**65**	<100	**8.8 J**	<250	**30**	–	–	<250	**19 J**	–	–	–	–	<100	**5.1**	–	–	–	–	–	–	–	–	–	–
Propionic Acid	mg/L	–	–	**2,700**	**1,200**	<5.0	**1.2**	**4,900**	**4,800**	**1,000**	**980**	**2,000**	**2,000**	–	–	**1,600**	**370**	–	–	–	–	**490**	**120**	–	–	–	–	–	–	–	–	–	–
Pyruvic Acid	mg/L	–	–	**46 J**	**81**	**1.2 J**	**0.77**	**37 J**	**110**	**13 J**	**23**	<250	**49**	–	–	<250	**73**	–	–	–	–	**42 J**	**15**	–	–	–	–	–	–	–	–	–	–
ADDITIONAL VOLATILE ORGANIC COMPOUNDS (VOCs)																																	
Acetone	ug/L	<5.0	<5.0	**710**	**1,200**	<250	<100	<500	**660**	**160 J**	**180 J**	<500	**410 J**	**1,400**	<250	<500	<1000	<500	<5000	**500**	<2500	**400**	<1000	**640**	**230 J**	**1,500**	**660**	**440 J**	**470**	<2500	<2500	<2500	**240 J**
Benzene	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Bromodichloromethane	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Butanone (2-) (MEK)	ug/L	<5.0	<5.0	**5,800**	**720**	<250	<100	**980**	**1,200**	**230 J**	**290**	<500	**520**	**130 J**	<250	**820**	**340 J**	**550**	<5000	<250	<2500	**750**	**400 J**	**770**	**300**	**1,100**	**2,200**	<500	**140 J**	**1,300 J**	<2500	<2500	**270 J**
Carbon disulfide	ug/L	<1.0	<1.0	<50	<50	<50	<20	<100	<100	<100	<50	<100	<100	<50	<20	<100	<200	<100	<1000	<50	<500	<50	<200	<50	<50	<50	<50	<100	<50	<500	<500	<500	<100
Carbon tetrachloride	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Chloroethane	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Chloroform (Trichloromethane)	ug/L	<0.50	<0.50	<25	<25	**6.3 J**	**3.4 J**	<50	<50	<50	<25	<50	<50	<25	<10	**31 J**	**85 J**	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Chloromethane	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Cyclohexane	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Dibromochloromethane	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Dichloroethane (1,2-)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	**21 J**	**86 J**	**8.4 J**	<500	**6.0 J**	<250	**4.4 J**	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Ethylbenzene	ug/L	<0.50	<0.50	<25	<25	**5.7 J**	**4.3 J**	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	**15 J**	<250	**22 J**	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Hexanone (2-)	ug/L	<5.0	<5.0	<250	<250	<250	<100	<500	<500	<500	<250	<500	<500	<250	<250	<500	<1000	<500	<5000	<250	<2500	<250	<1000	<250	<250	<250	<250	<500	<250	<2500	<2500	<2500	<500
Isopropylbenzene (Cumene)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Methylcyclohexane	ug/L	<0.50	<0.50	<25	<25	<25	**4.0 J**	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Methylene Chloride (Dichloromethane)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Toluene	ug/L	<0.50	<0.50	<25	<25	**39**	**26**	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	**41**	<250	**77**	**50 J**	<25	**5.2 J**	**7.9 J**	**4.0 J**	<50	<25	<250	<250	<250	<50
Trichlorobenzene (1,2,4-)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	**21 J**	<50	<500	<25	<250	<25	<100	<25	<25	**12 J**	<25	<50	<25	<250	<250	<250	<50
Trichloroethane (1,1,2-)	ug/L	<0.50	<0.50	<25	<25	<25	<10	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	<25	<250	<25	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Xylene (m,p-)	ug/L	<0.50	<0.50	<25	<25	**16 J**	**13**	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	**17 J**	<250	**65**	<100	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
Xylene (o-)	ug/L	<0.50	<0.50	<25	**3.6 J**	**6.5 J**	**5.5 J**	<50	<50	<50	<25	<50	<50	<25	<10	<50	<100	<50	<500	**20 J**	<250	**30**	**18 J**	<25	<25	<25	<25	<50	<25	<250	<250	<250	<50
OTHER LABORATORY DATA																																	
Total Organic Carbon	mg/L	–	–	**4,900**	**1,900**	**80**	**23**	**8,900**	**8,300**	**2,600**	**2,400**	**3,800**	**3,900**	**180**	**18**	**2,700**	**1,100**	**2,600**	**1,200**	**1,400**	**380**	**1,200**	**450**	**660**	**170**	**1,200**	**2,900**	**180**	**76**	**7,400**	**240**	**46**	**180**
WATER QUALITY PROBE DATA																																	
Temperature	C	**10**	**11**	–	–	**11**	**9.9**	–	–	**9.8**	**9.6**	–	–	**10**	**9.1**	**9.5**	**9.6**	**7.7**	**10**	**10**	**9.2**	**9.9**	**8.3**	**10**	**7.9**	**11**	**9.8**	**9.4**	**9.3**	**8.8**	**9.8**	**10**	**11**
Specific Conductance	uS/cm	**460**	**510**	–	–	**1,100**	**590**	–	–	**4,200**	**3,700**	–	–	**2,200**	**830**	**5,000**	**3,000**	**4,100**	**3,100**	**5,300**	**2,500**	**4,100**	**3,100**	**3,100**	**2,100**	**3,300**	**4,300**	**1,500**	**1,800**	**9,600**	**490**	**1,300**	**870**
pH	SU	**7.4**	**7.6**	–	–	**6.7**	**6.5**	–	–	**5.0**	**5.1**	–	–	**6.5**	**6.4**	**5.3**	**5.9**	**5.2**	**5.4**	**5.7**	**6.5**	**6.0**	**6.4**	**6.0**	**6.3**	**5.7**	**5.6**	**6.1**	**6.5**	**5.3**	**5.7**	**5.6**	**5.8**
Oxidation/Reduction Potential	mV	**-120**	**100**	–	–	**-130**	**-83**	–	–	**-18**	**-4.2**	–	–	**-110**	**-89**	**3.5**	**-25**	**20**	**-8.0**	**-66**	**-110**	**-57**	**-100**	**-35**	**-81**	**-34**	**-53**	**-99**	**-110**	**-59**	**-7.2**	**-22**	**-23**
Dissolved Oxygen	mg/L	**0.14**	**3.3**	–	–	**0.030**	**0.64**	–	–	**3.9**	**1.5**	–	–	**0.41**	**0.79**	**0.29**	**1.9**	**0.44**	**3.1**	**0.22**	**3.2**	**0.15**	**2.9**	**0.24**	**1.9**	**0.19**	**1.0**	**1.1**	**0.73**	**1.2**	**0.62**	**0.73**	**1.2**
Turbidity	NTU	**1.5**	**1.7**	–	–	**91**	**34**	–	–	**>1,000**	**61**	–	–	**190**	**56**	**26**	**550**	**910**	**>1,000**	**390**	**76**	**510**	**430**	**200**	**350**	**99**	**160**	**91**	**75**	**>1,000**	**>1,000**	**260**	**38**
GEOCHEMISTRY																																	
Iron	mg/L	–	–	–	–	**10**	**11**	–	–	**510**	**520**	–	–	–	–	**77**	**33**	–	–	–	–	**26**	**39**	–	–	–	–	–	–	–	–	–	–
Iron - Ferrous	mg/L	–	–	–	–	**19**	**11**	–	–	**1,000**	**540**	–	–	–	–	**110**	**37**	–	–	–	–	**30**	**27**	–	–	–	–	–	–	–	–	–	–
Nitrate	mg/L	–	–	–	–	<0.55	<0.11	–	–	<0.55	<1.1	–	–	–	–	<0.55	<0.55	–	–	–	–	<0.55	<0.55	–	–	–	–	–	–	–	–	–	–
Sulfate	mg/L	–	–	–	–	**6.6 J**	**1.4 J**	–	–	**8.7**	**6.2 J**	–	–	–	–	**7.1 J**	<7.5	–	–	–	–	**2.5 J**	<7.5	–	–	–	–	–	–	–	–	–	–
Sulfide	mg/L	–	–	–	–	<2.0	<2.0	–	–	**7.2 J**	<16	–	–	–	–	<2.0	<8.0	–	–	–	–	<2.0	<2.0	–	–	–	–	–	–	–	–	–	–

TABLE 3
SUMMARY OF NOVEMBER 2023 & APRIL 2024 GROUNDWATER RESULTS
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analyte Name	Unit	C-11	C-11	D-1	D-1	D-2	D-2	D-3	D-3	D-4	D-4	D-5	D-5	D-6	D-6	111	111	112	112	113	113	118	118	119	119
		Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Low Flow	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
		S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		11/02/23	04/11/24	11/01/23	04/11/24	11/01/23	04/10/24	11/01/23	04/11/24	11/01/23	04/10/24	11/01/23	04/11/24	11/01/23	04/11/24	11/02/23	04/09/24	11/02/23	04/09/24	11/02/23	04/09/24	11/02/23	04/09/24	11/02/23	04/09/24
VOLATILE ORGANIC COMPOUNDS (VOCs)																									
Trichloroethene (TCE)	ug/L	<50	<25	**87**	**41**	**290**	**49 J**	**71**	<25	**180**	<100	<25	<25	**260**	**100**	**0.10 J**	<0.50	**0.63**	**0.14 J**	<0.50	<0.50	**0.28 J**	**0.57**	<0.50	**0.095 J**
Dichloroethene (cis-1,2-)	ug/L	**44 J**	**45**	**350**	**810**	**2,700**	**540**	**250**	**240**	**1,700**	**490**	**110**	**5.0 J**	**110**	**110**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.087 J**	**0.18 J**	**0.30 J**	**0.23 J**
Dichloroethene (trans-1,2-)	ug/L	<50	<25	<50	<25	**14 J**	<250	<50	<25	**8.1 J**	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloroethene (1,1-)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene (PCE)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	ug/L	<50	<25	**17 J**	**30**	**280**	**74 J**	**16 J**	**21 J**	**130**	**26 J**	**29**	<25	<50	**7.4 J**	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
LIGHT GASSES																									
Ethane	ug/L	–	–	–	–	**29**	**21**	–	–	**6.4**	**3.1 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ethene	ug/L	–	–	–	–	**200**	**240**	–	–	**160**	**26**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Methane	ug/L	–	–	–	–	**4,500**	**11,000**	–	–	**1,700**	**7,700**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MOLAR CONCENTRATION																									
Trichloroethene (TCE)	µmol/l	ND	ND	0.66	0.31	2.2	0.37	0.54	ND	1.4	ND	ND	ND	2.0	0.76	0.00076	ND	0.0048	0.0011	ND	ND	0.0021	0.0043	ND	0.00072
Dichloroethene (cis-1,2-)	µmol/l	0.45	0.46	3.6	8.4	28	5.6	2.6	2.5	18	5.1	1.1	0.052	1.1	1.1	ND	ND	ND	ND	ND	ND	0.00090	0.0019	0.0031	0.0024
Dichloroethene (trans-1,2-)	µmol/l	ND	ND	ND	ND	0.14	ND	ND	ND	0.084	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichloroethene (1,1-)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	µmol/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	µmol/l	ND	ND	0.27	0.48	4.5	1.2	0.26	0.34	2.1	0.42	0.46	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethane	µmol/l	–	–	–	–	0.95	0.71	–	–	0.21	0.10	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ethene	µmol/l	–	–	–	–	7.0	8.5	–	–	5.7	0.92	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	µmol/l	0.45	0.46	4.5	9.1	43	16	3.4	2.8	27	6.5	1.6	0.052	3.1	2.0	0.00076	ND	0.0048	0.0011	ND	ND	0.0030	0.0062	0.0031	0.0031
MOLAR PERCENTAGE																									
TCE	%	ND	ND	15	3.4	5.2	2.3	16	ND	5.1	ND	ND	ND	64	38	100	ND	100	100	ND	ND	70	70	ND	23
DCEs	%	100	100	79	91	66	34	76	88	65	78	71	100	36	56	ND	ND	ND	ND	ND	ND	30	30	100	77
VC	%	ND	ND	6.0	5.2	11	7.3	7.6	12	7.7	6.4	29	ND	ND	5.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethane+Ethene	%	–	–	–	–	19	56	–	–	22	16	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VOLATILE FATTY ACIDS																									
Acetic Acid	mg/L	–	–	–	–	**1,900**	**1,100**	–	–	**1,600**	**330**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Butyric Acid	mg/L	–	–	–	–	**280**	**110 J**	–	–	**260**	**45**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Formic acid	mg/L	–	–	–	–	<250	<250	–	–	**20 J**	**5.5**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hexanoic Acid	mg/L	–	–	–	–	**30 J**	**39**	–	–	**28 J**	**9.2**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hexanoic Acid (i-)	mg/L	–	–	–	–	<250	<5.0	–	–	<100	<5.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lactic Acid	mg/L	–	–	–	–	<250	<250	–	–	<100	**1.9 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Pentanoic Acid	mg/L	–	–	–	–	**85 J**	**65**	–	–	**170**	**12**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Pentanoic Acid (i-)	mg/L	–	–	–	–	<250	**32**	–	–	**20 J**	**2.1 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Propionic Acid	mg/L	–	–	–	–	**890**	**370**	–	–	**1,100**	**68**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Pyruvic Acid	mg/L	–	–	–	–	**62 J**	**60**	–	–	**40 J**	**11**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ADDITIONAL VOLATILE ORGANIC COMPOUNDS (VOCs)																									
Acetone	ug/L	**320 J**	**210 J**	**710**	**990**	**1,200**	<2500	<500	**76 J**	**840**	<1000	**970**	**230 J**	<500	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**2.9 J**	**5.0**
Benzene	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Butanone (2-) (MEK)	ug/L	<500	**130 J**	**870**	**1,800**	**3,500**	<2500	<500	**220 J**	**1,600**	<1000	**180 J**	**79 J**	**1,400**	**310**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Carbon disulfide	ug/L	<100	<50	<100	<50	<50	<500	<100	<50	<50	<200	<50	<50	<100	<50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform (Trichloromethane)	ug/L	<50	<25	<50	<25	**11 J**	**56 J**	<50	<25	<25	**23 J**	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cyclohexane	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloroethane (1,2-)	ug/L	<50	<25	<50	**6.2 J**	**16 J**	<250	<50	<25	**4.8 J**	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexanone (2-)	ug/L	<500	<250	<500	<250	<250	<2500	<500	<250	<250	<1000	<250	<250	<500	<250	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Isopropylbenzene (Cumene)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylcyclohexane	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride (Dichloromethane)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**1.3**	**0.26 J**
Trichlorobenzene (1,2,4-)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethane (1,1,2-)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Xylene (m,p-)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Xylene (o-)	ug/L	<50	<25	<50	<25	<25	<250	<50	<25	<25	<100	<25	<25	<50	<25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
OTHER LABORATORY DATA																									
Total Organic Carbon	mg/L	**14**	**59**	**1,600**	**1,300**	**2,100**	**1,200**	**790**	**170**	**2,300**	**310**	**300**	**87**	**9,600**	**6,200**	–	–	–	–	–	–	–	–	–	–
WATER QUALITY PROBE DATA																									
Temperature	C	**8.3**	**10**	**11**	**11**	**11**	**8.9**	**11**	**11**	**9.1**	**9.6**	**11**	**9.8**	**11**	**11**	**9.5**	**12**	**8.7**	**11**	**7.2**	**10**	**9.5**	**10**	**7.5**	**13**
Specific Conductance	uS/cm	**810**	**770**	**3,100**	**3,600**	**5,300**	**3,400**	**1,900**	**1,400**	**6,100**	**1,500**	**2,400**	**2,200**	**21,000**	**15,000**	**190**	**120**	**180**	**170**	**210**	**170**	**370**	**310**	**600**	**690**
pH	SU	**5.8**	**6.1**	**5.4**	**5.9**	**5.6**	**6.1**	**5.6**	**6.1**	**5.4**	**5.9**	**6.6**	**6.7**	**6.7**	**6.3**	**7.0**	**6.7**	**6.6**	**6.8**	**7.5**	**7.3**	**7.4**	**7.2**	**6.6**	**7.0**
Oxidation/Reduction Potential	mV	**-32**	**-28**	**11**	**-51**	**-42**	**-51**	**-39**	**-68**	**-33**	**-64**	**-160**	**-140**	**-170**	**-160**	**25**	**130**	**23**	**99**	**-20**	**53**	**-55**	**70**	**-31**	**-66**
Dissolved Oxygen	mg/L	**1.5**	**2.4**	**0.090**	**0.28**	**0.050**	**0.60**	**0.52**	**2.1**	**0.21**	**0.30**	**0.21**	**0.13**	**0.38**	**0.61**	**8.7**	**8.4**	**6.1**	**8.5**	**9.4**	**9.7**	**8.7**	**10**	**0.44**	**0.98**
Turbidity	NTU	**84**	**270**	**>1,000**	**92**	**62**	**33**	**850**	**65**	**>1,000**	**>1,000**	**120**	**100**	**>1,000**	**280**	**175**	**29**	**10**	**100**	**45**	**68**	**2.3**	**4.6**	**78**	**27**
GEOCHEMISTRY																									
Iron	mg/L	–	–	–	–	**110**	**72**	–	–	**51**	**25**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Iron - Ferrous	mg/L	–	–	–	–	**170**	**60**	–	–	**84**	**17**	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Nitrate	mg/L	–	–	–	–	<0.55	<0.55	–	–	<0.55	<0.55	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sulfate	mg/L	–	–	–	–	**8.1**	<7.5	–	–	<7.5	<7.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sulfide	mg/L	–	–	–	–	<2.0	<2.0	–	–	<2.0	**2.2 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Notes:

1. The table summarizes samples collected during the weeks of October 30, 2023, and April 8, 2024 as part of performance monitoring at the IBM Gun Club former Burn Pit Area. Samples were analyzed both in the field and at fixed analytical laboratories as indicated on the table.

2. Analytical laboratory analysis was performed by Eurofins Lancaster Laboratories of Lancaster, Pennsylvania (Lancaster) and/or Pace Analytical (formerly Microseeps, Inc.) of Baton Rouge, Louisiana (Pace). Results are rounded to two significant figures and recorded in units indicated on the table. Detections of compounds are emboldened.

3. Definitions:
"S" indicates primary sample
"FD" indicates field duplicate
"PDB" indicates the sample was collected via a passive diffusion bag
"–" indicates the compounds were not analyzed for that particular sample.
"<" indicates the result was below the analytical detection limit.
"J" indicates that the laboratory data was below the lowest quantifiable limit and therefore estimated.
"B" indicates that the compound was found in the blank and sample.
"ND" indicates that results were not detected above the analytical reporting limit or the calibration range of the field screening device.

4. Refer to the report text for further discussion. The sample plan can be referenced in Table 2 and the Site Management Plan.

TABLE 4
Summary of qPCR and CSIA Results
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Analytical Method	Analyte	Units	BP-1A								BP-2A		BP-4A		BP-5A							
			06/30/21	10/13/21	04/13/22	08/02/22	10/12/22	04/26/23	08/09/23	11/01/23	11/01/23	04/10/24	11/01/23	04/09/24	06/30/21	10/13/21	04/13/22	08/02/22	10/11/22	04/26/23	08/10/23	11/01/23
qPCR	**Dechlorinating Bacteria**																					
	Dehalococcoides (DHC)	cells/mL	-	-	5.68E+03	1.58E+01	7.20E+00	5.94E+02	1.99E+02	2.99E+02	9.80E+01	1.80E+02	4.03E+03	3.10E+03	-	-	1.66E+01	4.78E+01	5.00E-01 J	5.80E+00	3.94E+02	1.20E+00
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	-	-	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<8.00E-01	<2.40E-01	<3.90E+00	<9.60E-01	-	-	<5.00E-01	<1.30E+00	2.00E-01 J	<5.00E-01	<2.50E+01	<5.00E-01
	tceA Reductase (tceA)	cells/mL	-	-	<5.00E-01	3.00E-01 J	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	2.98E+01	<2.40E-01	1.44E+02	4.60E+00	-	-	<5.00E-01	<1.30E+00	<5.00E-01	<5.00E-01	4.58E+01	<5.00E-01
	Vinyl Chloride Reductase (vcrA)	cells/mL	-	-	6.19E+02	9.30E+00	9.00E-01	2.01E+02	3.97E+01	1.10E+02	2.14E+01	7.90E+01	1.61E+03	9.90E+02	-	-	7.00E-01	1.80E+00	<5.00E-01	2.00E-01 J	1.13E+02	<5.00E-01
	Functional Genes																					
	Methanogens	cells/mL	-	-	2.88E+01	9.00E-01 J	5.00E-01 J	<5.00E+00	3.10E+00 J	4.00E+00 J	2.55E+02	3.30E+03	3.70E+05	8.80E+03	-	-	1.80E+00 J	4.00E-01 J	<4.90E+00	1.00E+00 J	6.99E+03	2.00E-01 J
CSIA	$^{13}C/^{12}C$ TCE	‰	-12.9	NA	-10.9	-13.9	-13.1	-10.2	-11.1	-8.4	ND	-19.6	ND	ND	-15.5	-13.5	-18.1	-17.9	-18.8	-18.7	-20.7	-17.2
	$^{13}C/^{12}C$ cis-DCE	‰	-25.7	-14.8	-25.6	-24.4	-23.1	-24.2	-22.6	-22.1	-17.8	-18.3	-8.3	-3.4	-6.2	-15.0	-11.3	-11.8	-12.9	-11.6	-10.4	-11.2
	$^{13}C/^{12}C$ Vinyl Chloride	‰	-27.5 J	ND	-28.6	NA	NA	-23.2	-32.0	-32.3	ND	ND	-7.3	-11.1	NA	ND	-16.7	NA	NA	ND	NA	NA

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Analytical Method	Analyte	Units	BP-6A												
			04/15/20	09/10/20	11/11/20	04/14/21	06/30/21	10/13/21	04/13/22	08/03/22	10/12/22	04/26/23	08/09/23	11/01/23	04/10/24
qPCR	**Dechlorinating Bacteria**														
	Dehalococcoides (DHC)	cells/mL	6.42E+03	3.78E+04	1.91E+05	3.18E+04	-	-	1.64E+04	1.83E+05	2.71E+05	1.52E+04	1.14E+04	1.72E+05	1.30E+04
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<1.10E+00	1.00E+00	<5.00E-01	<6.00E-01	-	-	<6.00E-01	<5.00E-01	<5.00E-01	<8.00E-01	<5.00E-01	<5.00E-01	<2.40E-01
	tceA Reductase (tceA)	cells/mL	<1.10E+00	3.00E-01 J	<5.00E-01	<6.00E-01	-	-	<6.00E-01	<5.00E-01	<5.00E-01	<8.00E-01	<5.00E-01	<5.00E-01	<2.40E-01
	Vinyl Chloride Reductase (vcrA)	cells/mL	1.55E+03	1.36E+04	4.70E+04	8.30E+03	-	-	2.03E+03	4.30E+03	3.79E+04	2.72E+03	1.61E+03	3.84E+04	2.60E+03
	Functional Genes														
	Methanogens	cells/mL	4.00E-01 J	<4.90E+00	9.00E-01 J	9.00E-01 J	-	-	5.00E-01 J	1.00E-01 J	1.00E+00 J	2.00E-01 J	6.00E-01 J	1.20E+00 J	1.80E+00
CSIA	$^{13}C/^{12}C$ TCE	‰	-19.2	NA	NA	-20.6	-12.8 J	ND	-21.9	-16.0 J	-14.5 J	-19.6	-19.3	-18.2	-16.2
	$^{13}C/^{12}C$ cis-DCE	‰	-24.4	-12.9	-0.9	-24.0	-19.9	-8.8	-25.2	-17.1	-6.0	-21.9	-20.2	-8.3	-23.1
	$^{13}C/^{12}C$ Vinyl Chloride	‰	-34.8 J	-50.4	-33.8	NA	-50.3 J	-25.9 J	NA	-40.0 J	-32.9	-42.9	-46.5	-41.0	-43.5

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Analytical Method	Analyte	Units	BP-9A											BP-30A			
			04/15/20	09/10/20	11/11/20	04/14/21	04/12/22	08/02/22	10/11/22	04/25/23	08/08/23	10/31/23	04/09/24	04/15/20	09/10/20	11/10/20	04/14/21
qPCR	**Dechlorinating Bacteria**																
	Dehalococcoides (DHC)	cells/mL	2.39E+02	3.58E+02	6.47E+02	3.36E+04	1.01E+04	7.00E+02	2.06E+01	4.76E+03	5.20E+02	3.72E+03	4.30E+02	2.50E+00	6.00E-01	7.00E-01	1.50E+00
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<5.00E-01	<1.10E+00	<5.00E-01	<1.10E+00	<1.70E+00	<1.60E+00	<1.00E+00	<9.10E+00	<3.80E+00	<1.70E+00	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
	tceA Reductase (tceA)	cells/mL	4.00E-01 J	<5.00E-01	<1.10E+00	<5.00E-01	<1.10E+00	<1.70E+00	<1.60E+00	2.00E+02	<9.10E+00	7.48E+01	1.60E+01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
	Vinyl Chloride Reductase (vcrA)	cells/mL	3.47E+01	1.27E+02	5.36E+01	5.37E+03	1.88E+02	1.28E+02	1.70E+00	2.86E+03	5.72E+01	5.48E+02	8.40E+01	2.00E-01 J	<5.00E-01	<5.00E-01	2.00E-01 J
	Functional Genes																
	Methanogens	cells/mL	2.00E-01 J	2.60E+01	3.33E+02	1.17E+04	3.33E+02	3.40E+04	<1.61E+01	<1.03E+01	1.45E+04	2.82E+05	1.80E+05	1.00E-01 J	<5.00E+00	2.10E+00 J	2.41E+01
CSIA	$^{13}C/^{12}C$ TCE	‰	-20	-12.0	NA	NA	NA	NA	NA	-22.4	-28.1	-23.0	ND	-3.4	ND	8.1 J	ND
	$^{13}C/^{12}C$ cis-DCE	‰	-17.9	-17.2	-13.1	-0.9	NA	-5.4	-1.0	4.9	-8.8	-9.4	-3.8	-10.3	ND	5.2	-6.0 J
	$^{13}C/^{12}C$ Vinyl Chloride	‰	-28	-35.8	-28.9	-1.7	NA	-13.8	0.7	-13.0	-27.6	NA	-5.6	NA	NA	NA	NA

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Analytical Method	Analyte	Units	BP-34A												
			04/15/20	09/10/20	11/11/20	04/14/21	06/30/21	10/13/21	04/12/22	08/03/22	10/11/22	04/25/23	08/08/23	10/31/23	04/09/24
qPCR	**Dechlorinating Bacteria**														
	Dehalococcoides (DHC)	cells/mL	1.38E+03	2.39E+02	3.00E+03	1.12E+01	-	-	1.05E+02	3.50E+02	5.86E+02	3.36E+03	2.52E+03	1.29E+02	3.00E+01
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<1.00E+00	<5.00E-01	<5.00E-01	-	-	<5.00E-01	<5.00E-01	<7.00E-01	<5.00E-01	<2.63E+01	<9.30E+00	<9.80E-01
	tceA Reductase (tceA)	cells/mL	<5.00E-01	6.00E-01 J	<5.00E-01	1.00E-01 J	-	-	<5.00E-01	<5.00E-01	<7.00E-01	<5.00E-01	1.71E+02	1.50E+01	1.40E+00
	Vinyl Chloride Reductase (vcrA)	cells/mL	1.15E+03	1.81E+02	1.18E+03	7.80E+01	-	-	2.32E+01	2.27E+01	8.60E+00	2.10E+03	2.72E+02	1.91E+01	1.40E+01
	Functional Genes														
	Methanogens	cells/mL	<4.90E+00	2.80E+00 J	<4.80E+00	<5.40E+00	-	-	<5.00E-01	<5.50E+00	3.80E+00 J	<5.00E+00	2.14E+02 J	1.79E+01 J	<9.80E-01
CSIA	$^{13}C/^{12}C$ TCE	‰	-20.5	-16.8	-18.4	-18.0	-17.5	-17.8	-21.3	-20.8	-20.5	-22.1	-20.4	-19.9	-16.5
	$^{13}C/^{12}C$ cis-DCE	‰	-22.6	-21.5	-22.9	-22.8	-23.4	-24.6	-23.5	-23.6	-22.4	-22.7	-22.7	-22.4	-21.5
	$^{13}C/^{12}C$ Vinyl Chloride	‰	-42.8 J	-44.0 J	NA	-36.4	-39.3 J	NA	NA	NA	-35.2 J	-42.0	-43.0	-41.4	-30.5

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Analytical Method	Analyte	Units	BP-35A									
			04/15/20	09/10/20	11/10/20	04/12/22	08/02/22	10/11/22	04/25/23	08/09/23	10/31/23	04/09/24
qPCR	**Dechlorinating Bacteria**											
	Dehalococcoides (DHC)	cells/mL	6.12E+01	7.00E-01	3.70E+00	2.10E+00	3.00E-01 J	1.50E+00	<5.00E-01	6.14E+01	5.05E+04	4.20E+04
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<1.20E+00	<2.60E-01
	tceA Reductase (tceA)	cells/mL	<5.00E-01	<5.00E-01	4.00E-01 J	<5.00E-01	4.00E-01 J	1.00E-01 J	<5.00E-01	3.50E+00	7.00E-01 J	3.00E-01
	Vinyl Chloride Reductase (vcrA)	cells/mL	5.40E+00	1.00E-01 J	7.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	8.90E+00	7.79E+03	1.60E+04
	Functional Genes											
	Methanogens	cells/mL	4.00E+00 J	3.00E-01 J	1.83E+01	7.00E-01 J	7.00E-01 J	5.60E+00	<5.00E+00	2.14E+02	5.26E+03	4.60E+04
CSIA	$^{13}C/^{12}C$ TCE	‰	-19.9	-15.9	-19.4	-21.8	-22.4	-22.5	-22.5	ND	-23.9	ND
	$^{13}C/^{12}C$ cis-DCE	‰	-20.6	-19.0	-22.1	-21.3	-22.0	-22.4	-20.2	-20.8	-16.9	5.6
	$^{13}C/^{12}C$ Vinyl Chloride	‰	NA	NA	NA	NA	NA	NA	ND	-36.8	-45.4	-0.9

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Analytical Method	Analyte	Units	BP-36A											
			04/15/20	09/10/20	11/10/20	06/30/21	10/13/21	04/12/22	08/02/22	10/11/22	04/25/23	08/08/23	10/31/23	04/09/24
qPCR	**Dechlorinating Bacteria**													
	Dehalococcoides (DHC)	cells/mL	9.03E+03	3.03E+04	3.98E+04	-	-	6.48E+03	2.88E+03	8.96E+02	3.74E+03	6.44E+01	4.95E+02	6.00E+03
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<5.00E-01	<5.00E-01	-	-	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<1.16E+01	<1.10E+00	<2.40E-01
	tceA Reductase (tceA)	cells/mL	<5.00E-01	2.00E-01 J	<5.00E-01	-	-	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<1.16E+01	7.00E-01 J	<2.40E-01
	Vinyl Chloride Reductase (vcrA)	cells/mL	1.77E+03	1.16E+04	7.04E+03	-	-	2.14E+02	1.07E+03	5.98E+01	1.30E+03	2.80E+00 J	4.90E+02	1.90E+03
	Functional Genes													
	Methanogens	cells/mL	1.64E+01	3.21E+02	1.63E+02	-	-	1.75E+01	1.11E+01	<4.90E+00	<4.80E+00	5.05E+01 J	<1.06E+01	9.70E+02
CSIA	$^{13}C/^{12}C$ TCE	‰	-21	-5.1 J	-17.3	-18.6	-18.1	-22.2	-20.9	-21.7	-22.1	-23.6	-25.3	-20.7
	$^{13}C/^{12}C$ cis-DCE	‰	-20.1	-10.0	-18.6	-22.7	-25.7	-23.4	-23.1	-22.8	-21.4	-19.0	-17.7	-15.8
	$^{13}C/^{12}C$ Vinyl Chloride	‰	-32.6	-28.1	-43.5	-37.5	NA	-32.7	ND	-35.4 J	-32.6	-36.3	-34.4	-28.2

TABLE 4
Summary of qPCR and CSIA Results
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Analytical Method	Analyte	Units	BP-39A												
			04/15/20	09/10/20	11/10/20	04/14/21	06/30/21	10/13/21	04/12/22	08/02/22	10/11/22	04/25/23	08/08/23	10/31/23	04/09/24
qPCR	**Dechlorinating Bacteria**														
	Dehalococcoides (DHC)	cells/mL	2.20E+00	2.40E+00	6.60E+00	3.00E-01 J	-	-	4.00E+00	2.70E+00	3.00E-01 J	2.92E+02	1.74E+01	4.90E+02	1.30E+03
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<5.00E-01	1.00E-01 J	<5.00E-01	-	-	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<8.00E-01	<5.00E-01	<2.50E-01
	tceA Reductase (tceA)	cells/mL	<5.00E-01	<5.00E-01	1.40E+00	<5.00E-01	-	-	<5.00E-01	1.00E-01 J	<5.00E-01	8.00E-01	5.00E-01 J	4.80E+01	2.80E+02
	Vinyl Chloride Reductase (vcrA)	cells/mL	2.00E-01 J	1.90E+00	1.60E+00	1.00E-01 J	-	-	<5.00E-01	6.00E-01	<5.00E-01	9.34E+01	1.40E+00	3.22E+01	1.40E+02
	Functional Genes														
	Methanogens	cells/mL	3.50E+00 J	8.00E+00	4.10E+00 J	1.87E+01	-	-	3.04E+01	2.10E+03	8.37E+01	<5.00E+00	3.00E+02	1.57E+03	1.60E+04
CSIA	$^{13}C/^{12}C$ TCE	‰	-20.3	-14.2	-14.2	-9.4	-17.7	-14.8	-13.7	-20.7	-20.3	-20.6	-19.9	ND	ND
	$^{13}C/^{12}C$ cis-DCE	‰	-15.9	-13.2	-10.2	-10.8	-14.5	-16.2	-16.1	-17.6	-16.8	-16.2	-15.3	-10.9	-12.2
	$^{13}C/^{12}C$ Vinyl Chloride	‰	-27.7	NA	NA	-18.0 J	-24.1	NA	NA	-26.2	NA	-29.9	-28.7	-6.2	ND

TABLE 4
Summary of qPCR and CSIA Results
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analytical Method	Analyte	Units	BP-42AS		BP-42AD			BP-43AS		BP-43AI			A-13	
			10/31/23	04/10/24	10/14/22	04/25/23	08/08/23	10/31/23	04/10/24	10/14/22	04/25/23	08/08/23	11/01/23	04/10/24
qPCR	**Dechlorinating Bacteria**													
	Dehalococcoides (DHC)	cells/mL	1.50E+00	5.90E+01	2.34E+02	4.40E+00	1.62E+02	5.00E-01 J	1.90E+00	1.25E+01	3.00E+00	9.60E+00	1.66E+03	5.40E+03
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<2.60E-01	<5.00E-01	<5.00E-01	<5.00E-01	<5.00E-01	<2.60E-01	<5.00E-01	<5.00E-01	<5.00E-01	<8.00E-01	<2.50E-01
	tceA Reductase (tceA)	cells/mL	1.00E-01 J	3.50E-01	<5.00E-01	<5.00E-01	1.59E+01	<5.00E-01	2.70E-01	<5.00E-01	<5.00E-01	4.00E-01 J	5.70E+00	7.00E-01
	Vinyl Chloride Reductase (vcrA)	cells/mL	3.00E-01 J	1.70E+01	2.75E+01	1.80E+00	1.96E+01	<5.00E-01	3.20E-01	2.00E-01 J	1.00E-01 J	6.00E-01	7.40E+02	1.90E+03
	Functional Genes													
	Methanogens	cells/mL	8.80E+00	3.00E+01	<4.90E+00	<5.10E+00	1.84E+03	1.60E+00 J	<2.60E-01	<5.00E+00	2.00E-01 J	1.12E+03	1.30E+03	5.40E+02
CSIA	$^{13}C/^{12}C$ TCE	‰	-23.4	ND	-21.5	-21.9	ND	-22.4	-21.2	-22.5 J	ND	-23.7	NA	ND
	$^{13}C/^{12}C$ cis-DCE	‰	-20.4	-20.2	-14.6	-15.5	-17.6	-21.1	-23.2	NA	ND	ND	-14.8	-12.4
	$^{13}C/^{12}C$ Vinyl Chloride	‰	ND	-19.3	-20.2	-21.0	ND	-24.8	-20.9	NA	ND	ND	-32.1	-21.4

TABLE 4
Summary of qPCR and CSIA Results
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analytical Method	Analyte	Units	B-7											C-1			C-2	
			04/15/20	09/10/20	11/10/20	04/14/21	04/13/22	08/03/22	10/12/22	04/26/23	08/09/23	10/31/23	04/10/24	10/12/22	04/26/23	08/09/23	11/01/23	04/10/24
qPCR	**Dechlorinating Bacteria**																	
	Dehalococcoides (DHC)	cells/mL	4.42E+03	4.31E+02	2.82E+02	2.18E+02	<1.32E+01	2.20E+02	3.32E+01	<8.90E+00	8.83E+01	<9.60E+00	2.50E+00	1.76E+02	3.23E+02	3.05E+02	1.18E+03	3.10E+05
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<2.50E+00	<1.80E+00	<4.30E+00	<6.30E-01	<1.32E+01	<8.50E+00	<1.00E+01	<8.90E+00	<6.20E+00	<9.60E+00	<2.50E-01	<5.00E-01	<6.00E-01	<5.00E-01	<9.60E+00	<4.90E-01
	tceA Reductase (tceA)	cells/mL	<2.50E+00	<1.80E+00	1.00E+00 J	<6.30E-01	<1.32E+01	<8.50E+00	<1.00E+01	<8.90E+00	<6.20E+00	<9.60E+00	<2.50E-01	<5.00E-01	<6.00E-01	5.34E+01	1.90E+01	3.70E+00
	Vinyl Chloride Reductase (vcrA)	cells/mL	1.11E+03	2.87E+02	6.99E+01	6.11E+01	<1.32E+01	4.39E+01	<1.00E+01	<8.90E+00	5.50E+00 J	<9.60E+00	7.20E-01	2.74E+01	6.12E+01	4.92E+01	2.35E+02	4.80E+04
	Functional Genes																	
	Methanogens	cells/mL	1.17E+03	2.64E+03	1.04E+04	1.11E+04	1.41E+03	1.70E+04	1.49E+03	3.28E+02	7.56E+03	3.09E+02	5.50E+01	9.44E+03	1.69E+02	1.12E+05	2.97E+02	2.00E+02
CSIA	$^{13}C/^{12}C$ TCE	‰	NA	NA	-18.5	NA	NA	NA	NA	ND	ND	NA	-21.0	NA	ND	ND	-22.8	-20.7
	$^{13}C/^{12}C$ cis-DCE	‰	-17.1	-10.2	-18.9	ND	NA	NA	NA	-24.4	-21.4	-25.0	-20.4	NA	-12.4	-16.3	-21.0	8.7
	$^{13}C/^{12}C$ Vinyl Chloride	‰	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	-32.3	NA	ND	ND	-37.1	2.0

TABLE 4
Summary of qPCR and CSIA Results
Routine April 2024 Sampling Report
Former IBM Gun Club - Former Burn Pit Area
Union, New York

Analytical Method	Analyte	Units	C-5					D-1			D-2		D-4				
			10/12/22	04/26/23	08/10/23	11/01/23	04/10/24	10/12/22	04/26/23	08/10/23	11/01/23	04/10/24	10/12/22	04/26/23	08/09/23	11/01/23	04/10/24
qPCR	**Dechlorinating Bacteria**																
	Dehalococcoides (DHC)	cells/mL	2.00E+01	8.48E+01	1.03E+03	8.28E+01	4.30E+02	1.16E+02	2.52E+03	3.00E+00	2.61E+04	9.60E+04	1.56E+04	7.86E+03	3.86E+02	1.24E+04	1.40E+03
	BAV1 Vinyl Chloride Reductase (bvcA)	cells/mL	<5.00E-01	<6.00E-01	<4.00E+00	<3.00E+00	<1.10E+00	<5.00E-01	<5.00E-01	2.00E-01 J	<1.70E+00	<2.40E+00	<5.00E-01	<5.00E-01	<2.78E+01	<7.70E+00	<1.10E+00
	tceA Reductase (tceA)	cells/mL	<5.00E-01	<6.00E-01	5.97E+01	6.73E+01	5.00E+00	<5.00E-01	<5.00E-01	<5.00E-01	5.10E+00	2.20E+01	<5.00E-01	<5.00E-01	1.77E+01 J	1.53E+01	<1.10E+00
	Vinyl Chloride Reductase (vcrA)	cells/mL	1.40E+00	1.62E+01	3.40E+02	3.75E+01	1.10E+02	2.72E+01	6.91E+02	<5.00E-01	4.28E+03	1.90E+04	3.23E+03	1.21E+03	2.60E+01 J	3.50E+03	2.80E+02
	Functional Genes																
	Methanogens	cells/mL	1.90E+02	1.39E+01	2.90E+03	1.34E+05	1.00E+05	1.40E+00 J	1.07E+03	2.00E-01 J	2.42E+04	4.60E+05	8.93E+02	2.51E+02	3.05E+04	8.50E+04	5.90E+04
CSIA	$^{13}C/^{12}C$ TCE	‰	-11.6	ND	-21.4	ND	ND	-23	-22.0	-20.6	-20.4	-19.9	-22.2	-19.7	-21.7	-21.6	-16.0
	$^{13}C/^{12}C$ cis-DCE	‰	-21.1	-18.9	-18.1	-16.8	-14.8	-18.8	-17.7	-19.5	-16.1	-13.9	-19.5	-19.6	-17.3	-19.0	-16.4
	$^{13}C/^{12}C$ Vinyl Chloride	‰	ND	ND	-33.4	-28.8	-25.5	-18.1 J	-41.5	NA	-27.9	-14.2	-32	-36.9	-36.4	-26.5	-25.6

Notes:

1. The table summarizes samples collected as part of supplemental forensic sampling at the IBM Gun Club former Burn Pit Area. Samples were analyzed by Microbial Insights of Knoxville, Tennessee (MI). April 2024 CSIA results were analyzed by Isodetect GmbH of Leipzig, Germany, subbed by SiREM of Knoxville, Tennessee. Results are recorded in units indicated on the table.

2. Definitions:
"qPCR" indicates quantitative polymerase chain reaction analysis, which is a DNA-based analysis used to quantify specific microorganisms and specific functional genes responsible for biodegradation.
"CSIA" indicates compound-specific isotope analysis, which identifies the ratio of carbon-13 to carbon-12 isotopes in the compounds of interest for this site (TCE, cDCE, and vinyl chloride)
"J" indicates that the laboratory data was below the lowest quantifiable limit and therefore estimated.
"NA" indicates that the compound was not detected in the VOC sample collected concurrently with the CSIA sample, so CSIA results are not applicable. NA results for compounds detected in the VOC sample were due to targets below the limit of detection after required dilutions and were therefore not analyzed.
"ND" indicates not detected.
A blank cell indicates the sample was not analyzed for this parameter.

3. Refer to the report text for further discussion.

Figures

Figure 1

Injection Well and Monitoring Location Plan

April 2024 Routine Sampling Report and Remediation Performance Update

Former IBM Gun Club -
Former Burn Pit Area

Union, New York

Drawn By:	H. LaPointe / O. Moseley
Designed By:	E. Bosse
Reviewed By:	B. Green
Project No:	3526.30
Date:	July 2024

Figure Narrative

This figure shows the locations of injection borings and wells, monitoring wells, multi-level monitoring systems, and surface water sampling points where depth to water is measured and water quality samples may be collected for field and analytical laboratory testing as part of routine and performance monitoring programs.

The locations of site features, including monitoring wells, seeps, springs, and culverts are based on field surveys by Butler Land Surveying, LLC of Little Meadows, Pennsylvania between 2006 and 2022.

Notes

1. Aerial imagery provided by Google Earth Pro.(May 2022). Union, New York, USA. 42° 7'49.13"N, 76° 0'20.09"W, Eye alt 6200 feet. [March, 2023].

Legend

- Monitoring Well Location
- Injection Boring Location installed in 2013
- Injection Well Location installed in 2022
- ORP Sensor Location
- Active-Distributed Temperature Sensing Location
- Observed Drainage Features (arrows indicate flow direction)
- BP-5A Dedicated Water Quality Parameter Probe
- Surface Water Sampling Point
- Culvert
- A-DTS Transect Line
- Site Boundary

100 50 0 100 200 Feet

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Figure 2

Summary of April 2024 Groundwater Quality Conditions

April 2024 Routine Sampling Report and Remediation Performance Update

Former IBM Gun Club -
Former Burn Pit Area
Union, New York

Drawn By:	H. LaPointe
Designed By:	E. Bosse
Reviewed By:	B. Green
Project No:	3526.20
Date:	July 2024

Figure Narrative

This figure shows groundwater quality data and inference based on monitoring conducted April 2024.

The groundwater data for site key VOCs including TCE, cDCE, vinyl chloride, and ethane/ethene from water table monitoring wells are presented as pie diagrams. The wedges of each pie diagram represent concentrations of the four compounds expressed in micromoles per liter (umol/L). The relative diameter of each pie diagram varies based on the sum of the above-described CVOCs and ethene/ethaneat each location.

The inferred oxidation reduction potential (ORP) inferences are based on ORP measurements collected during groundwater sampling. In general, ORP readings less than 50 mV are considered favorable to reductive dechlorination of CVOCs.

Legend

BP-38A 39,000 Well Name and April 2024 total VOCs Concentrations in Groundwater (µg/L)

Inferred Groundwater Contour November 2023

Inferred ORP Readings <-100 mV

Inferred ORP Readings <50 mV

Former Property Boundary

>1 mg/kg Total CVOCs
>10 mg/kg Total CVOCs
Primary Source Zone in Rock

Parent VOC (Trichloroethene)

Primary Daughter Product (*cis*-1,2DCE)

Secondary Daughter Product (Vinyl Chloride)

Terminal Breakdown Products (Ethane, Ethene)

Total VOC Concentration in Groundwater (µmol/L)
< 0.1
>0.1 to 1
>1 to 10
>10 to 100
>100

Feet
40 20 0 40 80

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Last Edited By: hlapointe

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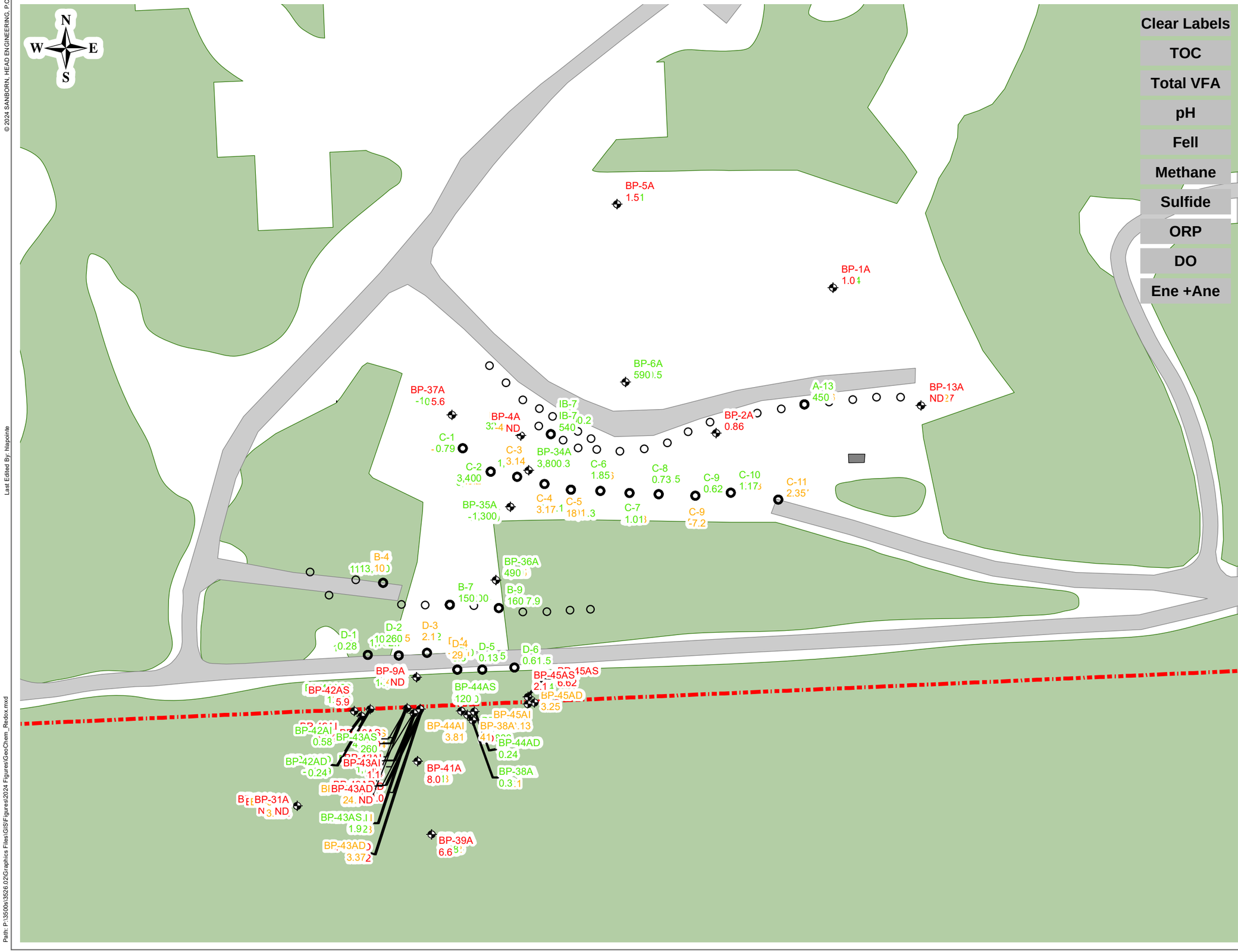

Clear Labels

TOC

Total VFA

pH

Fell

Methane

Sulfide

ORP

DO

Ene +Ane

Figure 3

April 2024 Assessment of Geochemical Conditions

Former IBM Gun Club - Former Burn Pit Area
Union, New York

Drawn By:	H. LaPointe
Designed By:	E. Bosse
Reviewed By:	B. Green
Project No:	3526.20
Date:	July 2024

Figure Narrative

This interactive figure summarizes the results from multiple geochemical parameters. Green labels indicate conditions conducive to reductive dehalogenation. Orange labels indicate reductive dehalogenation may be possible, but conditions are less conducive. Red labels indicate conditions where reductive dehalogenation is less likely.

Posted data is from the April 2024 sampling round.

Legend

DO mg/L	>5	2-5	<=2
ORP mV	>50	50- −100	<=−100
Sulfide µg/L	<10	10-50	>=50
Methane µg/L	<0.5	0.5-20	>=20
Fe(II) mg/L	<1		>=1
pH SU	<5 or >9	5-6 or 8-9	6.0-8.0
Total VFA mg/L	<1		>=1
TOC mg/L	<4	4-20	>=20
Ethane + Ethene µg/L	<10	10-50	>=50

30 15 0 30 60 Feet

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Last Edited By: hlapointe

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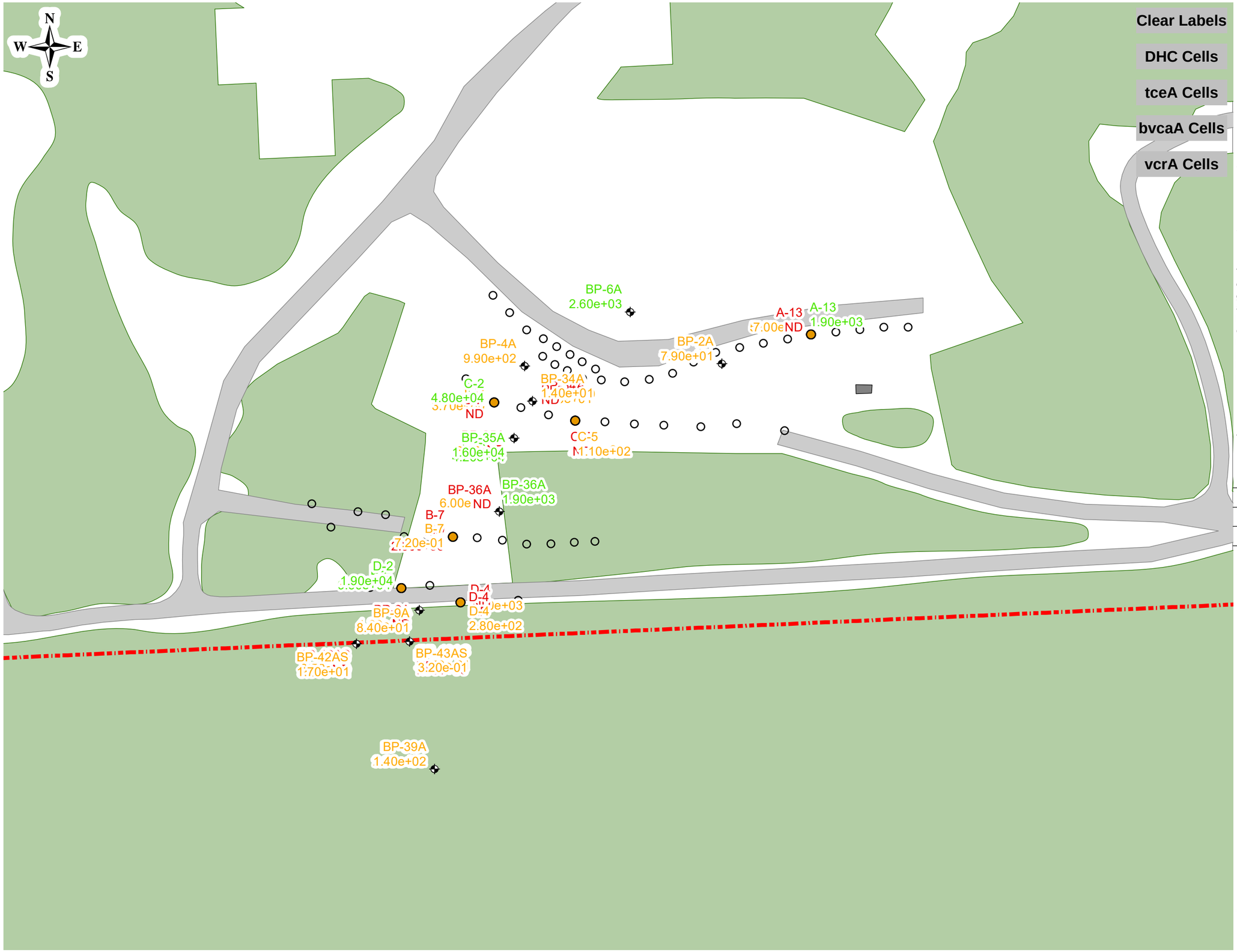

Figure 4

April 2024 Summary of qPCR

IBM Gun Club - Former Burn Pit Area

Union, New York

Drawn By:	H. LaPointe
Designed By:	E. Bosse
Reviewed By:	B. Green
Project No:	3526.20
Date:	July 2024

Figure Narrative

This figure summarizes the results from analysis of Dehalococcoides (DHC) bacteria and functional genes to support a multiple lines of evidence assessment of reductive dehalogenation. Green labels indicate concentrations thought to be highly conducive to reductive dehalogenation. Orange labels indicate reductive dehalogenation is possible, but levels are less conducive. Red labels indicate conditions where there is limited or no evidence for reductive dehalogenation.

Legend

DHC (cells/mL)	$< 10^1$	10^1 - 10^4	$> 10^4$
tceA (cells/mL)	ND	ND - 10^7	$> 10^7$
bvcaA (cells/mL)	ND	ND - 10^3	$> 10^3$
vcrA (cells/mL)	ND	ND - 10^3	$> 10^3$

DHC = *Dehalococcoides*

tceA = TCE reductase

bvcaA = BAV1 vinyl chloride reductase

vcrA = Vinyl chloride reductase

30 15 0 30 60 Feet

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Figure 5A
CSIA Results - TCE
Summary of Water Quality Monitoring
IBM Gun Club - Former Burn Pit Area
Union, New York

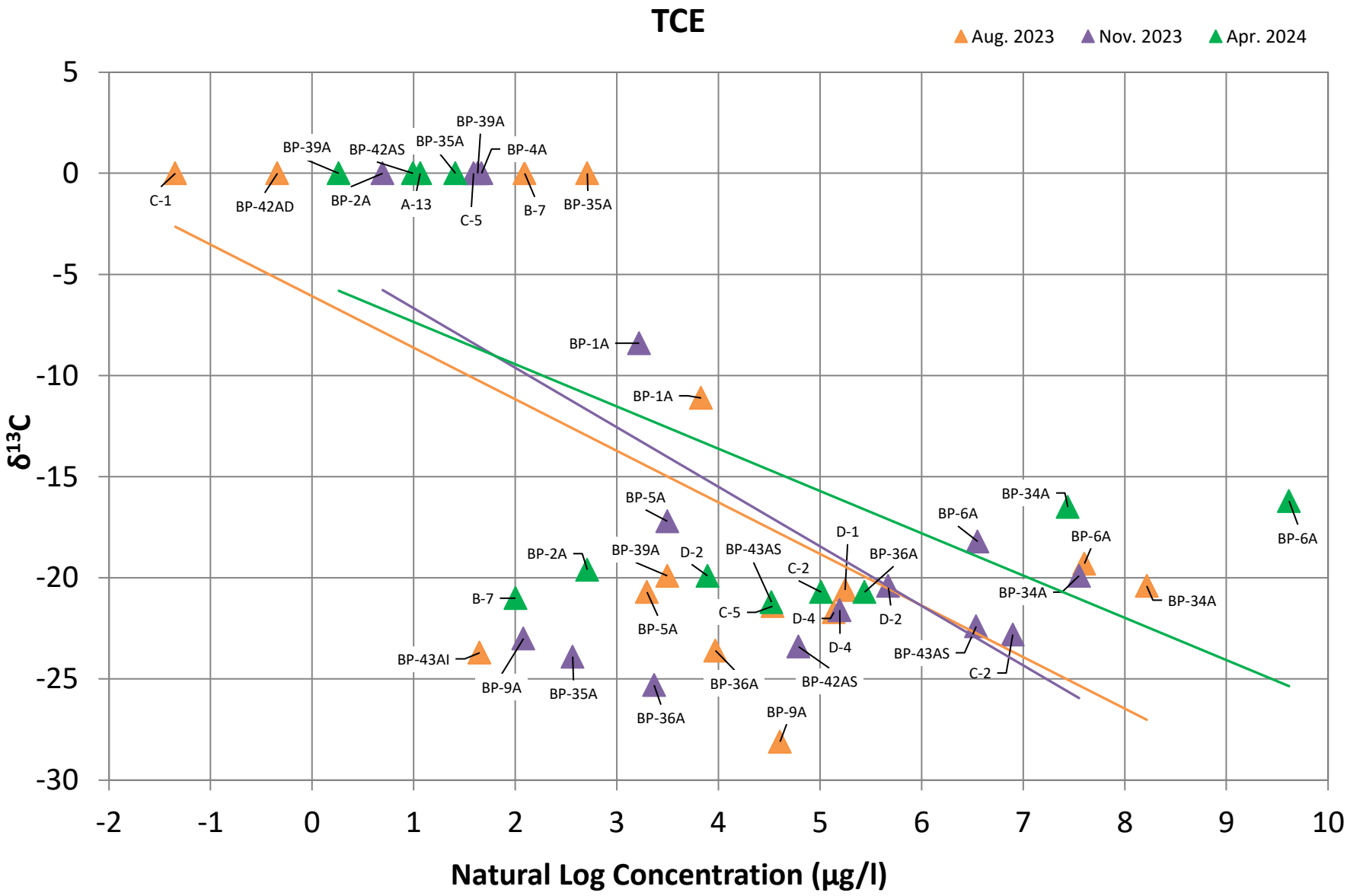


Figure 5B
CSIA Results - cis-DCE
Summary of Water Quality Monitoring
IBM Gun Club - Former Burn Pit Area
Union, New York

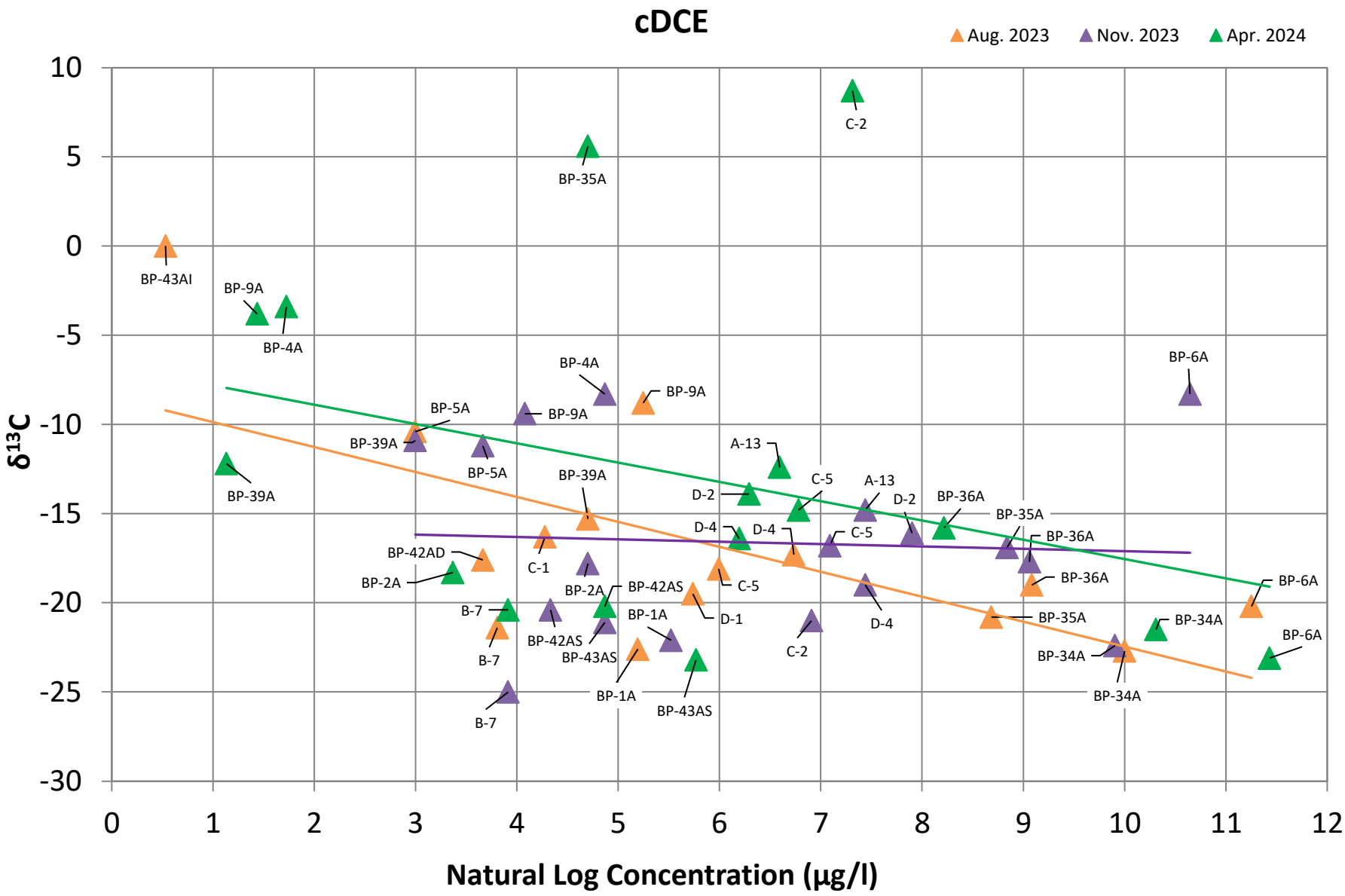
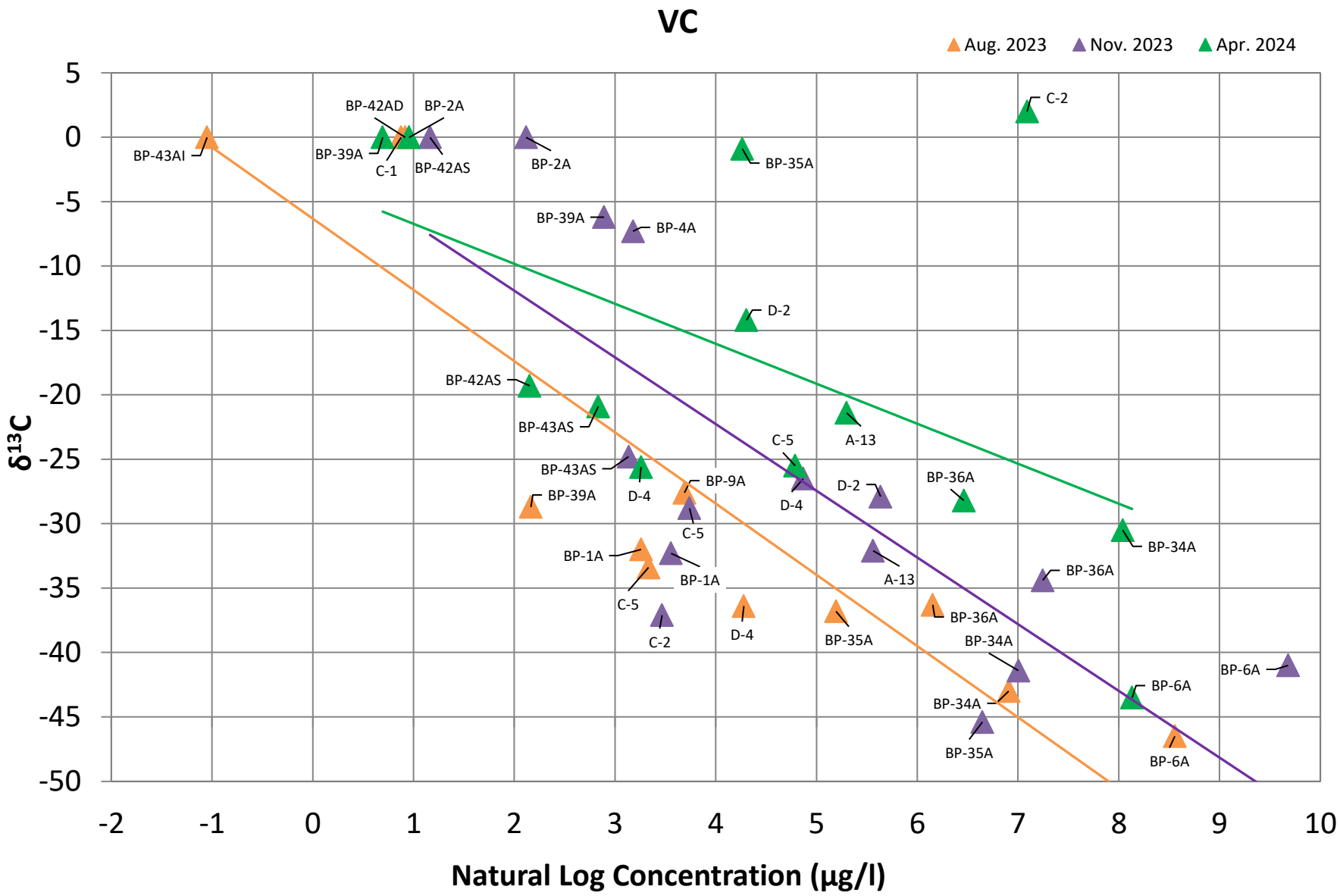
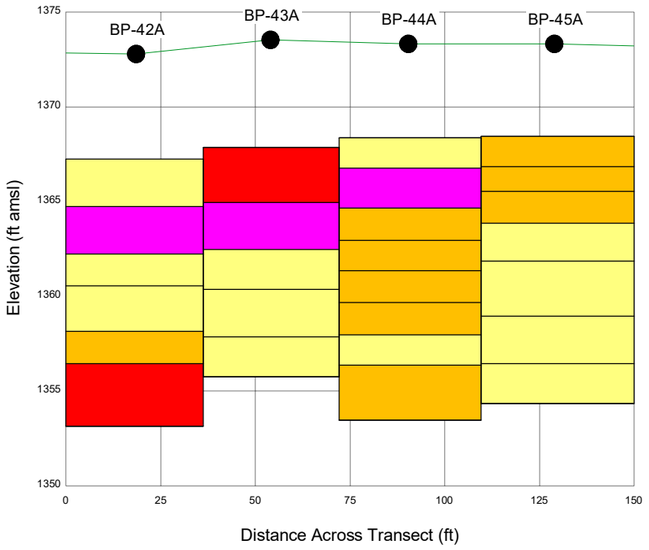
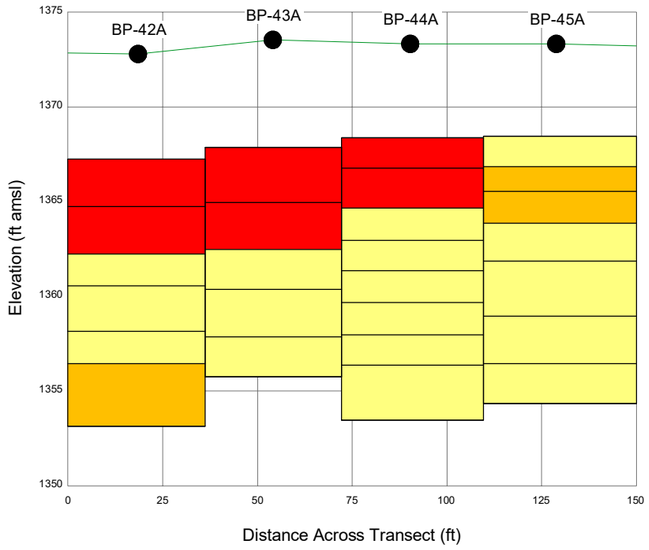
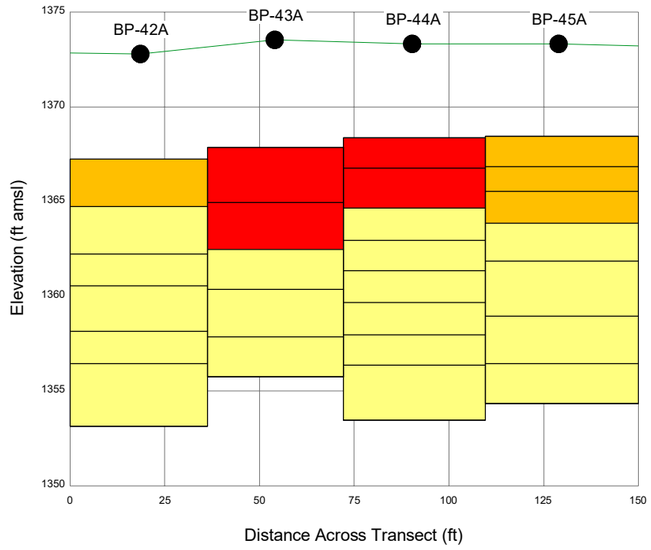


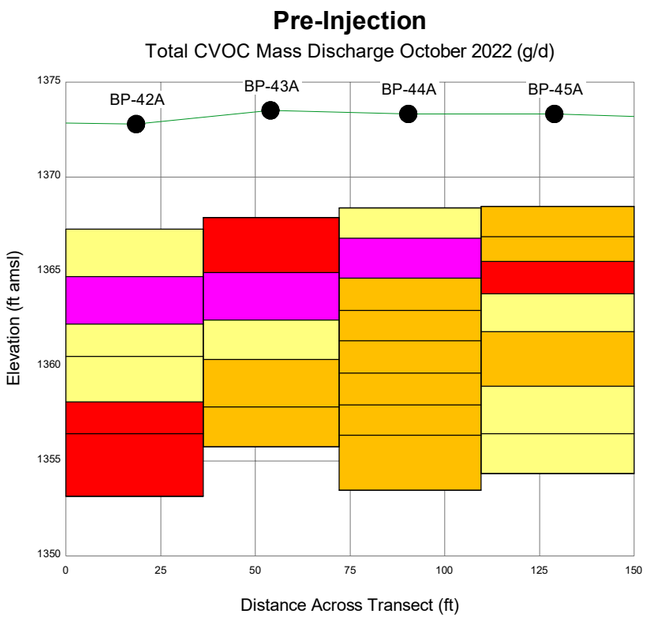
Figure 5C
CSIA Results - VC
Summary of Water Quality Monitoring
IBM Gun Club - Former Burn Pit Area
Union, New York

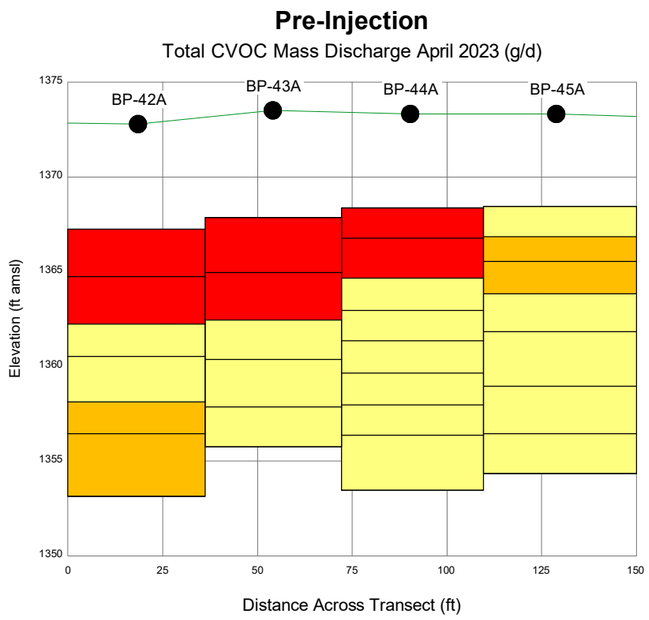












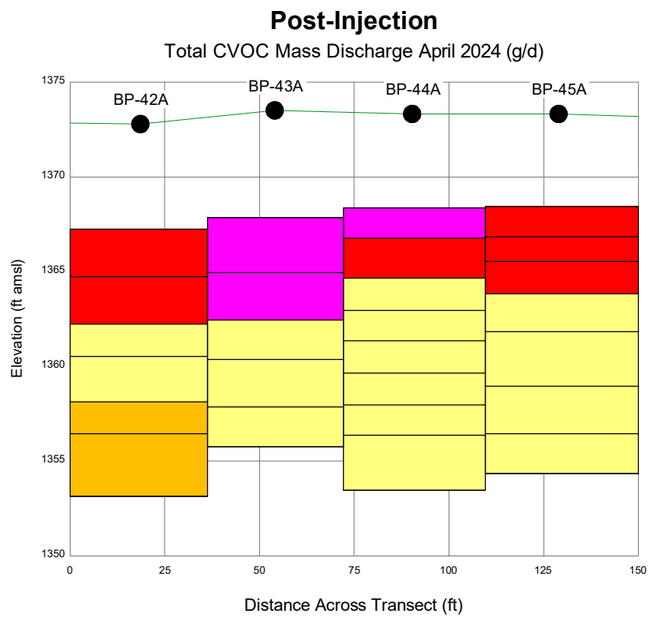


Figure 6

Summary of Mass Discharge

April 2024 Routine Sampling Report and Remediation Performance Update

Former IBM Gun Club - Former Burn Pit Area
Union, New York

Drawn By: E. Wright
Designed By: E. Finger
Reviewed By: B. Green
Project No: 3526.30
Date: July 2024

Figure Narrative

This figure shows mass discharge estimates across the BP-24 to BP-45A transect. Unit flows calculated from A-DTS testing and groundwater concentrations from the nested wells for each grid section were used to calculate mass discharge. See the report text for details.

Legend

- 0 - <0.001 (g/day)
- 0.001 - <0.01 (g/day)
- 0.01 - <0.1 (g/day)
- 0.1 - <1 (g/day)
- Approximate ground surface

20' 10' 0 20' 40' Feet

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File:\\conserv1\SHDATA\3500s\3526.02\Graphics Files\CAD\Mass Discharge Graphs\A-DTS FlowRates_202404.dwg Plot Date: 7-26-24

Appendix A

Limitations

APPENDIX A
LIMITATIONS

1. The conclusions and recommendations described in this report are based in part on the data obtained from a limited number of soil samples from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further investigation is initiated. If variations or other latent conditions then appear evident, it will be necessary to re-evaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the exploration logs.
3. Water level measurements have been made in the observation wells at times and under conditions stated within the text of the report and indicated on the exploration logs and in the report. Note that fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors not evident at the time measurements were made.
4. Quantitative laboratory analyses were performed as part of the investigation as noted within the report. The analyses were performed for specific parameters that were selected during the course of this study. It must be noted that additional compounds not searched for during the current study may be present in soil and groundwater at the site. Sanborn Head has relied upon the data provided by the analytical laboratory, and has not conducted an independent evaluation of the reliability of these data. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their distribution within the groundwater and soil may occur due to the passage of time, seasonal water table fluctuations, recharge events, and other factors.
5. The conclusions and recommendations contained in this report are based in part upon various types of chemical data. While Sanborn Head has reviewed that data and information as stated in this report, any of Sanborn Head's interpretations, conclusions, and recommendations that have relied on that information will be contingent on its validity. Should additional chemical data, historical information, or hydrogeologic information become available in the future, such information should be reviewed by Sanborn Head and the interpretations, conclusions and recommendations presented herein should be modified accordingly.
6. This report has been prepared for the exclusive use of International Business Machines in accordance with generally accepted hydrogeologic practices. No other warranty, express or implied, is made.
7. The analyses and recommendations contained in this report are based on the data obtained from the referenced subsurface explorations. The explorations indicate subsurface conditions only at the specific locations and times, and only to the depths penetrated. They do not necessarily reflect strata variations that may exist between such locations. The validity of the recommendations is based in part on assumptions Sanborn Head has made about conditions at the site. Such assumptions may be confirmed only

during remediation. If subsurface conditions different from those described become evident, the recommendations in this report must be re-evaluated.

8. In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed, and conclusions of this report modified or verified in writing by Sanborn Head. Sanborn Head is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or re-use of the subsurface data or engineering analyses without the express written authorization of Sanborn Head.

Appendix B

Time Series Charts of Select Compounds

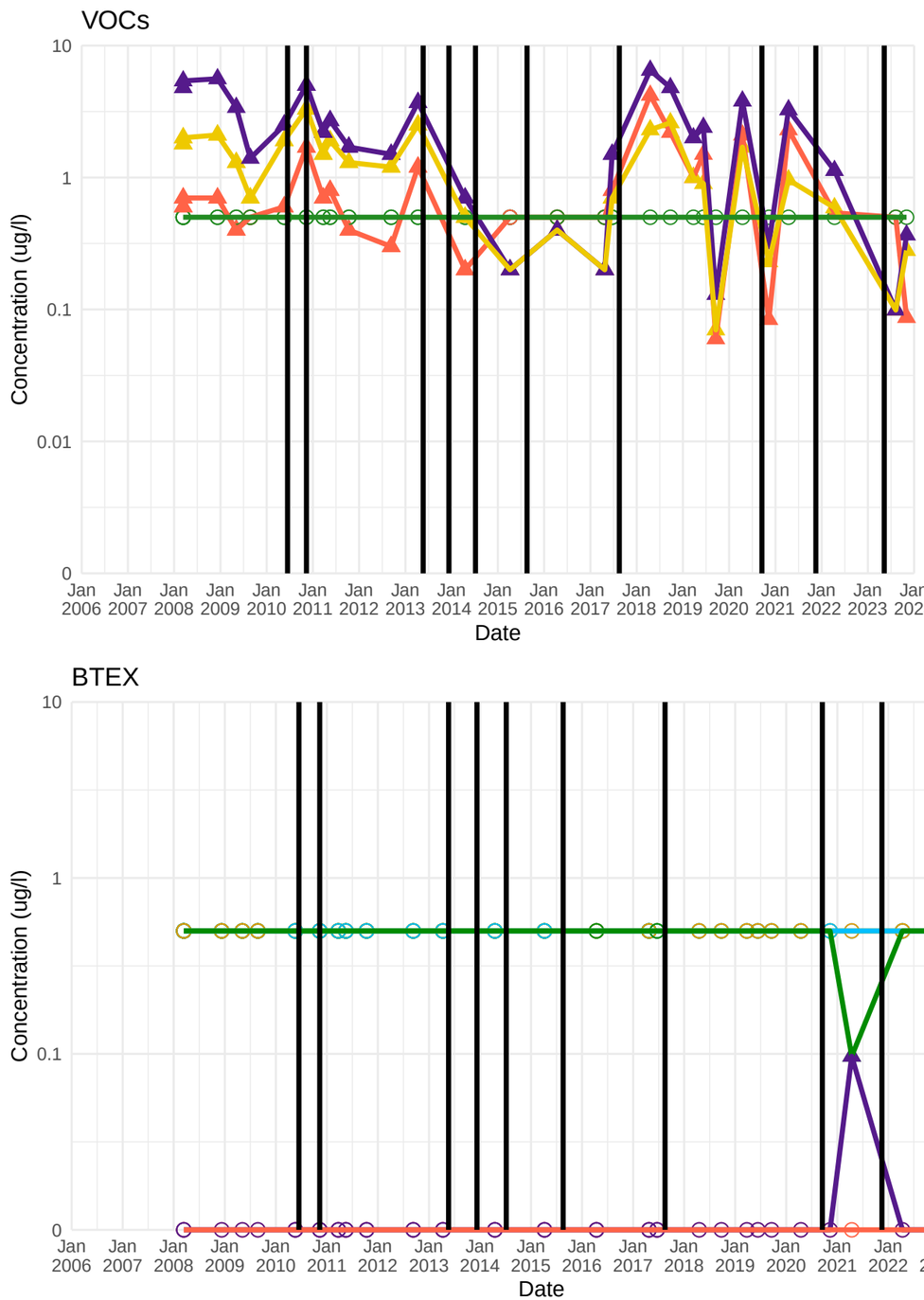
118

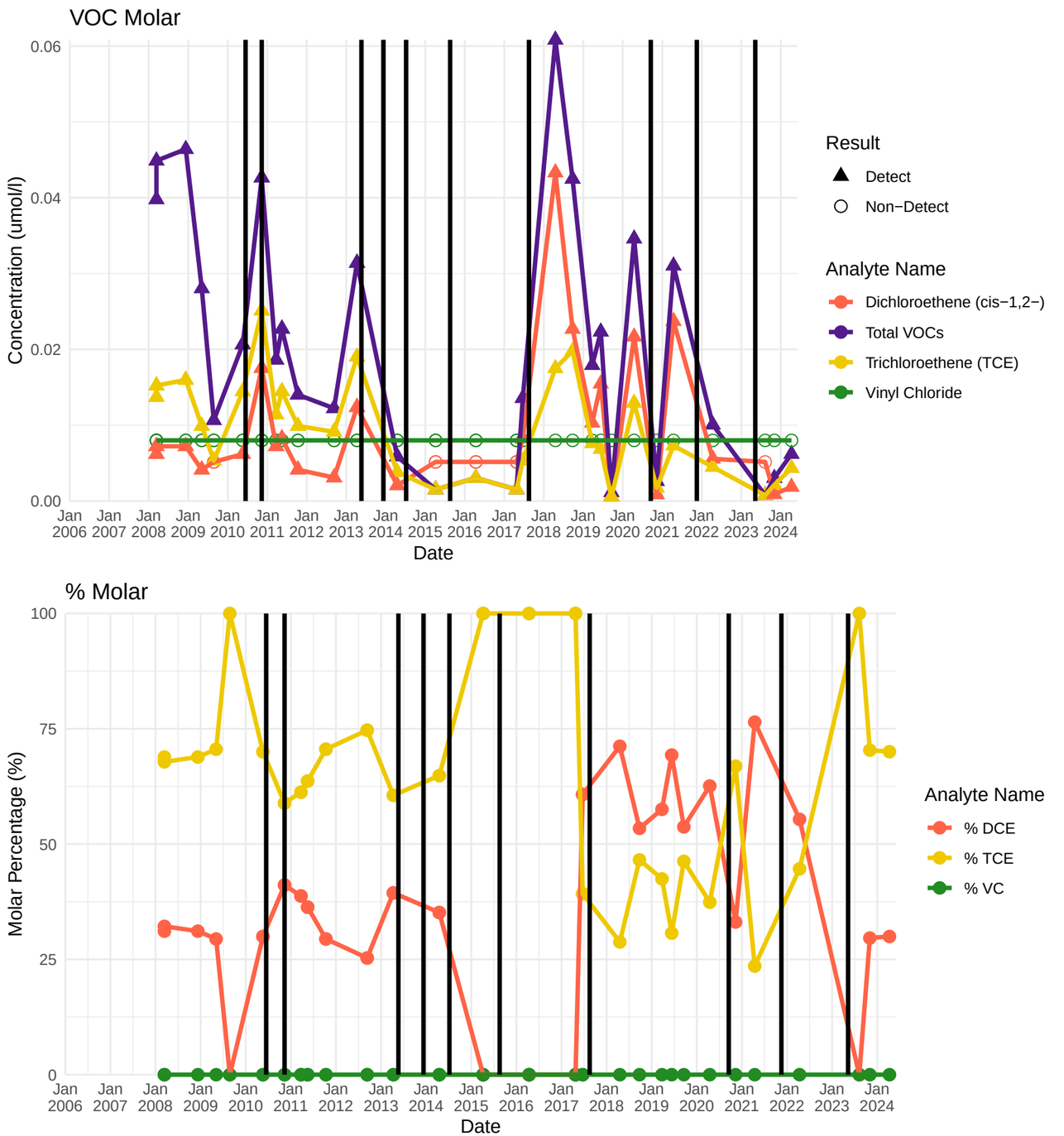
Notes:

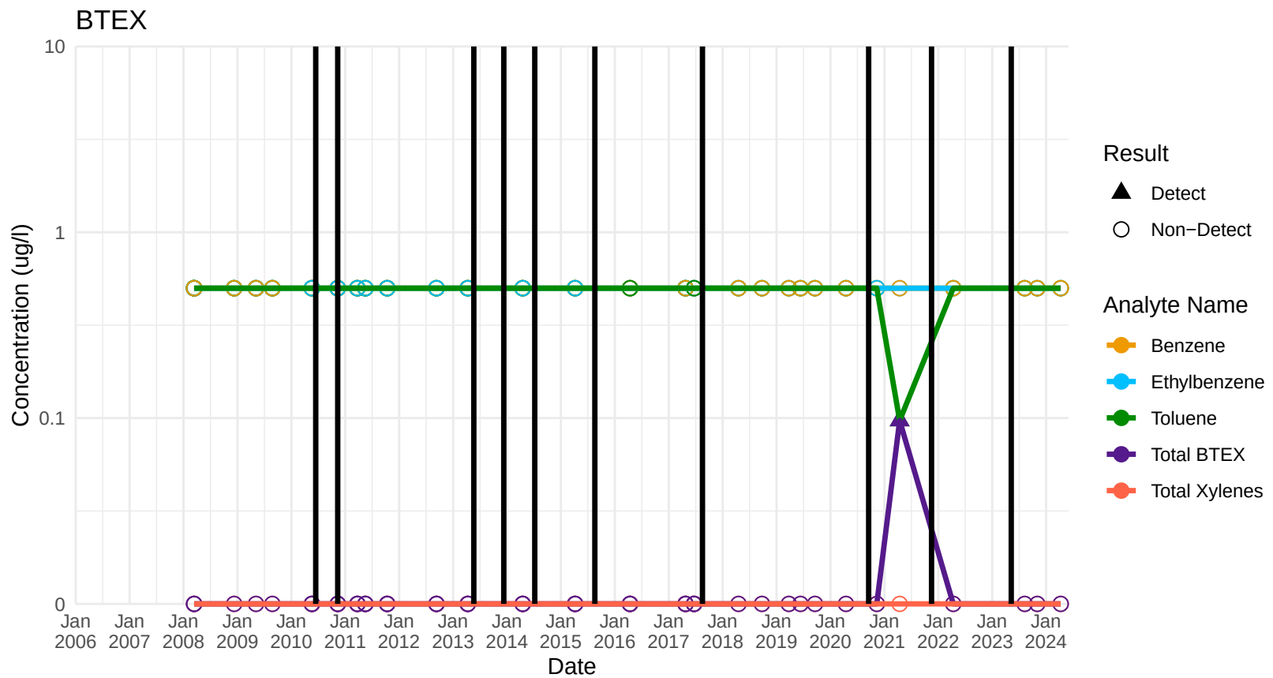
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.







118

Notes:

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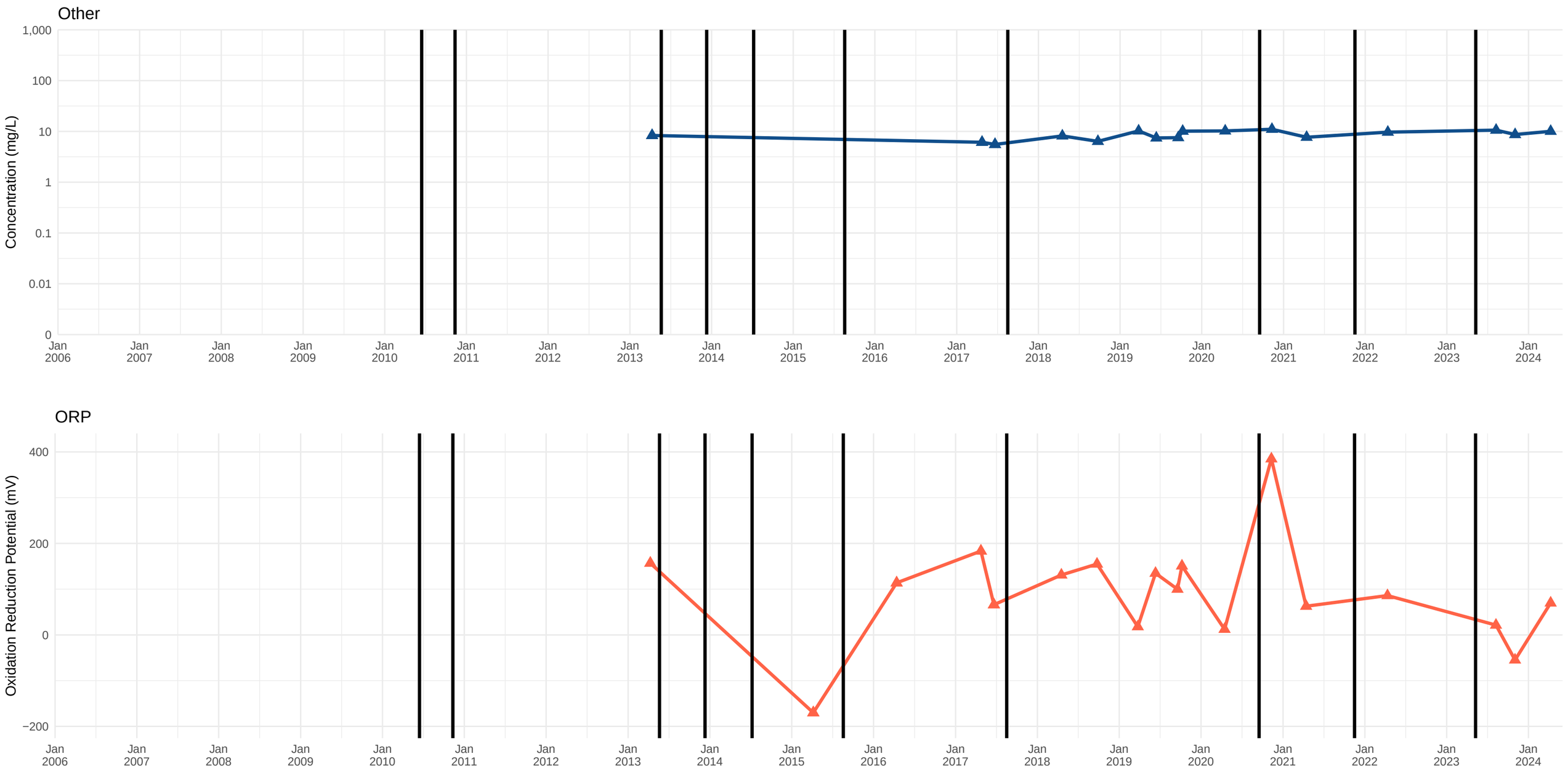

A−13

Notes:

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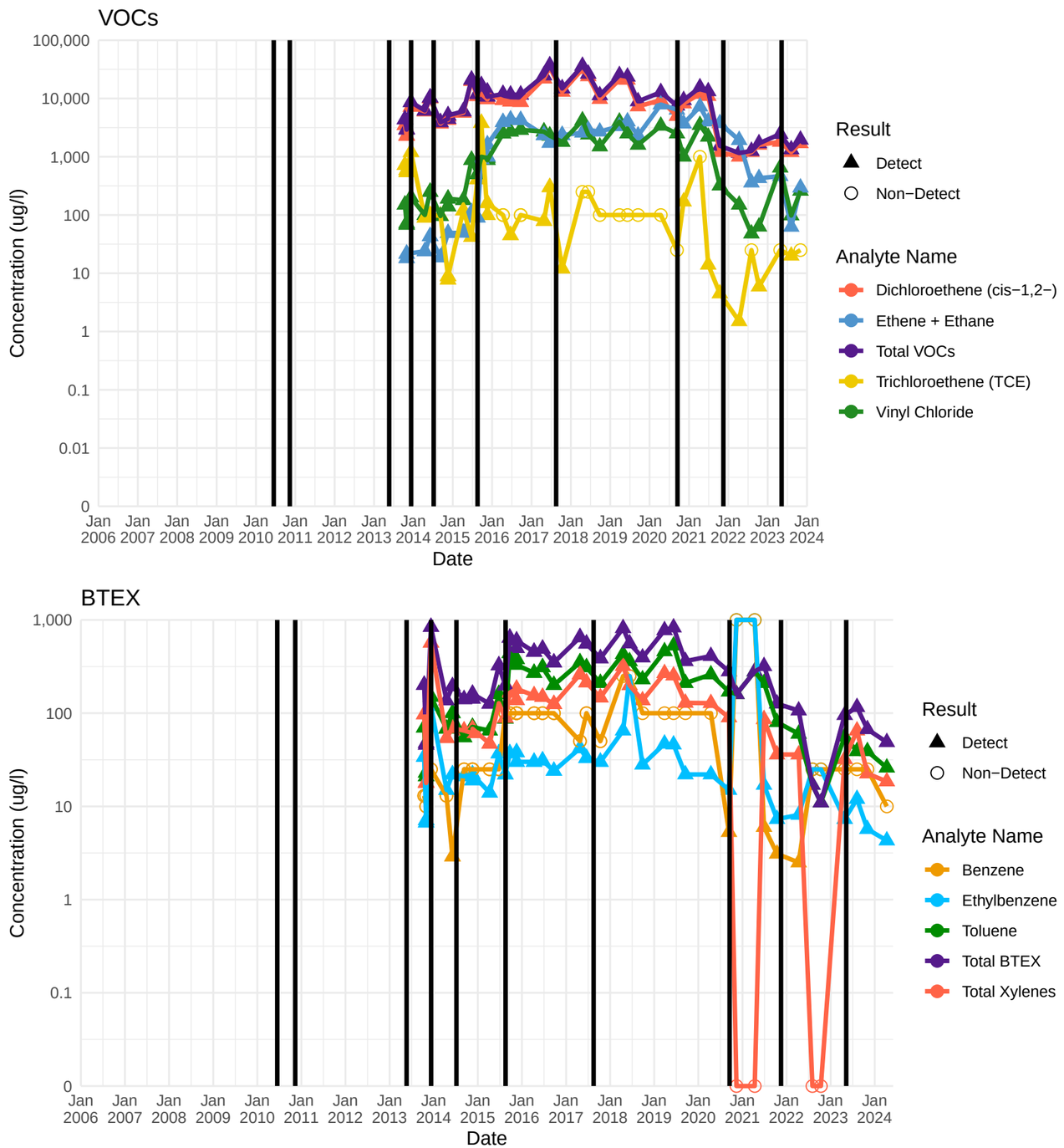

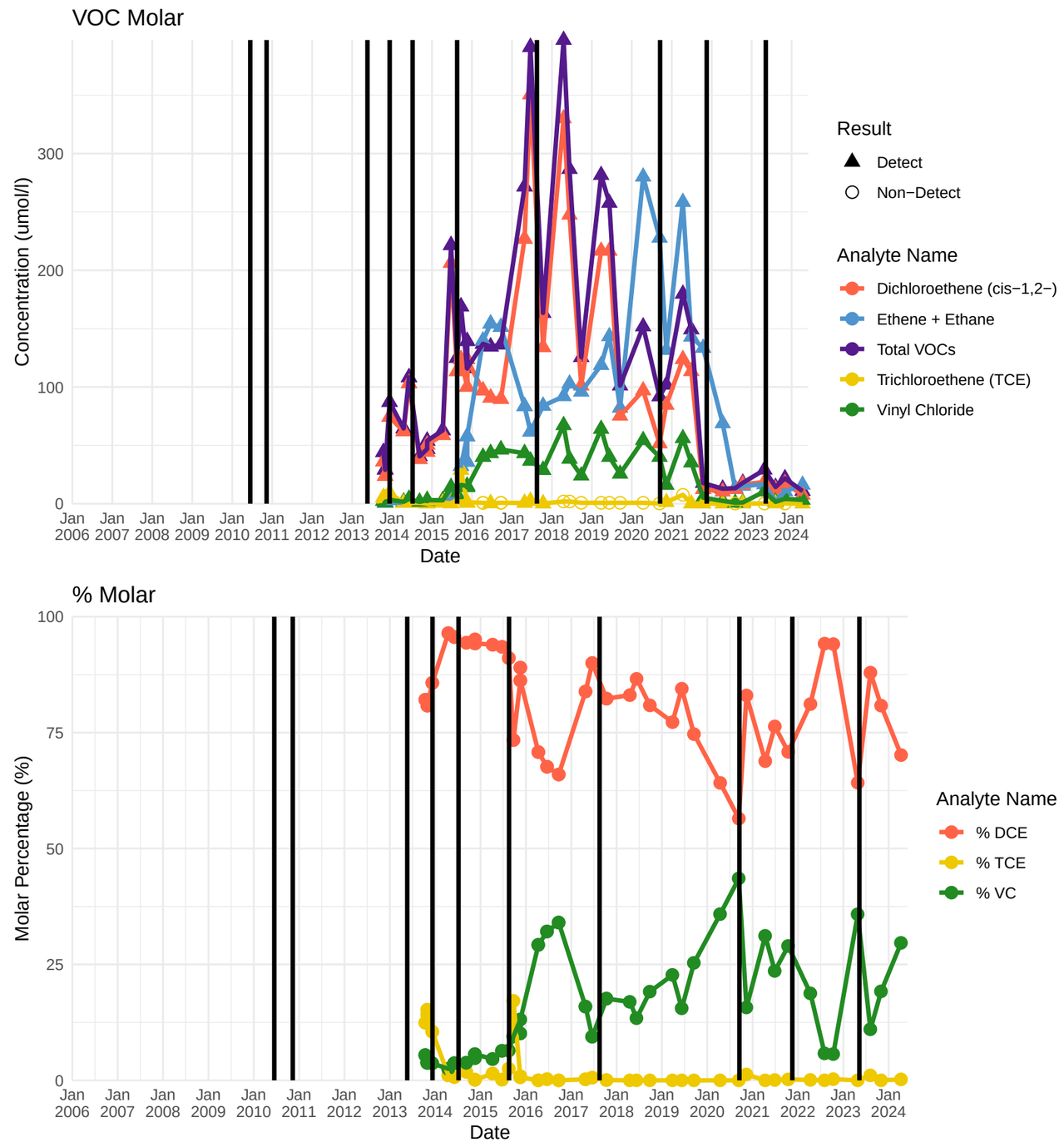

A−13

Notes:

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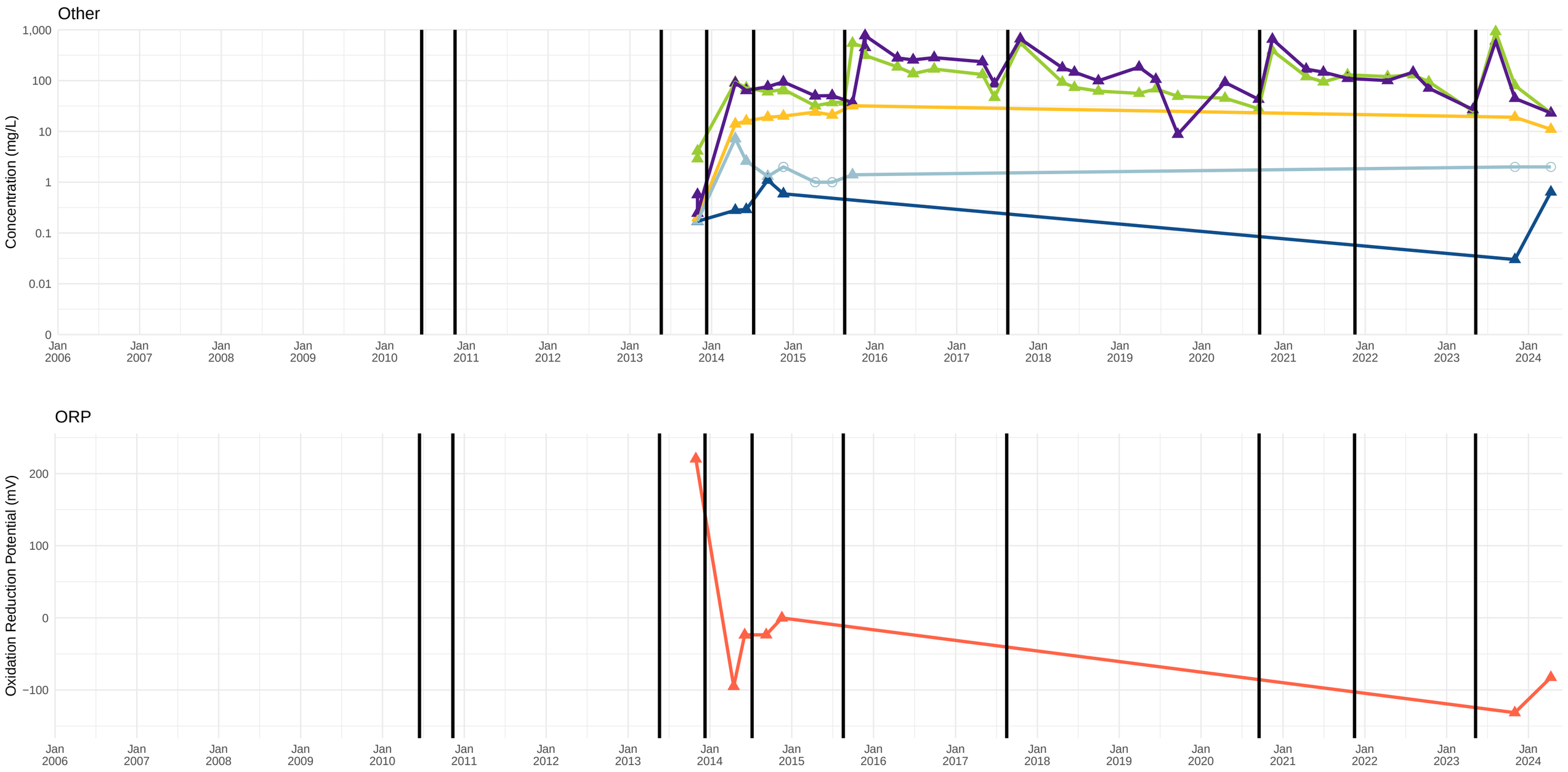

B−4

Notes:

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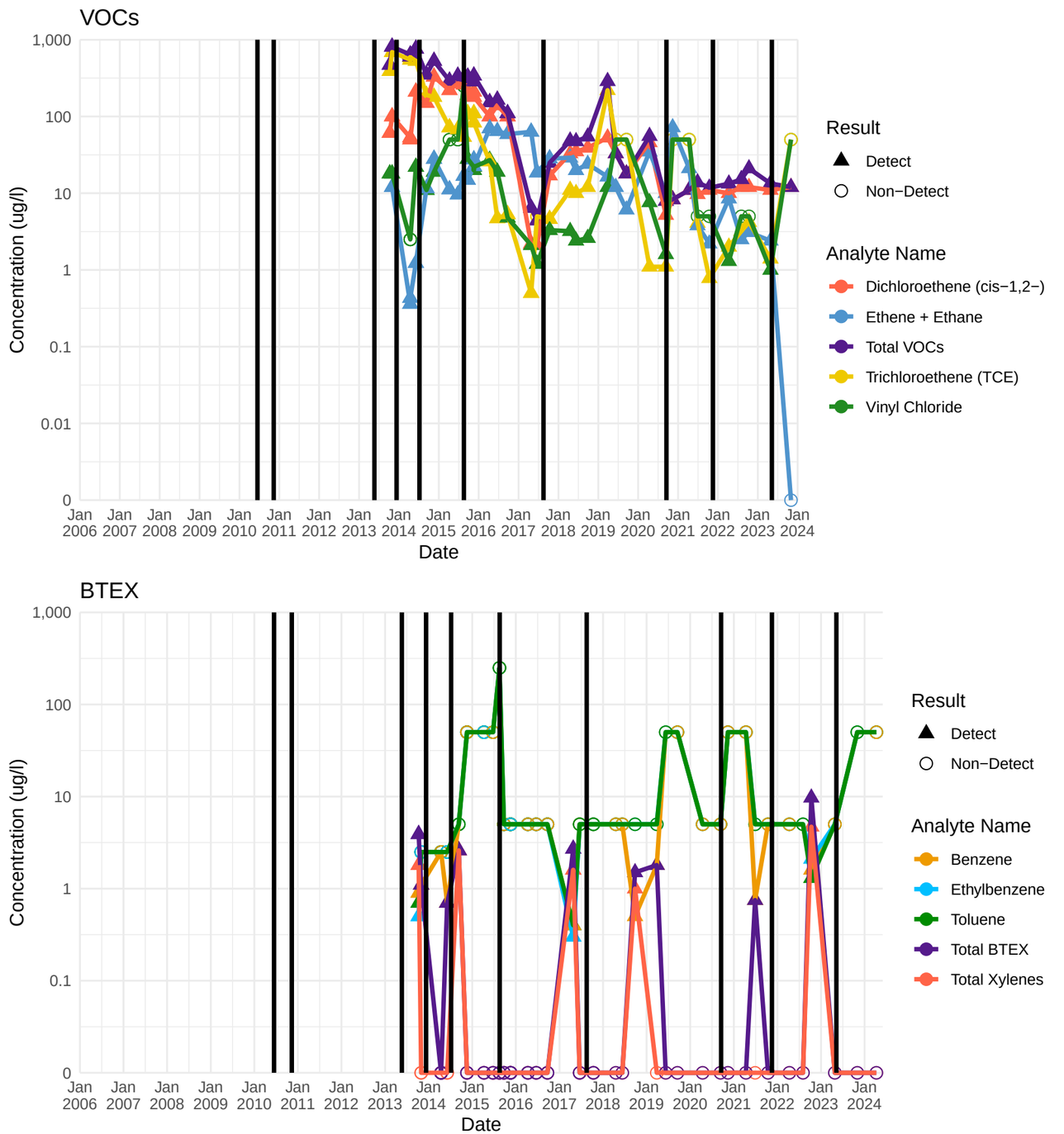

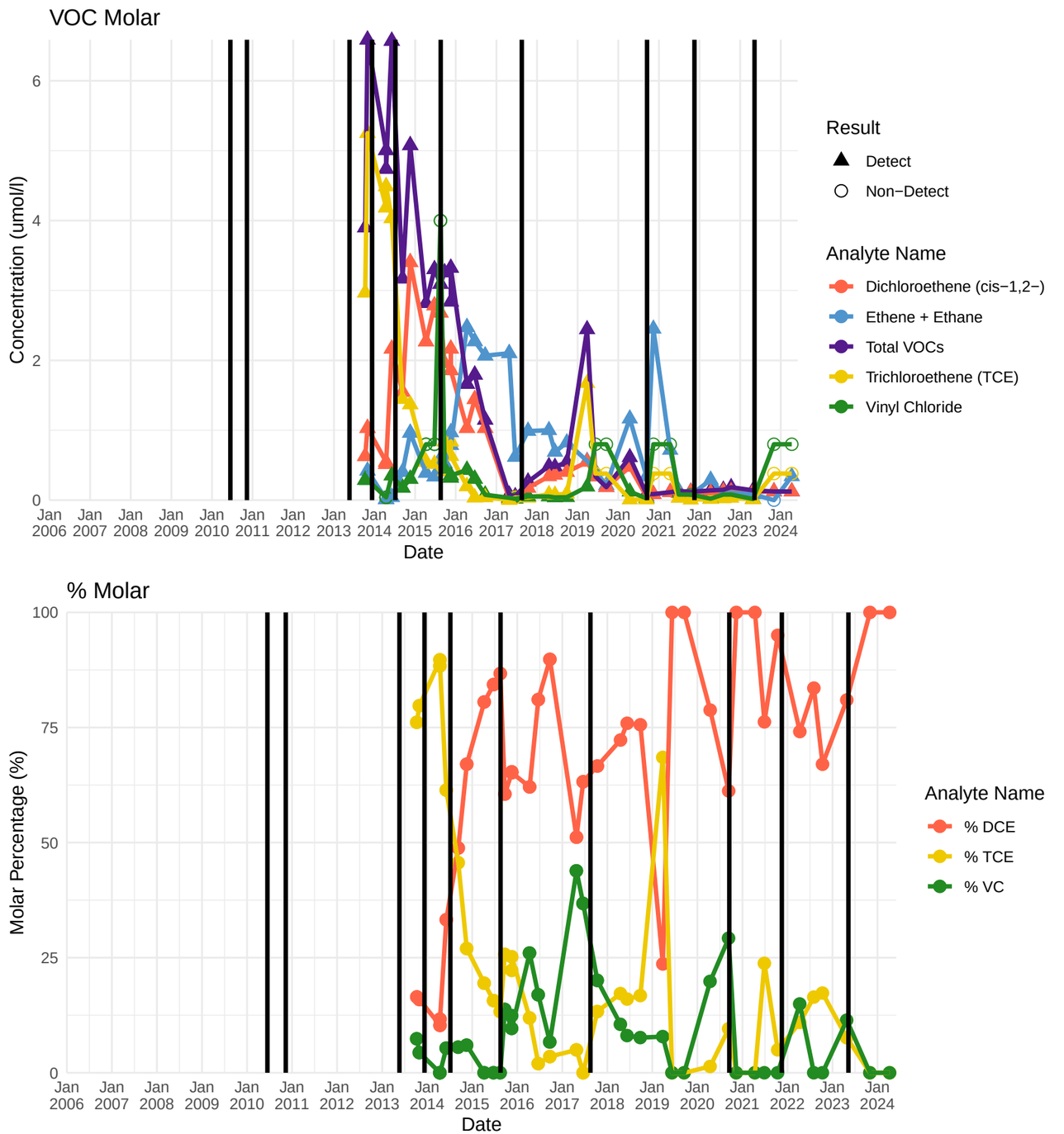

Sanborn, Head & Associates, Inc.

B−4

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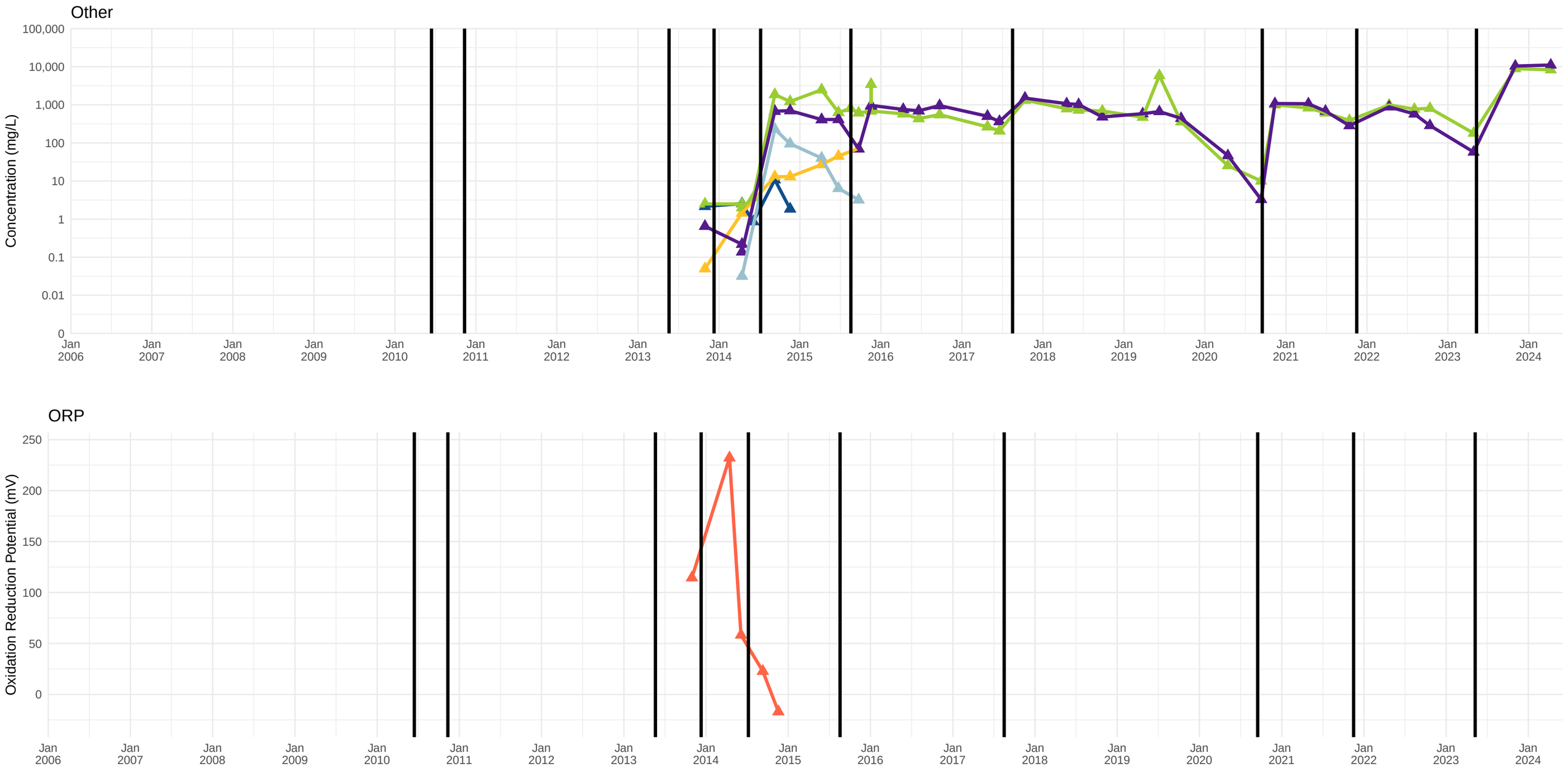

B−7

Notes:

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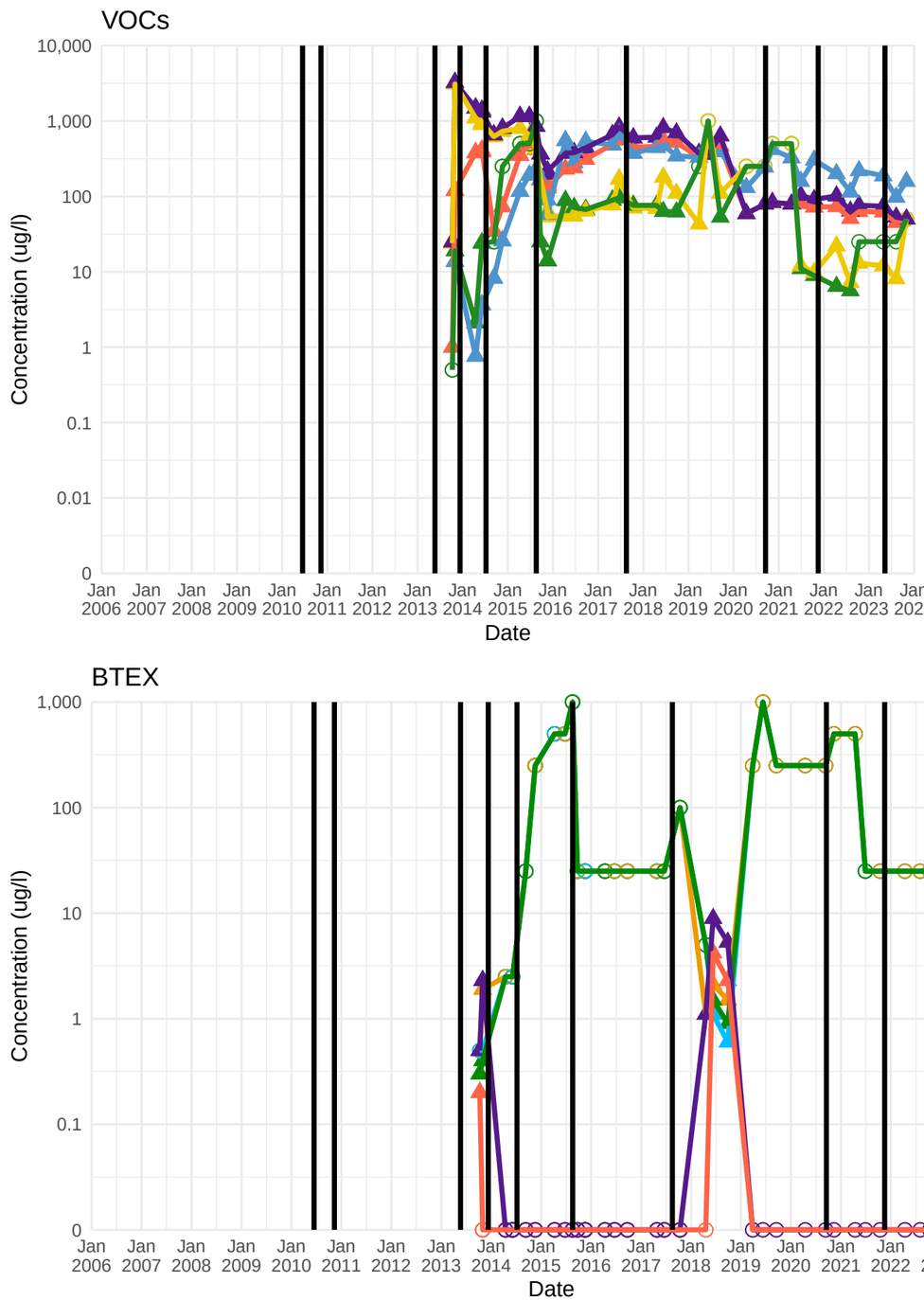

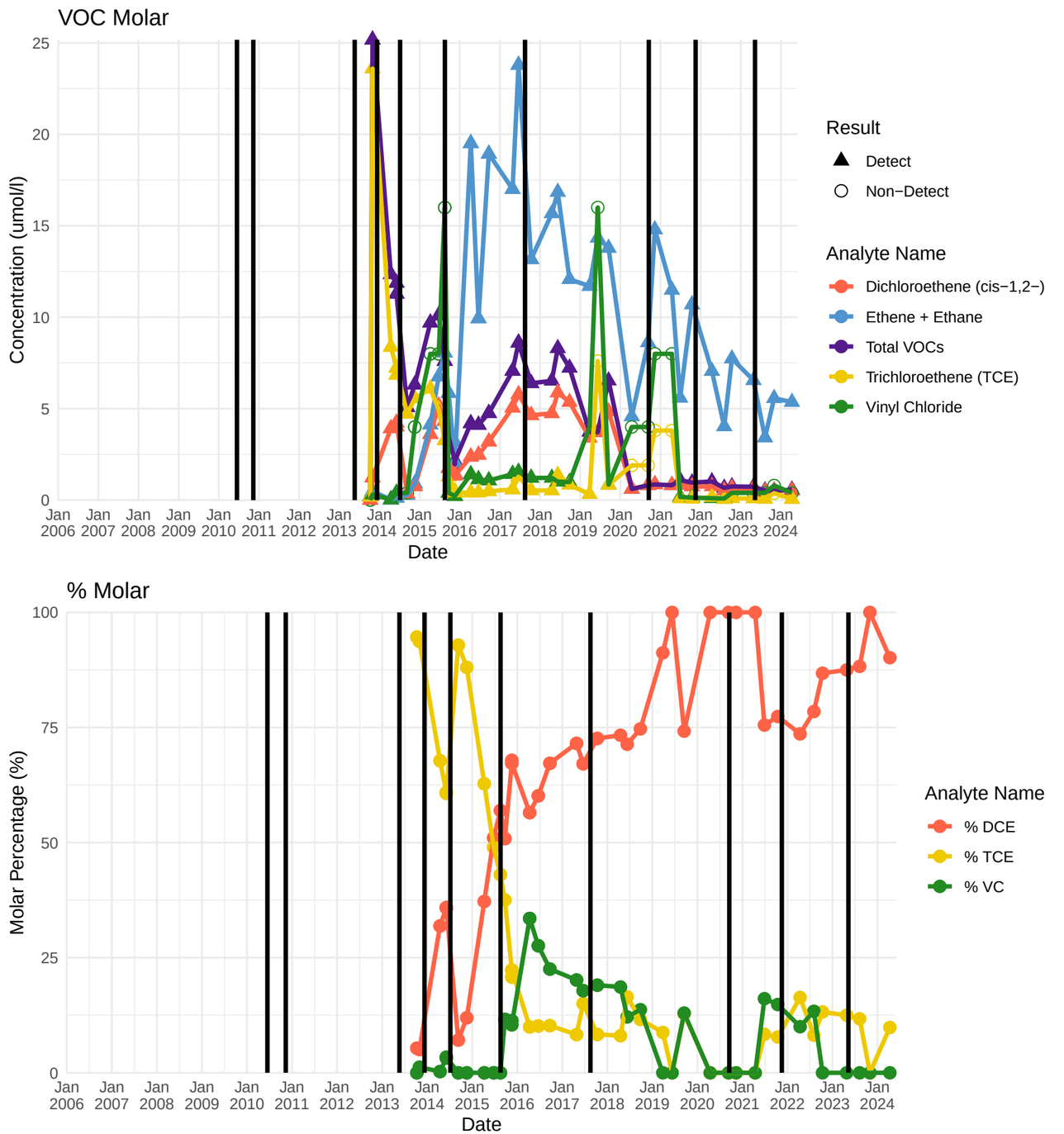

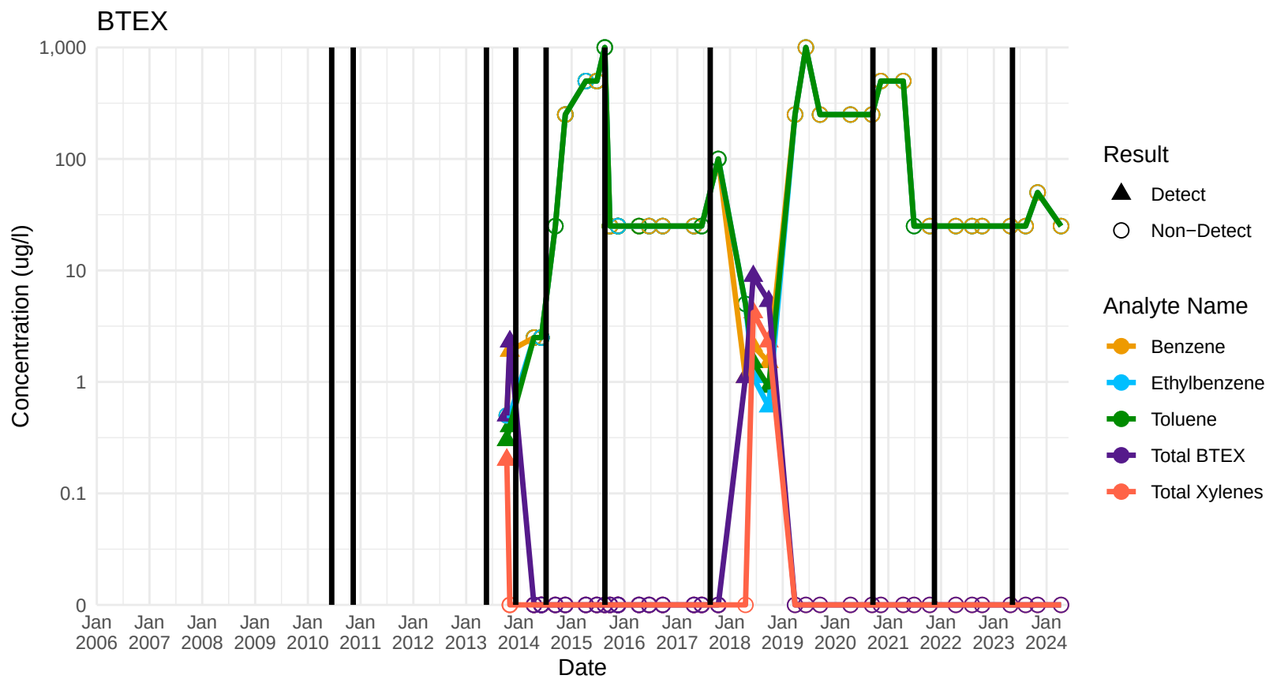

B−7

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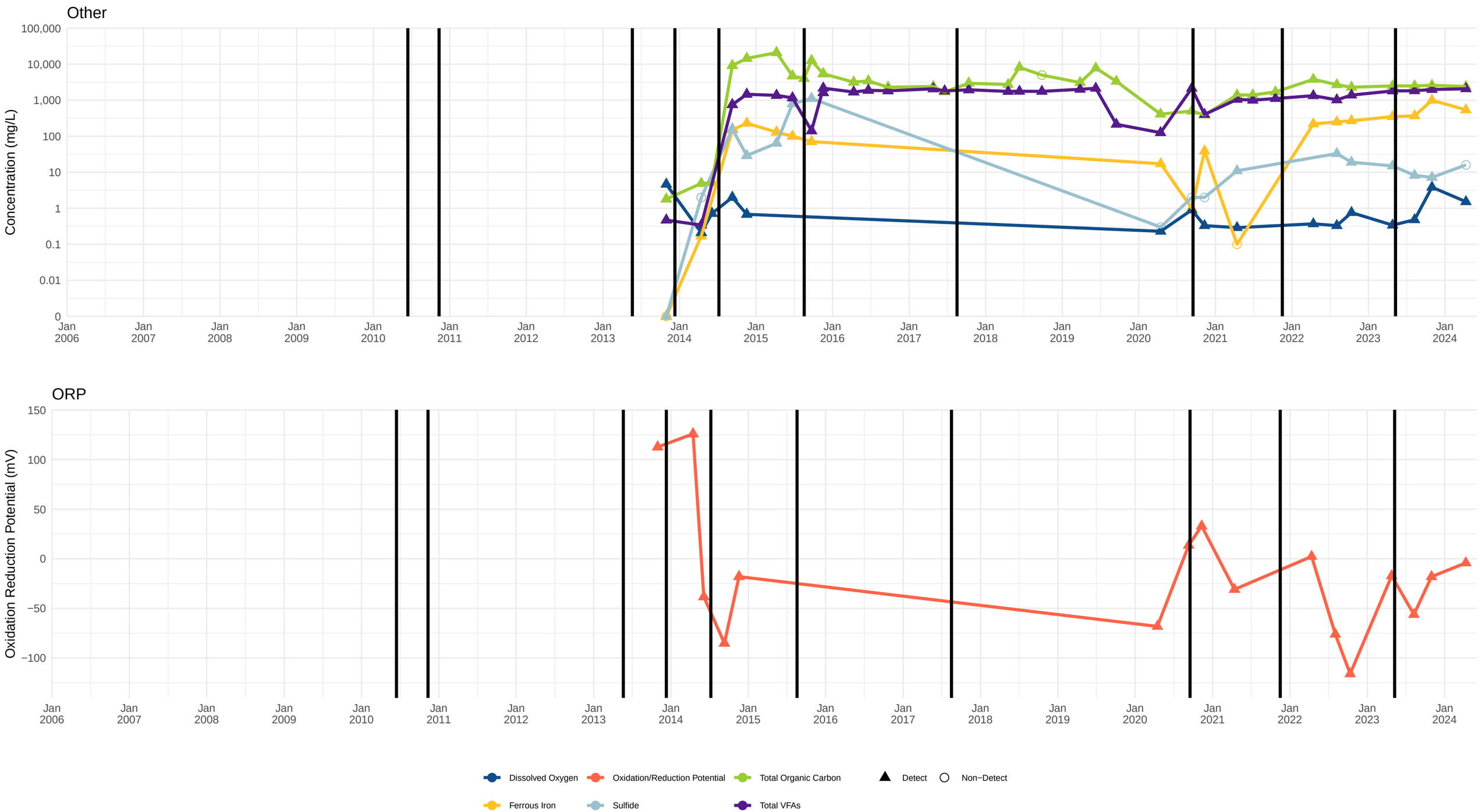

B−9

Notes:

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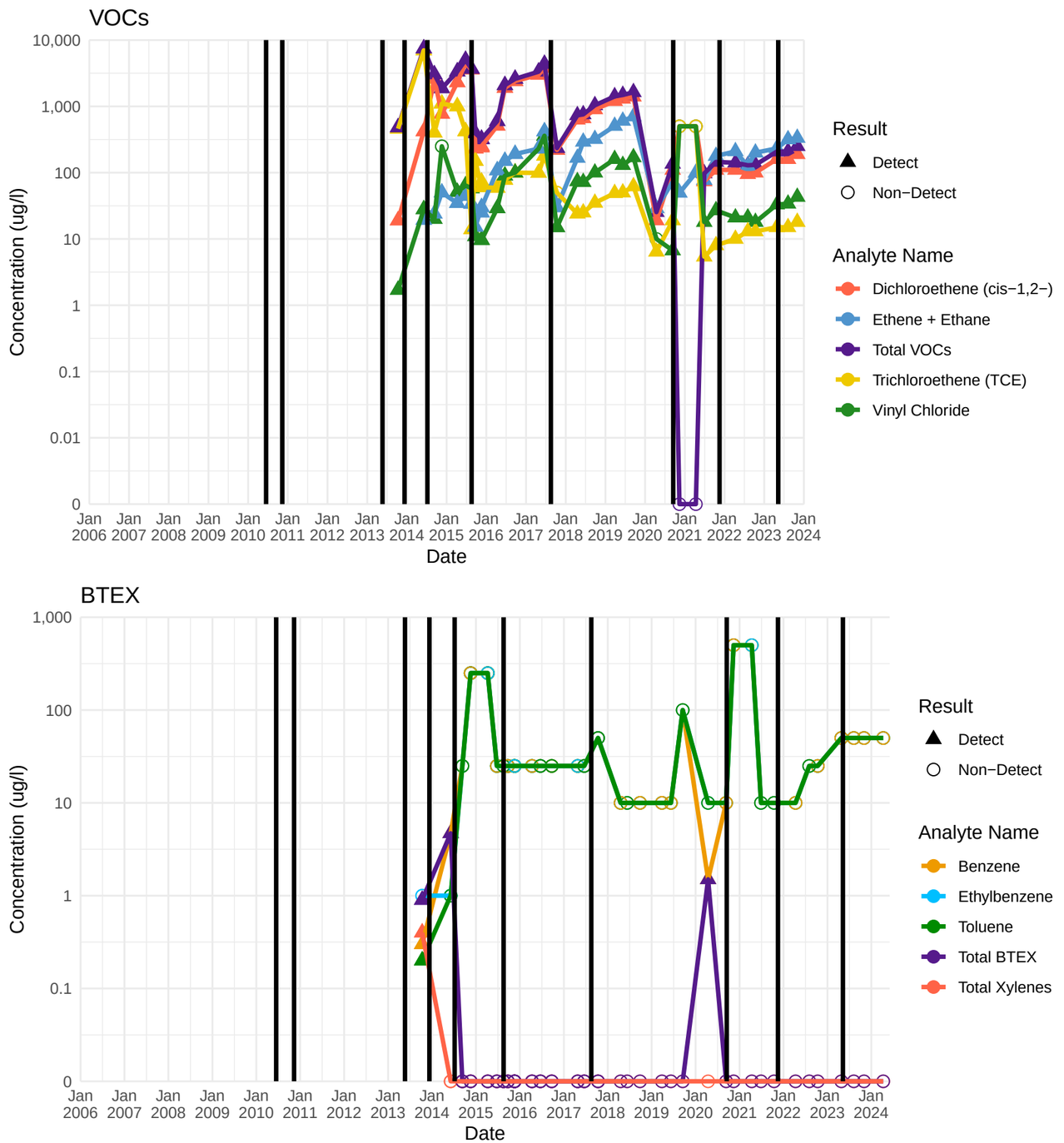

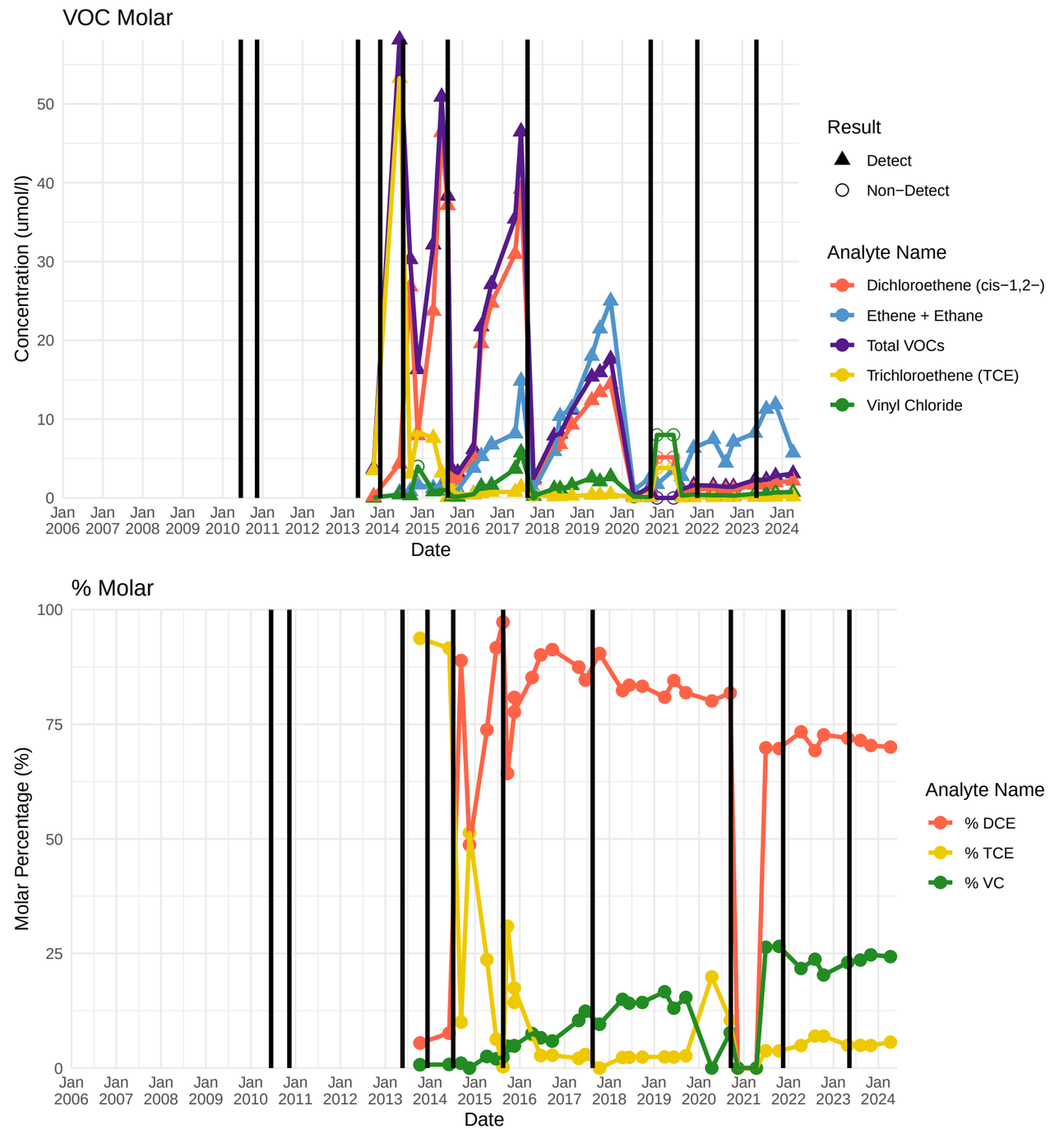

B−9

Notes:

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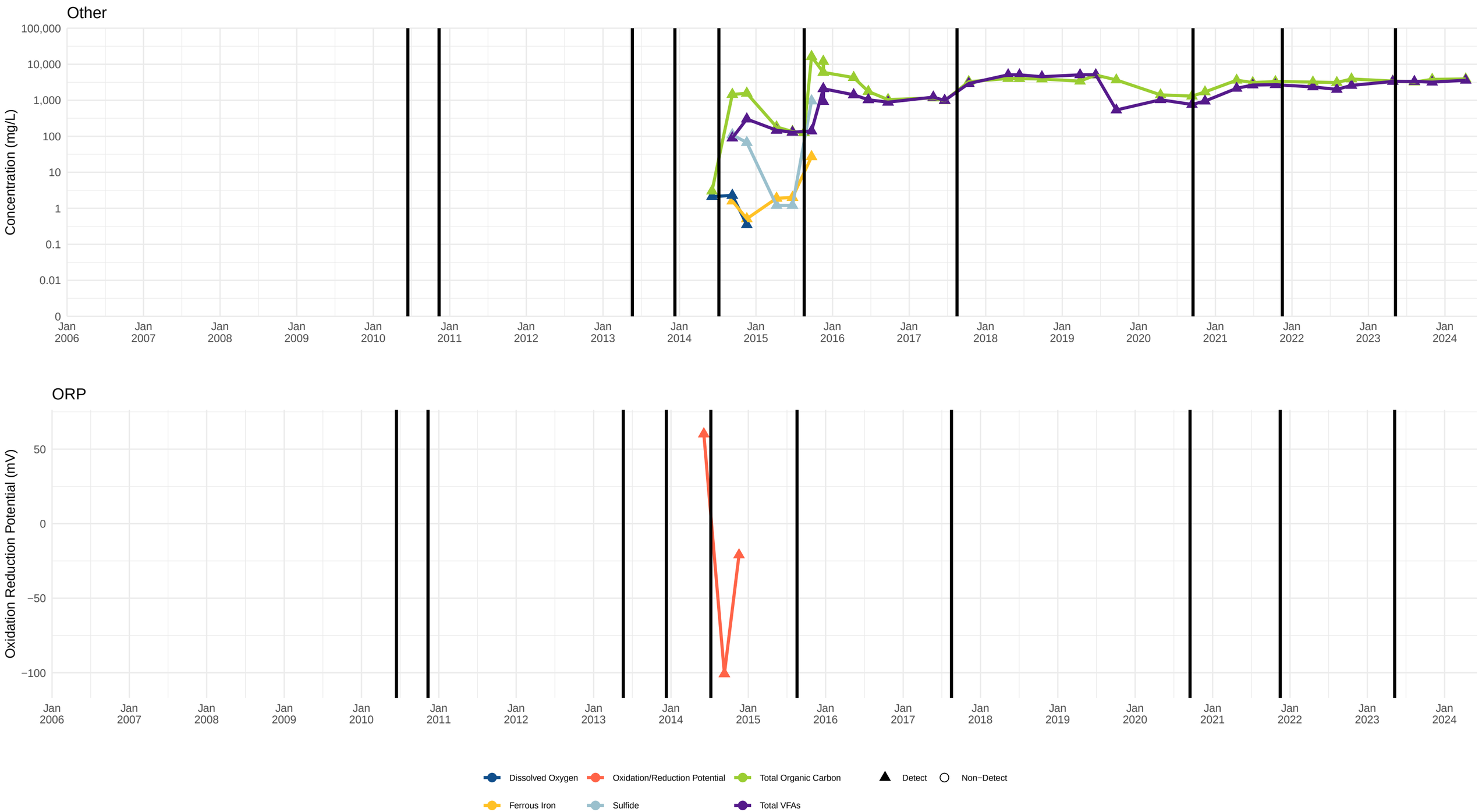

C−1

Notes:

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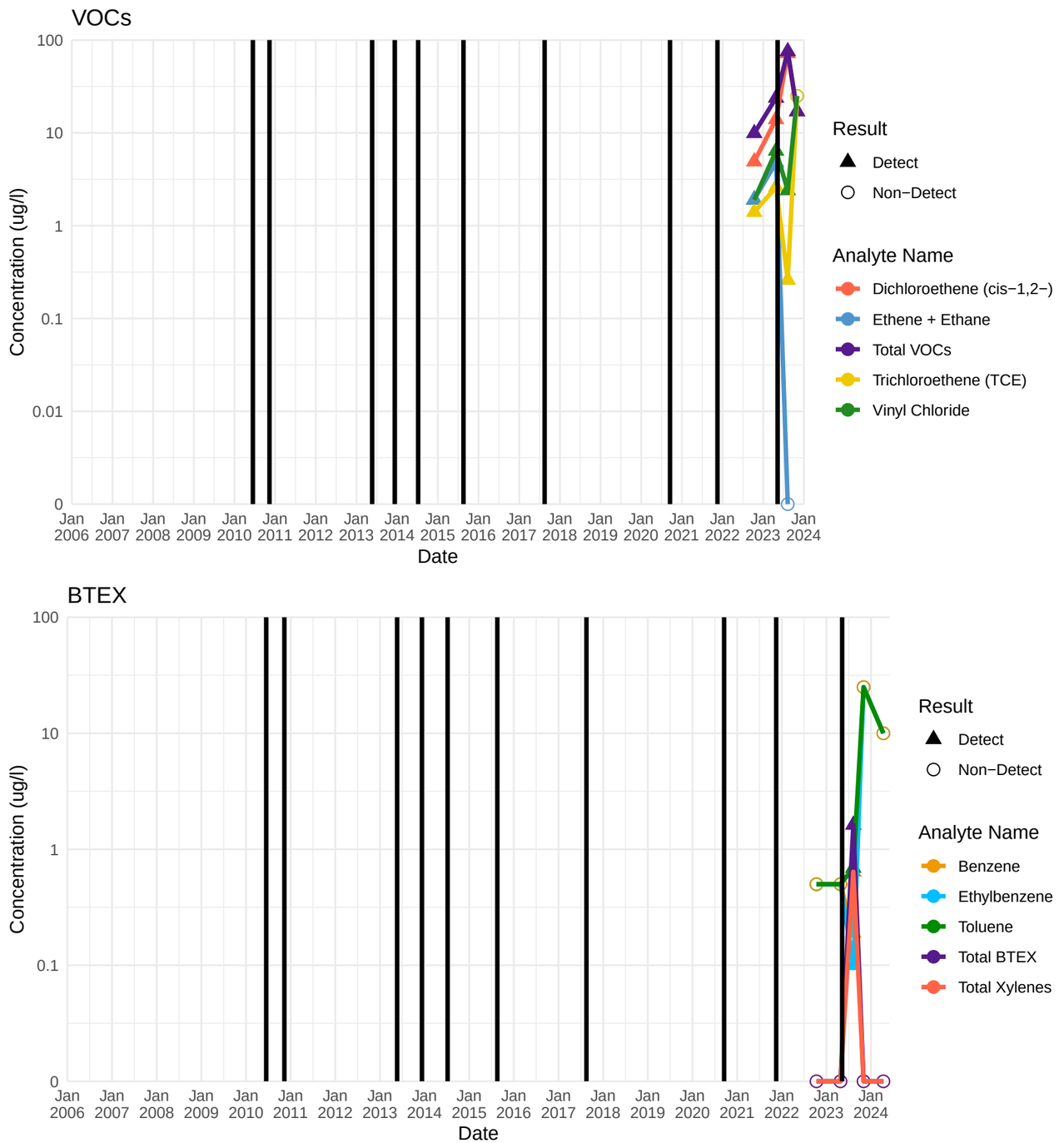

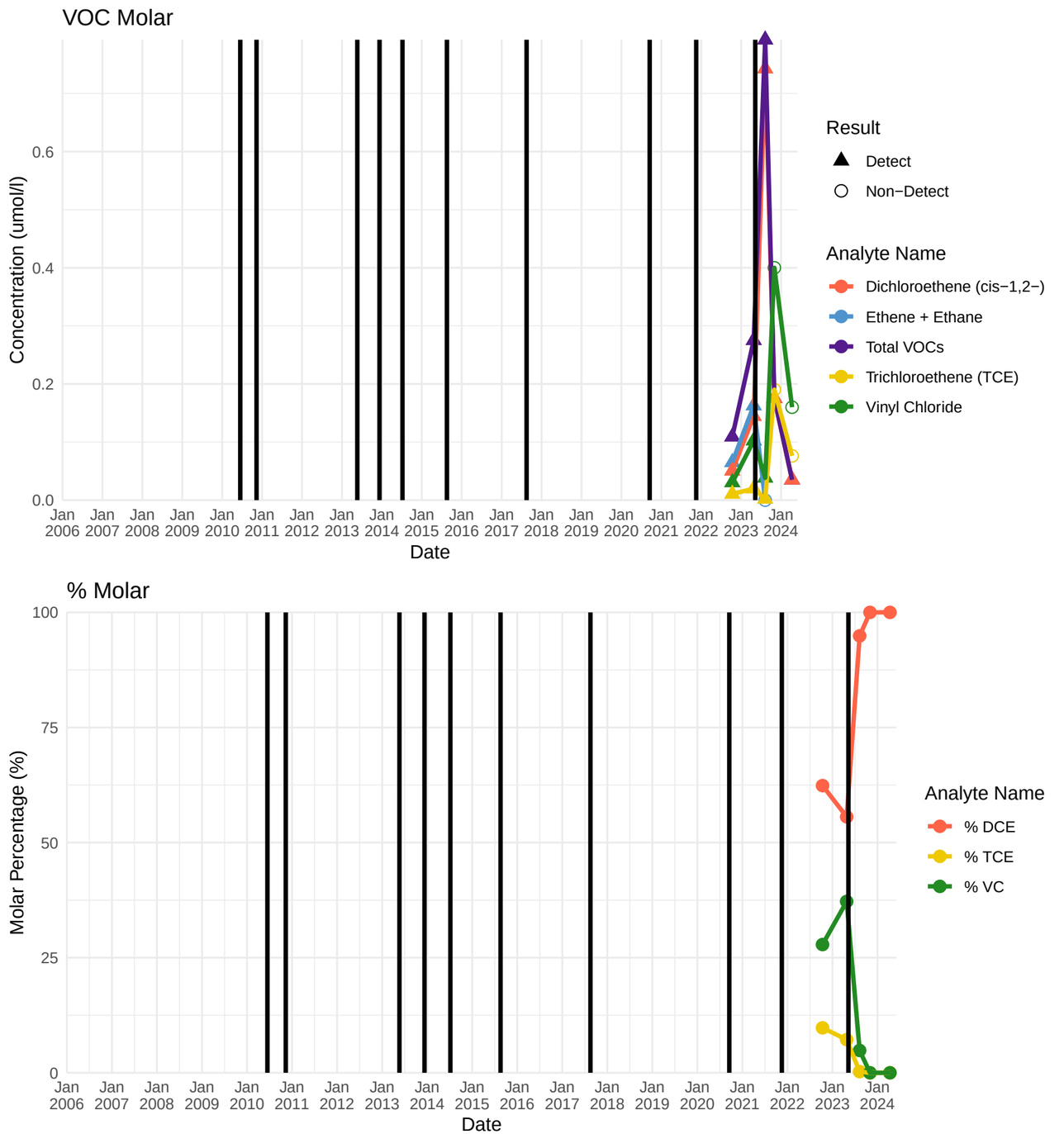

C−1

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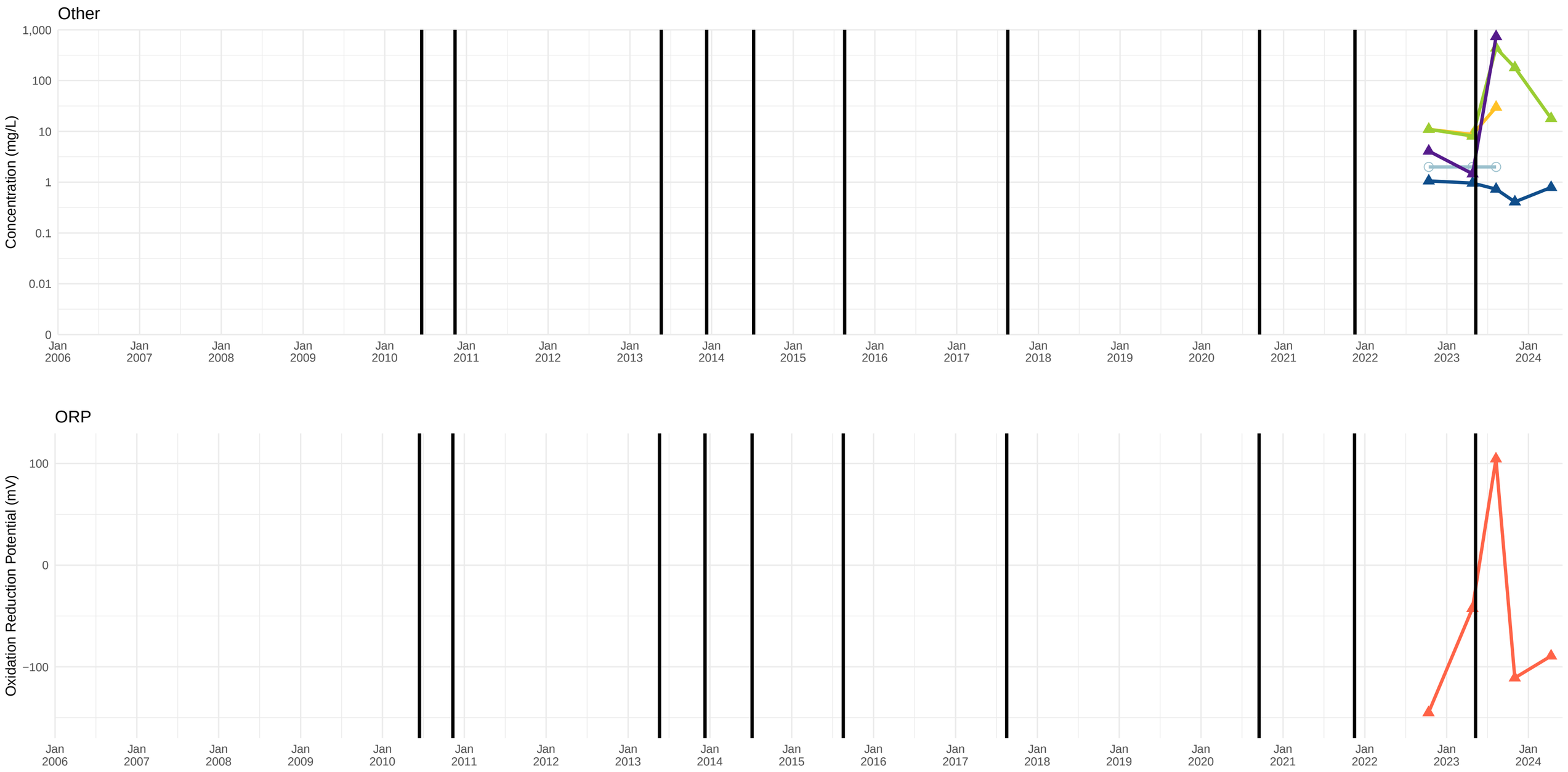

C−2

Notes:

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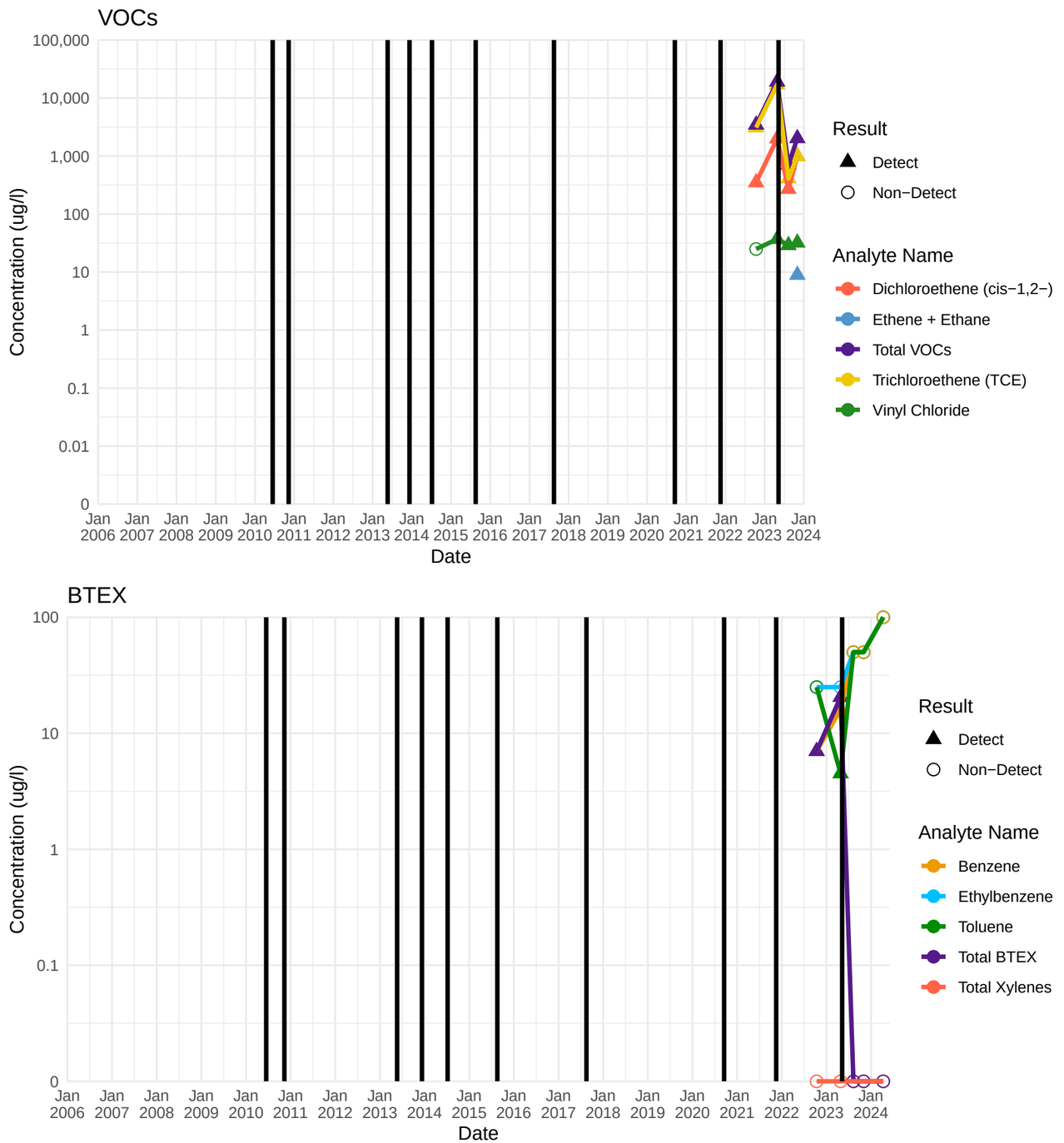

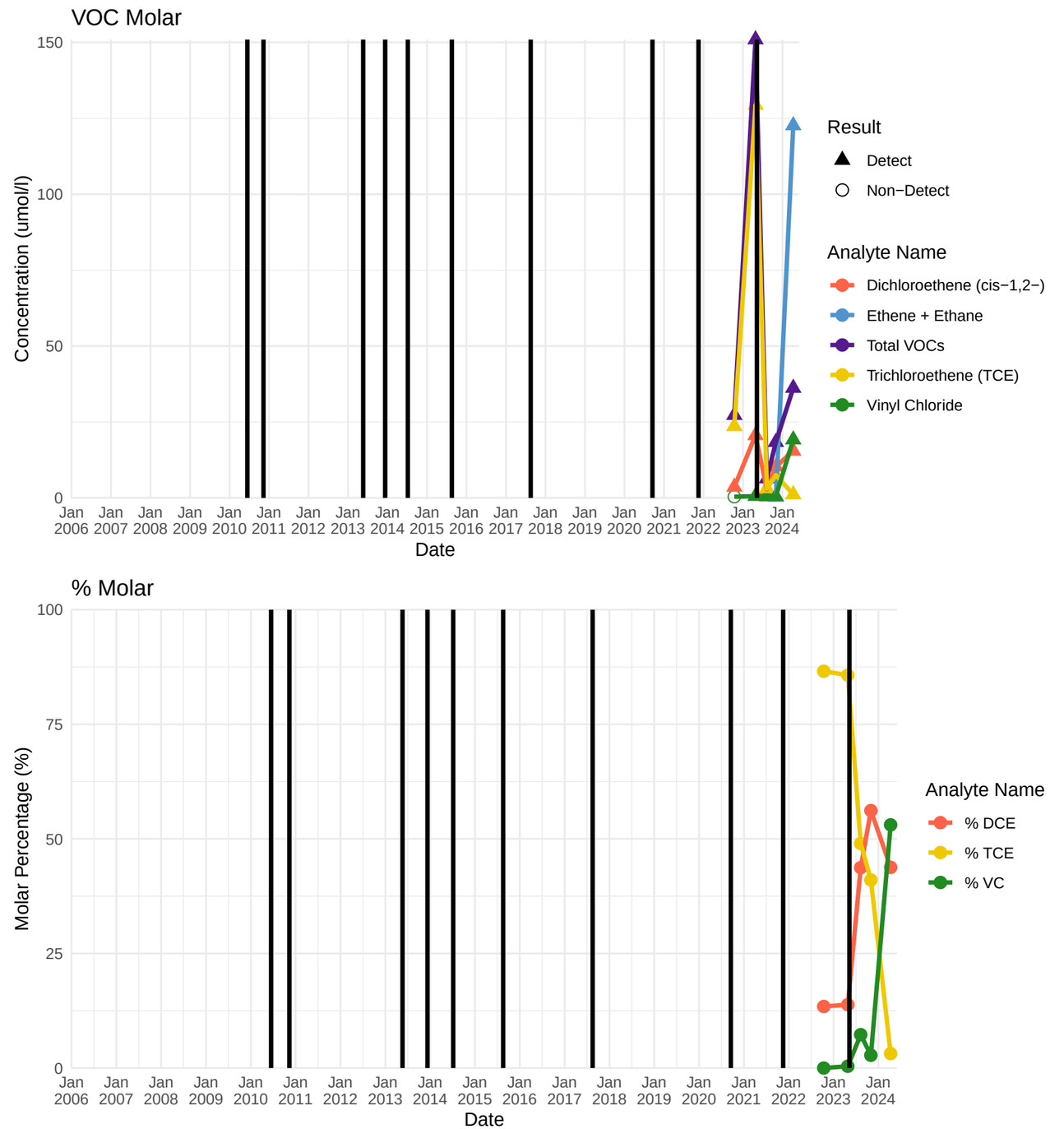

C−2

Notes:

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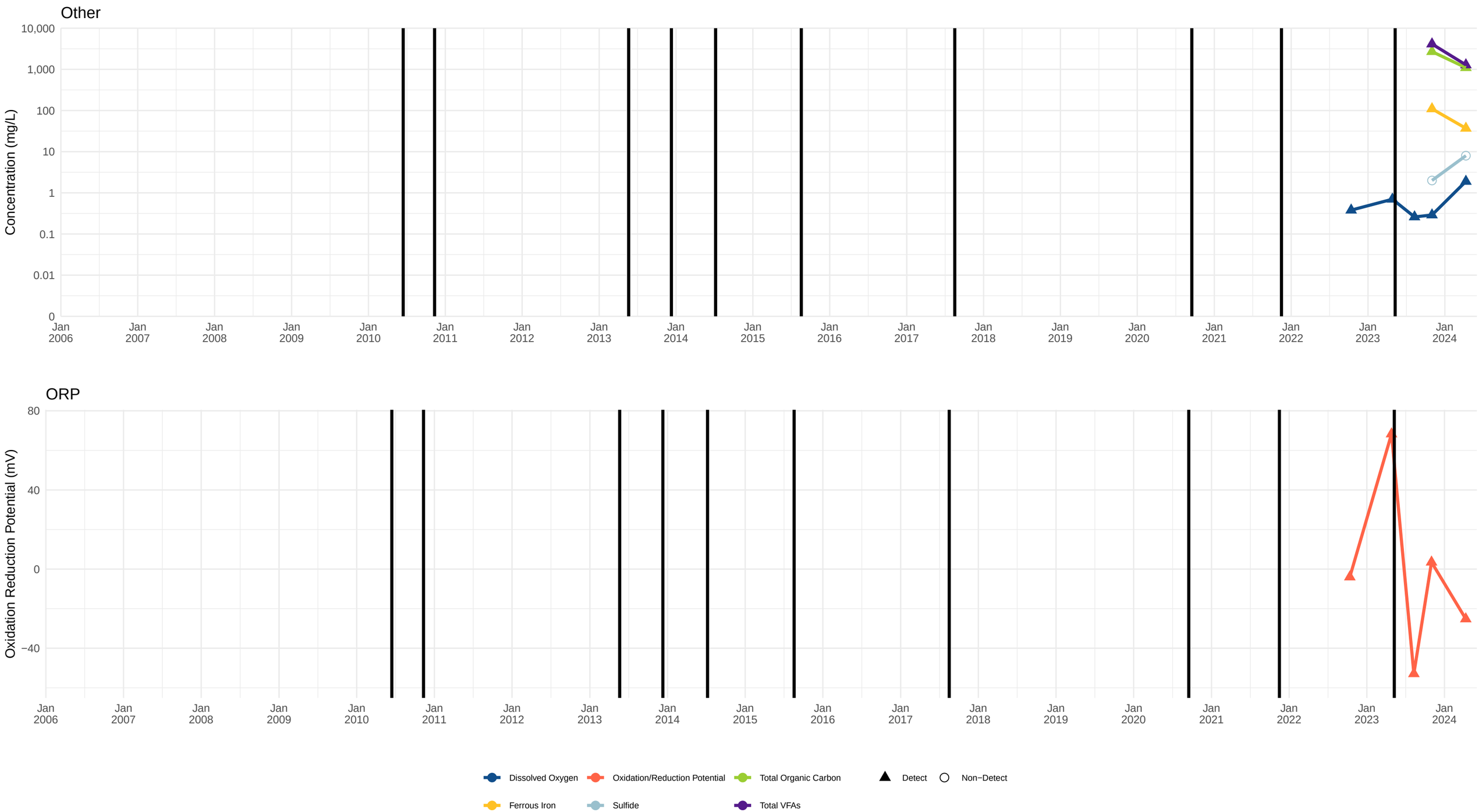

C−3

Notes:

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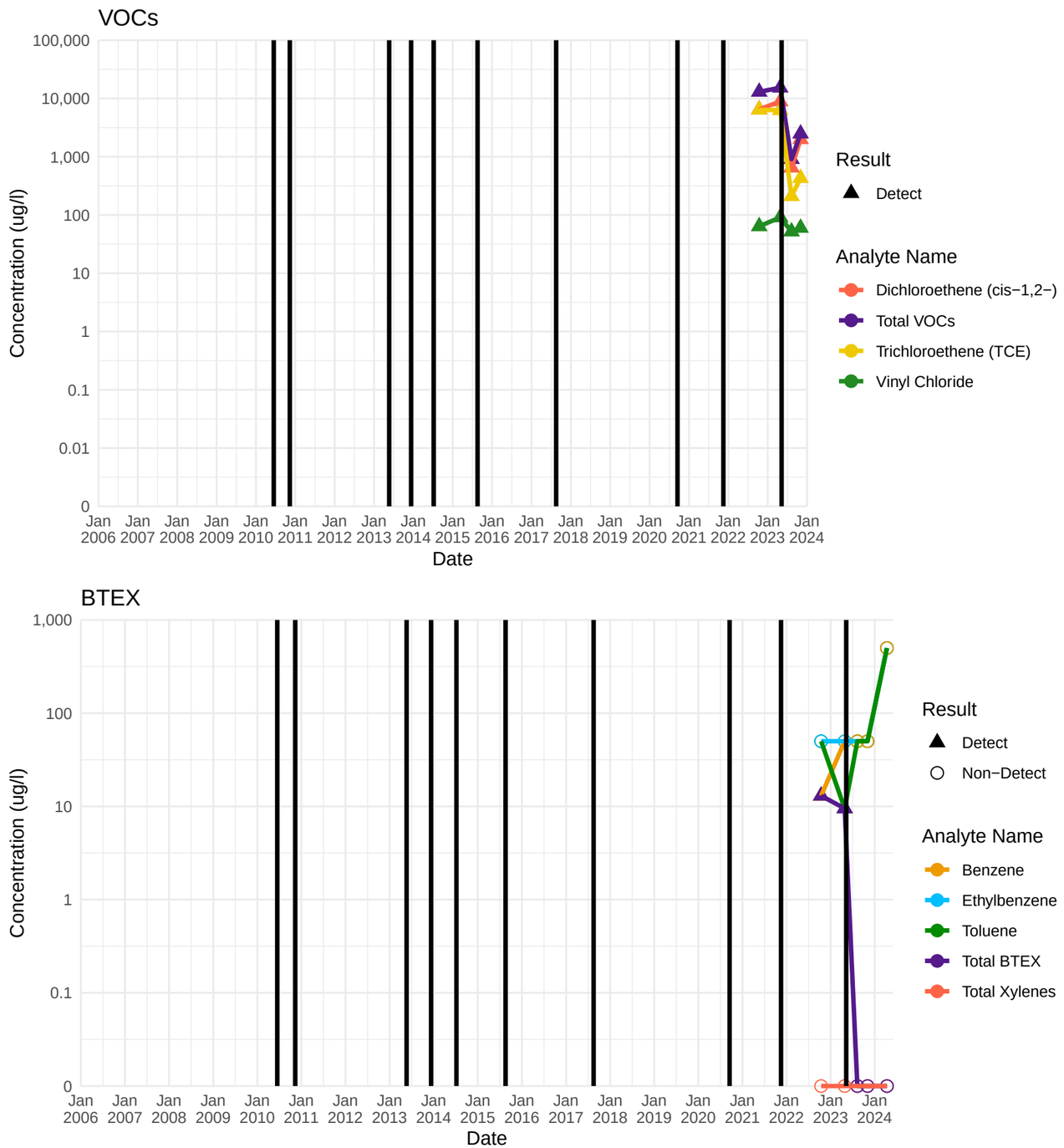

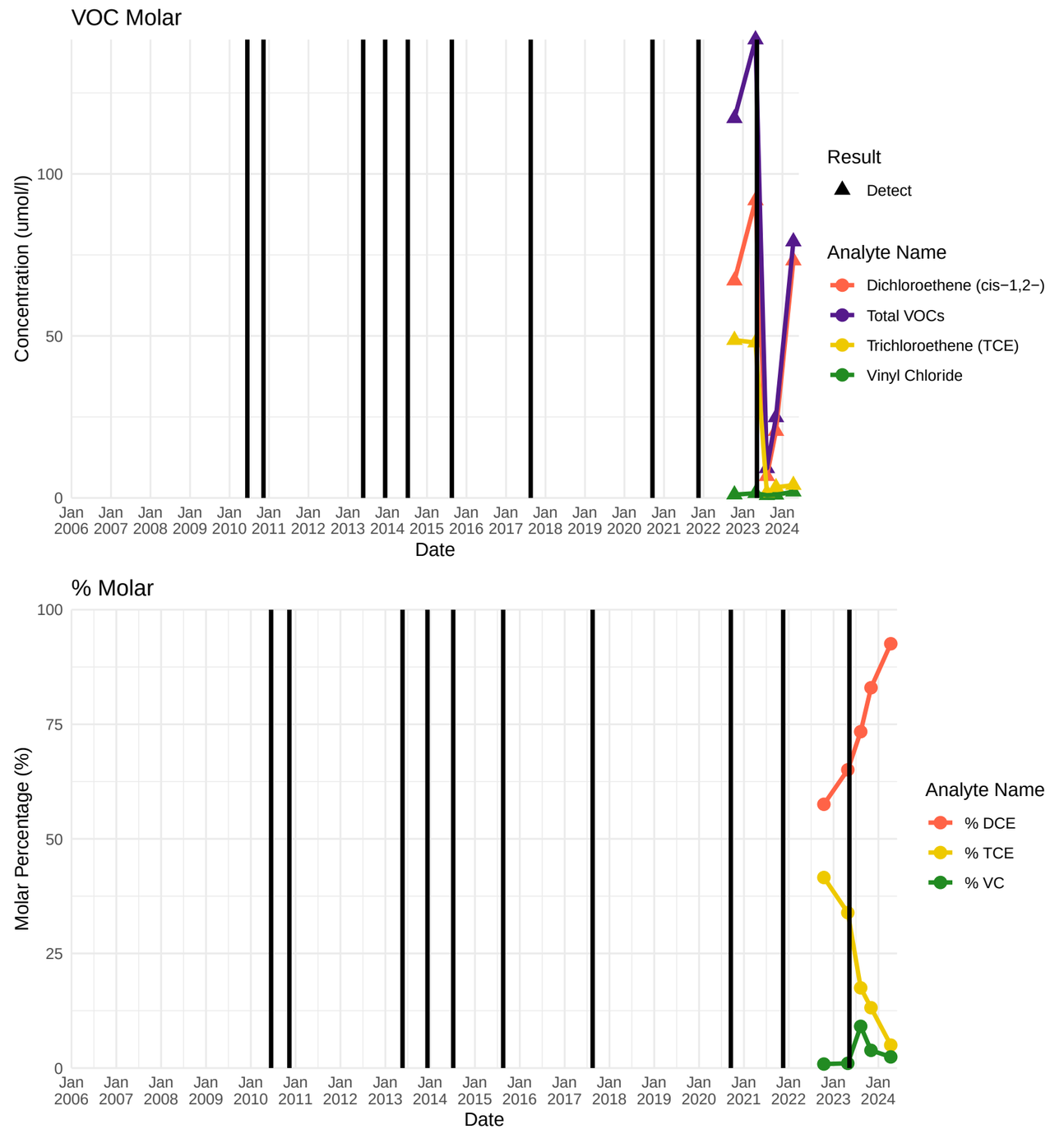

C−3

Notes:

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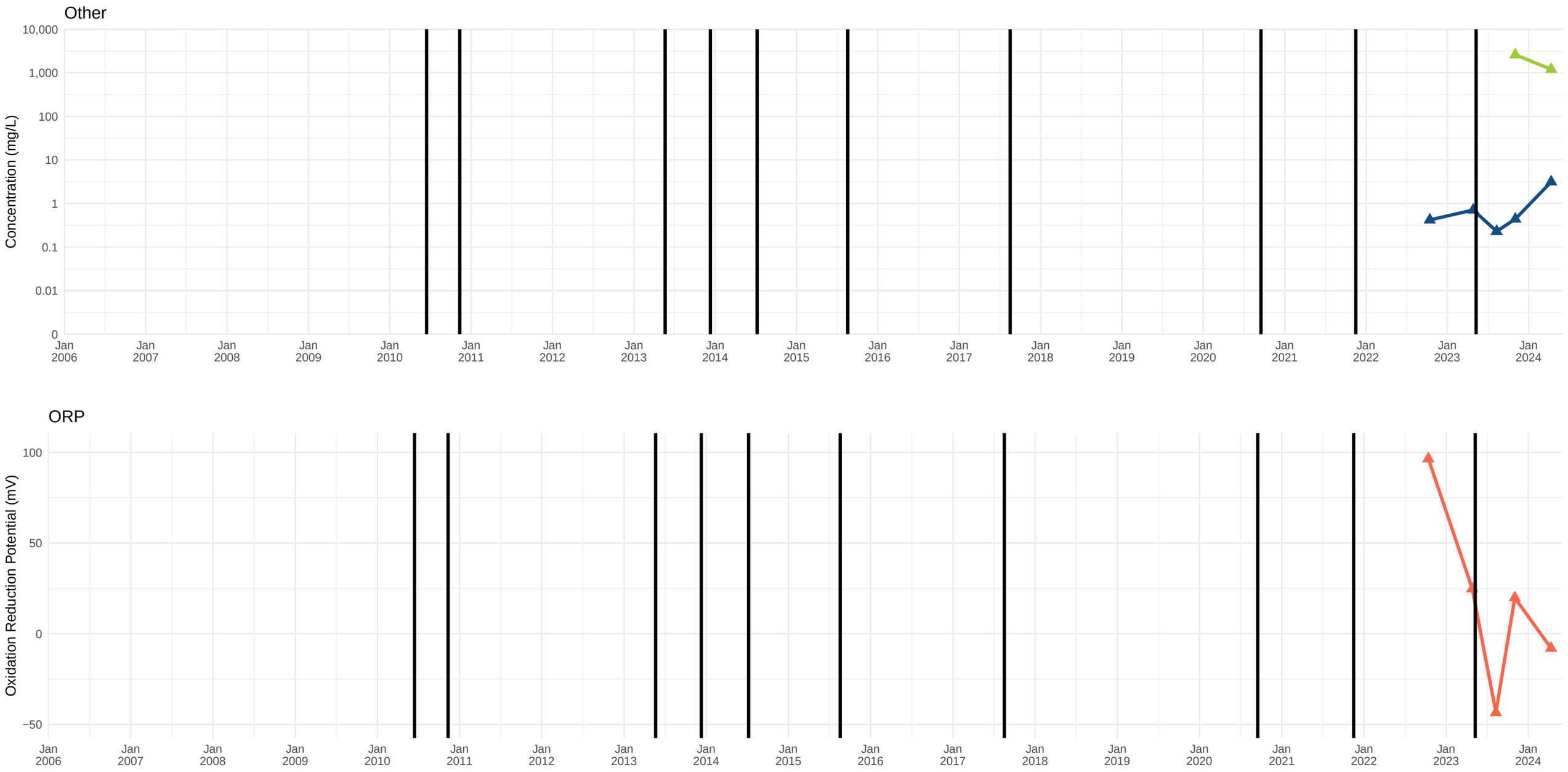

C−4

Notes:

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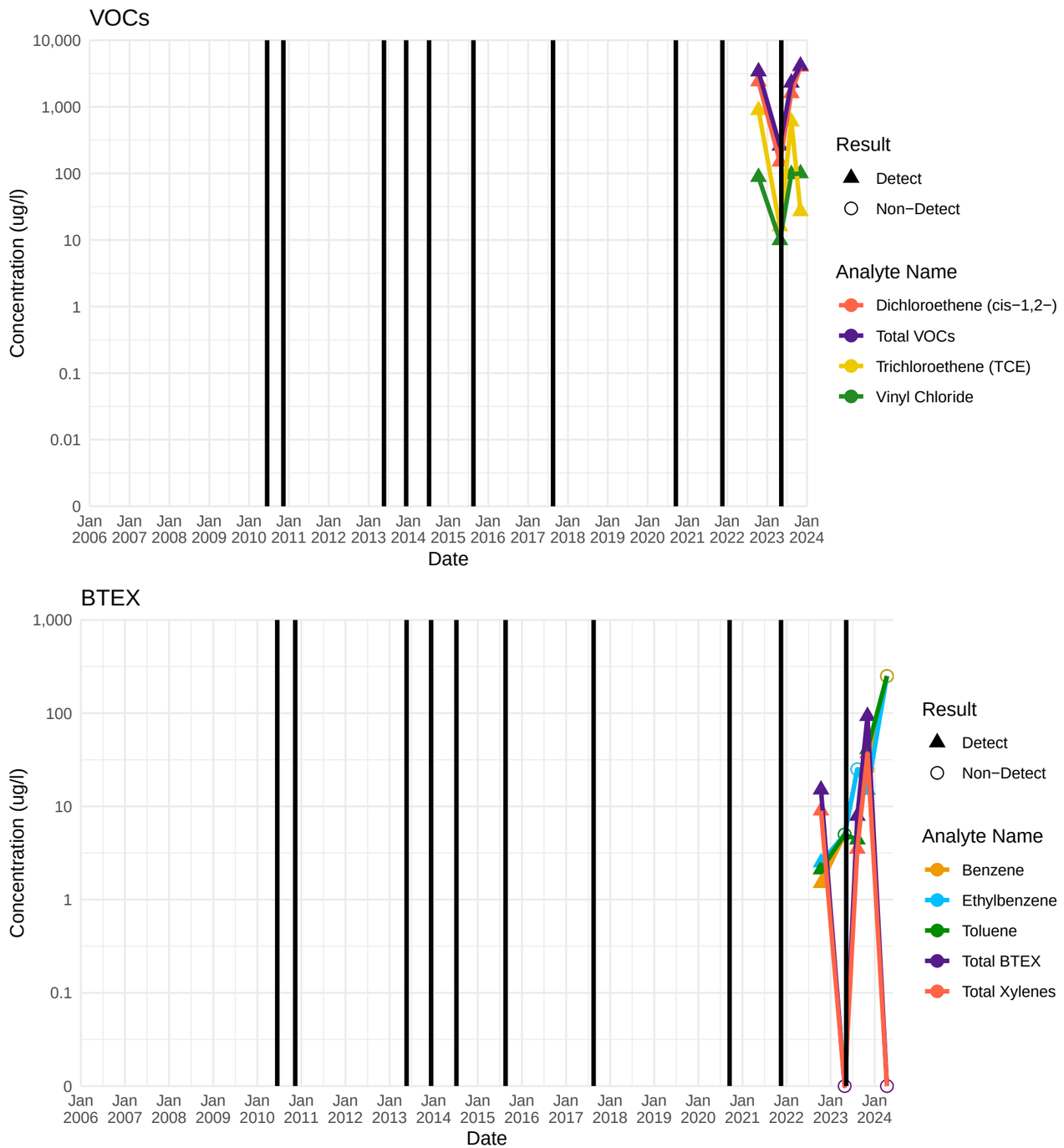

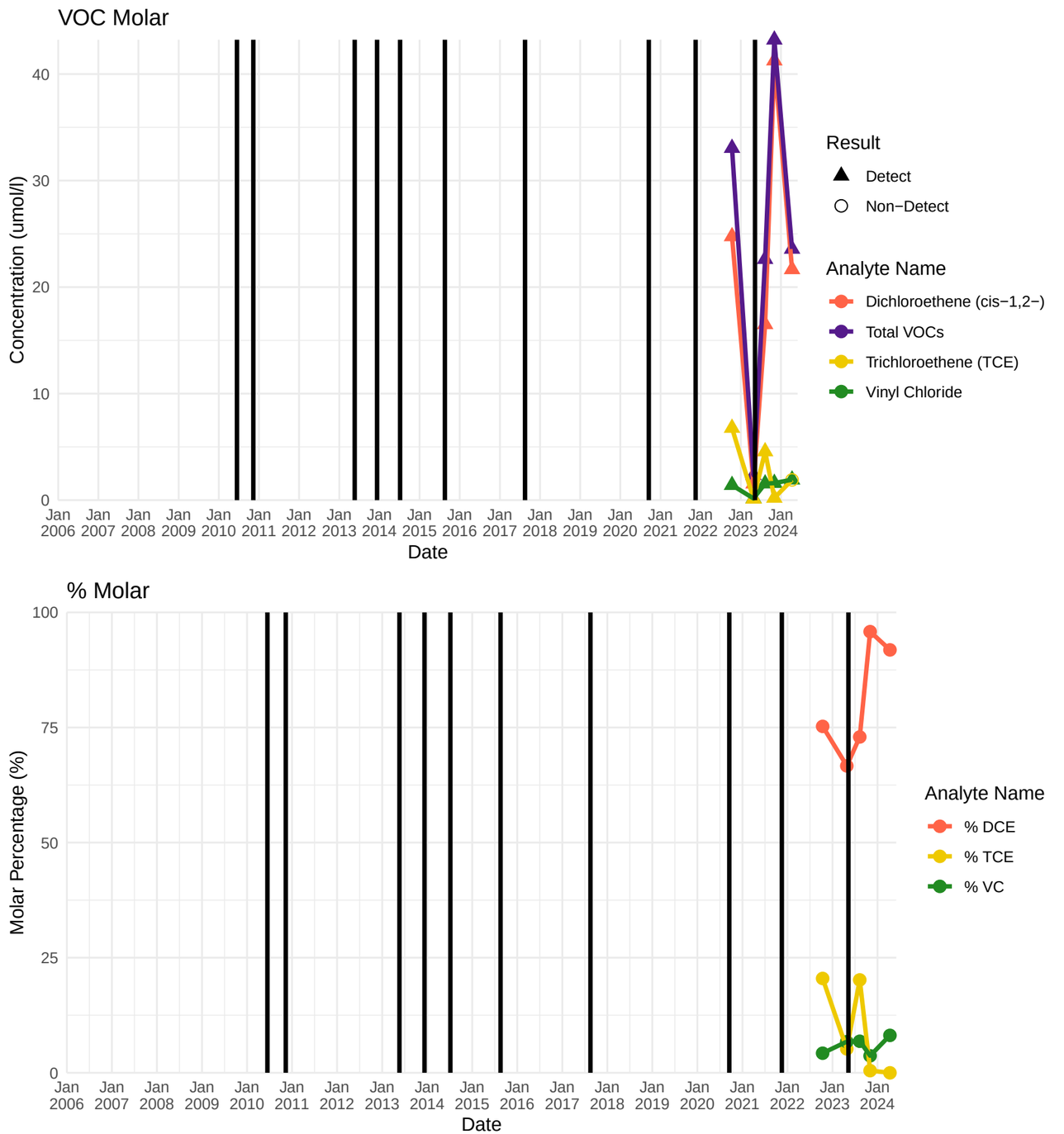

C−4

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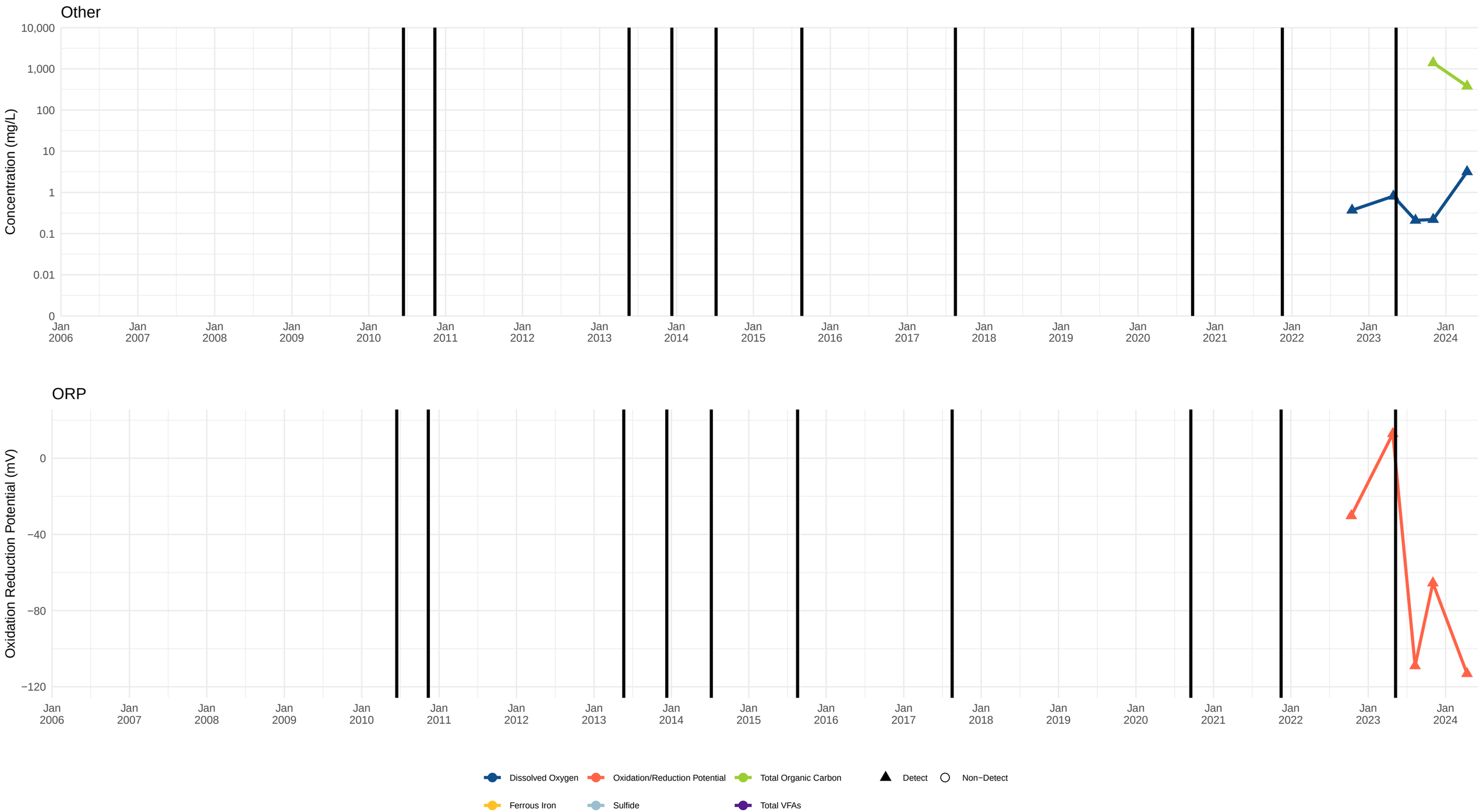

C−5

Notes:

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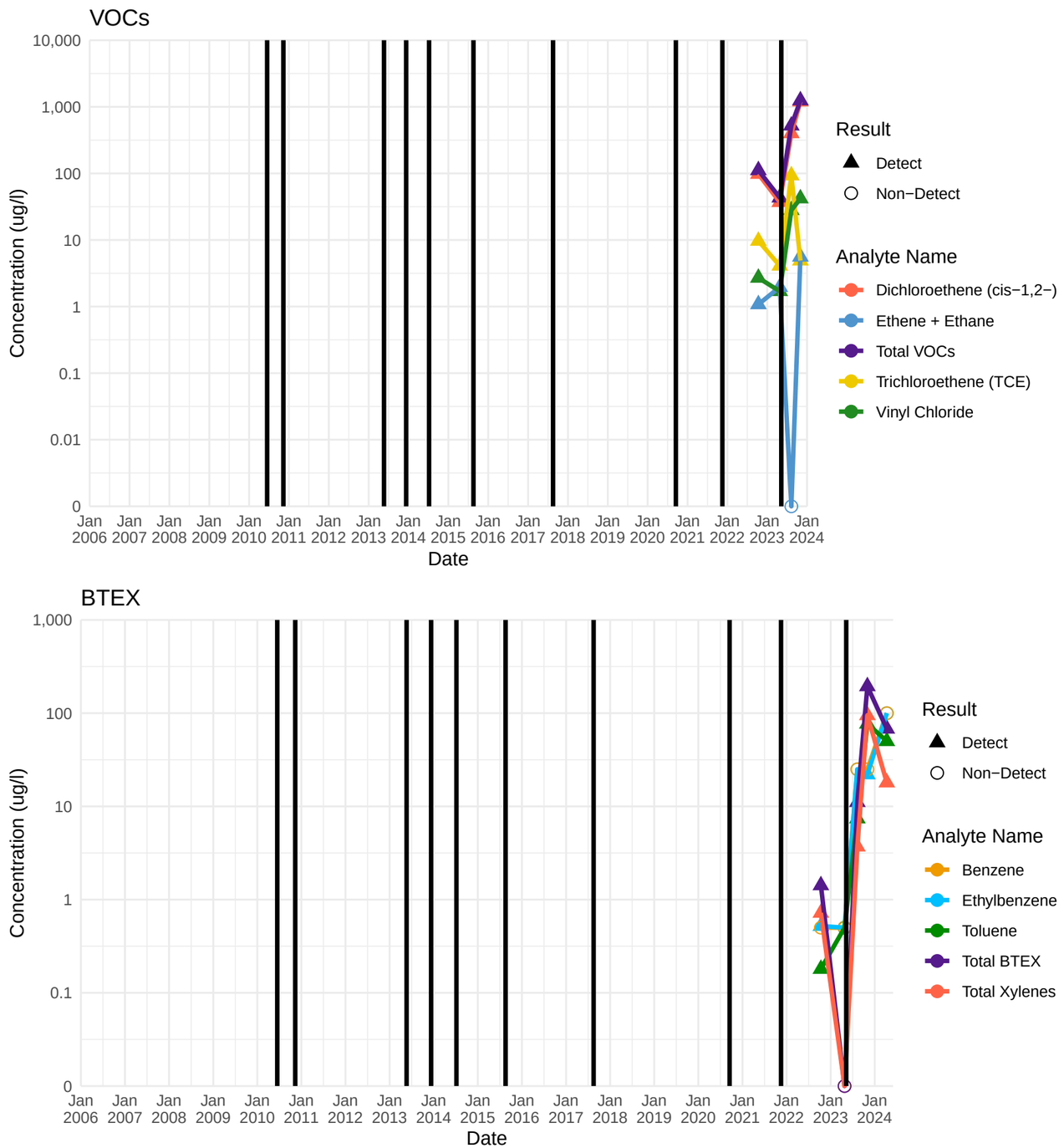

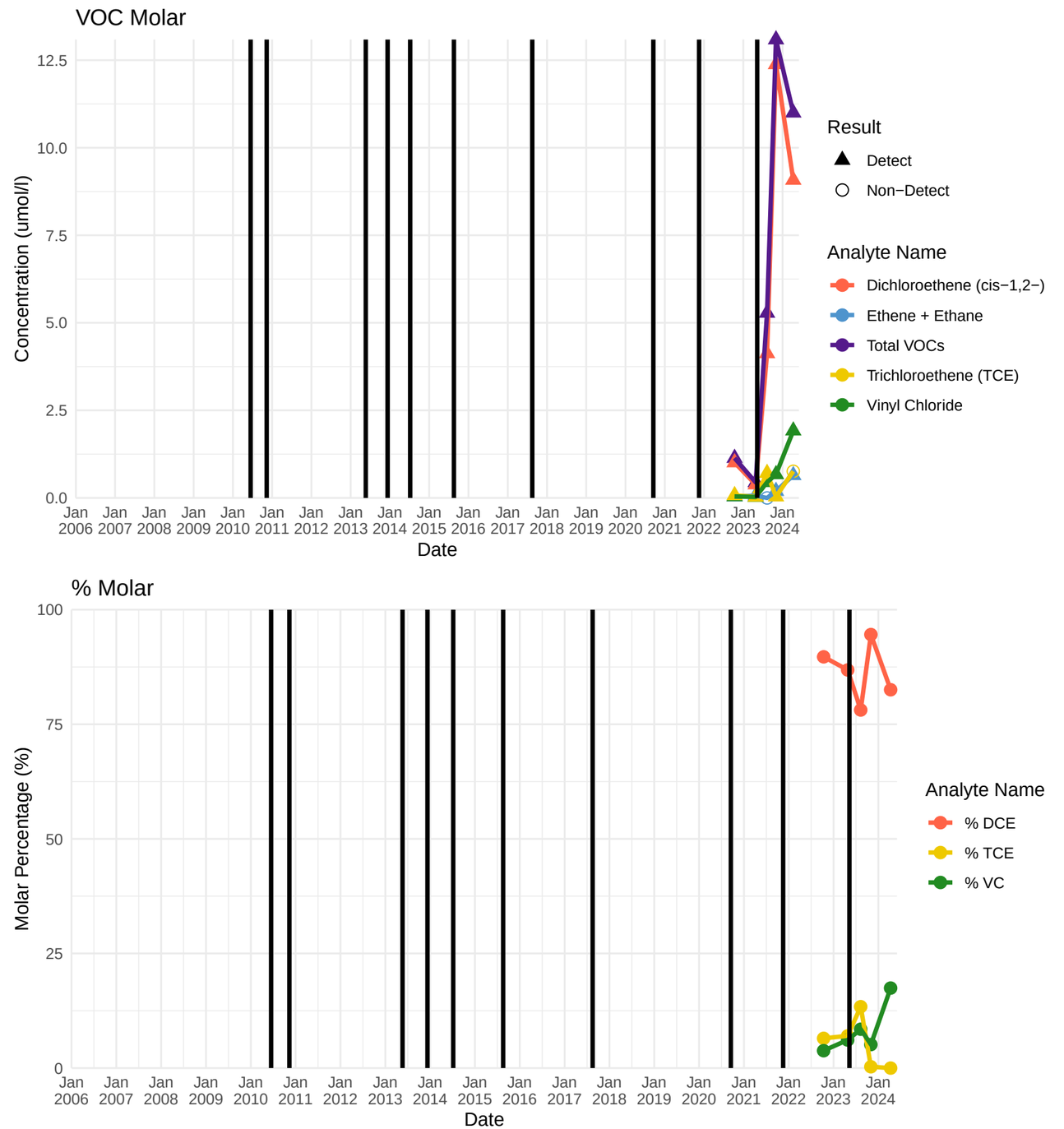

C−5

Notes:

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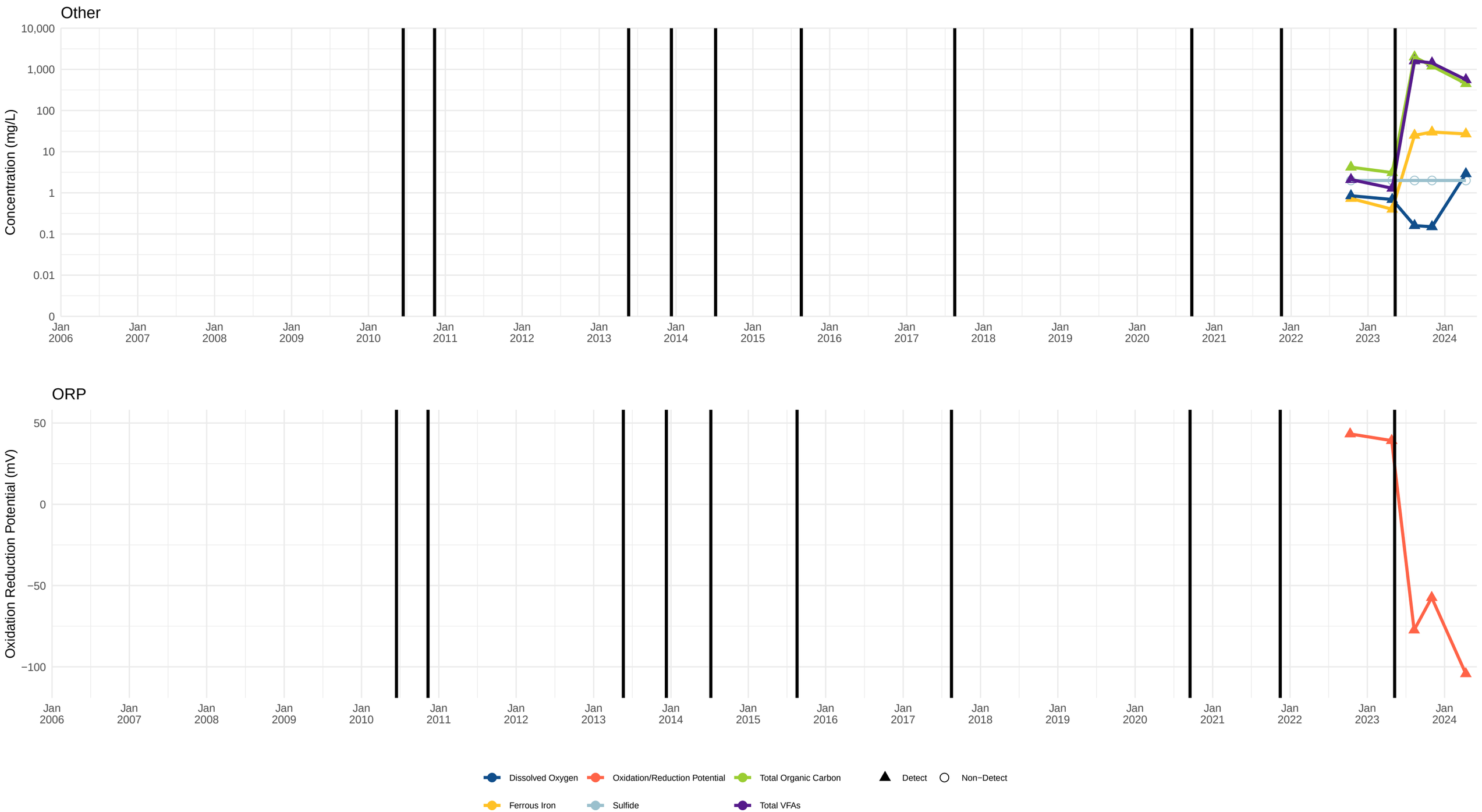

C−6

Notes:

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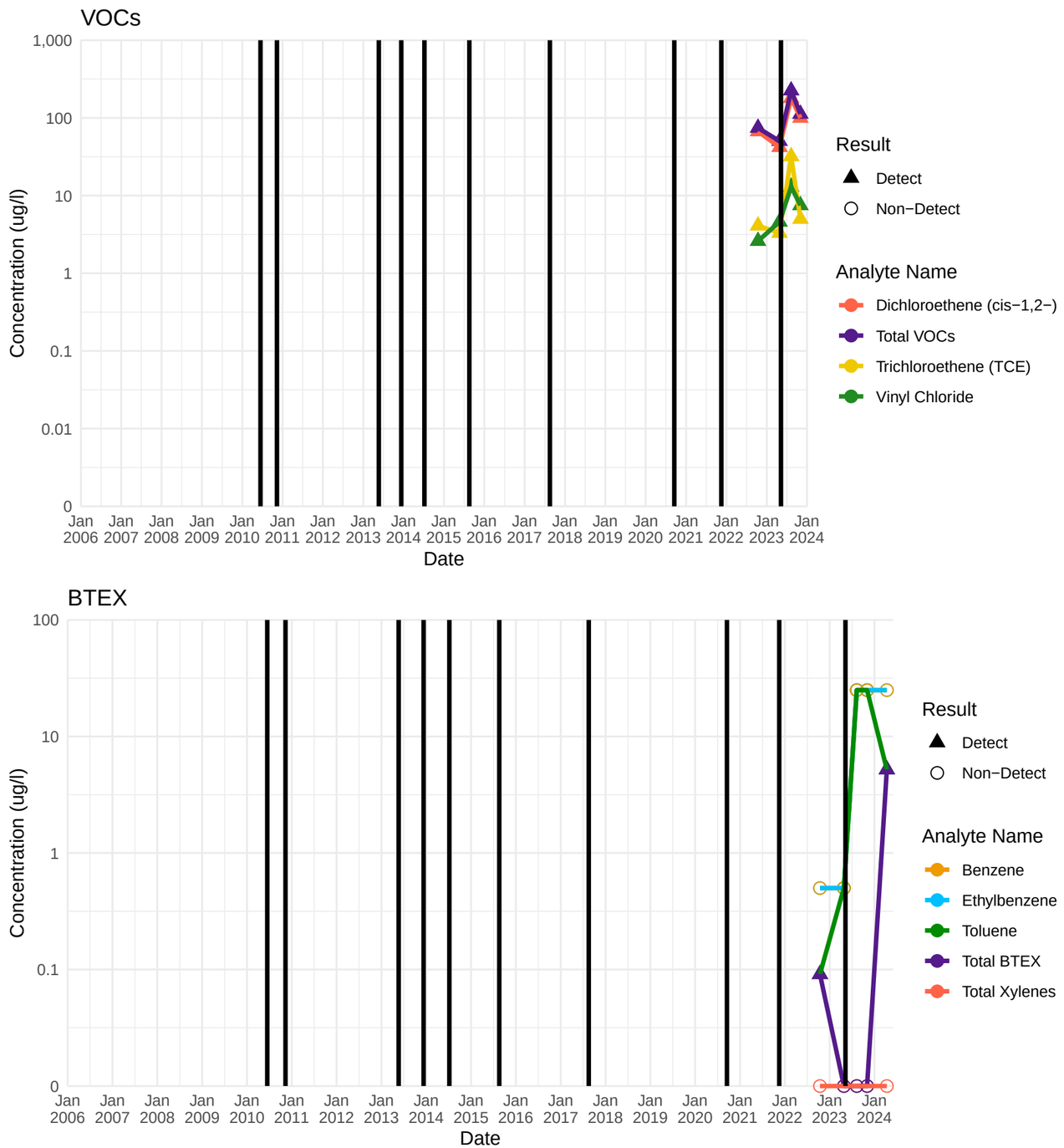

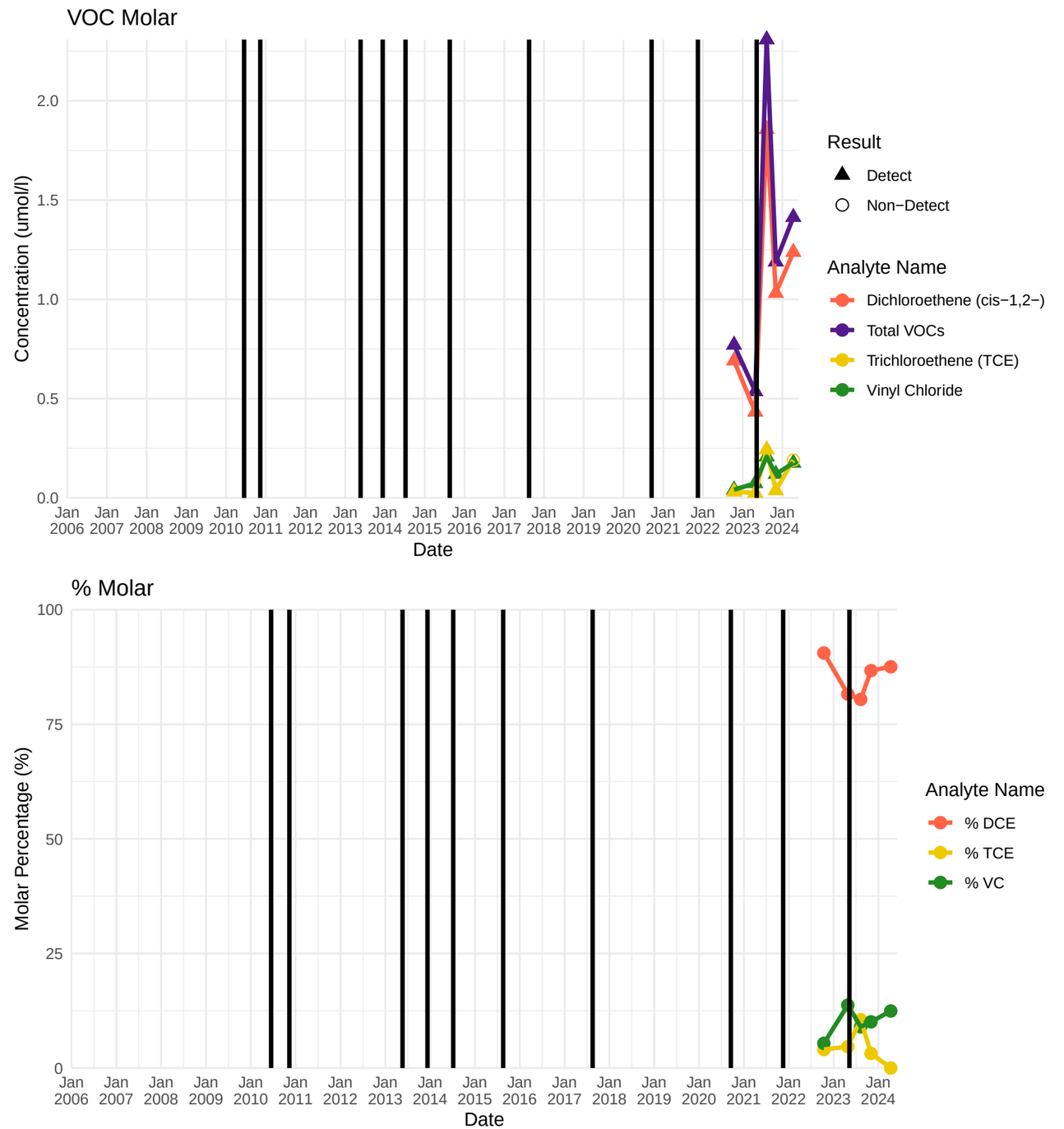

C−6

Notes:

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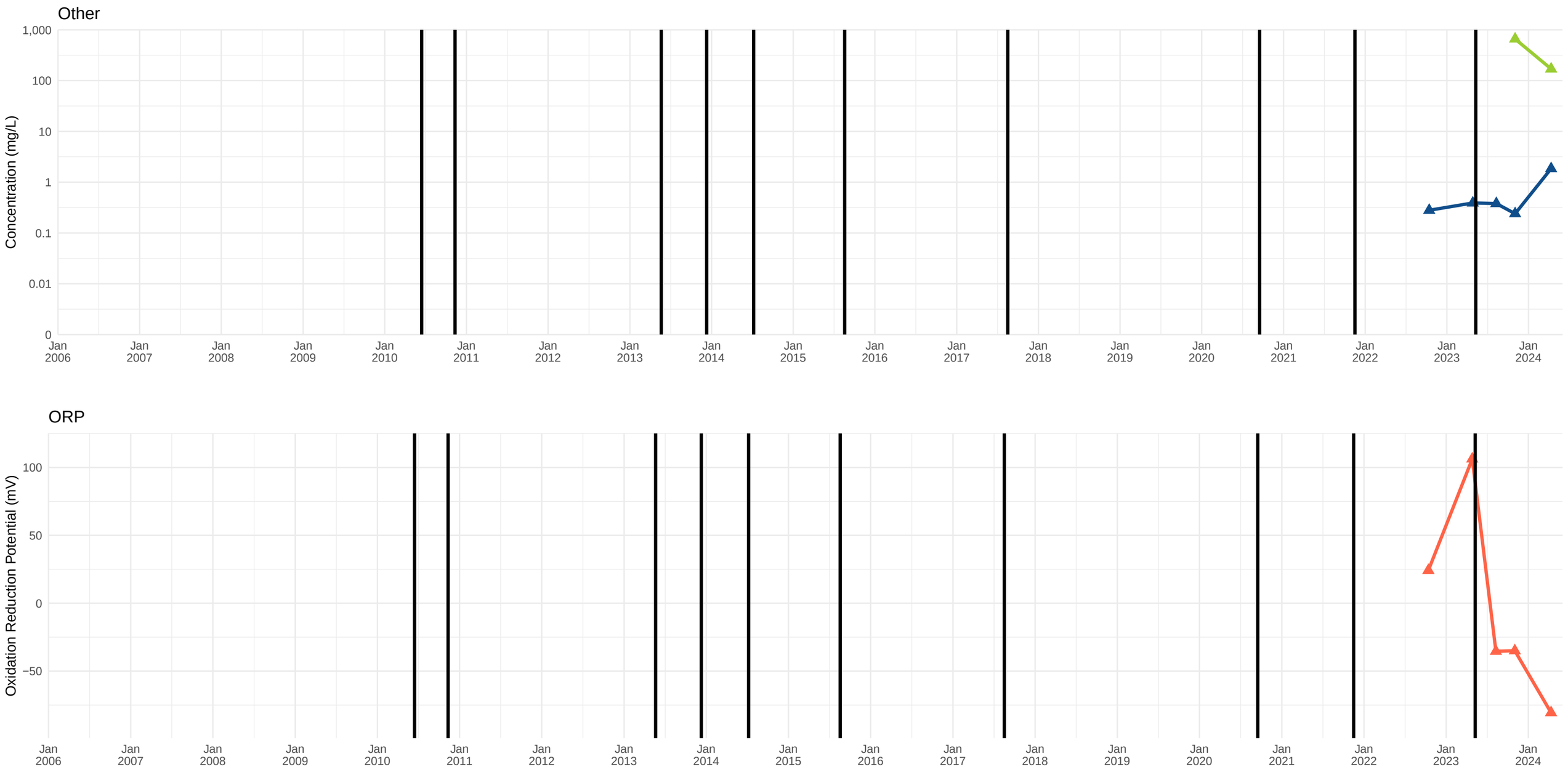

C−7

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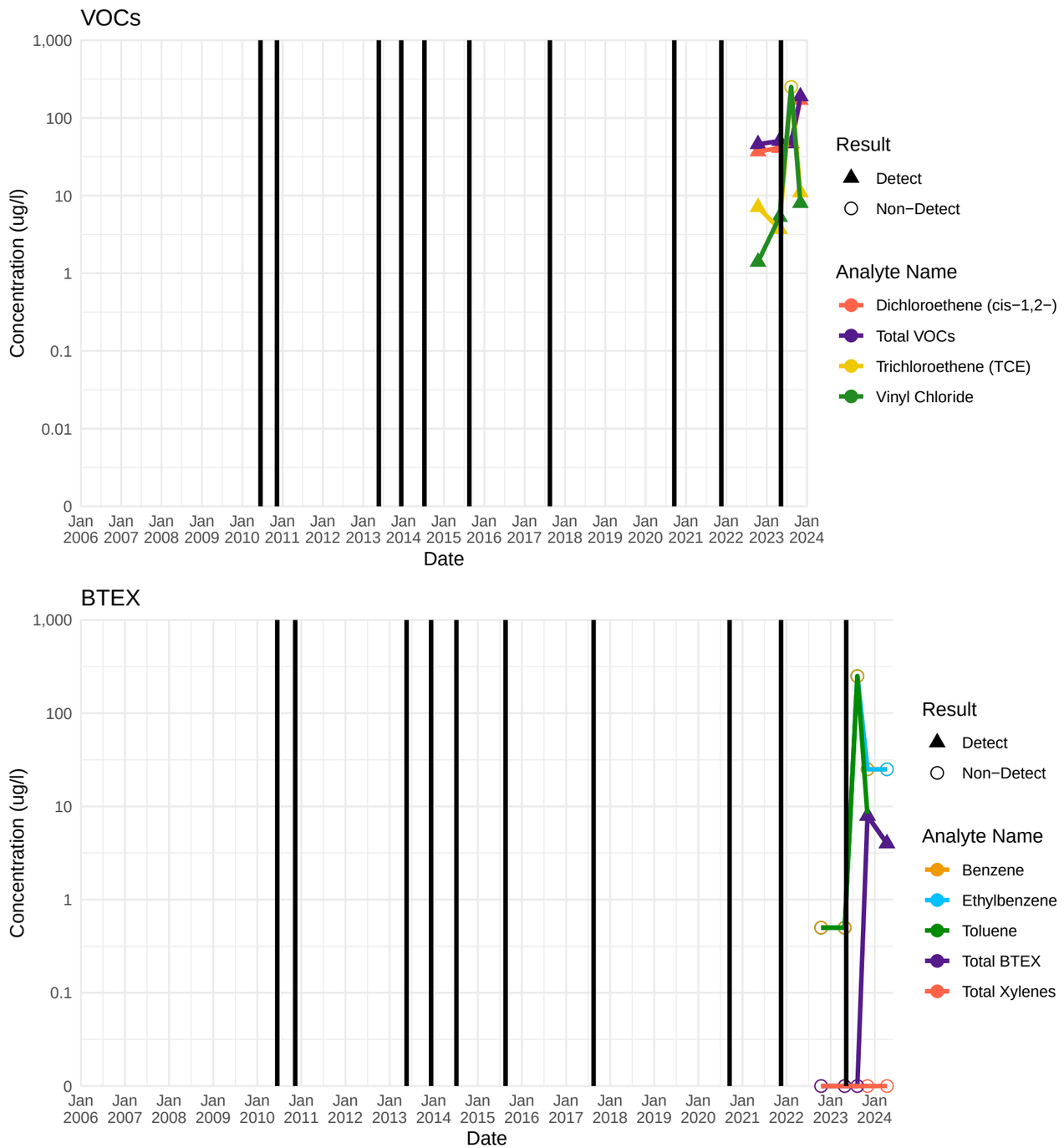

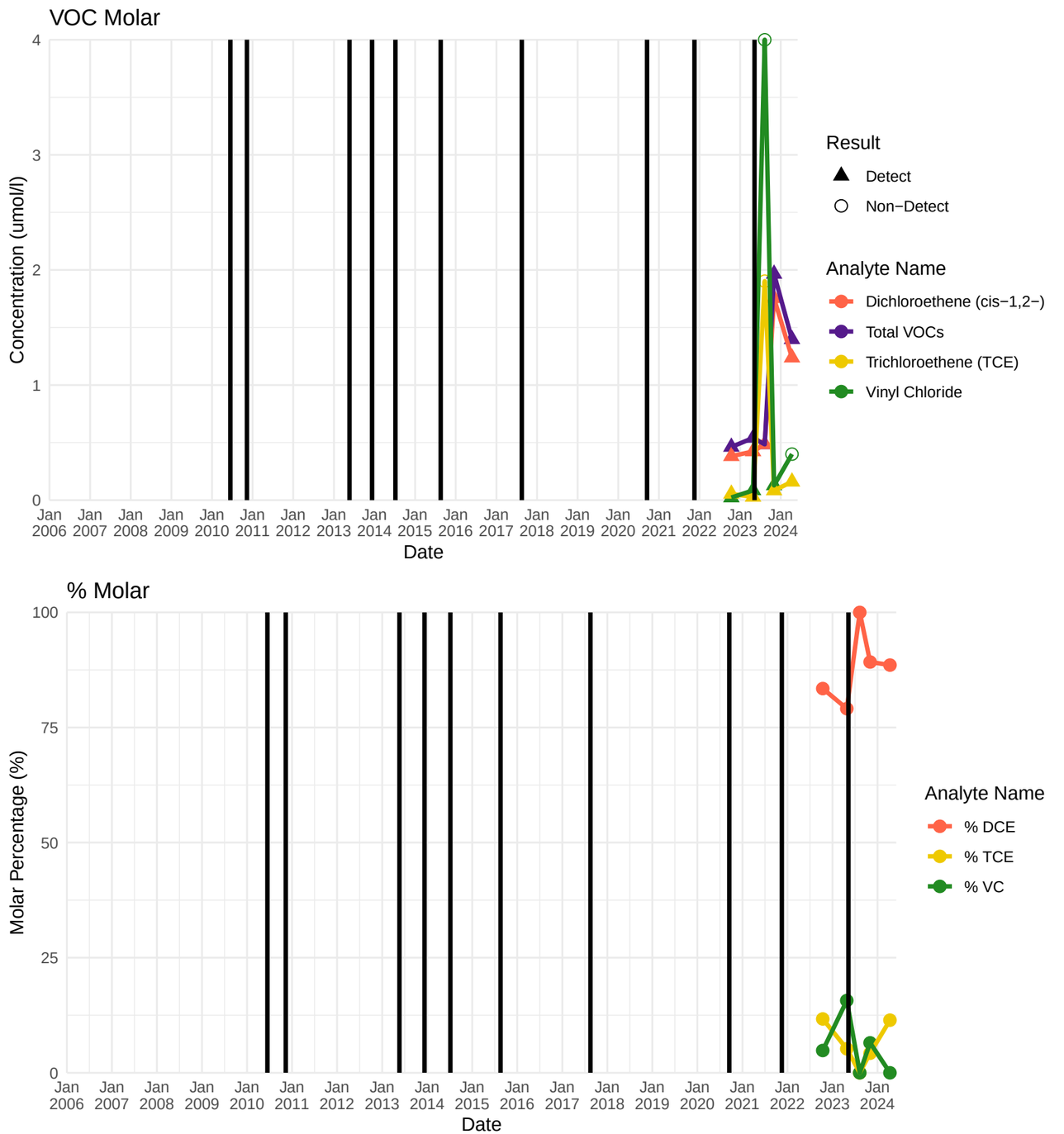

C−7

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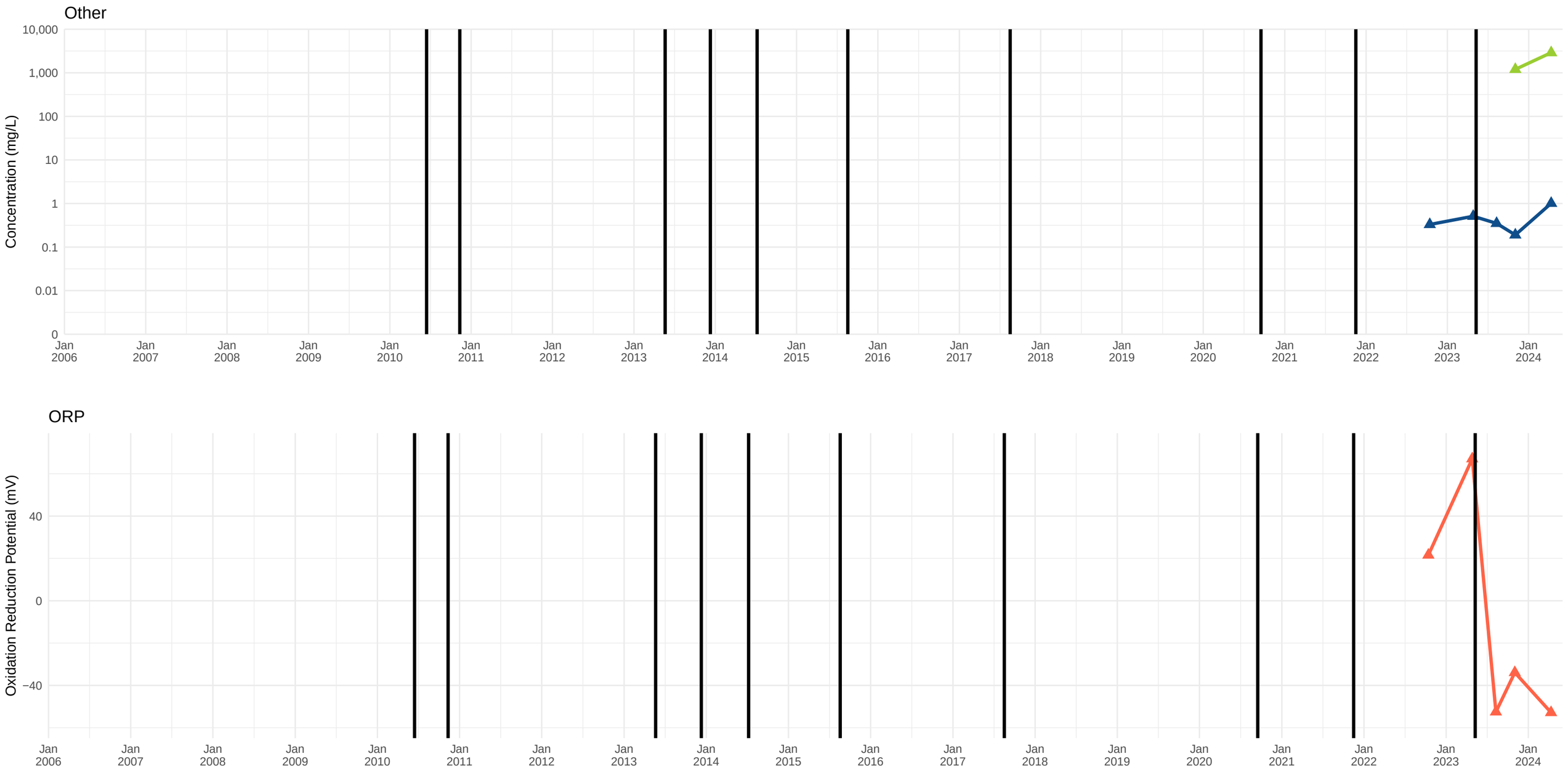

C−8

Notes:

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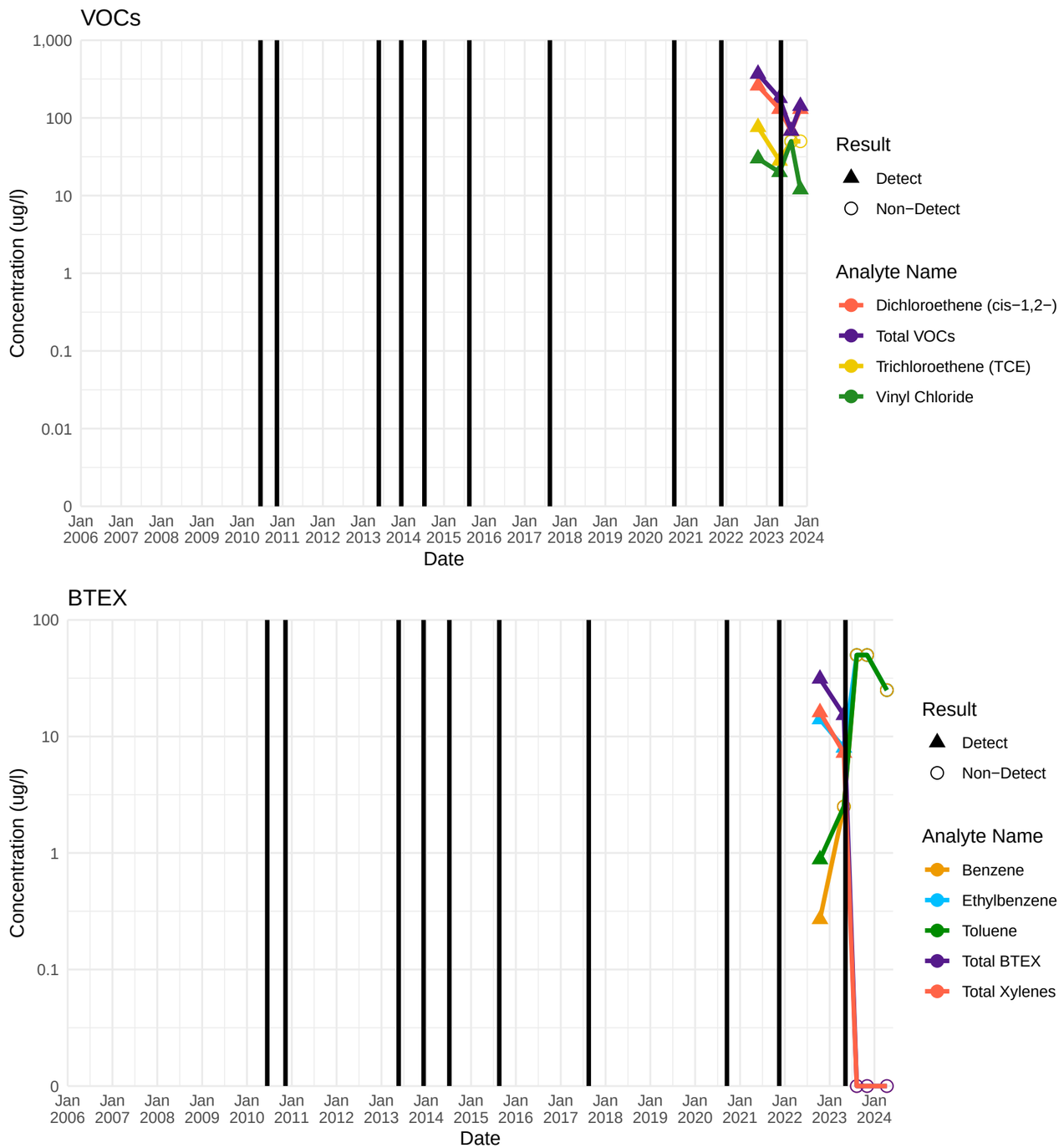

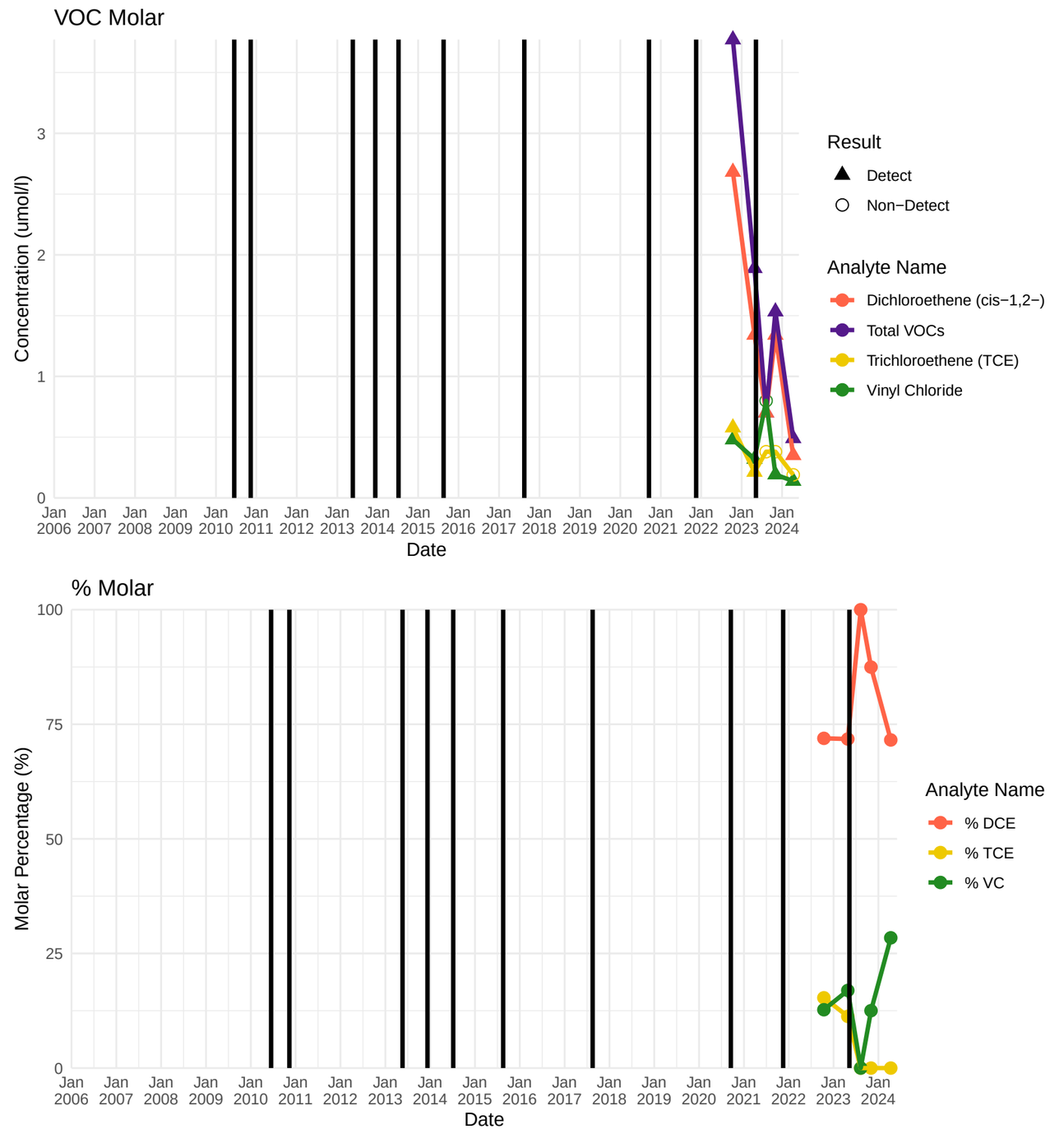

C−8

Notes:

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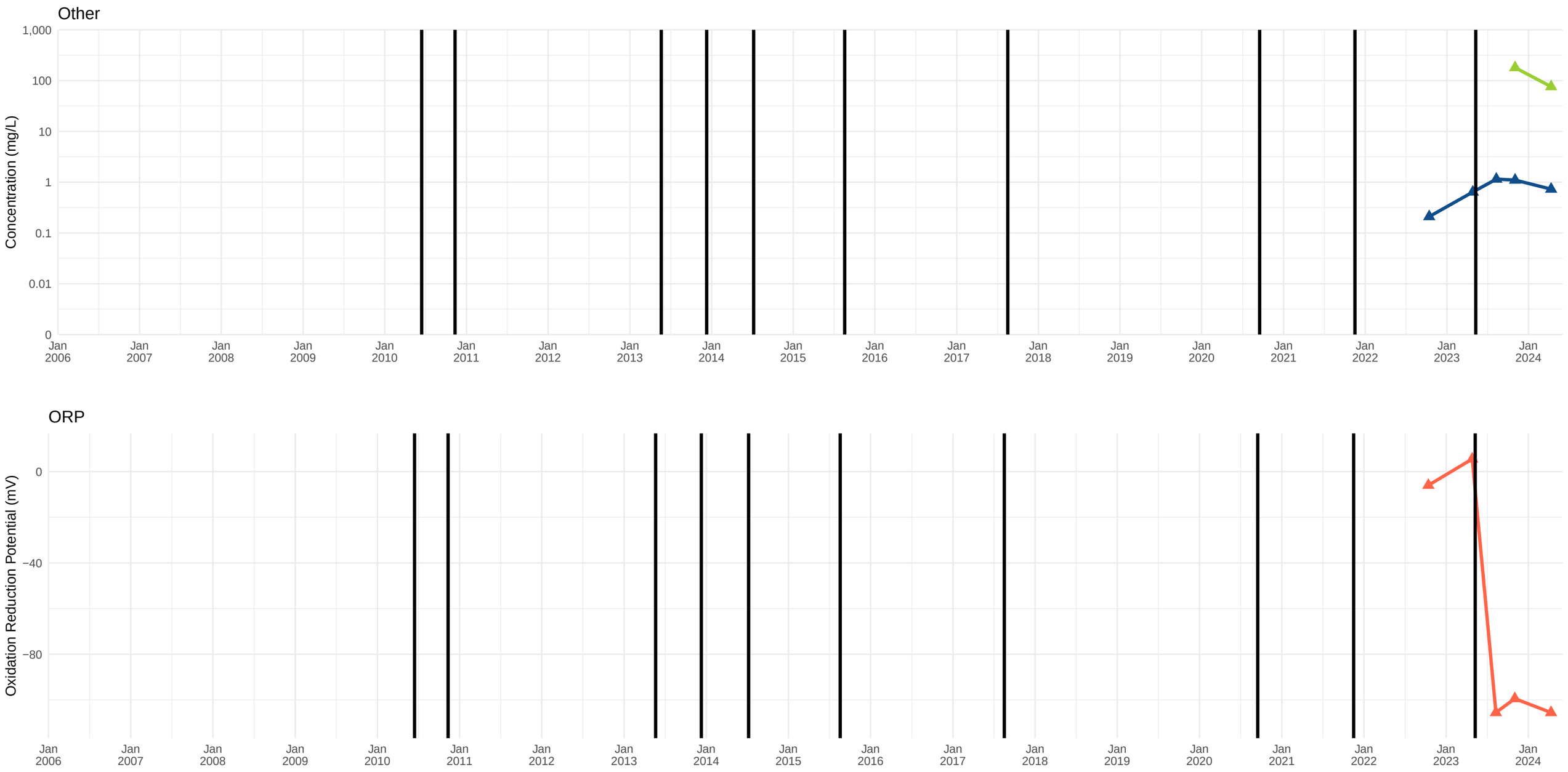

C−9

Notes:

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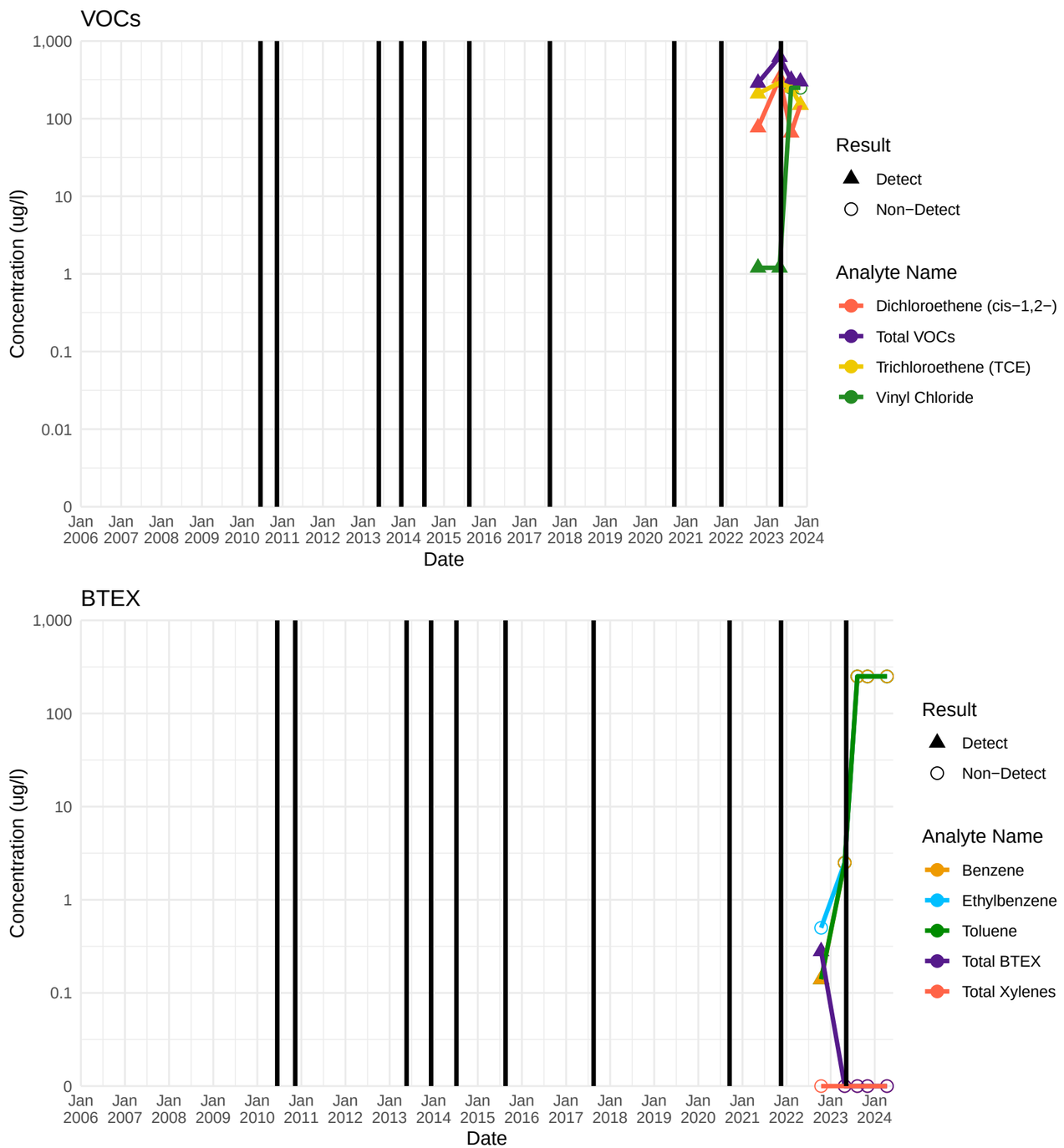
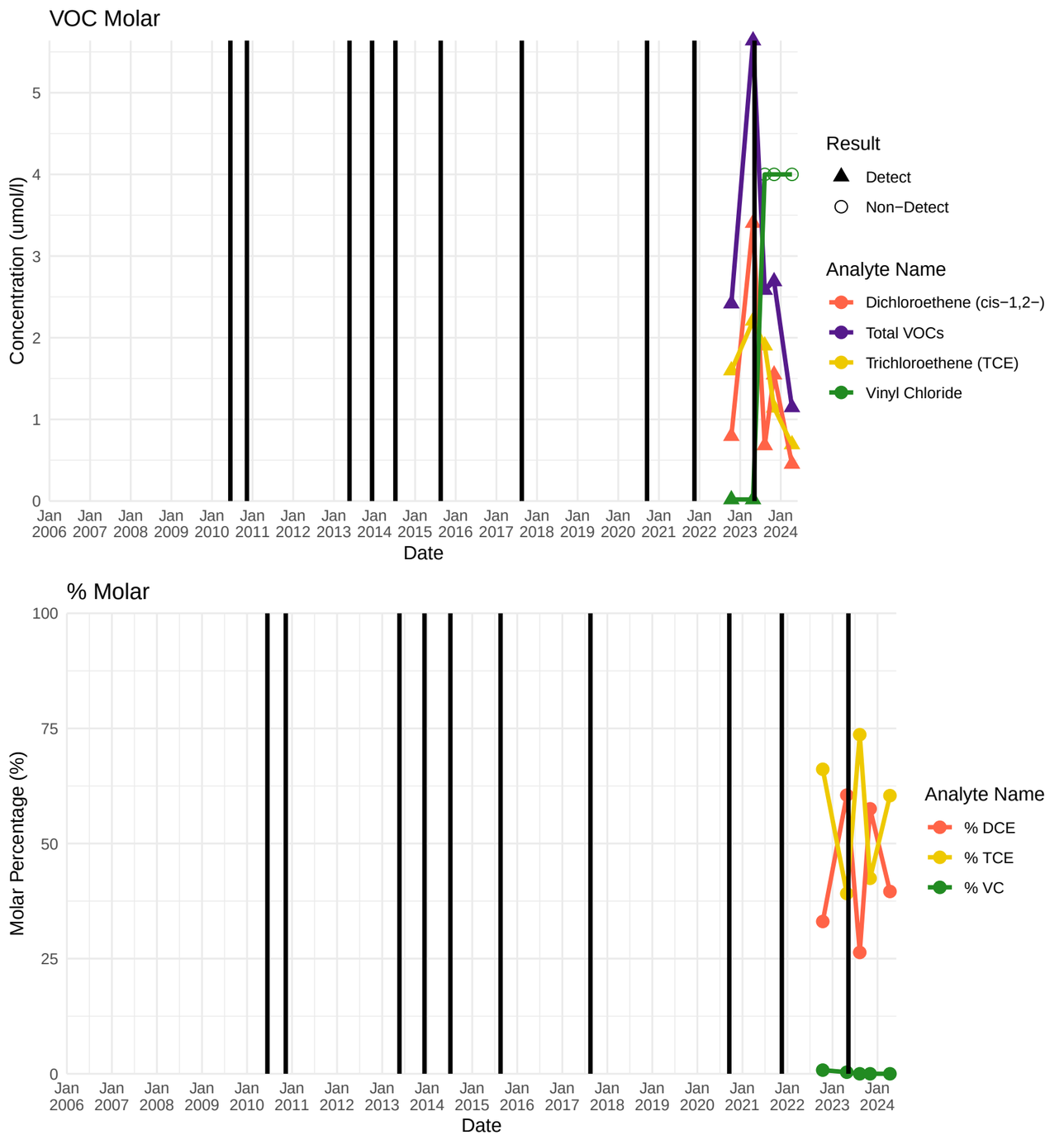
(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





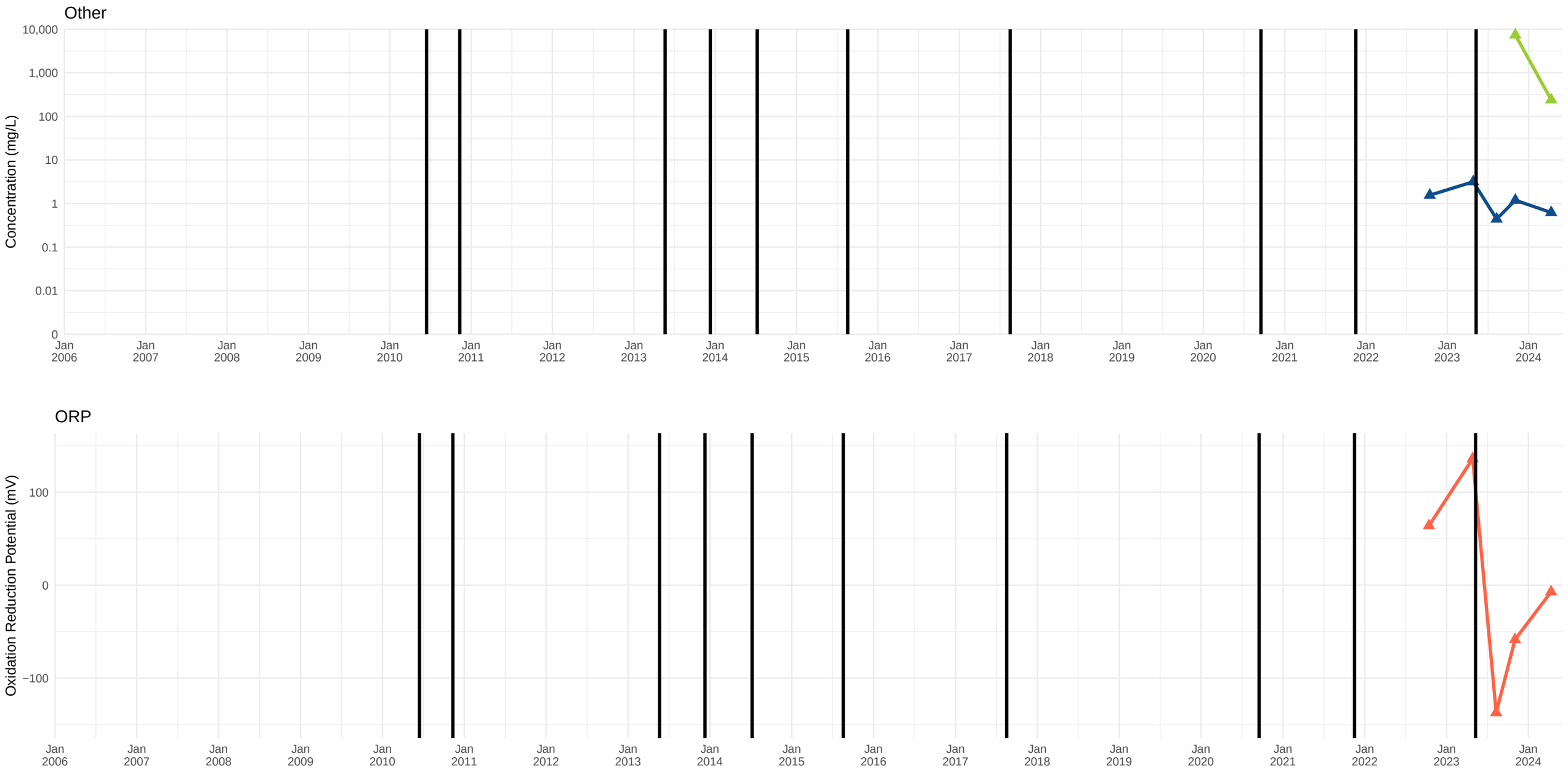
C−9

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



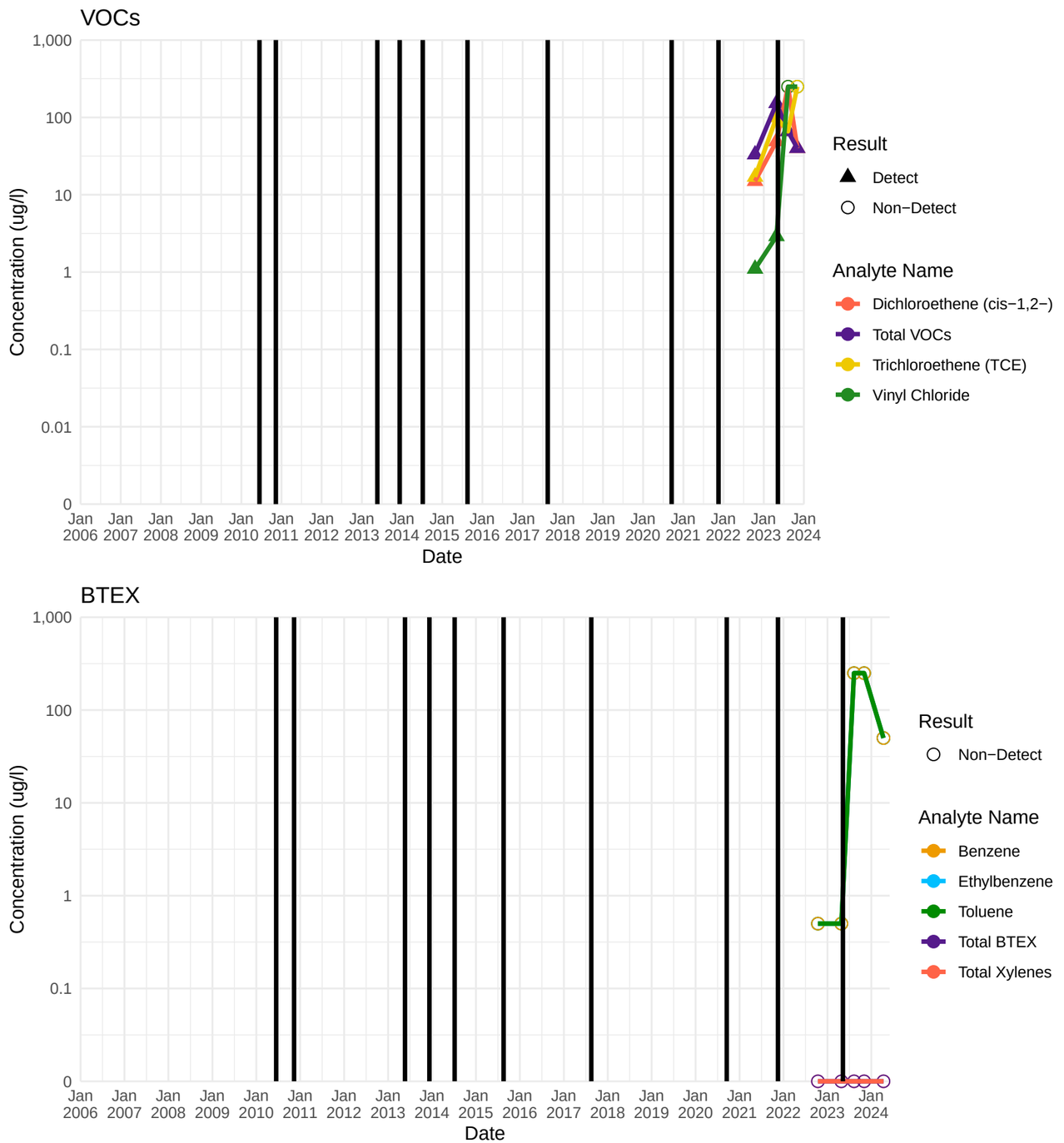
C−10

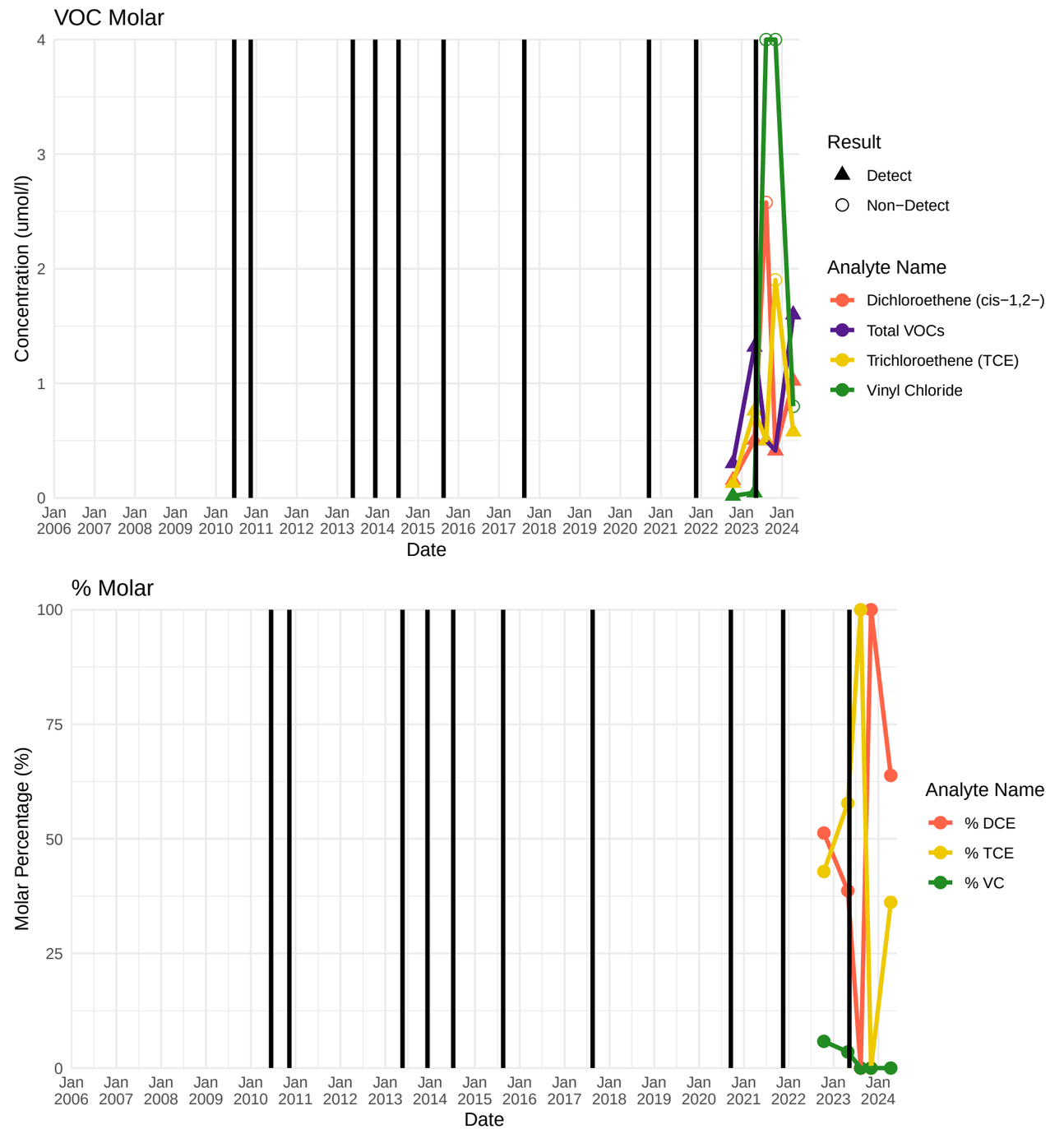
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





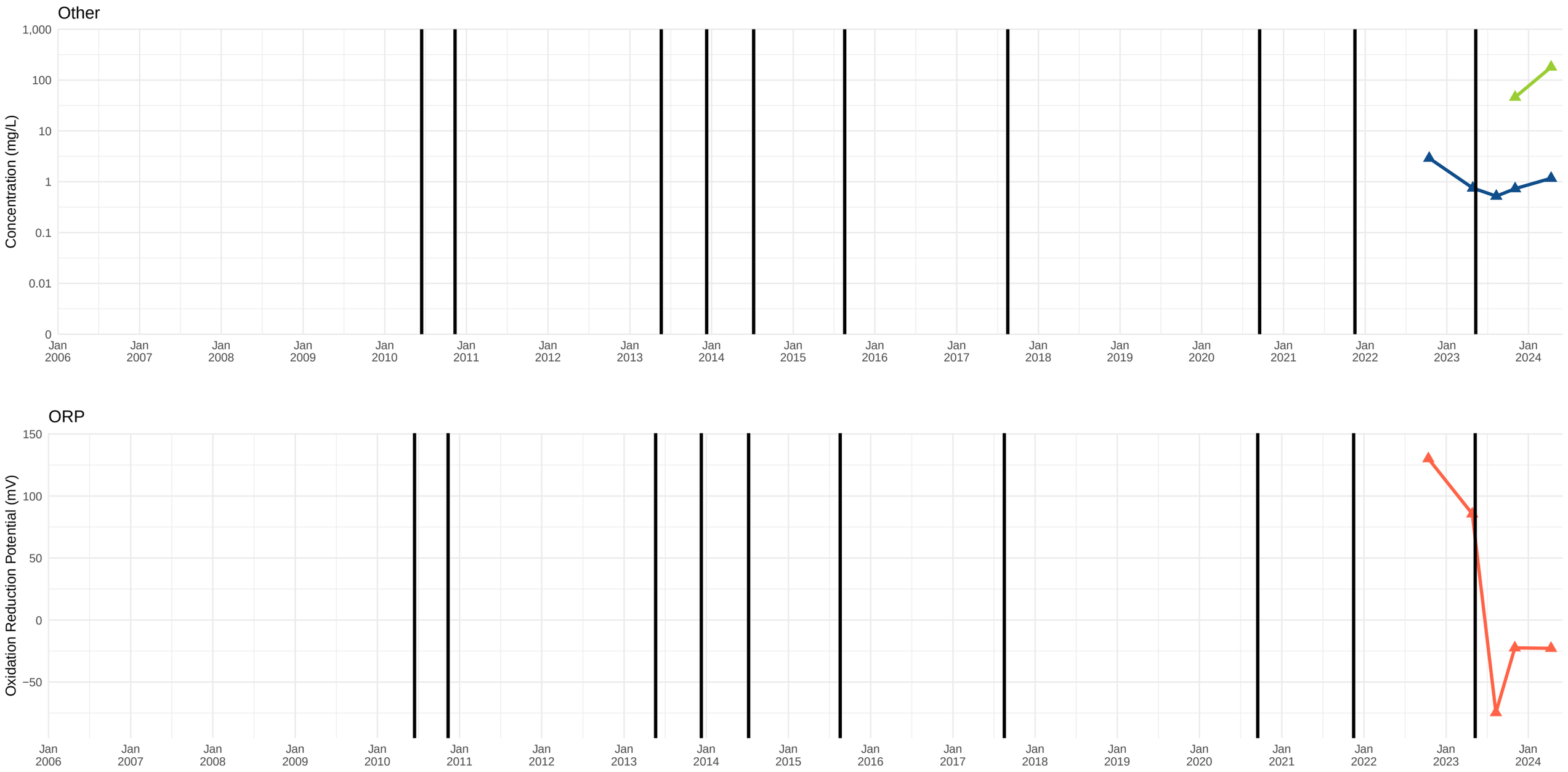
C−10

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



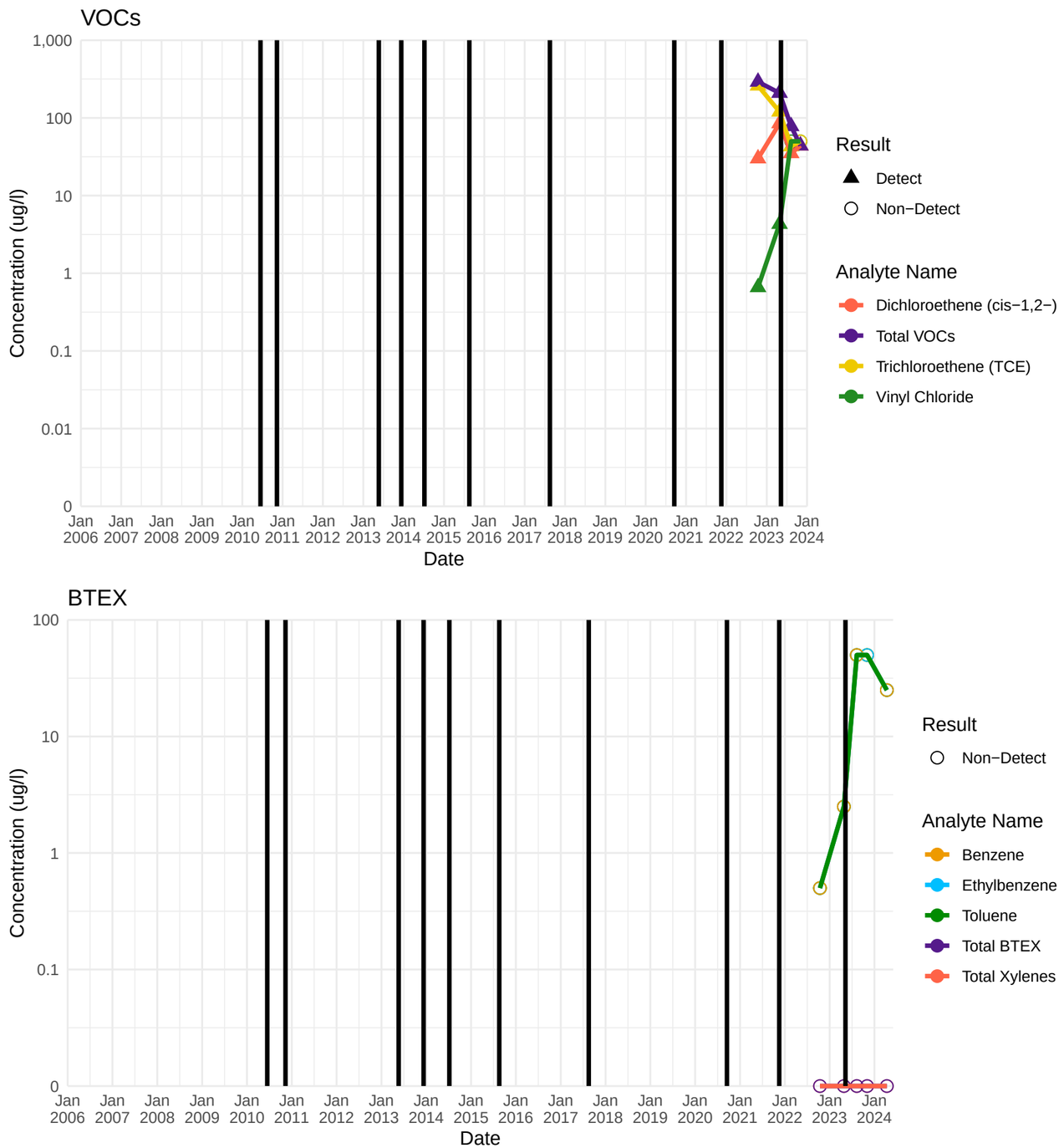
C−11

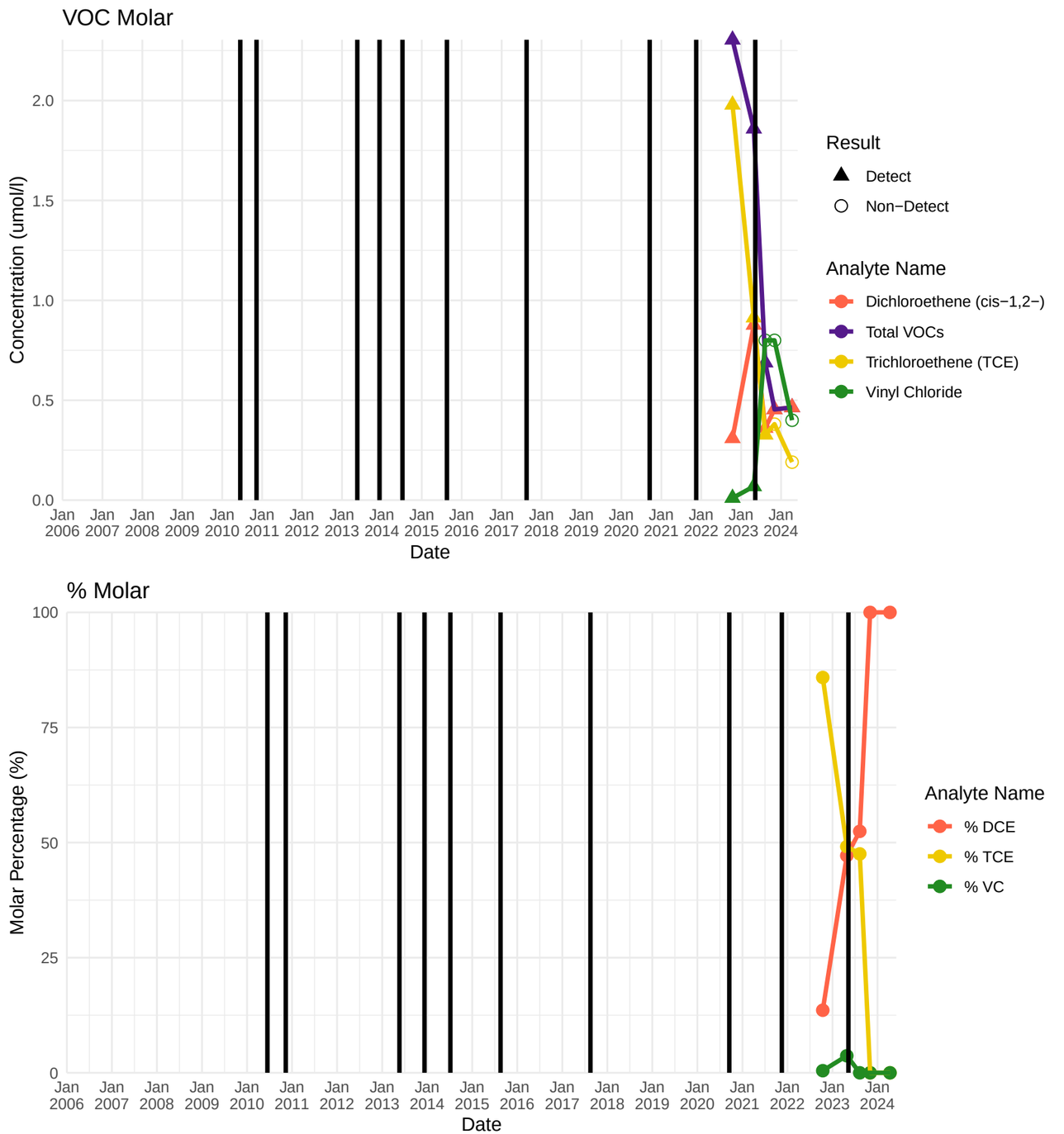
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





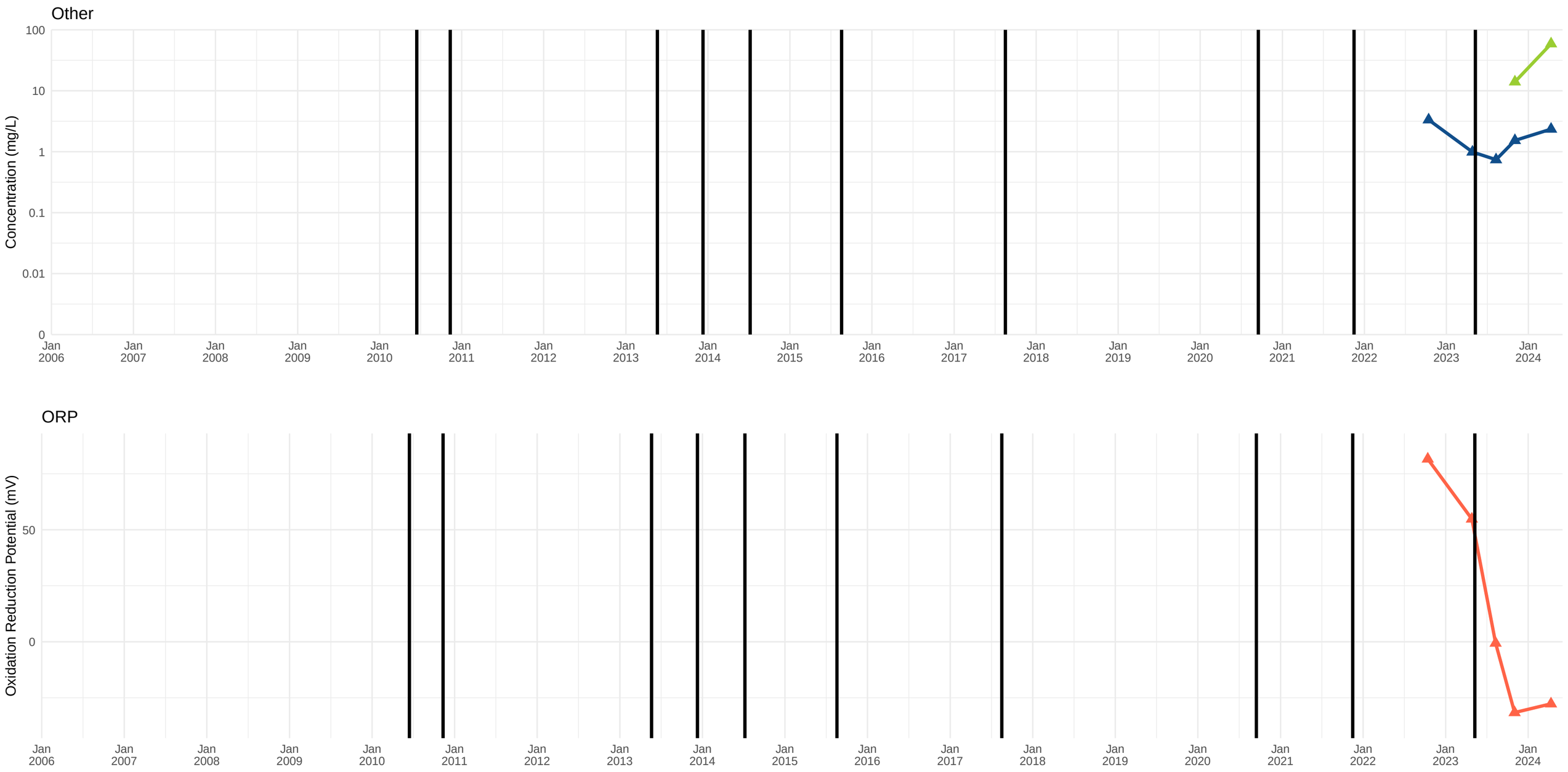
C−11

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



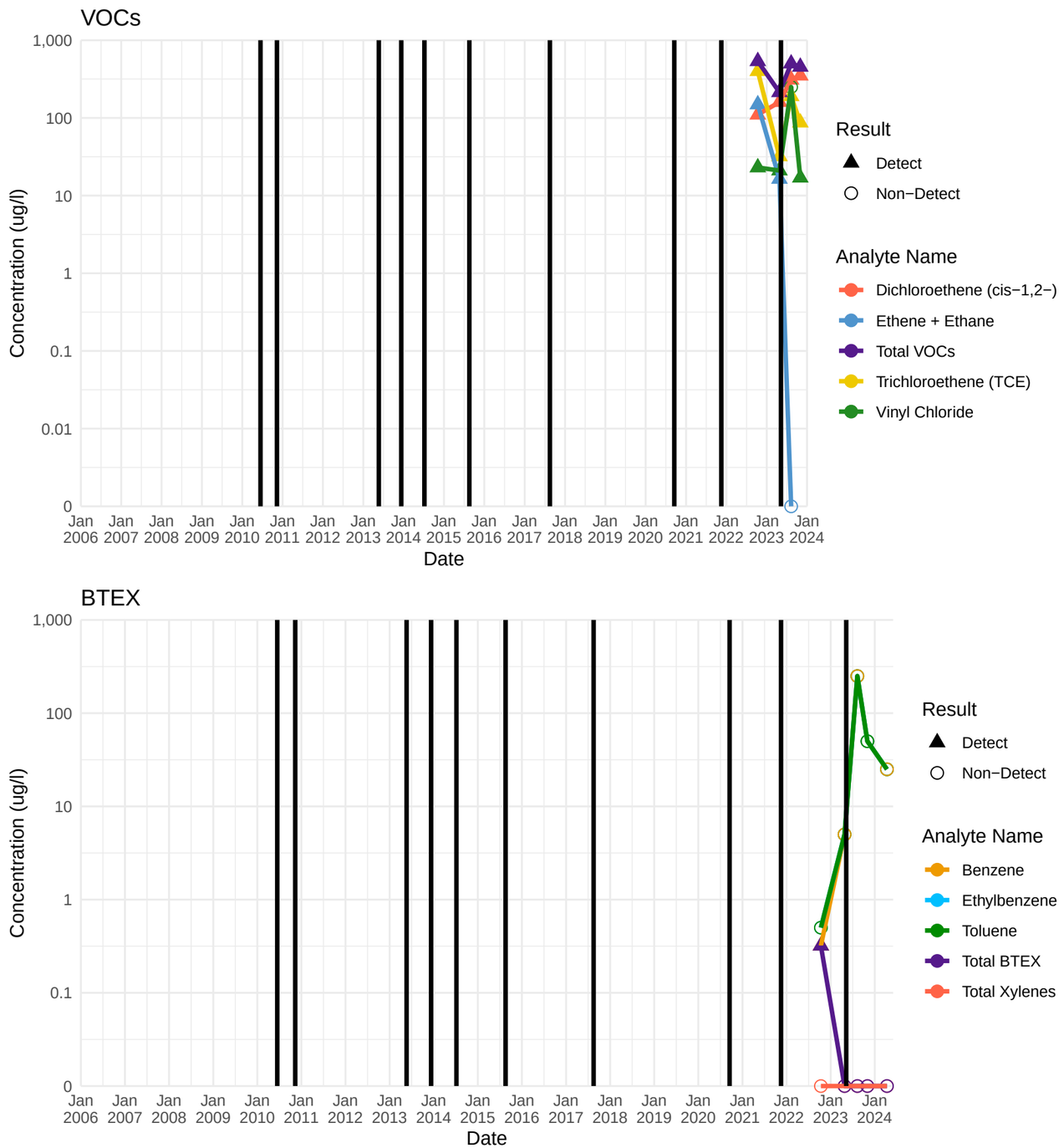
D−1

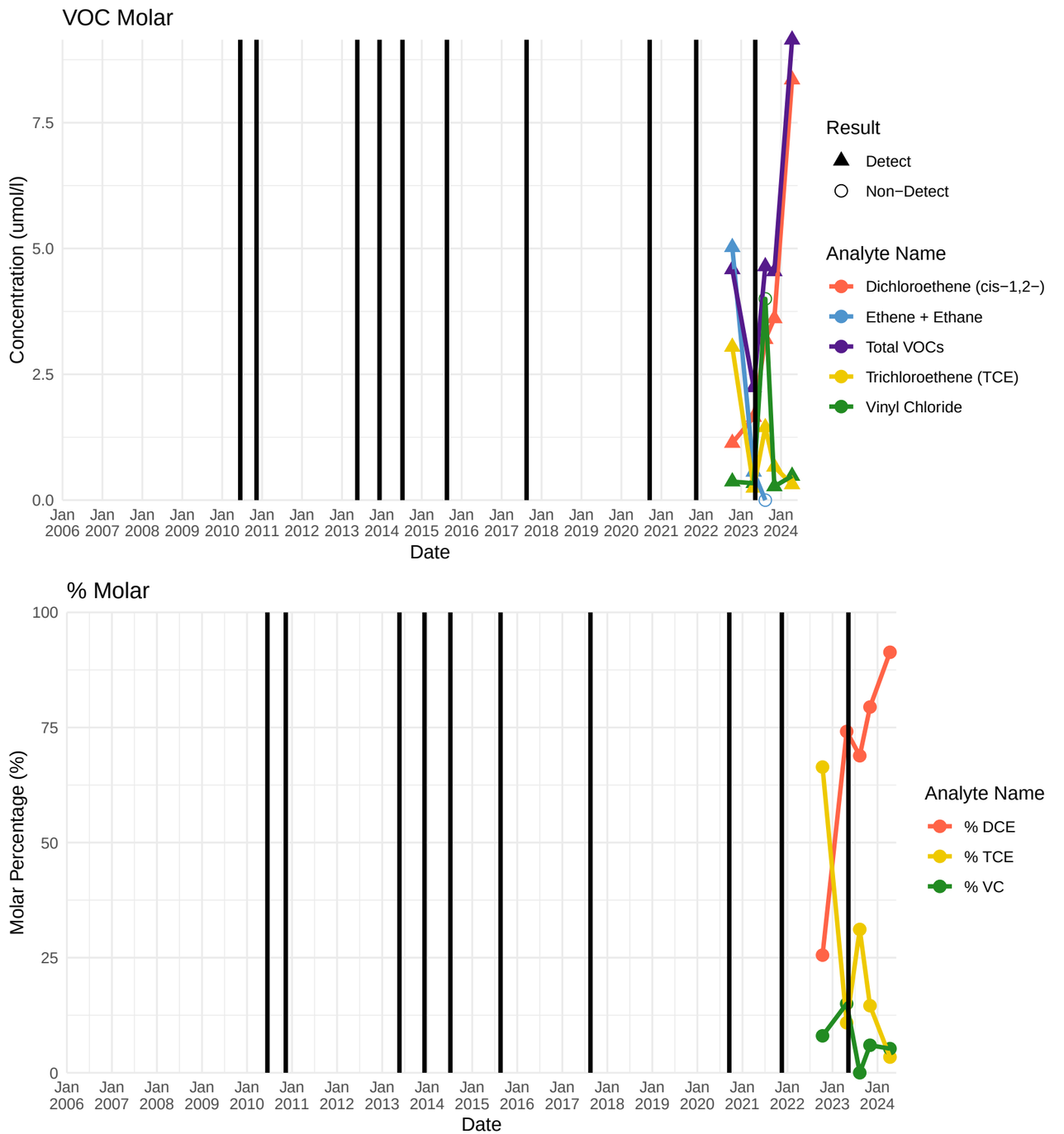
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





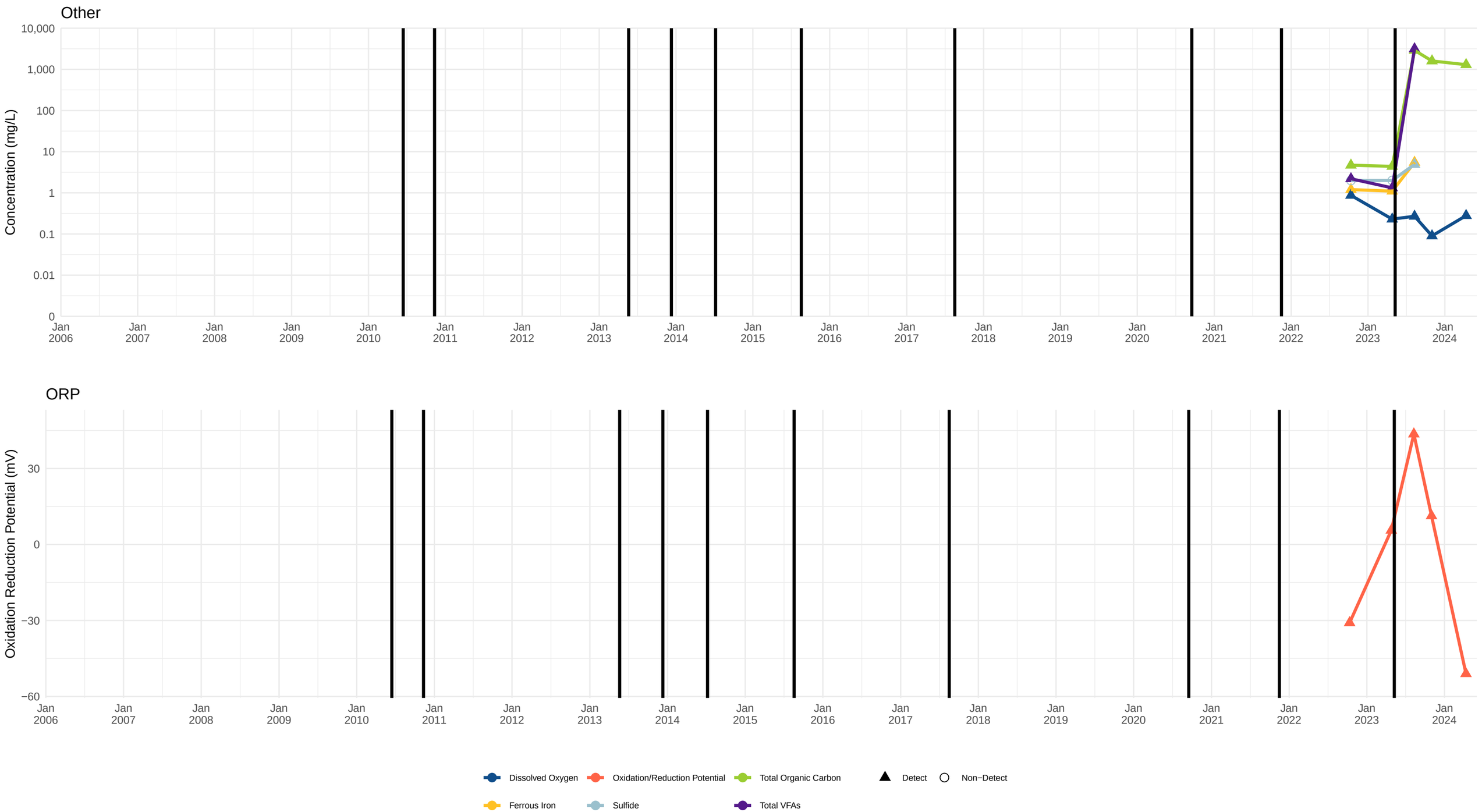
D−1

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



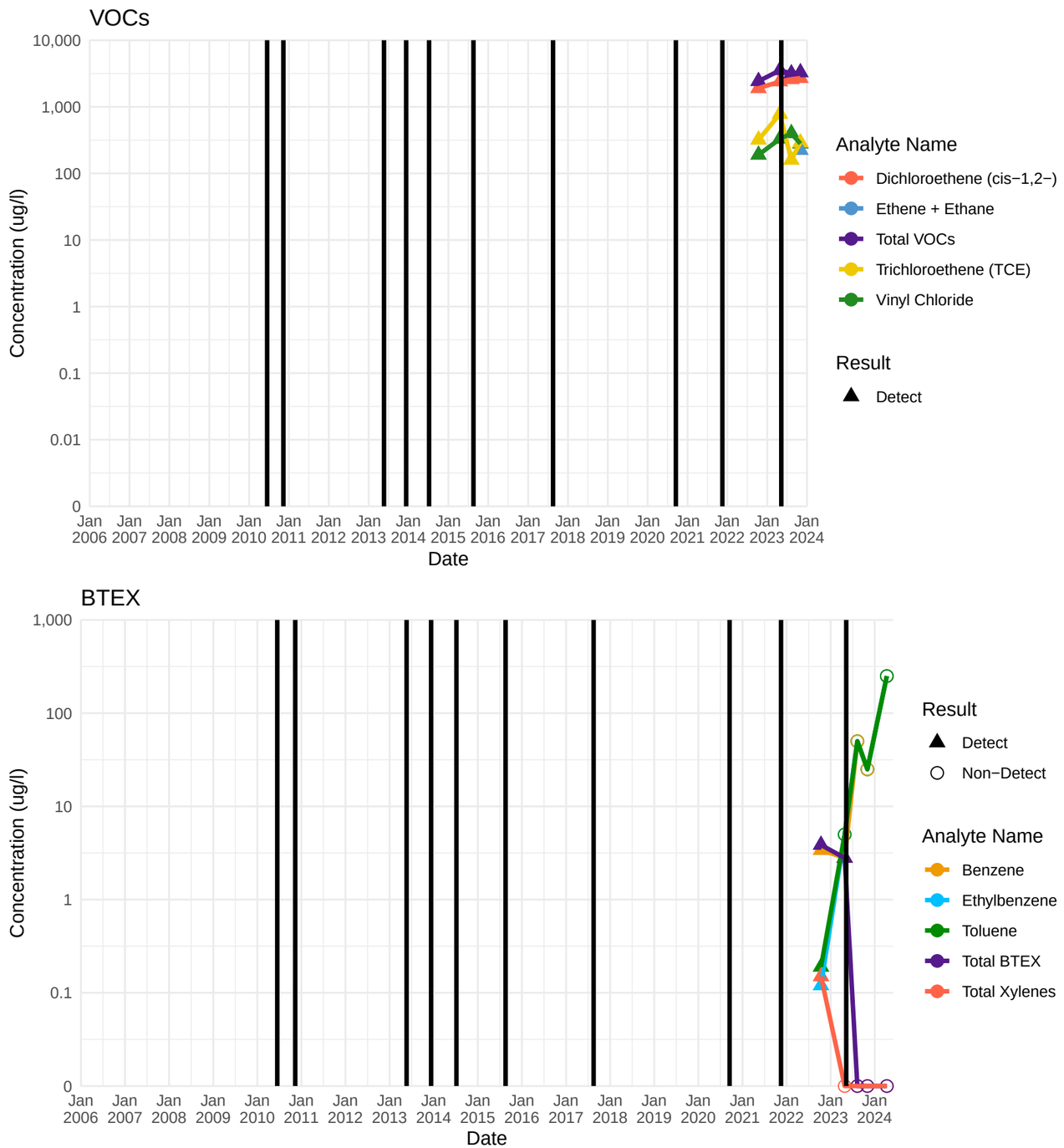
D−2

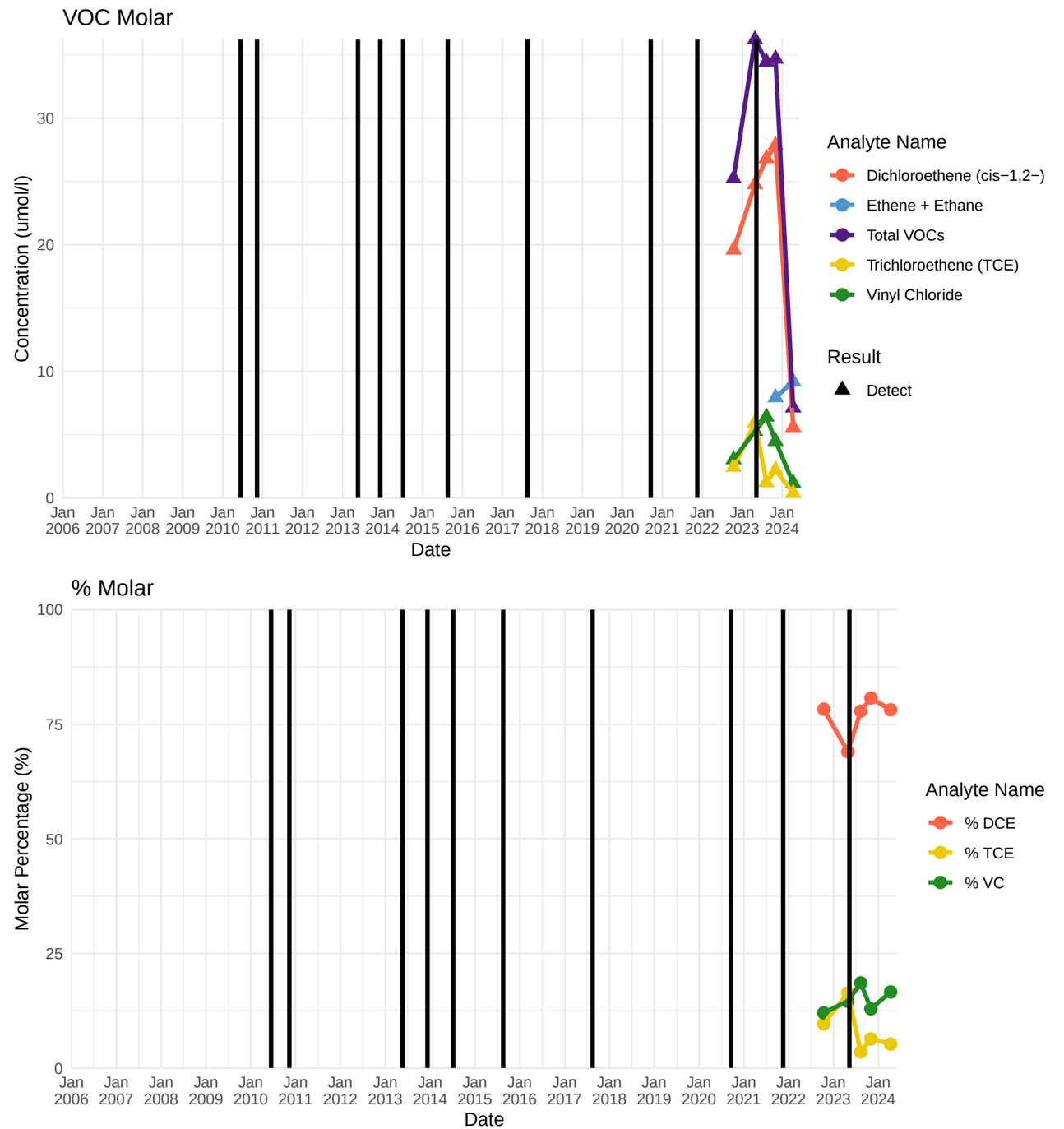
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





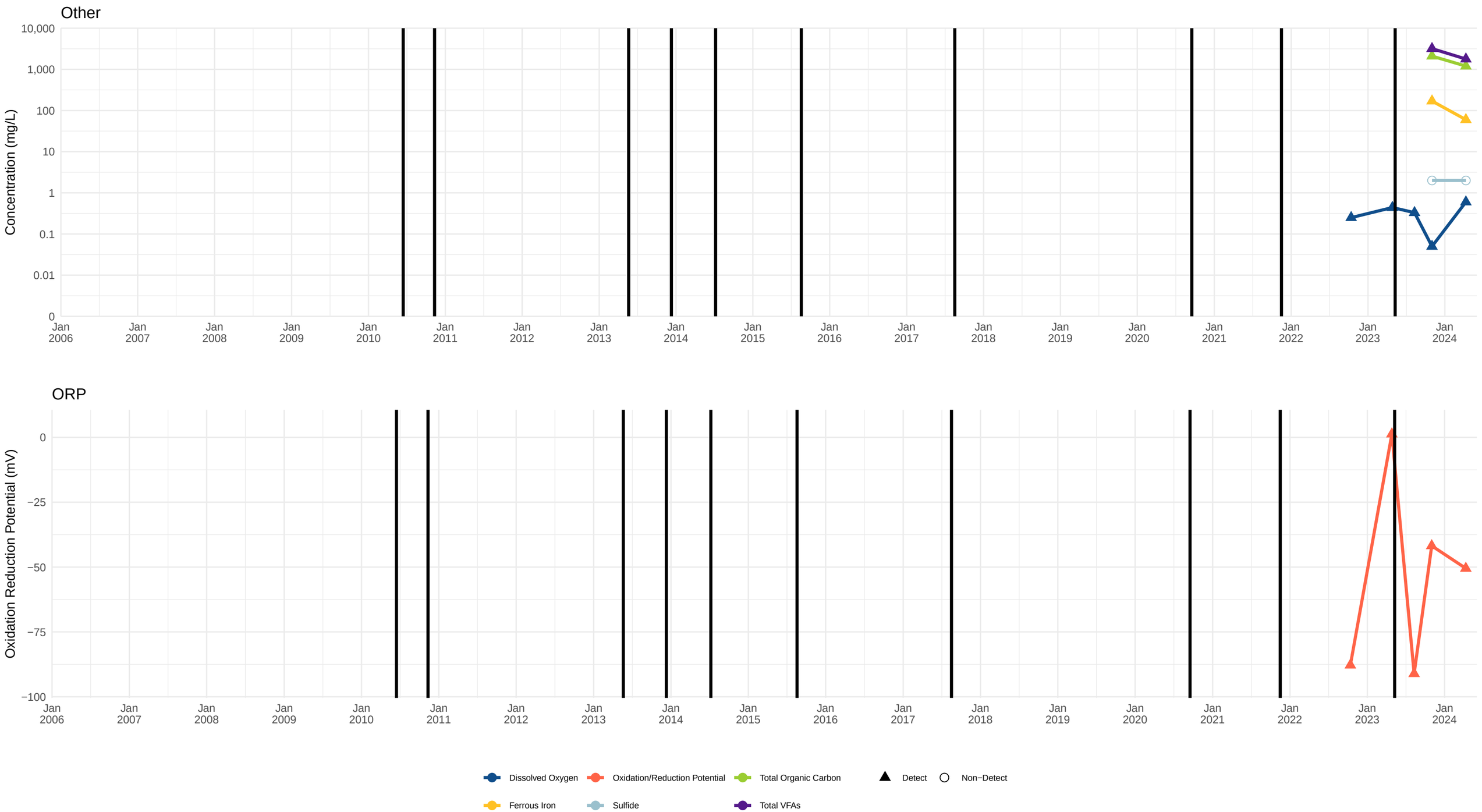
D−2

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



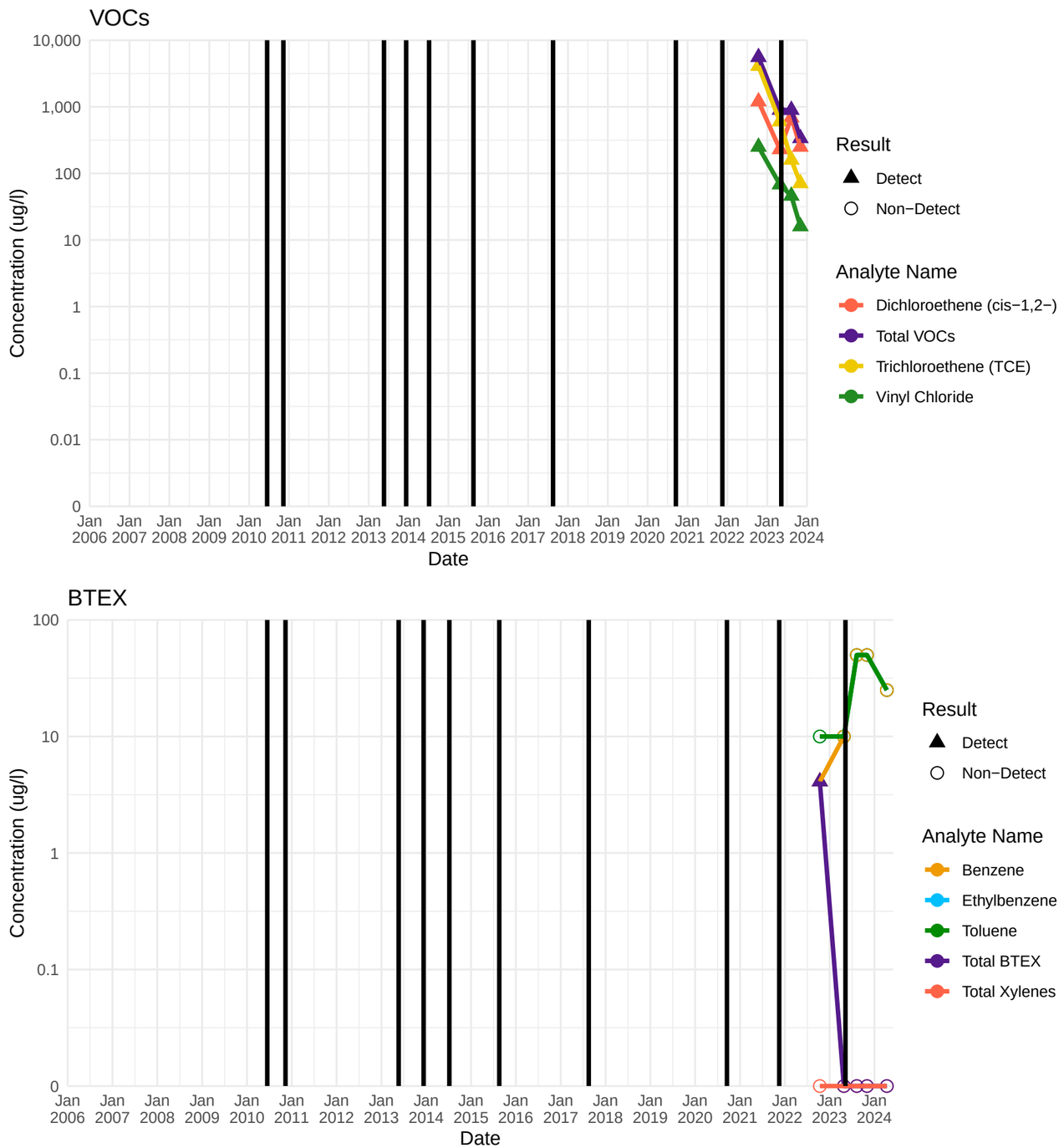
D−3

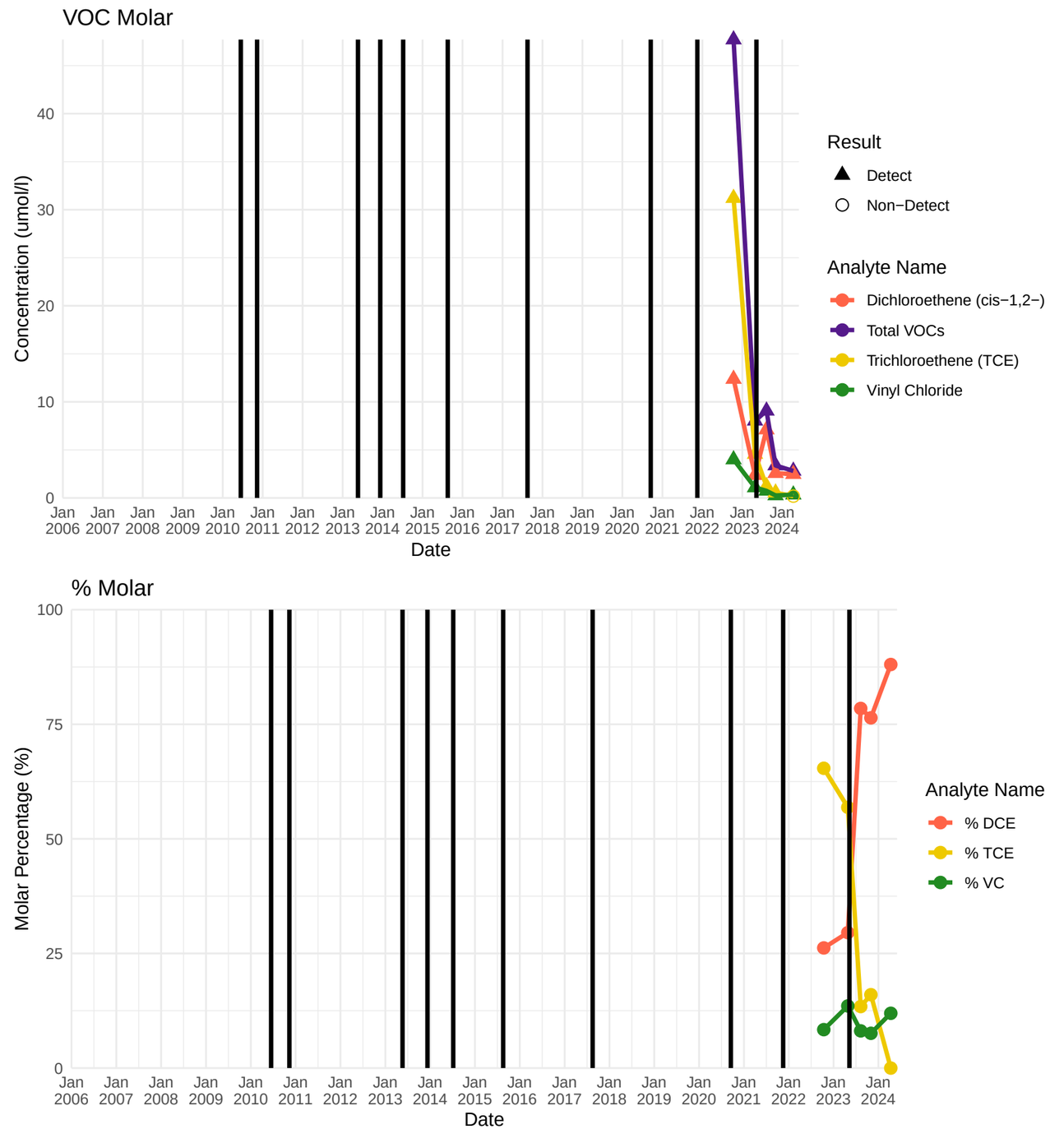
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





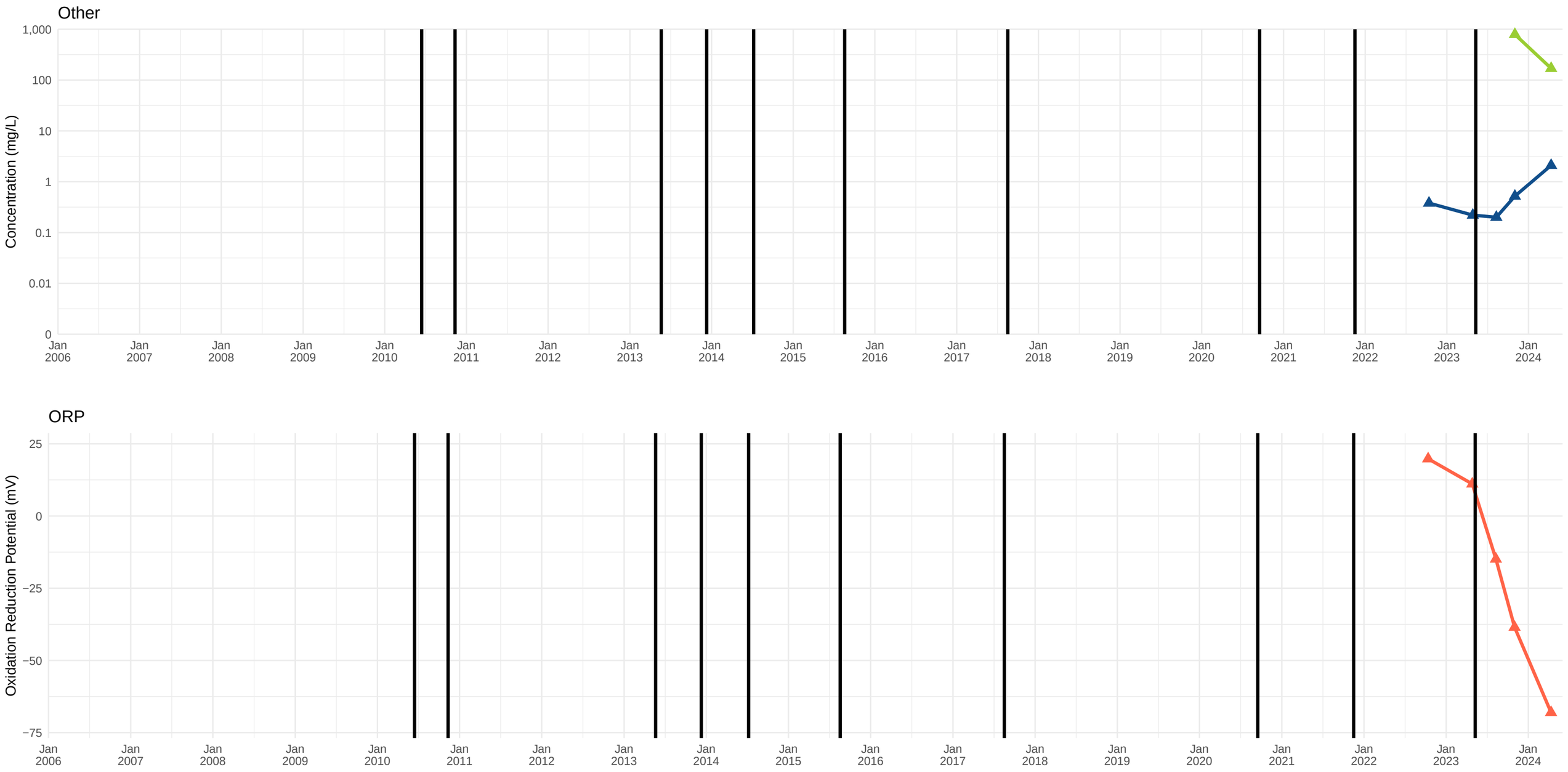
D−3

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



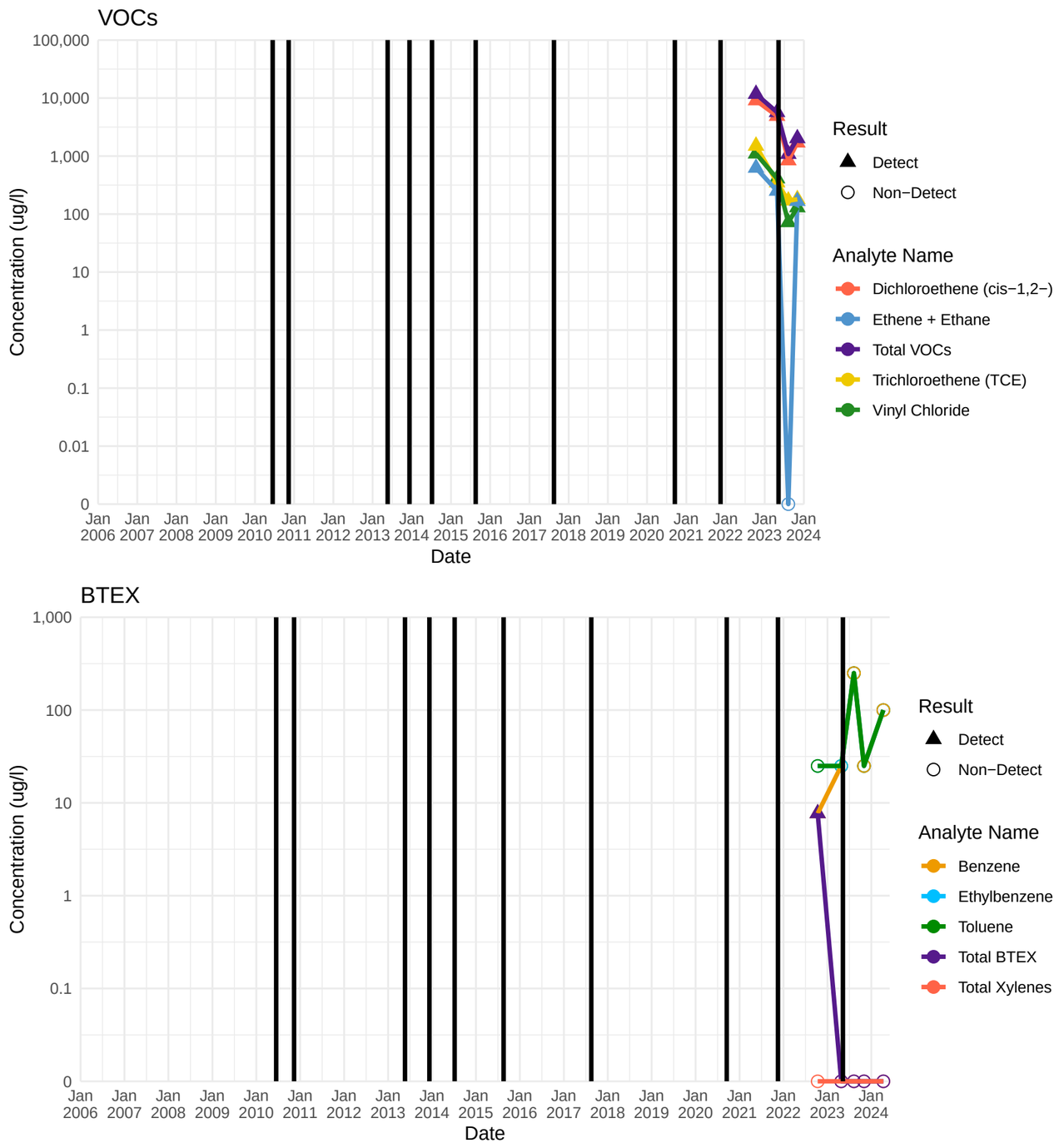
D−4

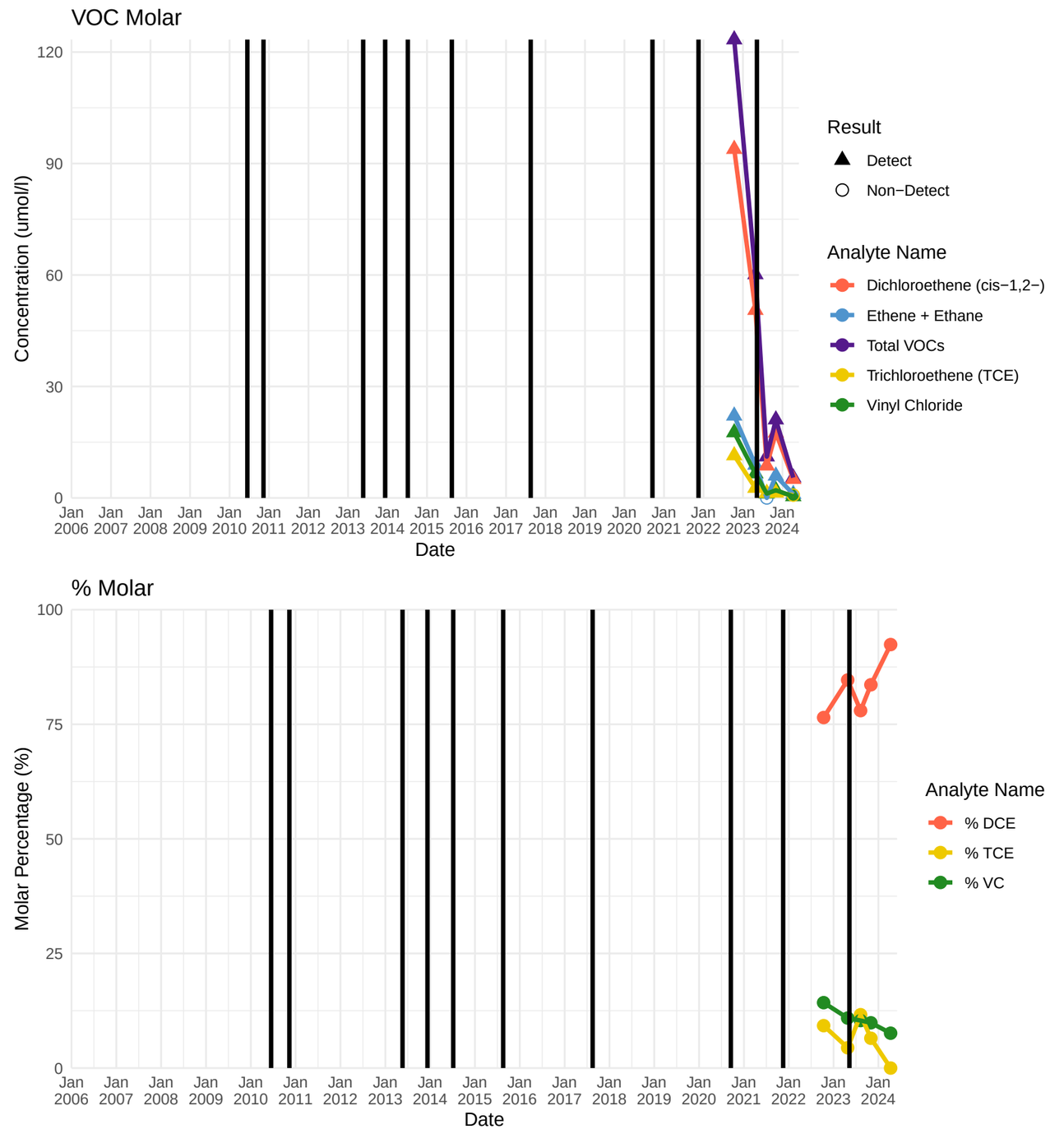
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





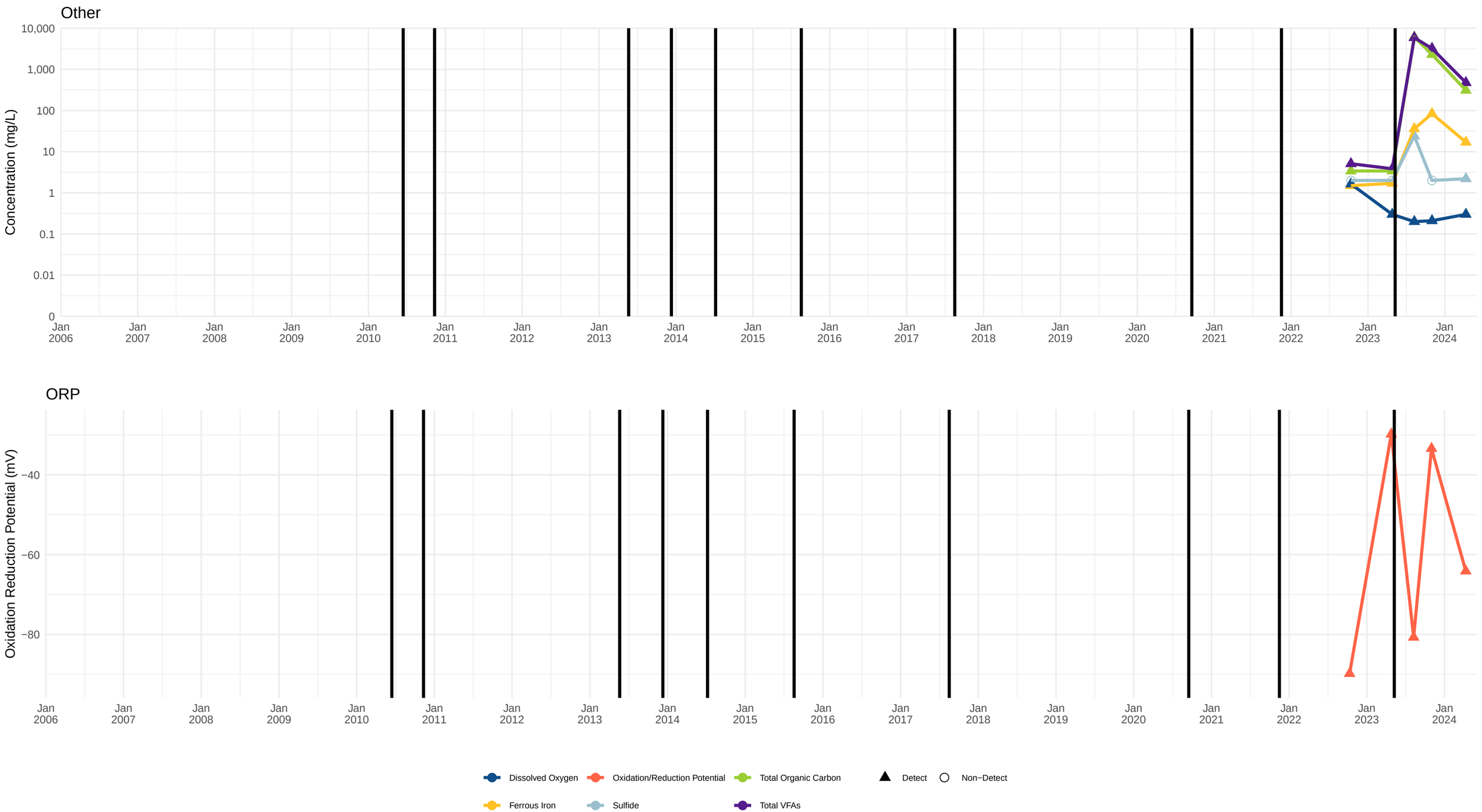
D−4

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



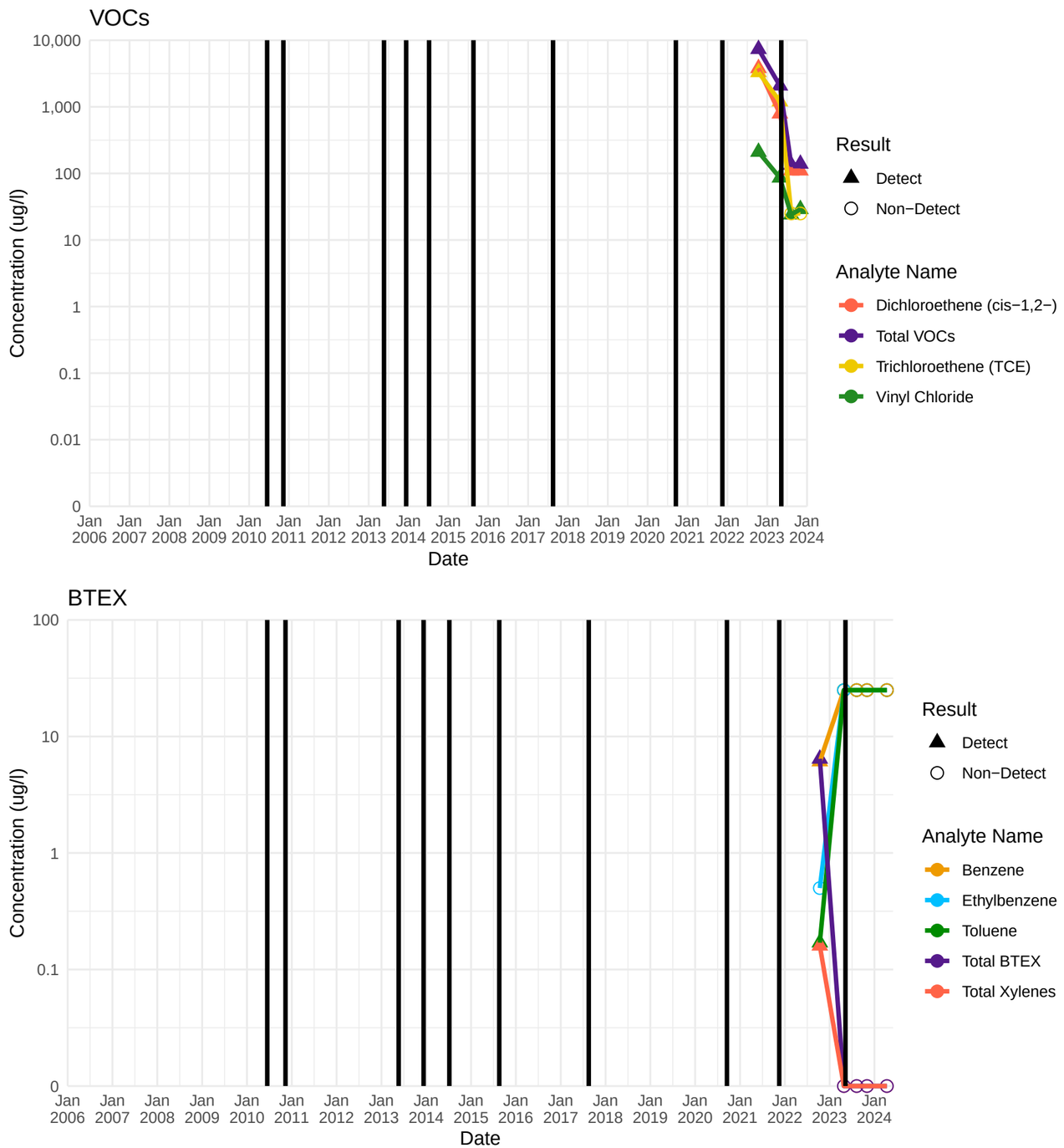
D−5

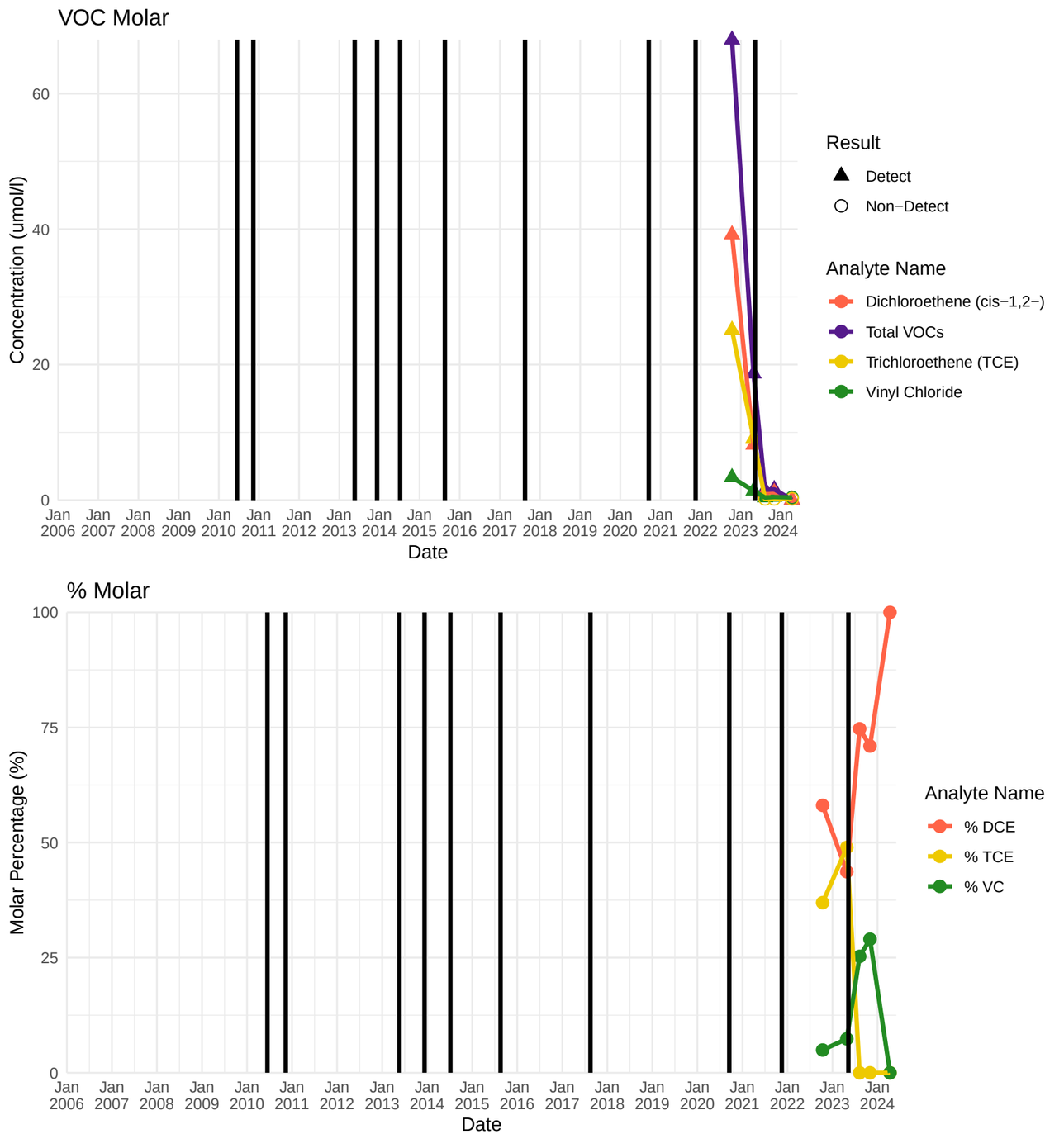
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





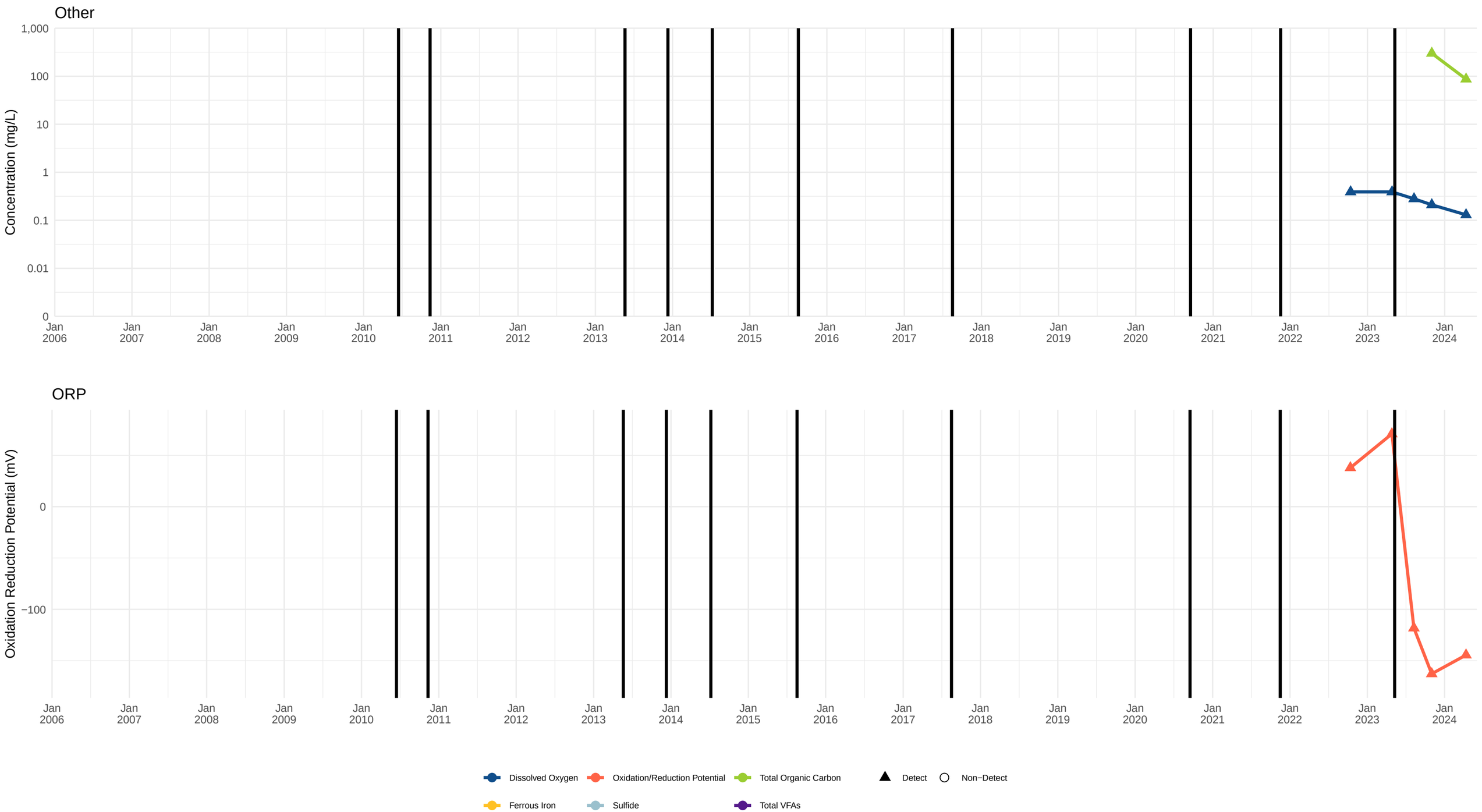
D−5

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



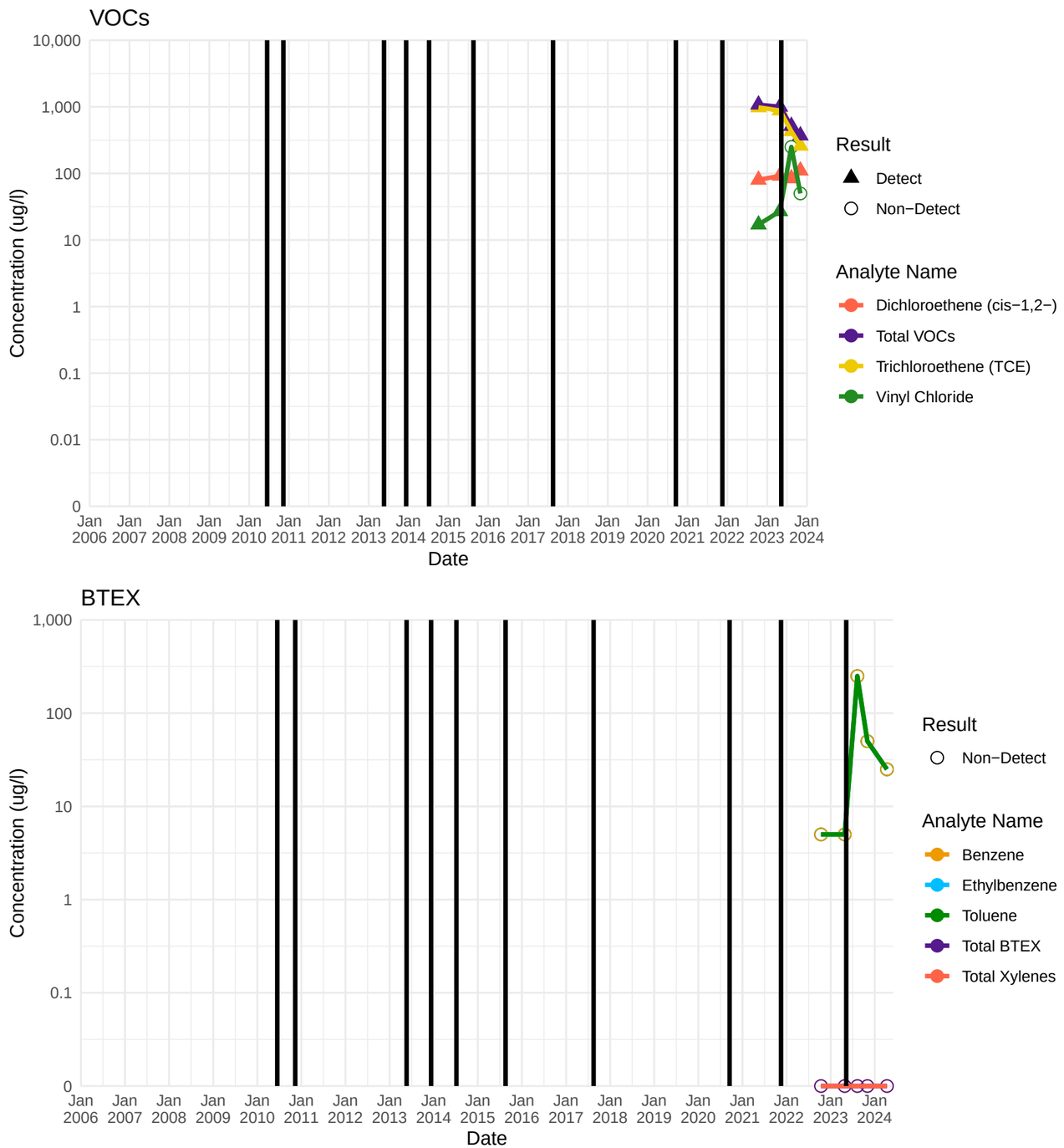
D−6

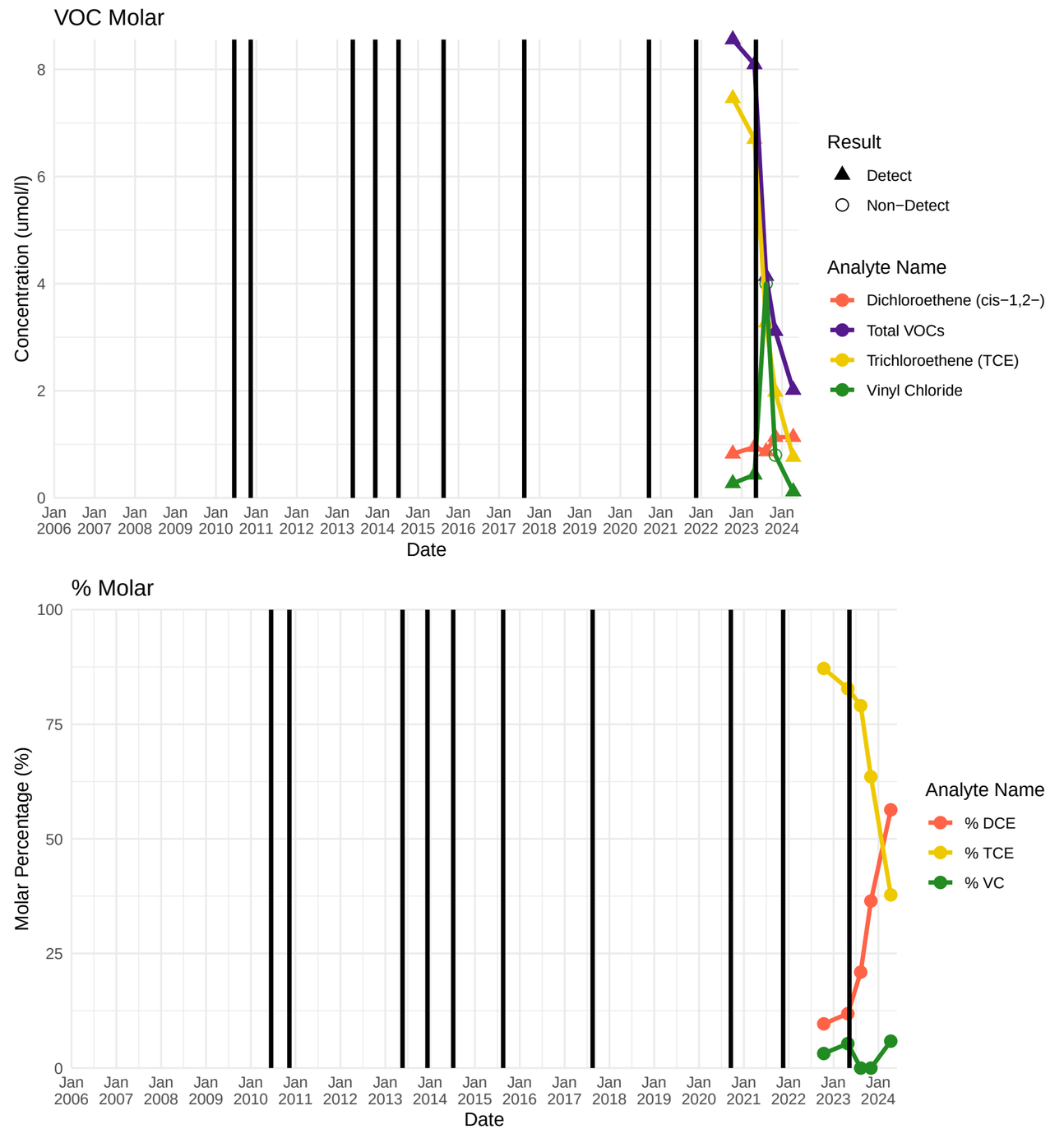
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





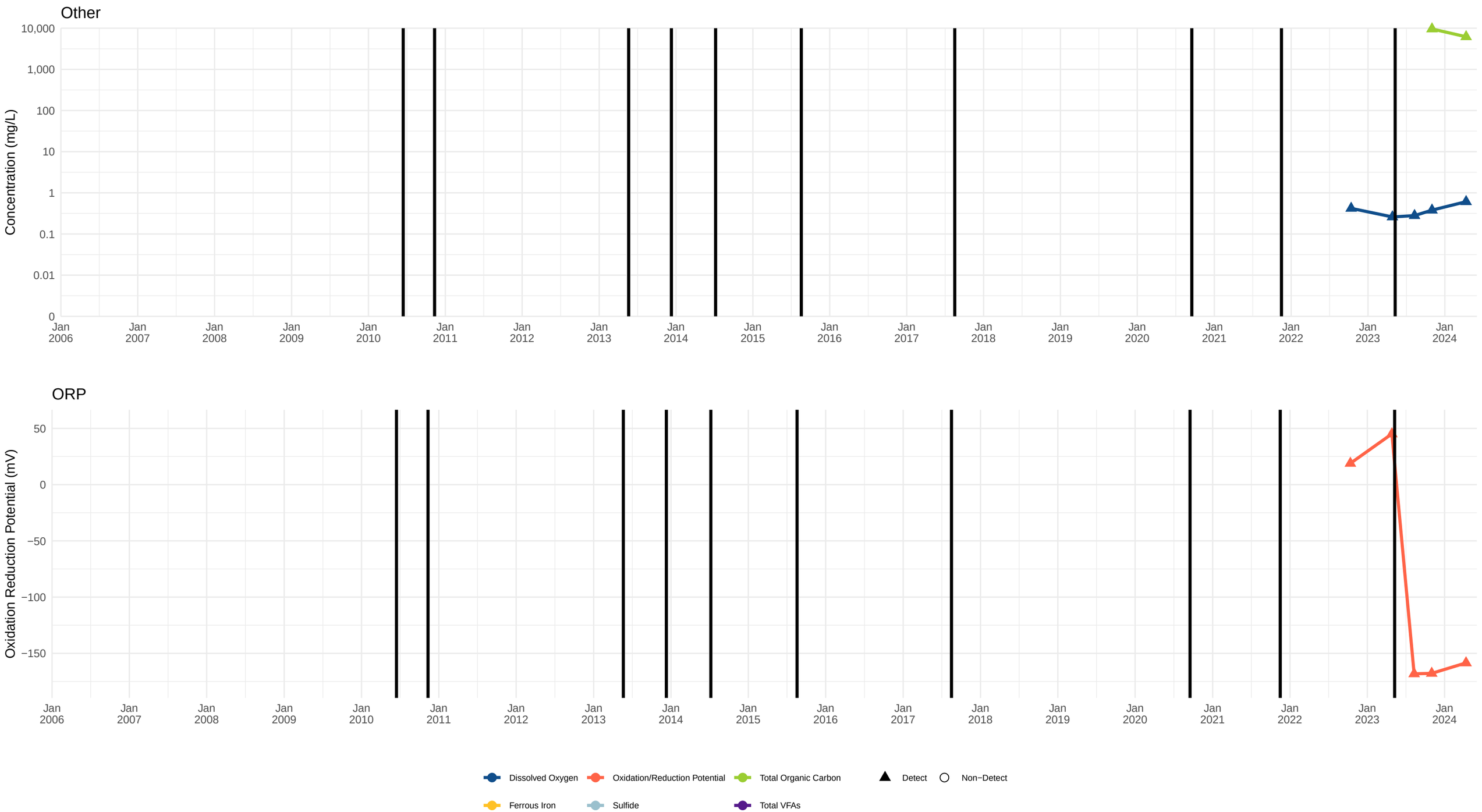
D−6

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



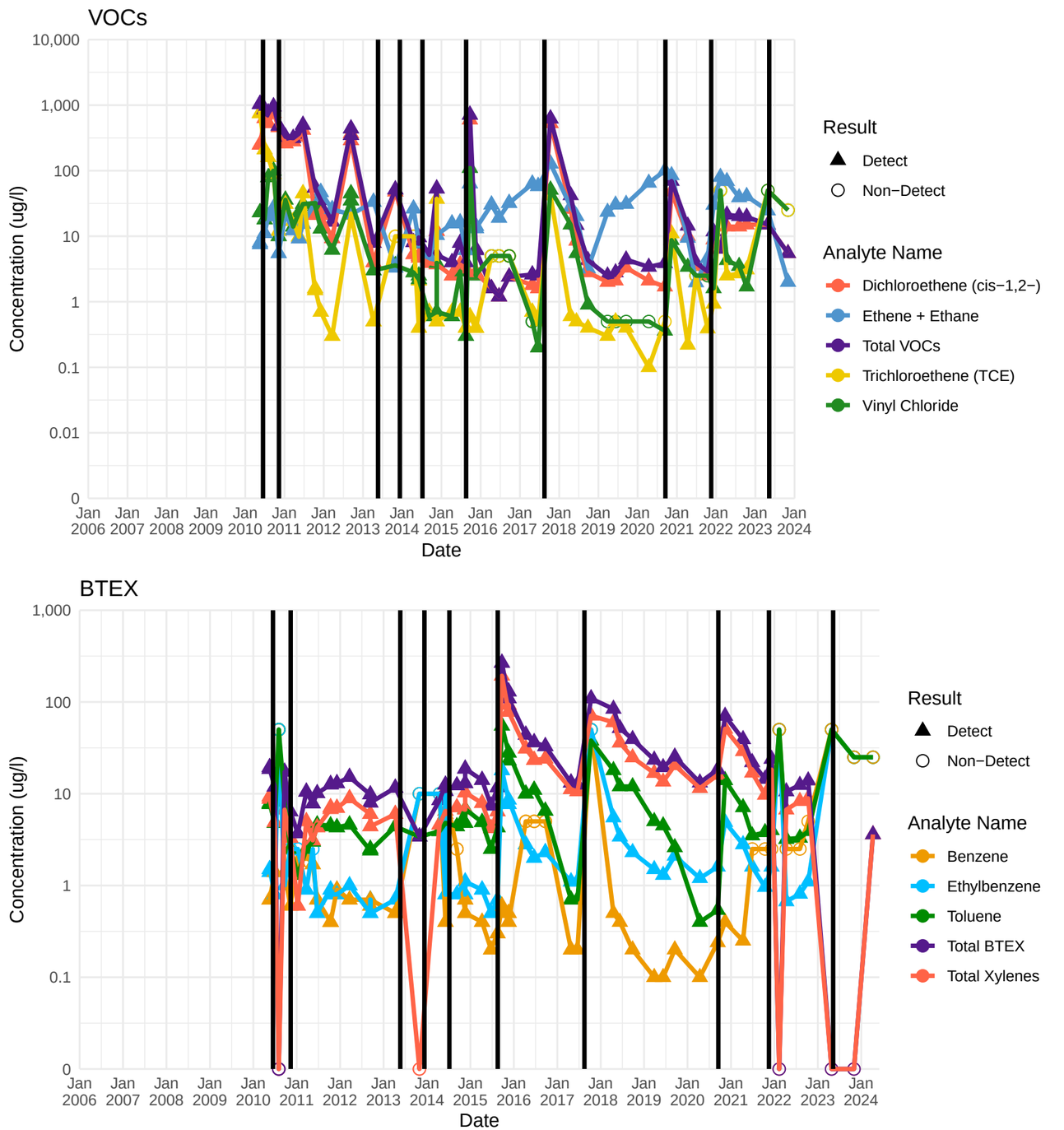
IB−7

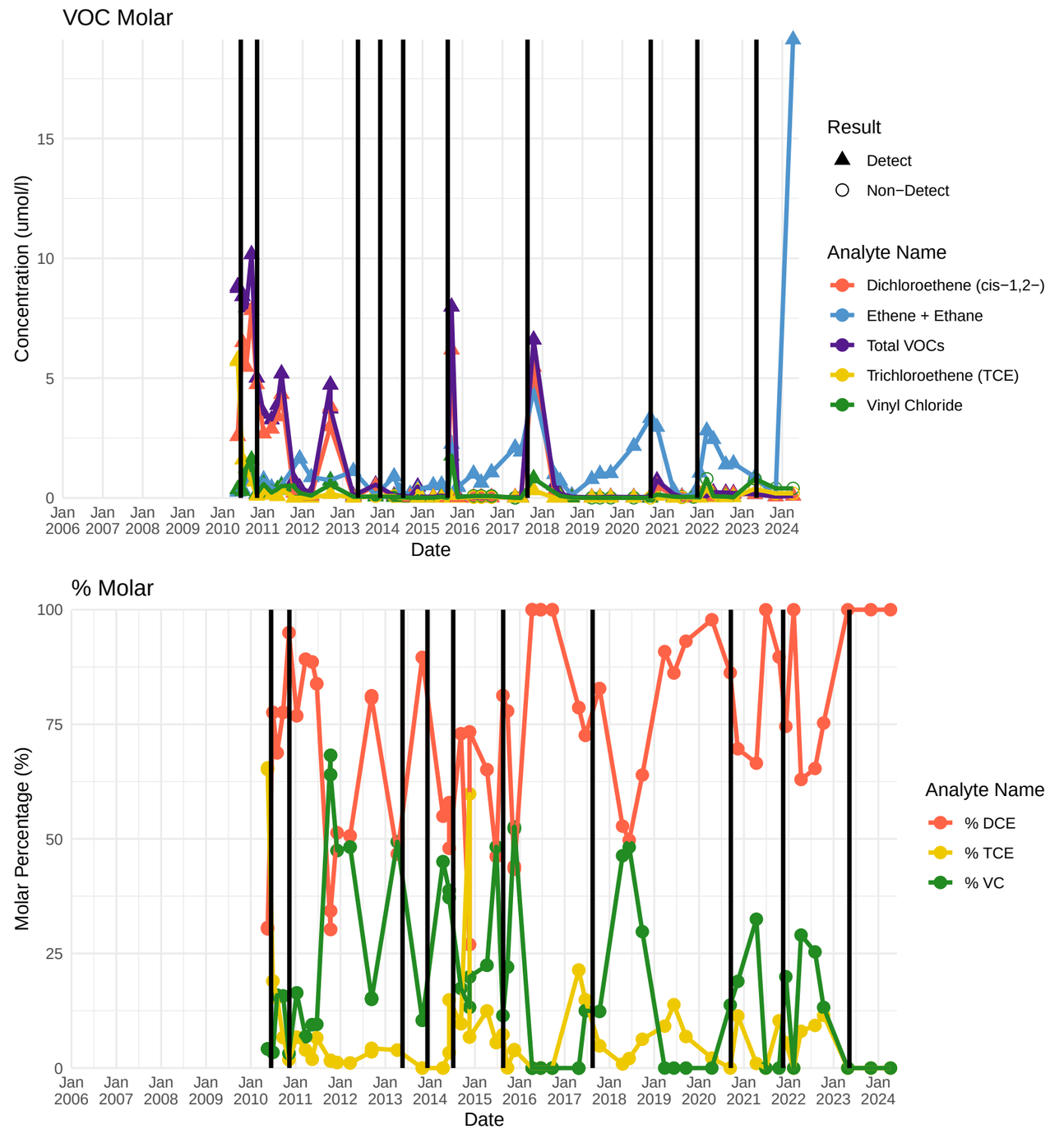
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





IB−7

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.

BP−1A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

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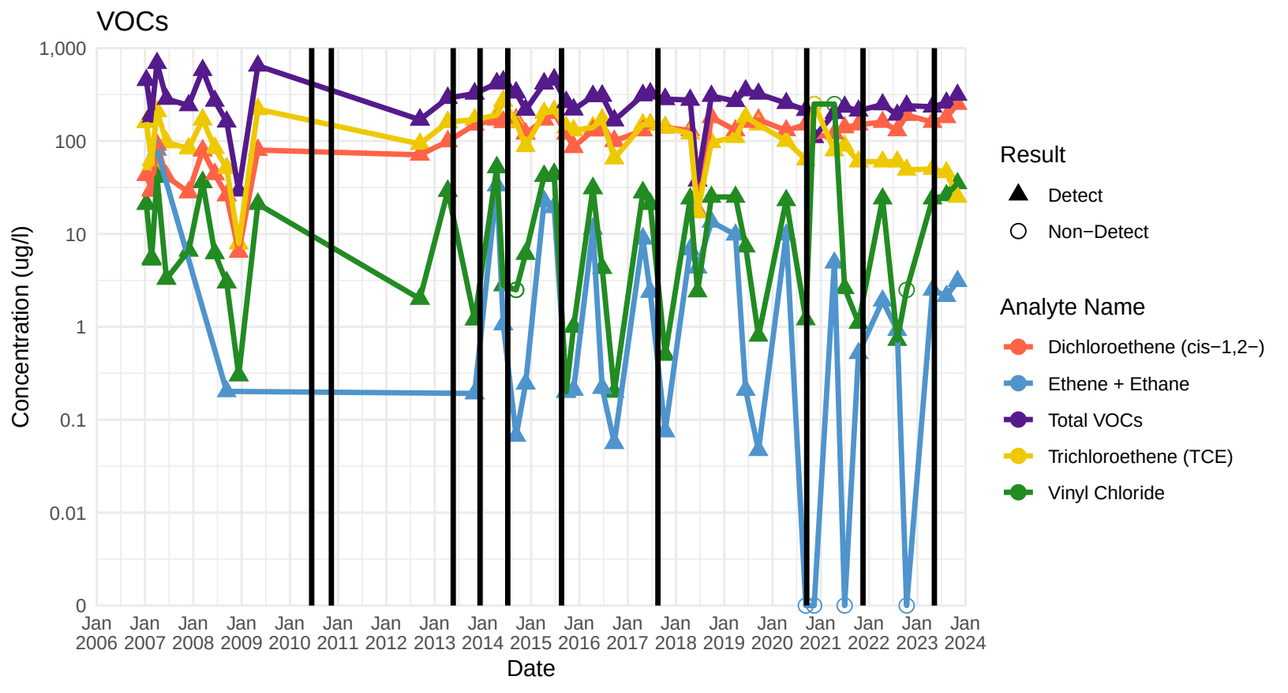

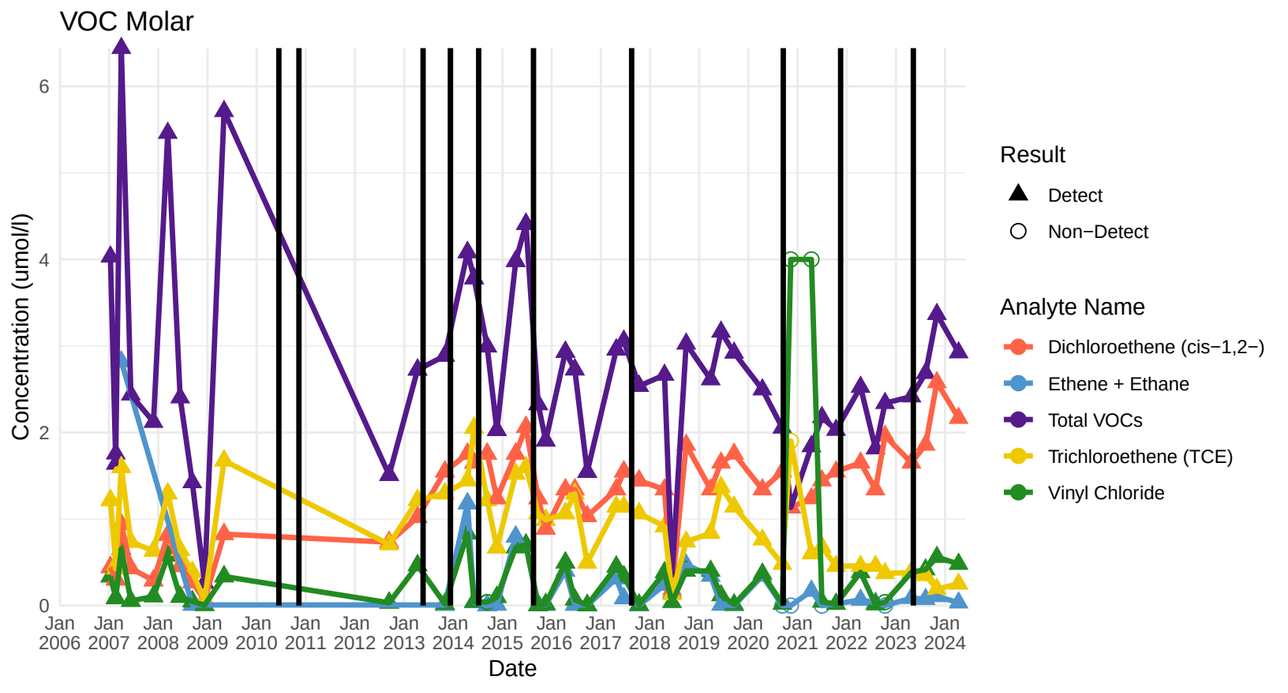

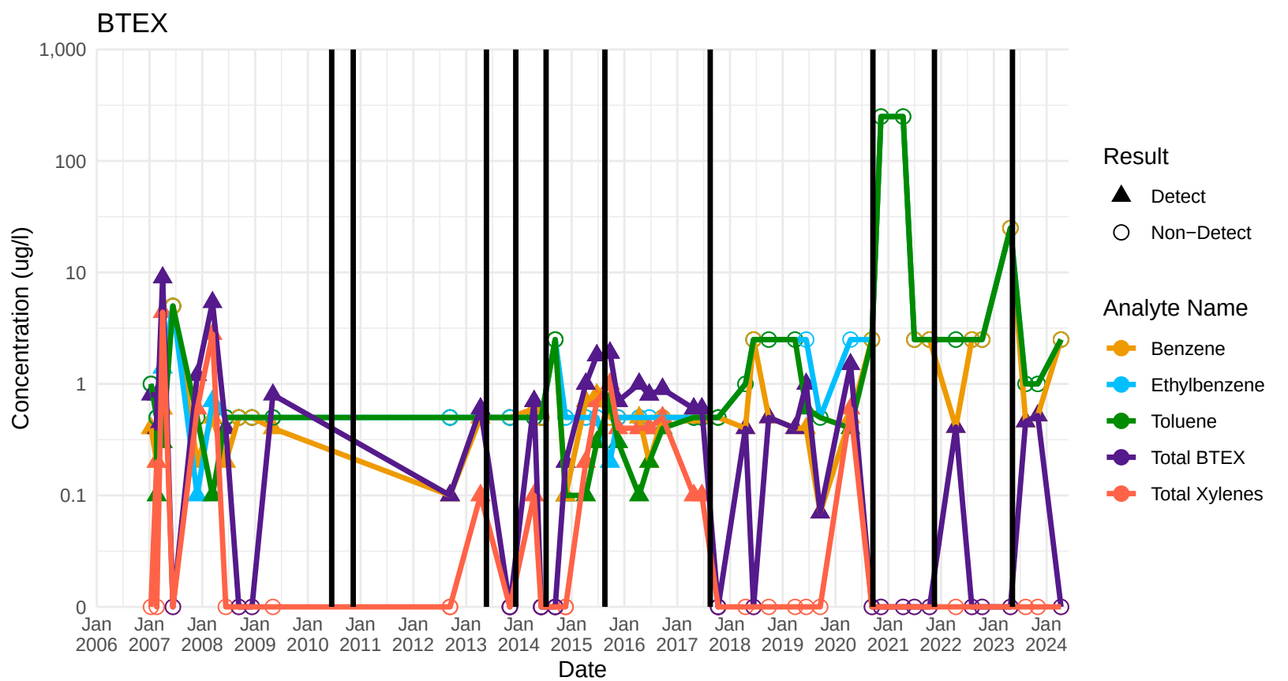

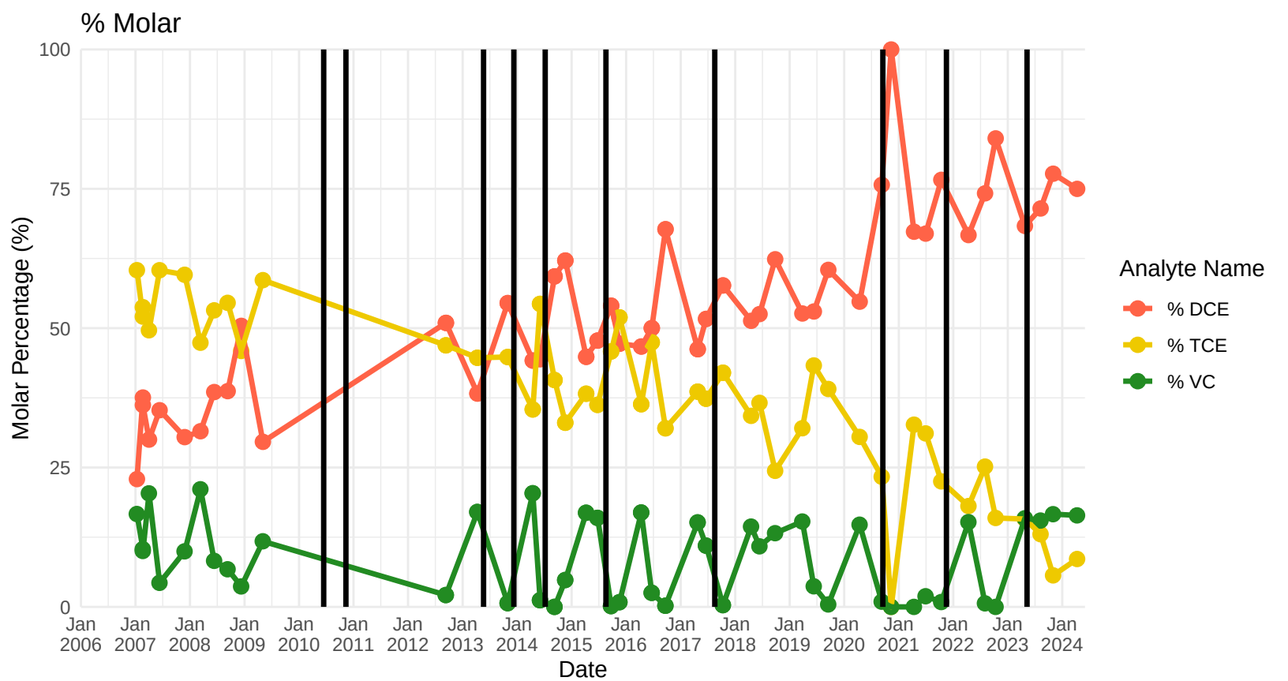

BP−1A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

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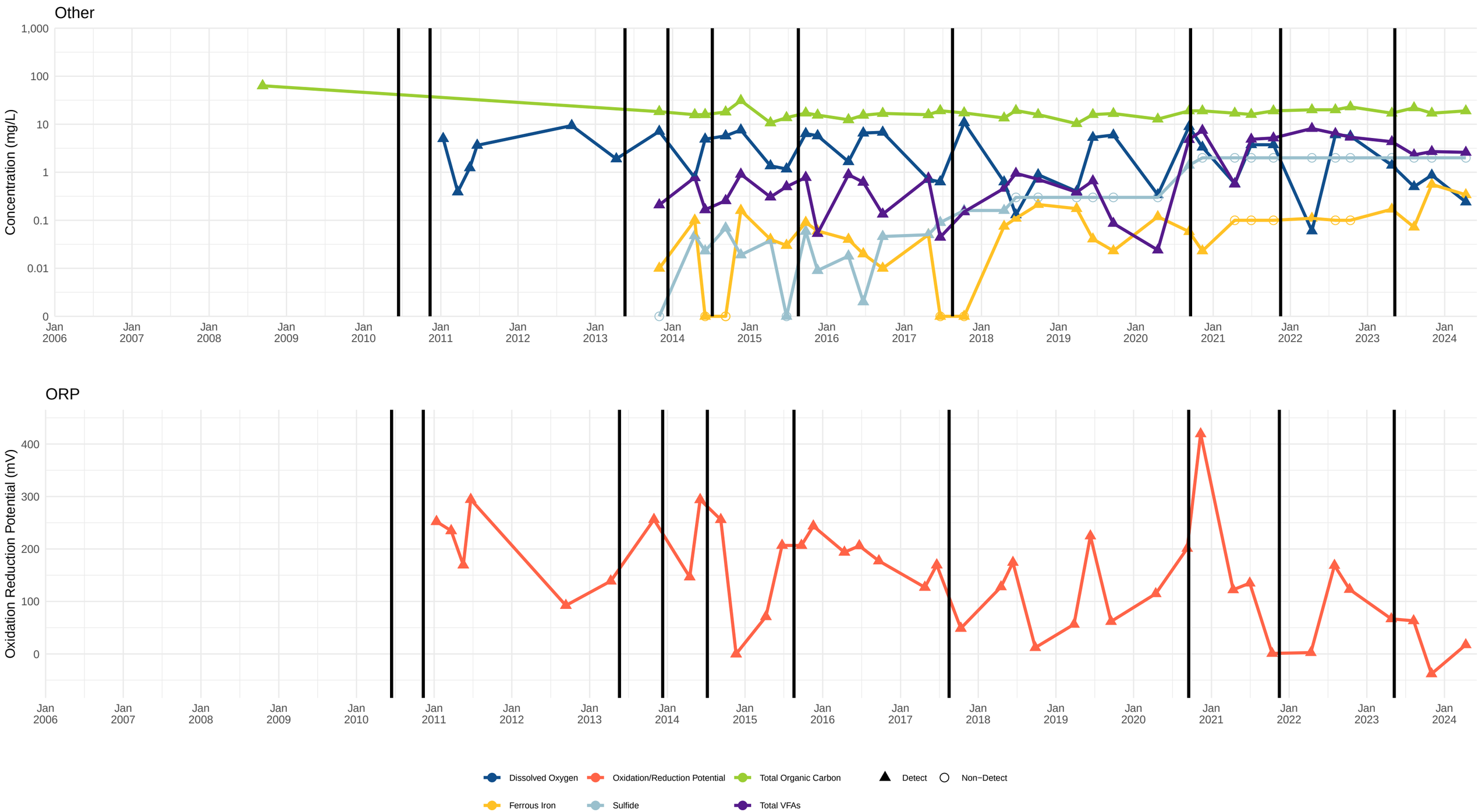


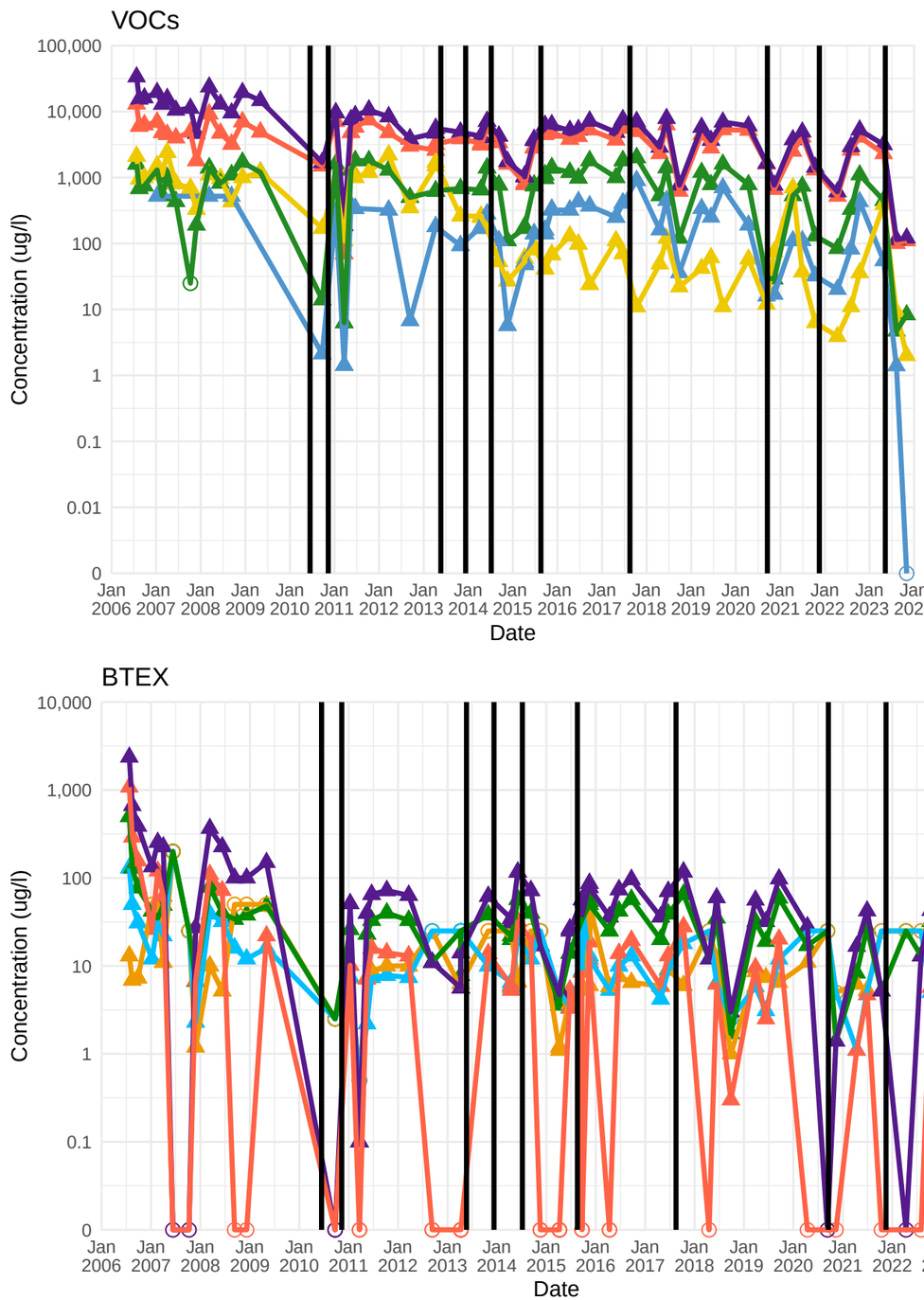
BP−2A

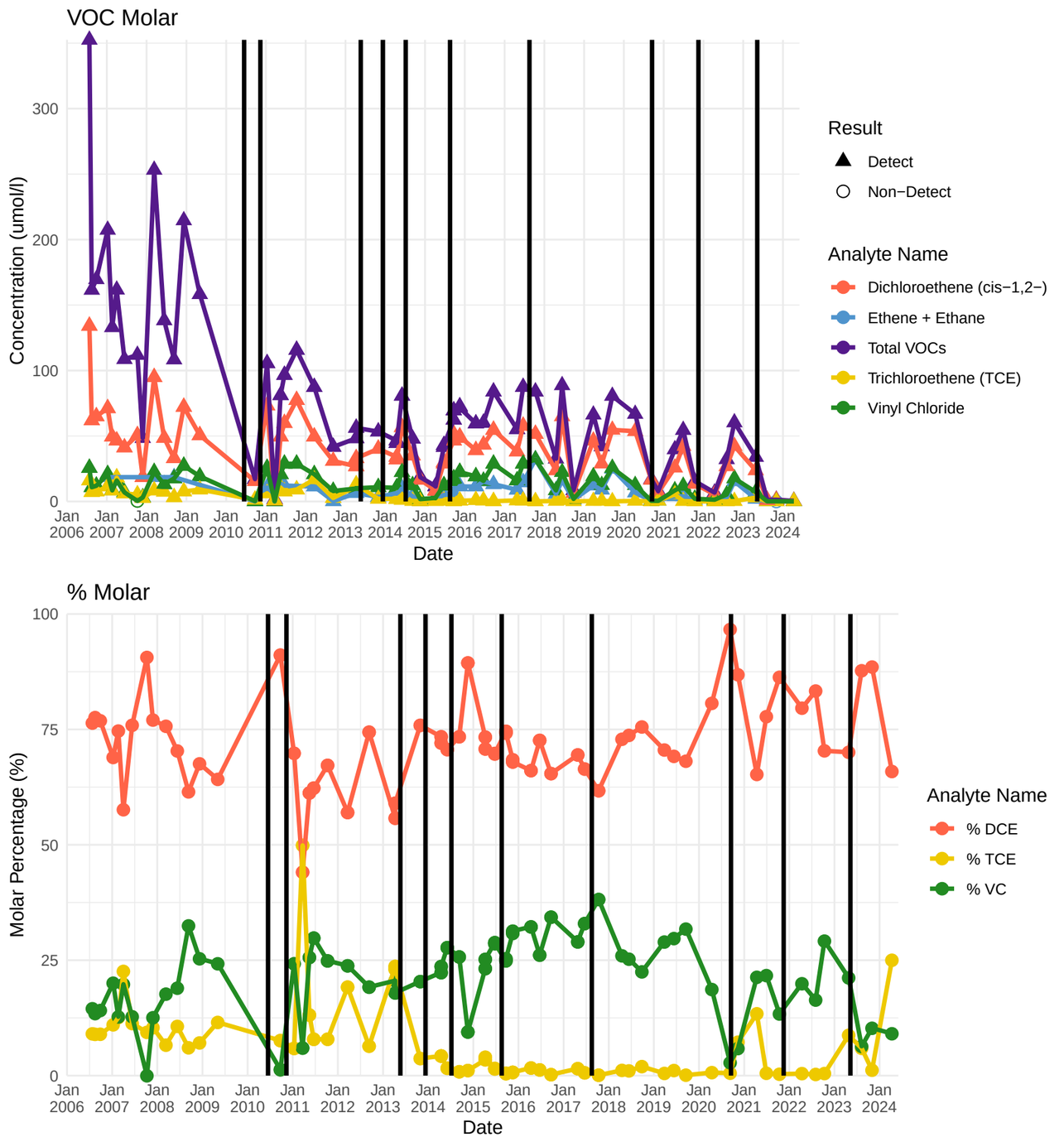
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





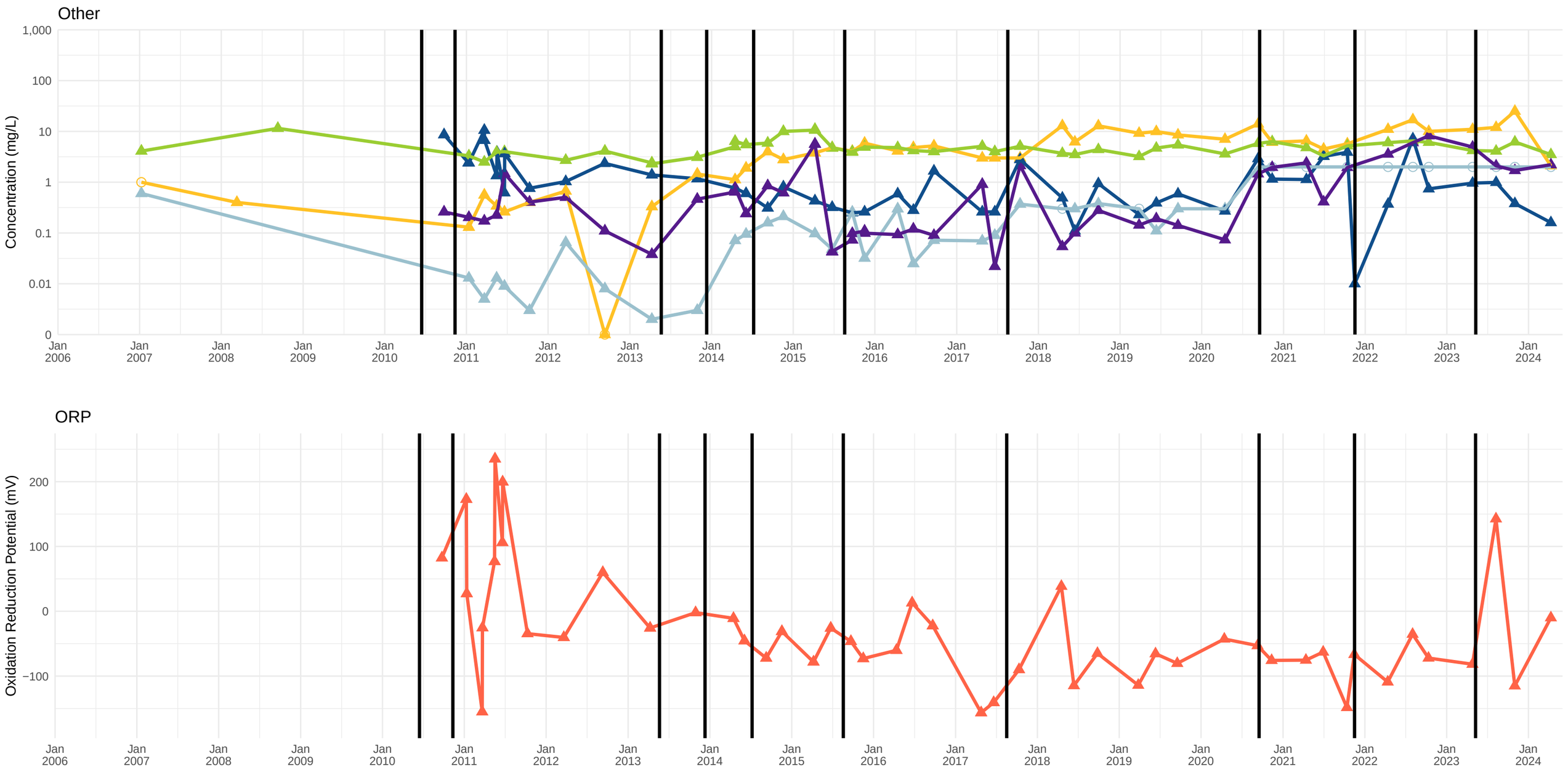
BP−2A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



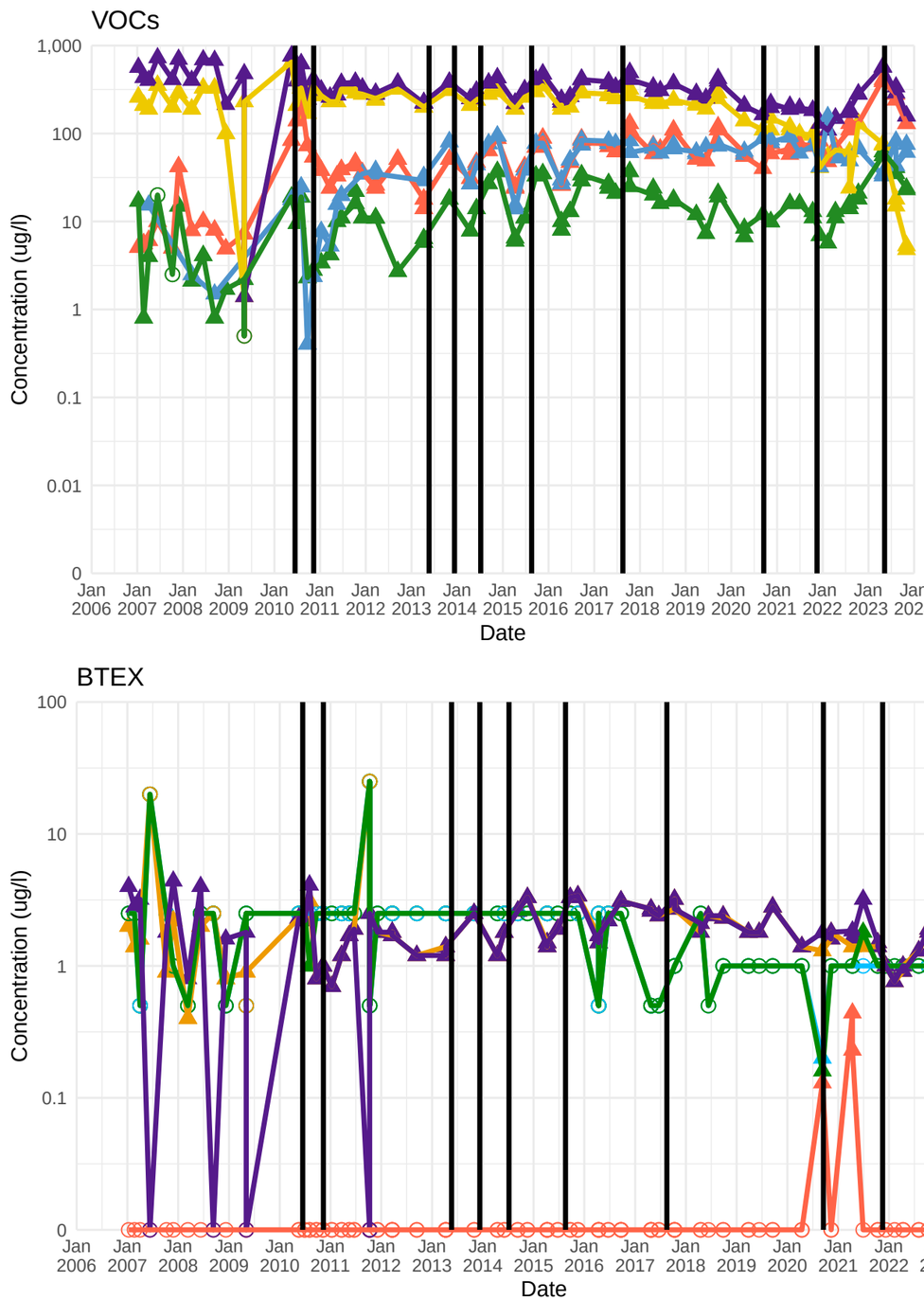
BP−4A

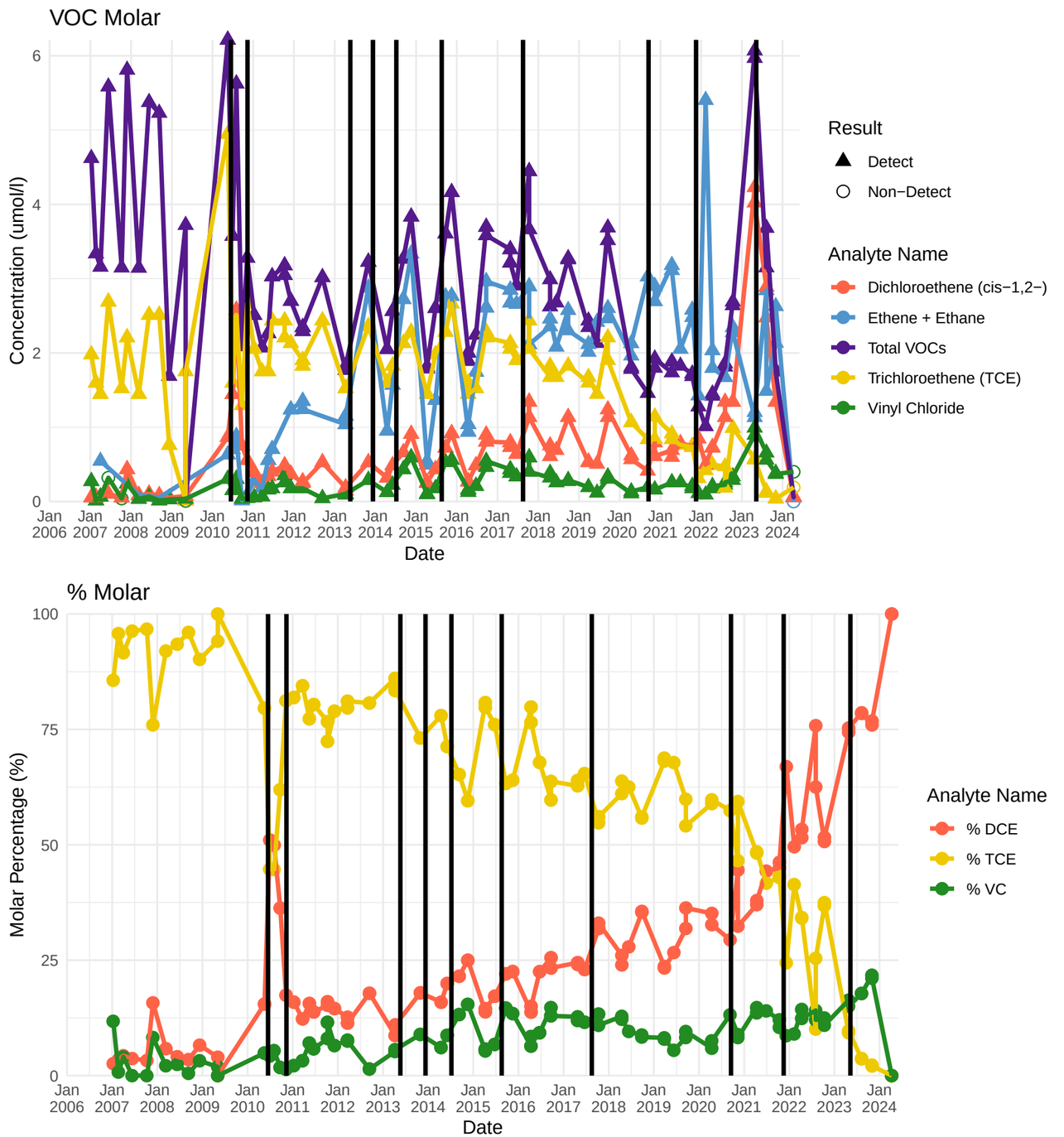
Notes:

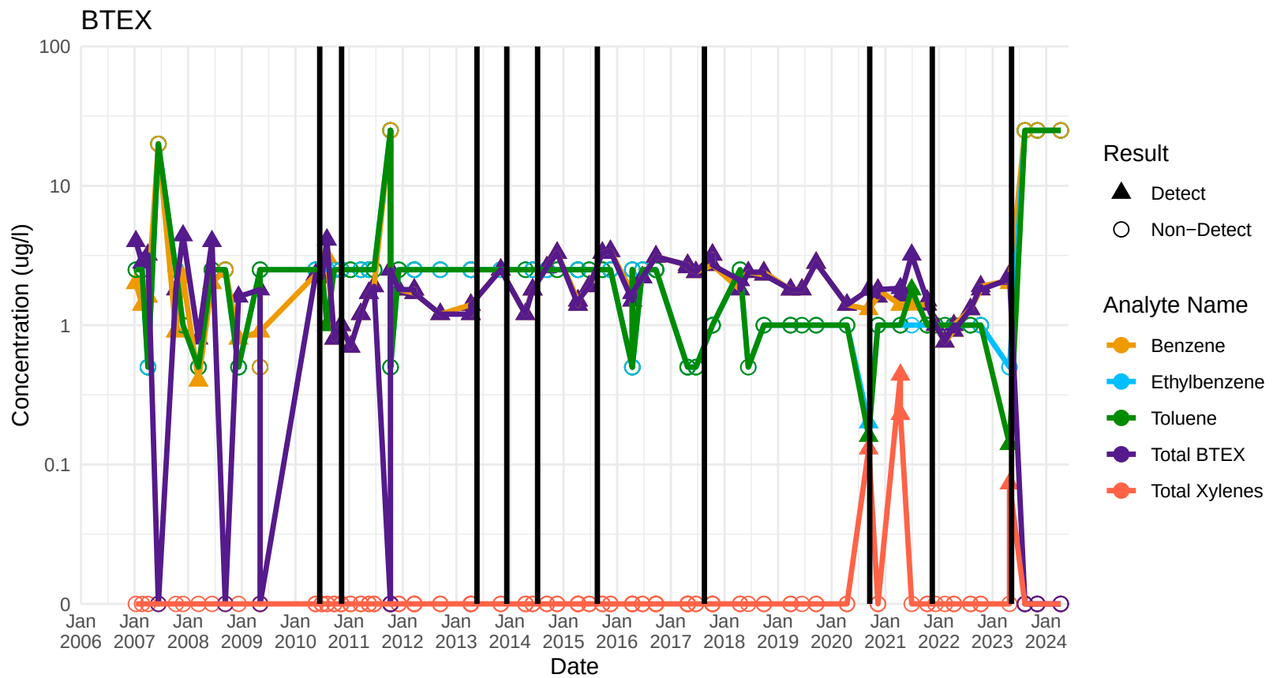
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.







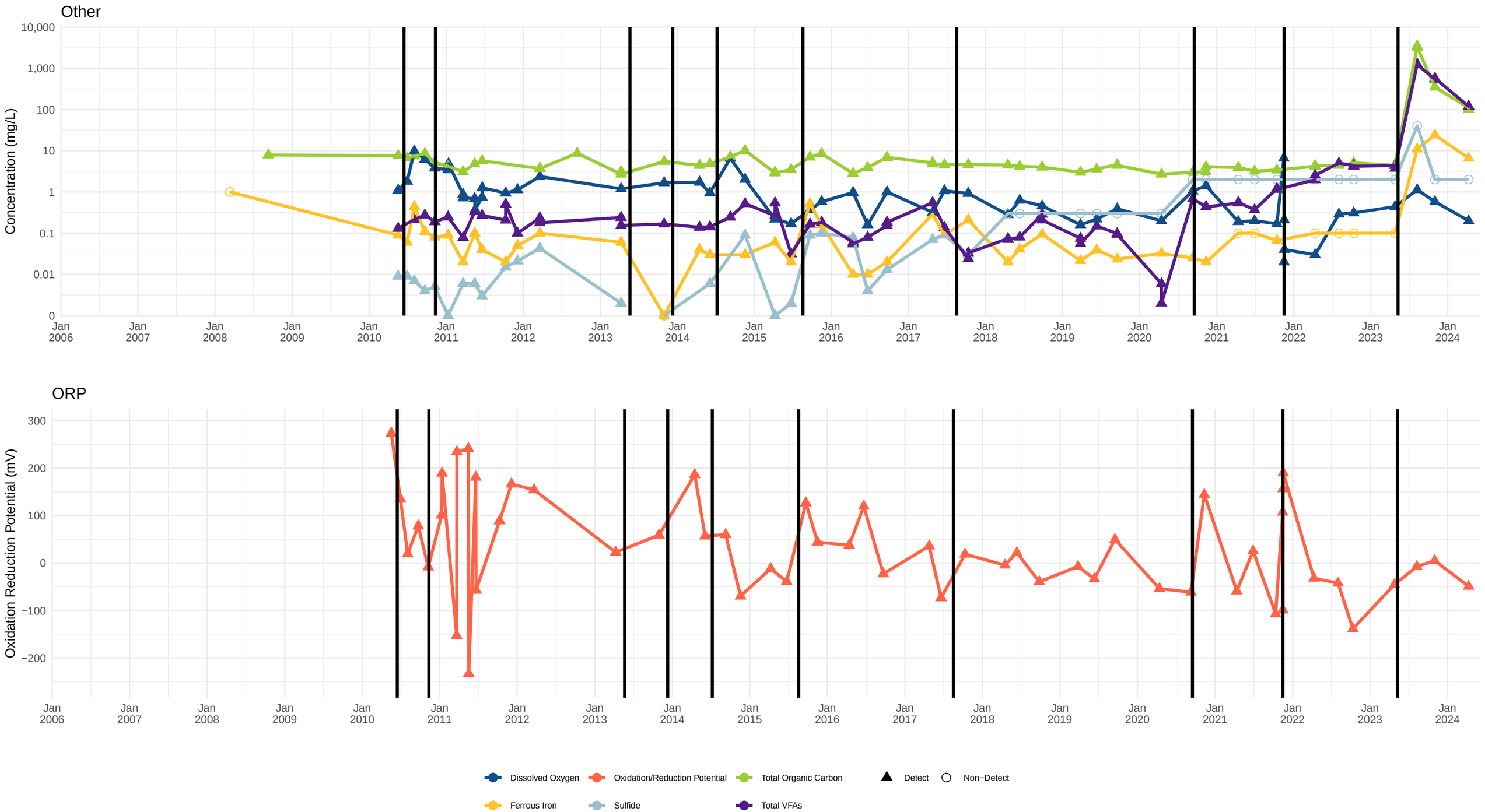
BP−4A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



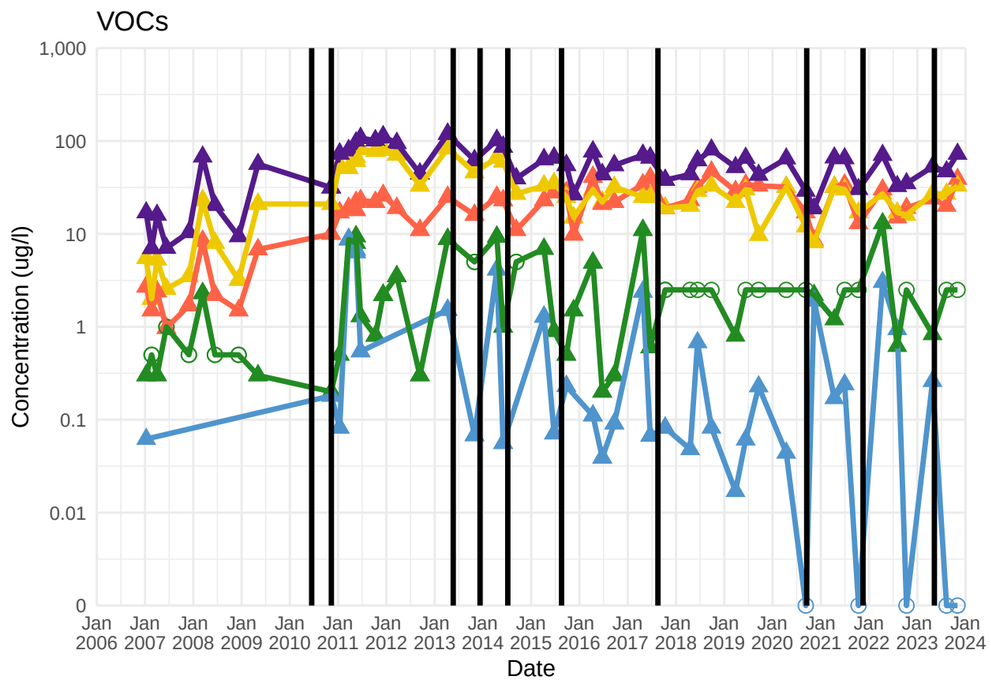
BP−5A

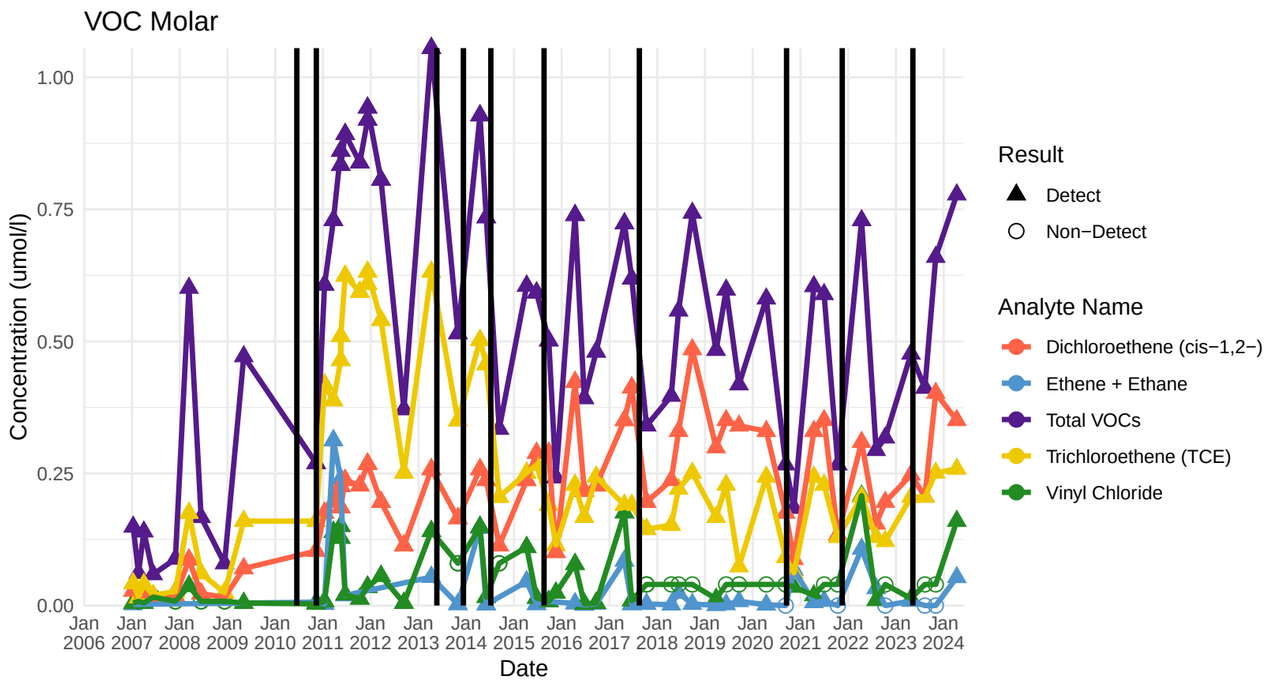
Notes:

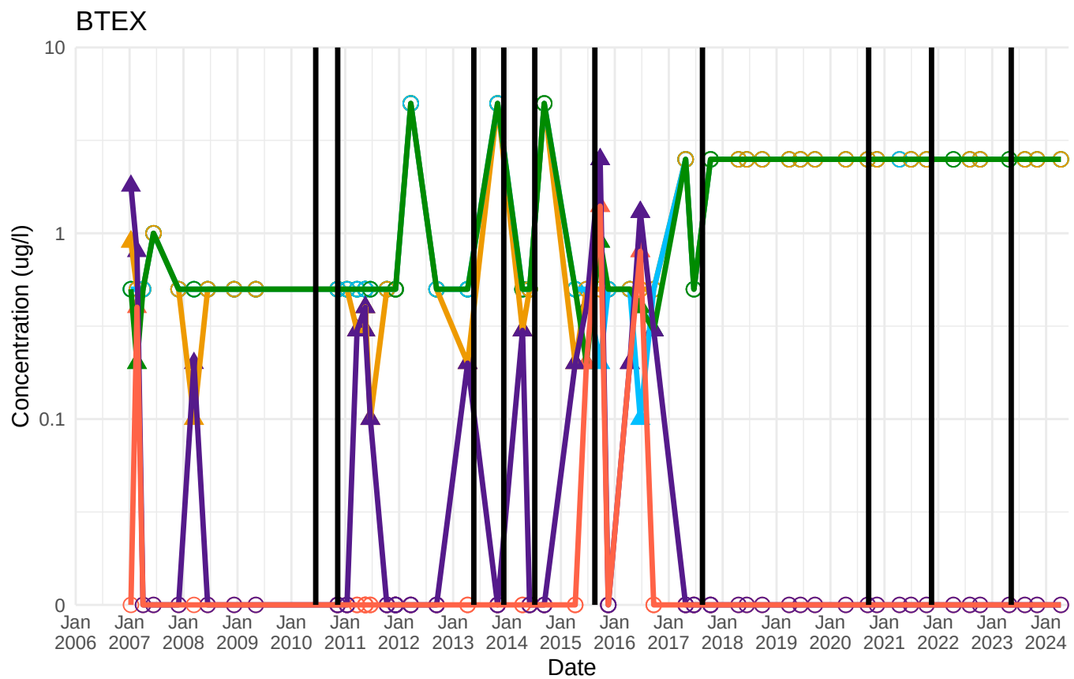
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

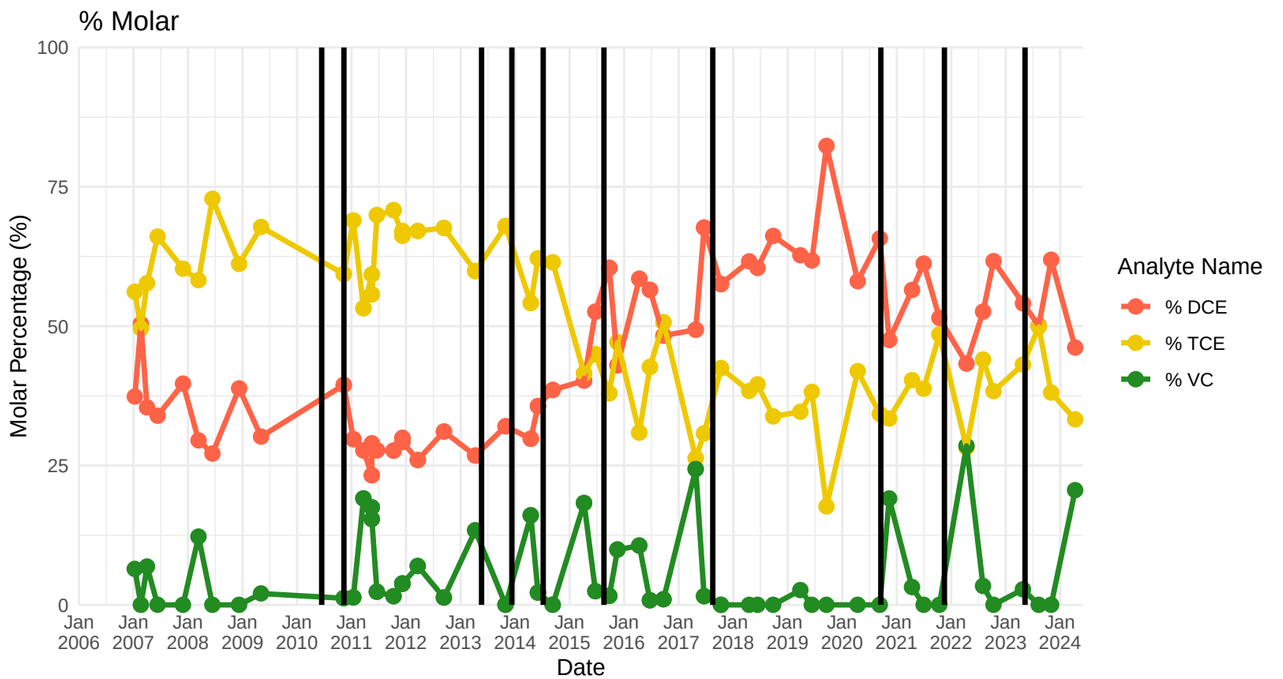
(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.









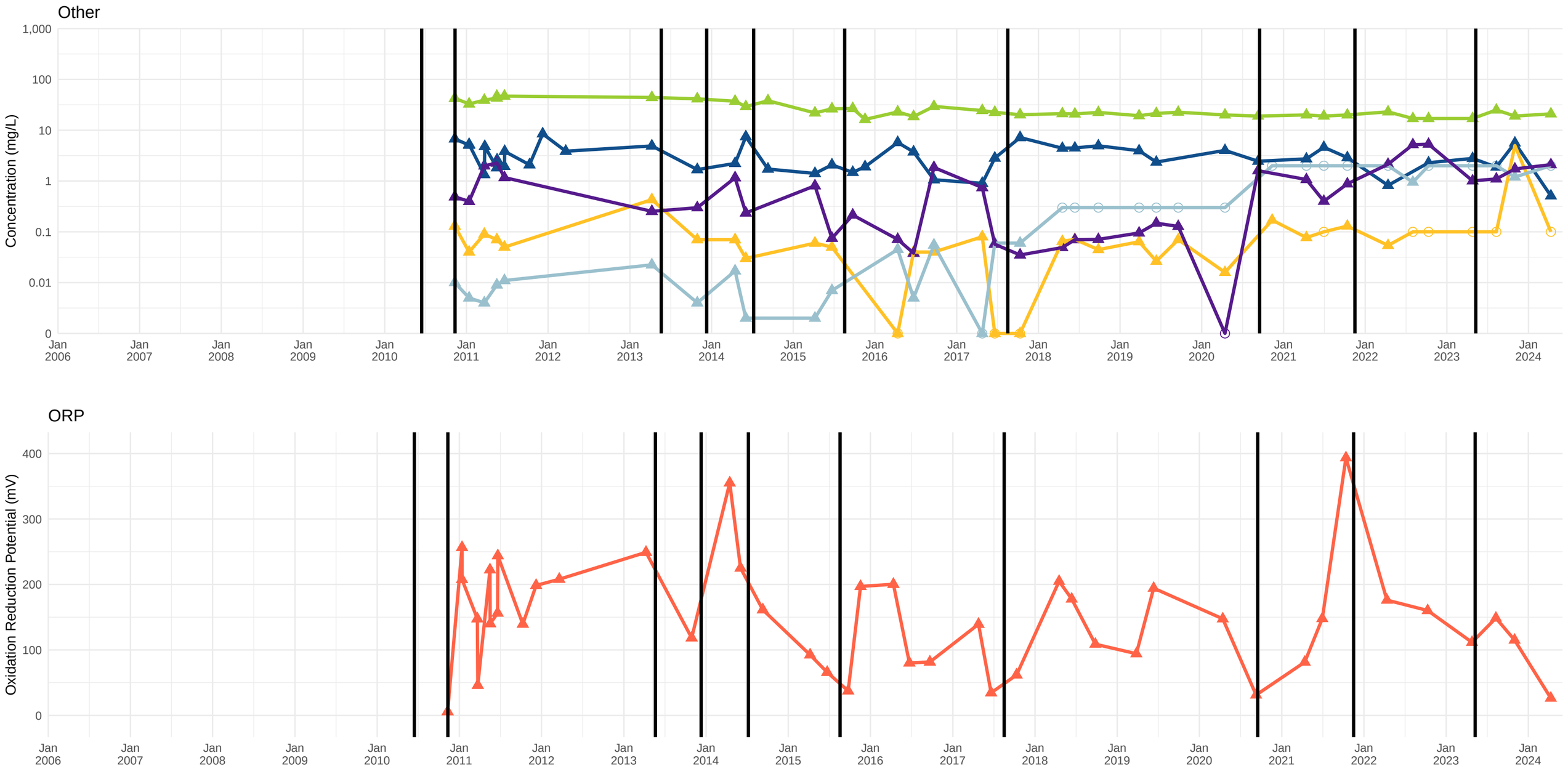
BP−5A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



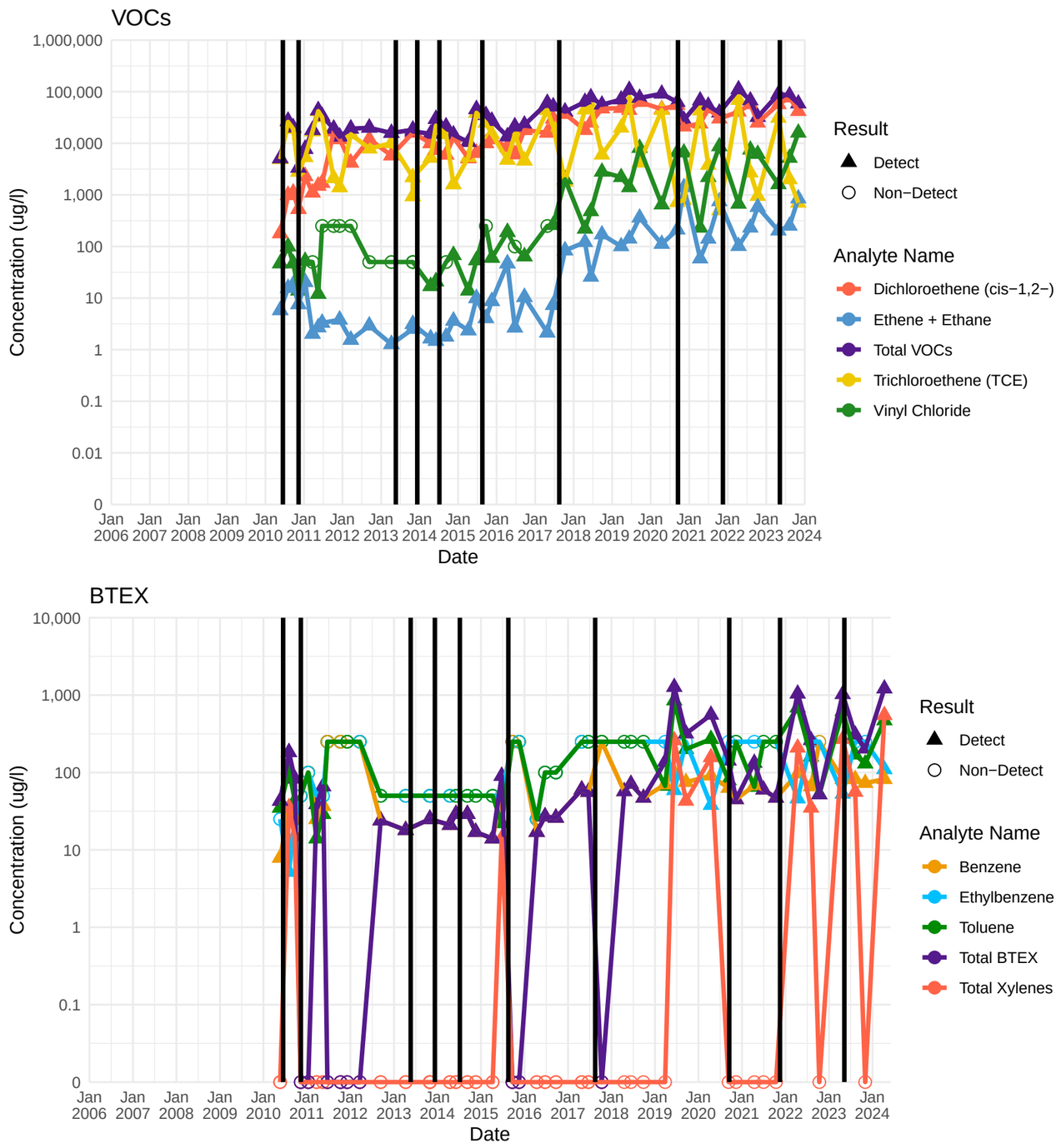
BP−6A

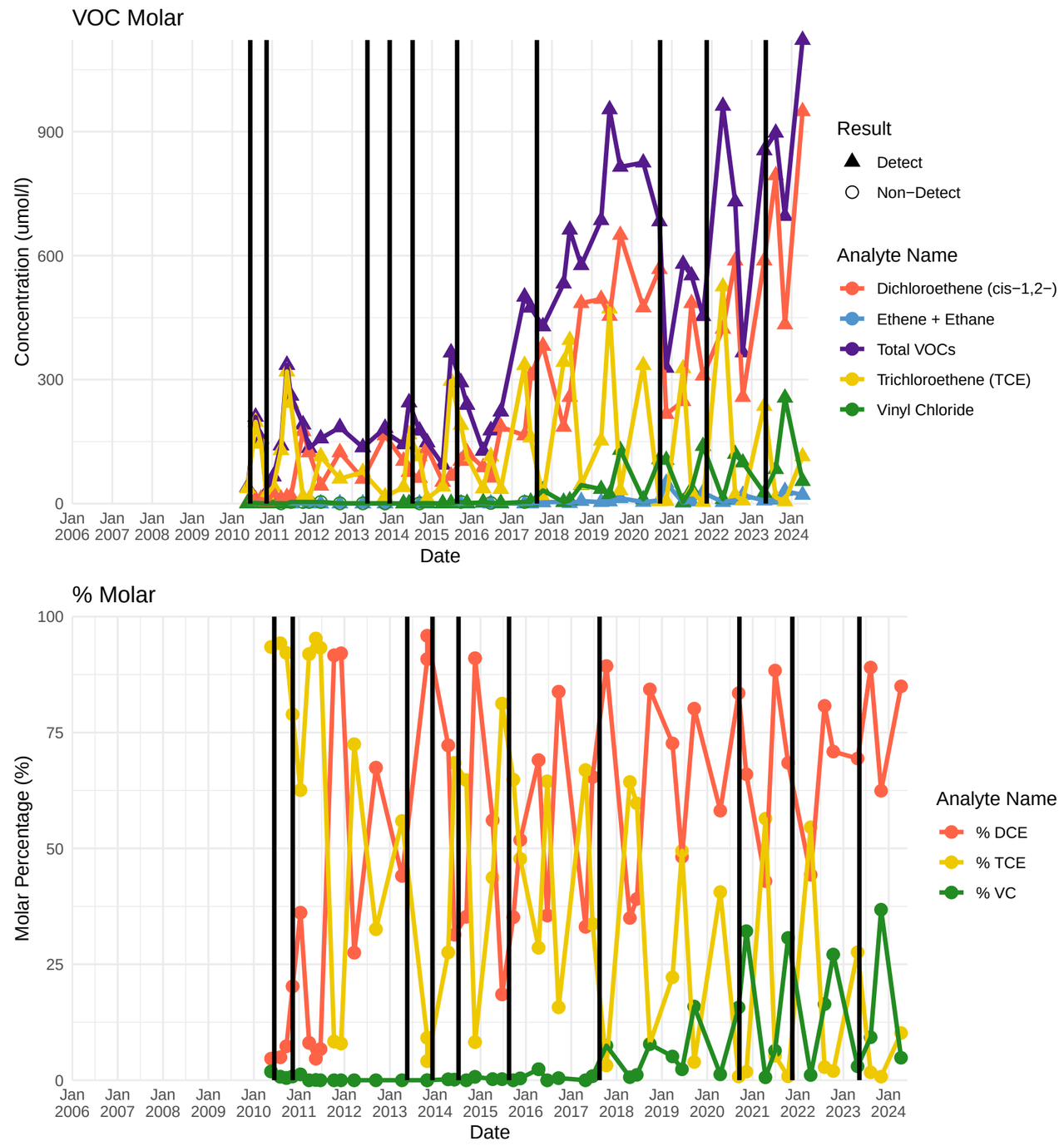
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





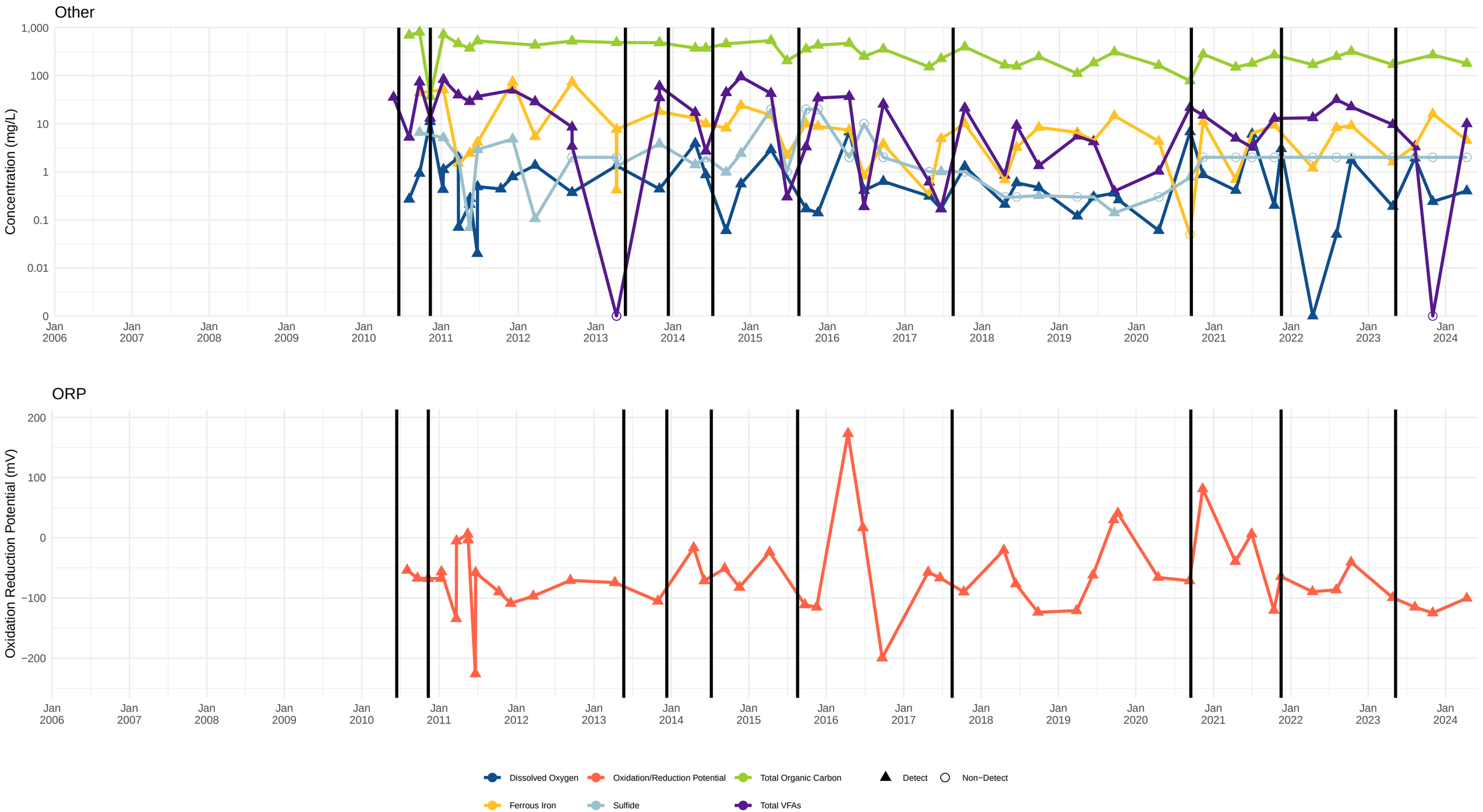
BP−6A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



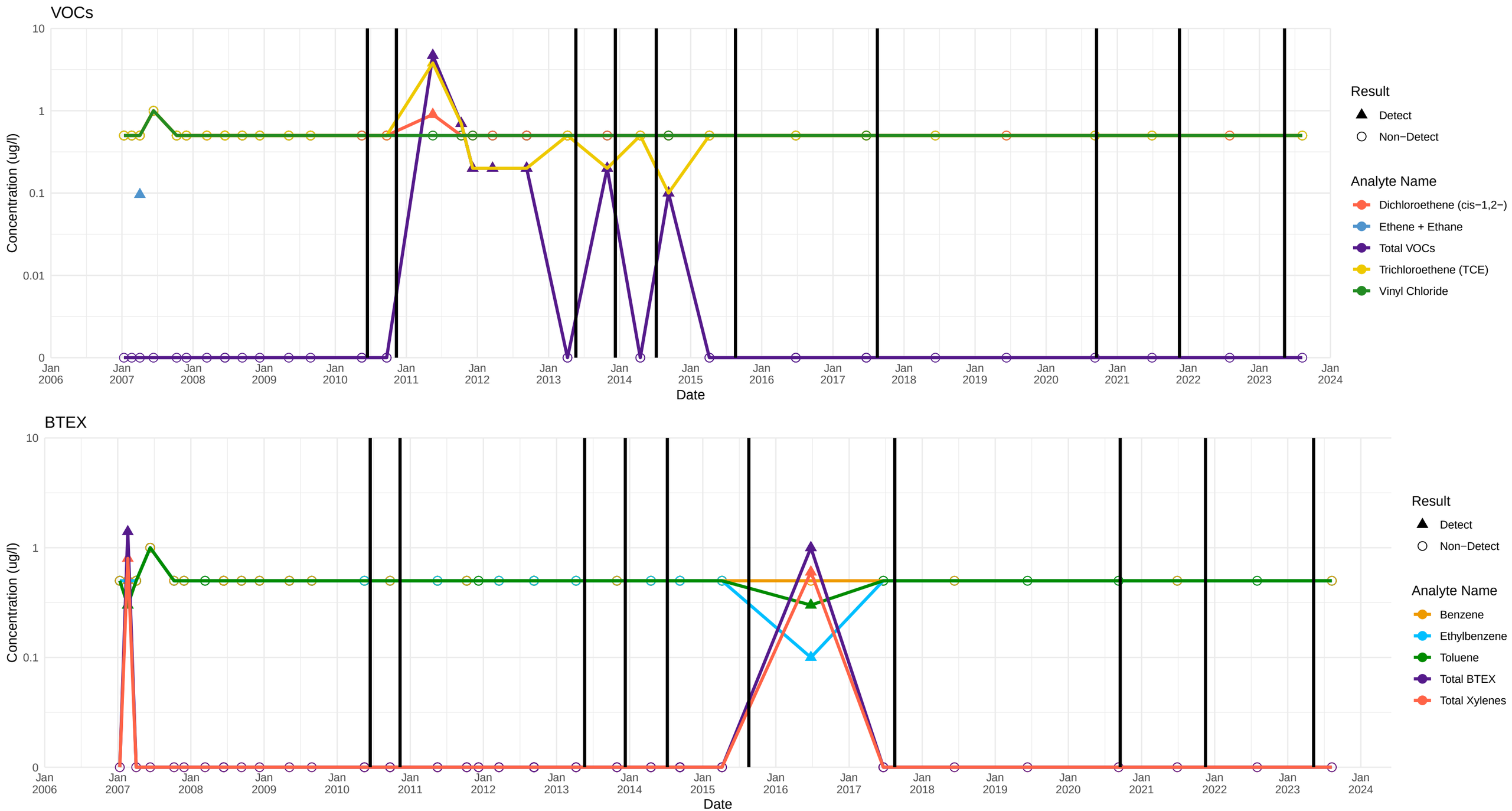
BP−7A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



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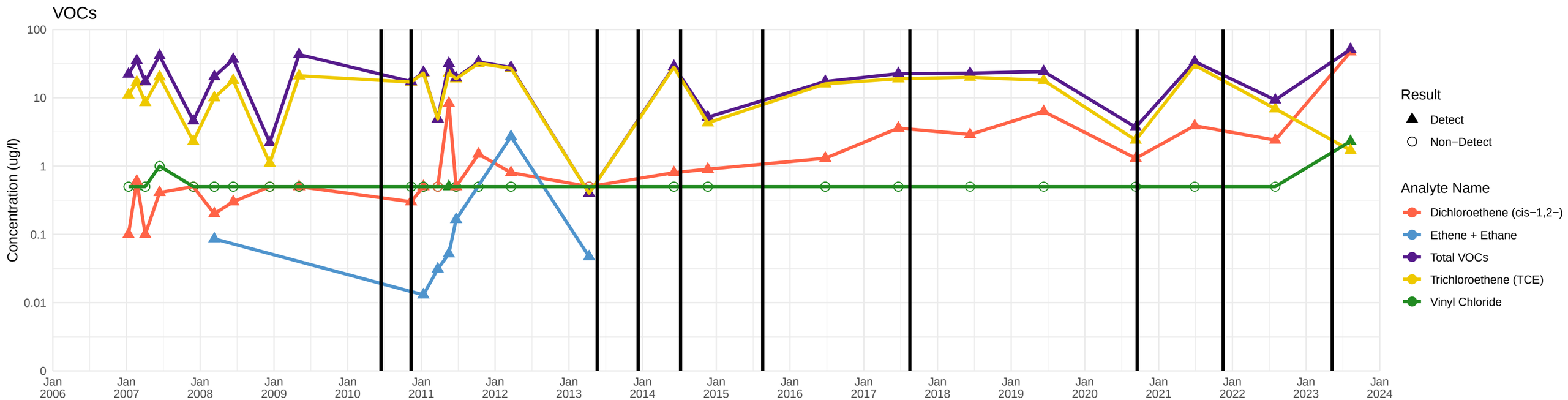
BP−8A

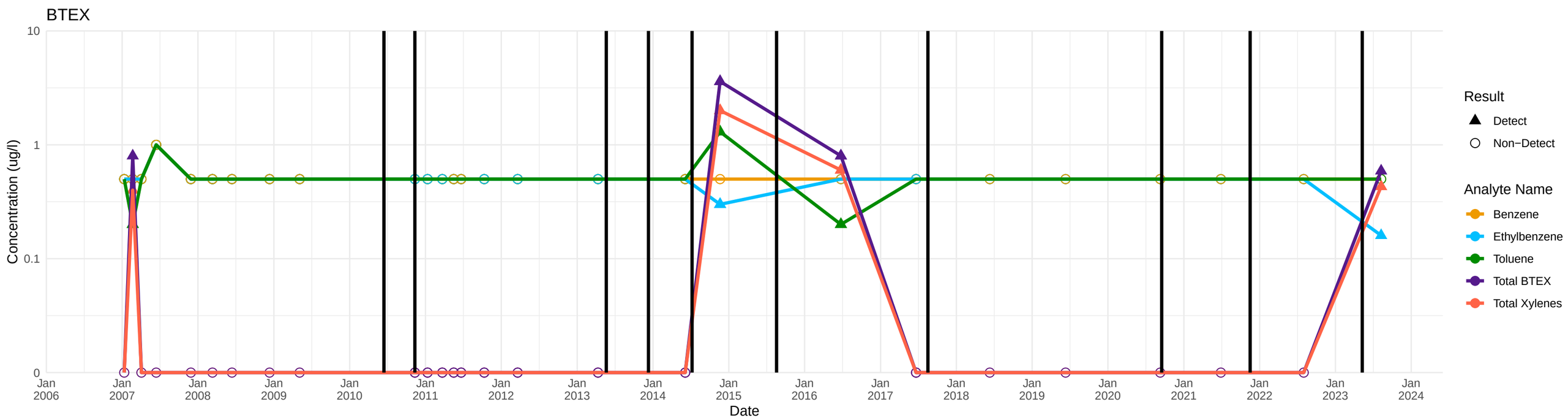
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





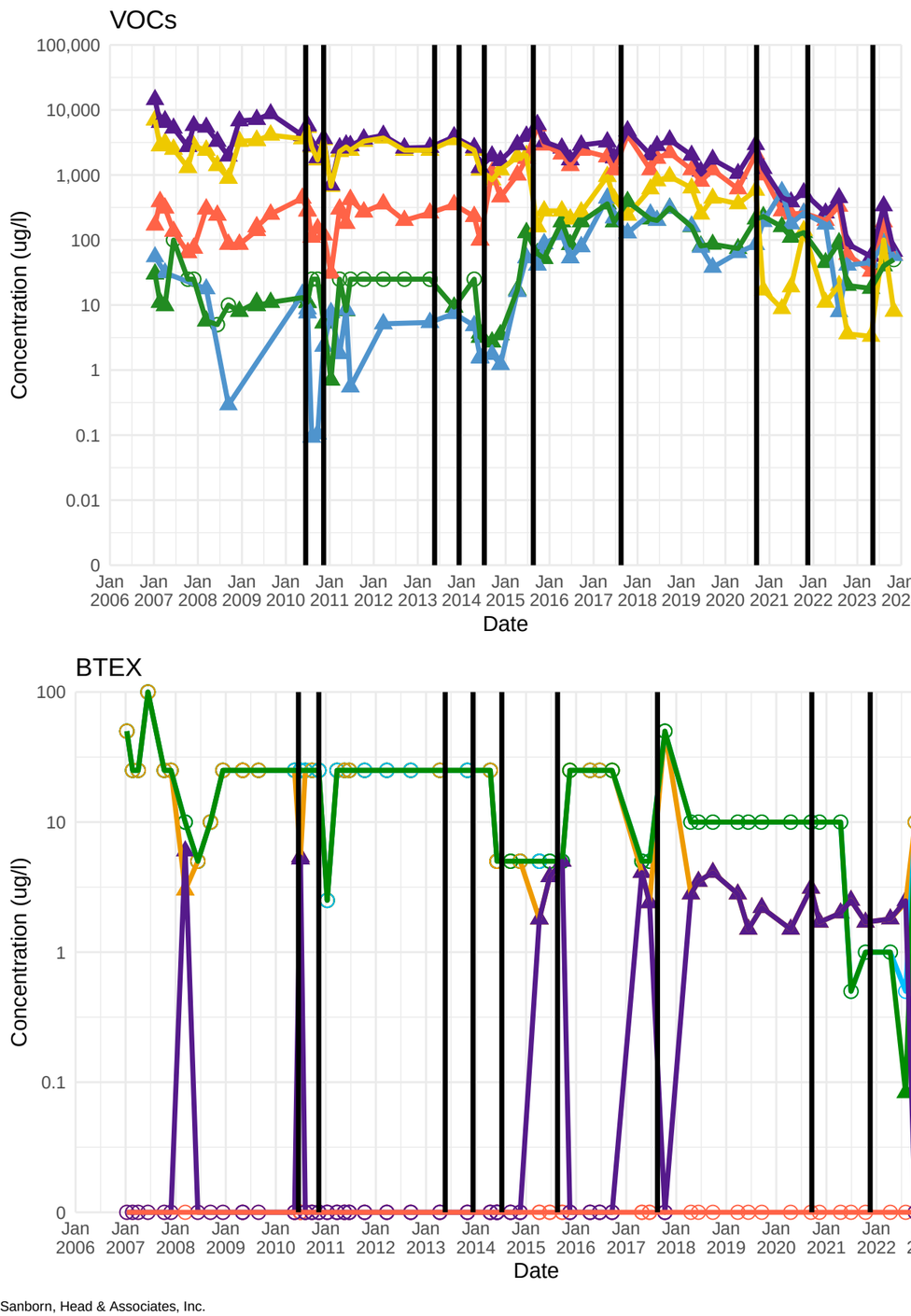
BP−9A

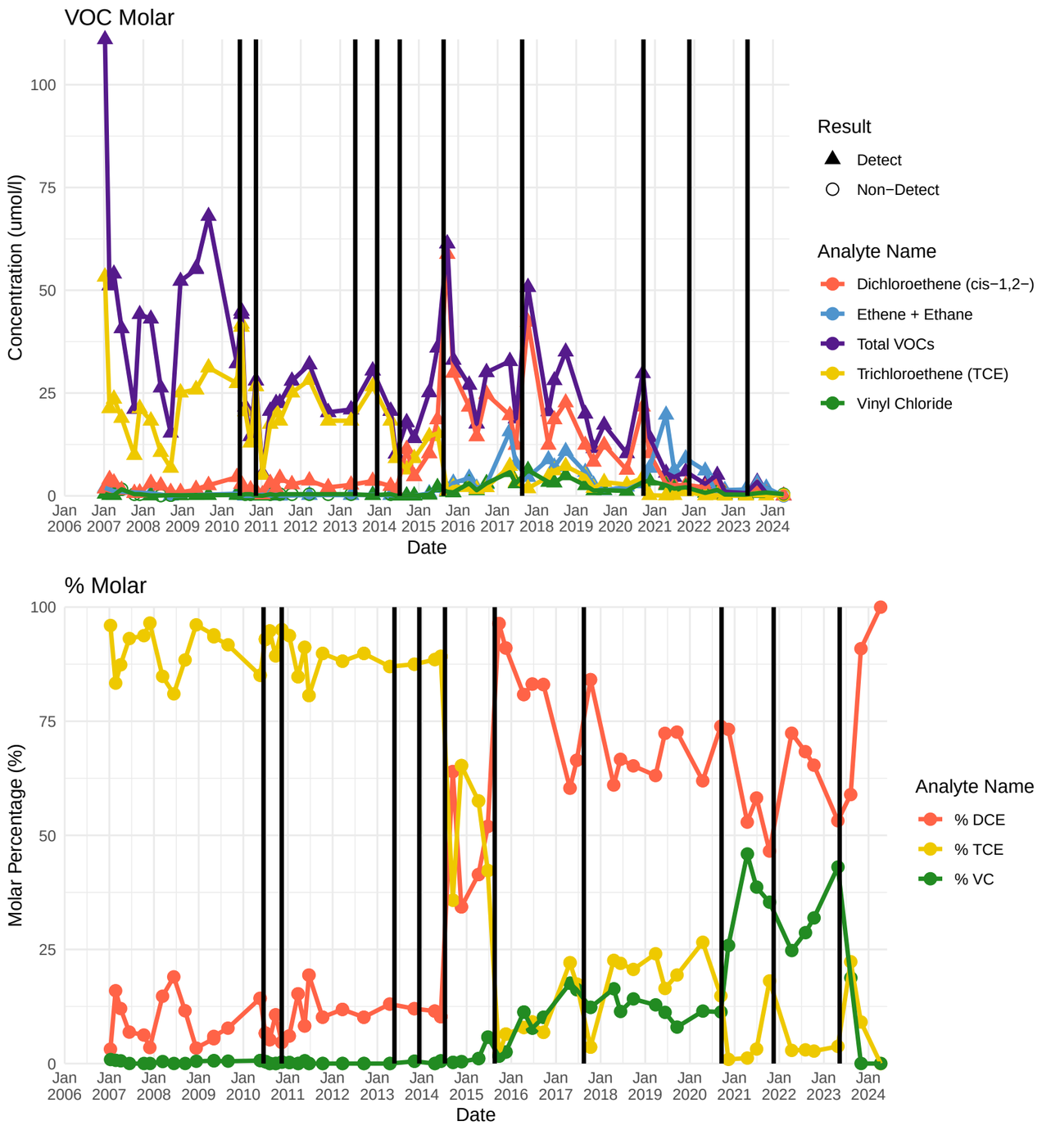
Notes:

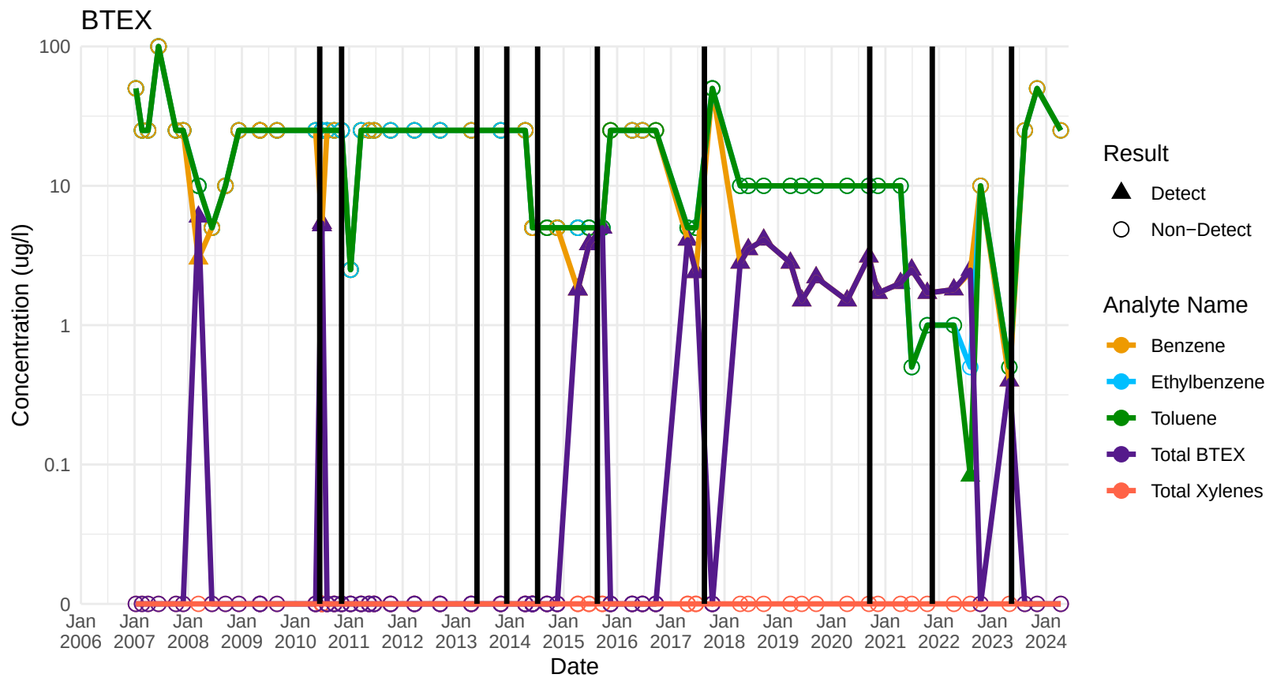
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.







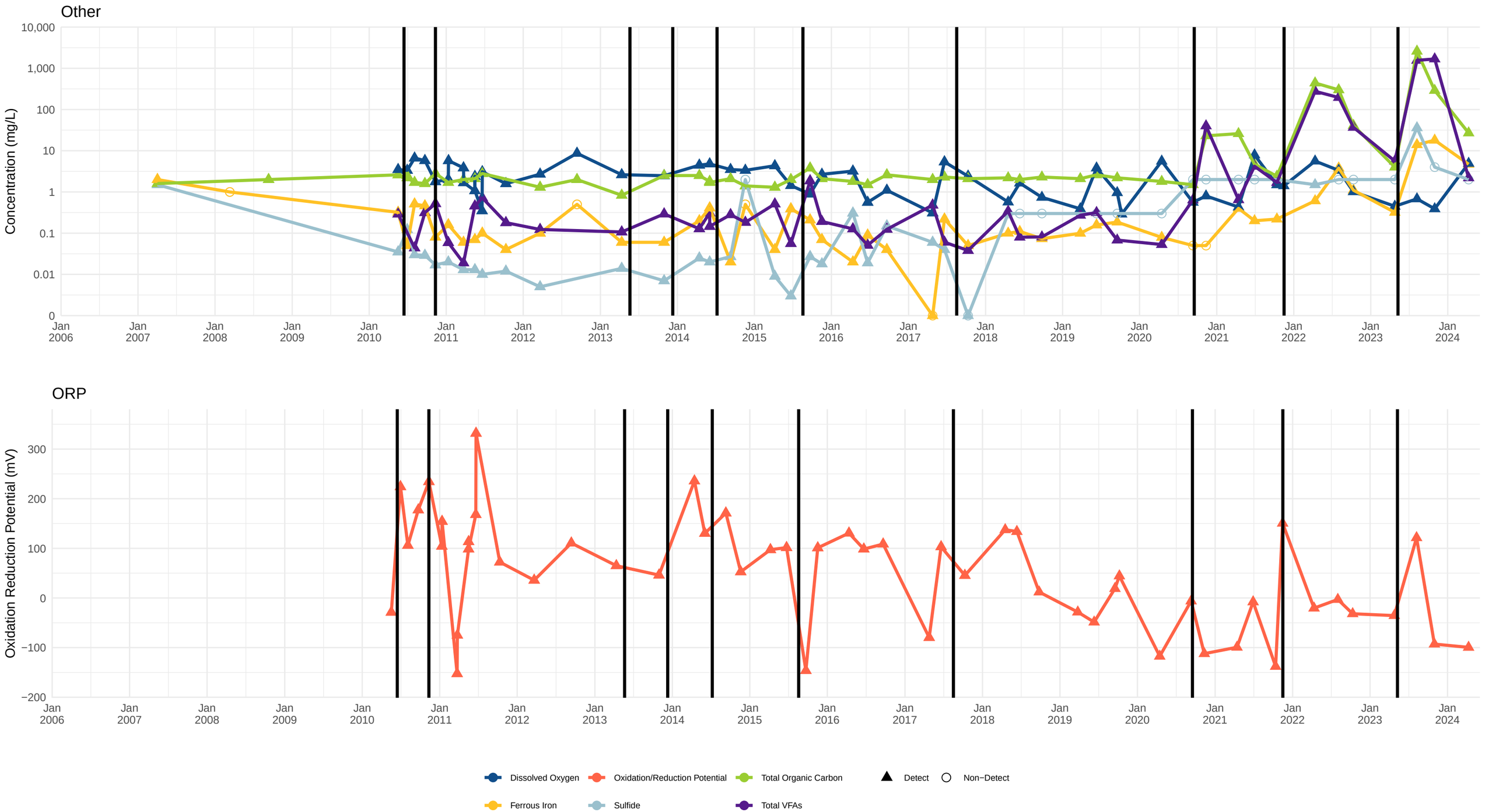
BP−9A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



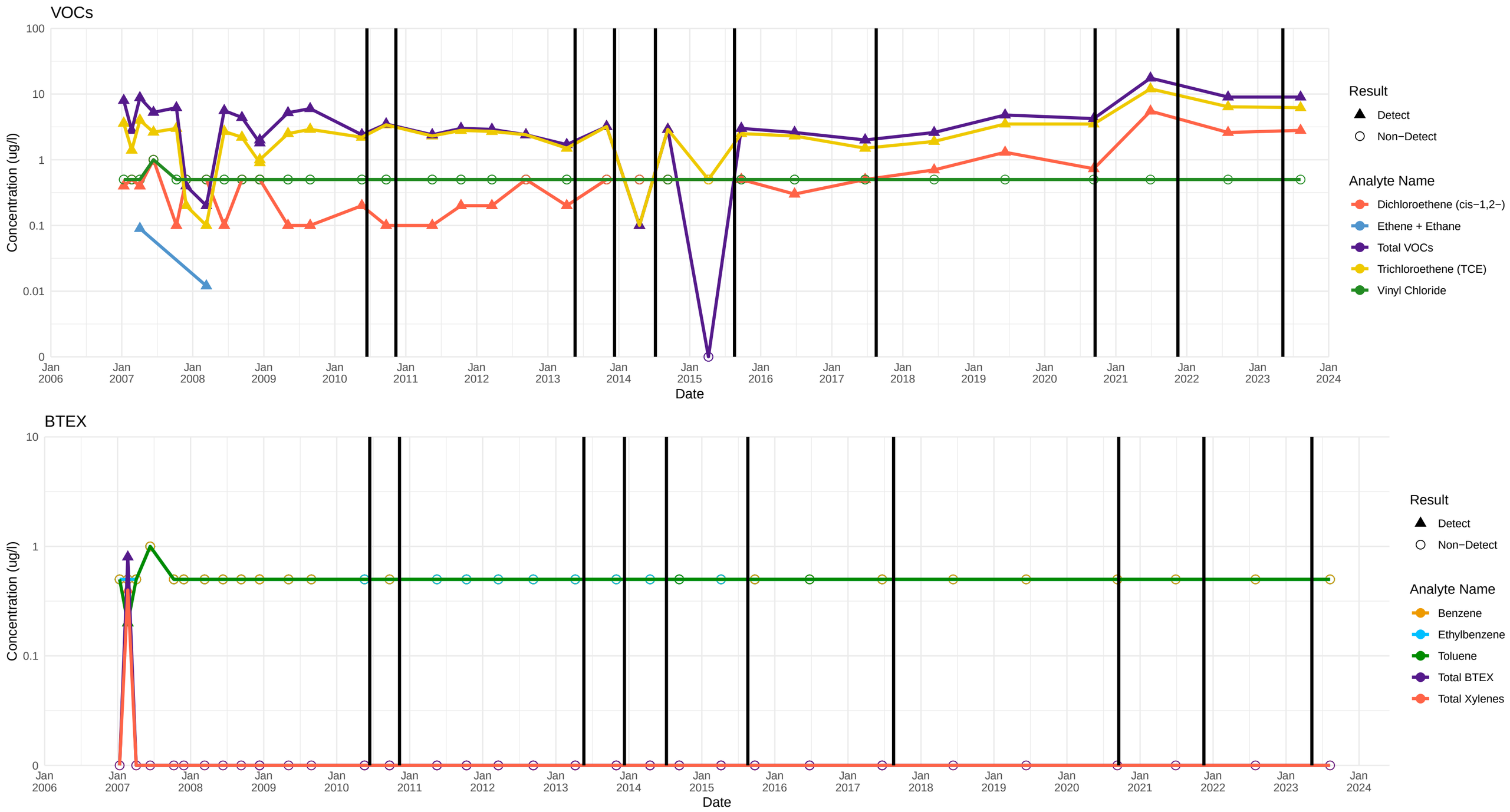
BP−10A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



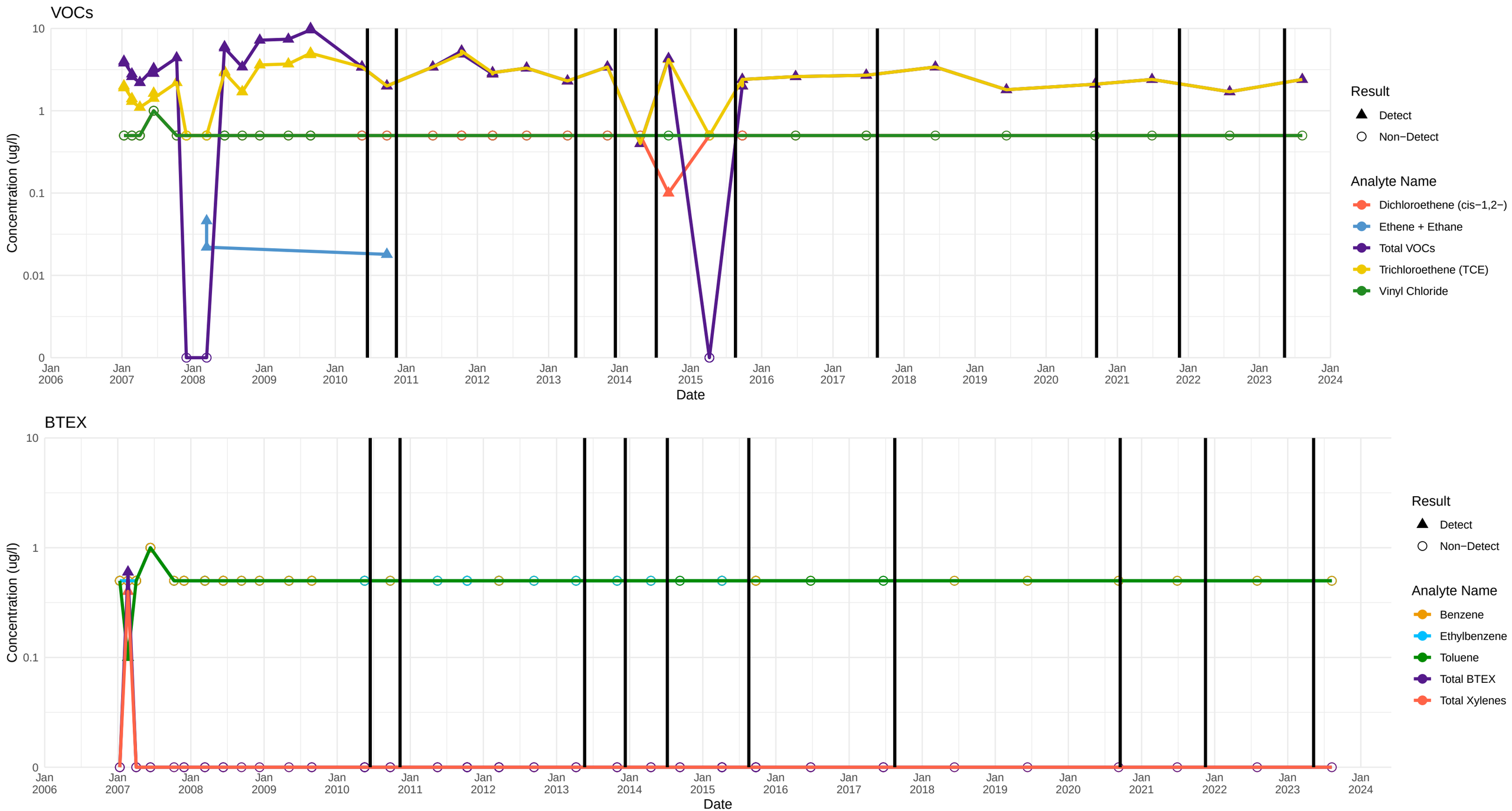
BP−11A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



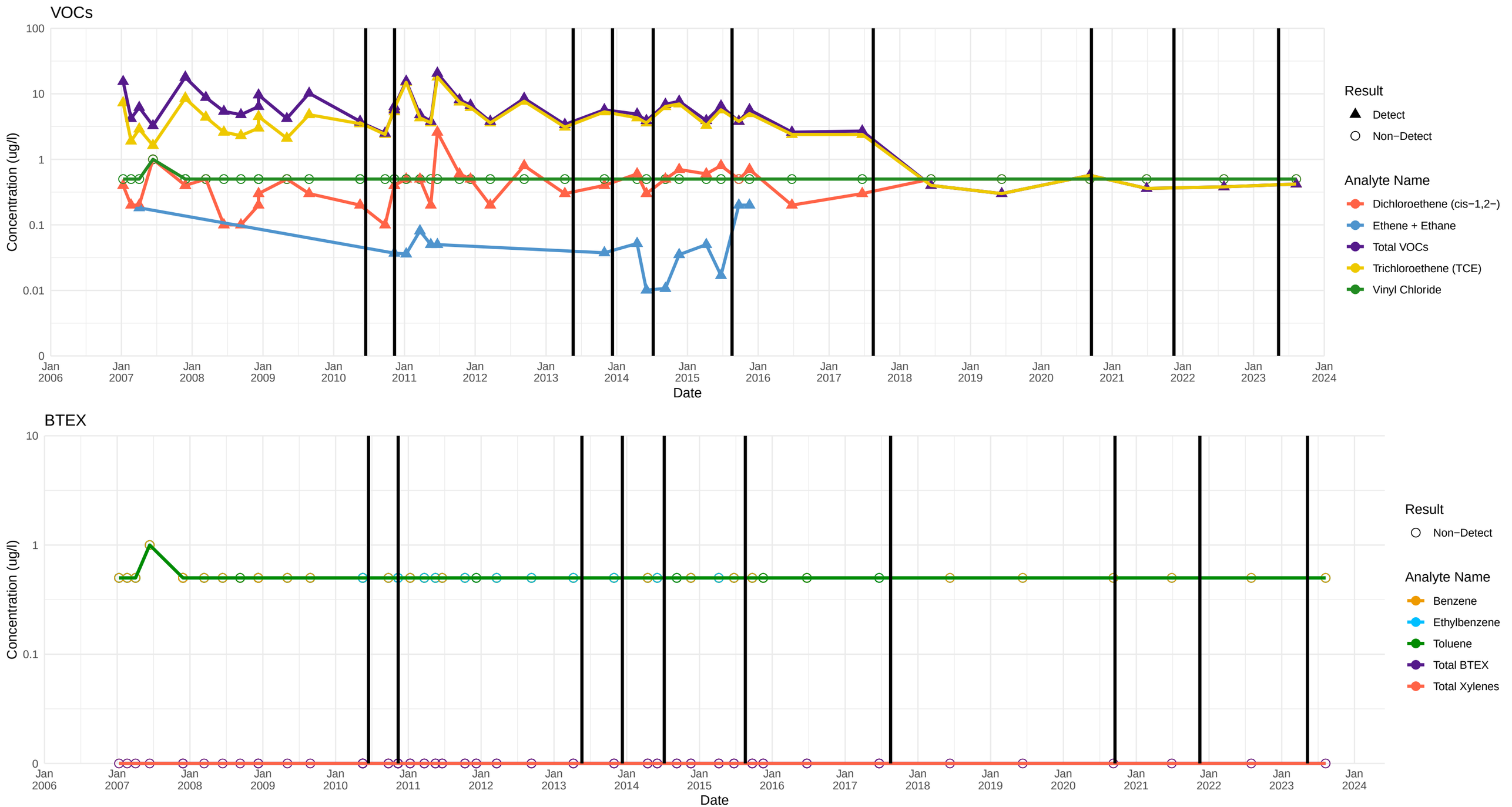
BP−12A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



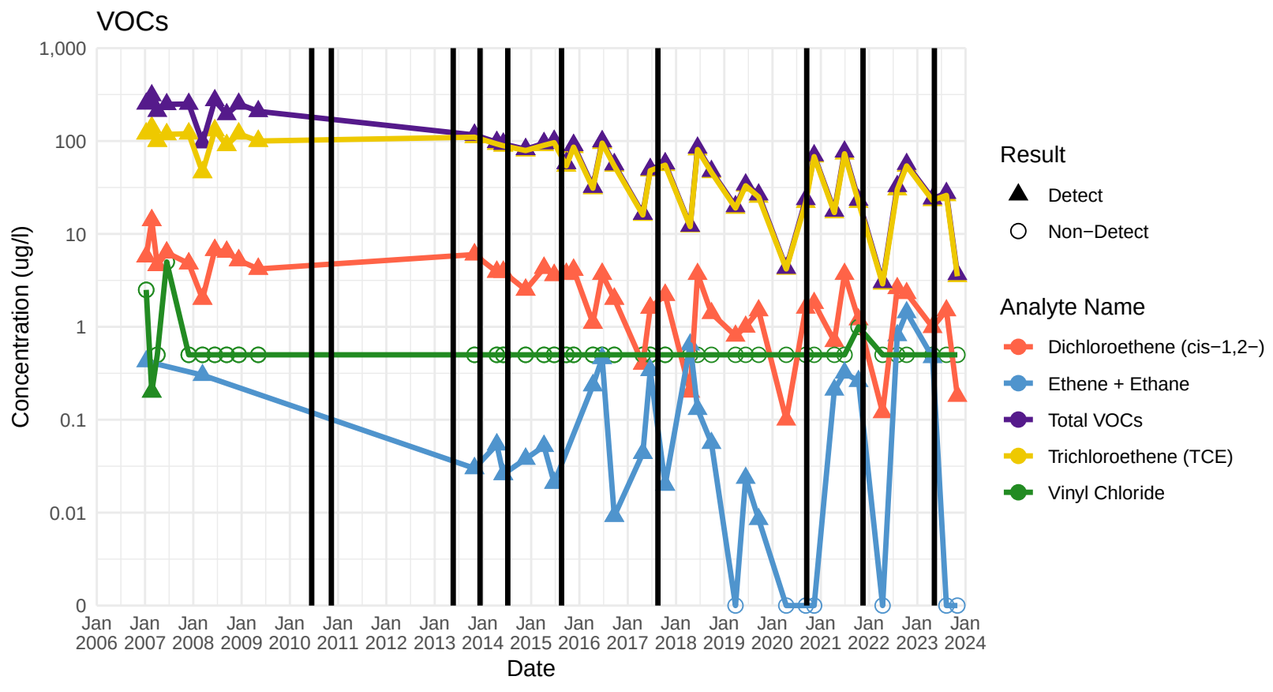
BP−13A

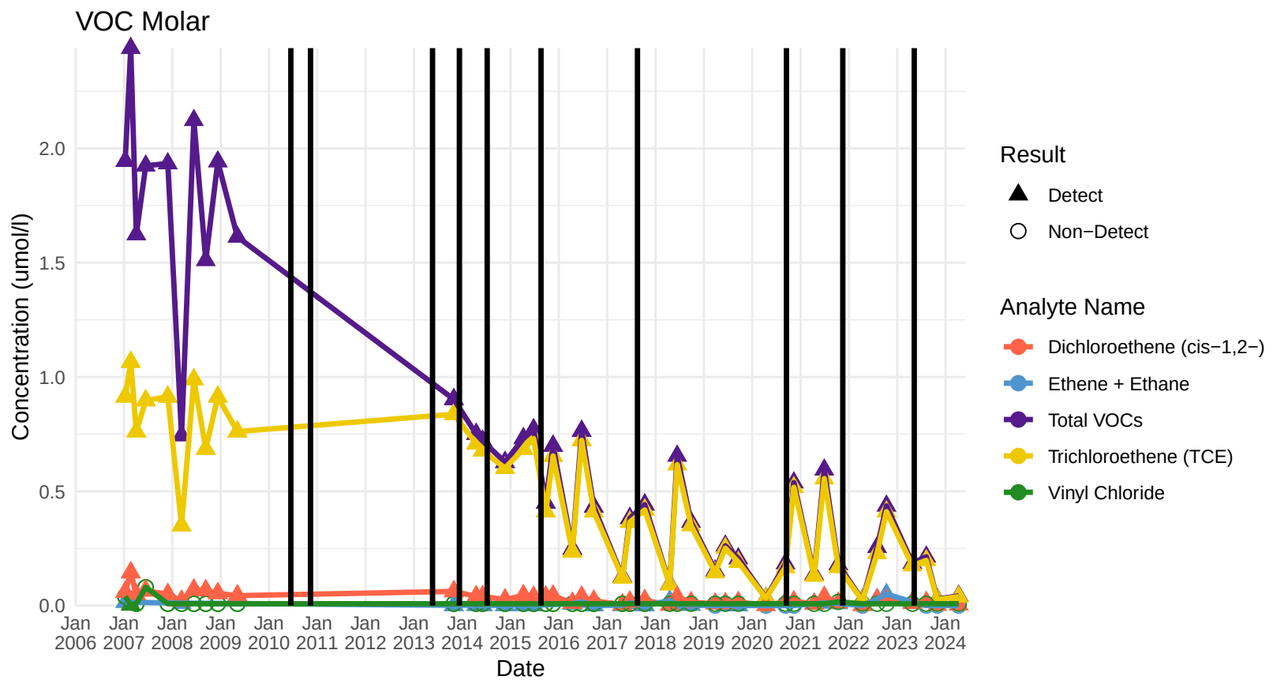
Notes:

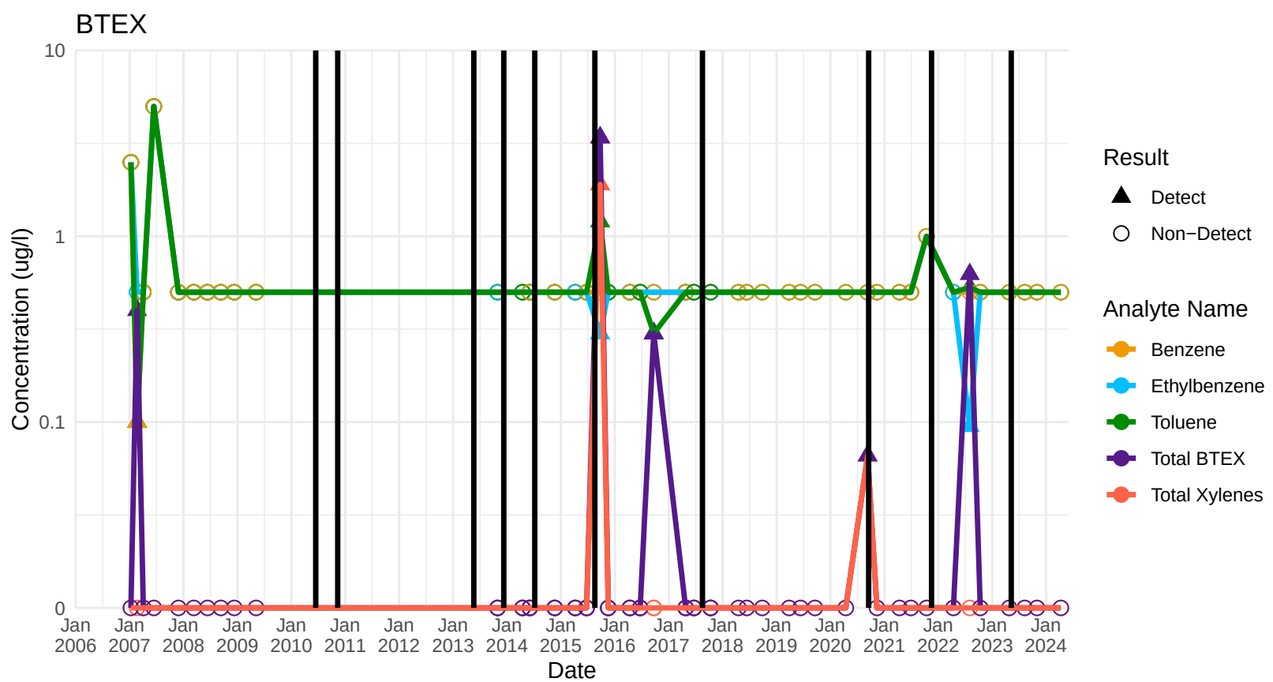
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

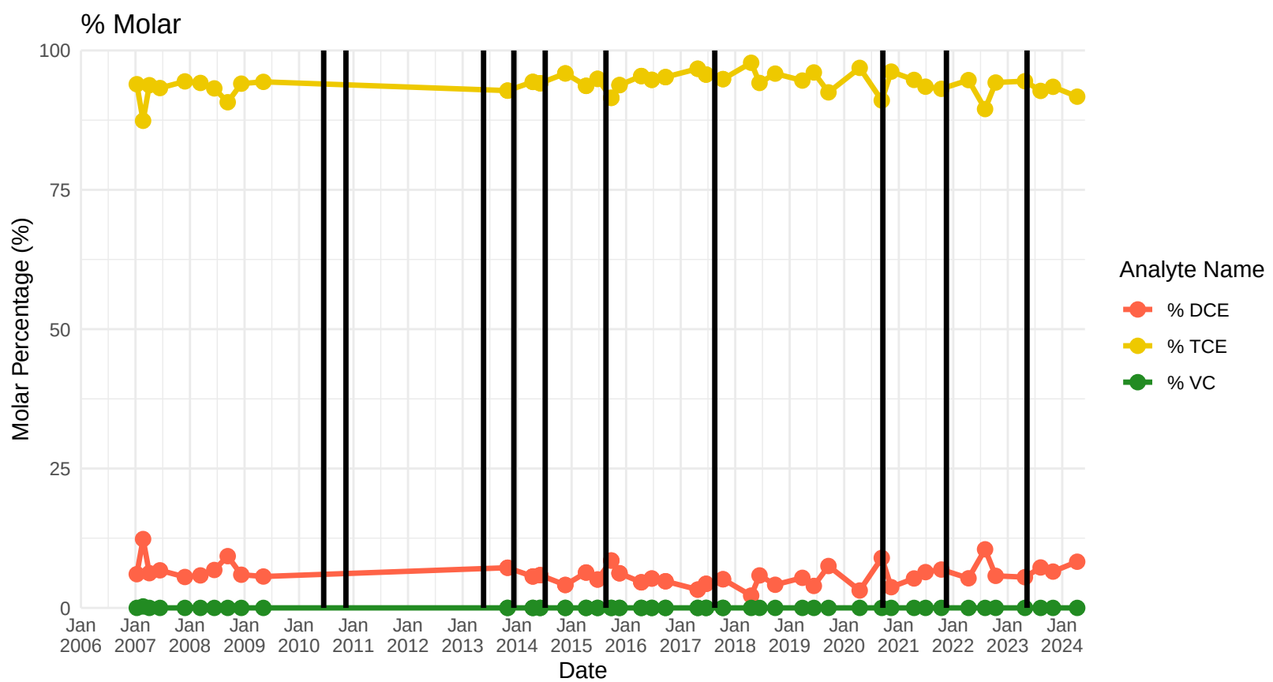
(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.









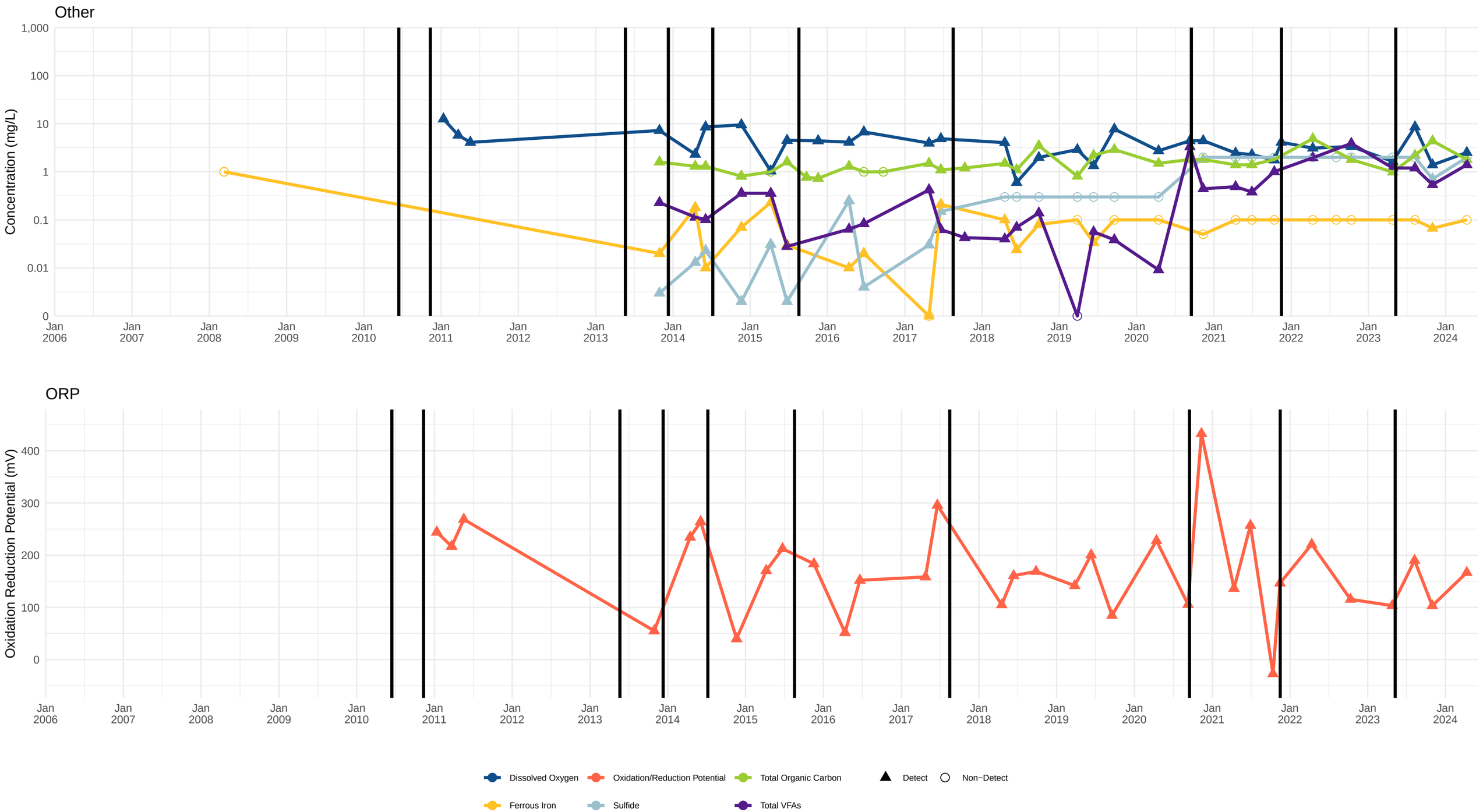
BP−13A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



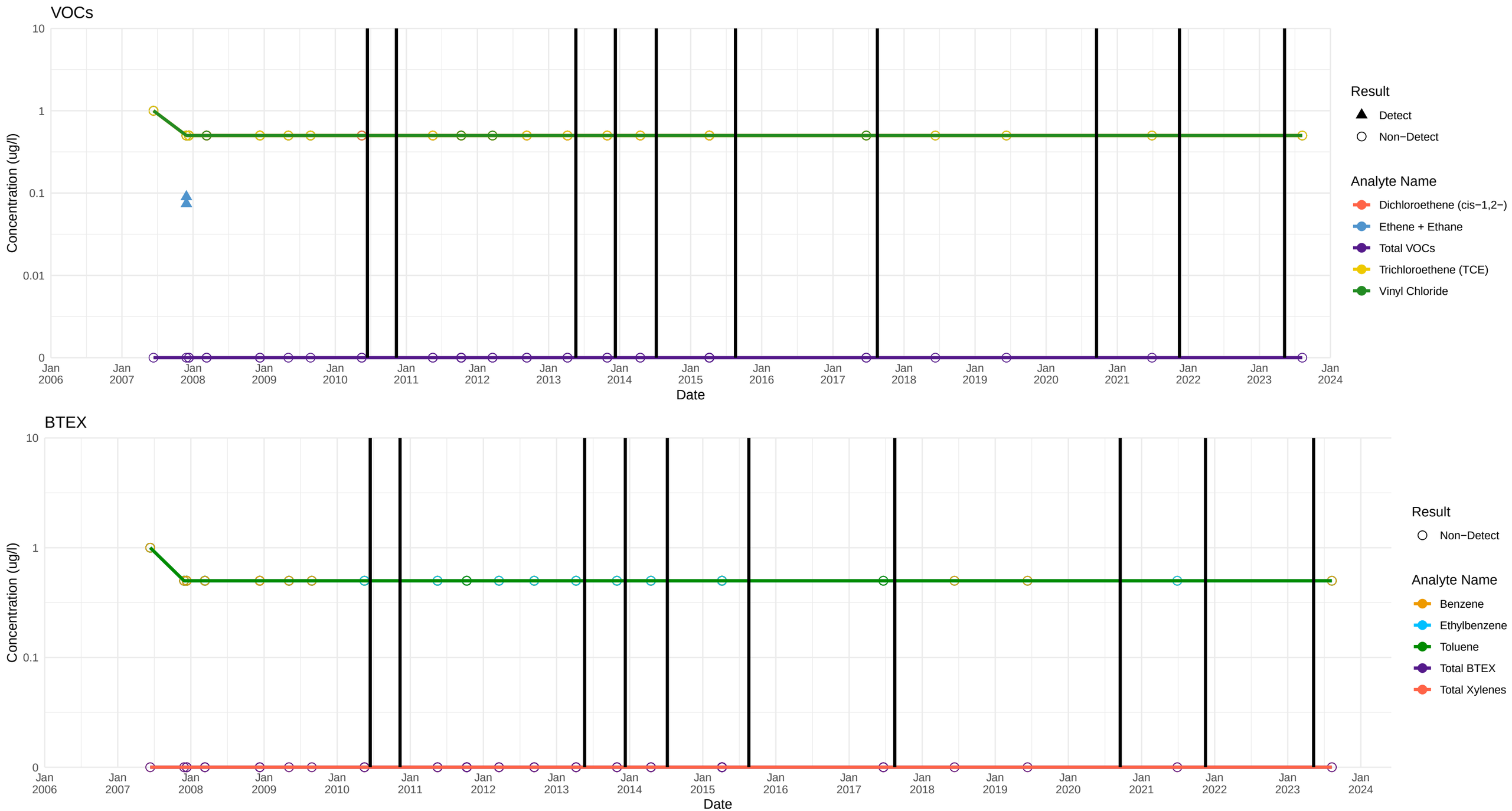
BP−16A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



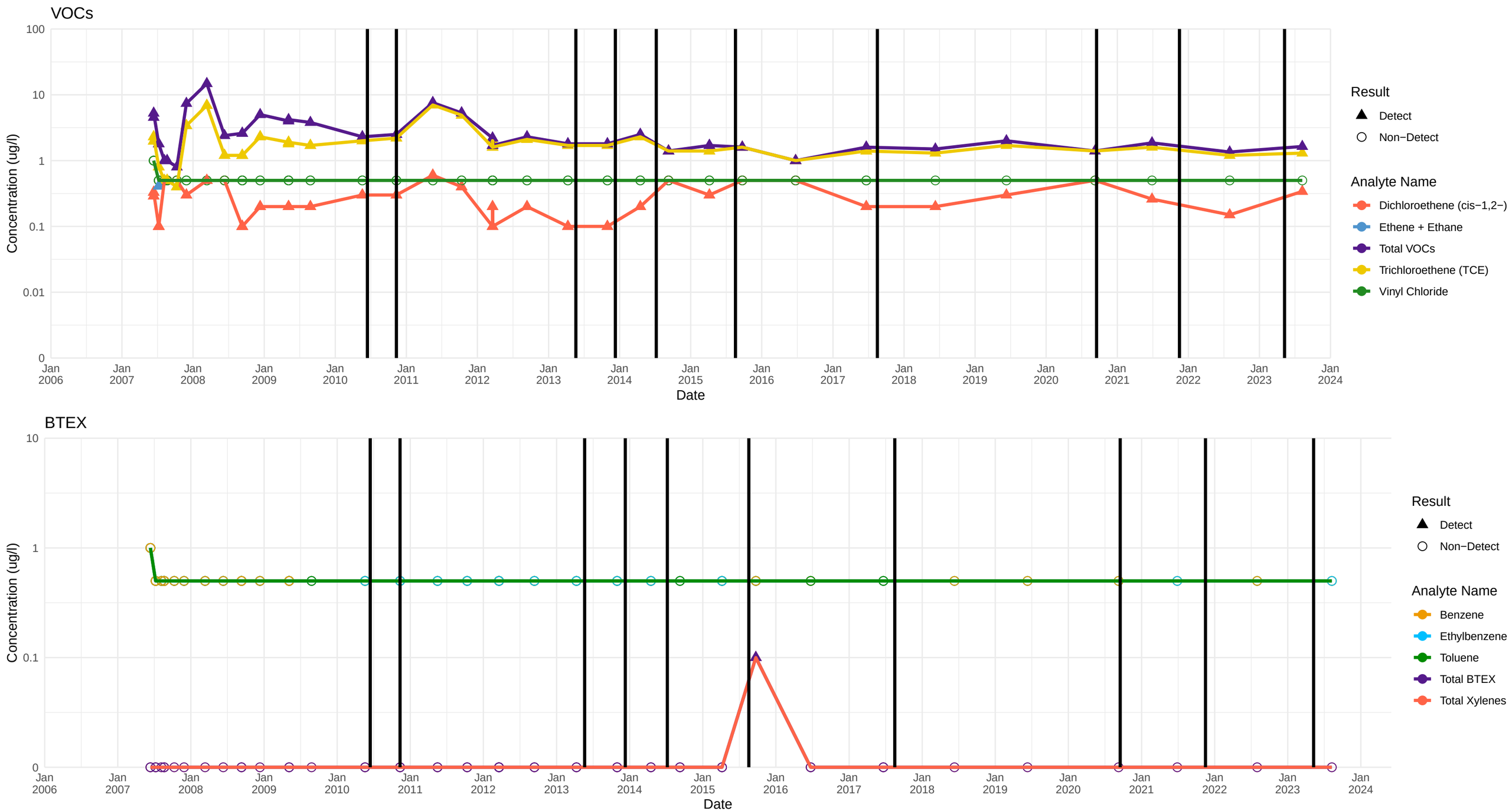
BP−17A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



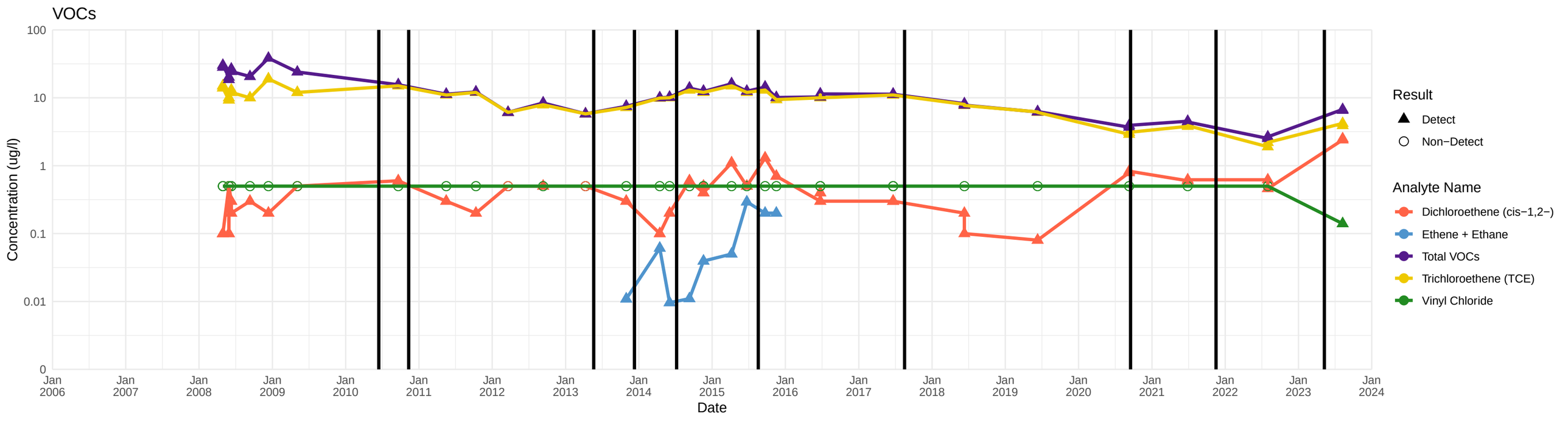
BP−18A

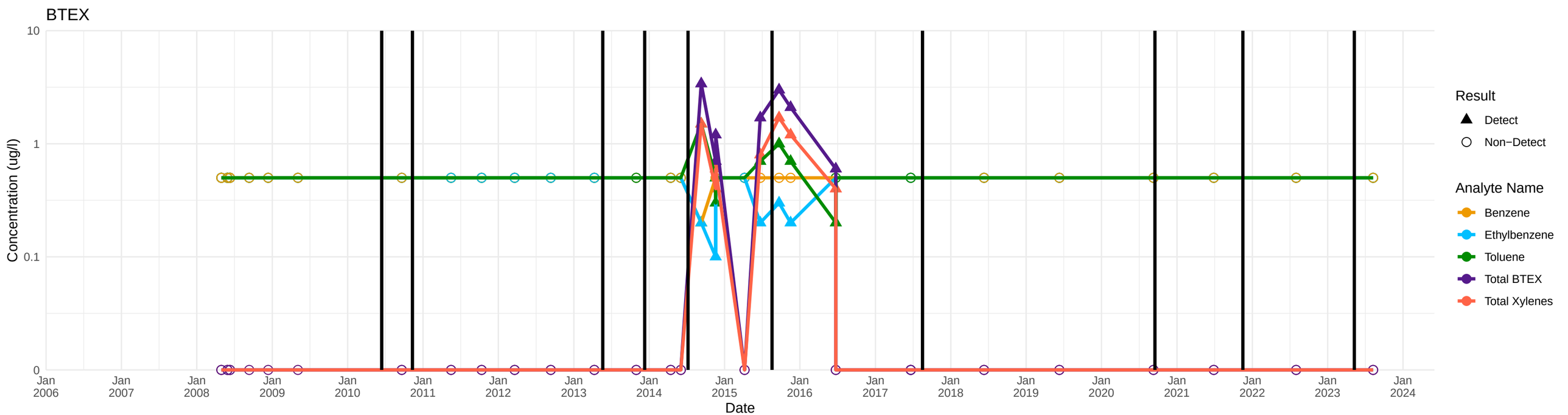
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





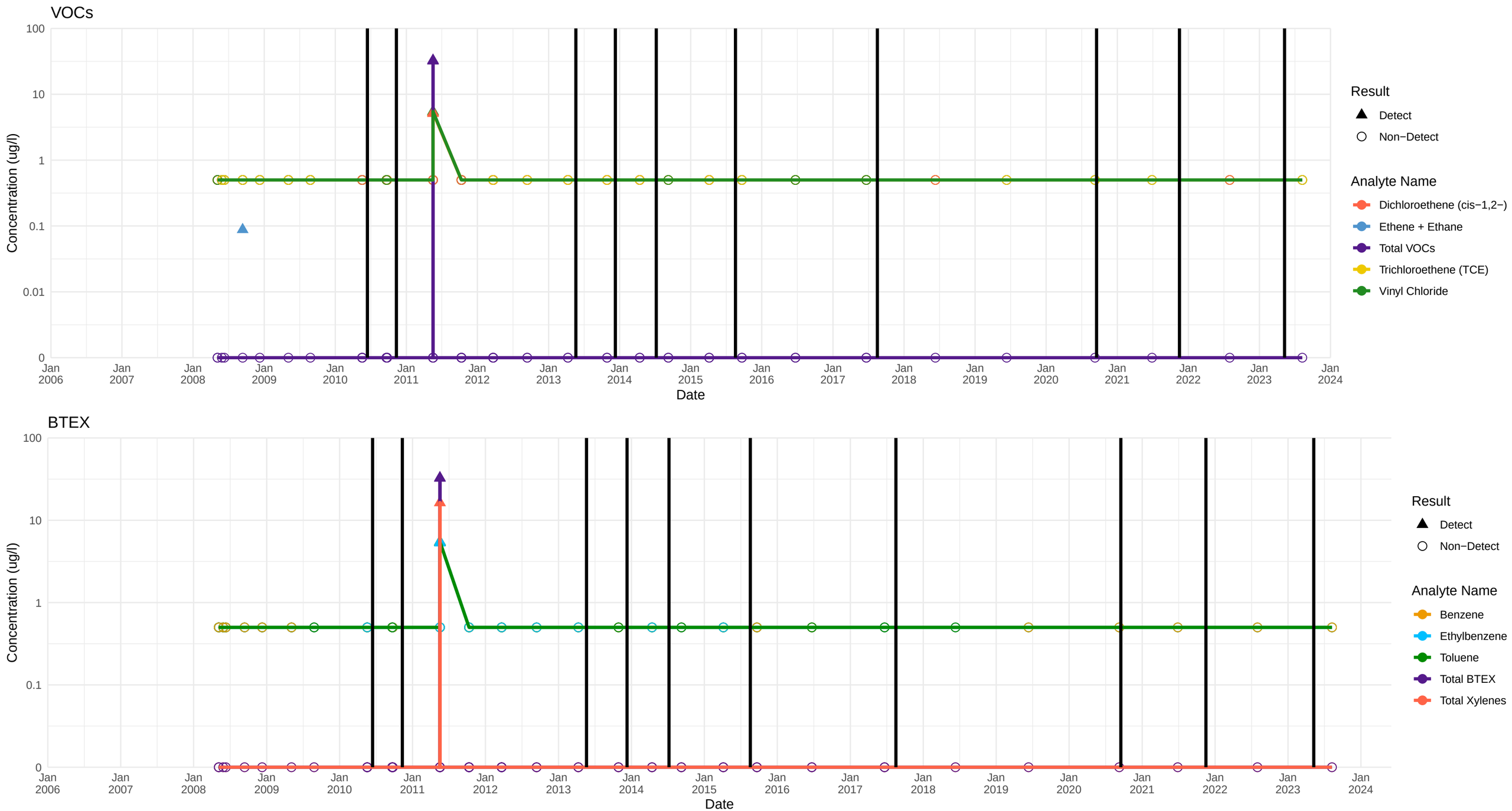
BP−19A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



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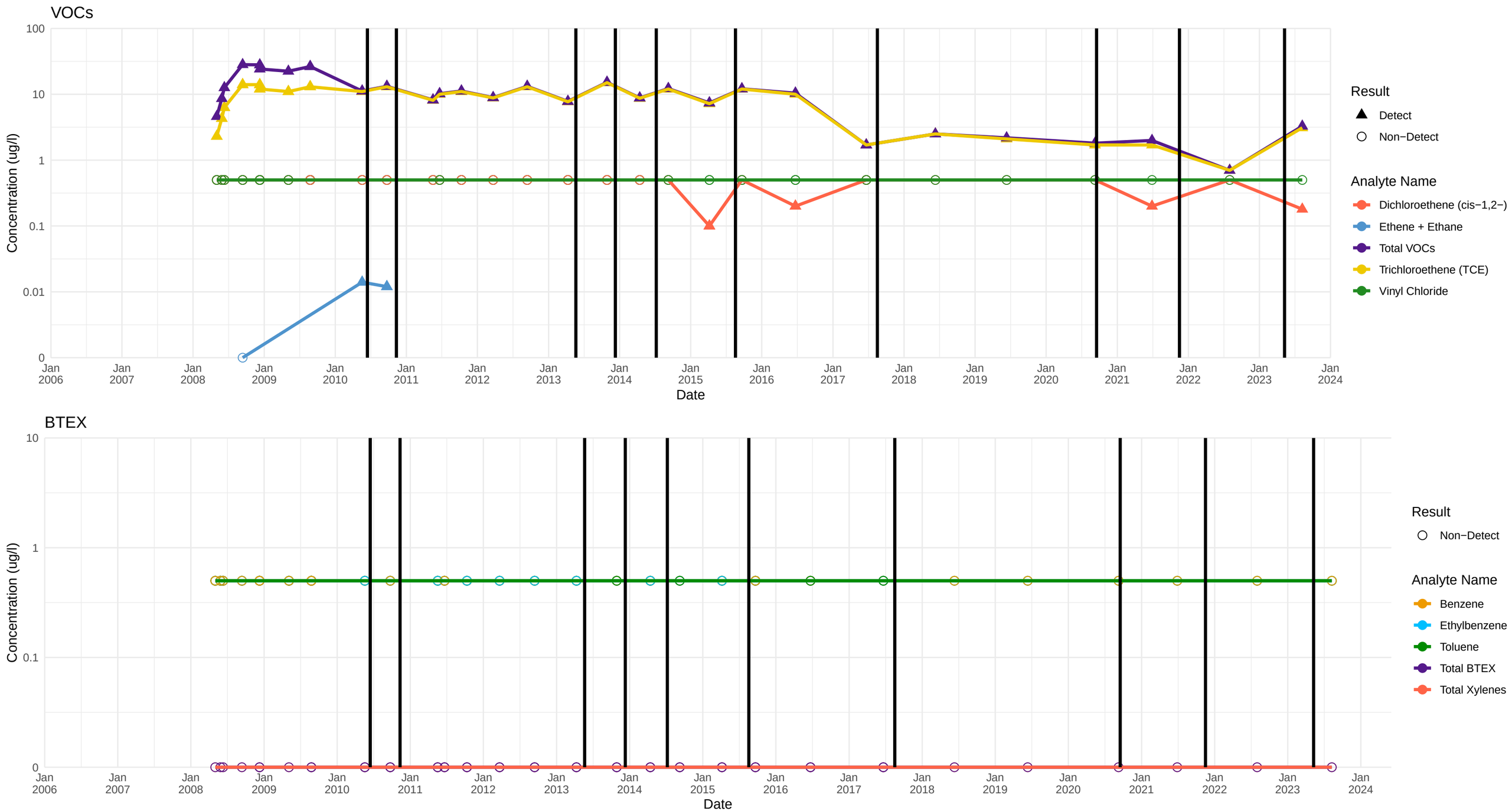
BP−20A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



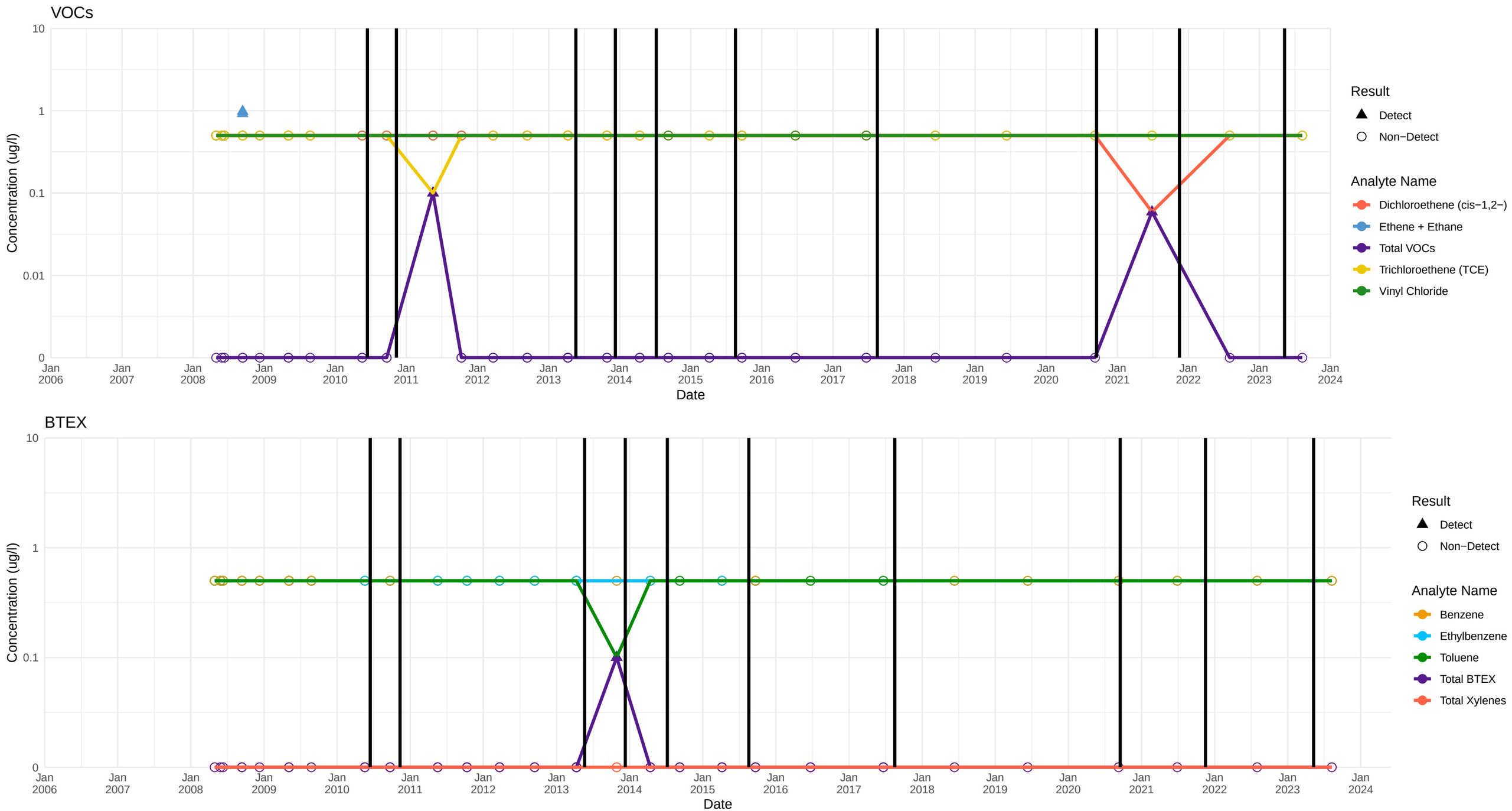
BP−21A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



Sanborn, Head & Associates, Inc.

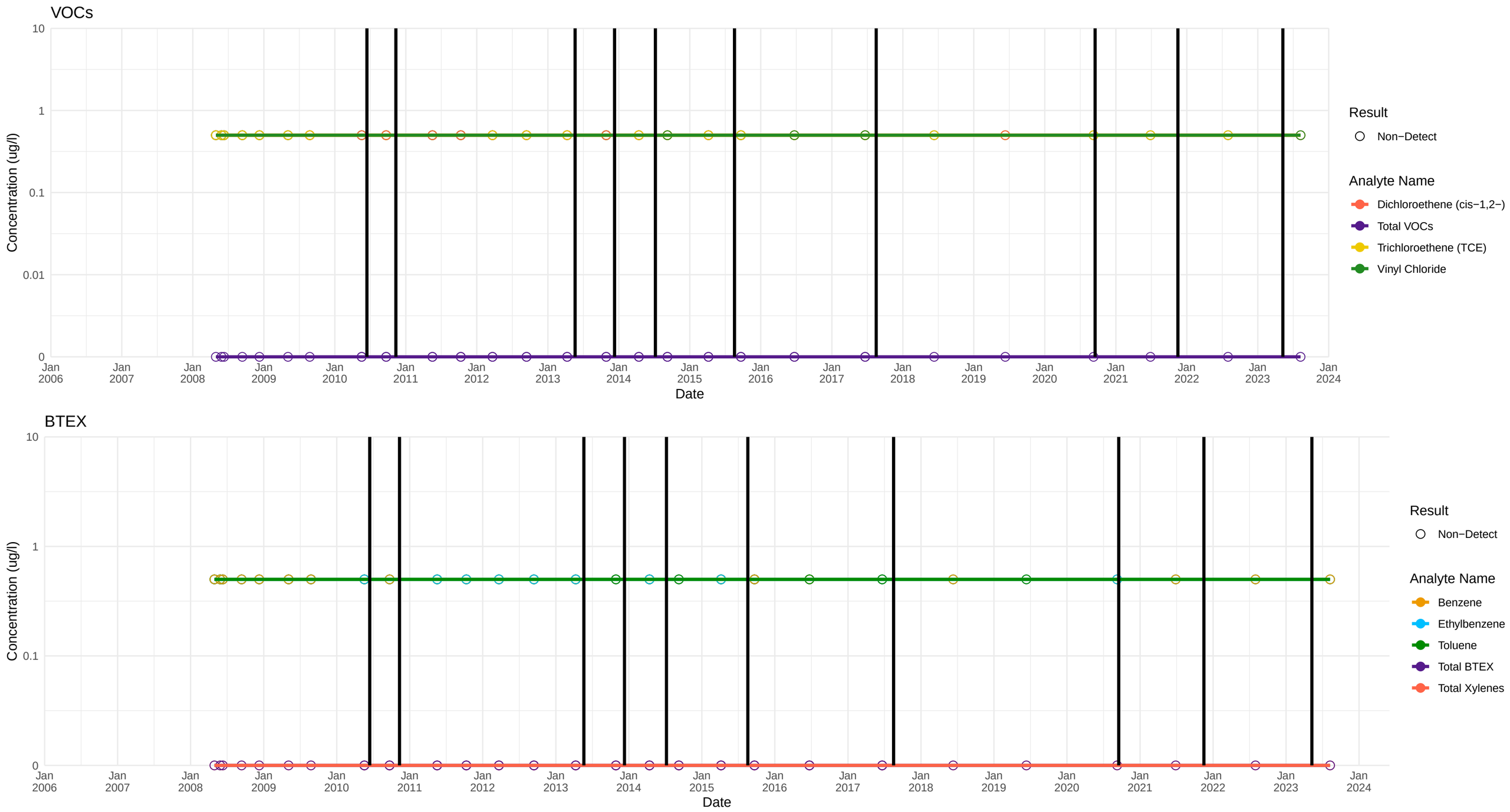
BP−22A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



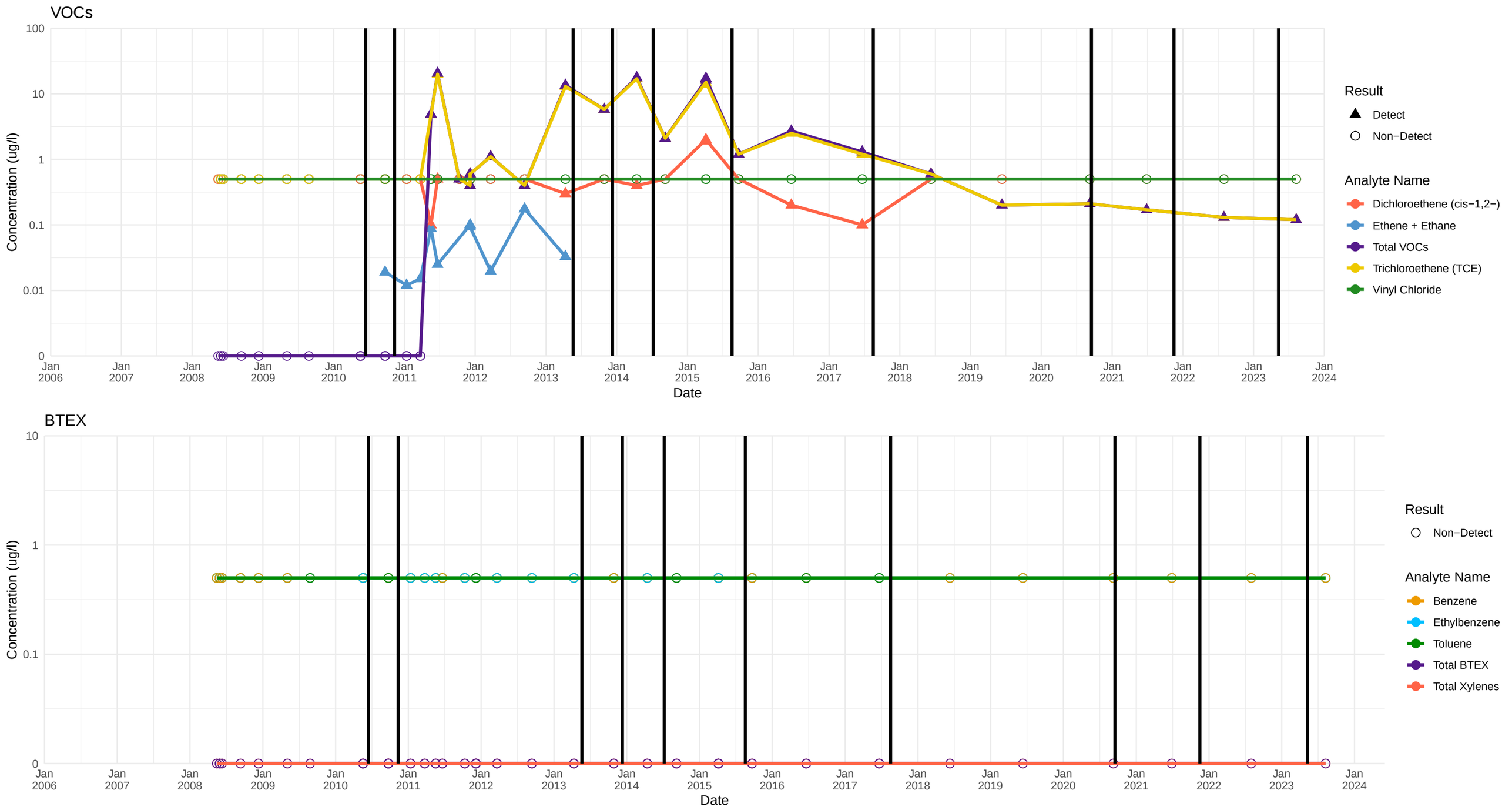
BP−23A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



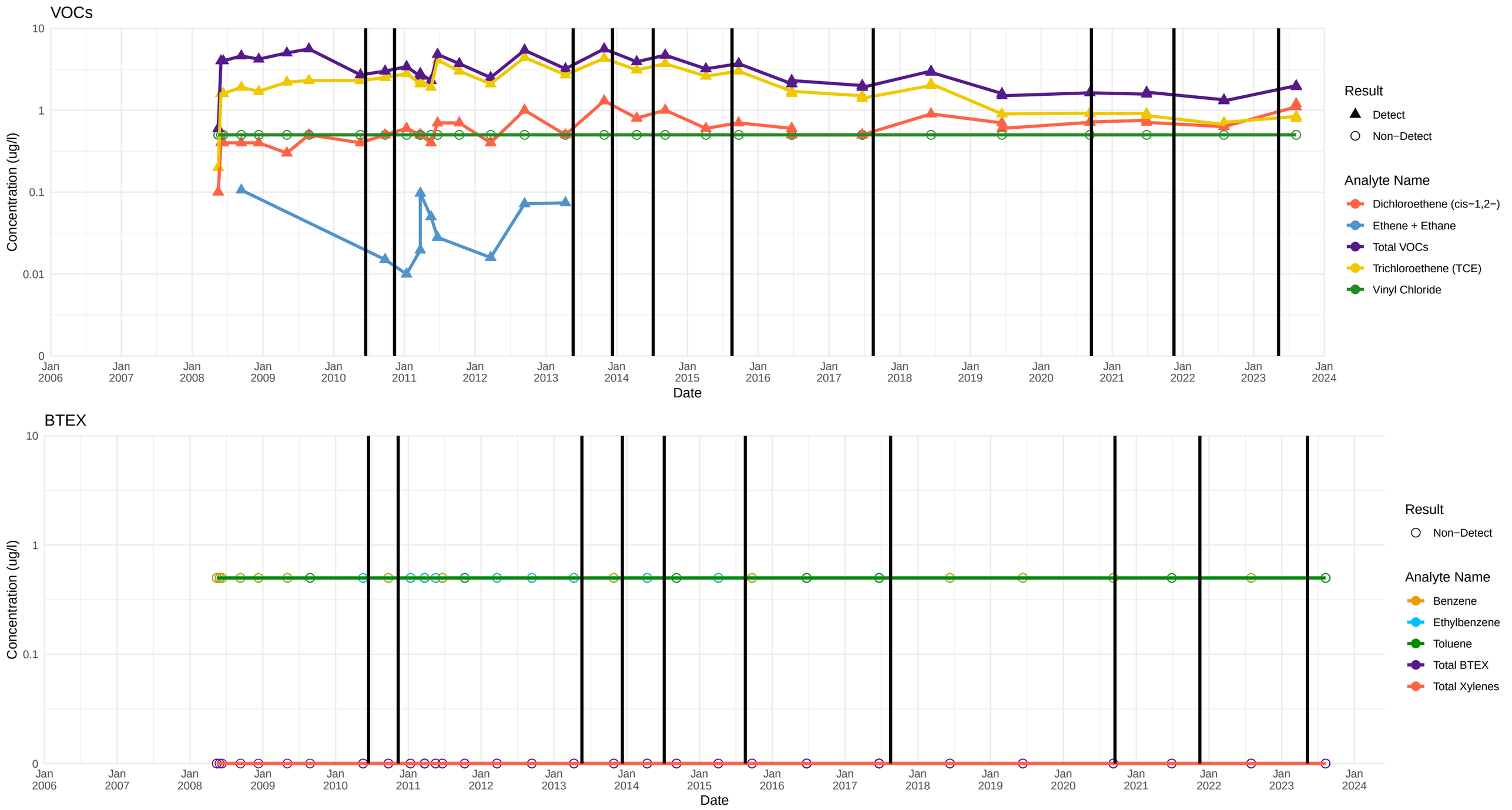
BP−24A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



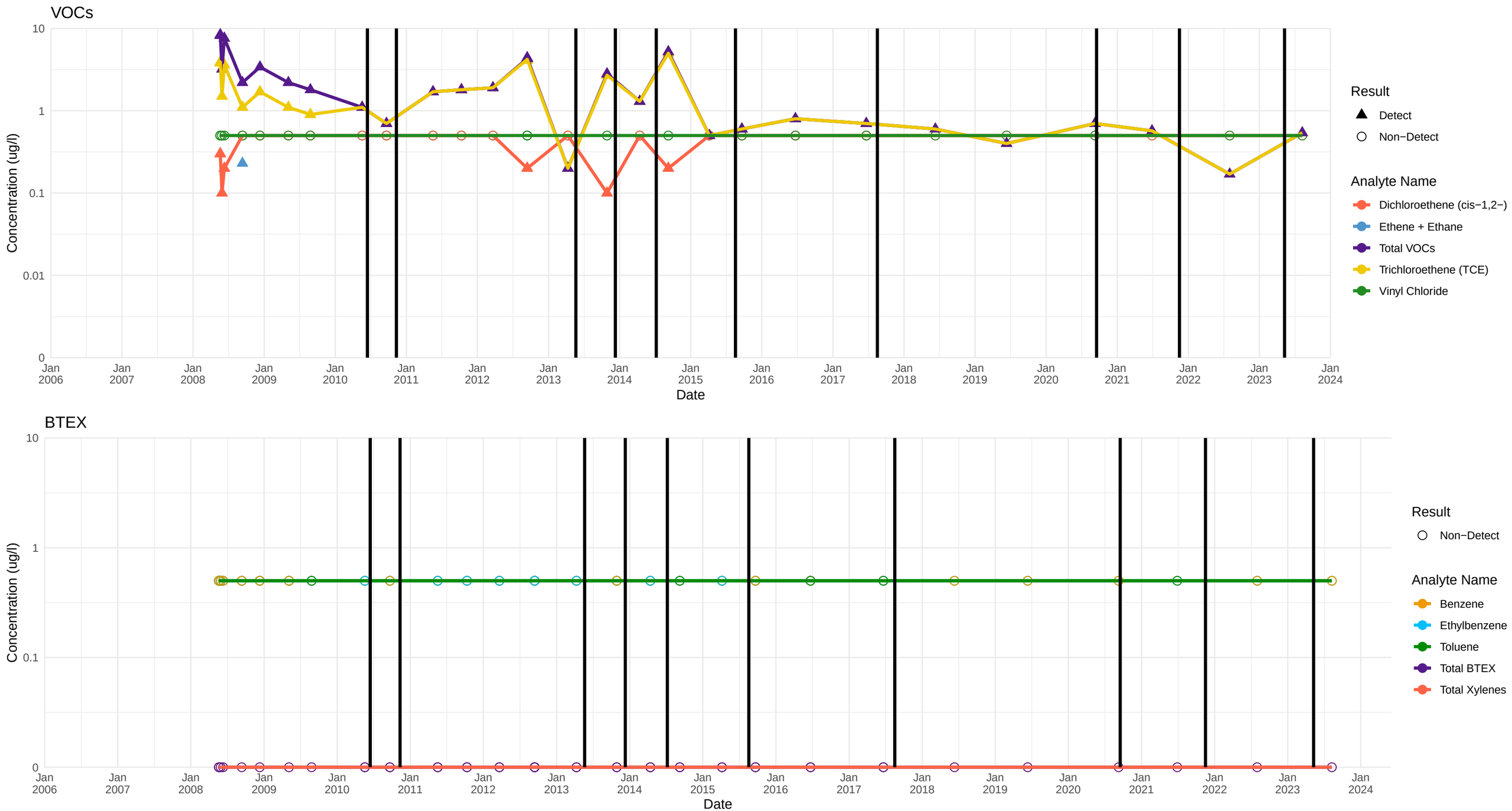
BP−25A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



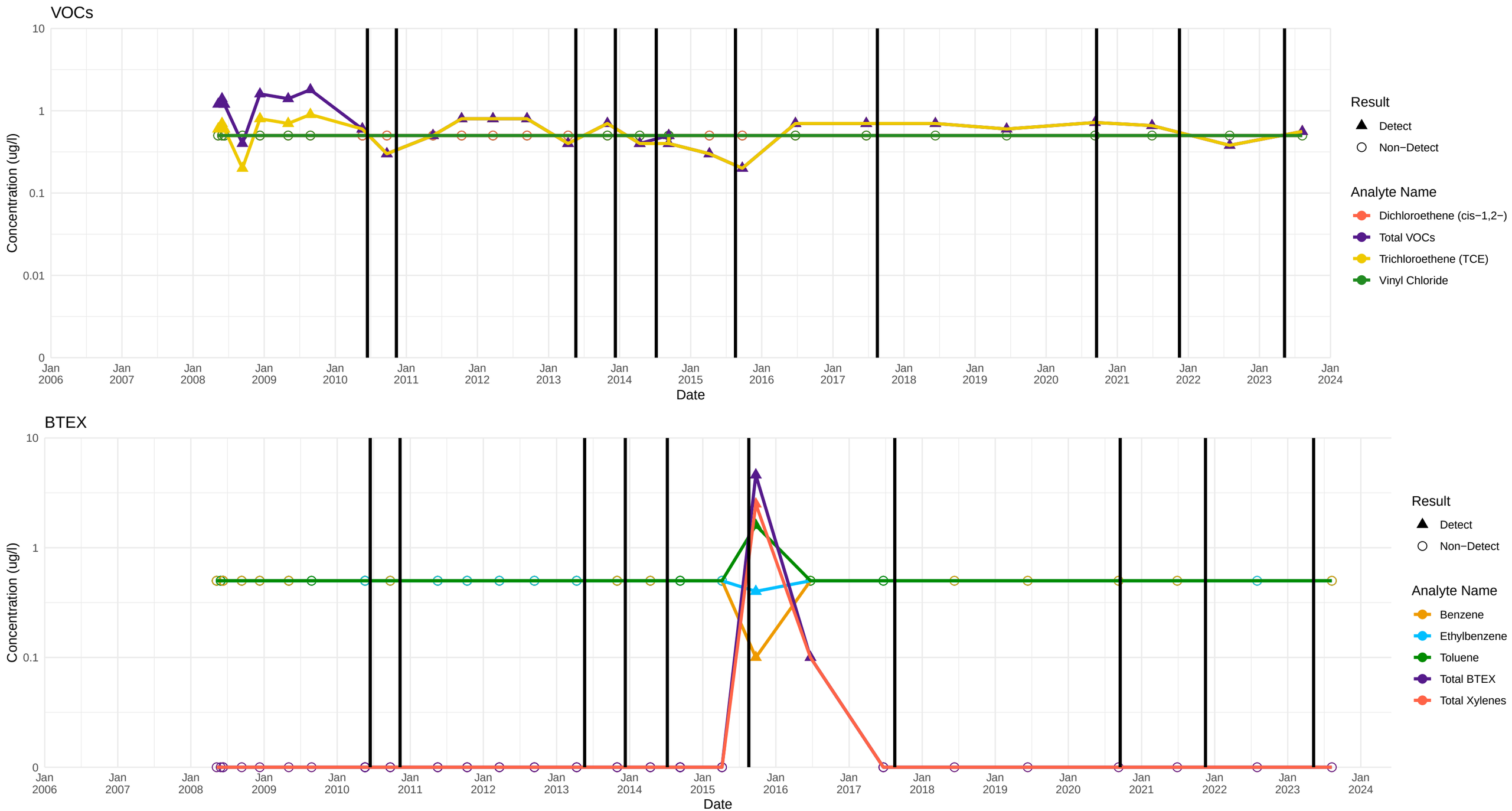
BP−26A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



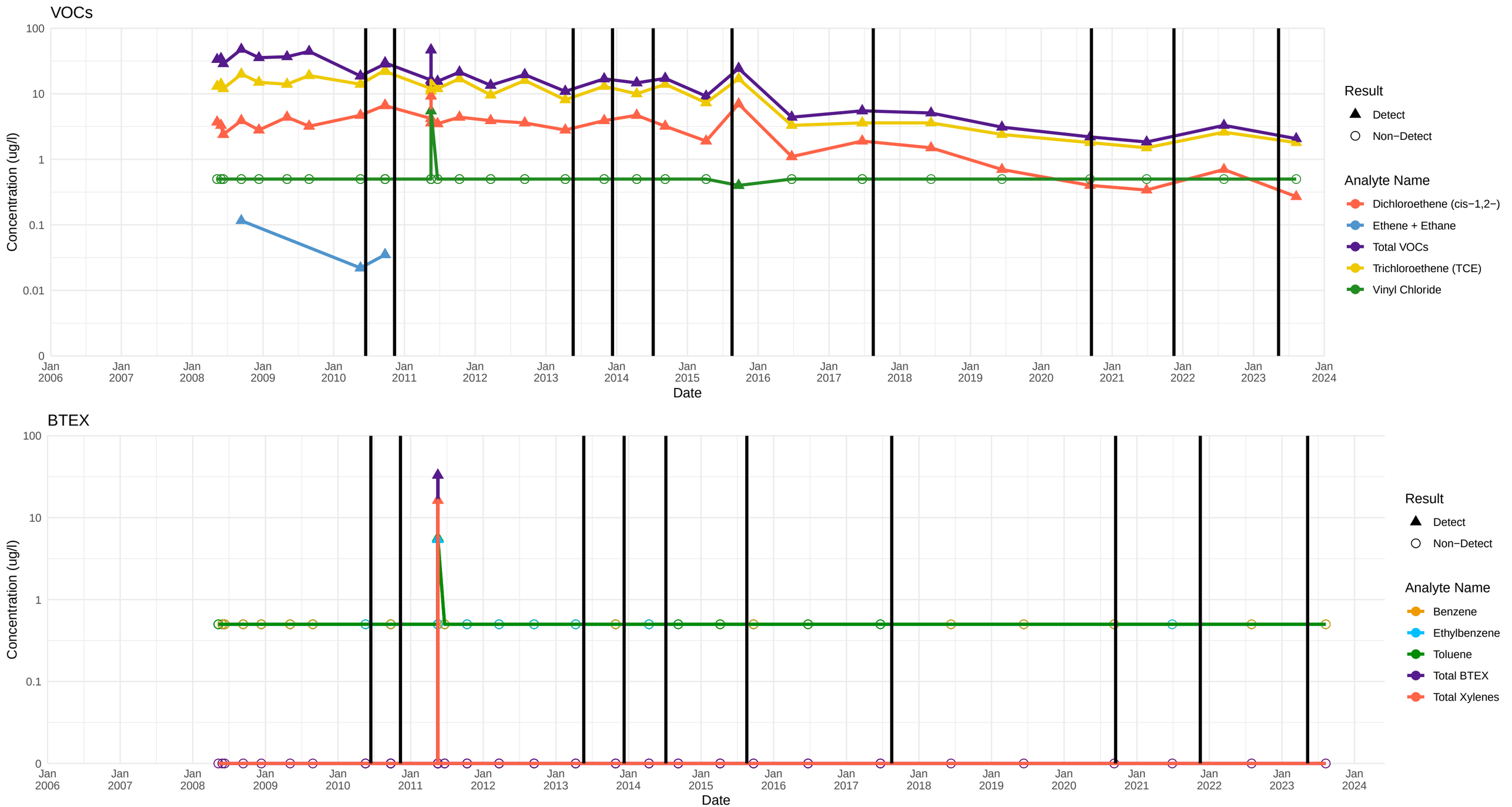
BP−27A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



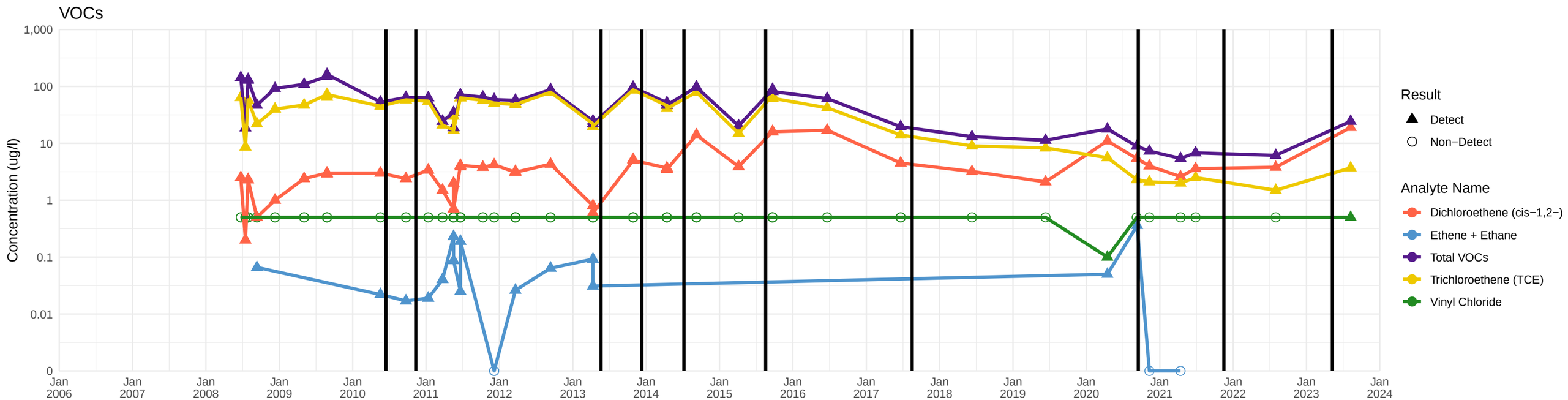
BP−30A

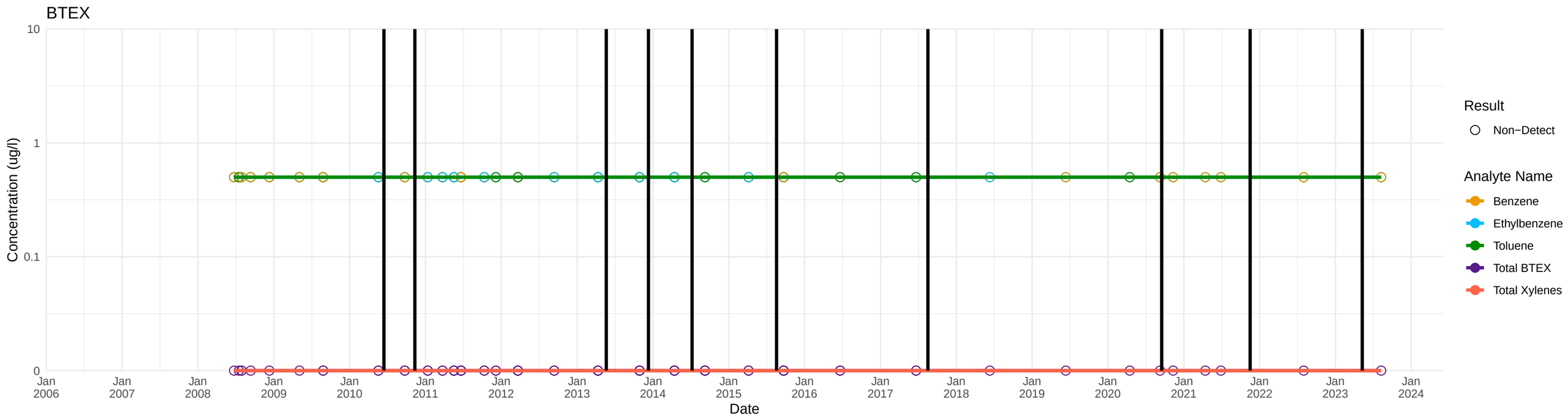
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





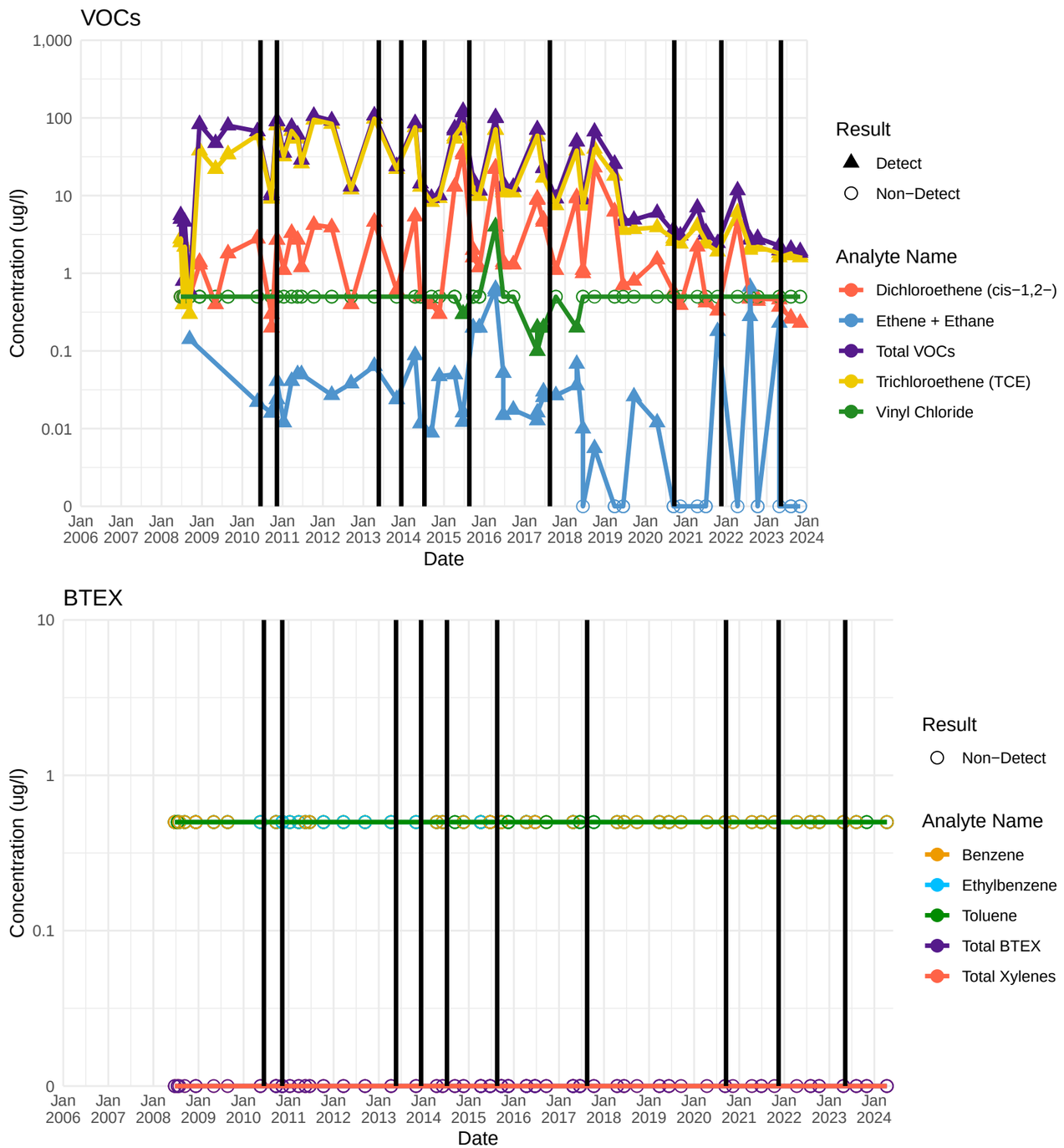
BP−31A

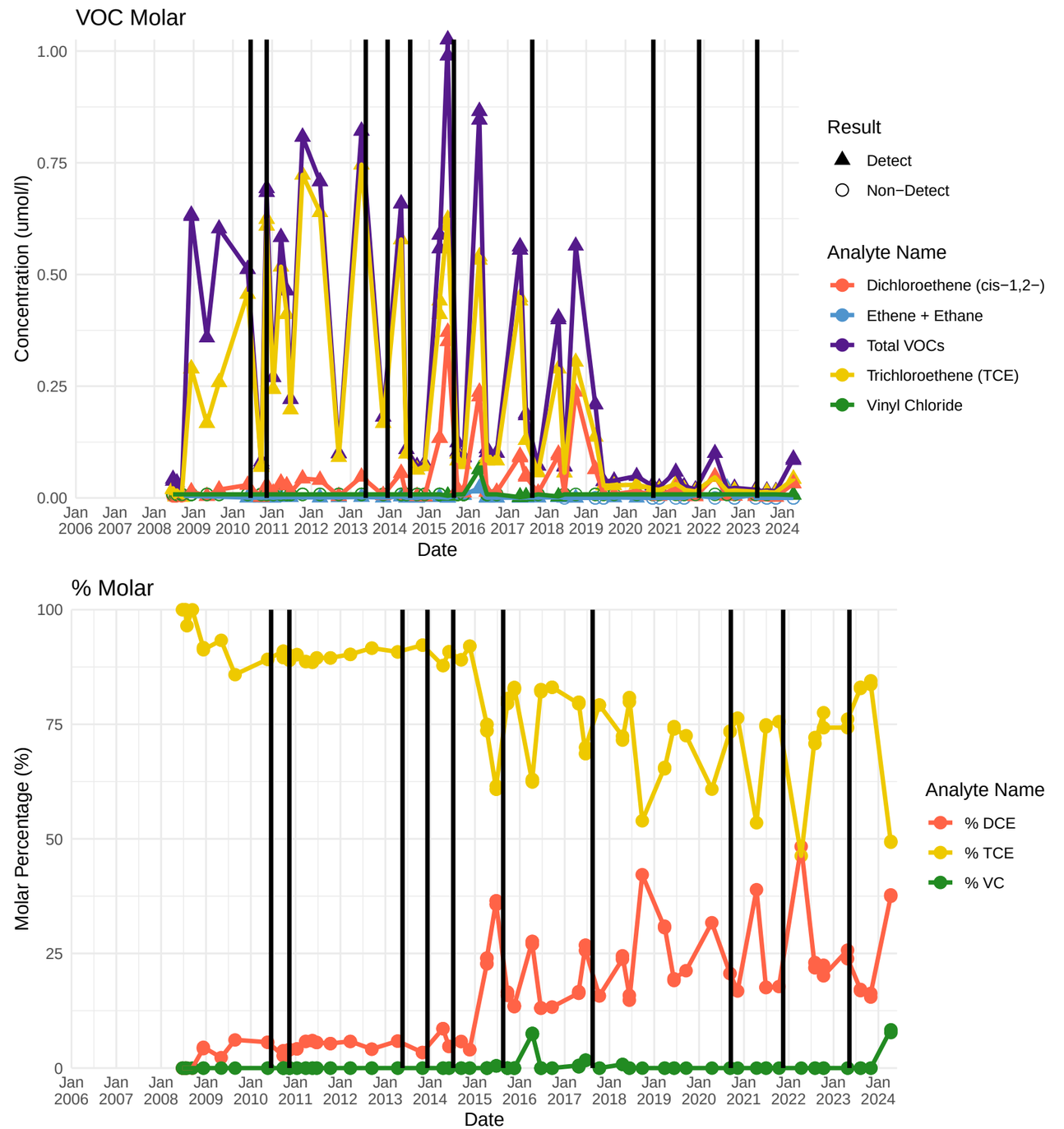
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





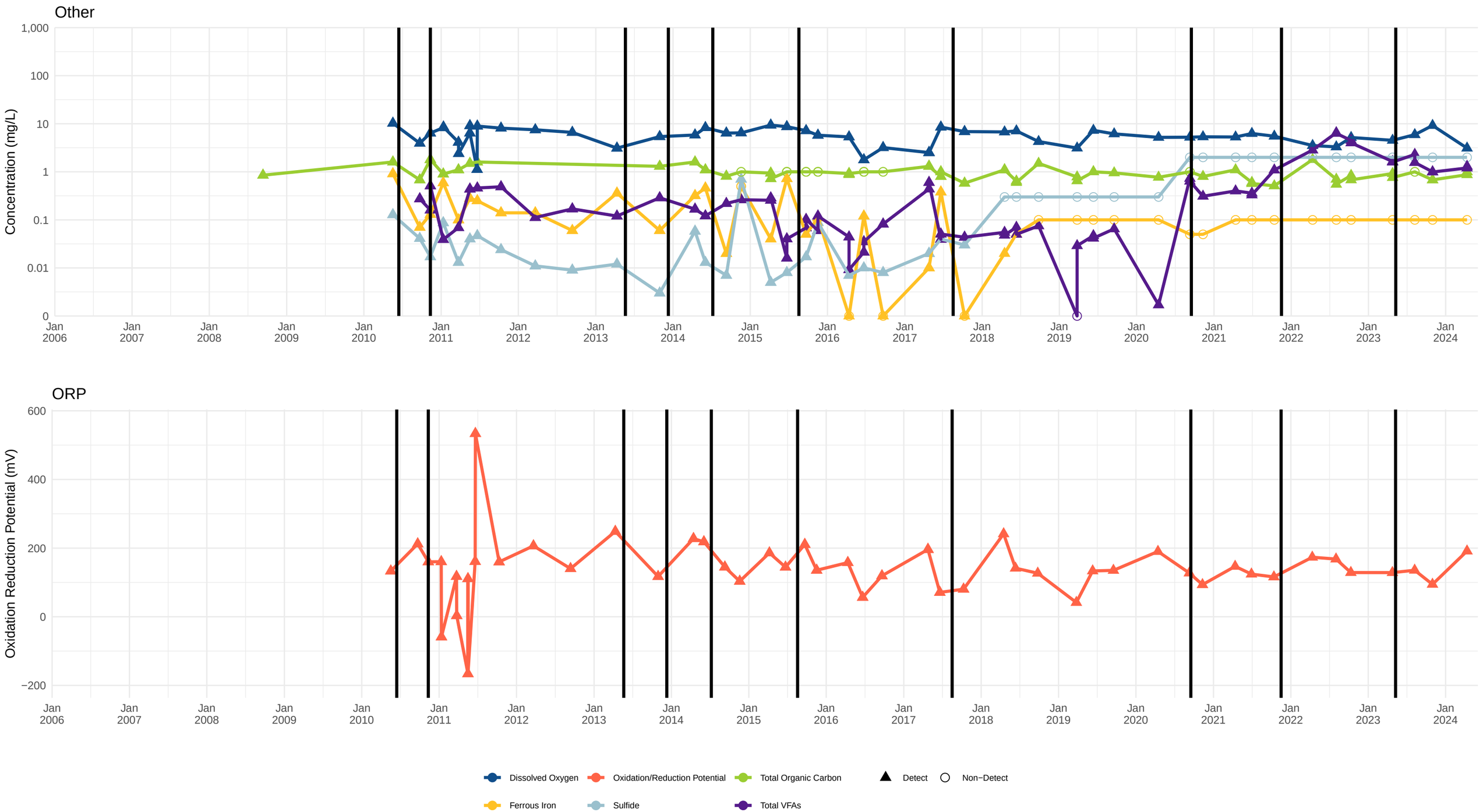
BP−31A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



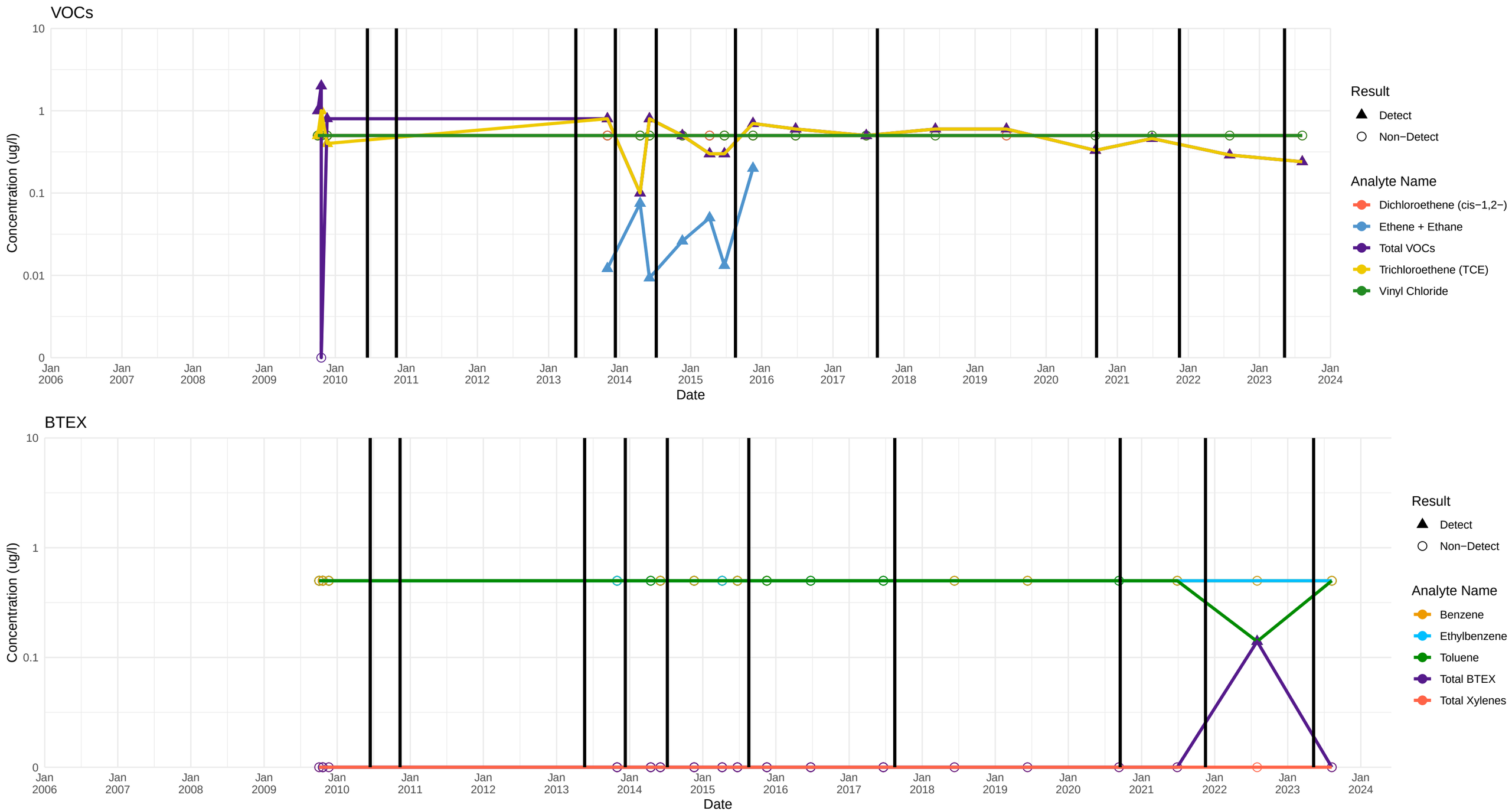
BP−32A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



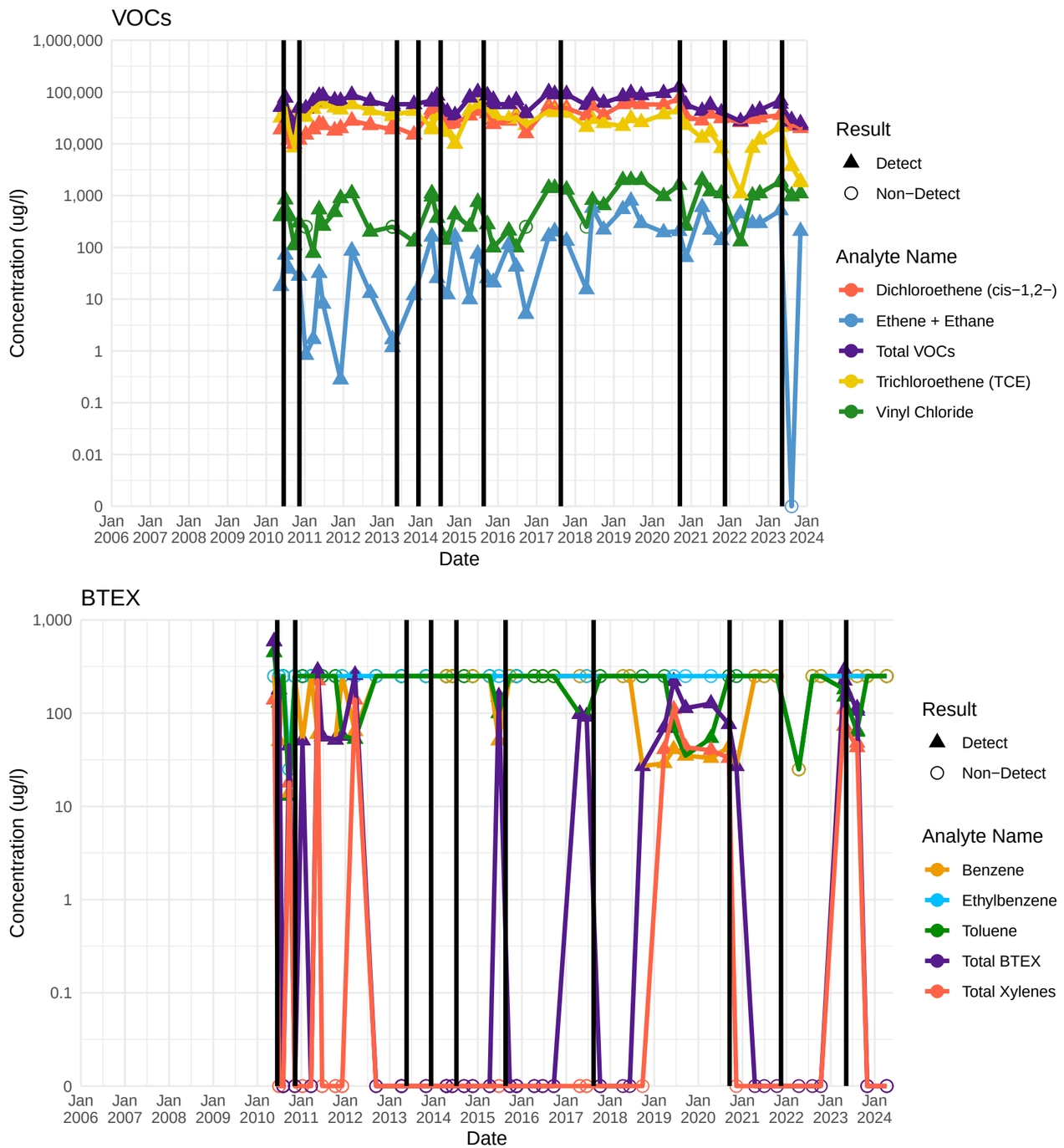
BP−34A

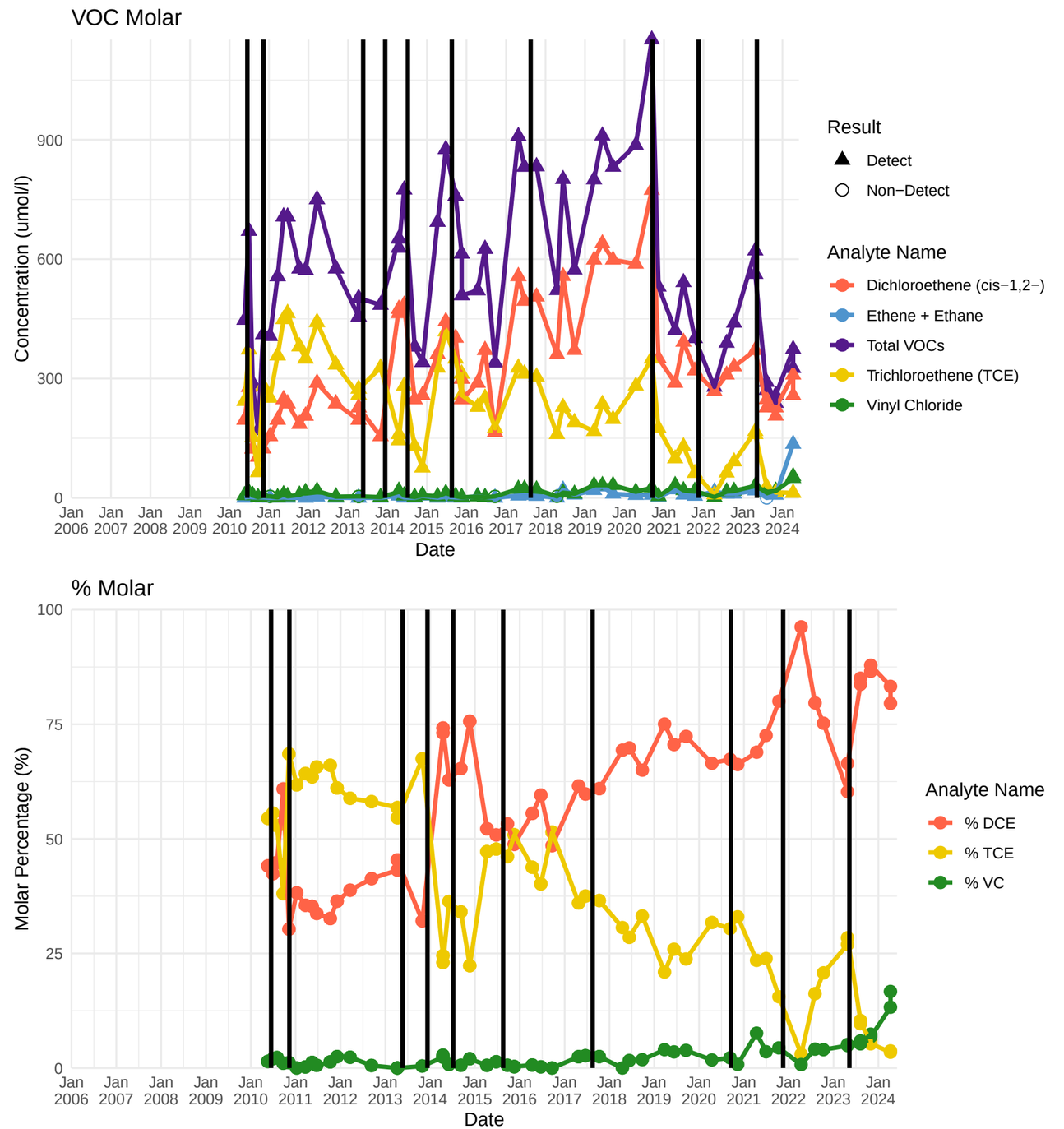
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





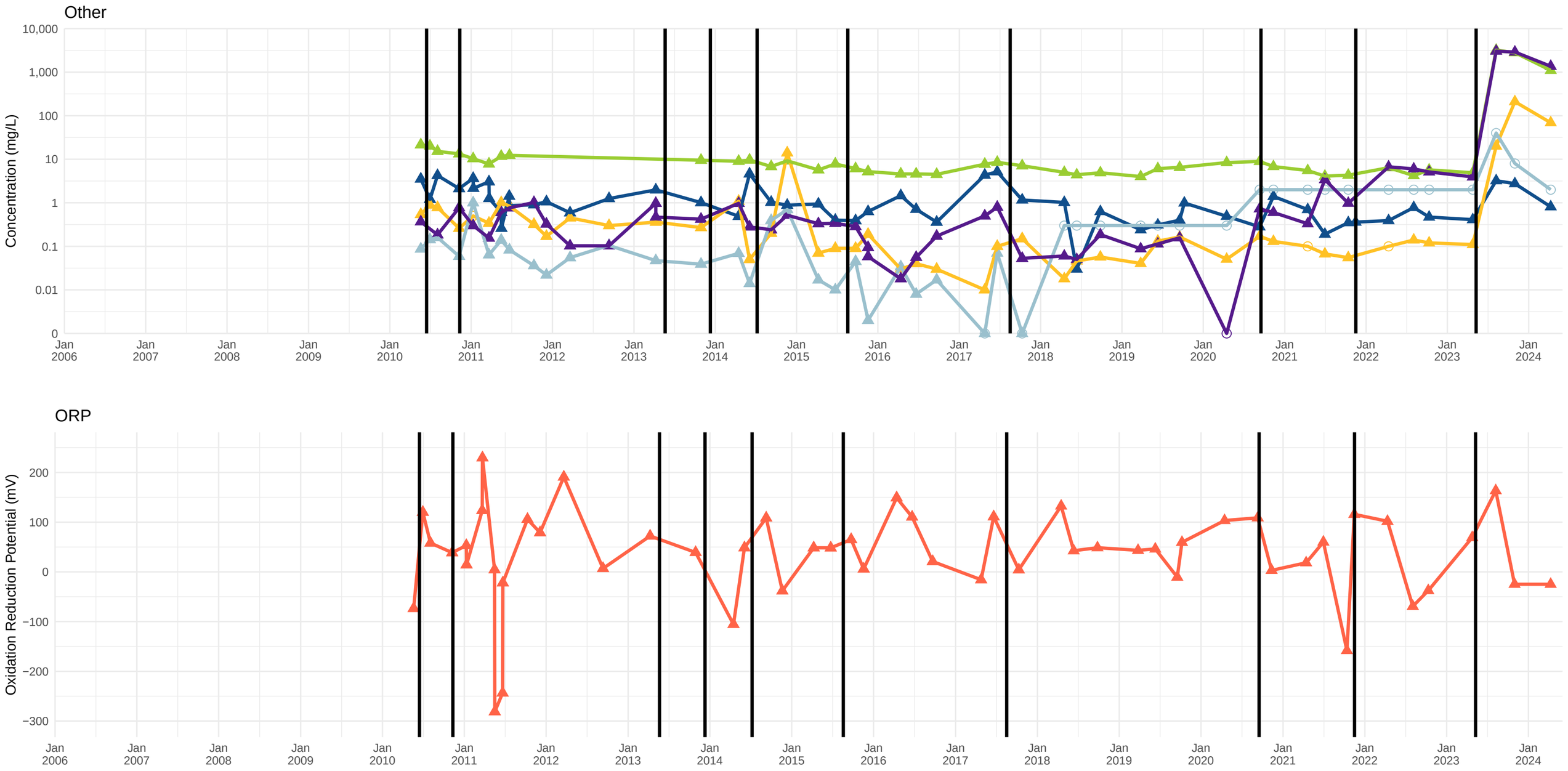
BP−34A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



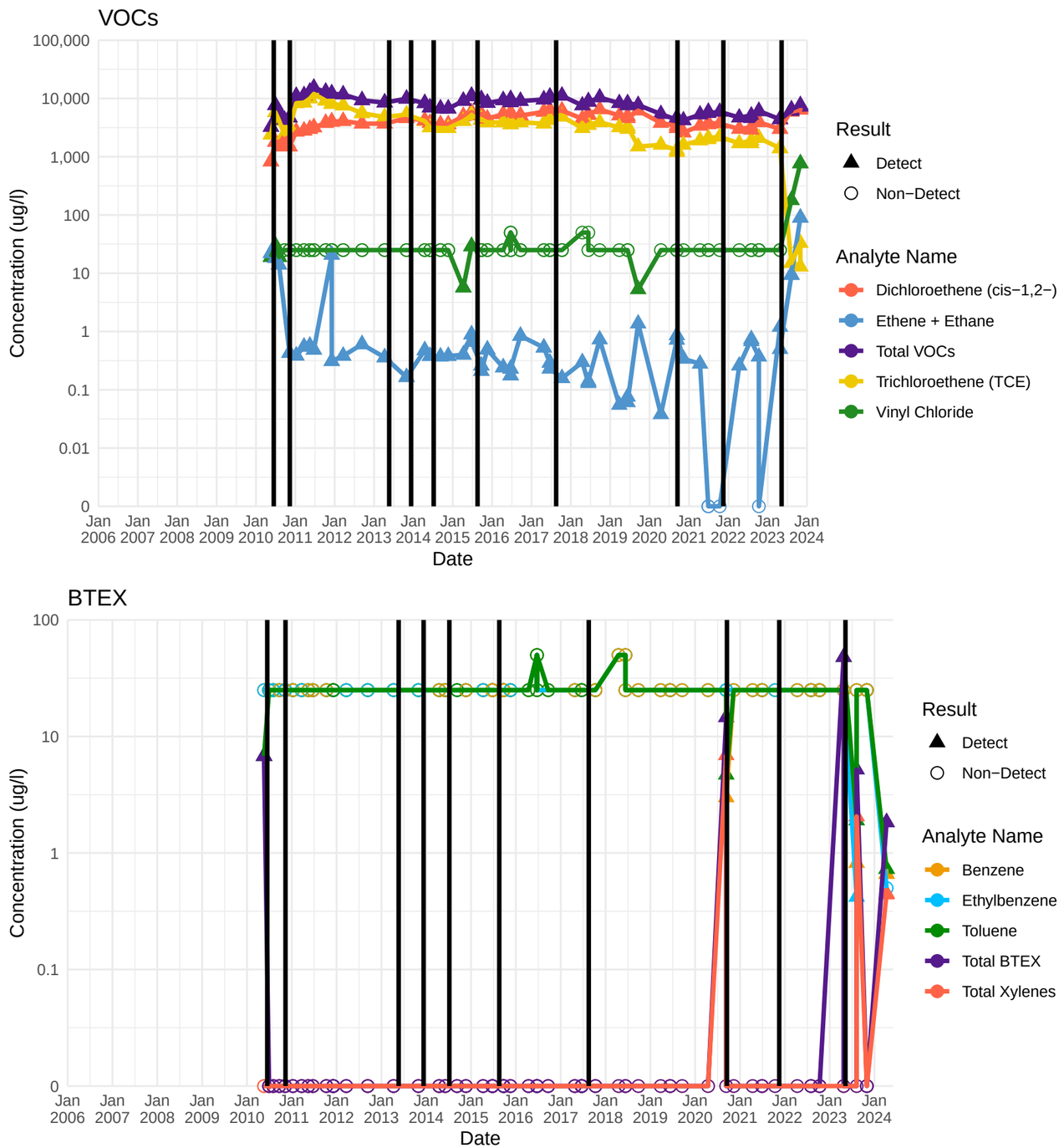
BP−35A

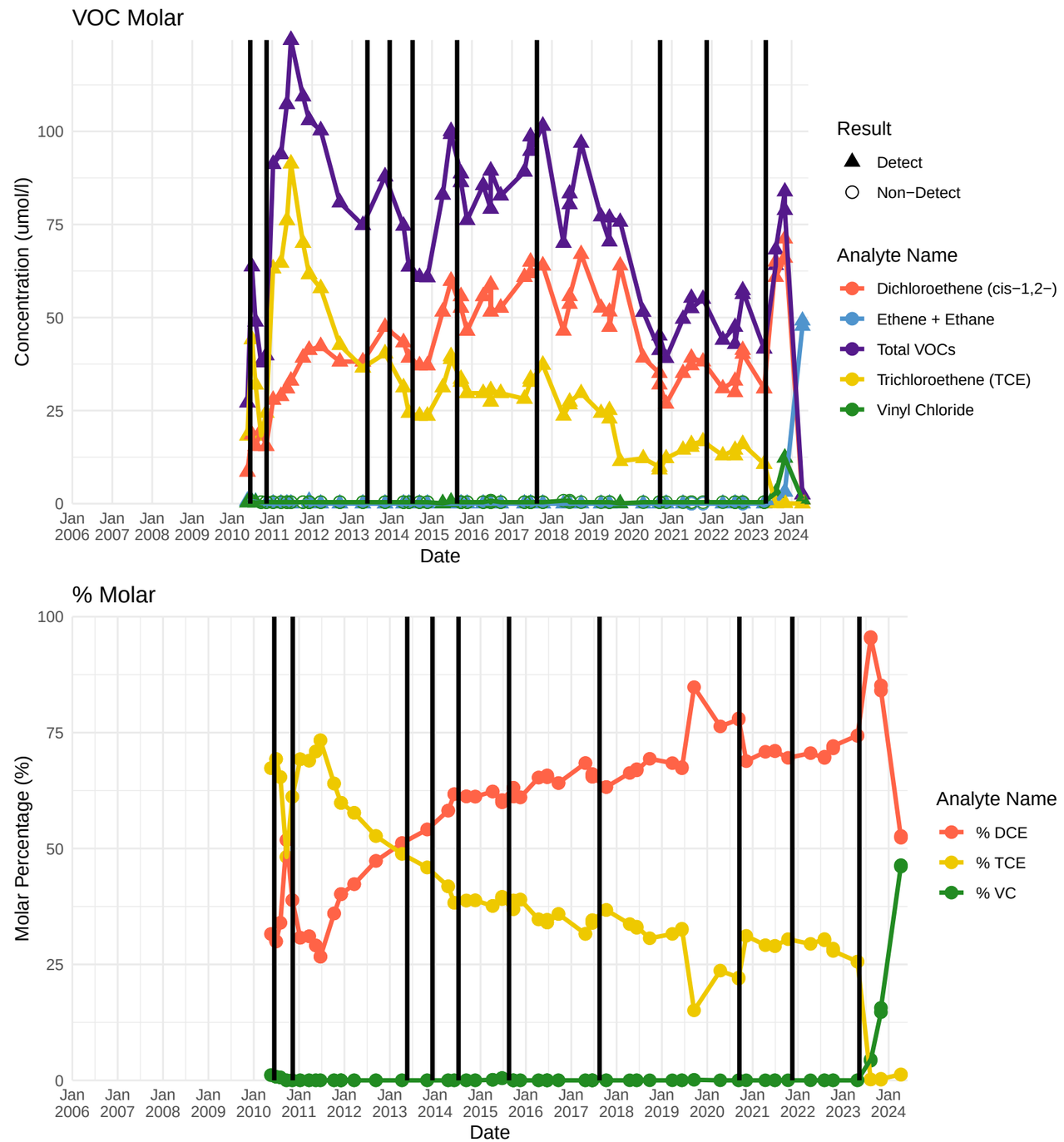
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





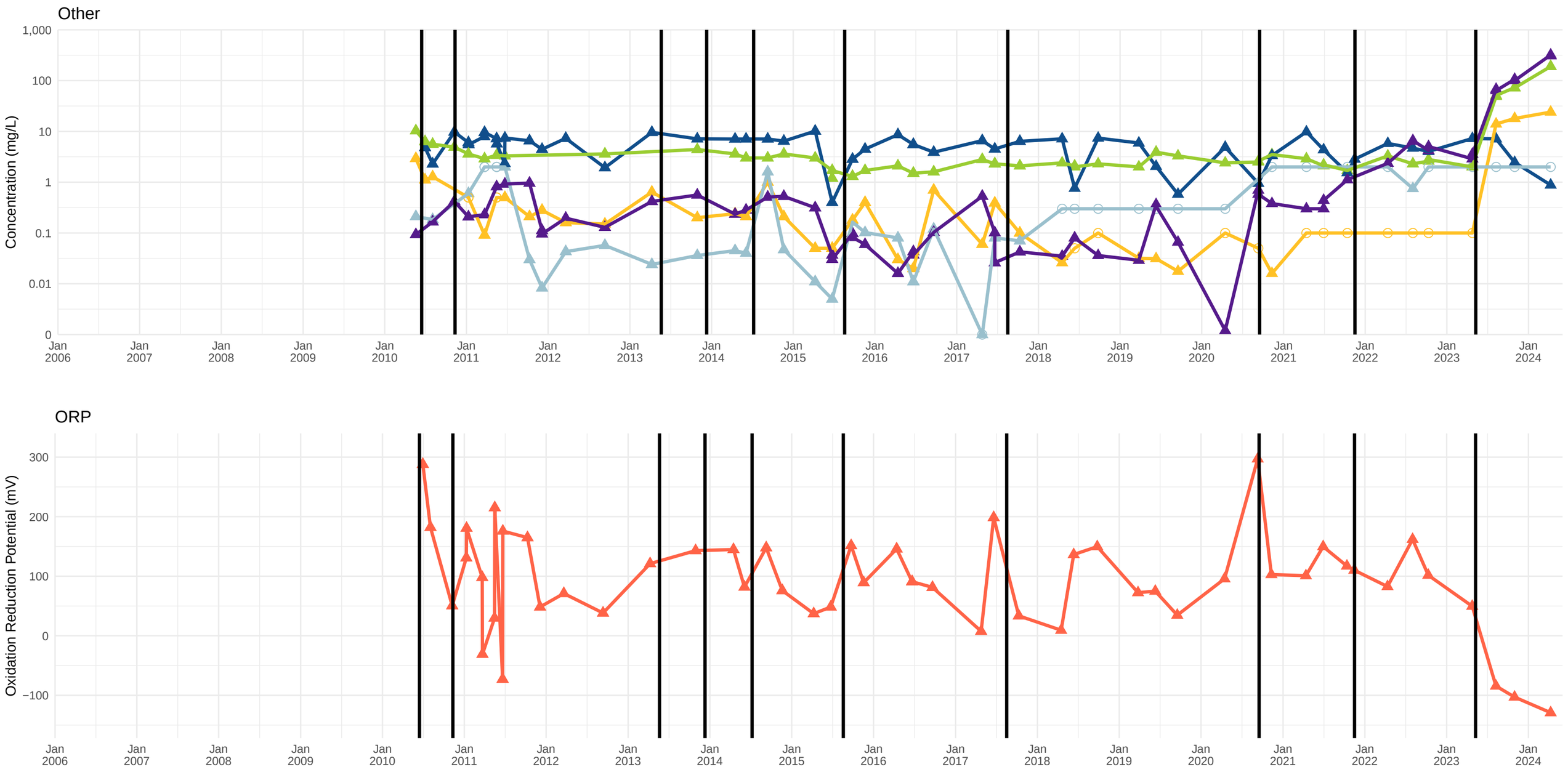
BP−35A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



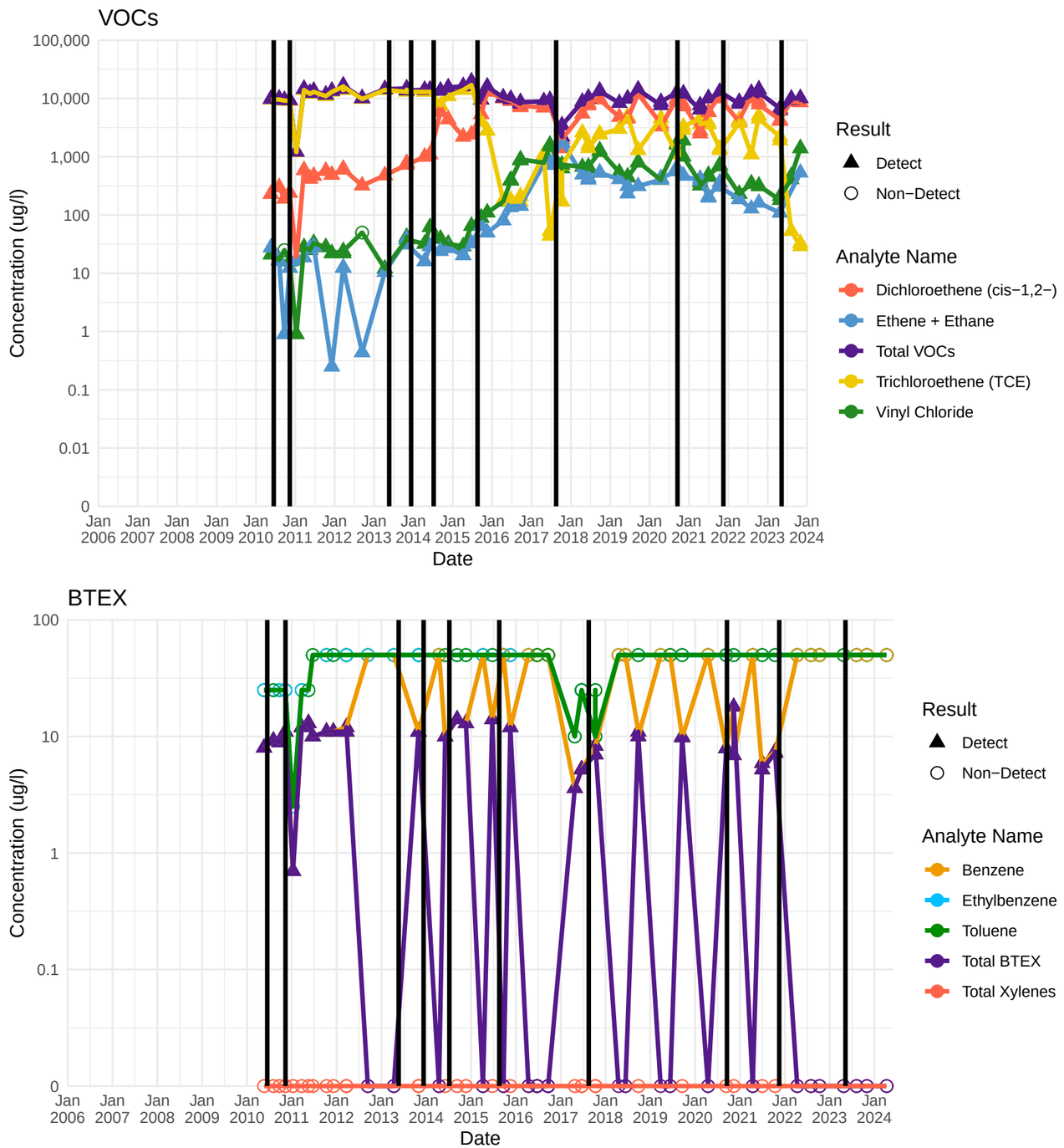
BP−36A

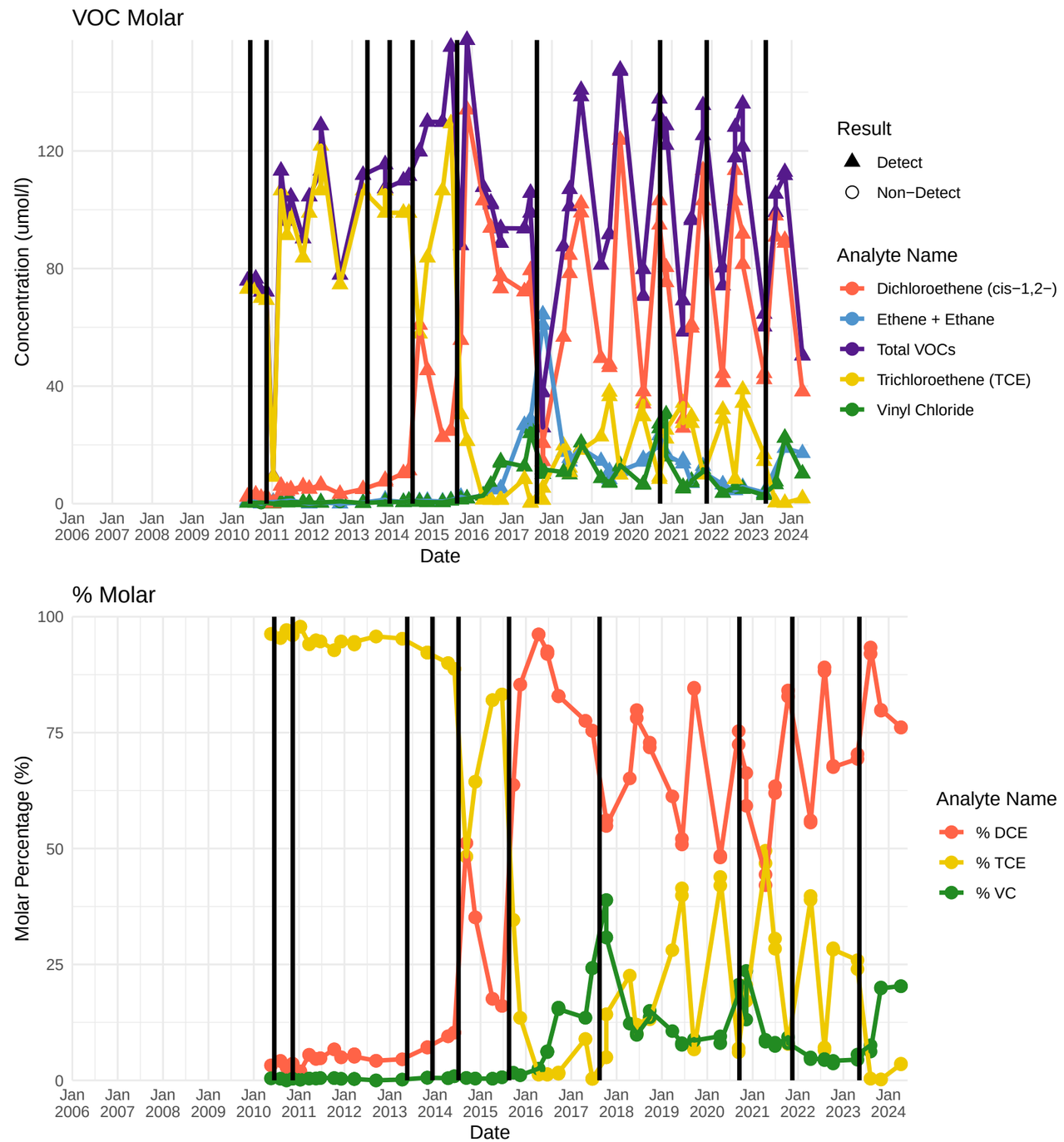
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





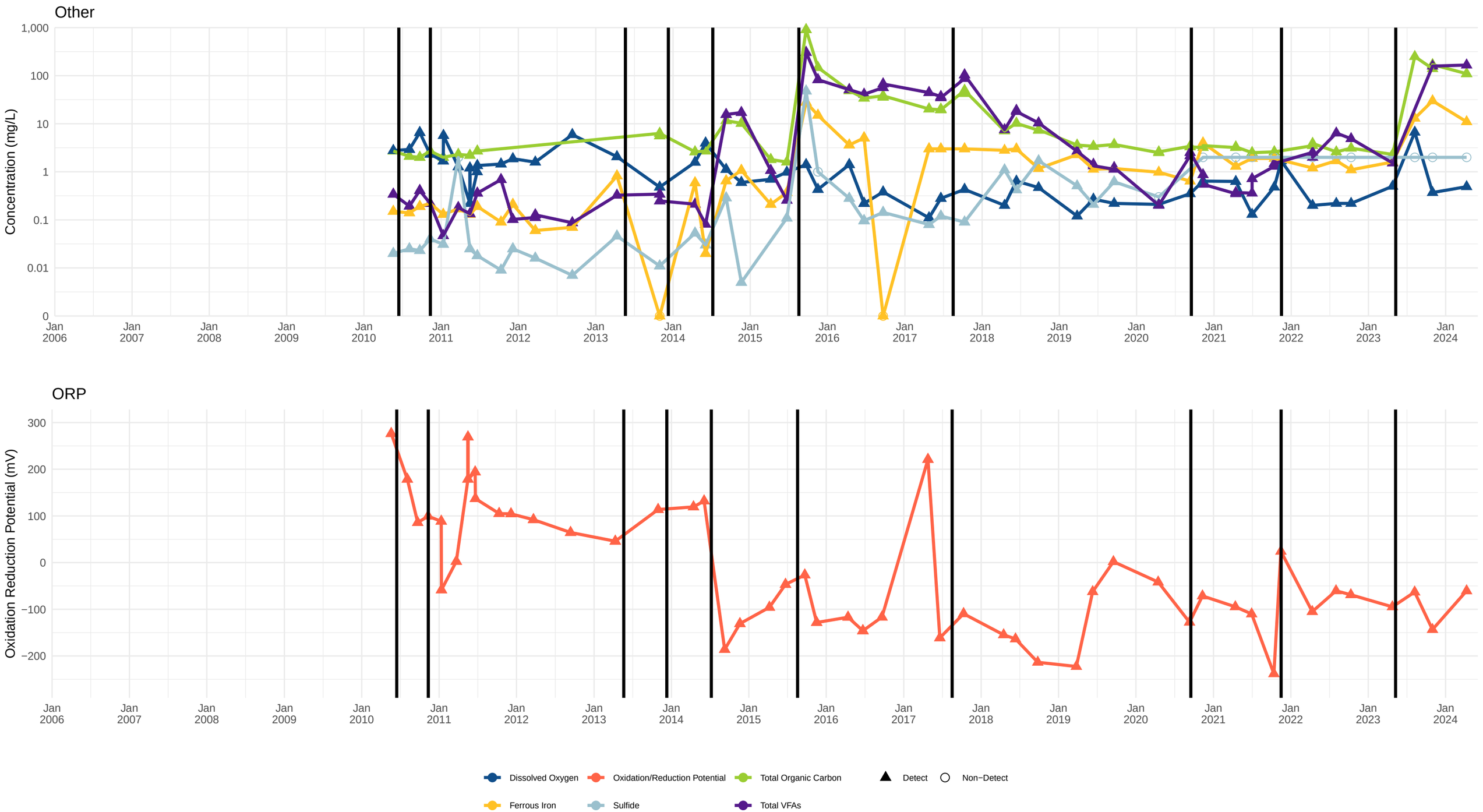
BP−36A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



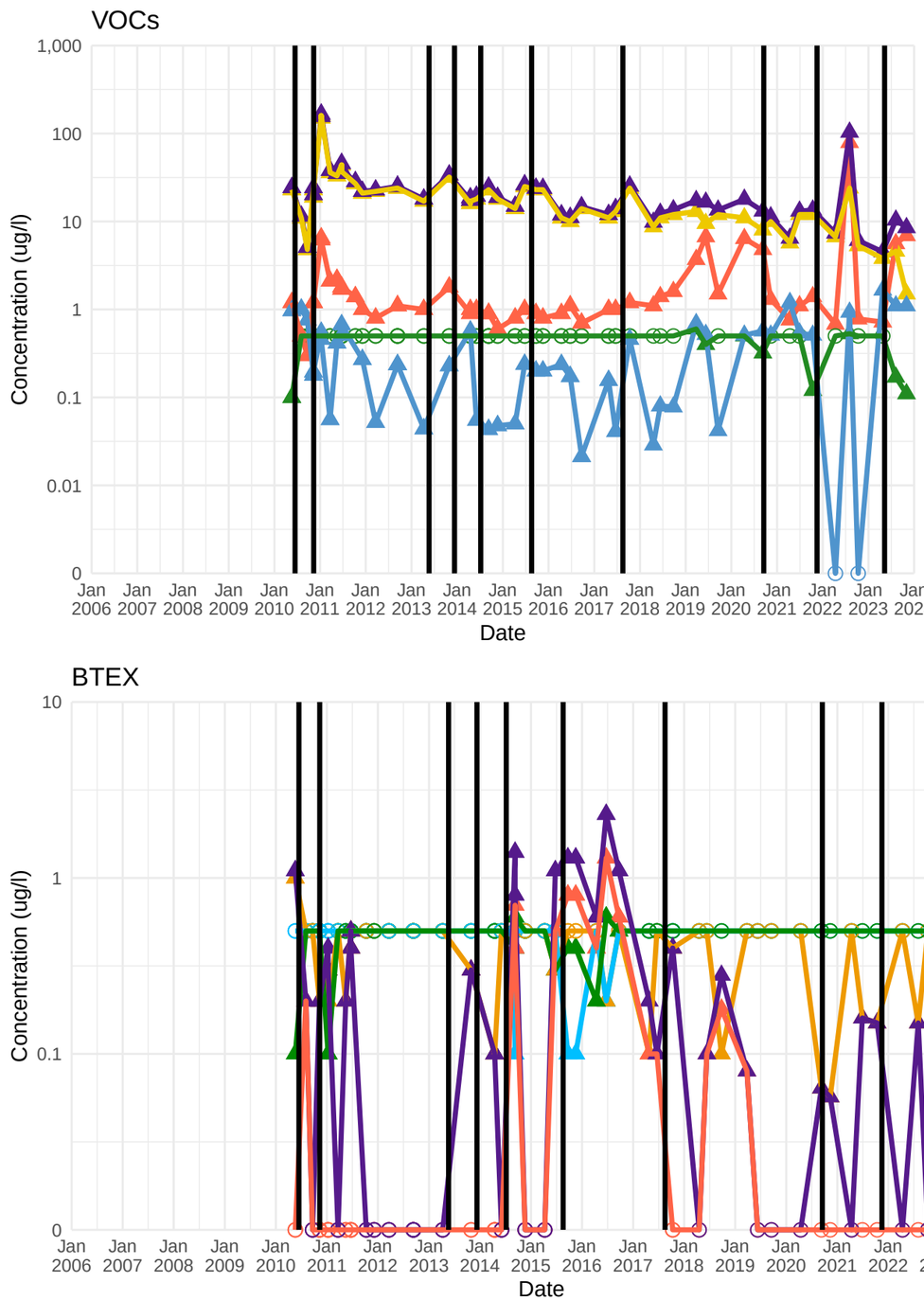
BP−37A

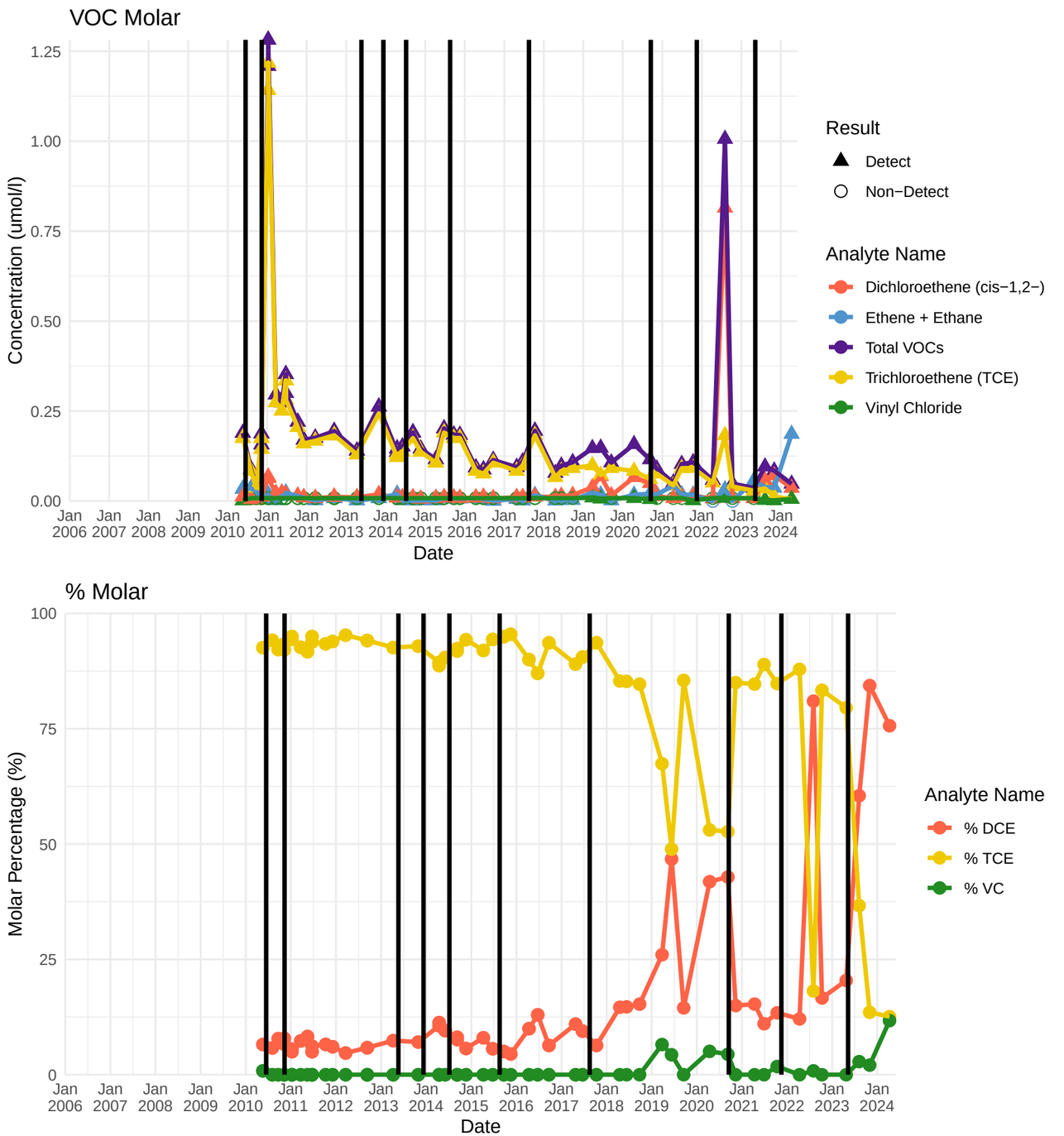
Notes:

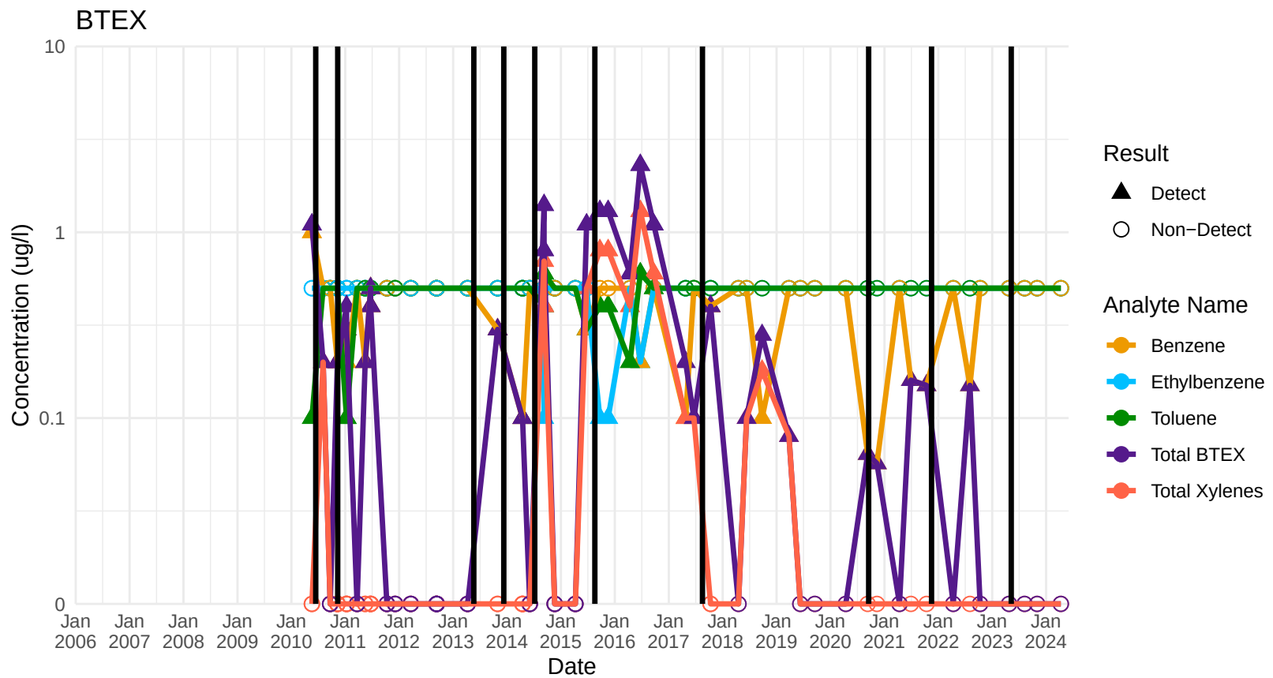
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.







BP−37A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.

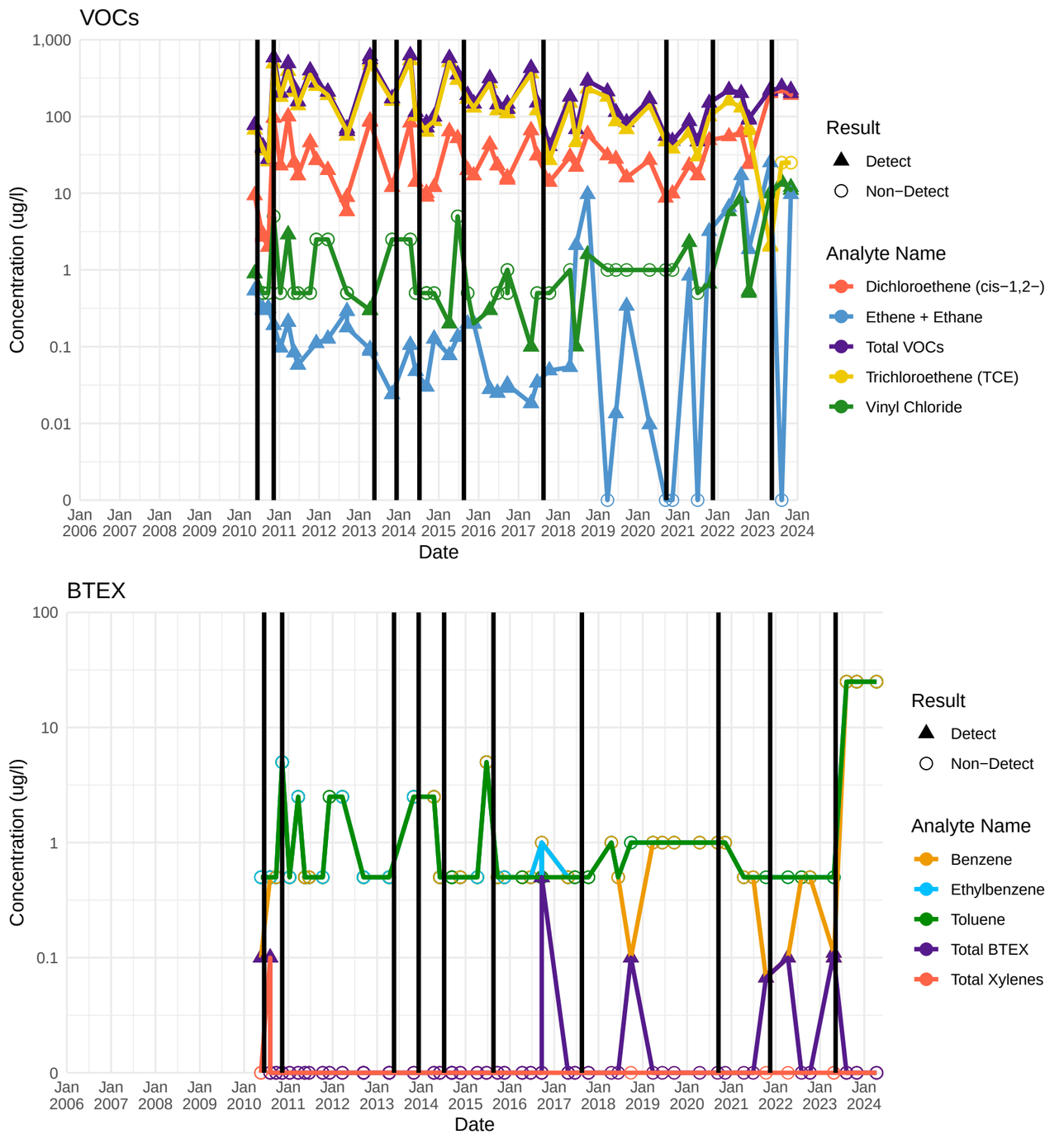
BP−38A

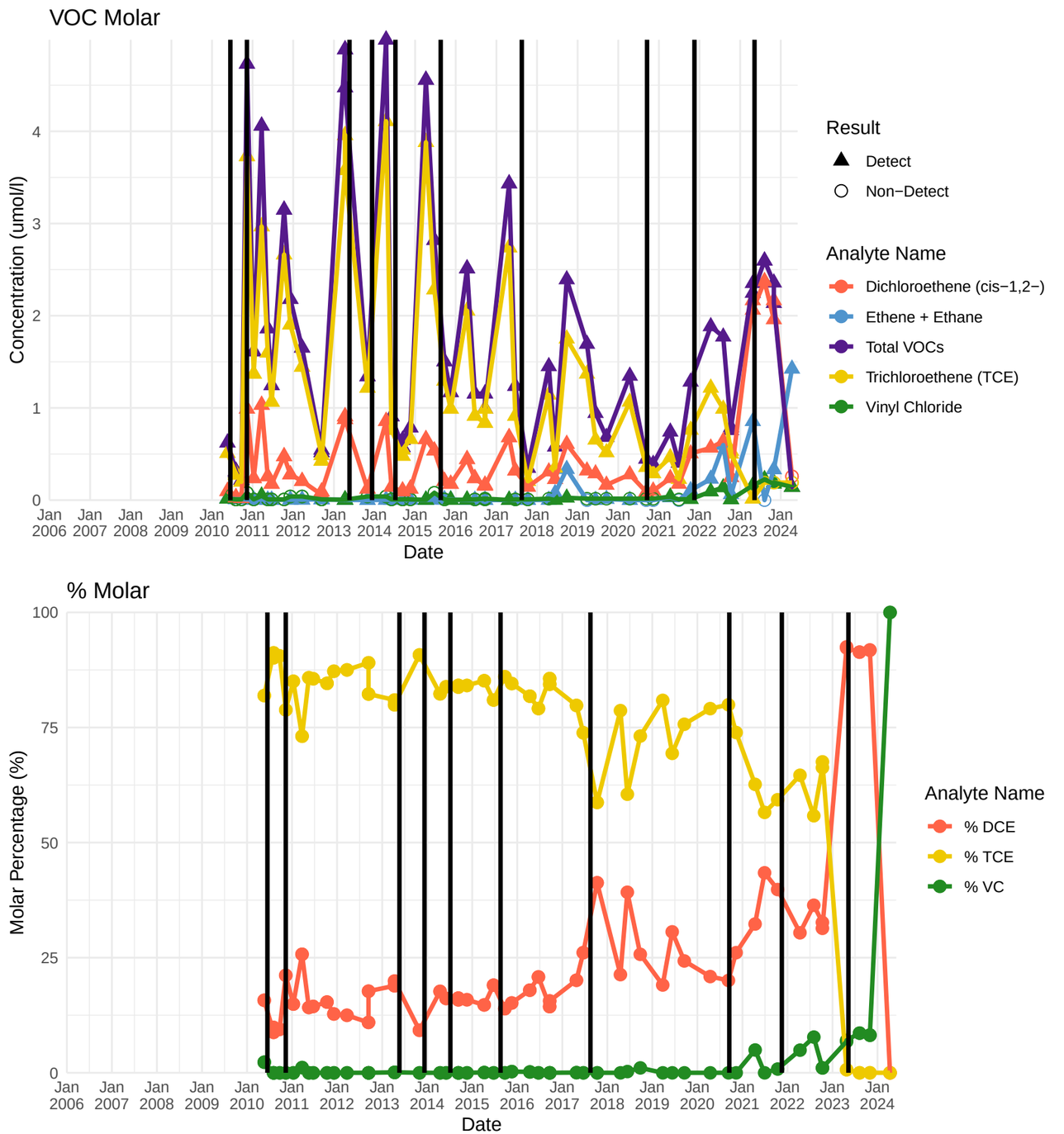
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





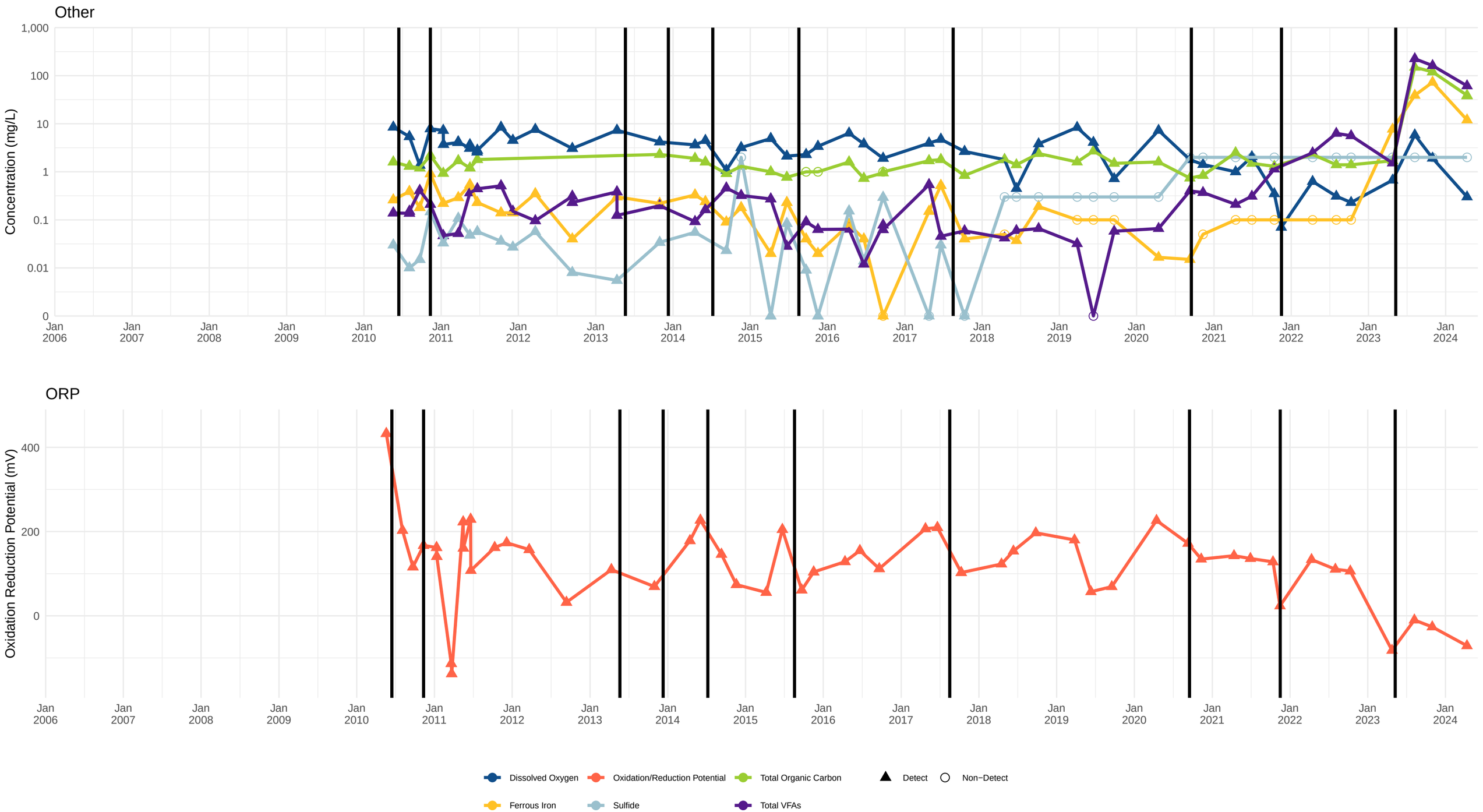
BP−38A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



BP−39A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

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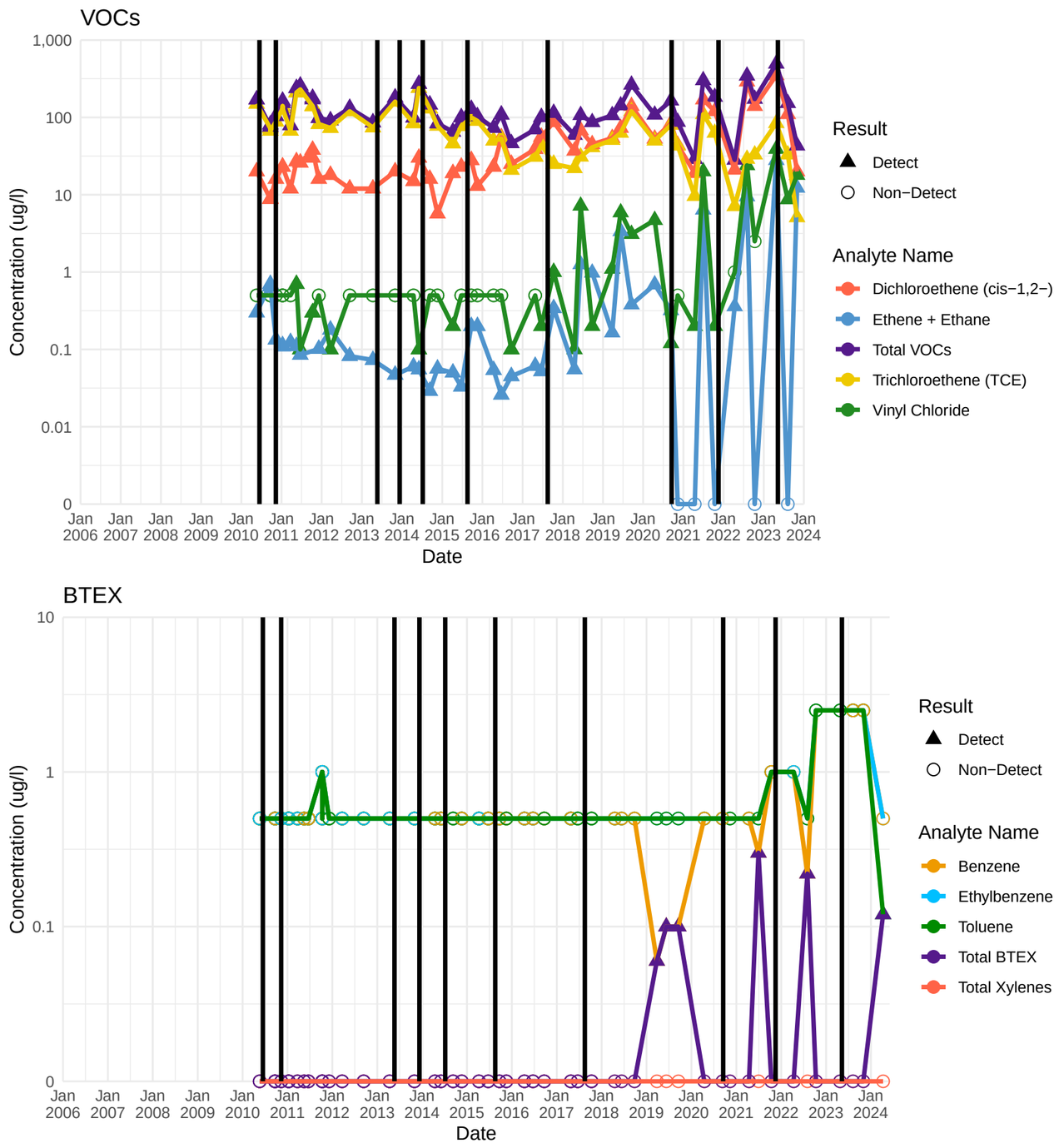

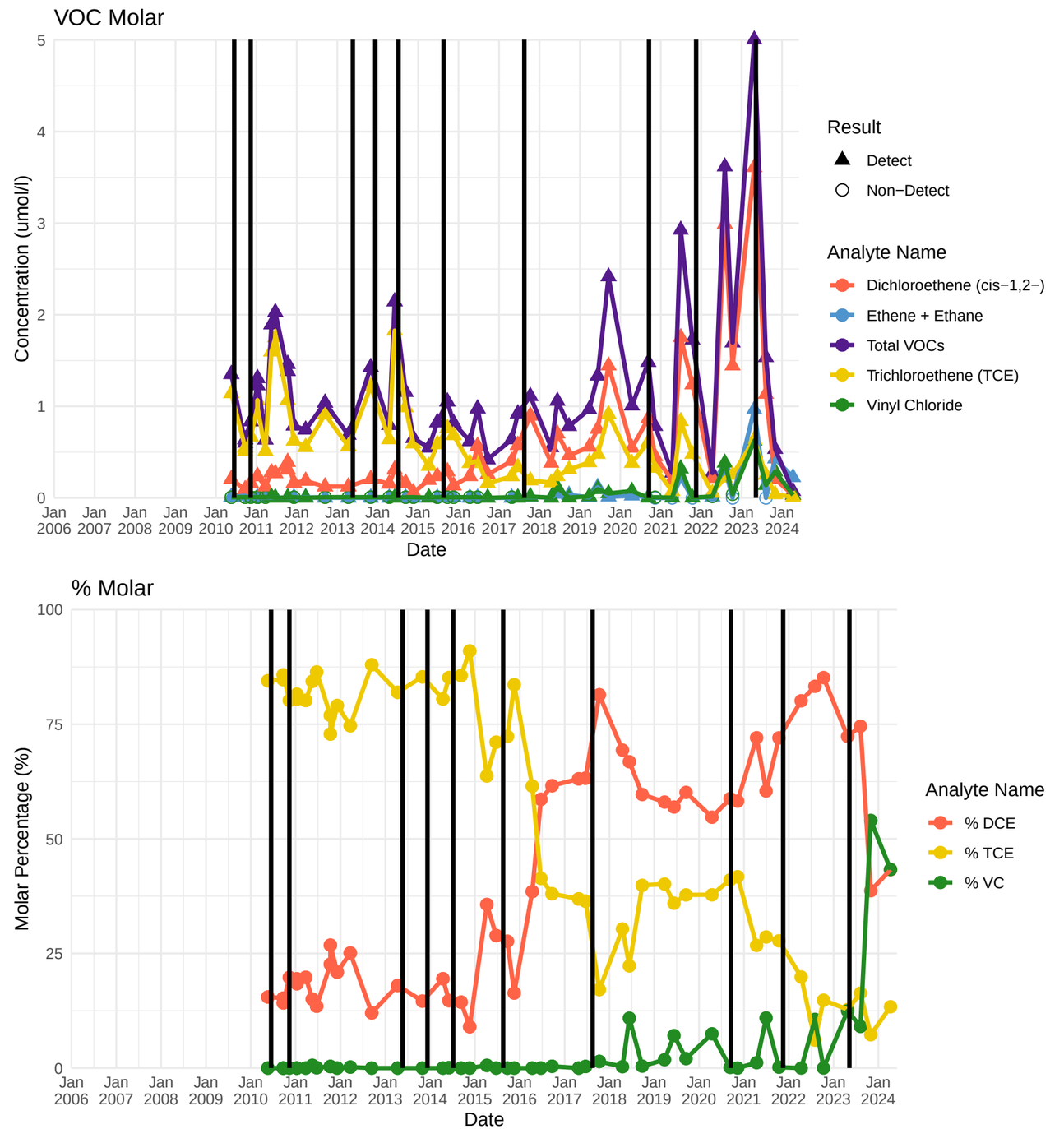

BP−39A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

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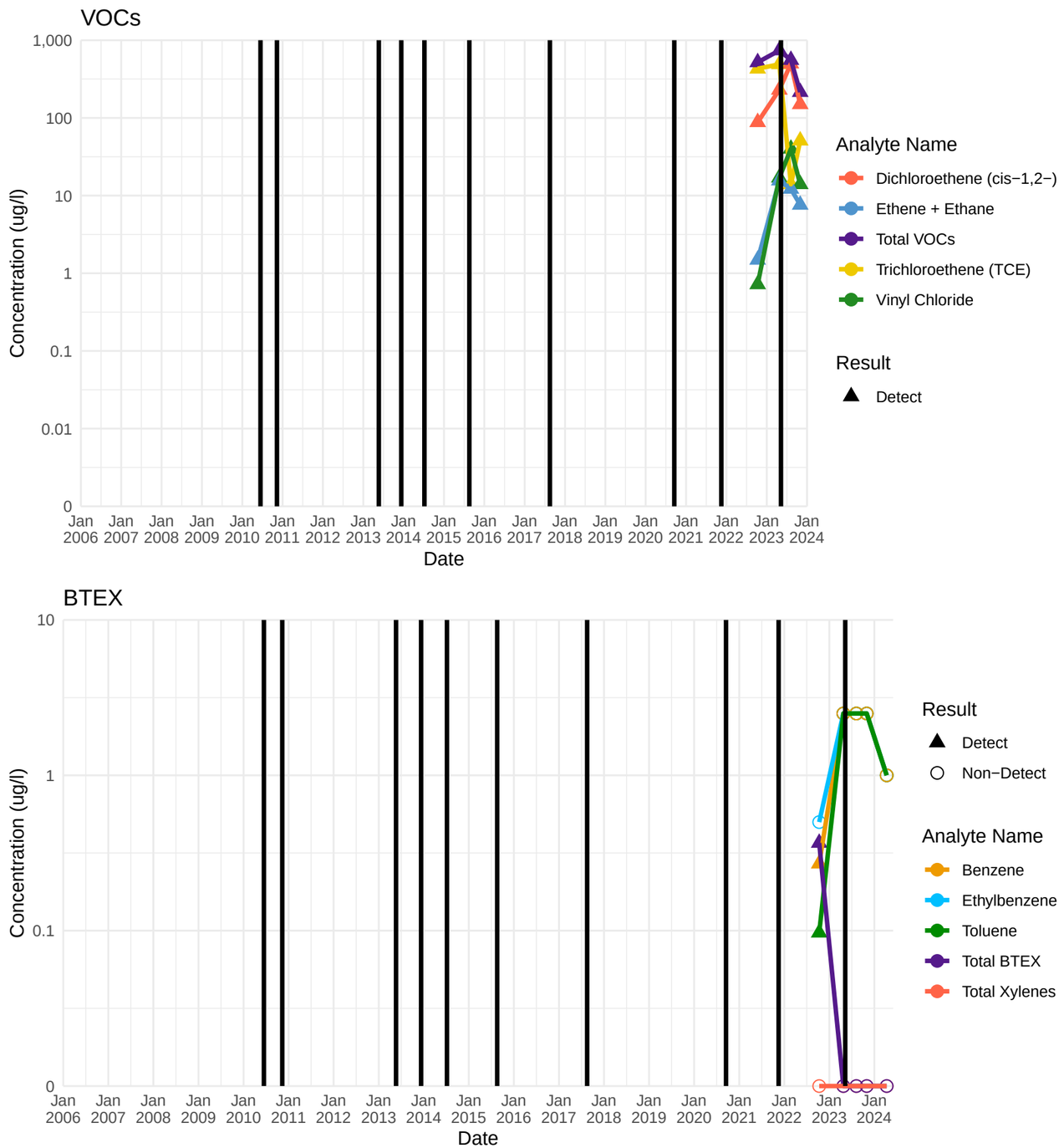
BP−41A

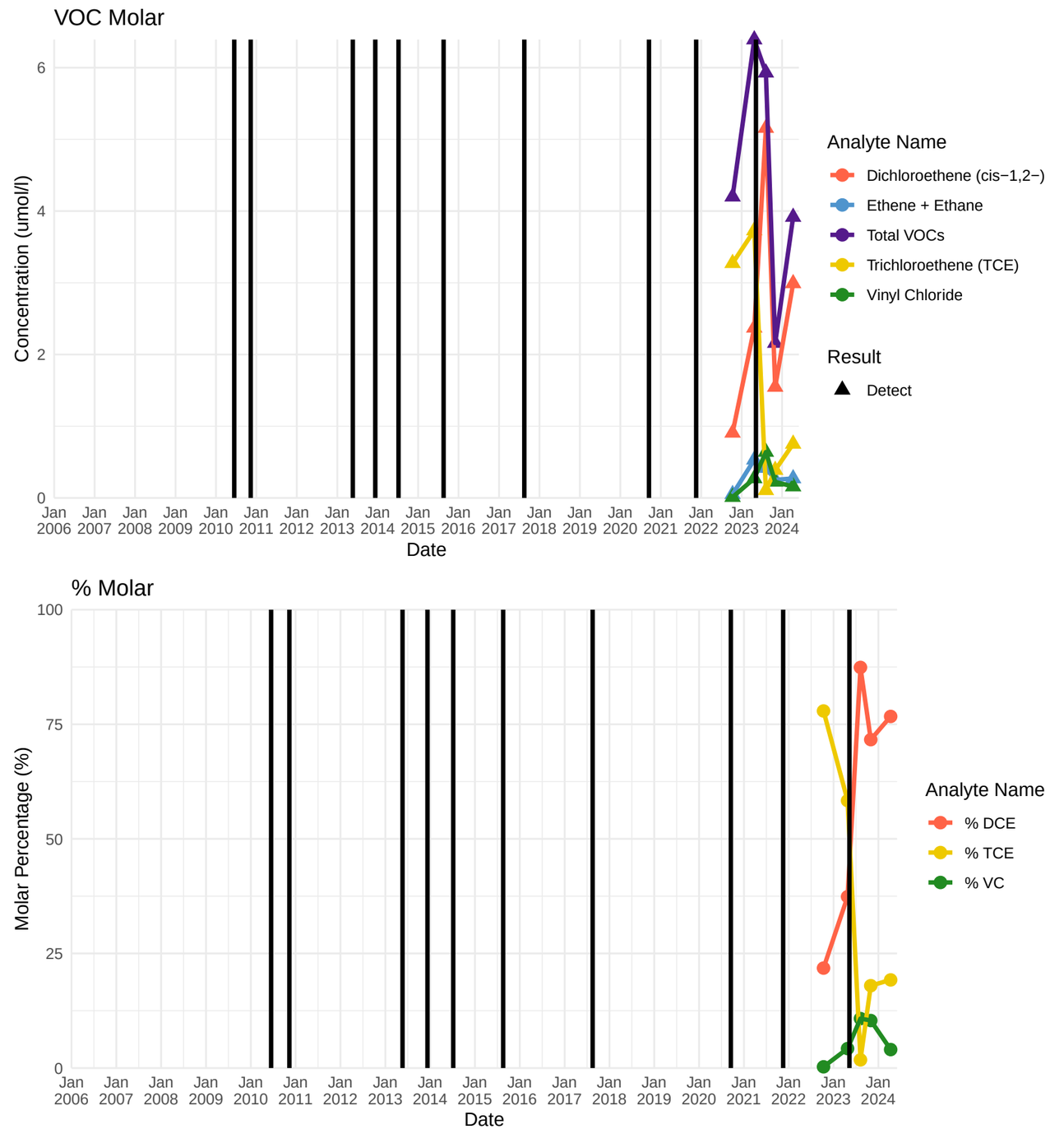
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





Sanborn, Head & Associates, Inc.

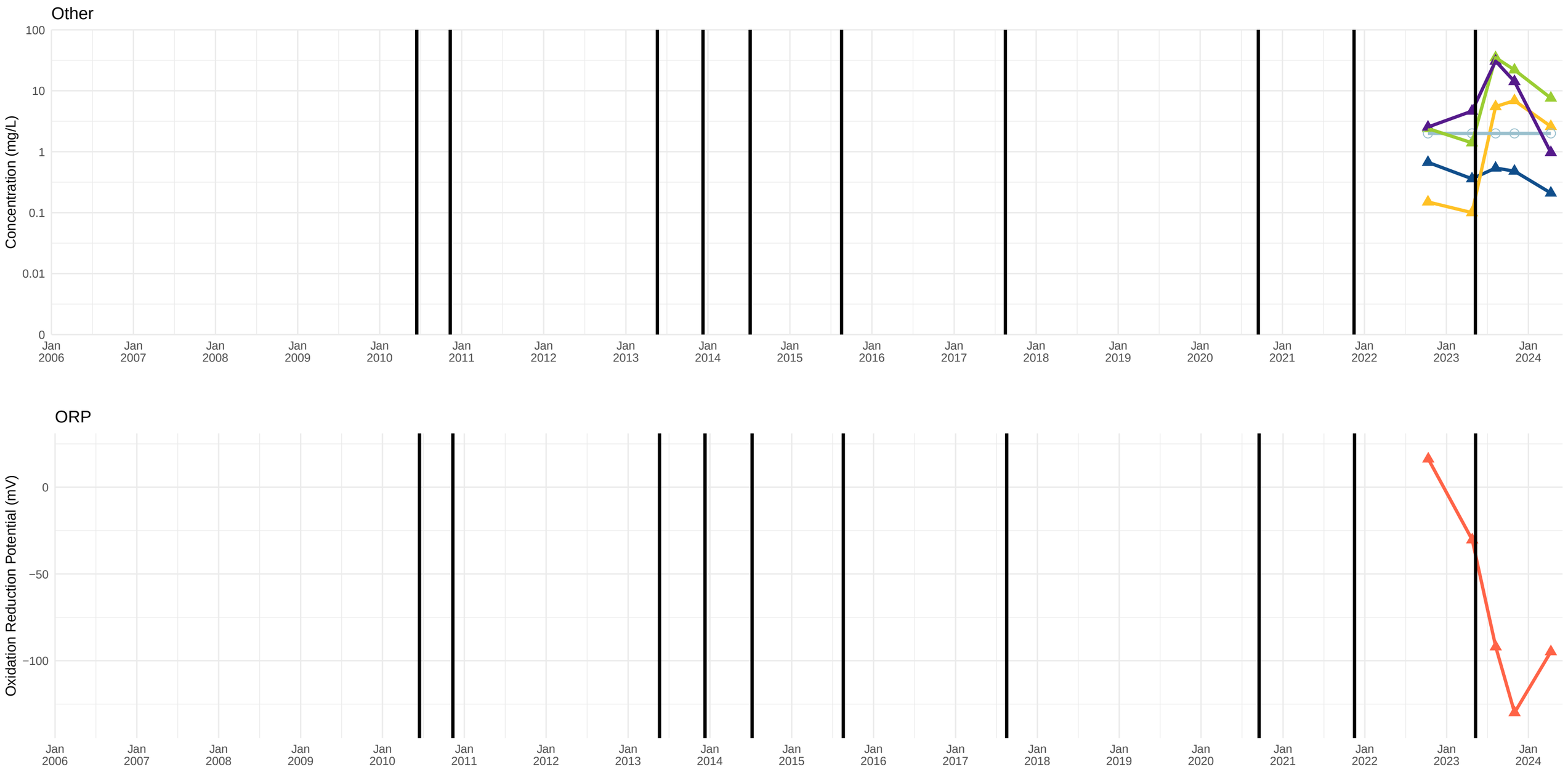
BP−41A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



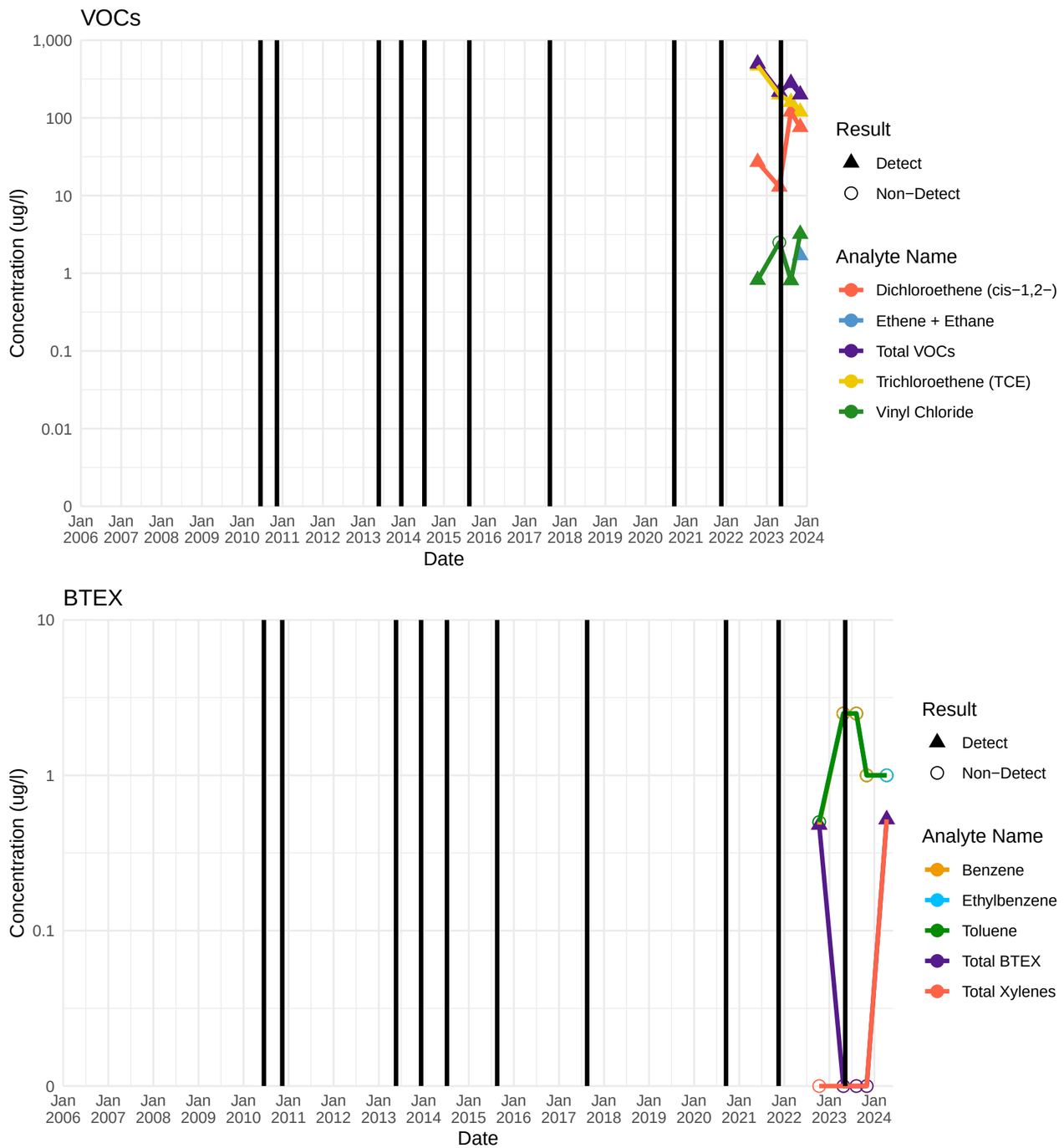
BP−42AS

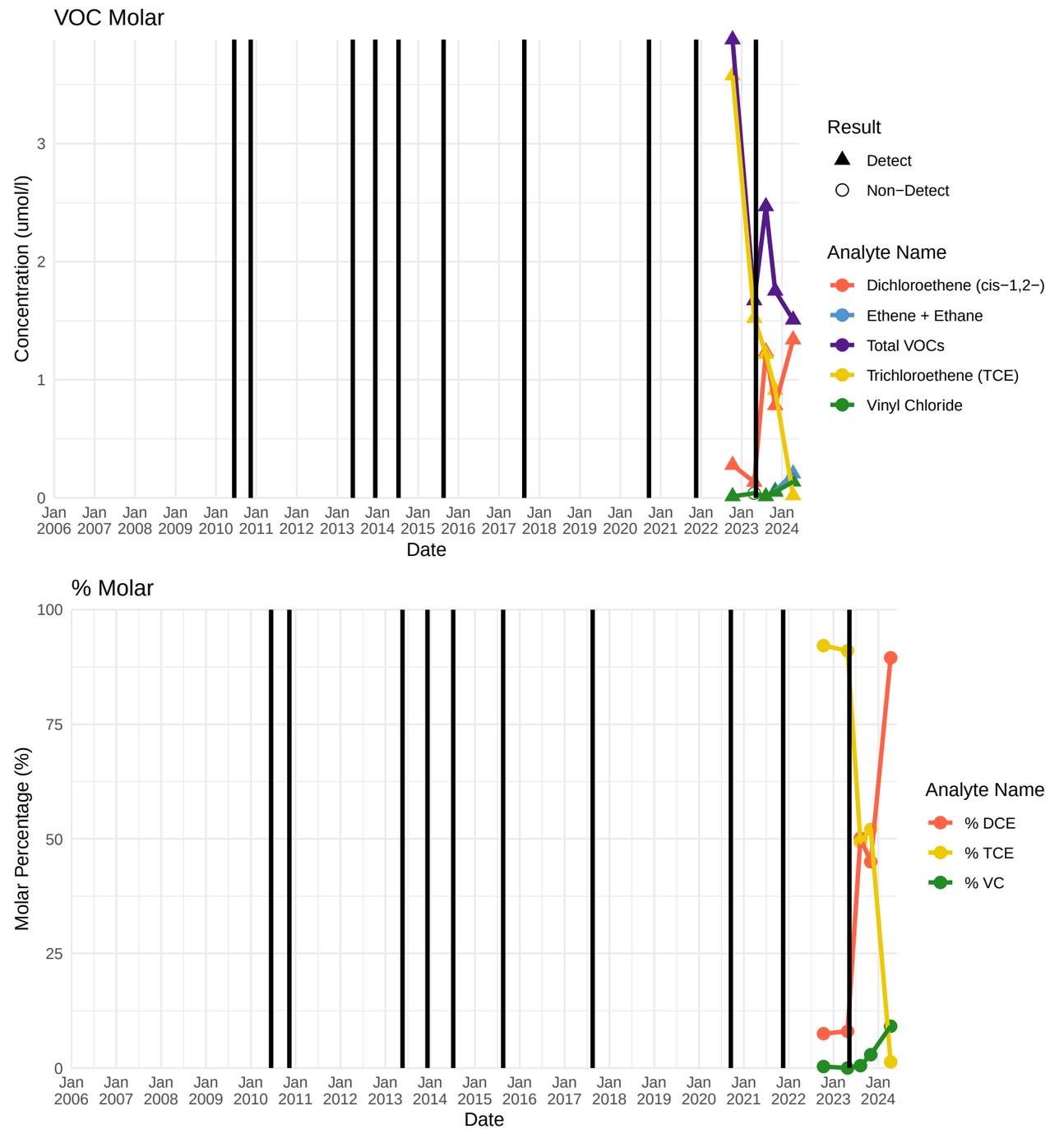
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





BP−42AS

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

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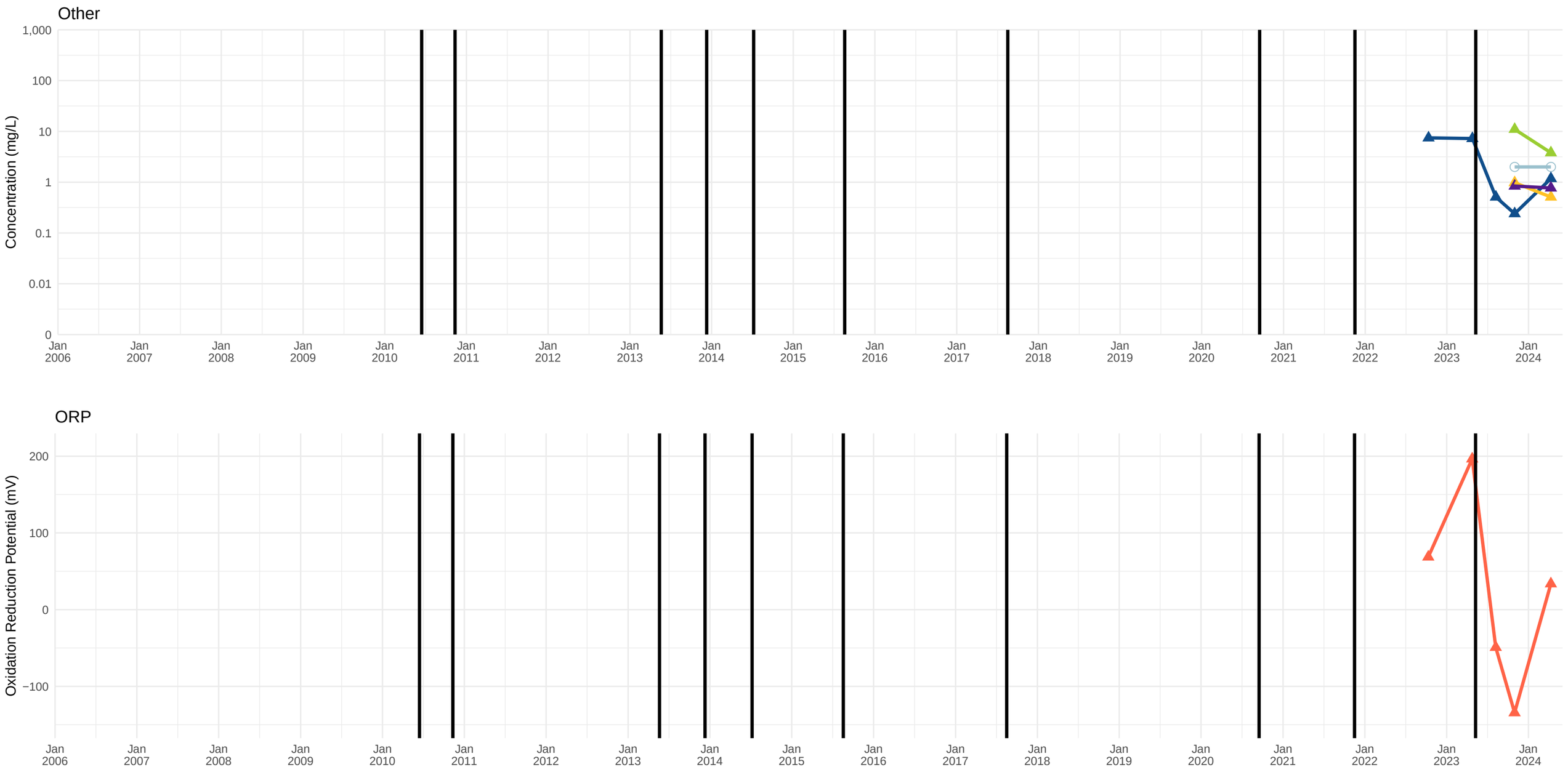


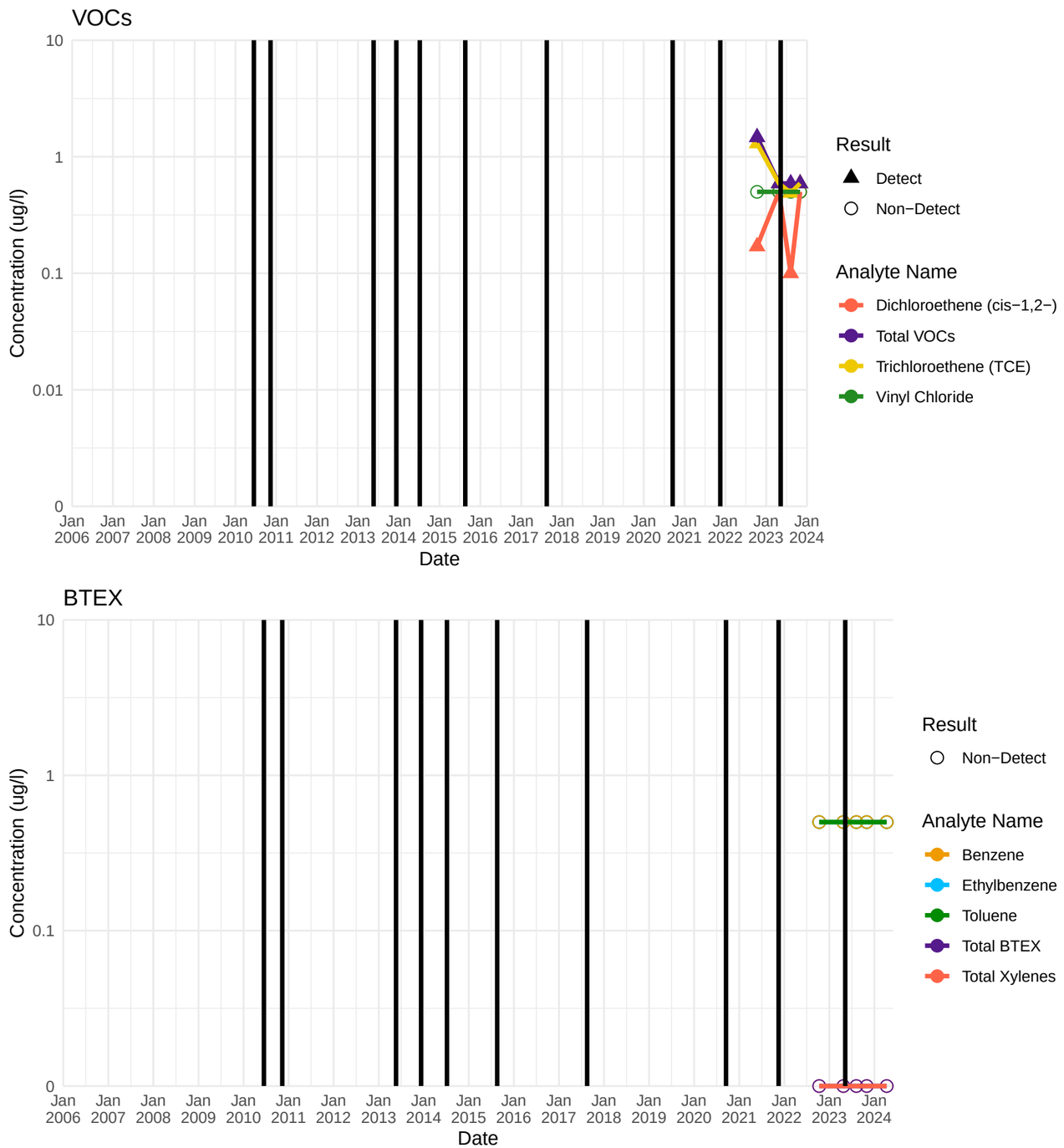
BP−42AI

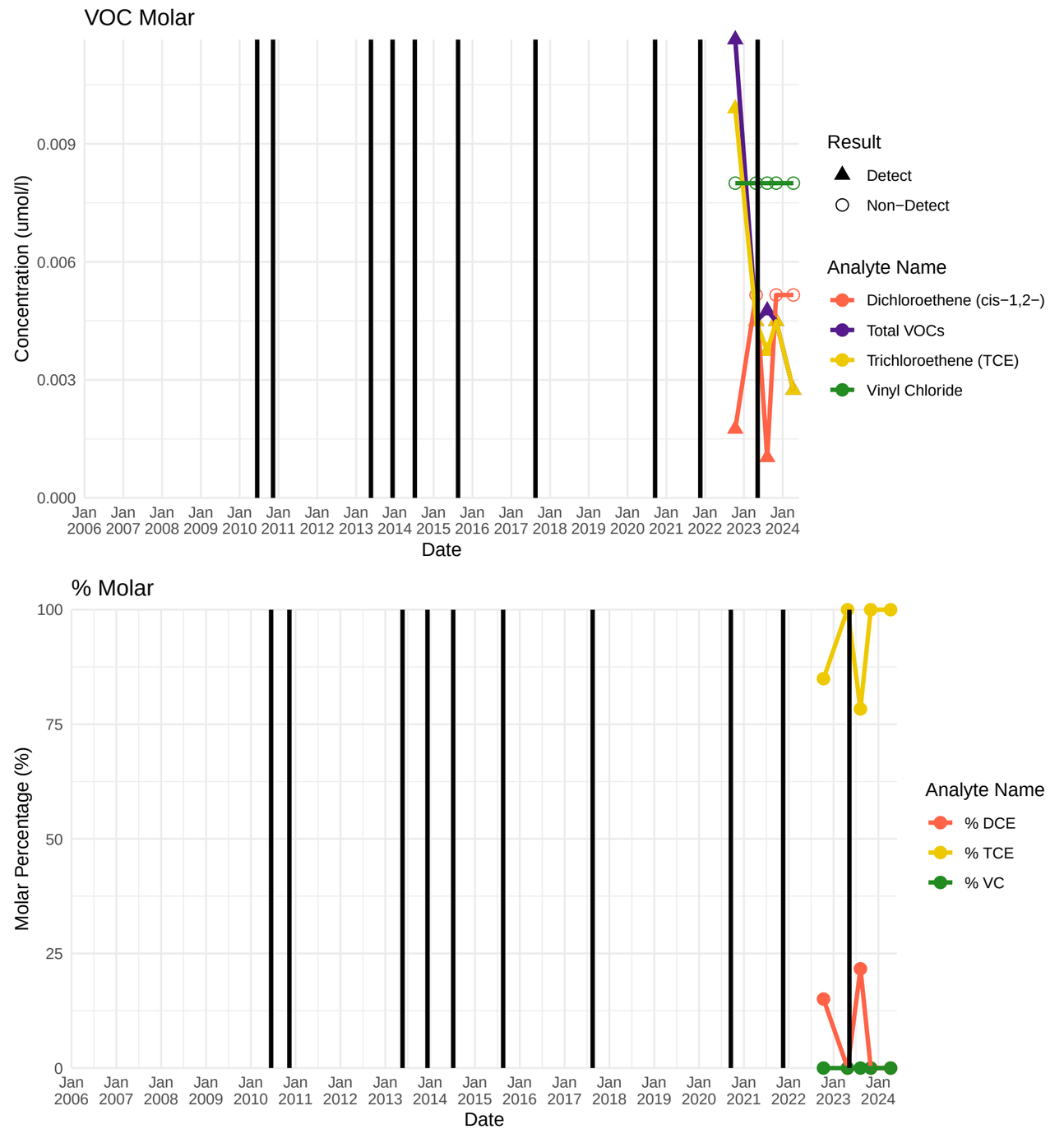
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





BP−42AI

Notes:

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(2) Black vertical lines indicate amendment injection events.

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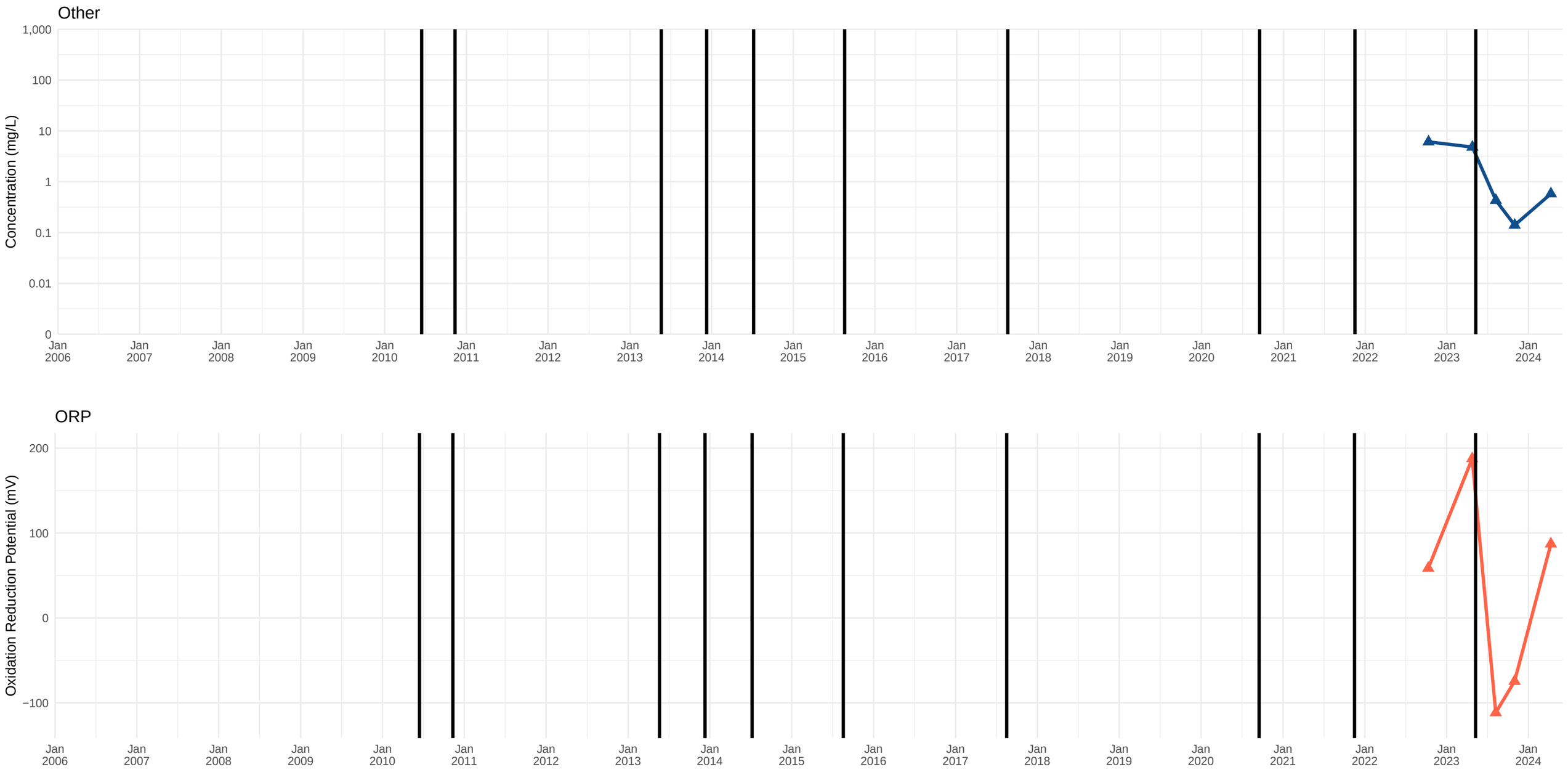


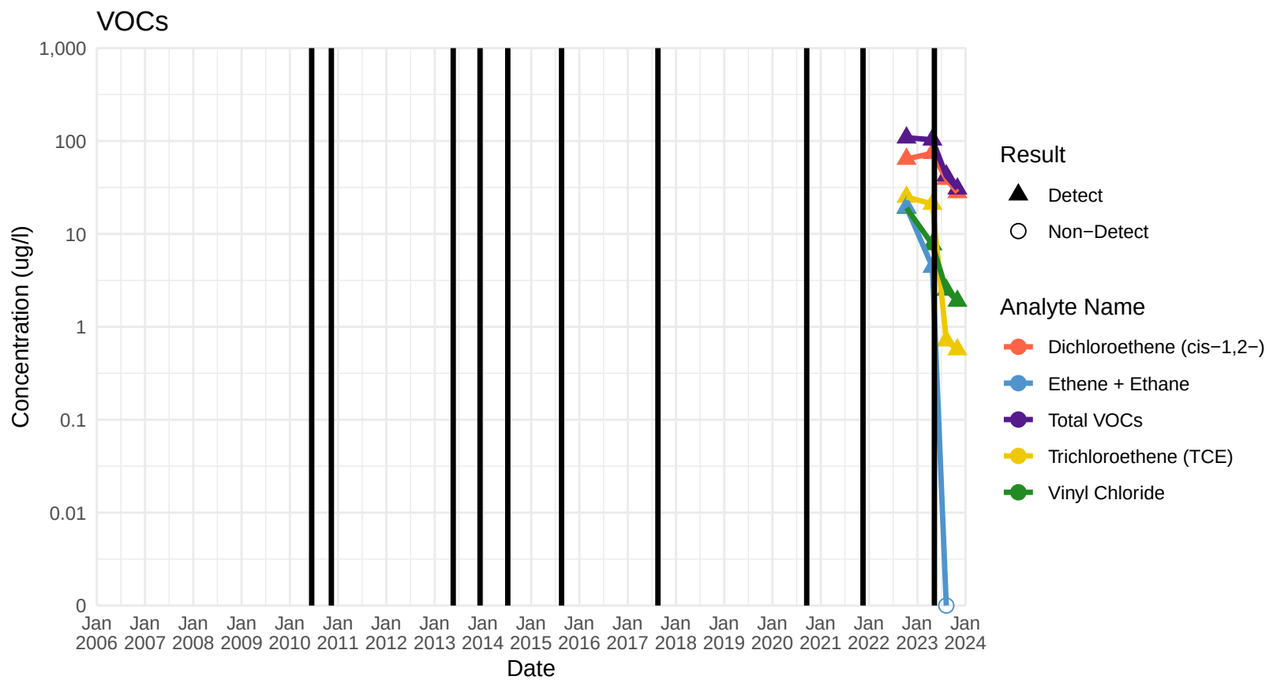
BP−42AD

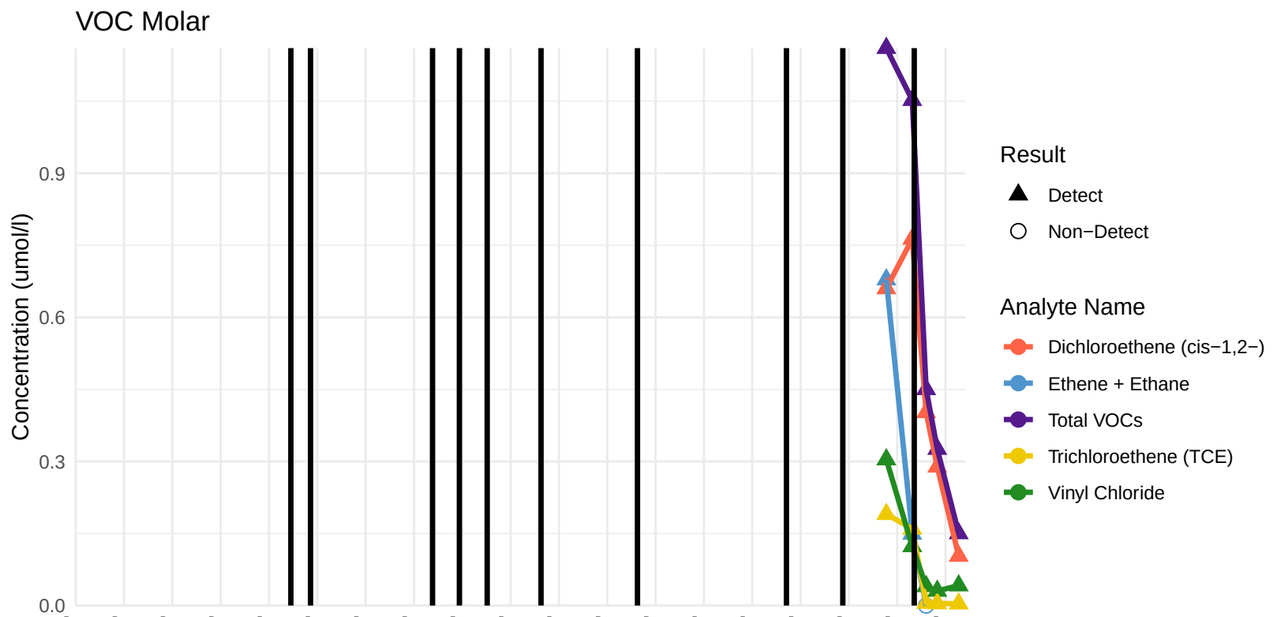
Notes:

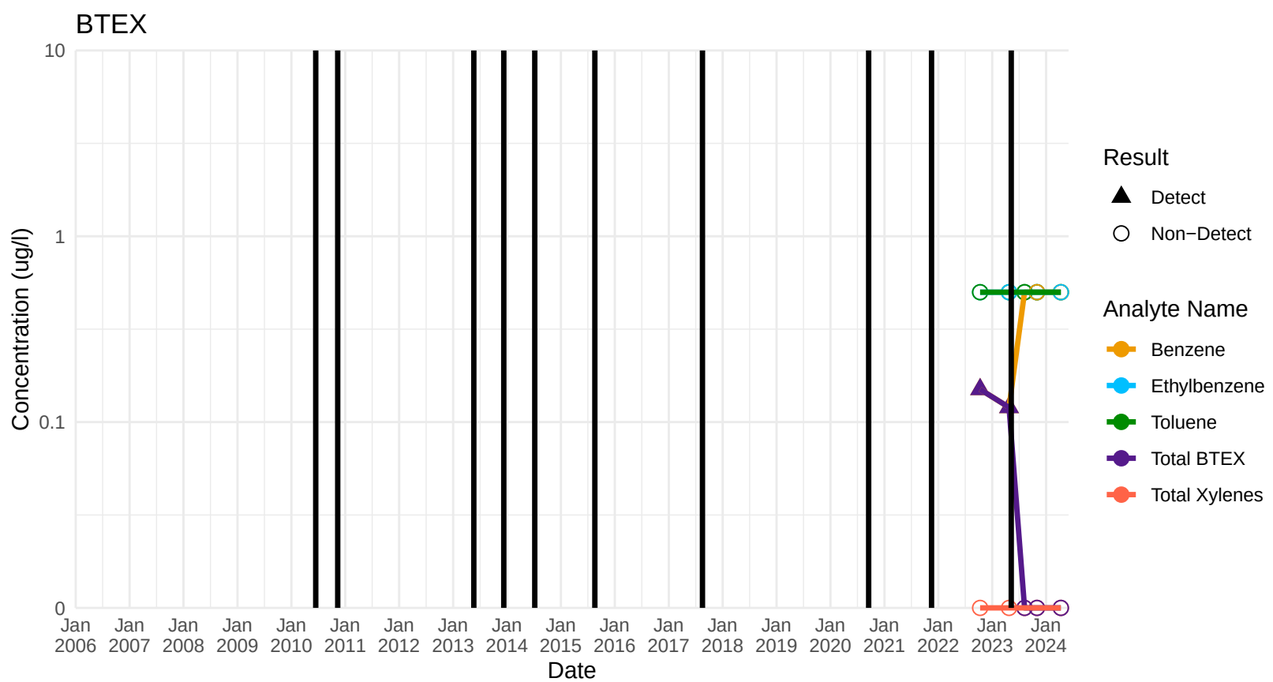
(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

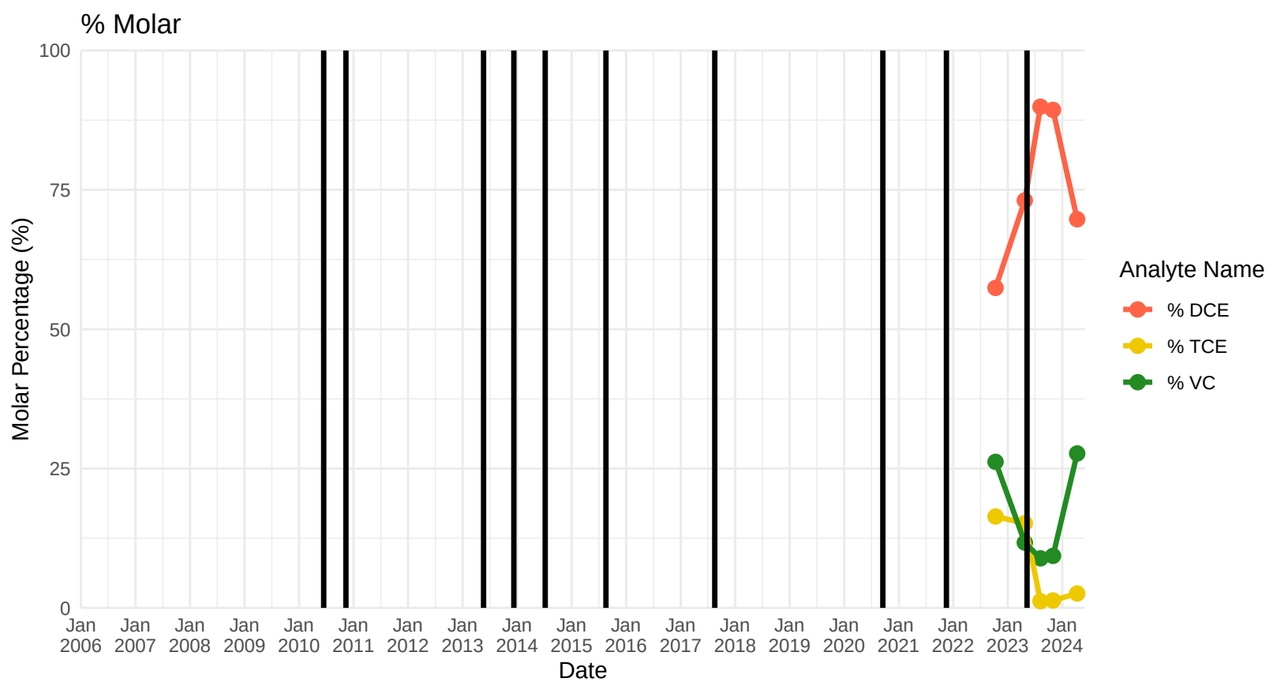
(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.









BP−42AD

Notes:

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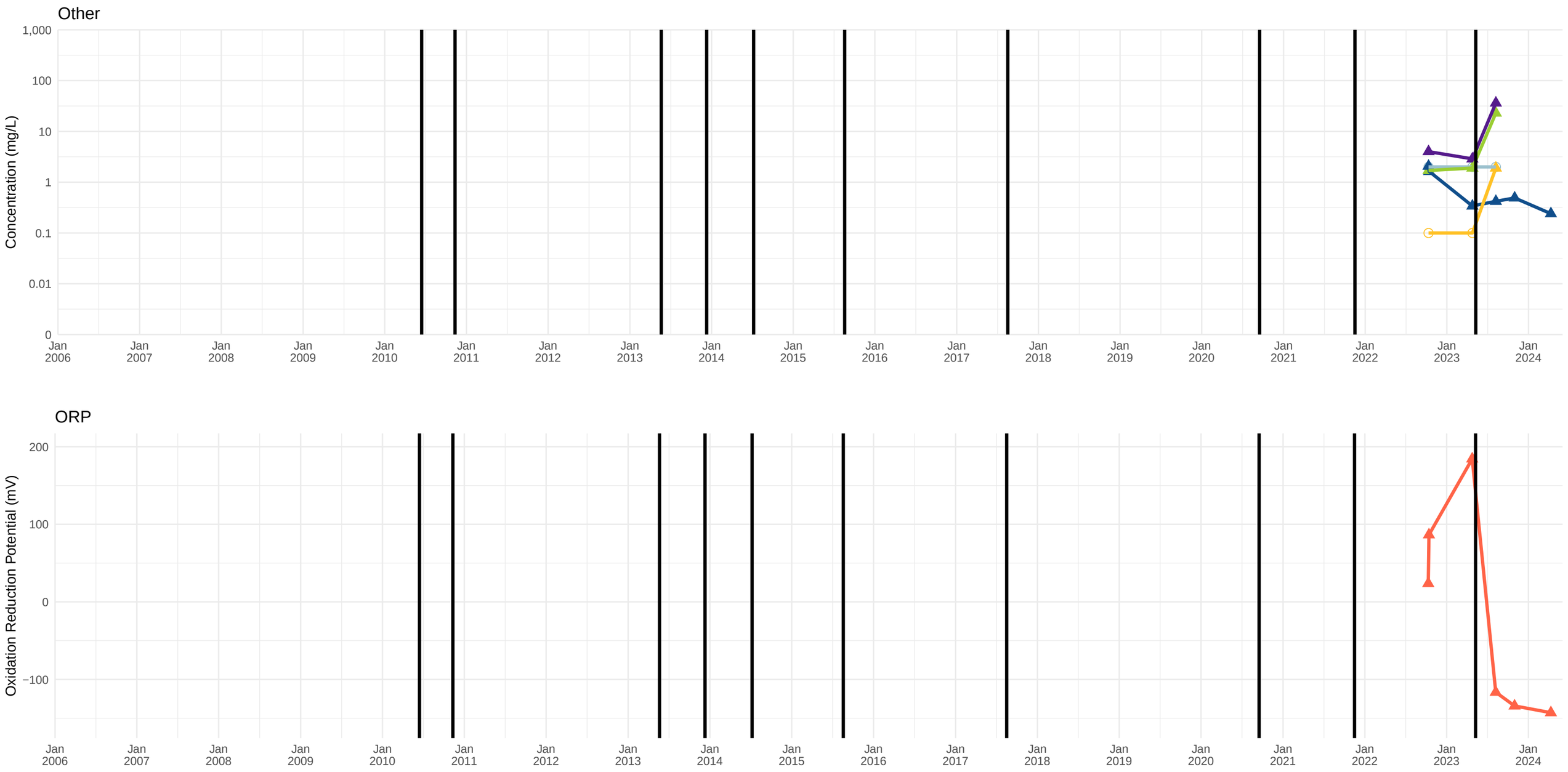


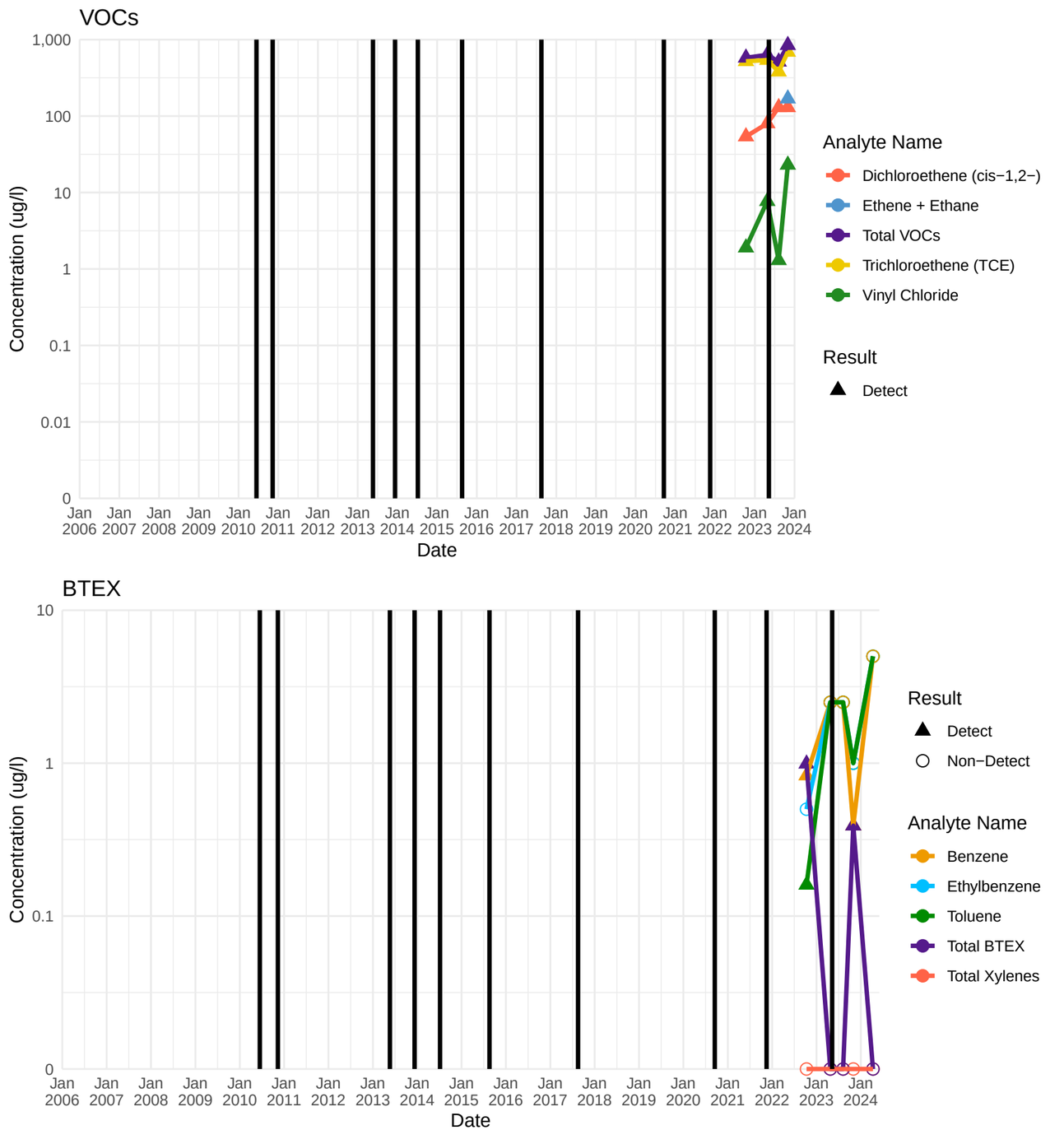
BP−43AS

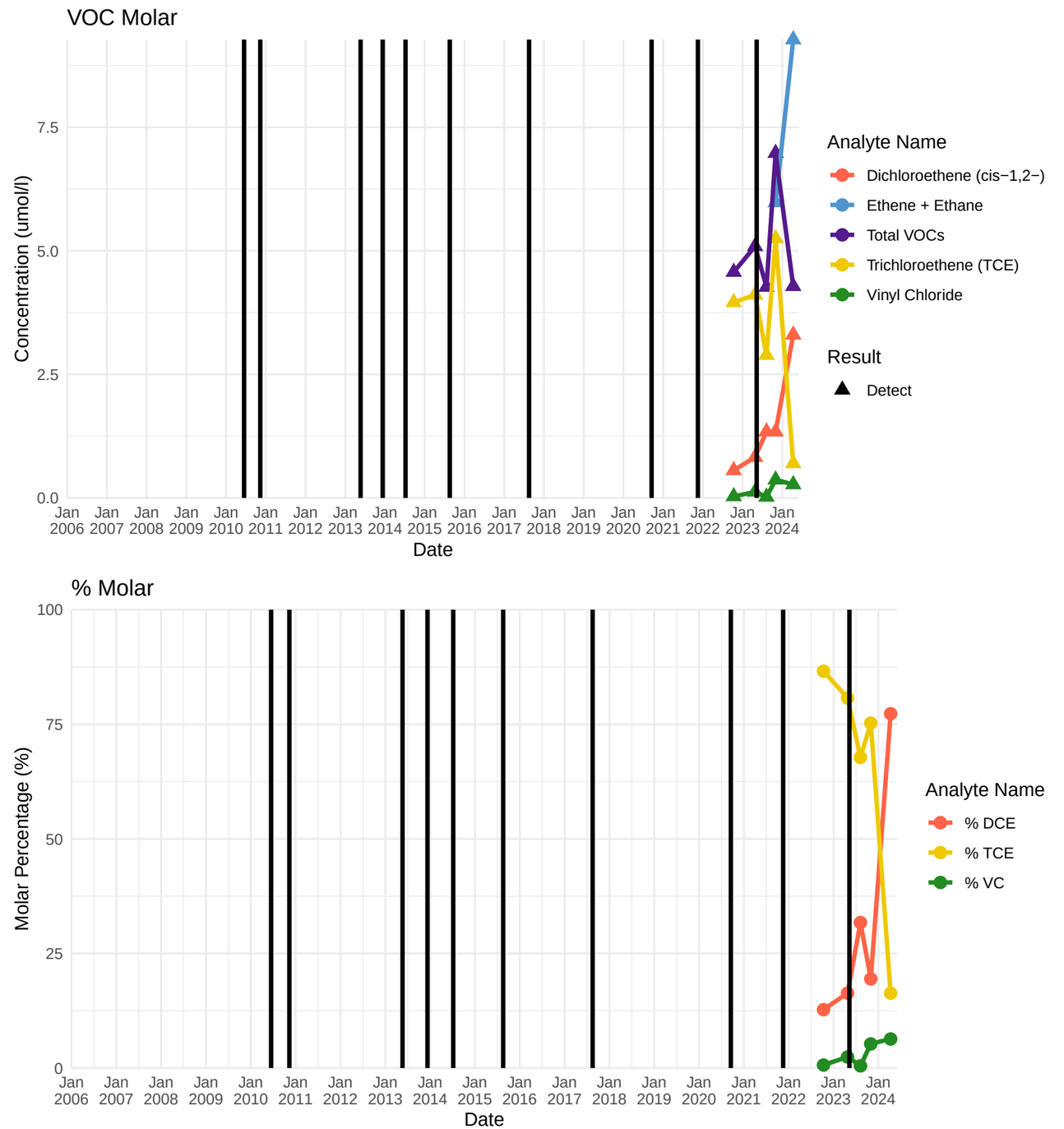
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





BP−43AS

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

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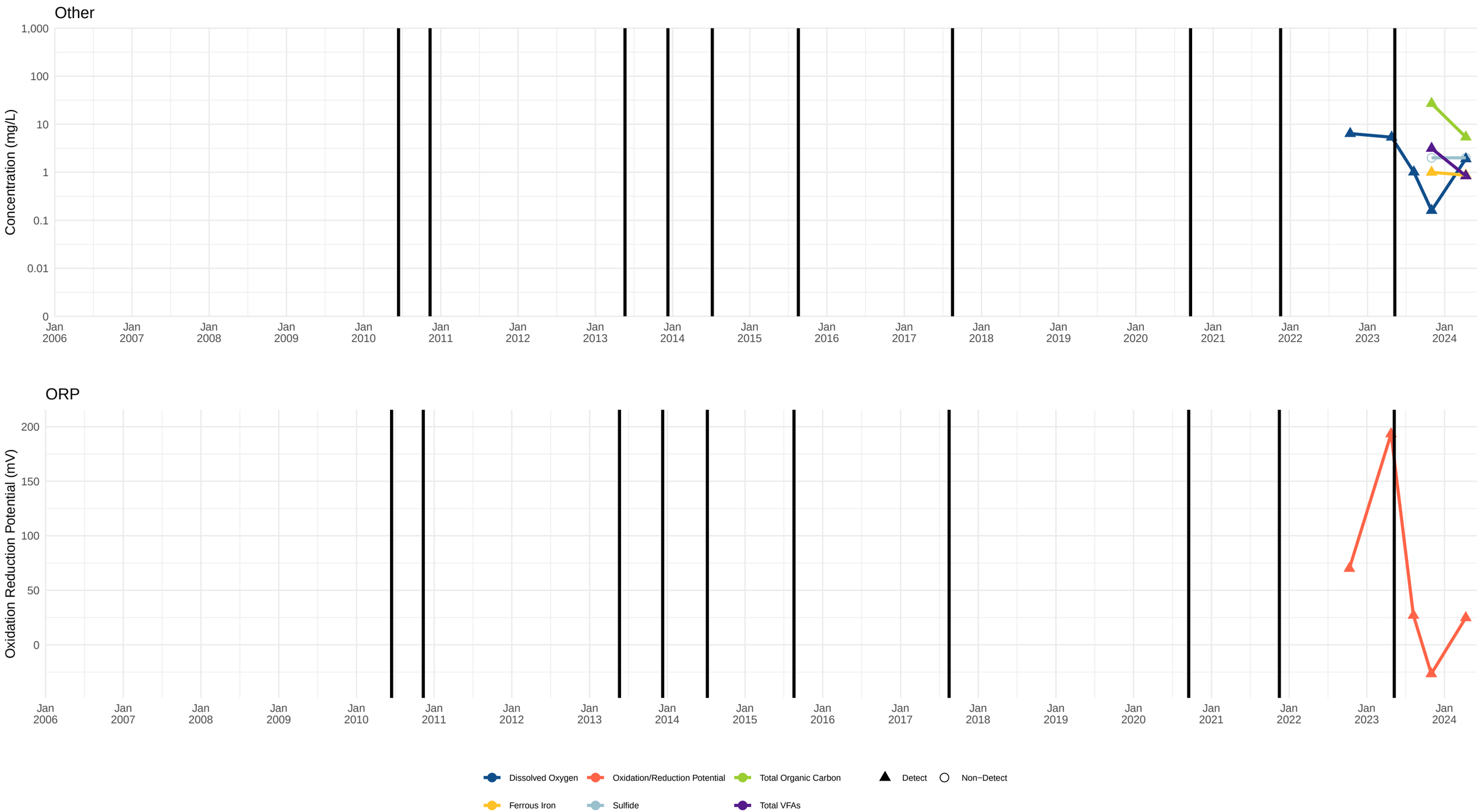

BP−43AI

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

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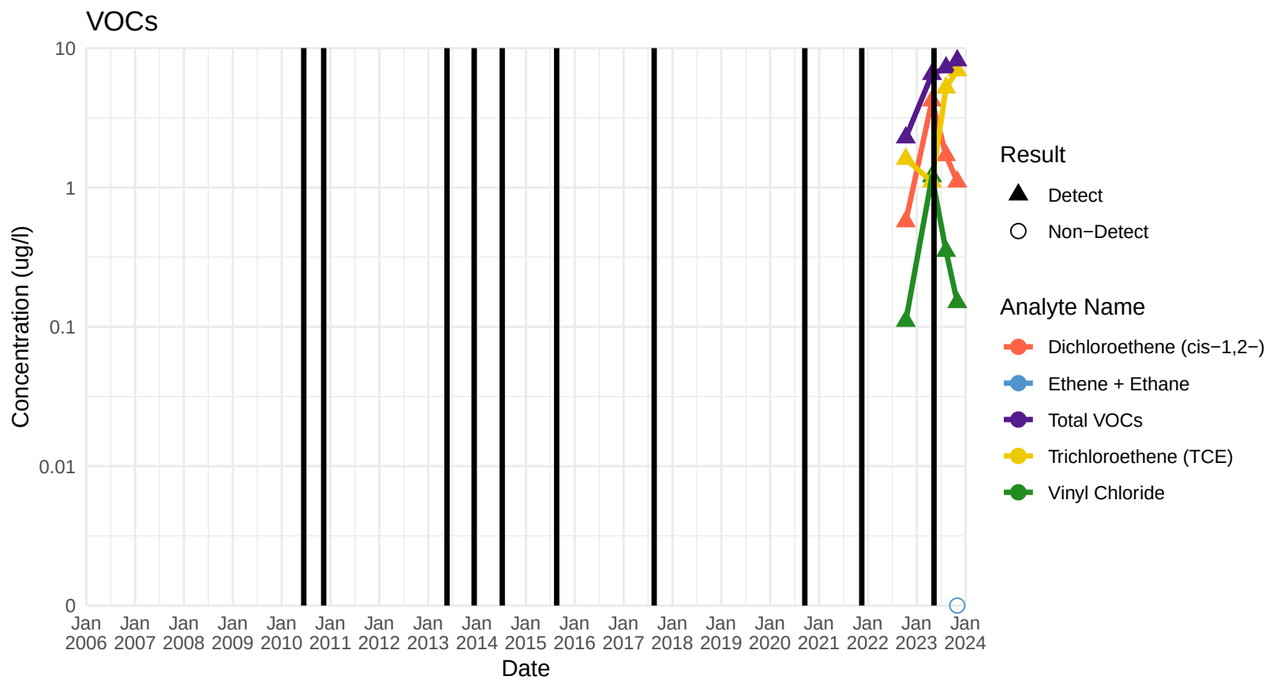

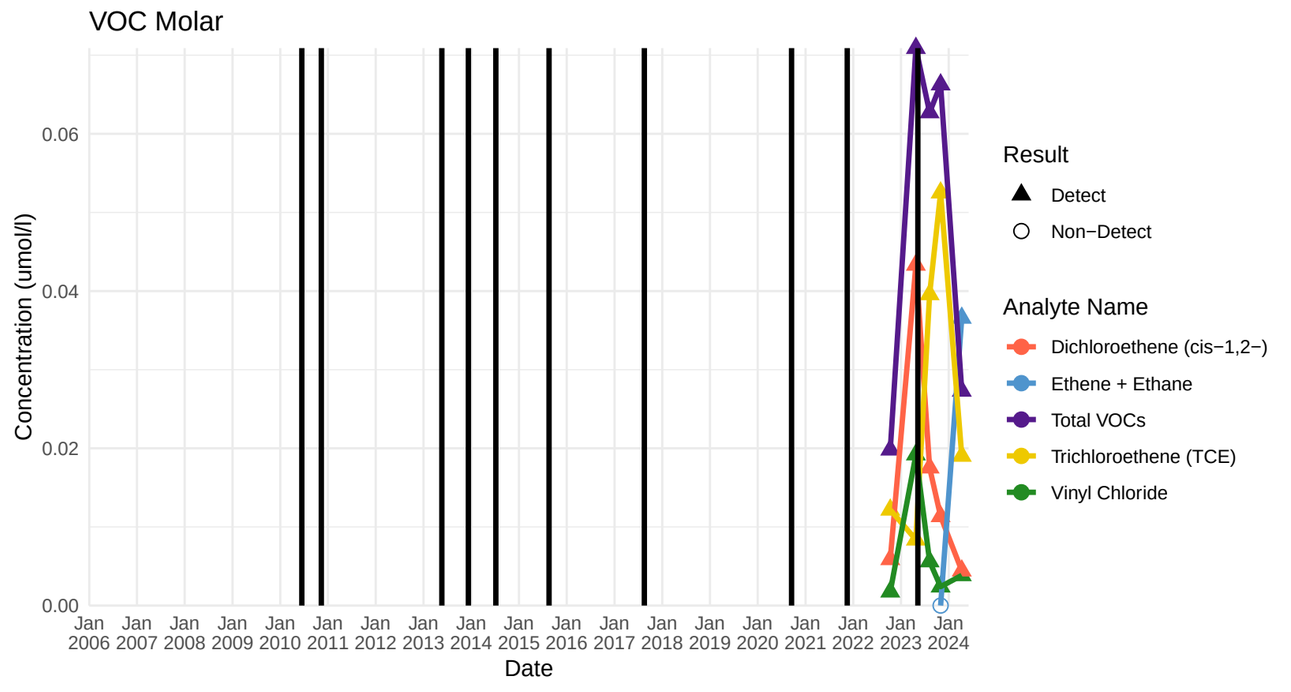

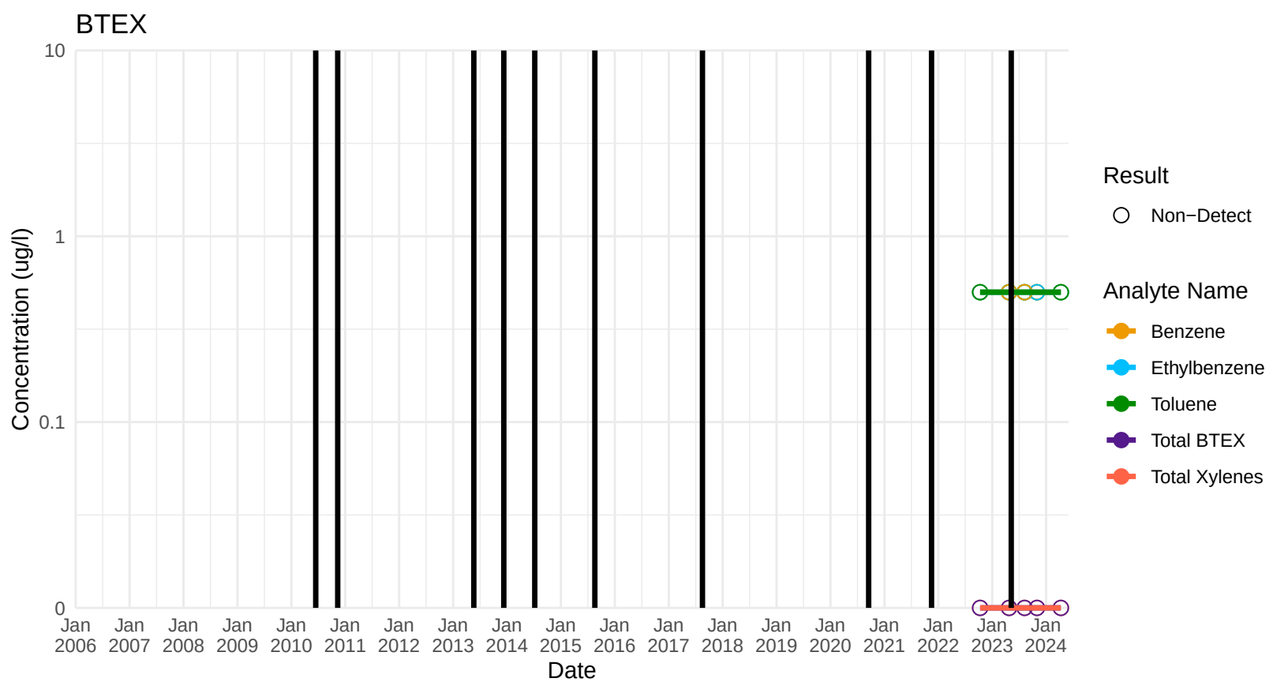

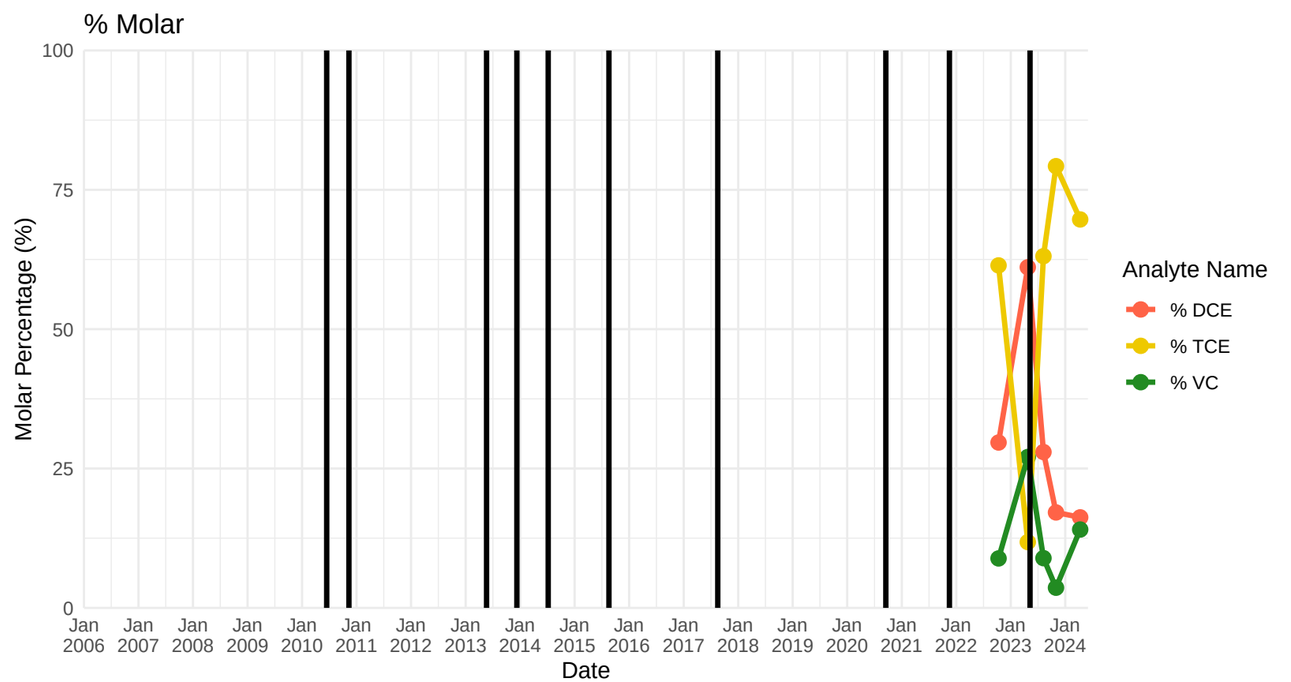

BP−43AI

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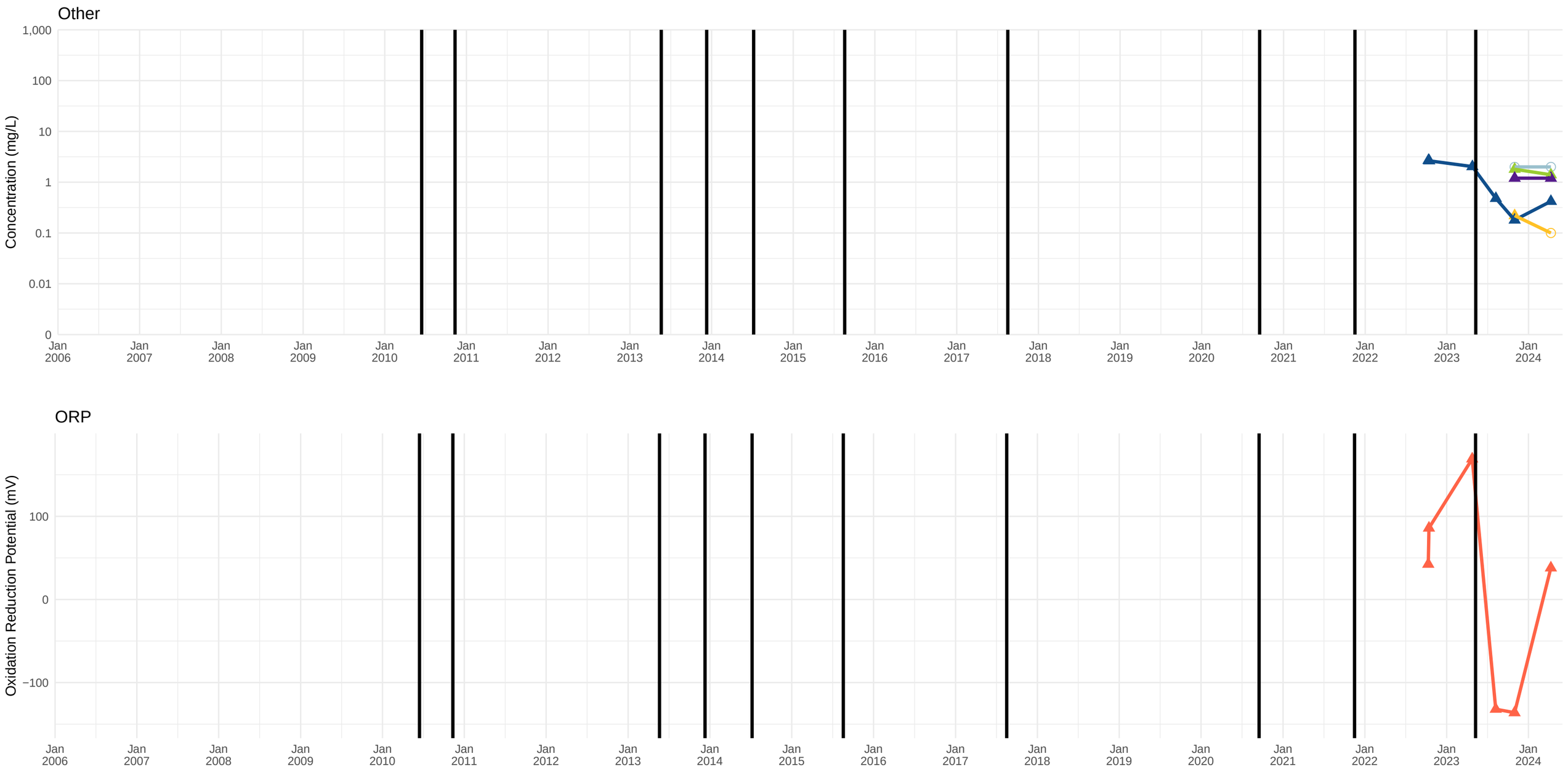


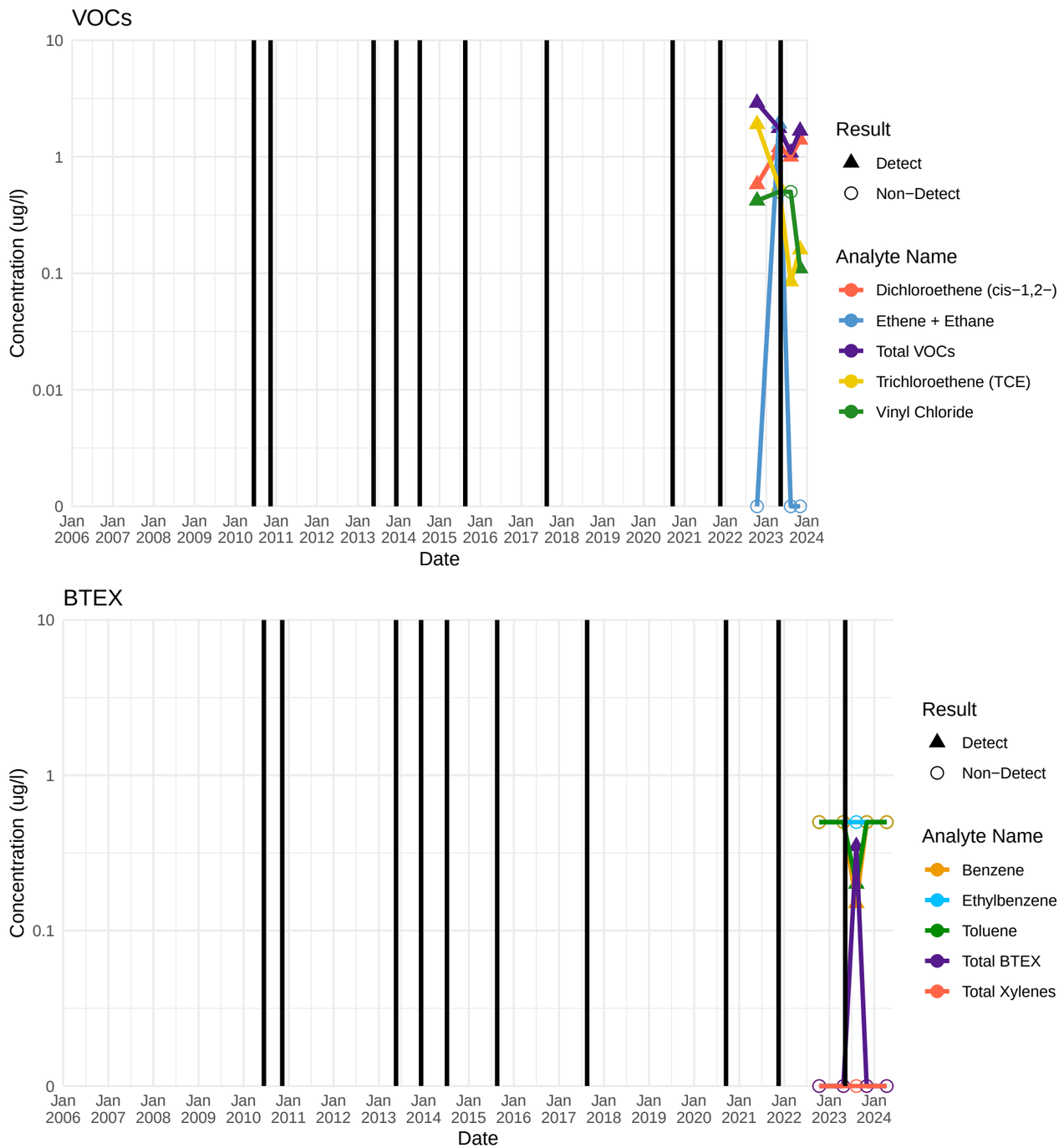
BP−43AD

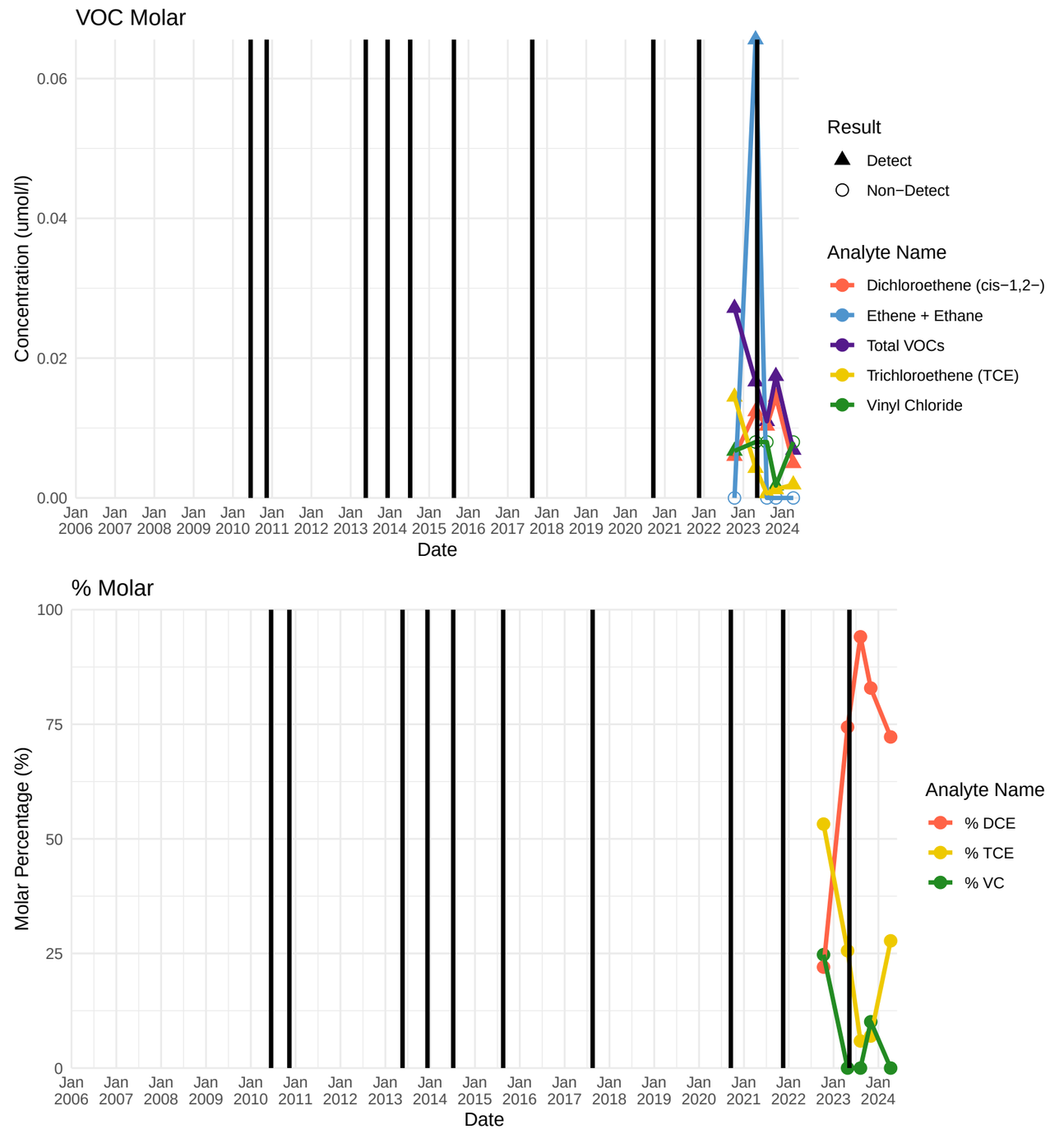
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





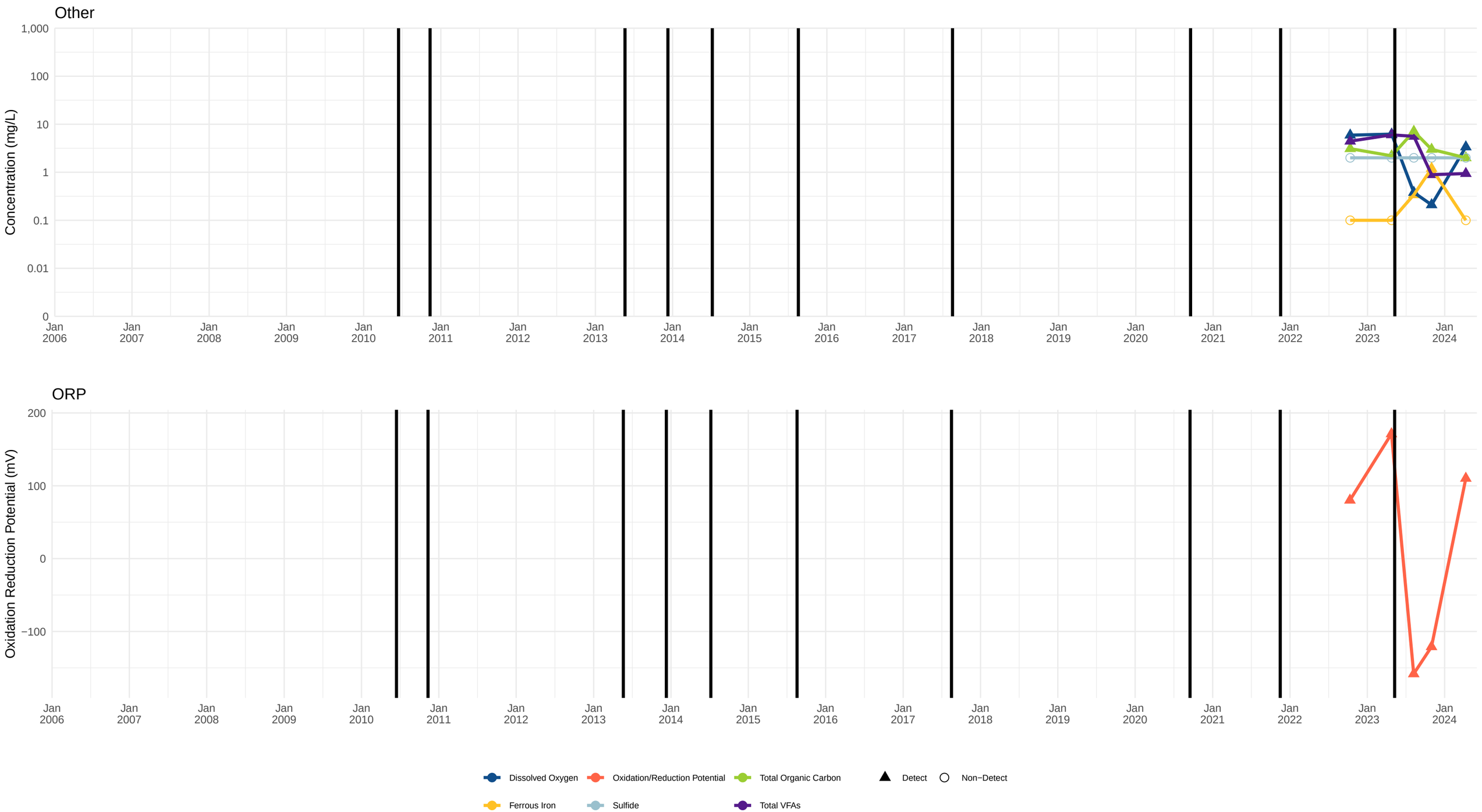
BP−43AD

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



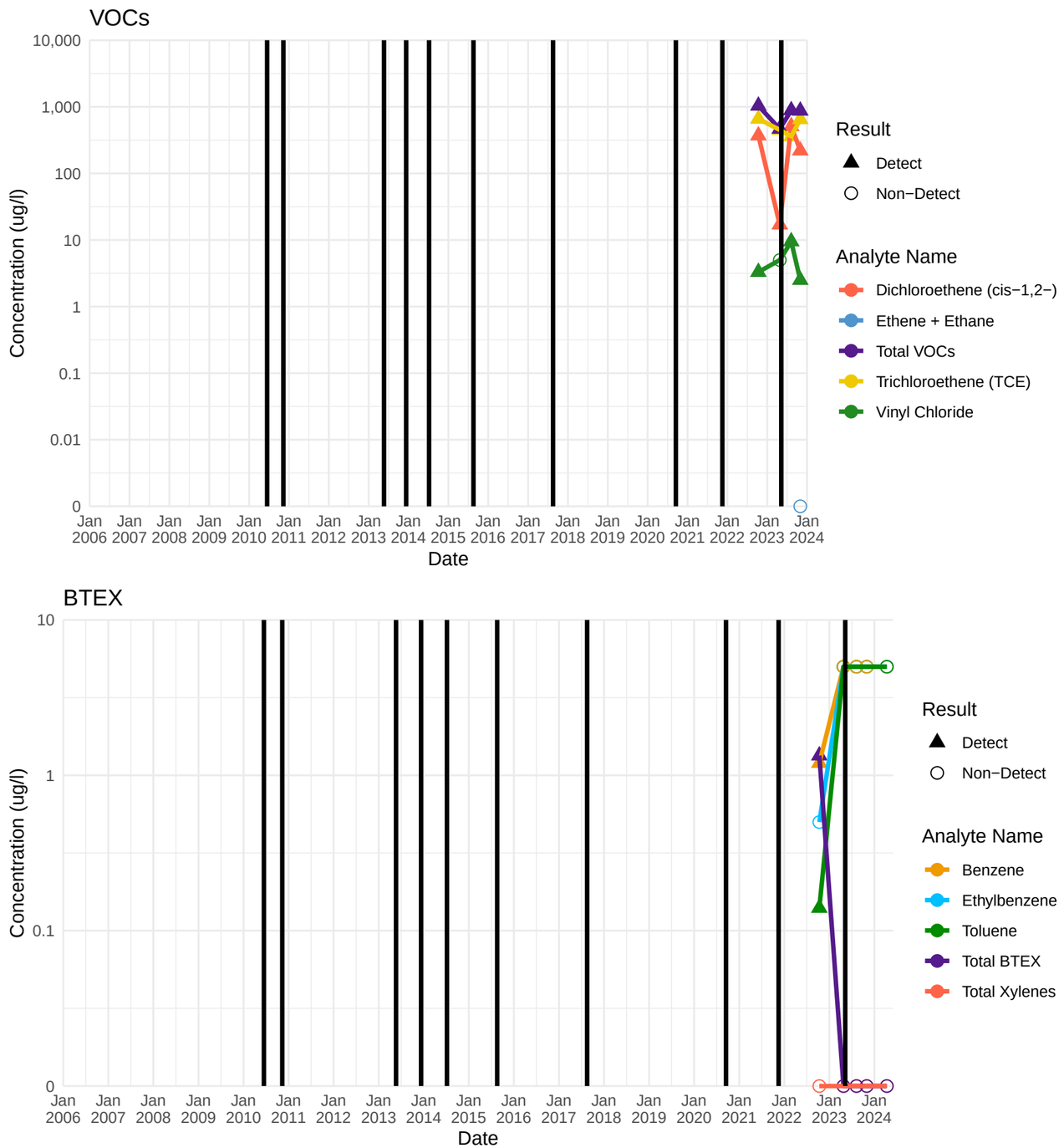
BP−44AS

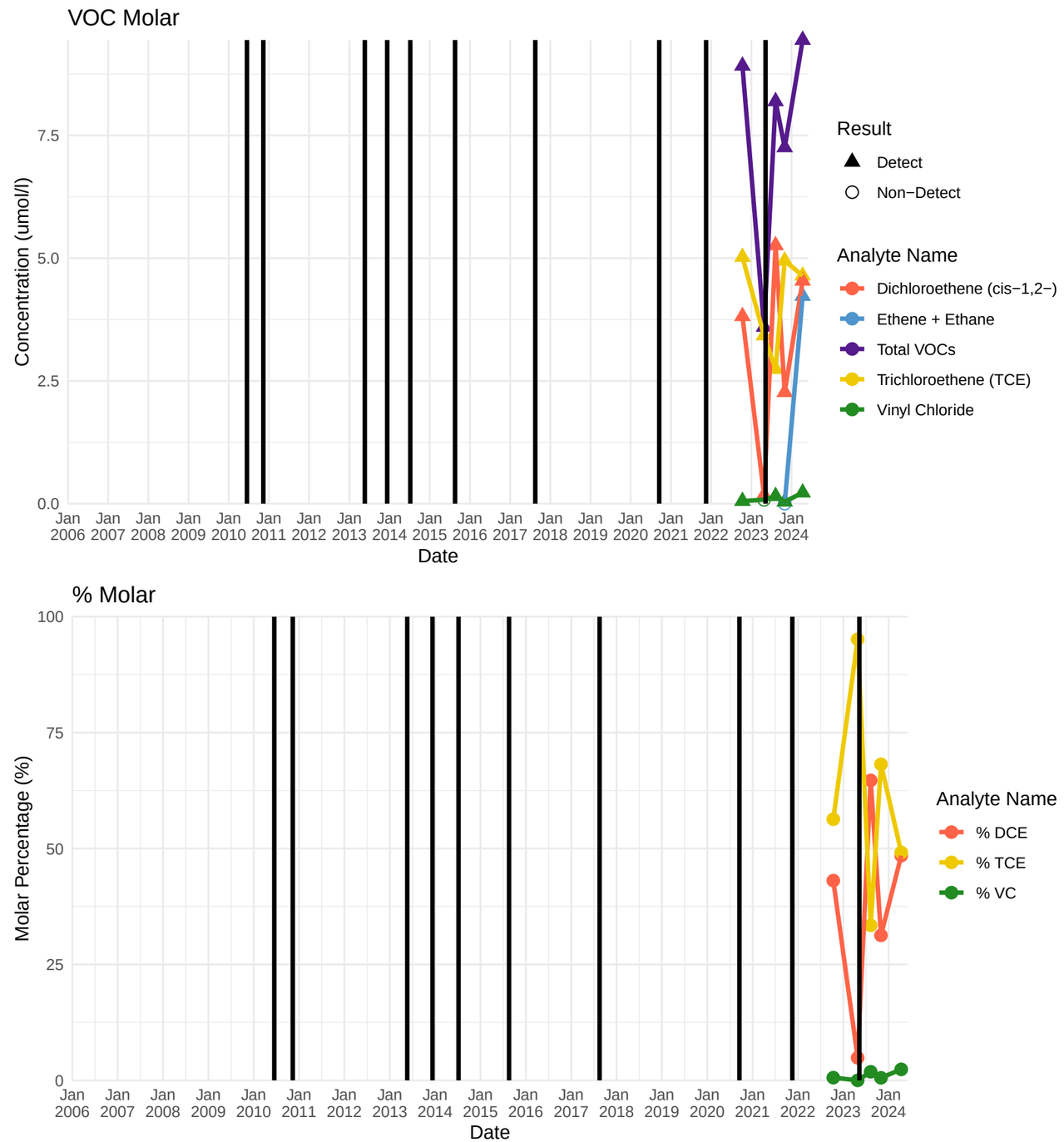
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





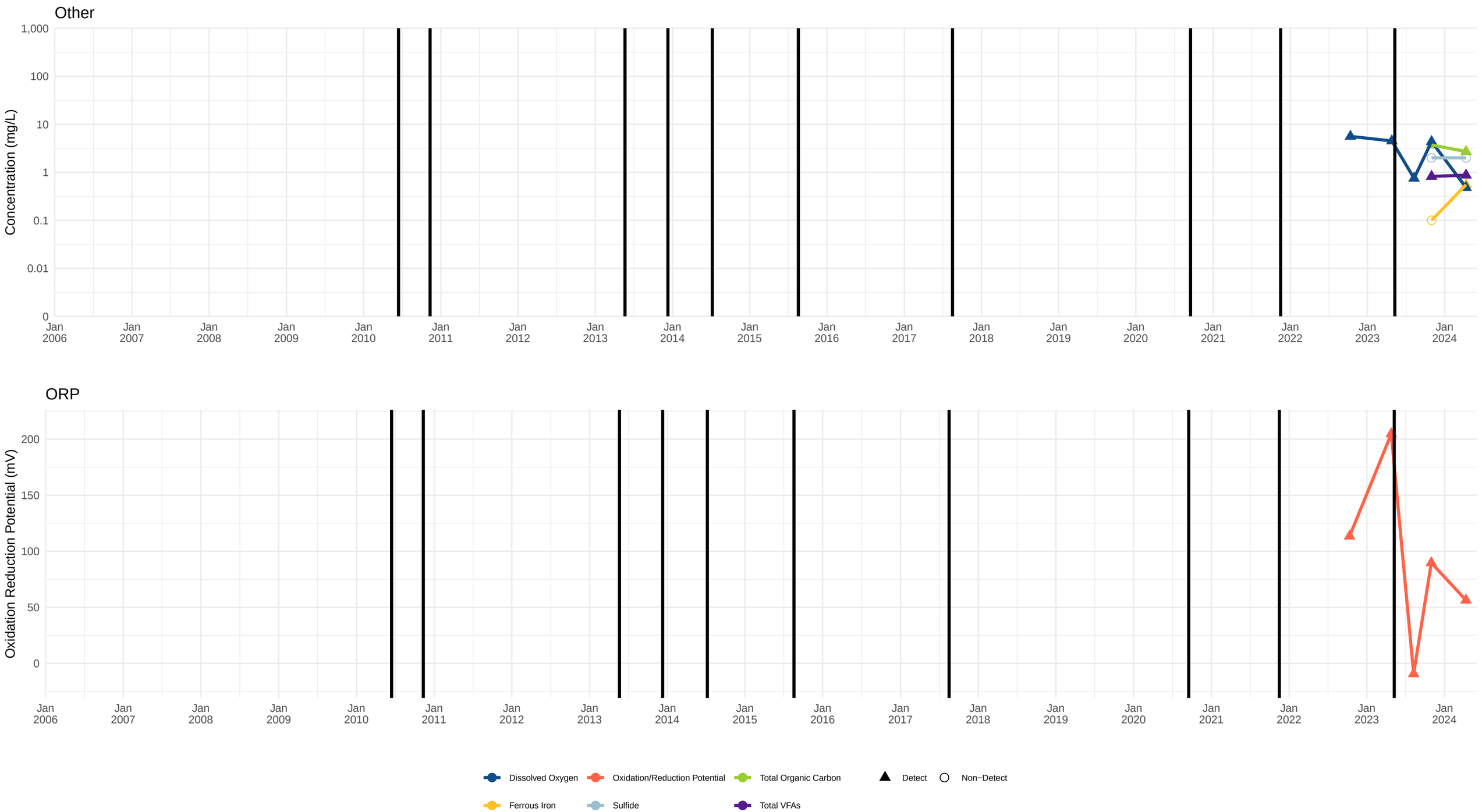
BP−44AS

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



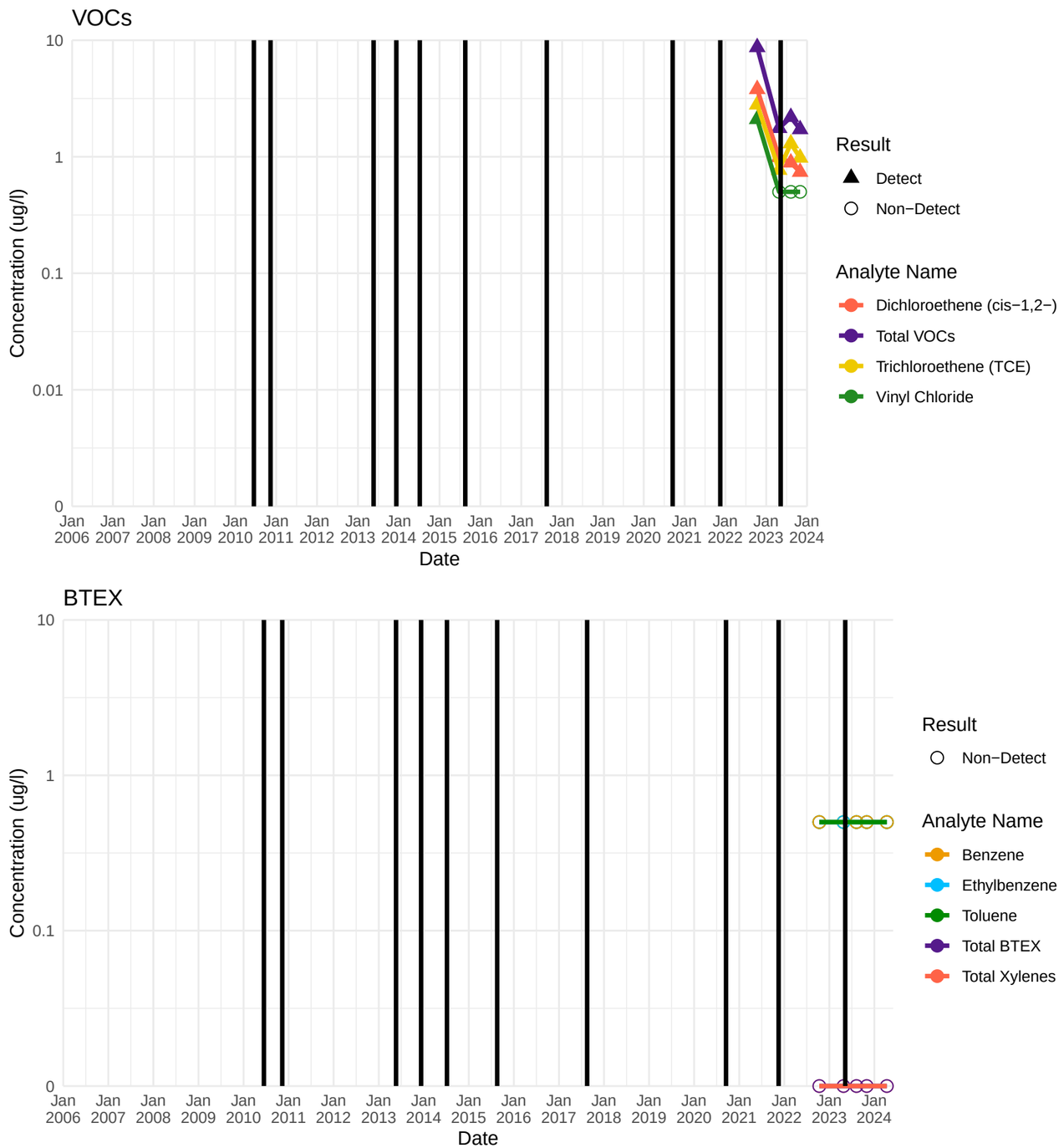
BP−44AI

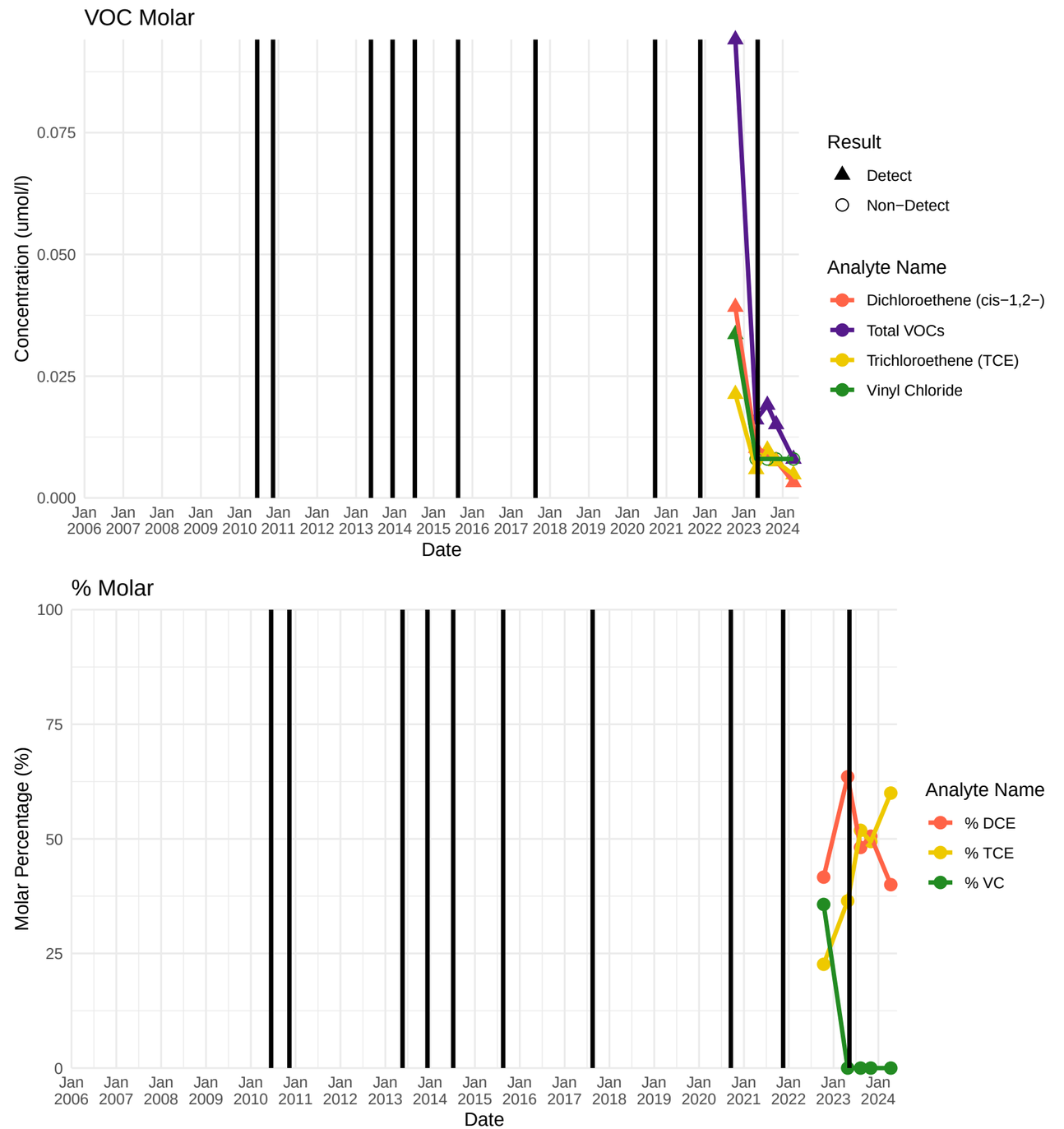
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





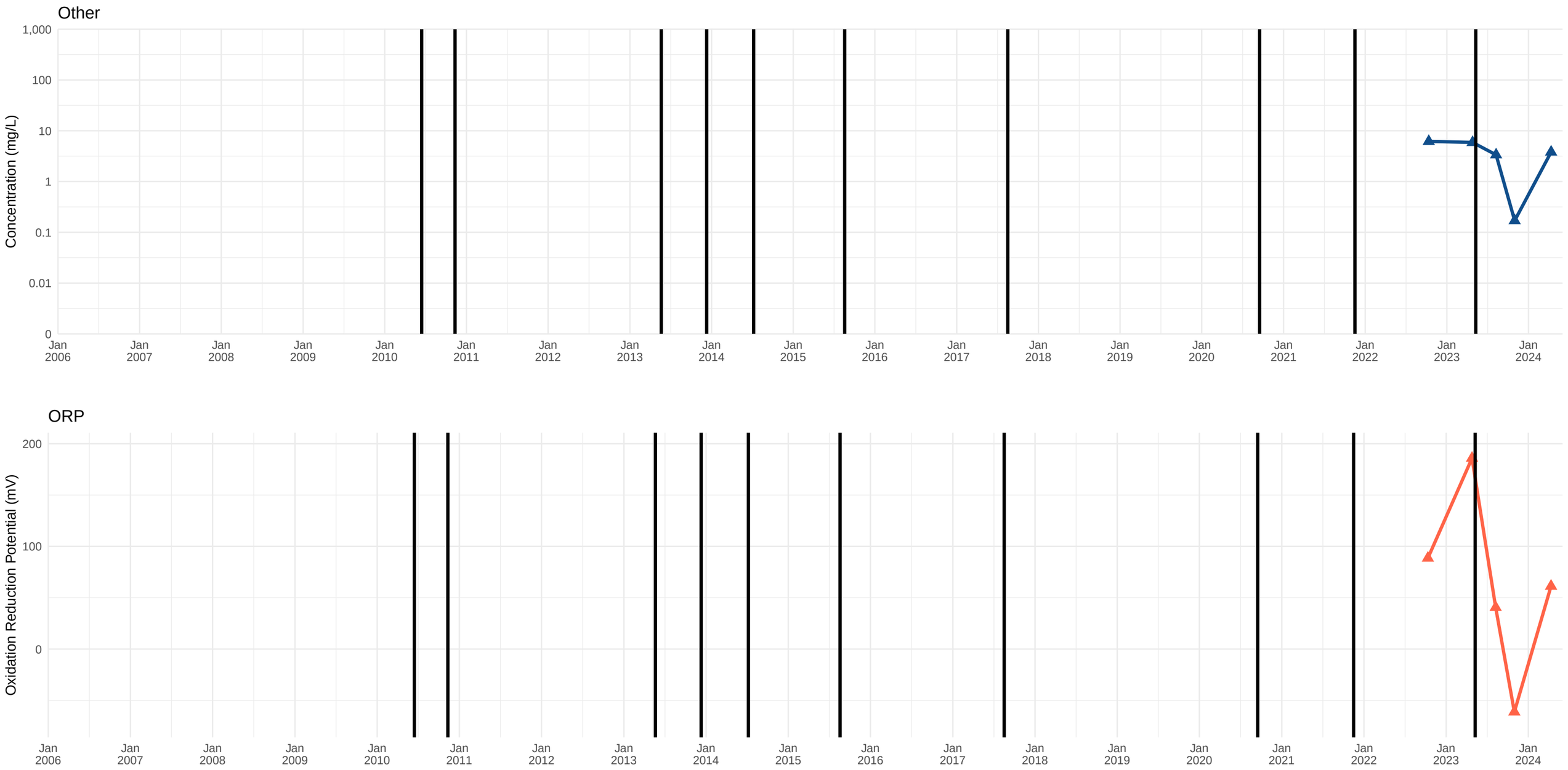
BP−44AI

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



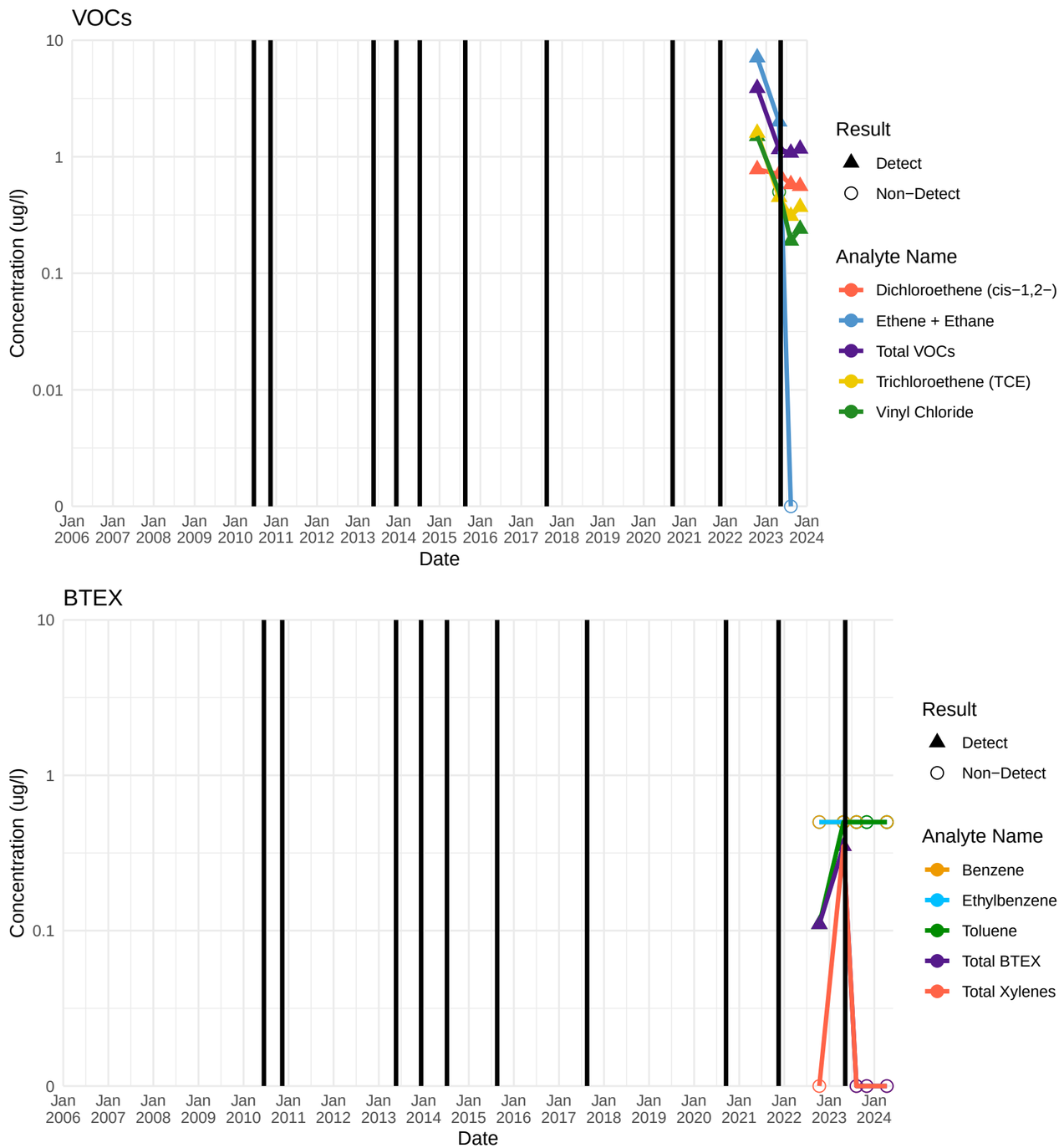
BP−44AD

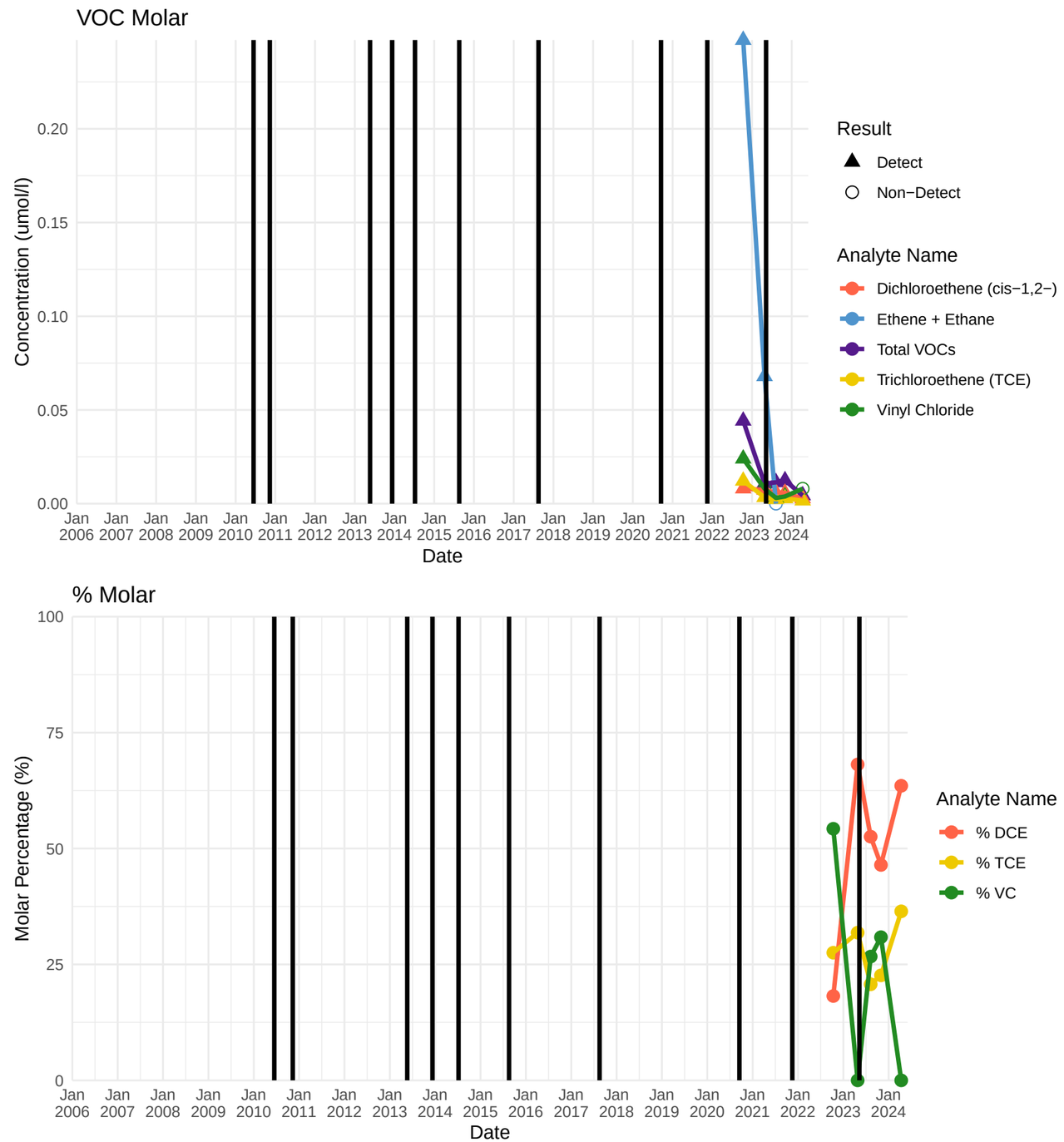
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





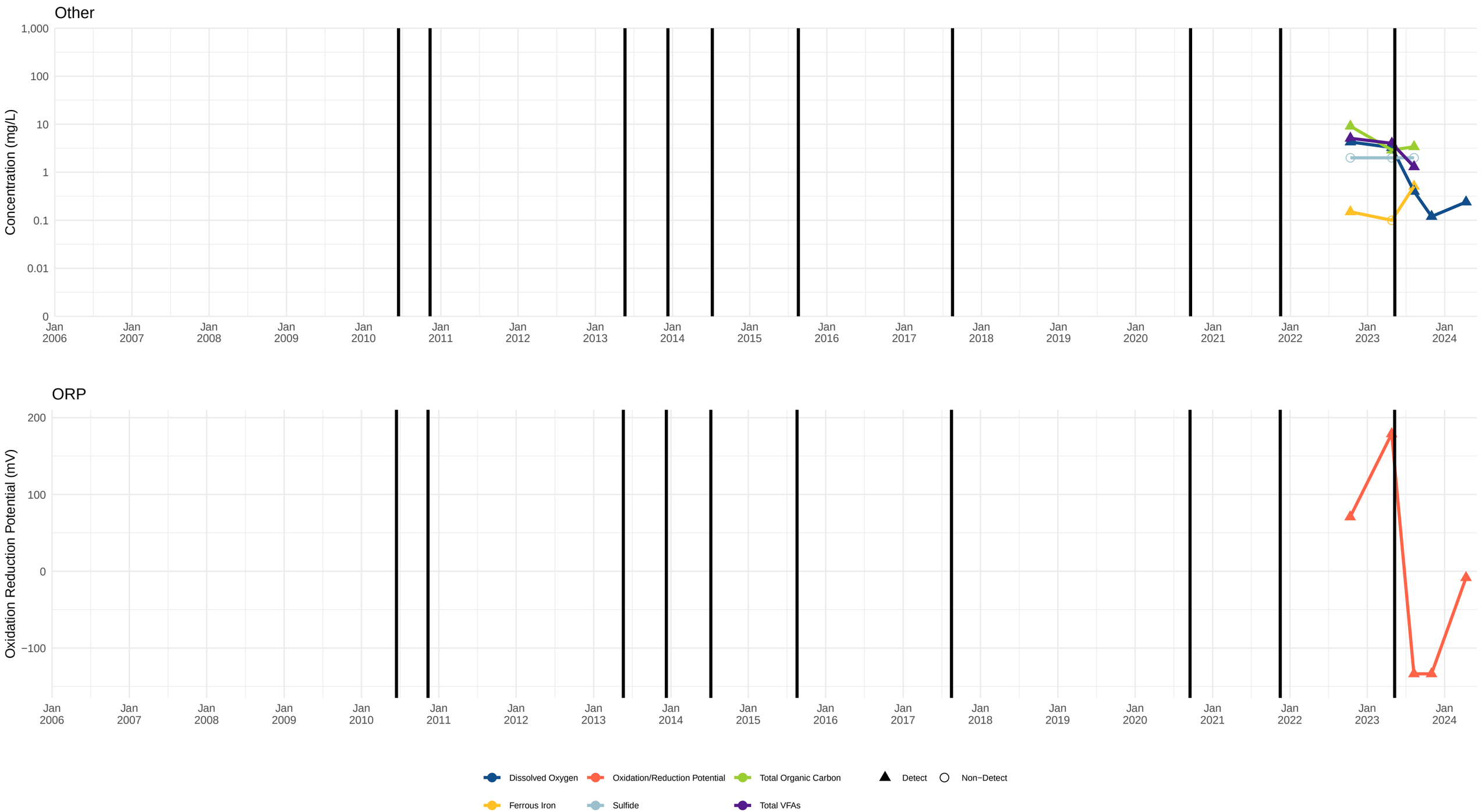
BP−44AD

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



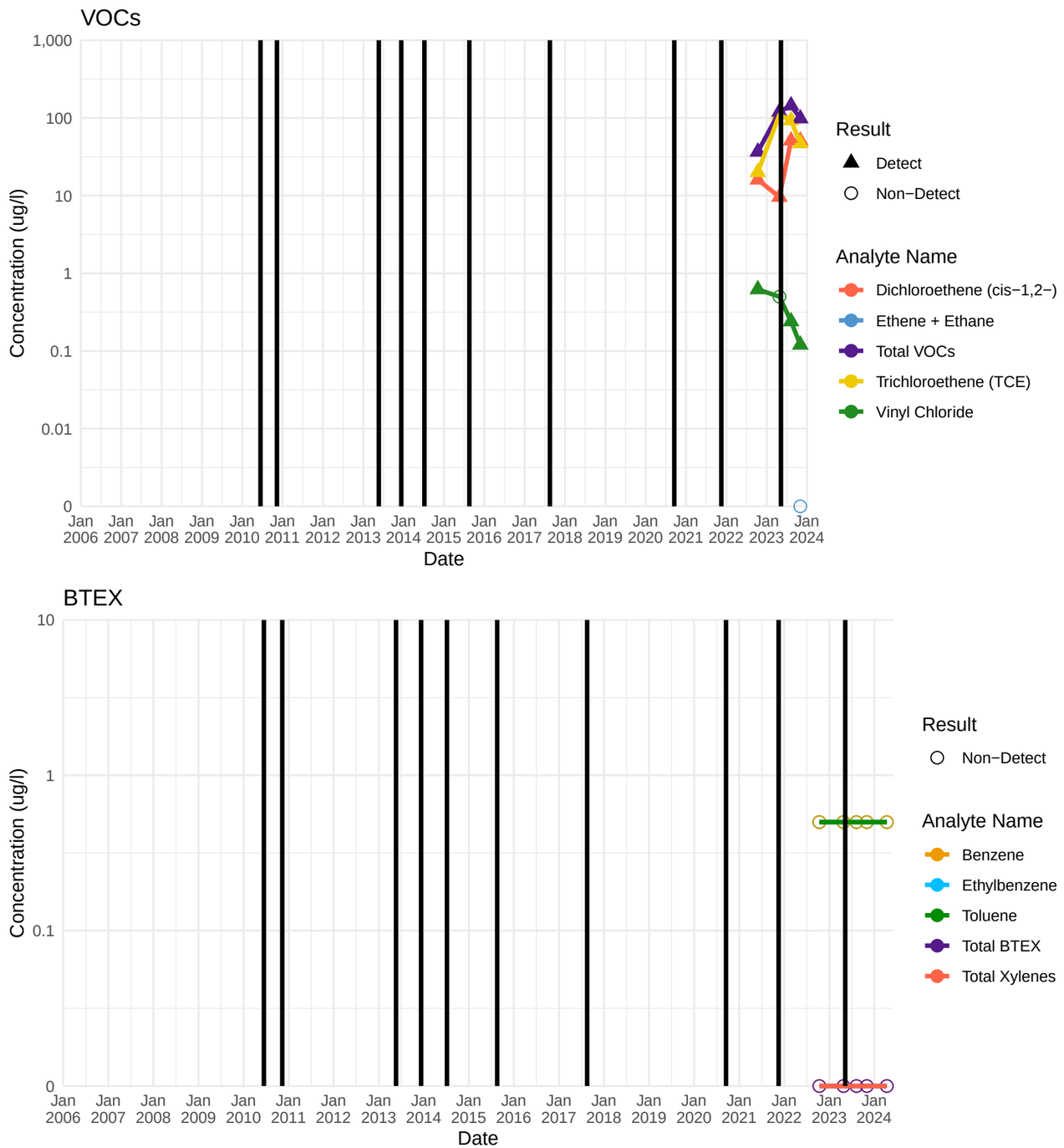
BP−45AS

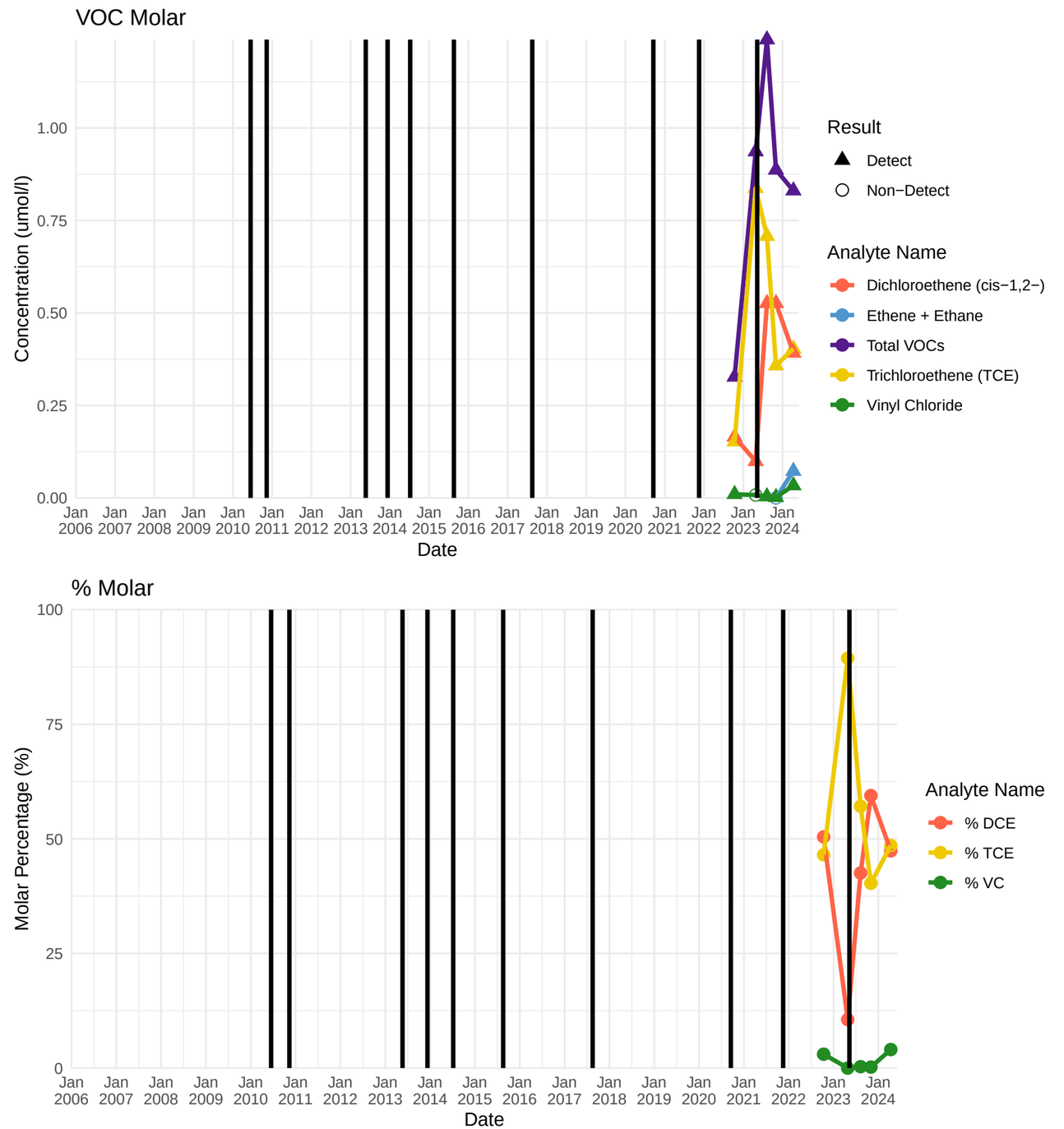
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





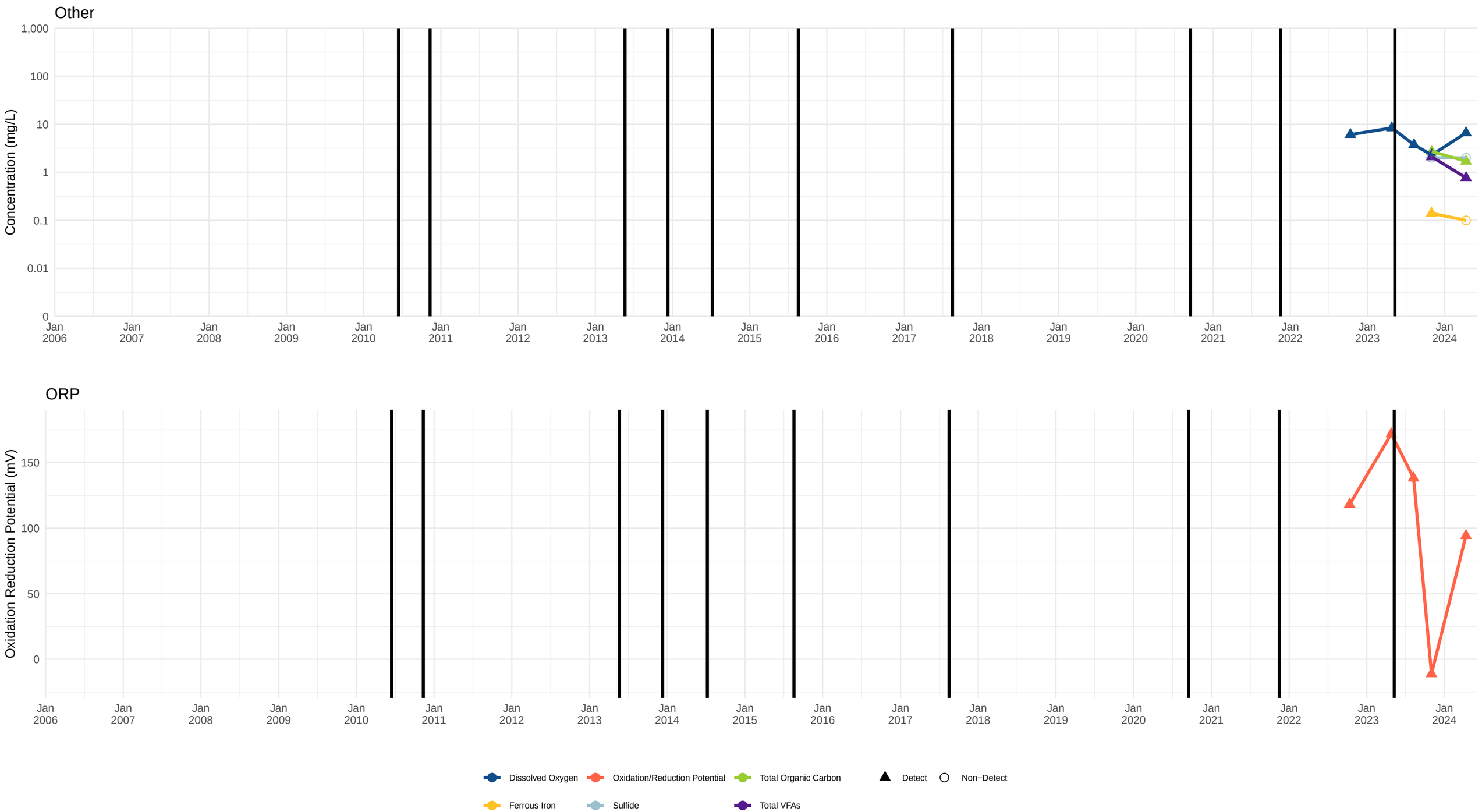
BP−45AS

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



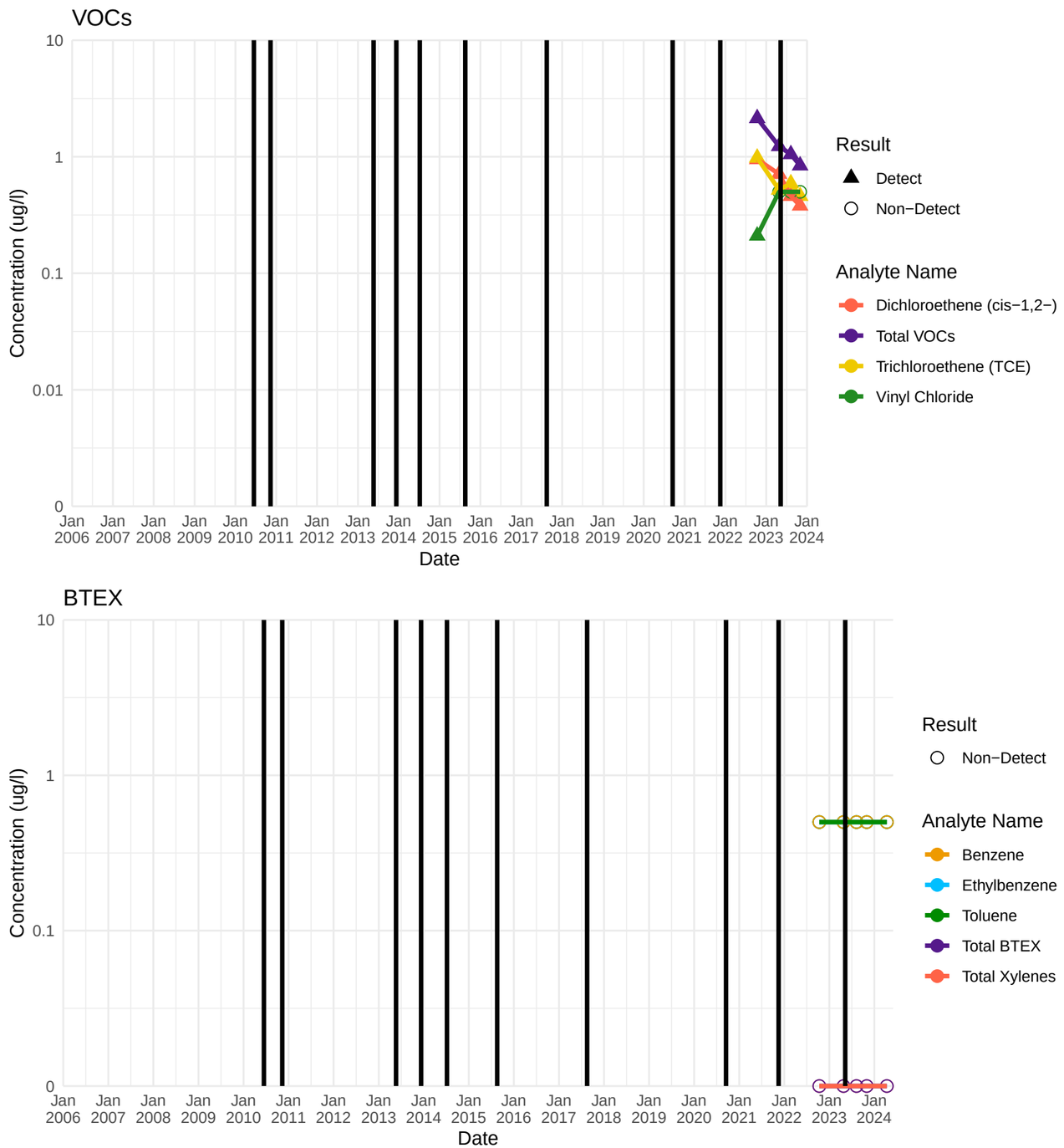
BP−45AI

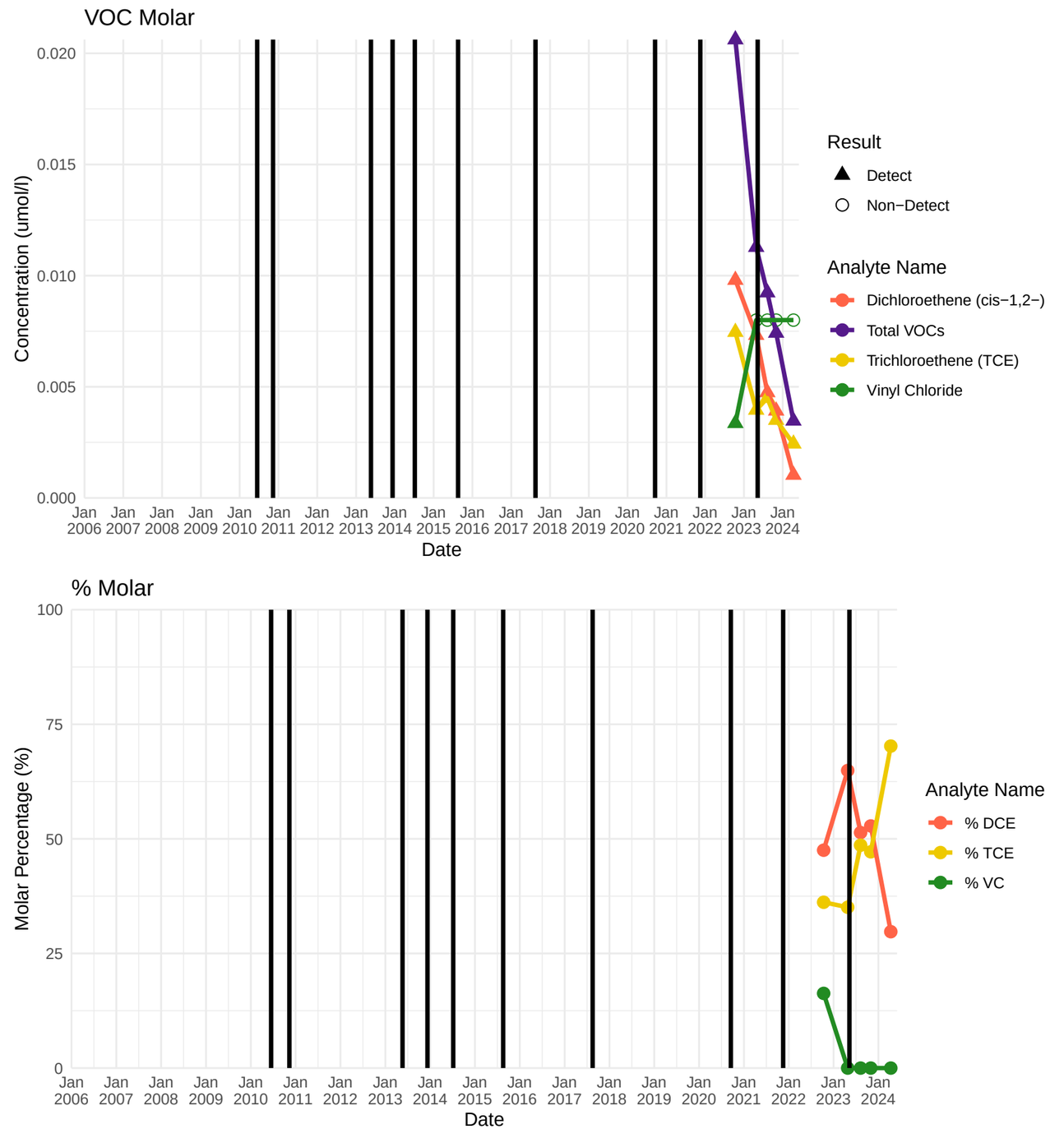
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





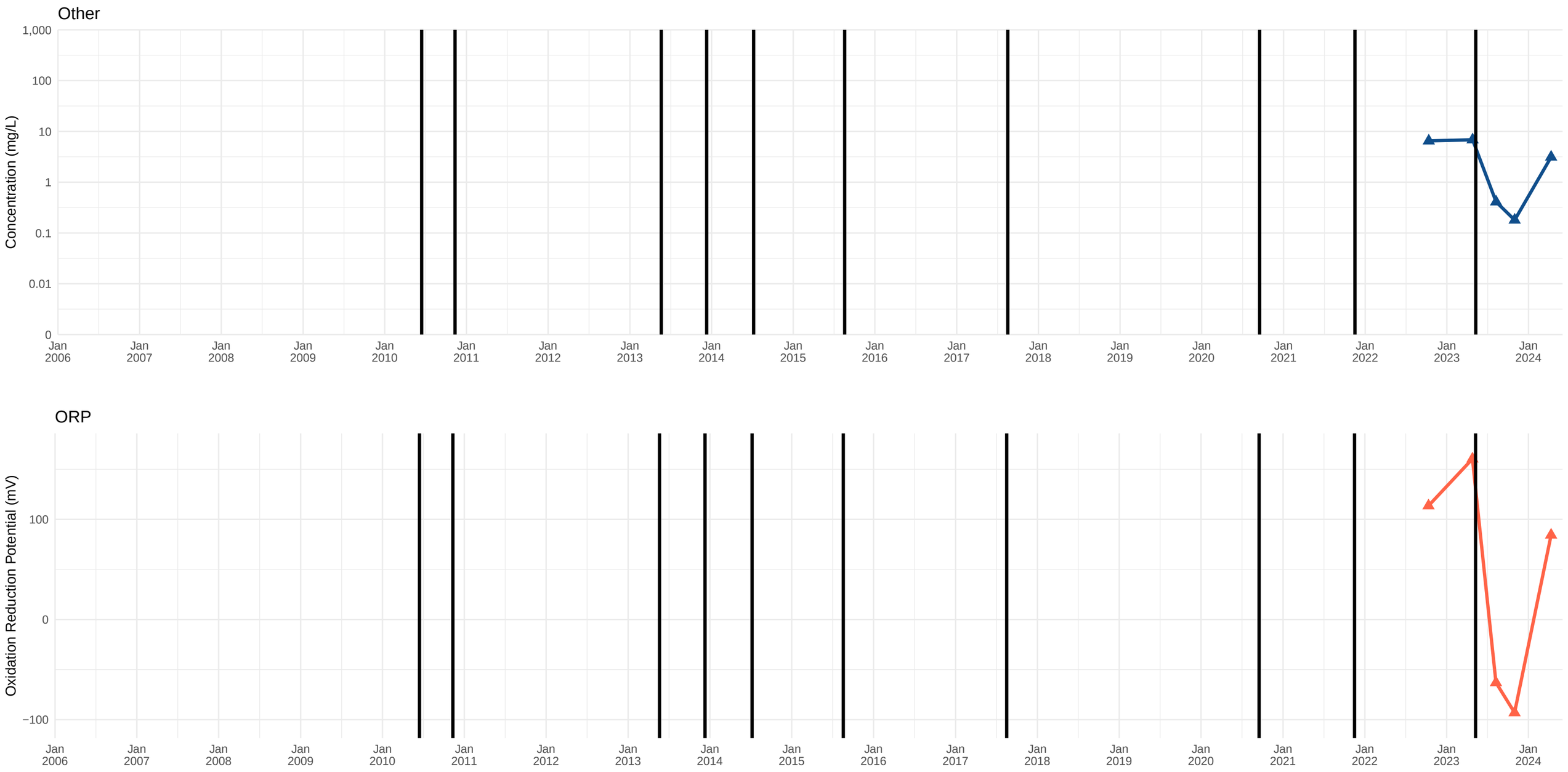
BP−45AI

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



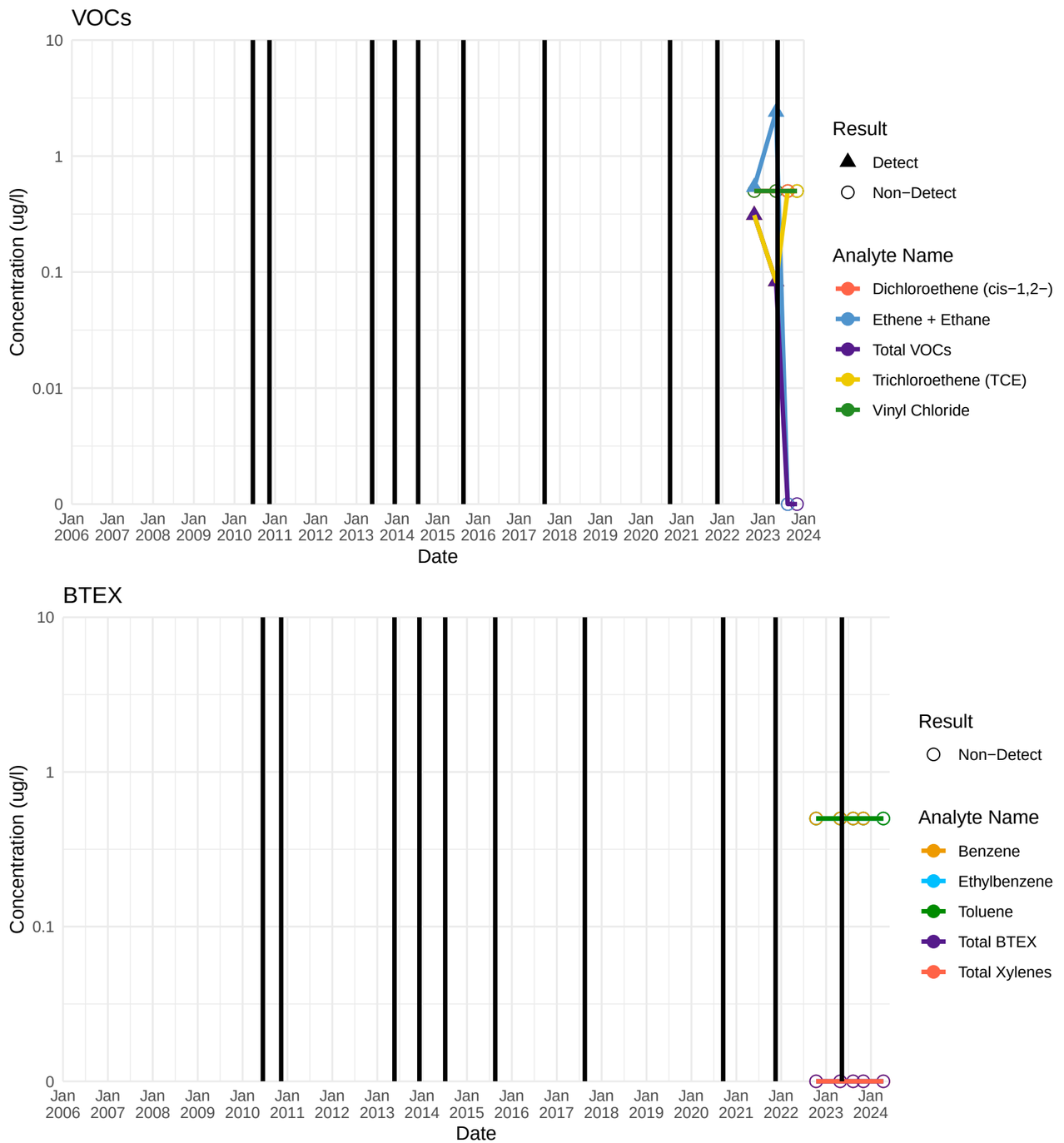
BP−45AD

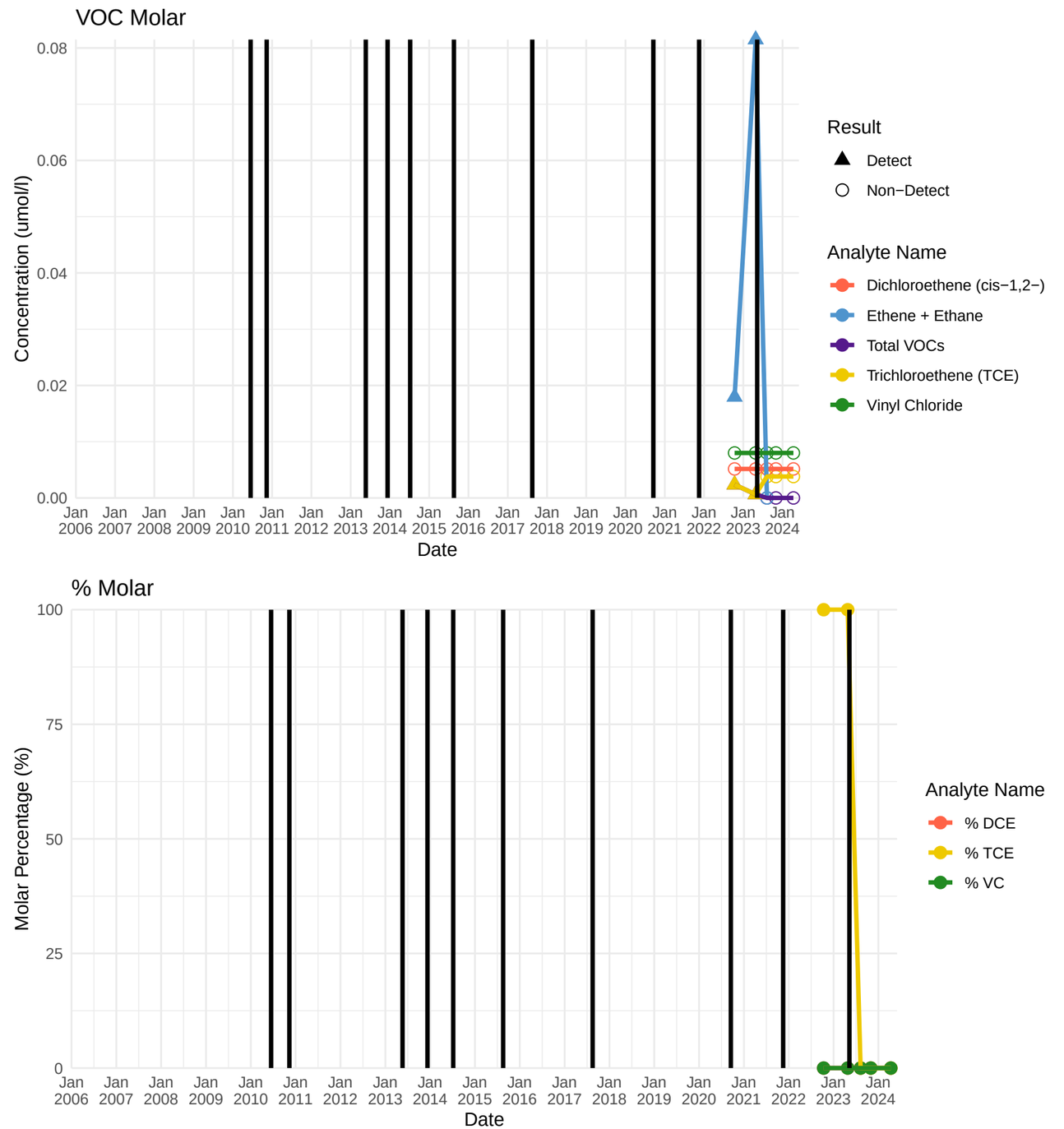
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





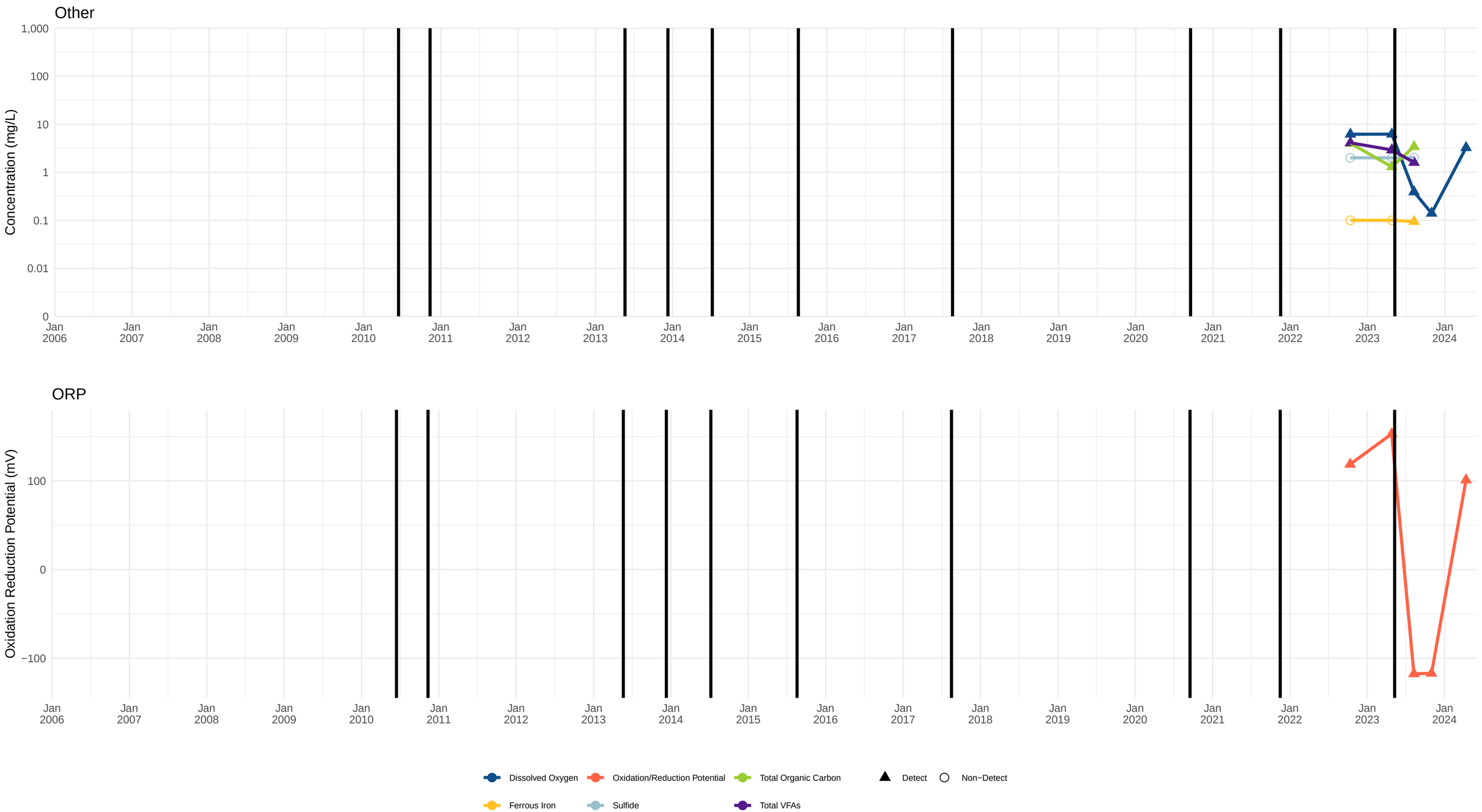
BP−45AD

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



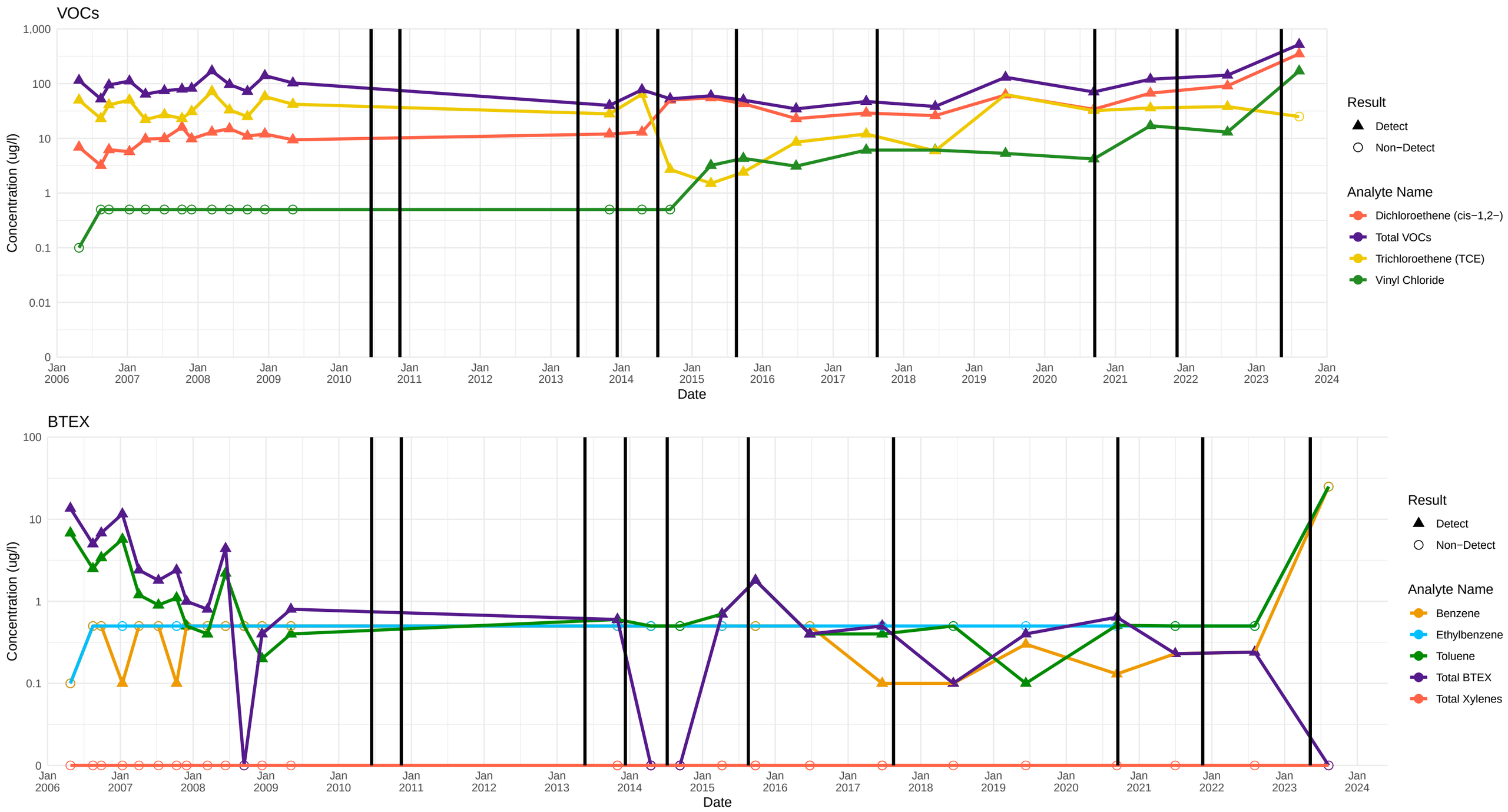
GC−1 Port 1

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



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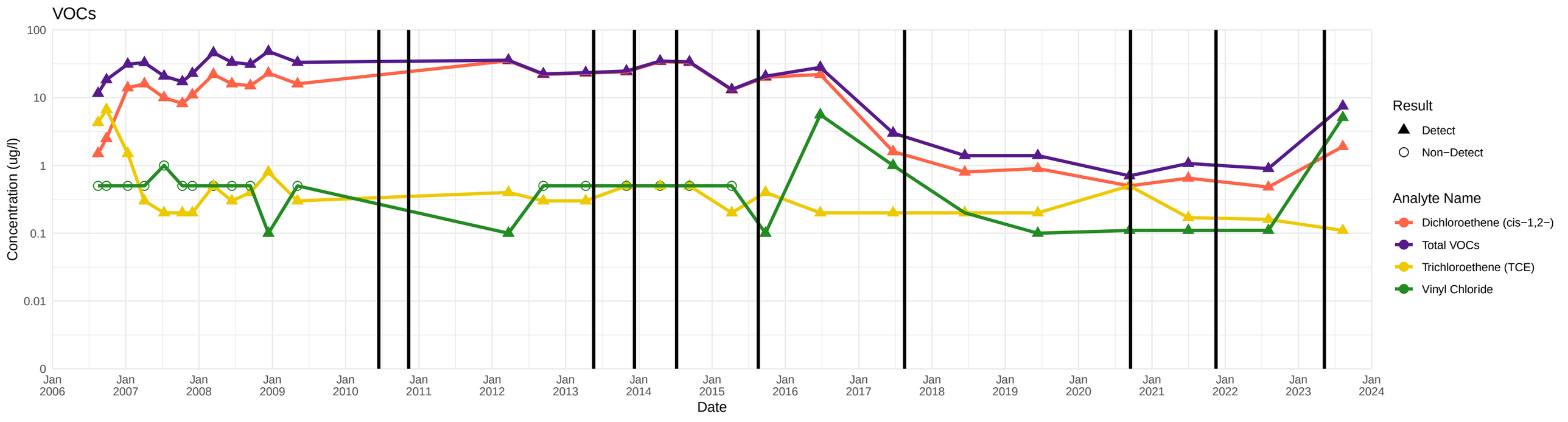
GC−1 Port 8

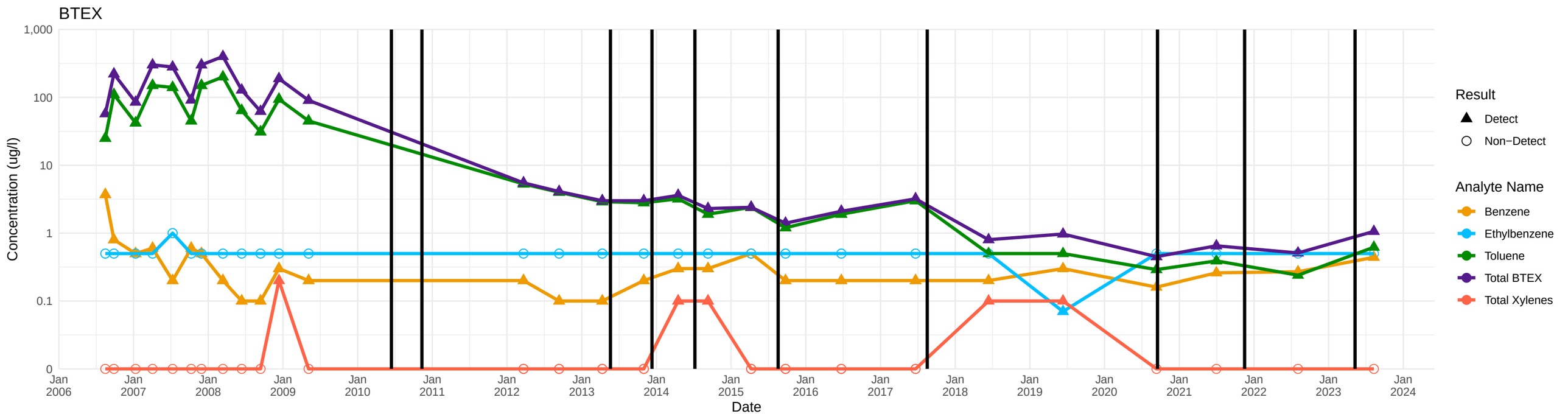
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





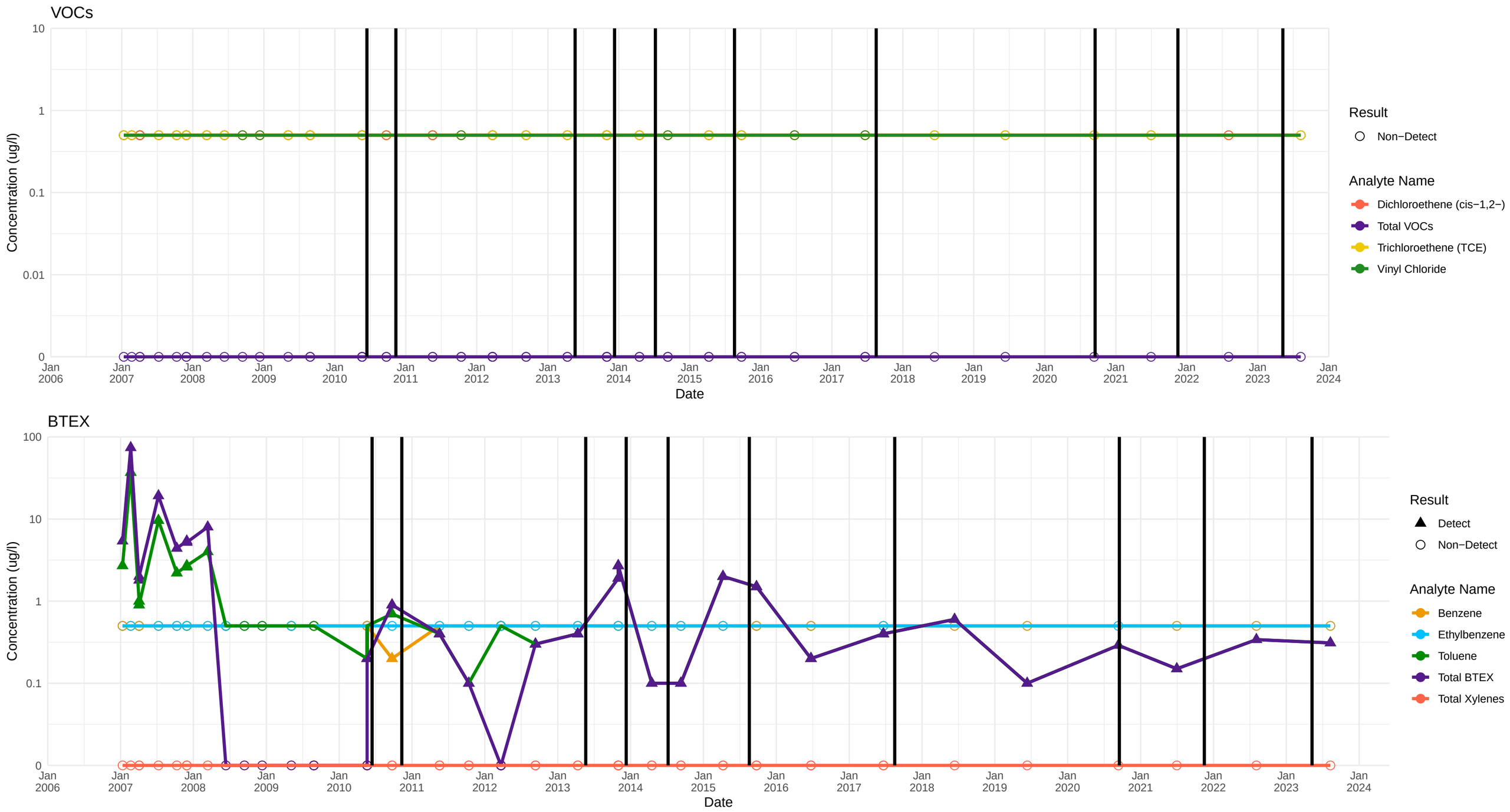
BP−12D Port 1

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



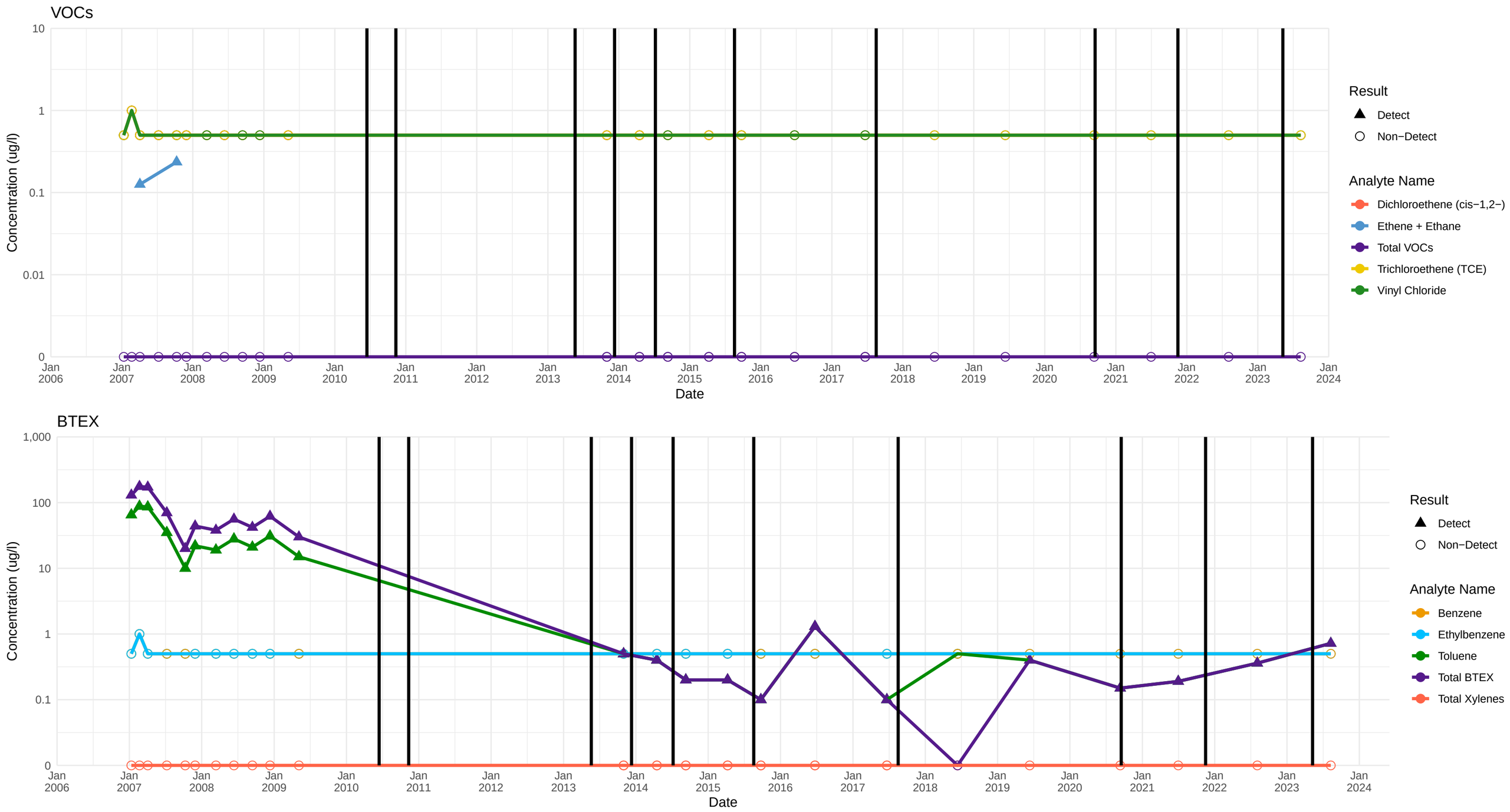
BP−12D Port 7

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



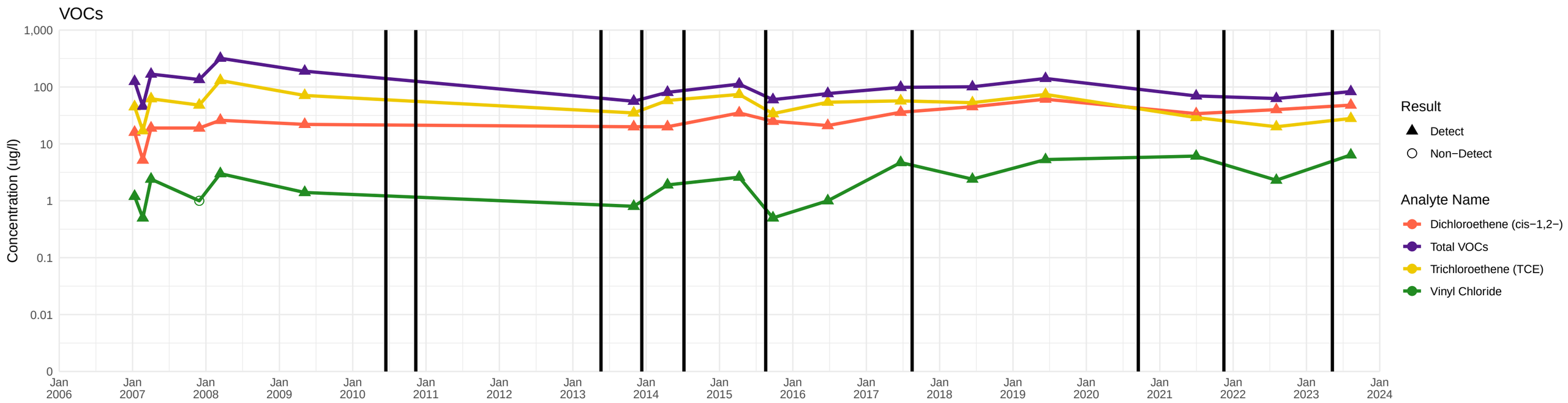
BP−13D Port 1

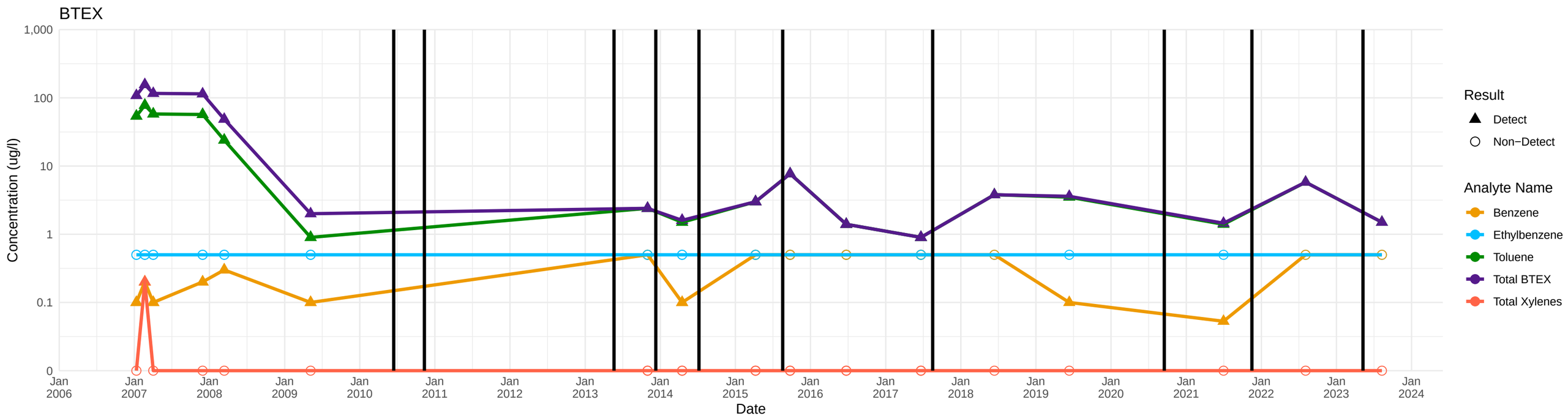
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





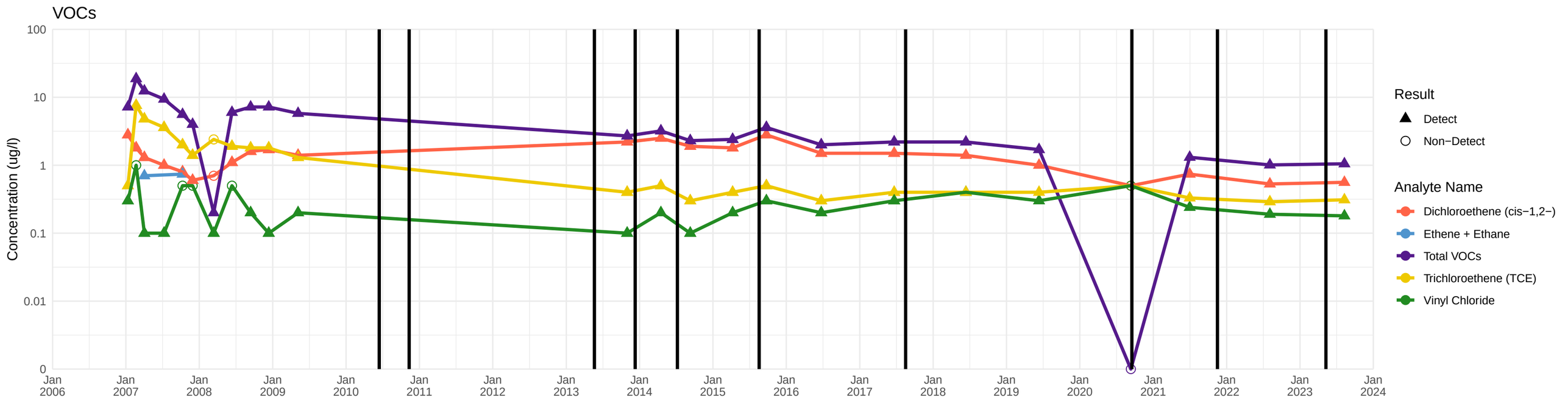
BP−13D Port 5

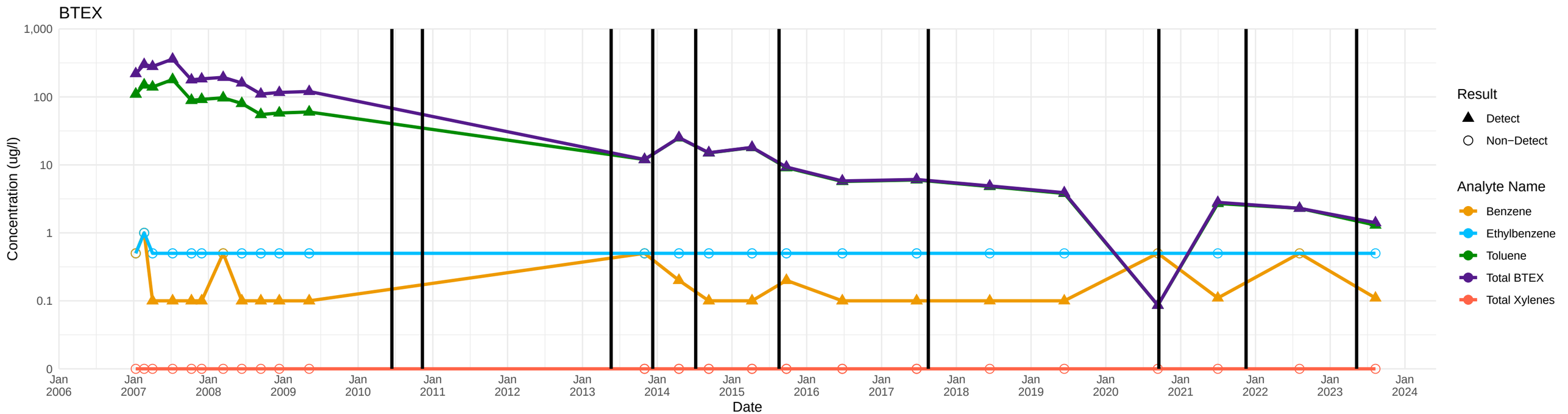
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





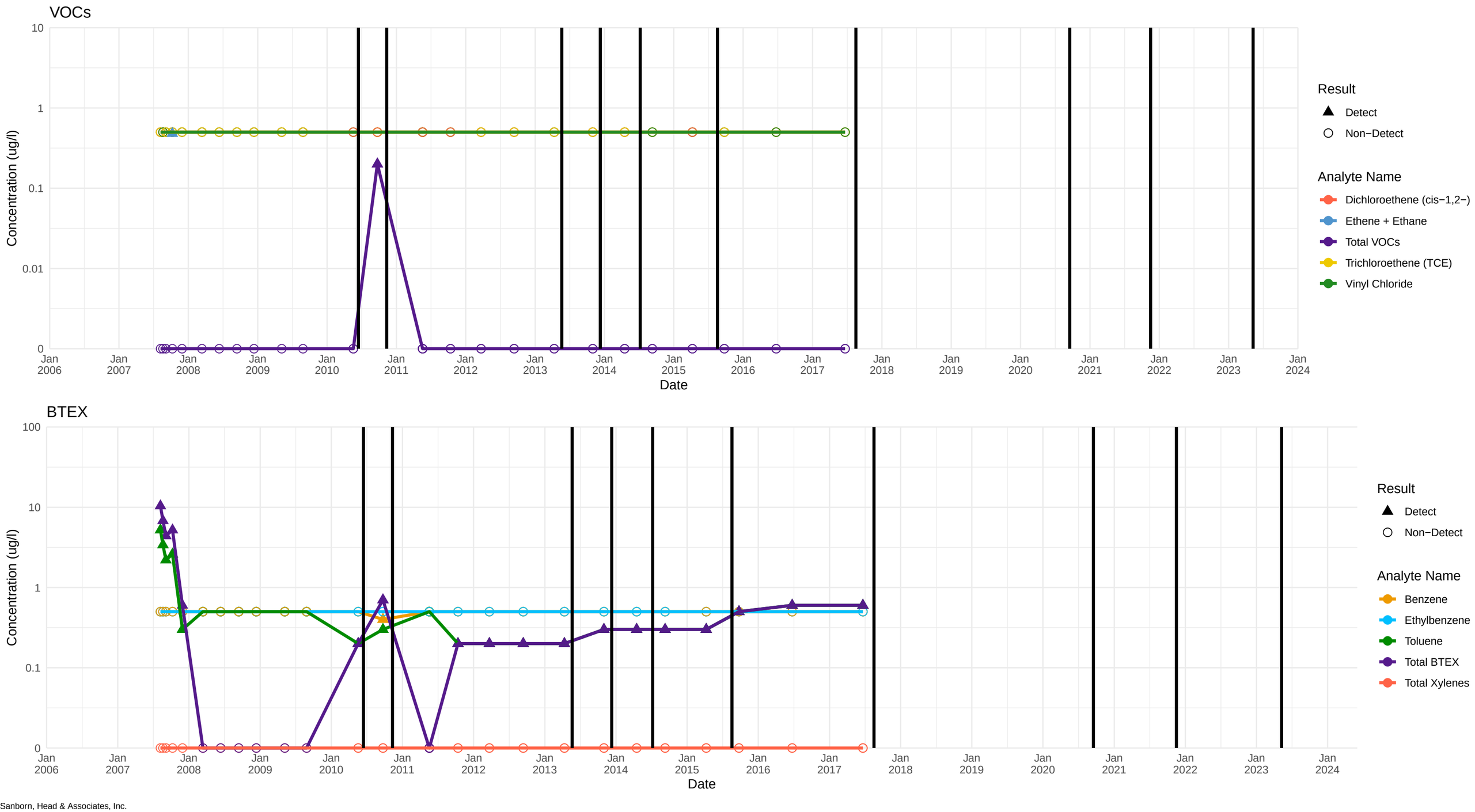
BP−14D Port 1

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



Sanborn, Head & Associates, Inc.

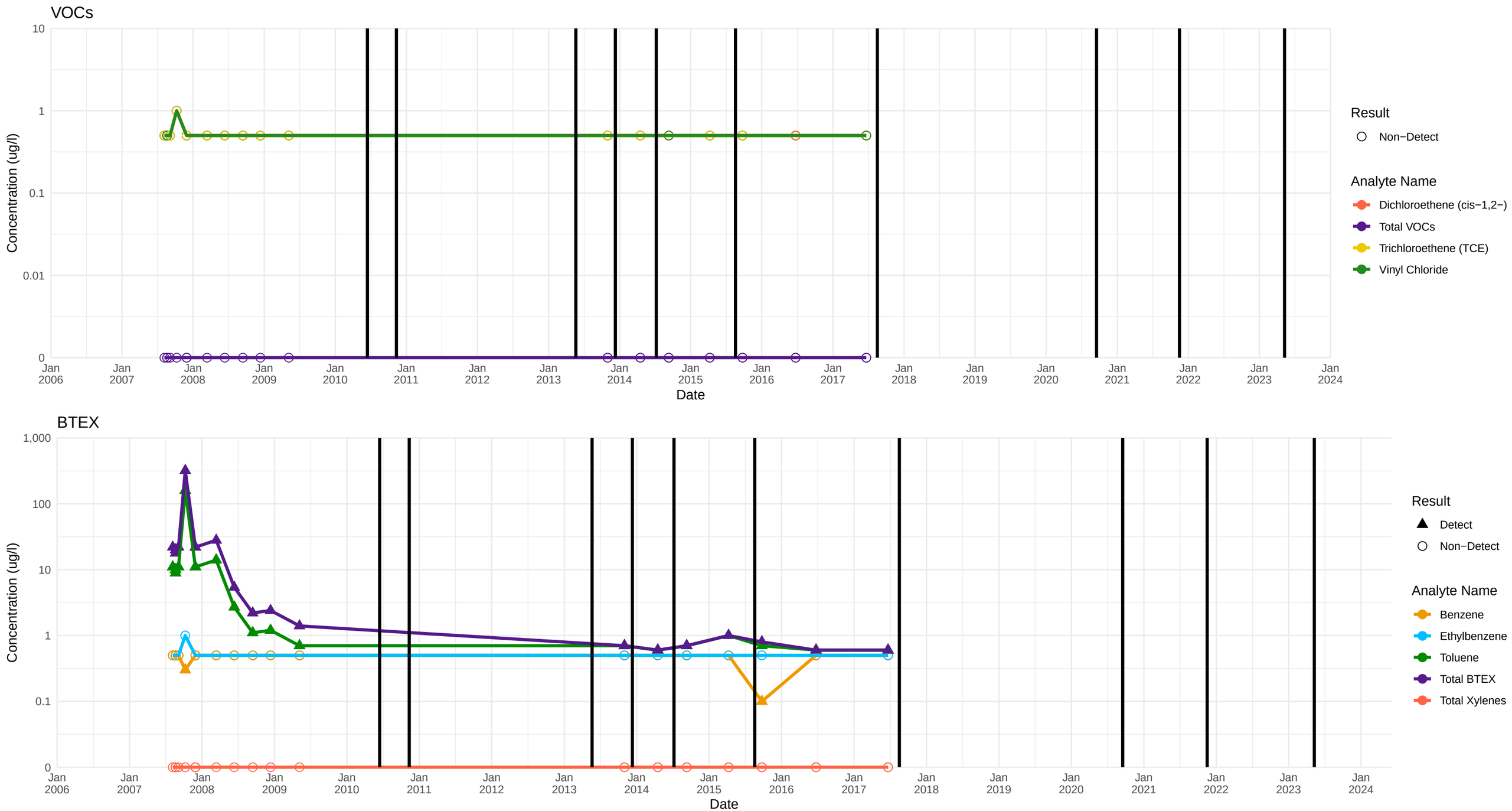
BP−14D Port 5

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



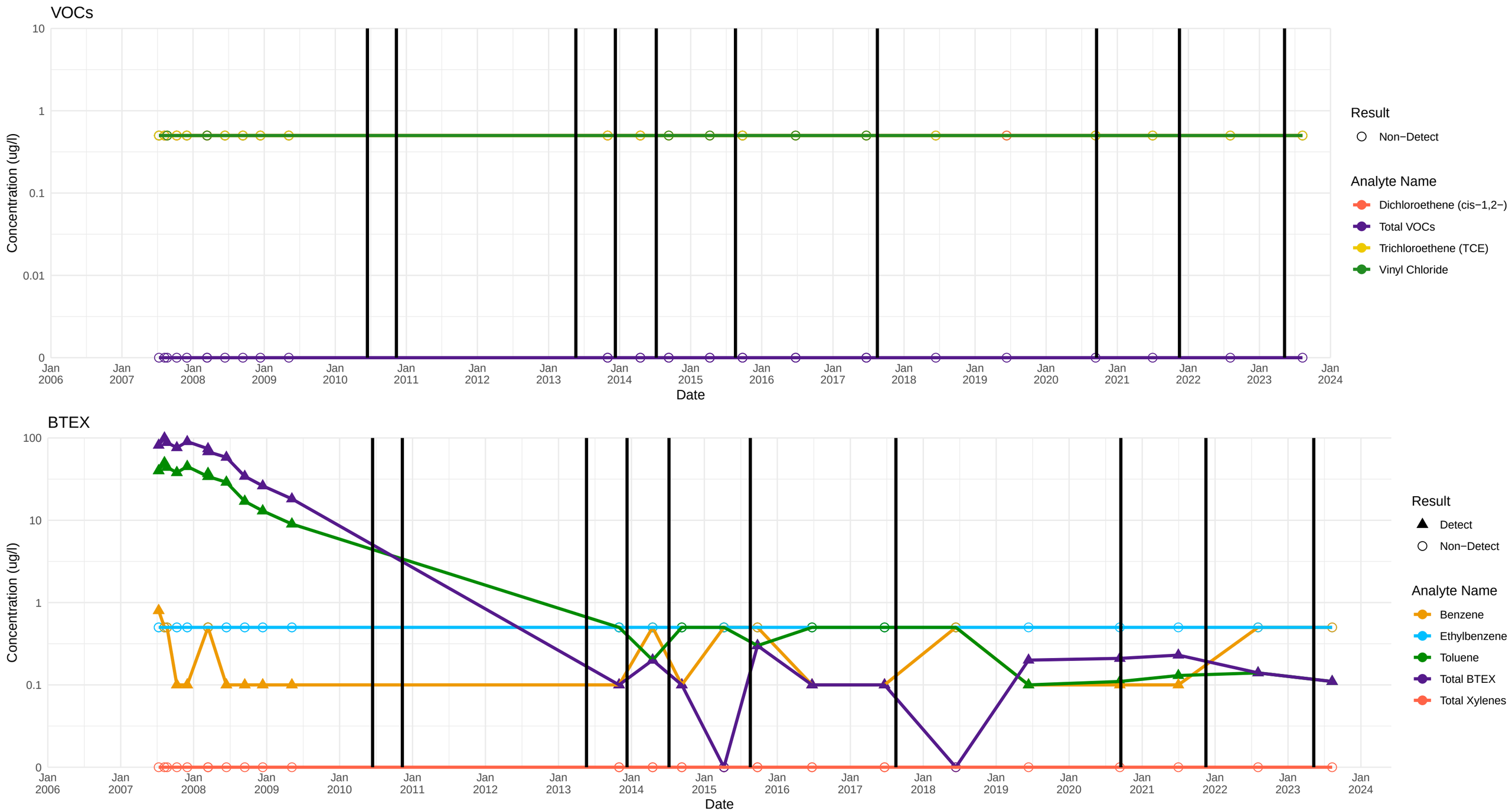
BP−15D Port 5

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



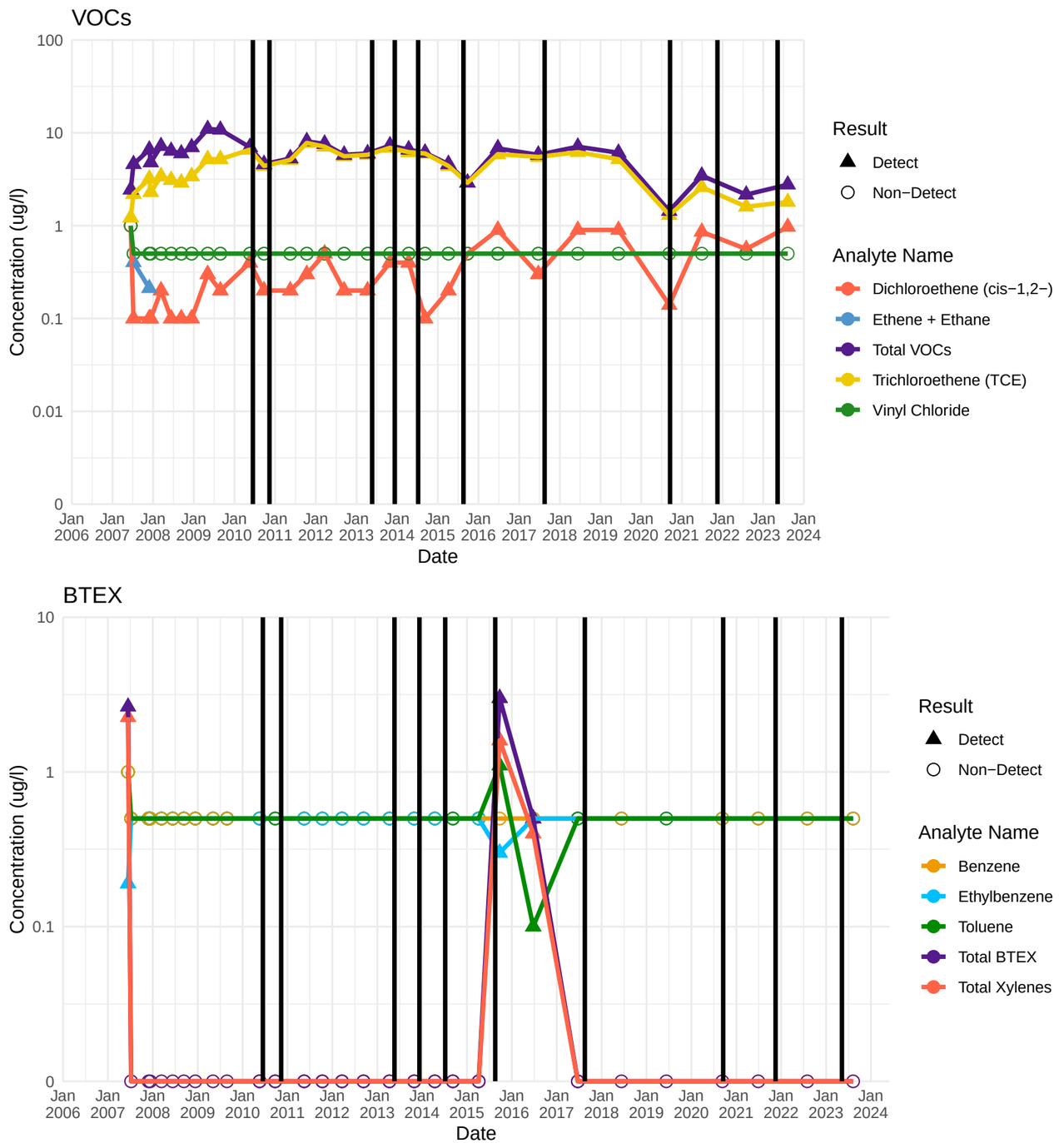
GC−2A

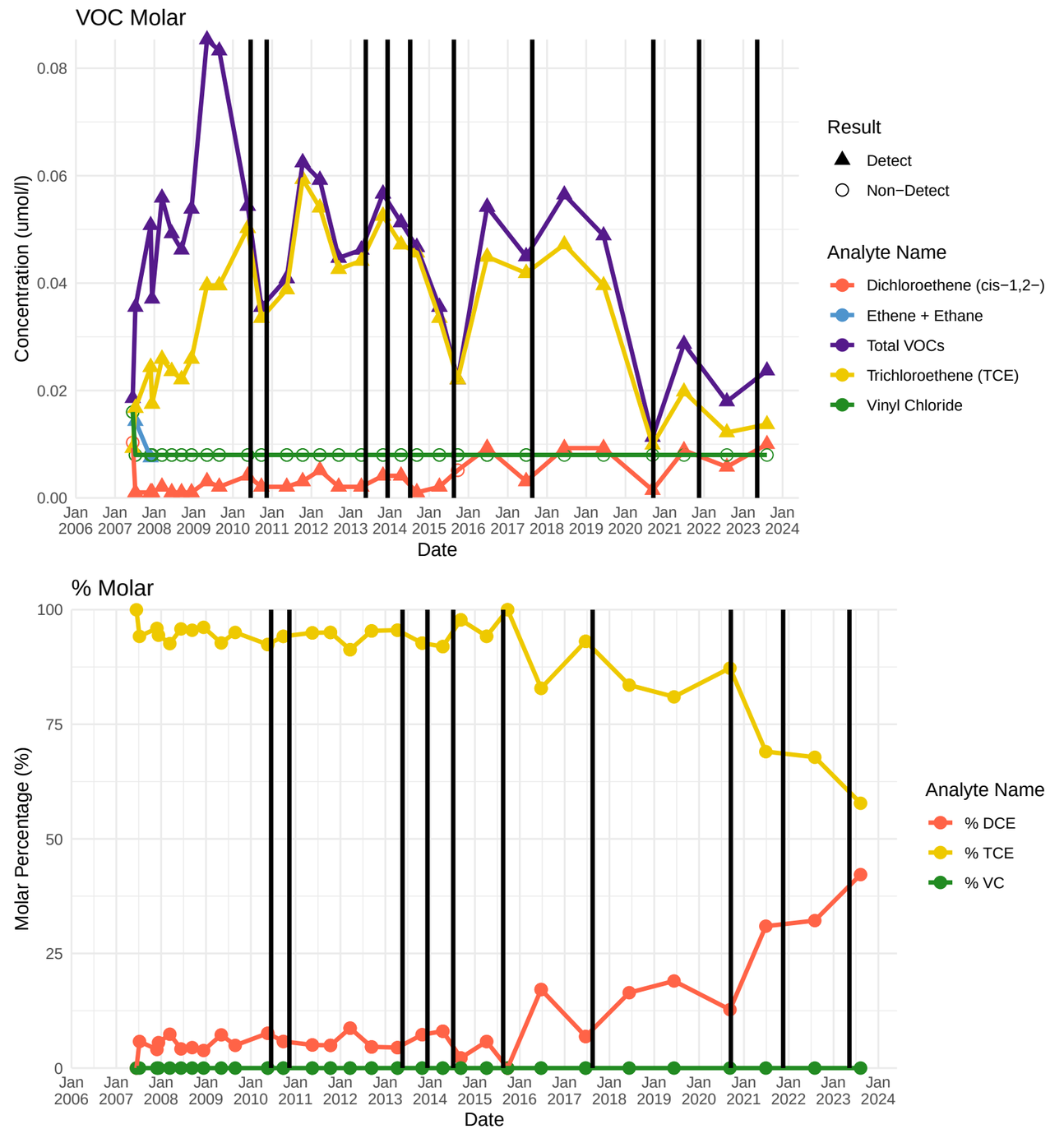
Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.





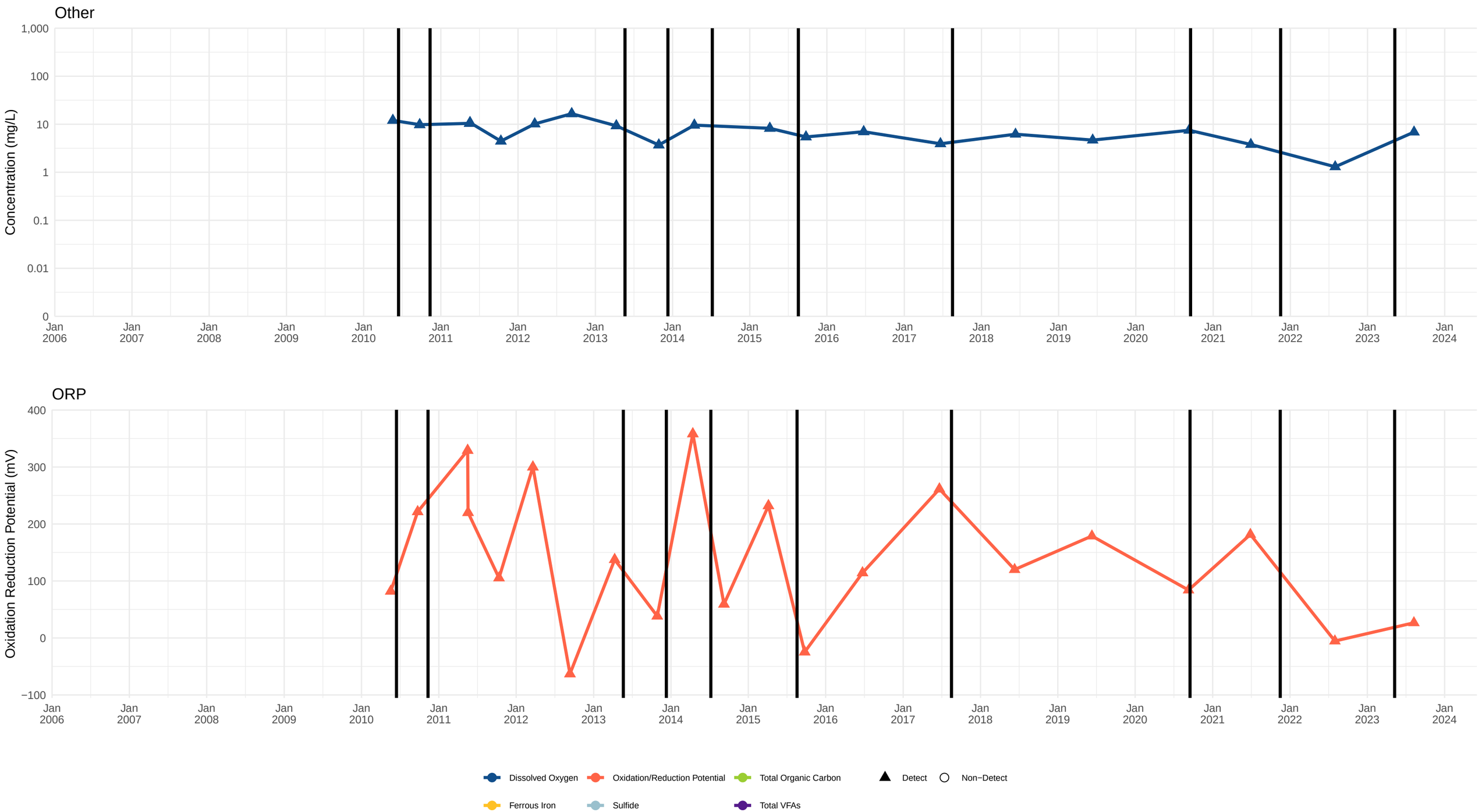
GC−2A

Notes:

(1) Where applicable, non−detects are plotted at reporting limit and are shown with hollow symbols. Summed (total) concentrations are plotted at zero.

(2) Black vertical lines indicate amendment injection events.

(3) Reporting limits can fluctuate based on sample dilutions performed by the lab due to varying concentrations of other compounds, some of which may not be shown in these time series, matrix interference like the presence of amendment oil droplets, or other factors.



Appendix C

WellCAD Mass Discharge Data Montages

Appendix C - WellCAD Data Montages

Former IBM Gun Club
Former Burn Pit Area
Union, New York

SANBORN HEAD

Lithology Legend

- Fill
- Native Overburden
- Shale
- Sandstone
- Sandy Siltstone
- Interbedded Sandy Siltstone and Shale
- No recovery
- Clay

Unit Legend

- Bedrock
- Overburden

Mass Discharge Legend

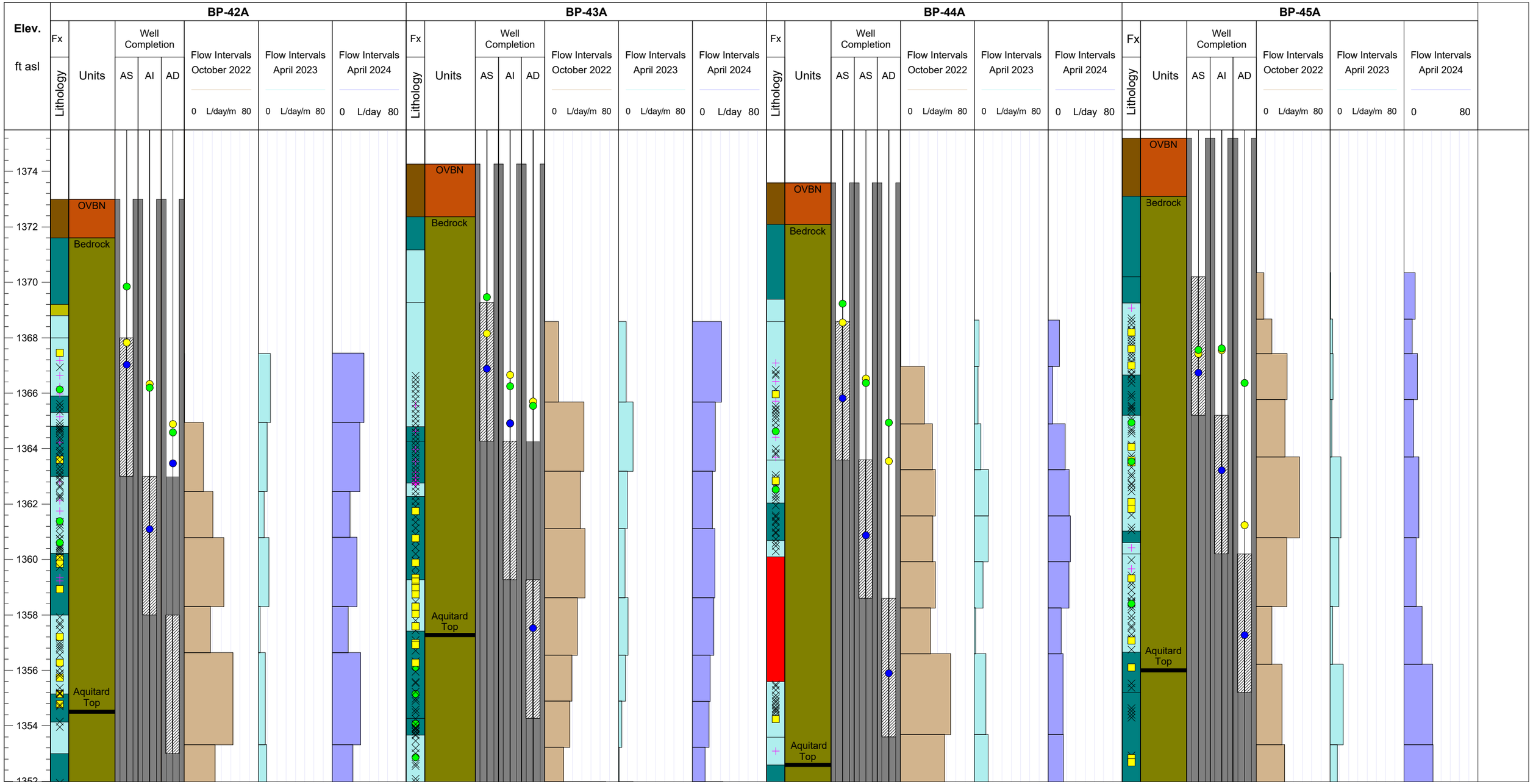
- Total CVOCs (g/day)
- TCE (g/day)

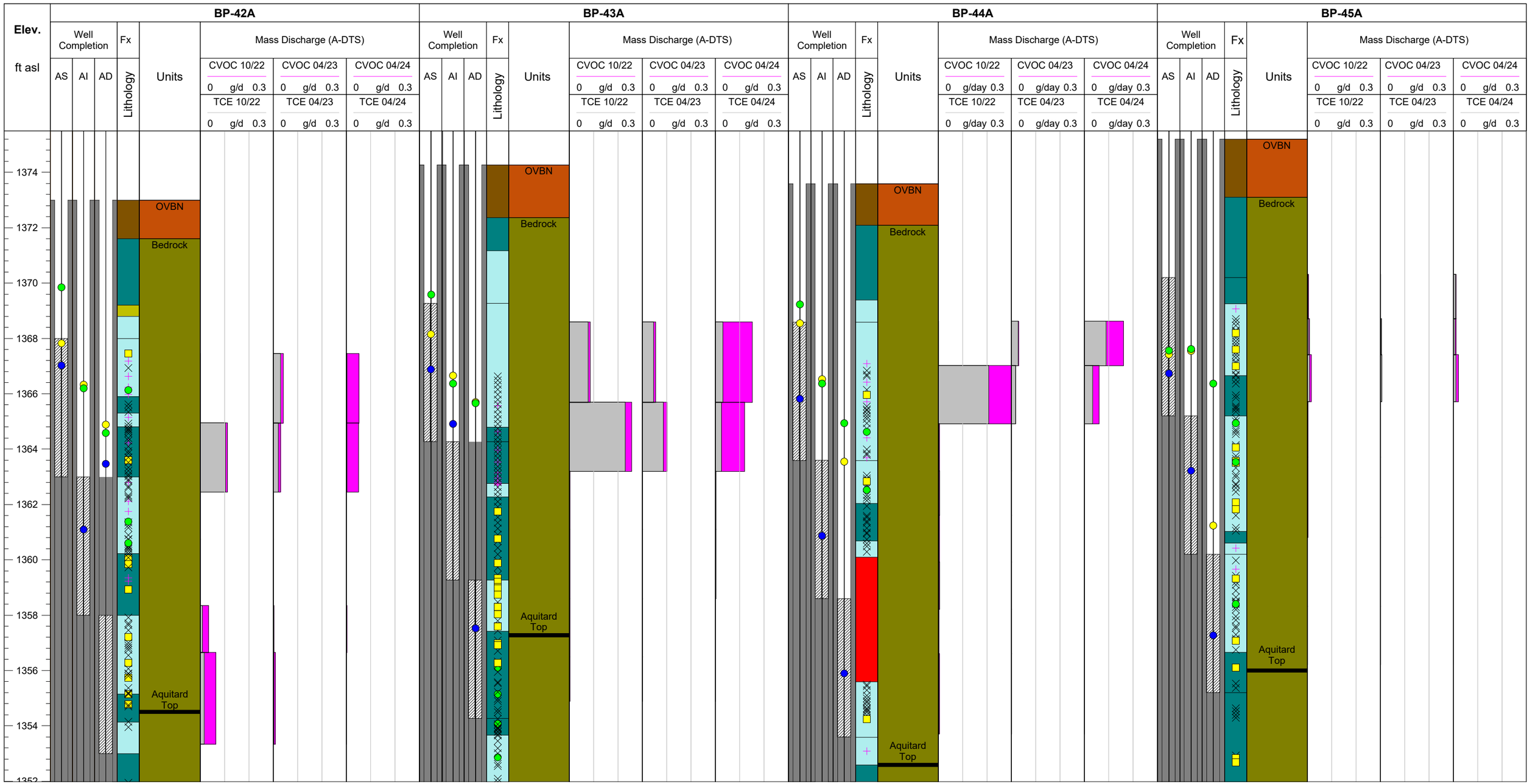
Fracture Legend

- Extremely Fractured
- Horizontally Fractured
- Diagonally Fractured
- Vertically Fractured

Water Elevation Legend

- October 2022
- April 2023
- April 2024


Elev.
ft asl
BP-42A
BP-43A
BP-44A
BP-45A
Fx
Lithology
Units
Well Completion
AS
AI
AD
Flow Intervals October 2022
Flow Intervals April 2023
Flow Intervals April 2024
0 L/day/m 80
0 L/day 80
1374
1372
1370
1368
1366
1364
1362
1360
1358
1356
1354
1352
OVBN
Bedrock
Aquitard Top


BP-42A
BP-43A
BP-44A
BP-45A
Elev.
ft asl
Well Completion
Fx
Units
Mass Discharge (A-DTS)
AS
AI
AD
Lithology
CVOC 10/22
CVOC 04/23
CVOC 04/24
TCE 10/22
TCE 04/23
TCE 04/24
0 g/d 0.3
0 g/day 0.3
OVBN
Bedrock
Aquitard Top
1374
1372
1370
1368
1366
1364
1362
1360
1358
1356
1354
1352