

US EPA ARCHIVE DOCUMENT

Technical Memorandum

Date: December 21, 2012

To: Joseph Kelly, Project Manager
USEPA

From: Graham Crockford, Project Manager
TRC Environmental Corporation

cc: Susan Perdomo, USEPA Attorney
David Petrovski, USEPA Hydrogeologist
Jason Smith, Tecumseh Products Company
Douglas McClure, Conlin, McKenney & Philbrick, PC
Stacy Metz, TRC Environmental

Subject: Proposed Revisions to the Quarterly Groundwater Compliance Monitoring Program
Former Tecumseh Products Company Site, Tecumseh, Michigan (RCRA-05-2010-0012)

Project No.: 004304.0001.0000, Phase 2

Introduction

Tecumseh Products Company (TPC) has retained TRC Environmental Corporation (TRC), Inc., to investigate soil and groundwater conditions at the former TPC site located in Tecumseh, Michigan. TRC has been conducting quarterly groundwater monitoring to demonstrate groundwater stability in accordance with Paragraph 13(b) of the RCRA Administrative Order on Consent (“AOC”) (RCRA 05-2010-0012) for the site.

TPC and TRC met with the United States Environmental Protection Agency (USEPA) for a project meeting on October 29 and 30, 2012 at USEPA Region V Headquarters in Chicago, Illinois. The current statistical evaluation (through the second quarter of 2012) indicates that in most cases contaminant concentrations do not exhibit an upward trend. However, USEPA would like additional rounds of data at monitoring wells exhibiting relatively high standard deviation to confirm that groundwater concentrations remain stable. Conversely, additional data from wells with low standard deviation, particularly those that are consistently below the detection limit, add little value to overall site assessment and corrective measures. As agreed during the October 29-30, 2012 project meeting, this Technical Memorandum documents proposed revisions to the existing groundwater monitoring program for USEPA. Note that the revised groundwater sampling

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program only includes existing compliance monitoring locations. The workplan to address USEPA comments provided during the October 29-30, 2012 project meeting is expected to include the installation of additional monitoring wells. This workplan is under preparation and will be submitted to USEPA in January 2013. New wells will be added to the groundwater monitoring program as appropriate to document groundwater stability within the groundwater plume.

Summary of the Sampling Plan 2010 through 2012

The previous sampling plan is summarized below:

n Quarterly Monitoring

- Collect static groundwater measurements at each of the groundwater monitoring wells. Note that monitoring well MW-09s was excavated during the installation of the permeable reactive barrier (PRB) in May 2011, and is no longer part of the monitoring program. Since that time, static water levels at monitoring wells PRB-01s and PRB-02s, which are part of the PRB monitoring network, have been collected in conjunction with regular quarterly monitoring to help define groundwater elevations and flow direction along the eastern perimeter of the site.
- Collect static water levels at each of the two gauge point locations on the River Raisin.
- Use low-flow sampling techniques to collect groundwater samples at all groundwater monitoring well locations, except at monitoring wells MW-08s, MW-10d, and MW-16s. The following field parameters are measured during groundwater sample collection: pH, specific conductivity, redox potential, dissolved oxygen, turbidity and temperature. Groundwater samples are submitted to the analytical laboratory for VOCs analysis.
- Collect a surface water sample from the wetland area for VOCs analysis.

n Semi-Annual Monitoring (conducted during the second and fourth quarters)

- Conduct all quarterly monitoring as described above.
- At a subset of the groundwater monitoring wells (MW-01s, MW-03s, MW-04s, MW-06s, MW-10s, MW-14d, MW-17s, MW-18s, MW-19s, MW-19d, MW-21, MW-23, MW-24s, MW-24d, MW-27s, MW-27d, MW-32s, MW-33s, and MW-34s), collect samples for analysis of monitored natural attenuation (MNA) parameters: chloride, nitrate, sulfate and ferrous iron.
- Previous semi-annual monitoring included the collection of drinking water samples from private wells identified in and around the area of VOC-affected groundwater for VOCs analysis. A groundwater use ordinance, restricting the use of private wells within the area of VOC-affected groundwater, was passed by the City of Tecumseh during the second quarter of 2011. These wells were decommissioned in December 2011 and are no longer part of the monitoring program; properties not previously connected to municipal water were connected prior to well decommissioning in November 2011.

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Summary of the Proposed Changes

The following changes to the 2012 sampling plan, effective beginning during the first quarter 2013, are proposed. The proposed groundwater monitoring program is summarized in Table 1. Trend charts for detect parameter-well combinations which are inclusive of data through the third quarter 2012 sample event area attached for reference.

- n The elimination of two monitoring wells from the monitoring program.
 - **MW-14s:** This well is screened in perched groundwater that is not connected to the affected aquifer.
 - **MW-16s:** This well has been dry since installation. Collection of water levels will be discontinued.
- n The discontinuation of sample collection for routine, semi-annual analysis of MNA analysis.
- n Reduced sample frequency to annual (fourth quarter) at select wells.
 - **Non-Detect Monitoring Wells:** MW-10s, MW-11s, MW-12d, MW-13s, MW-14d, MW-15s, MW-17s, MW-18s, MW-19d, MW-24s, MW-24d, MW-26s, MW-27s, MW-27d, MW-28s, MW-28d, MW-29d, MW-30s, and MW-30d.
 - **MW-12s and MW-29s:** Each of these monitoring wells has a single compound that is consistently detected near the detection limit. For purposes of plume delineation these wells are effectively non-detect.
 - **Up Gradient Monitoring Wells:** Up gradient monitoring wells MW-05s, MW-06s, MW-07s and MW-19s exhibit very low variance (less than 25-percent [$<25\%$] for all detected compounds).
 - **MW-02s:** Monitoring well MW-02s is a side gradient well. The trichloroethene (TCE) concentration exhibits low variance ($<25\%$). Other detected compounds have mean concentrations less than two times the typical reporting limit of 2 micrograms per liter (ug/L).
 - Water levels will be collected semi-annually at these locations so that a groundwater contour map can still be prepared semi-annually.
- n Reduced sample frequency to semi-annual (second and fourth quarters) at select wells with moderate variability and/or trends which are unlikely to be critical to plume stability.
 - **Source Area Wells:** MW-32s, MW-33s, and MW-34s
 - **Select Downgradient Wells:** MW-01s, MW-03s, MW-20s, MW-20d, and MW-22
- n Continued quarterly sample collection at select wells.
 - **MW-04s:** High variability
 - **MW-21:** To evaluate PRB effectiveness further downgradient of the site

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- **MW-23:** To evaluate vinyl chloride trend
- **MW-25s:** To evaluate TCE trend
- **MW-31:** To monitoring groundwater-to-surface water interface concentrations
- **MW-35d:** New well in 2012

Table

Table 1
 Groundwater Monitoring Program
 Former Tecumseh Products Company Site
 Tecumseh, Michigan

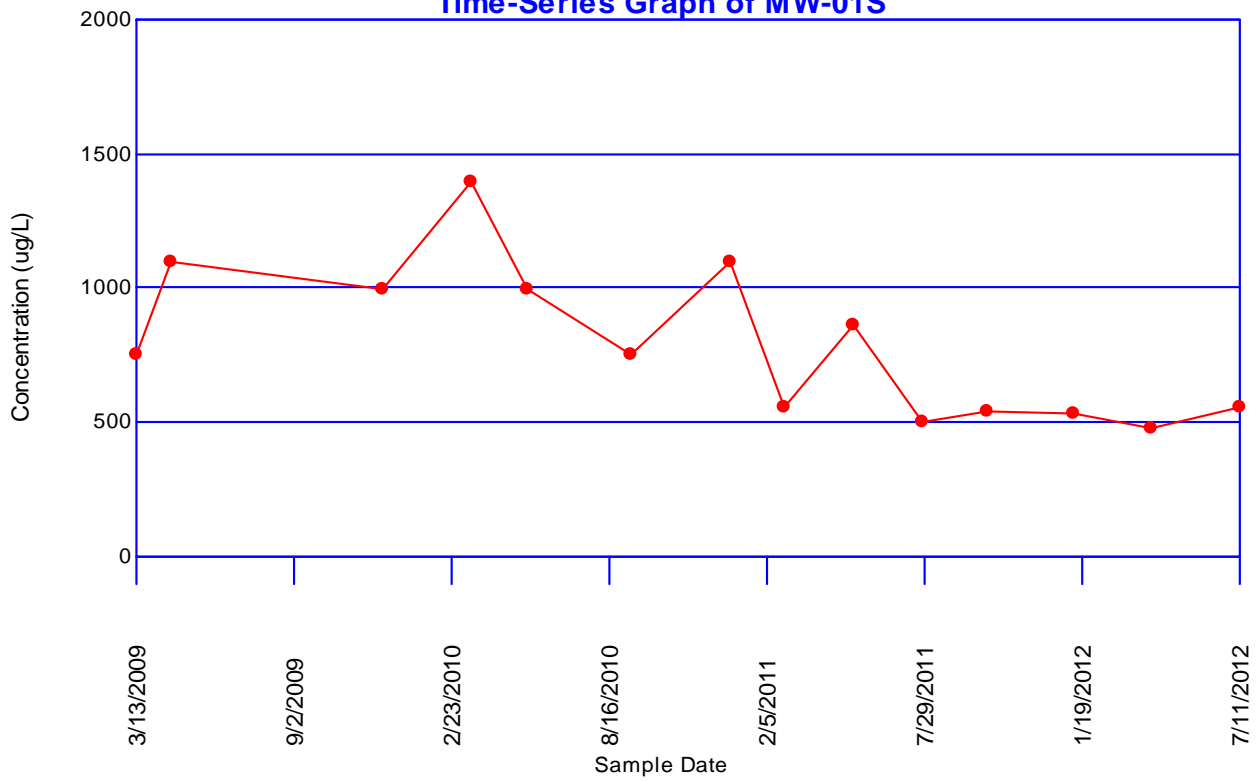
Groundwater Sample Location	Water Level				VOCs Analysis			
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
MW-01s		Ö		Ö		Ö		Ö
MW-02s		Ö		Ö				Ö
MW-03s		Ö		Ö		Ö		Ö
MW-04s	Ö	Ö	Ö	Ö	Ö	Ö	Ö	Ö
MW-05s		Ö		Ö				Ö
MW-06s		Ö		Ö				Ö
MW-07s		Ö		Ö				Ö
MW-08s		Ö		Ö				
MW-09s	Well Decommissioned							
MW-10s		Ö		Ö				Ö
MW-10d		Ö		Ö				
MW-11s		Ö		Ö				Ö
MW-12s		Ö		Ö				Ö
MW-12d		Ö		Ö				Ö
MW-13s		Ö		Ö				Ö
MW-14s								
MW-14d		Ö		Ö				Ö
MW-15s		Ö		Ö				Ö
MW-16s								
MW-17s		Ö		Ö				Ö
MW-18s		Ö		Ö				Ö
MW-19s		Ö		Ö				Ö
MW-19d		Ö		Ö				Ö
MW-20s		Ö		Ö		Ö		Ö
MW-20d		Ö		Ö		Ö		Ö
MW-21	Ö	Ö	Ö	Ö	Ö	Ö	Ö	Ö
MW-22		Ö		Ö		Ö		Ö
MW-23	Ö	Ö	Ö	Ö	Ö	Ö	Ö	Ö
MW-24s		Ö		Ö				Ö
MW-24d		Ö		Ö				Ö
MW-25s	Ö	Ö	Ö	Ö	Ö	Ö	Ö	Ö
MW-26s		Ö		Ö				Ö
MW-27s		Ö		Ö				Ö
MW-27d		Ö		Ö				Ö
MW-28s		Ö		Ö				Ö
MW-28d		Ö		Ö				Ö
MW-29s		Ö		Ö				Ö
MW-29d		Ö		Ö				Ö
MW-30s		Ö		Ö				Ö
MW-30d		Ö		Ö				Ö
MW-31	Ö	Ö	Ö	Ö	Ö	Ö	Ö	Ö
MW-32s		Ö		Ö		Ö		Ö
MW-33s		Ö		Ö		Ö		Ö
MW-34s		Ö		Ö		Ö		Ö
MW-35d	Ö	Ö	Ö	Ö	Ö	Ö	Ö	Ö
PRB-01s ⁽¹⁾		Ö		Ö				
PRB-02s ⁽¹⁾		Ö		Ö				

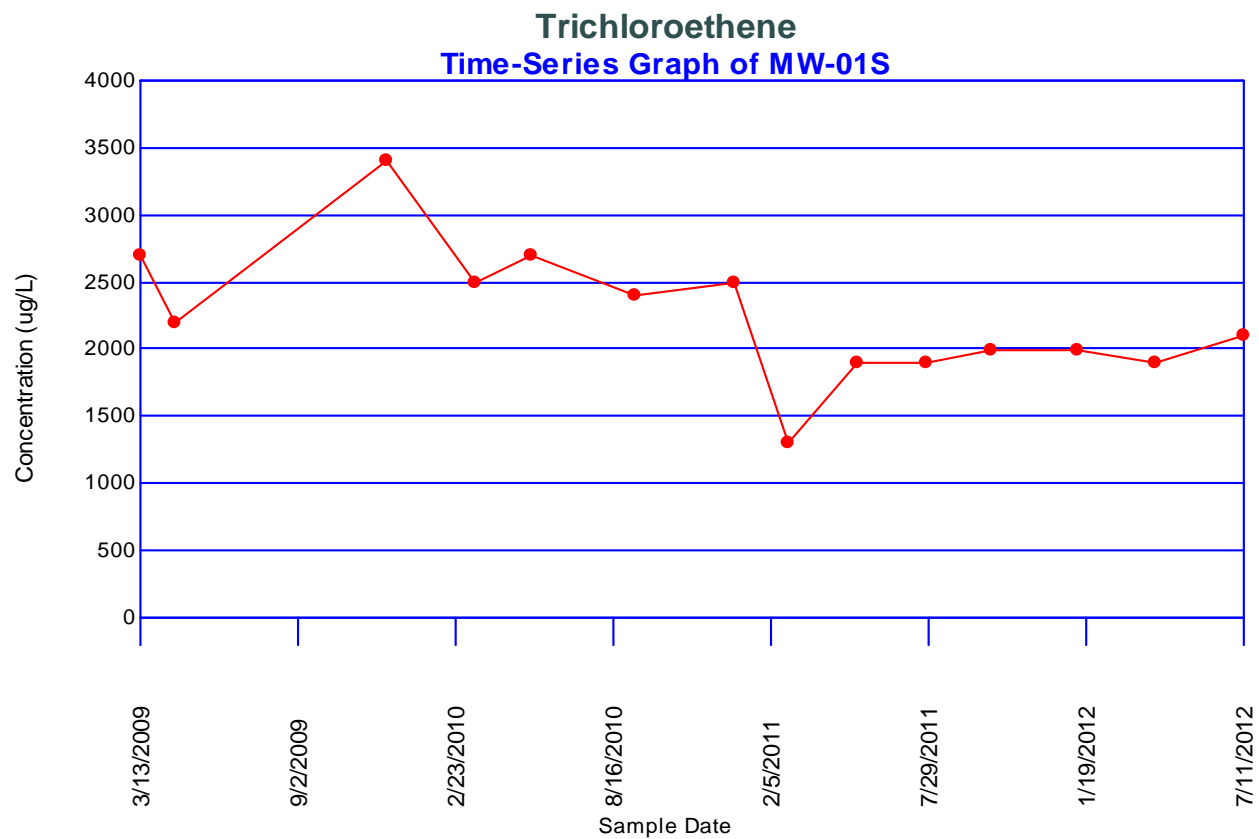
Note:

(1) Water levels are monitored at PRB-01s and PRB-02s to facilitate preparation of a site-wide groundwater contour map. This table does not reflect sample requirements associated with routine PRB performance monitoring.

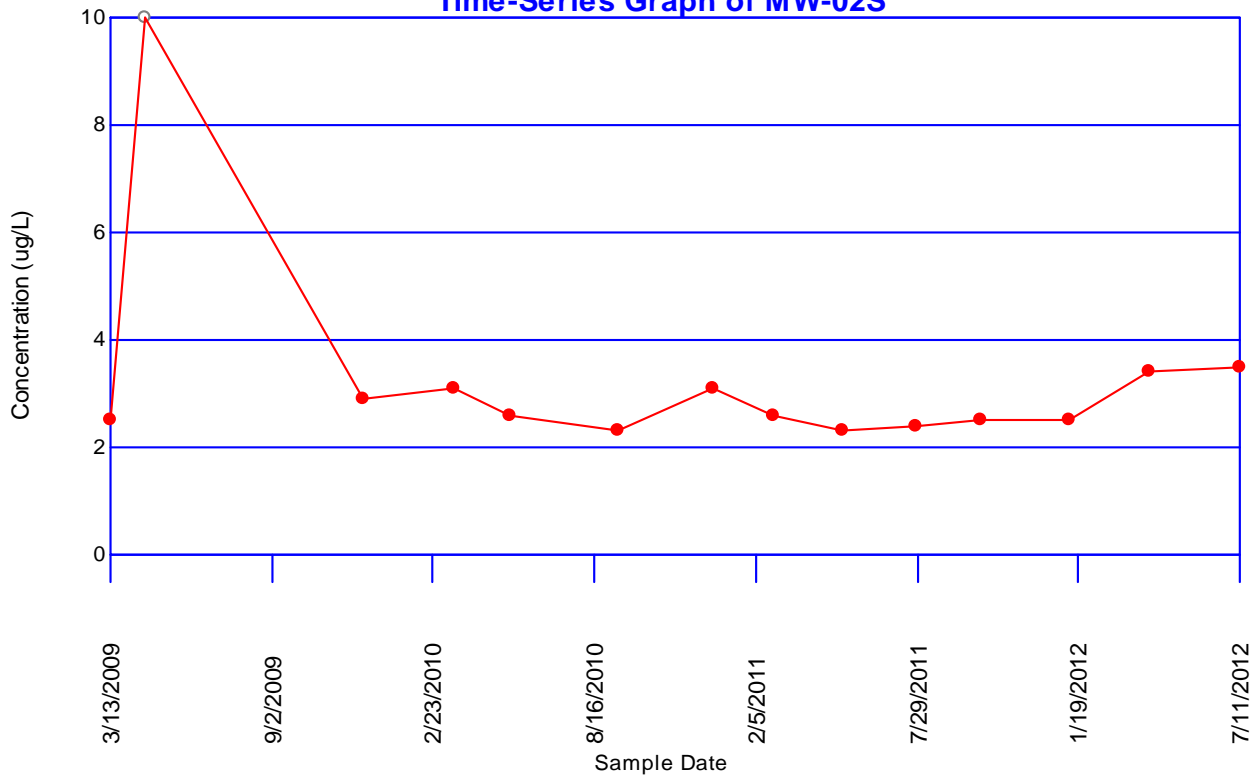
Trend Charts

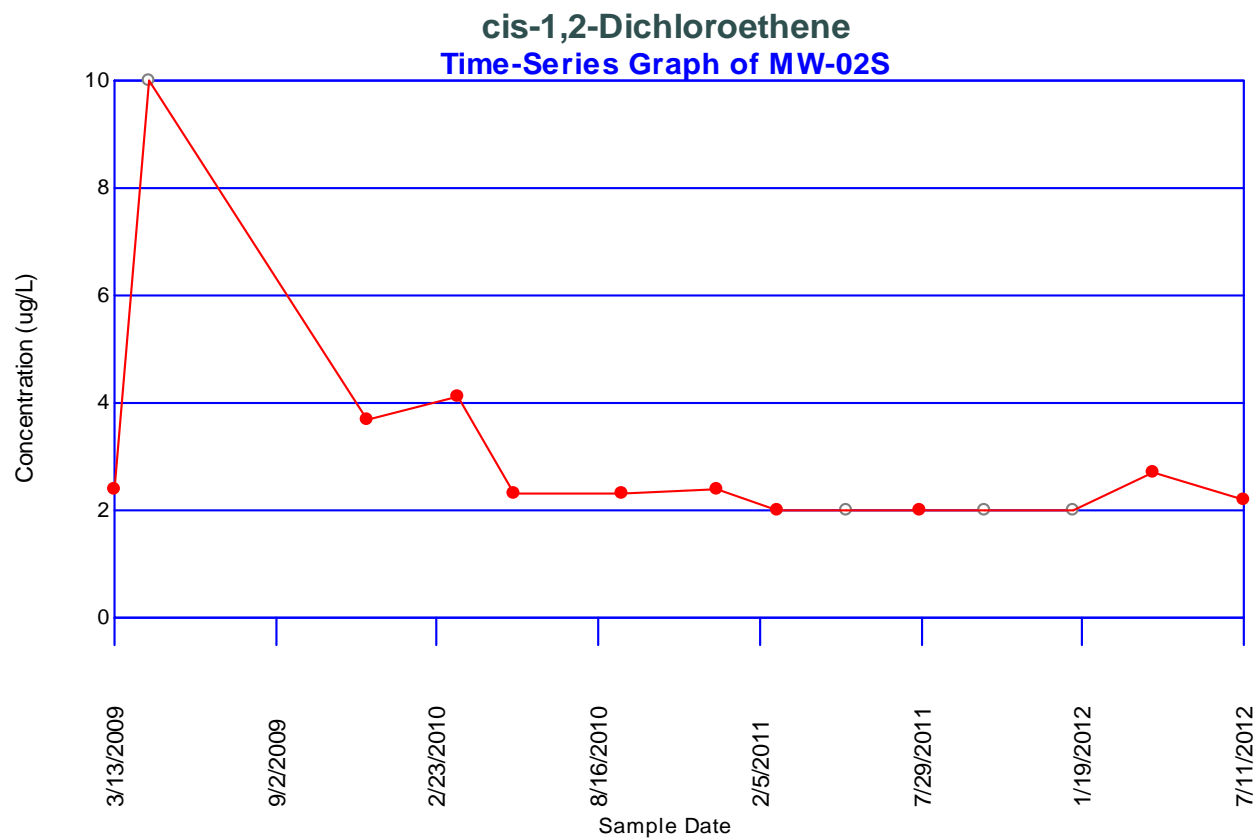
1,1,1-Trichloroethane Time-Series Graph of MW-01S



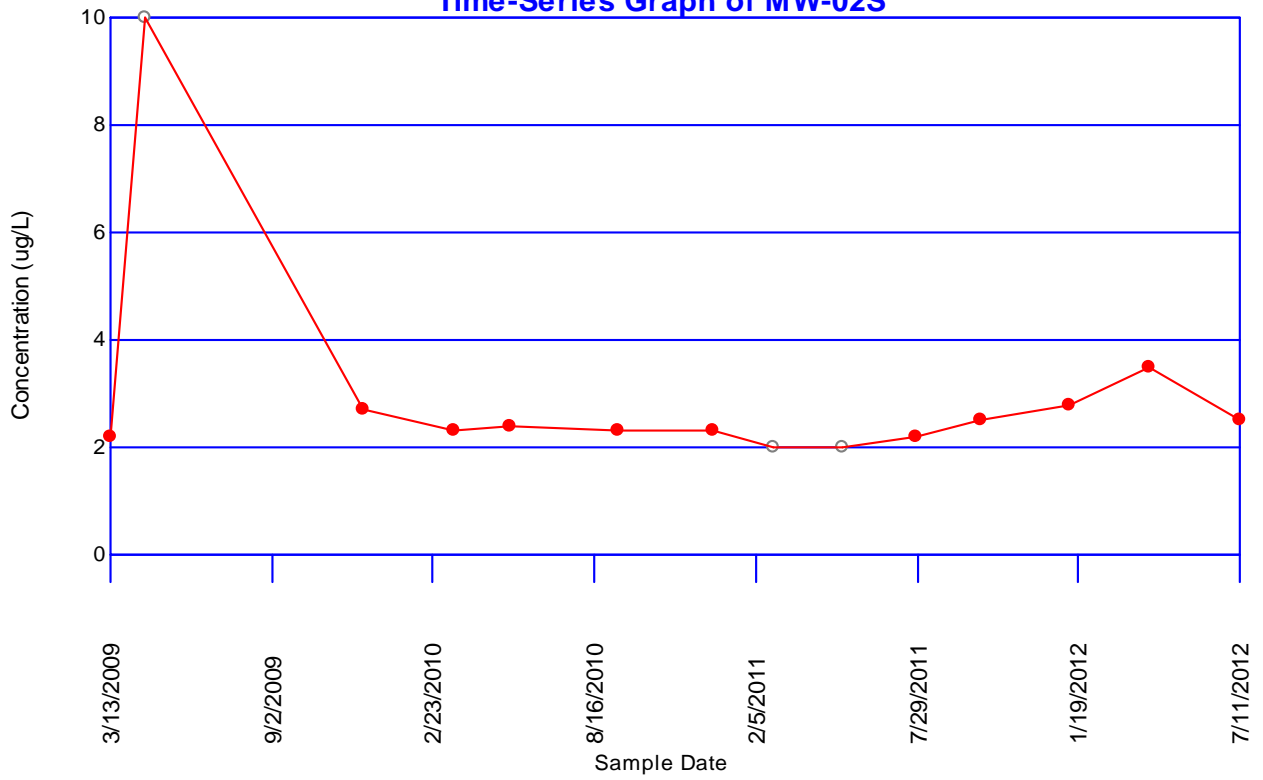


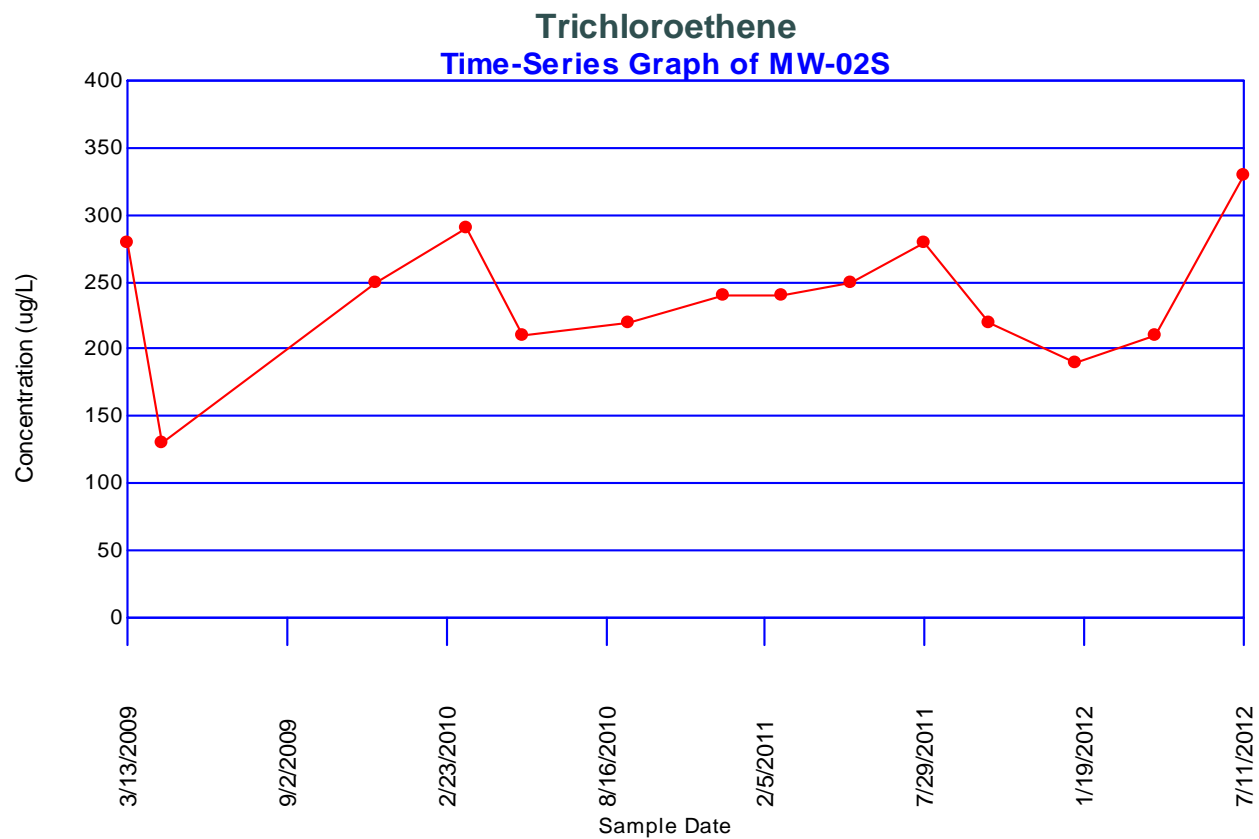
1,1,1-Trichloroethane Time-Series Graph of MW-02S

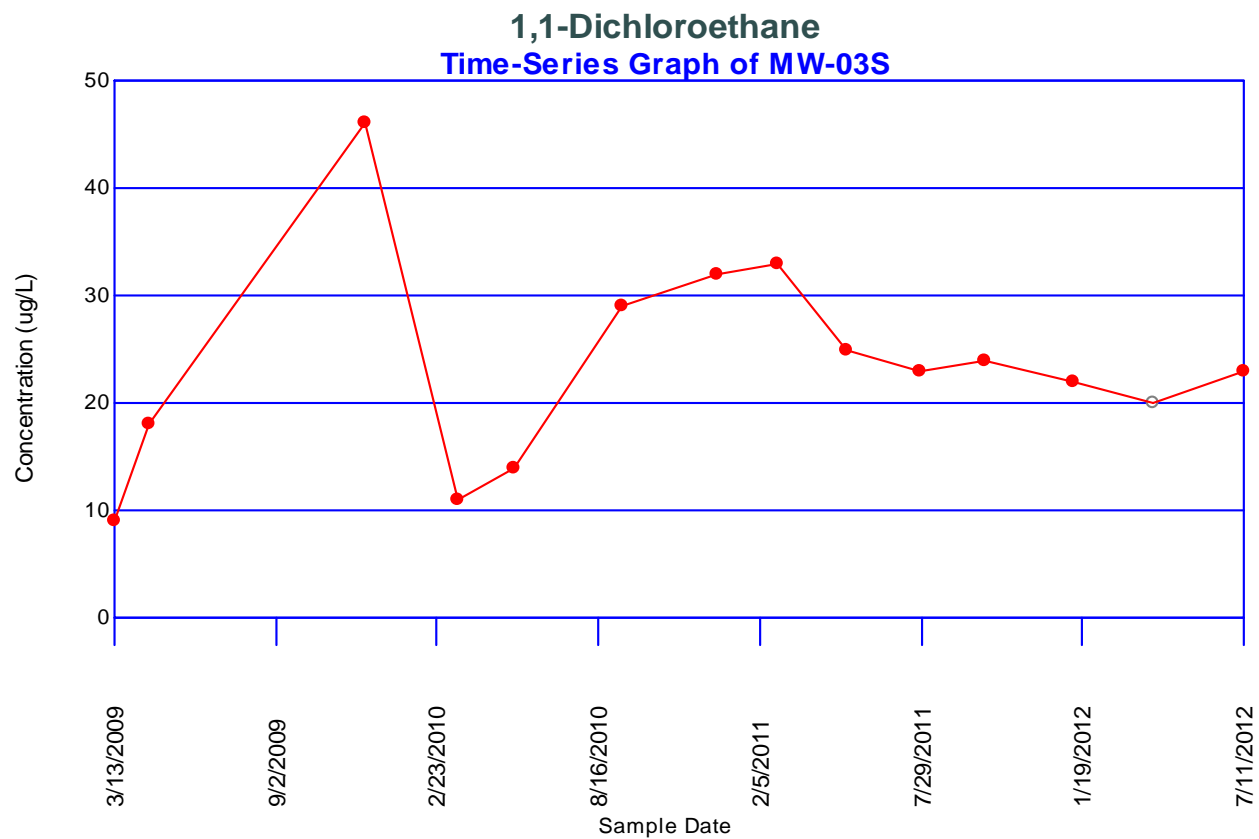


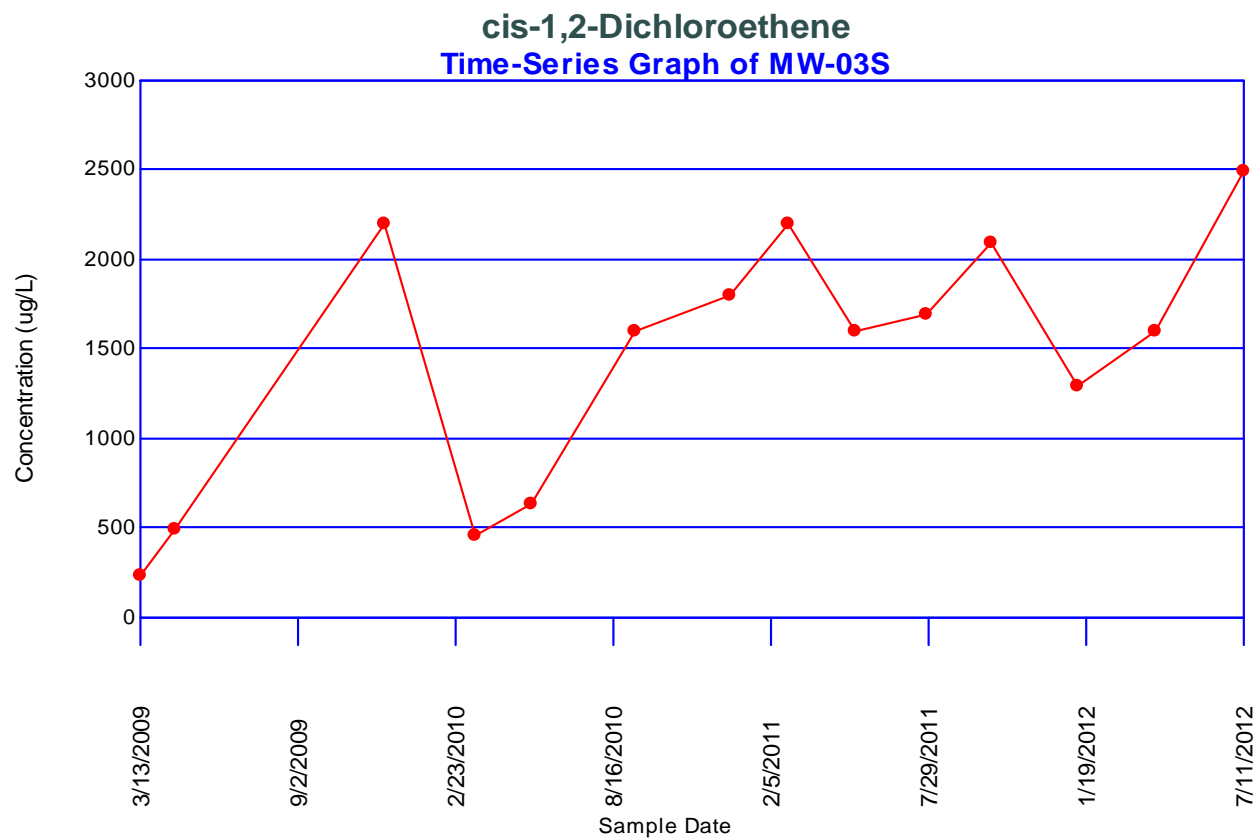


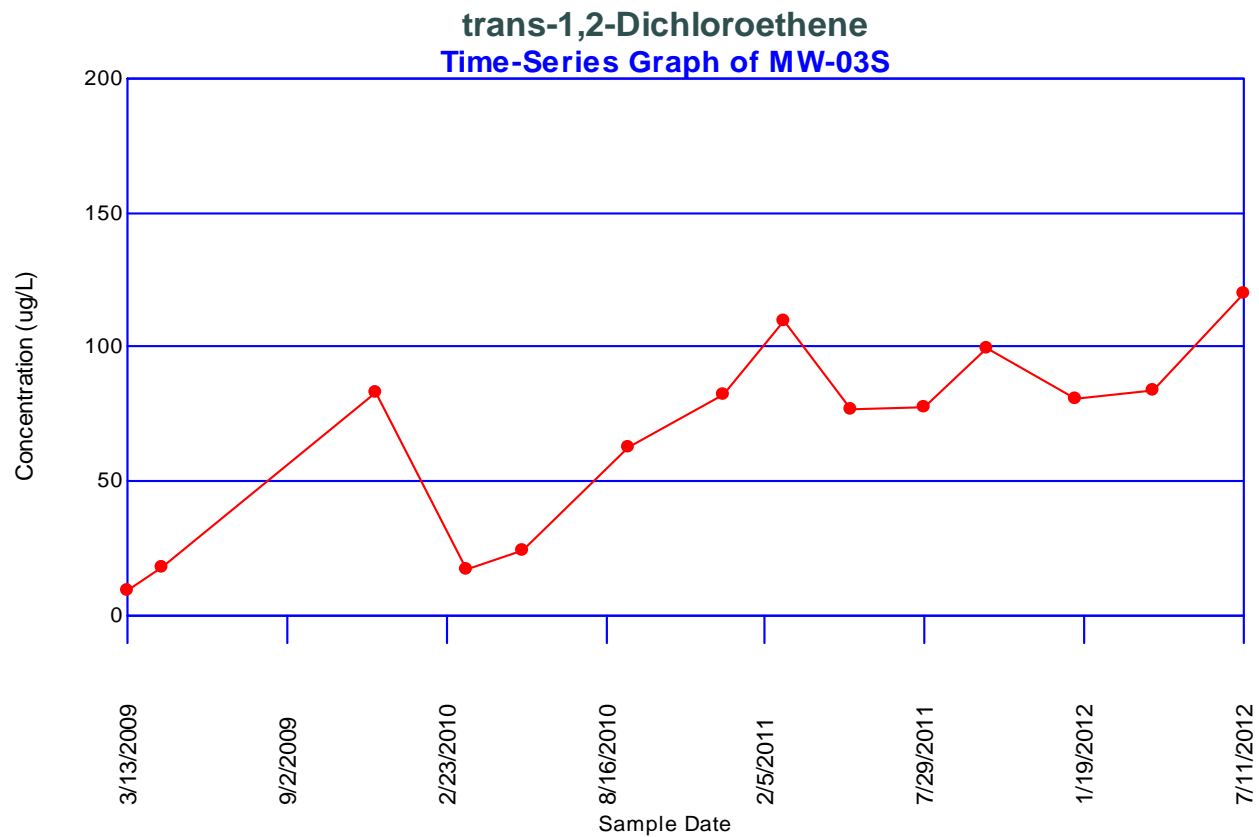
Tetrachloroethene Time-Series Graph of MW-02S



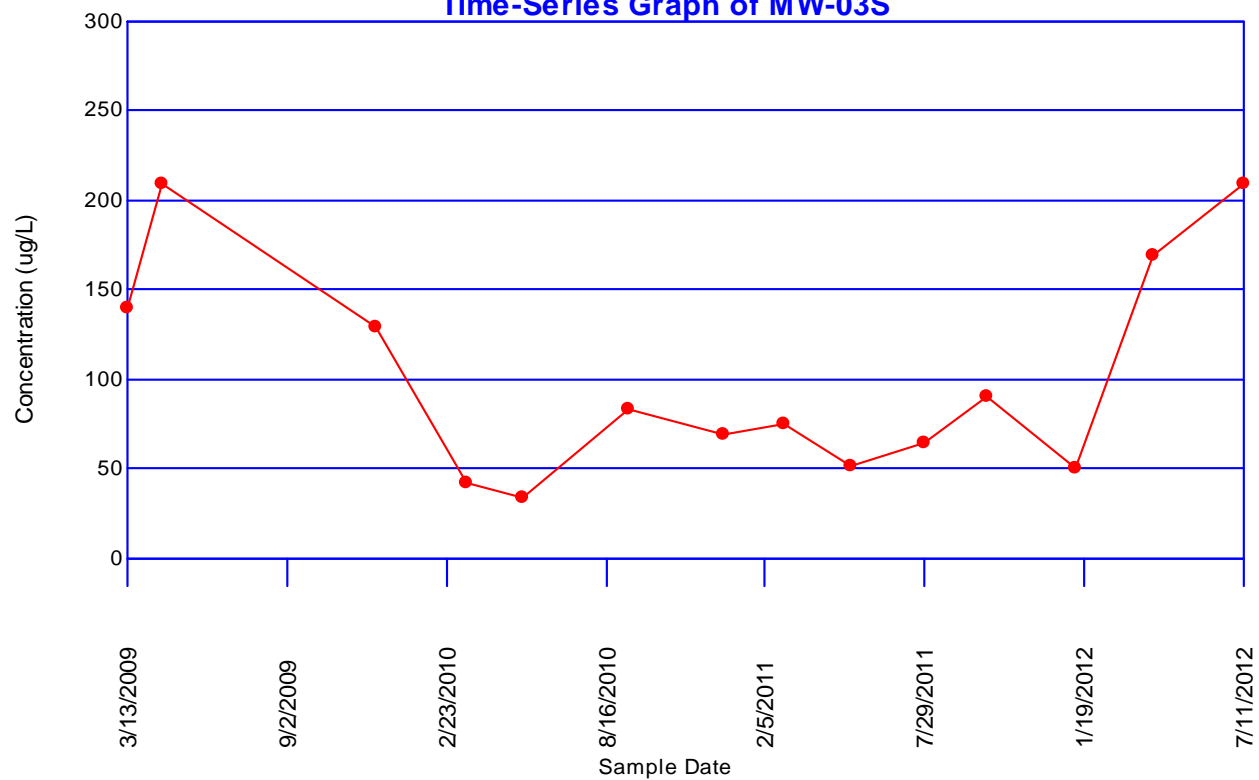


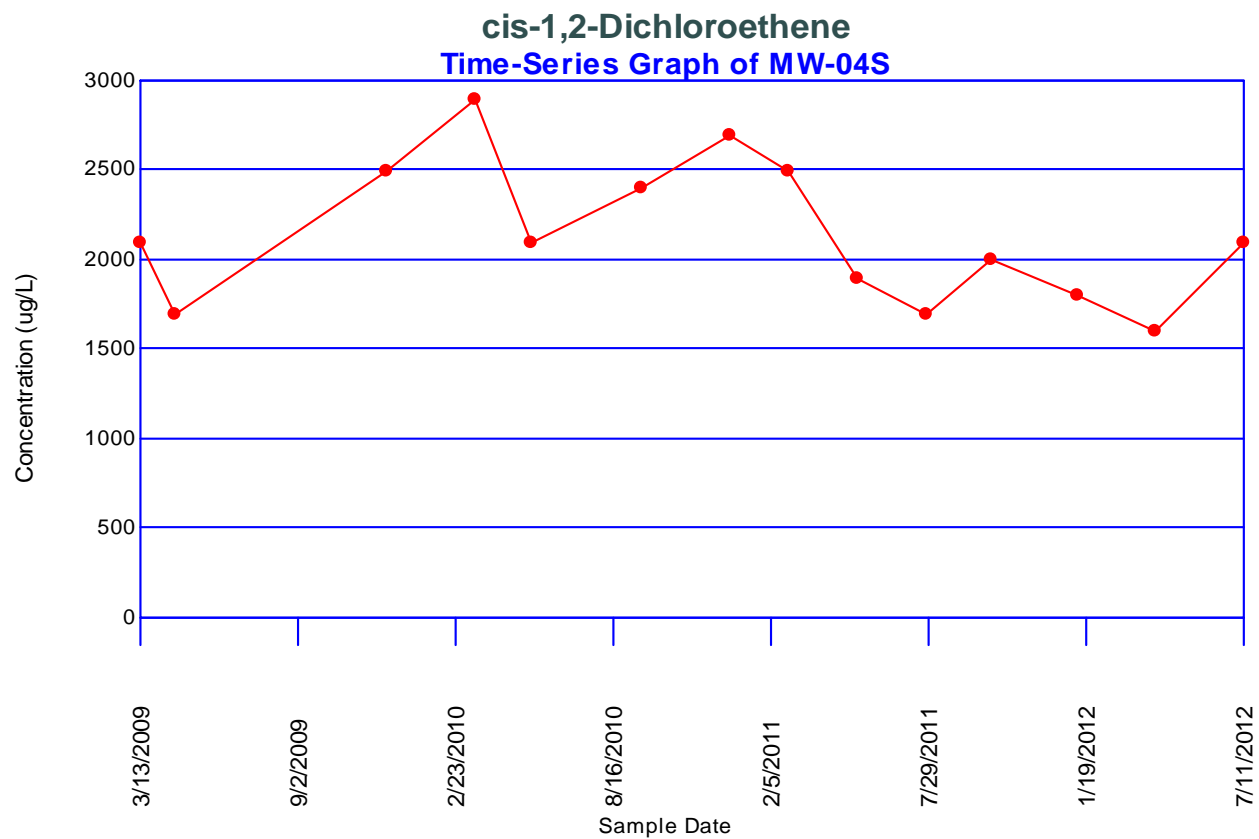


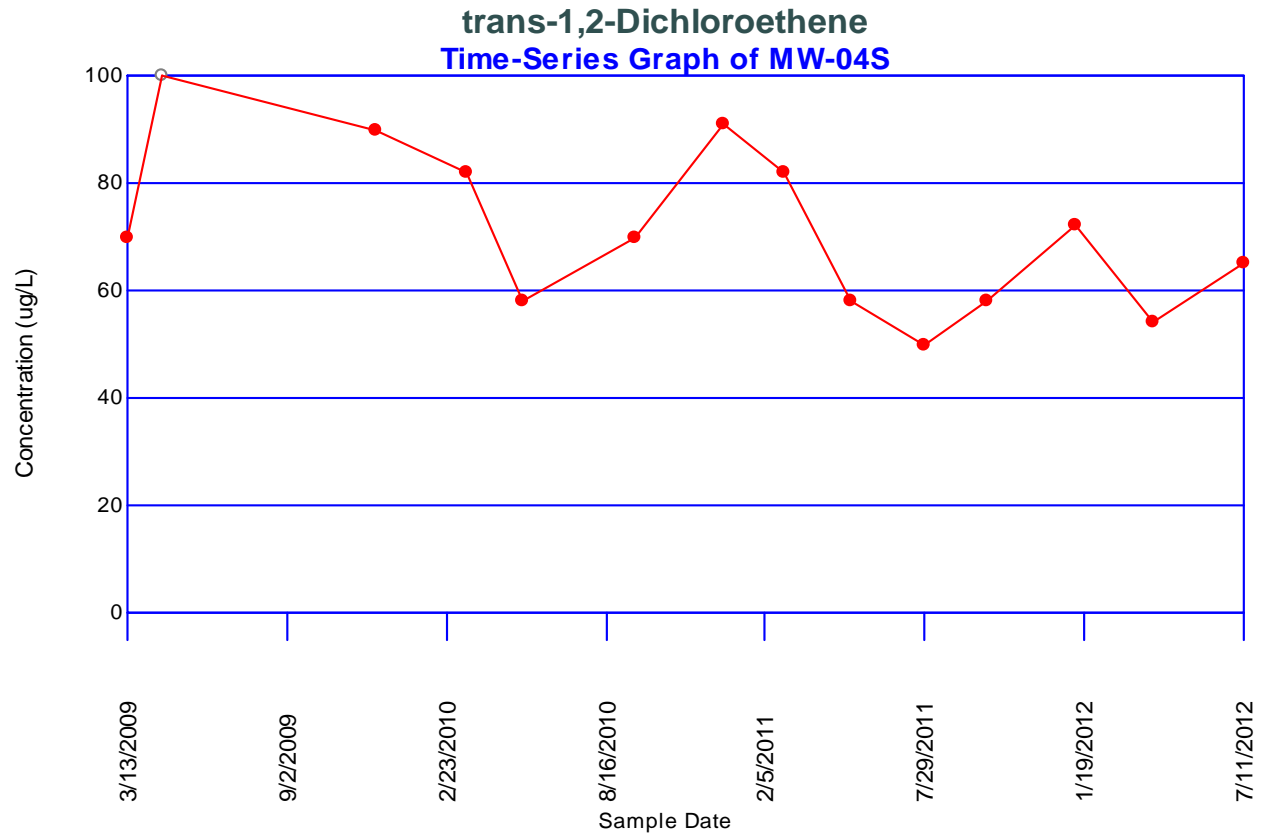


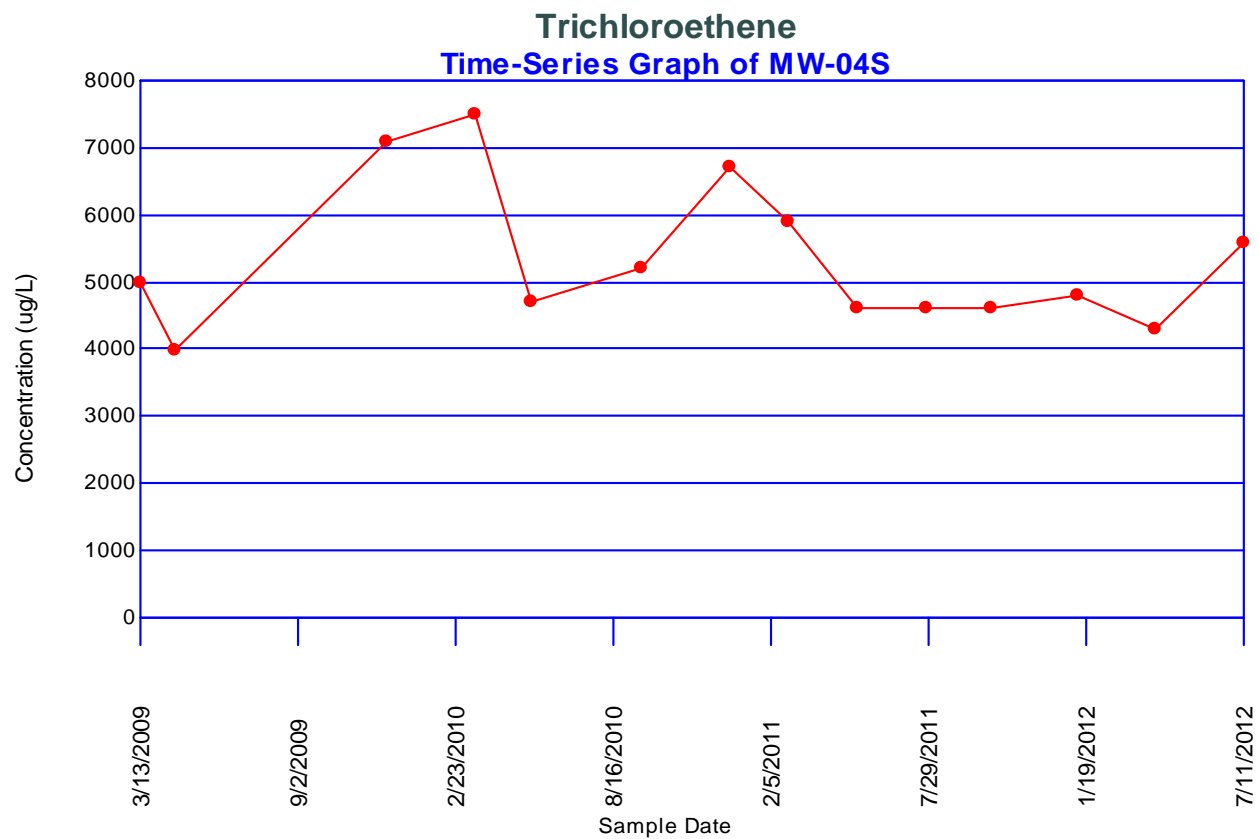


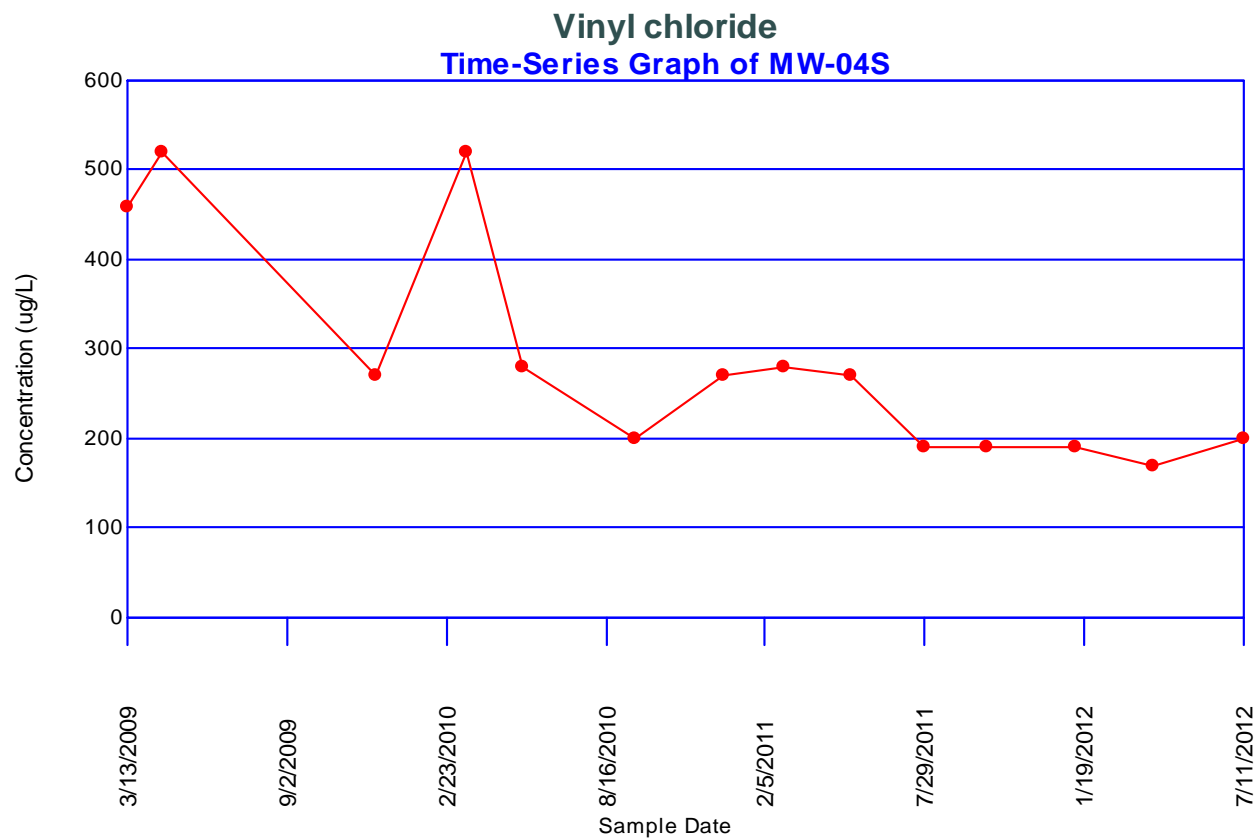
Vinyl chloride Time-Series Graph of MW-03S

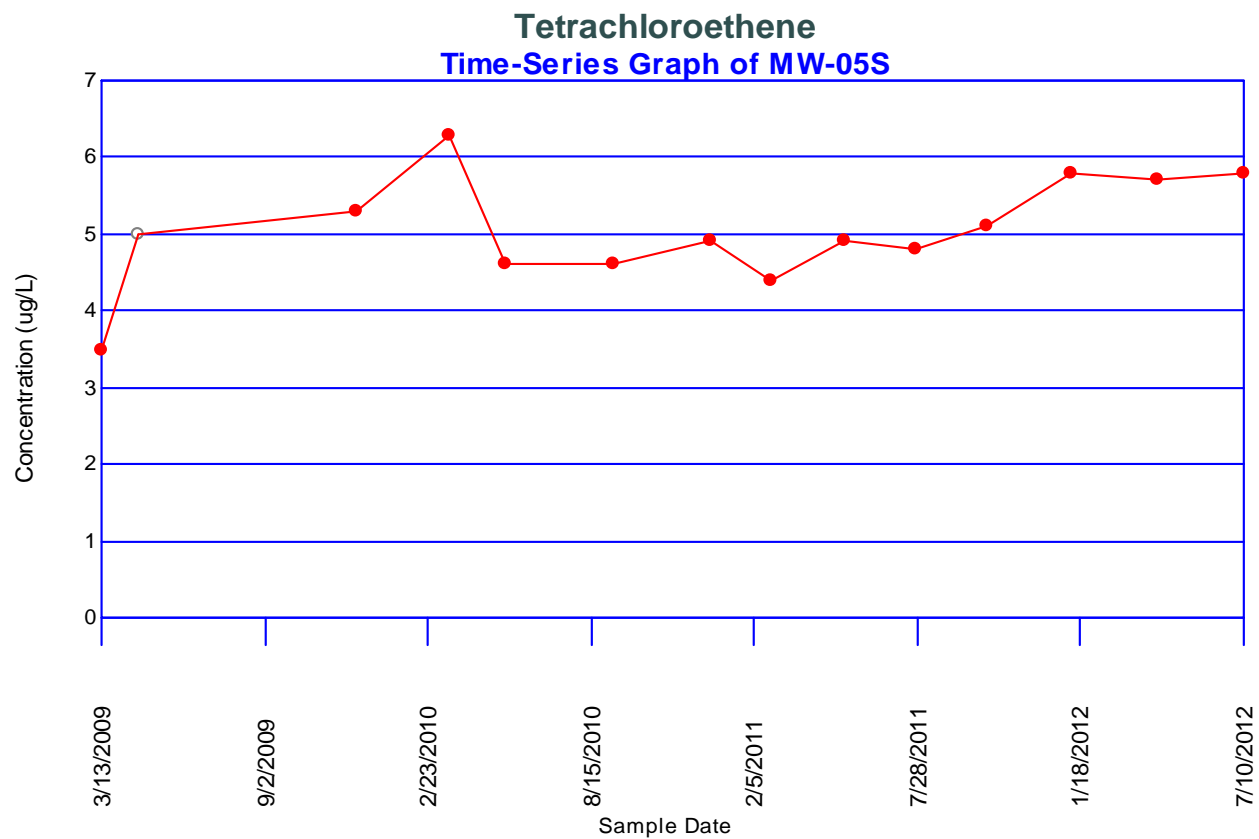


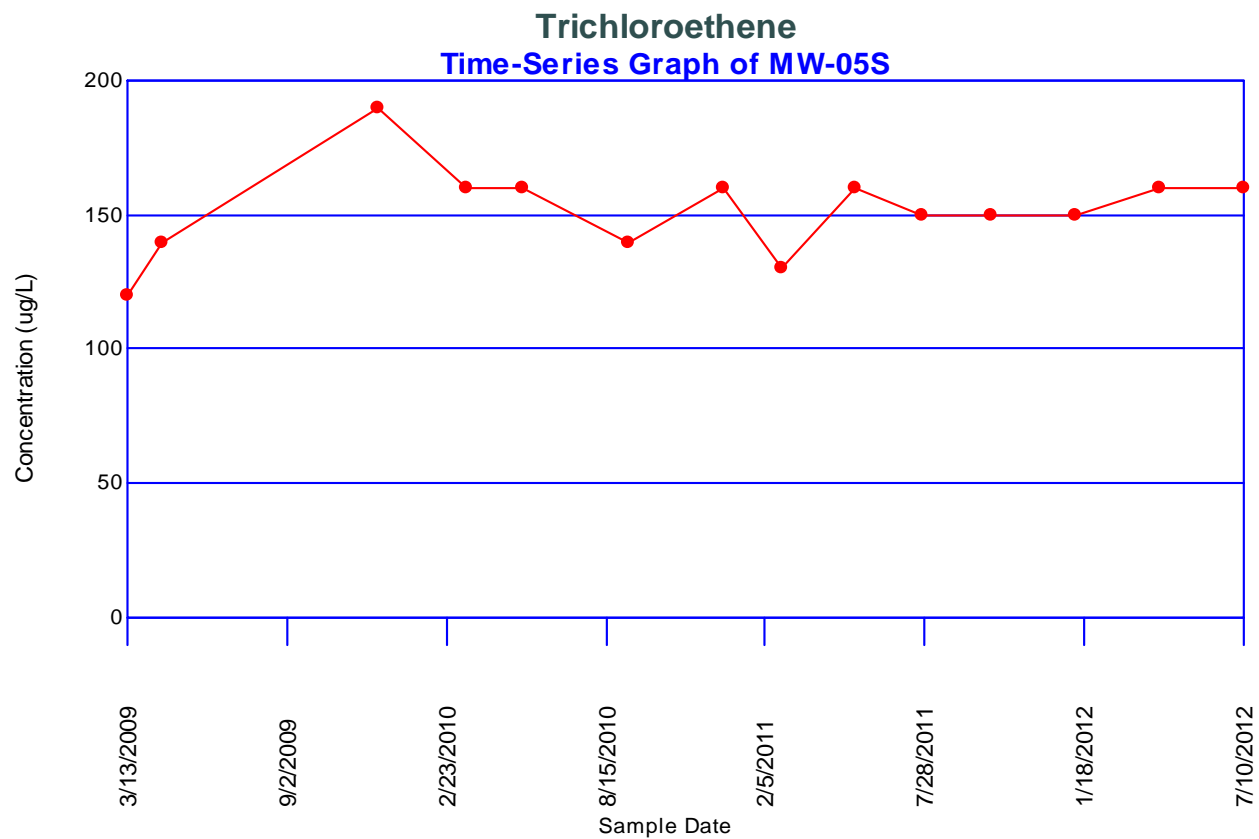


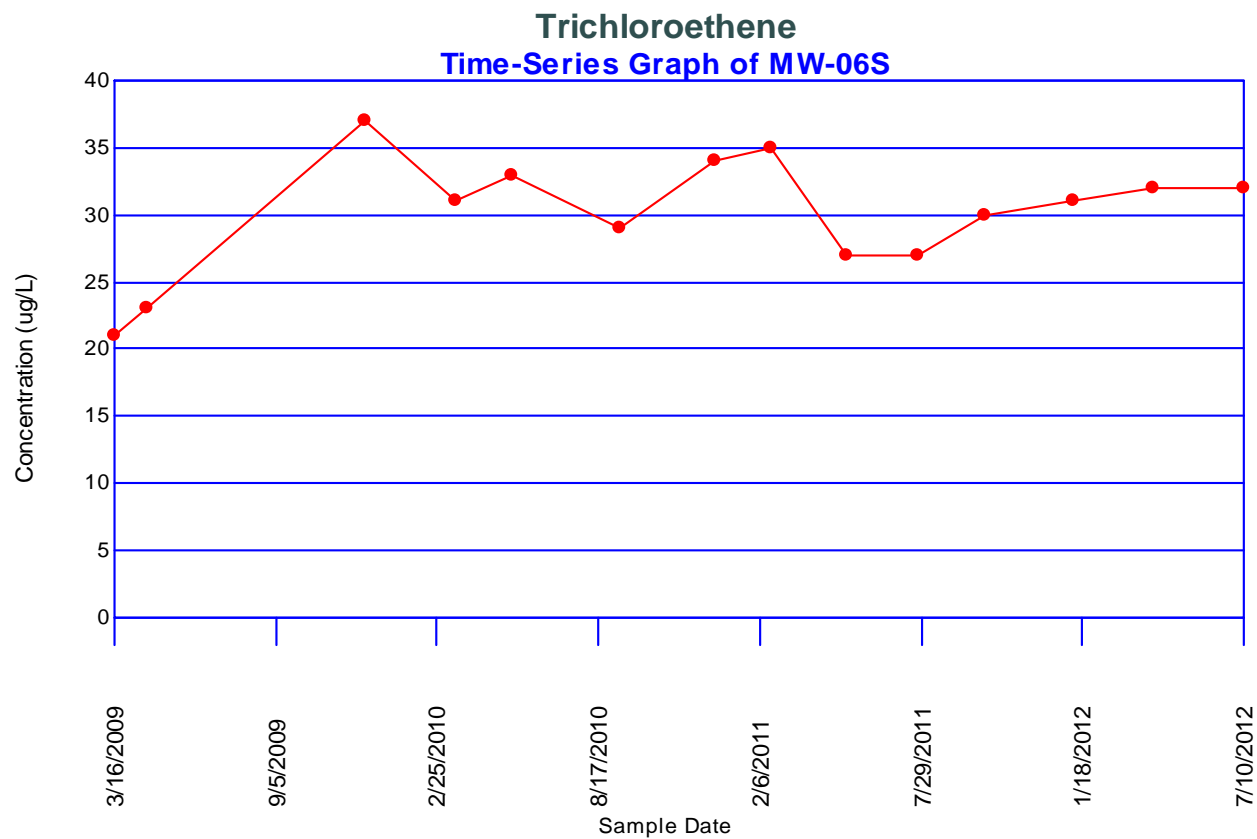




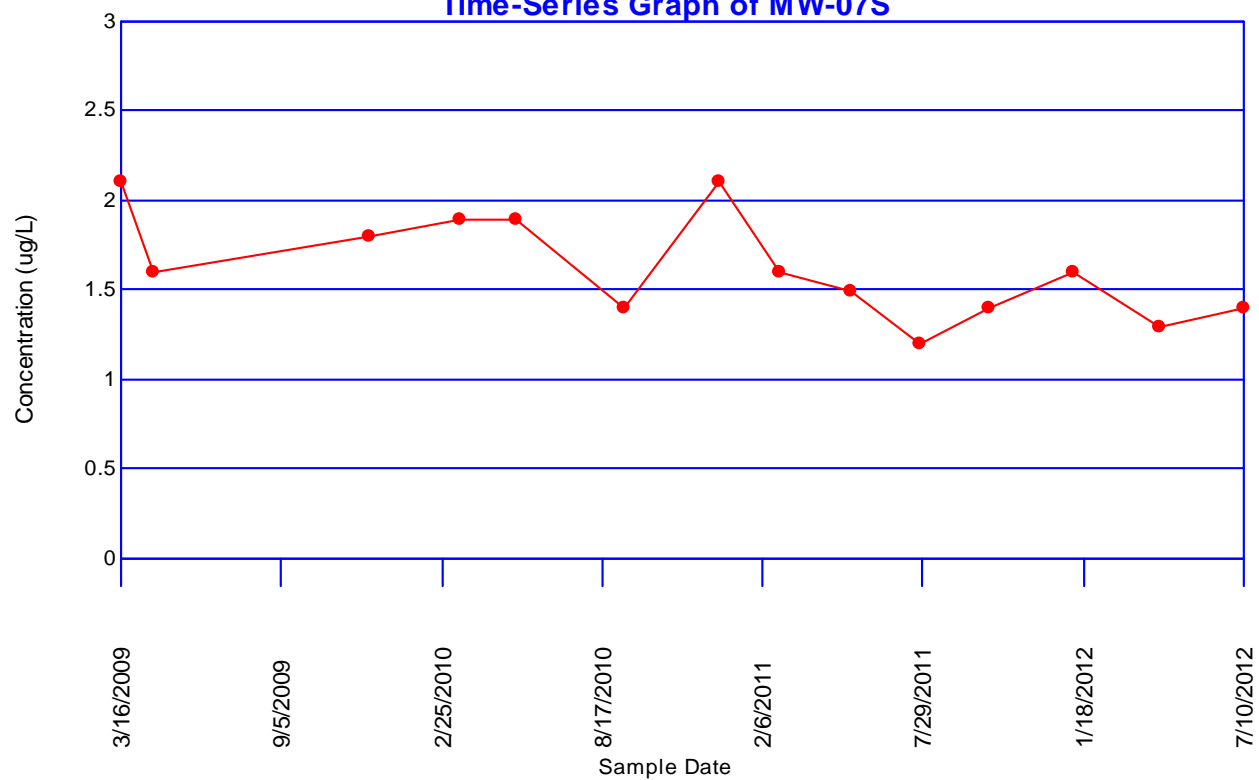


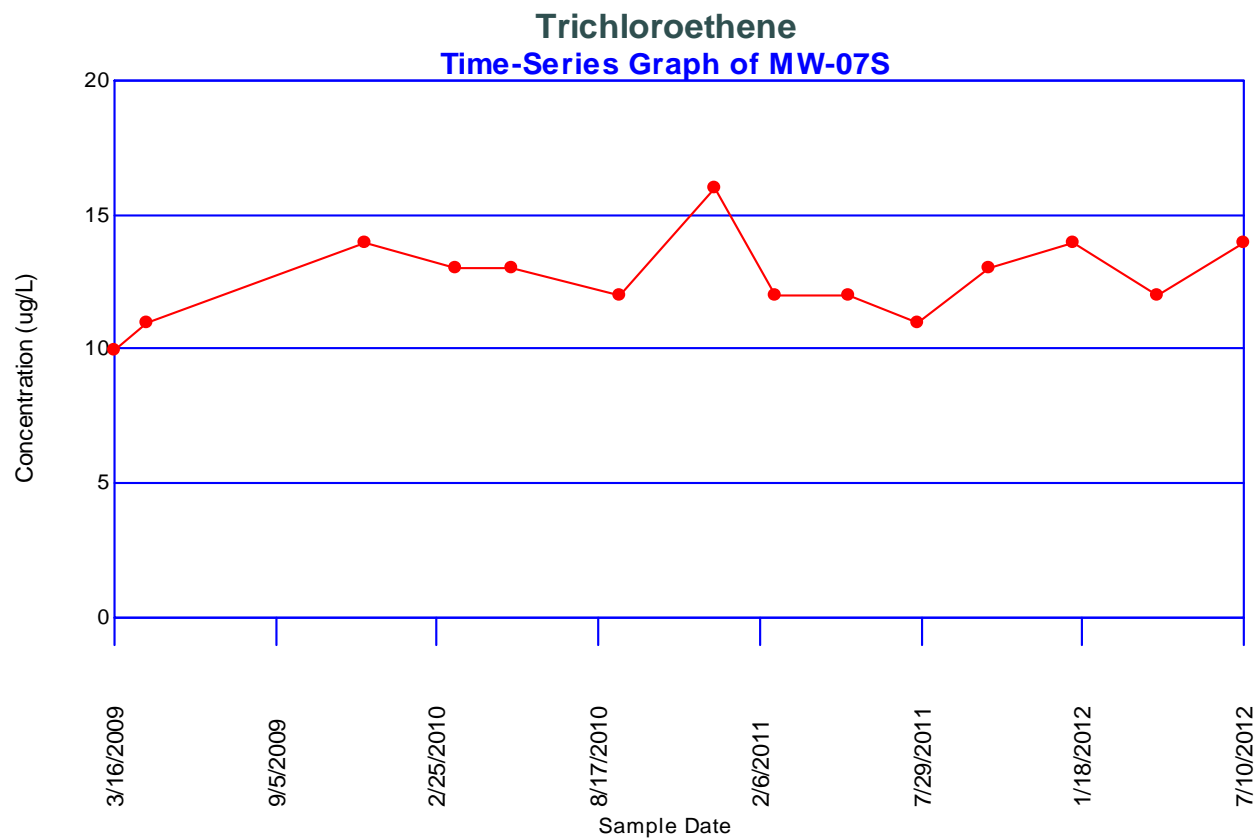




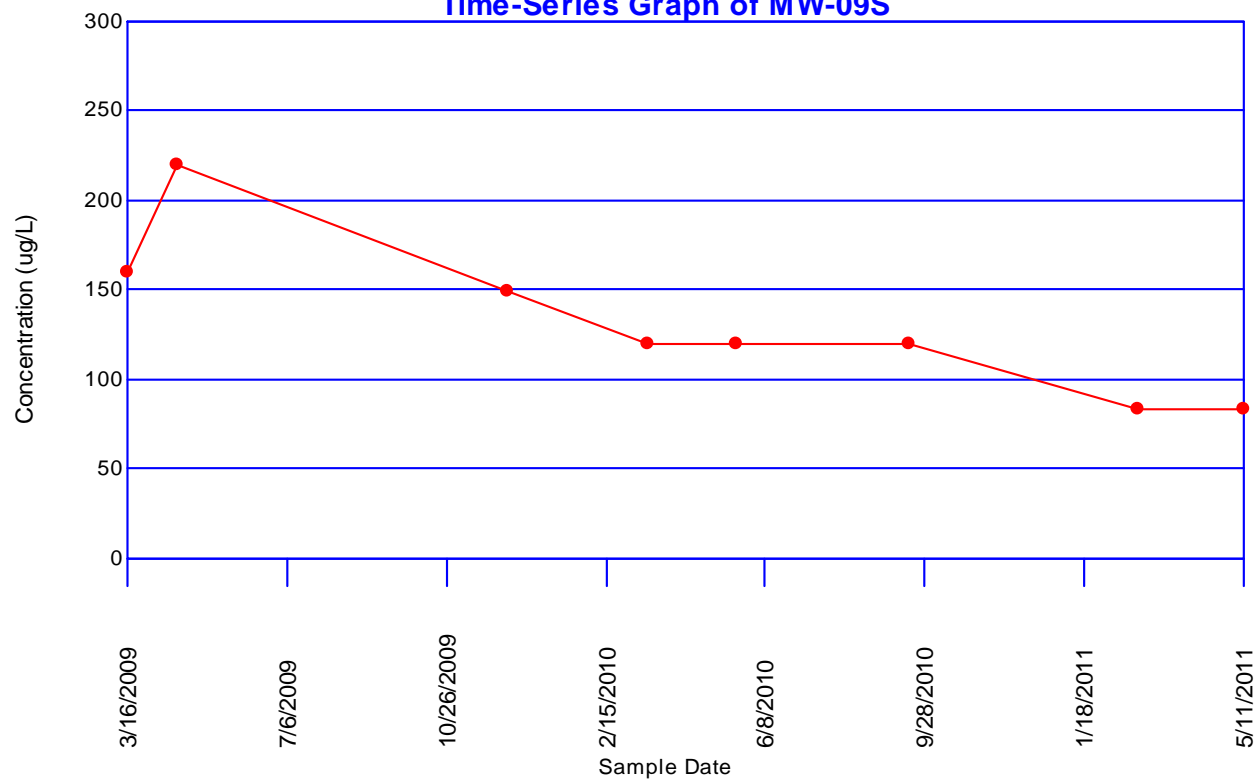


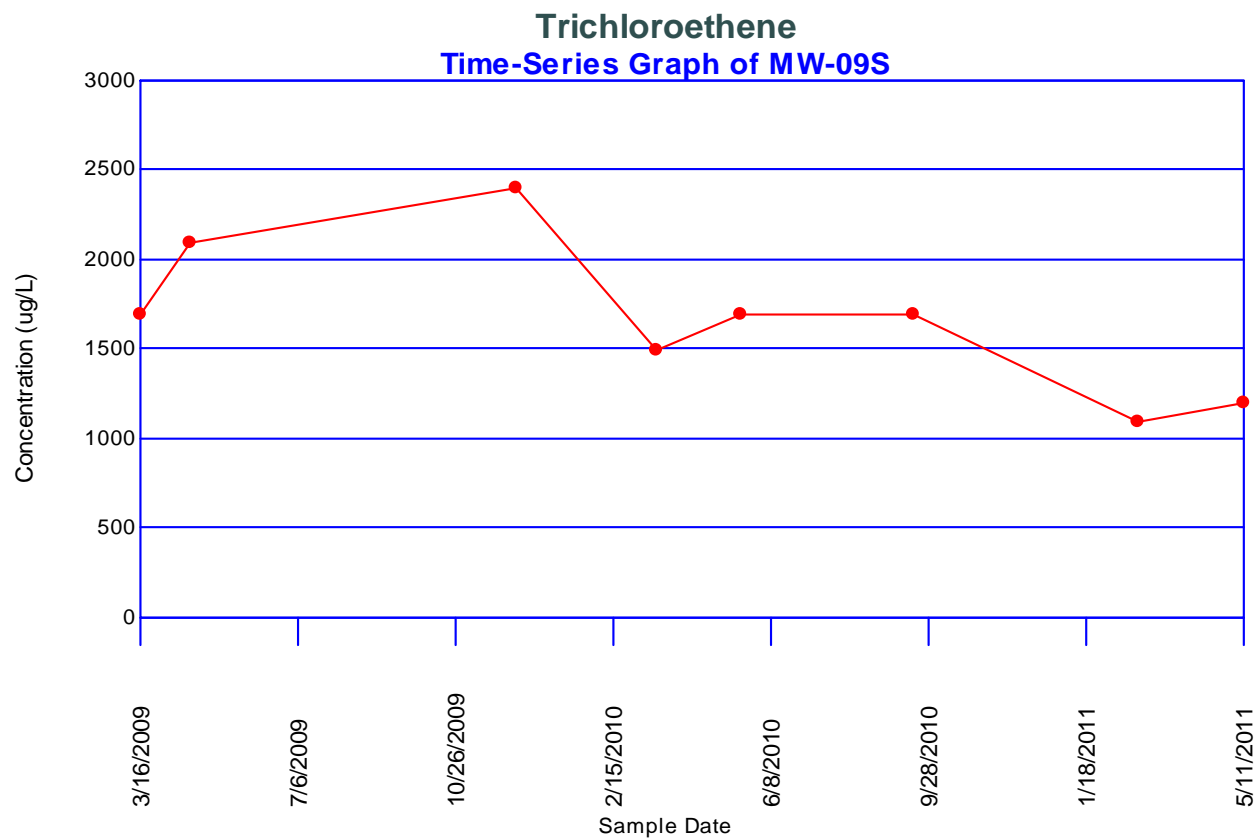
1,1,1-Trichloroethane Time-Series Graph of MW-07S

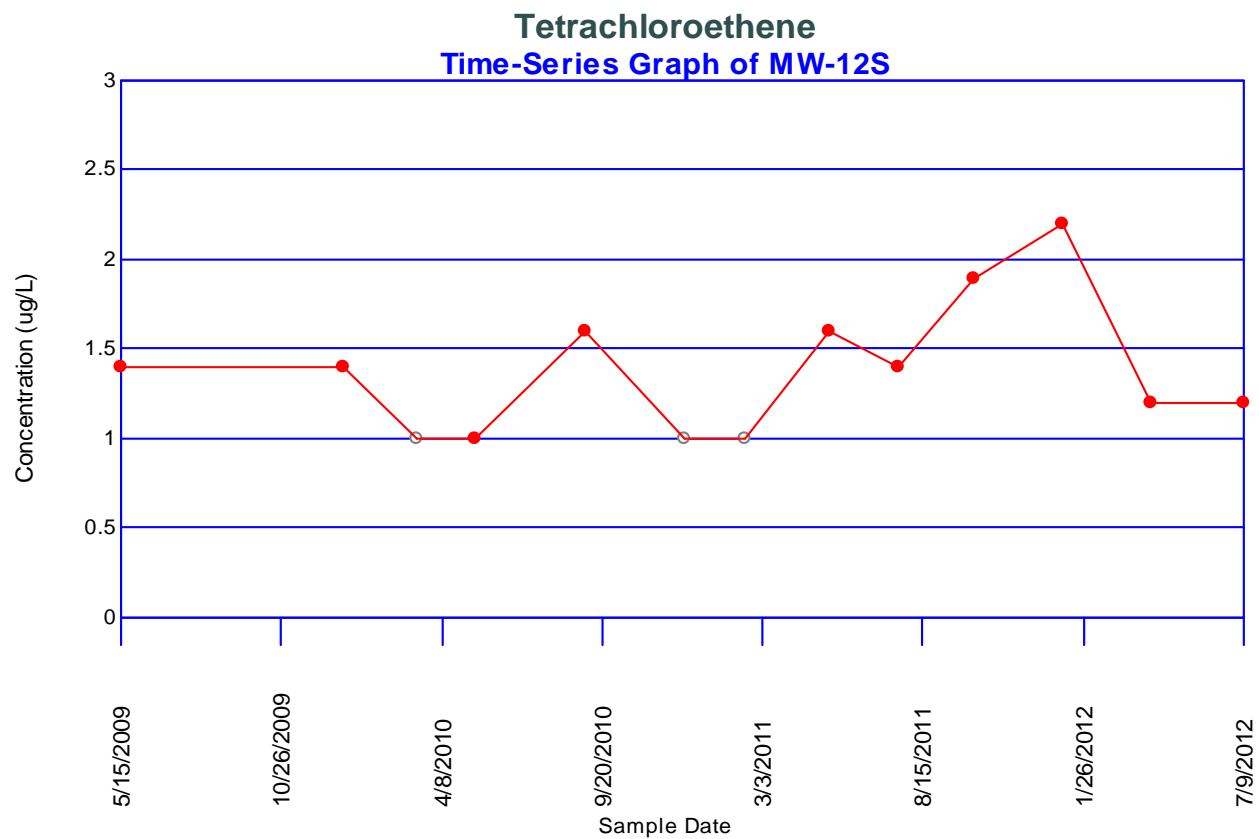




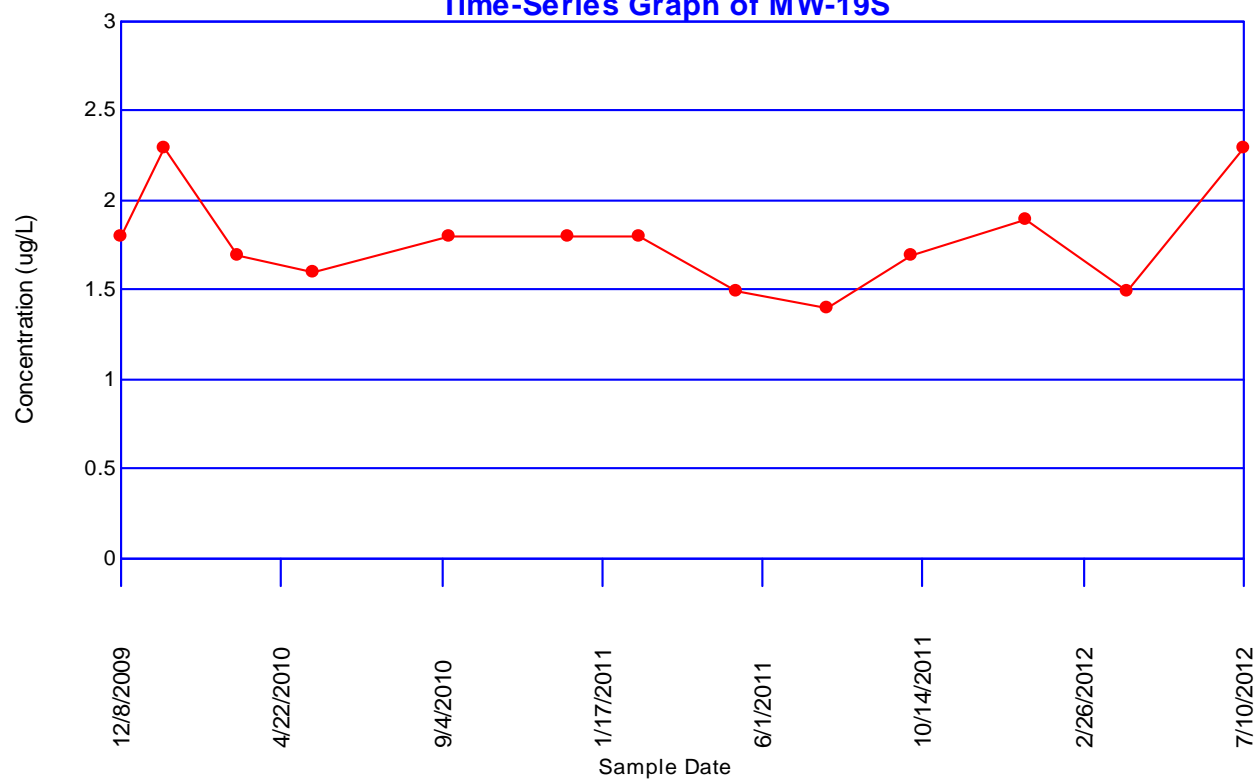
1,1,1-Trichloroethane Time-Series Graph of MW-09S



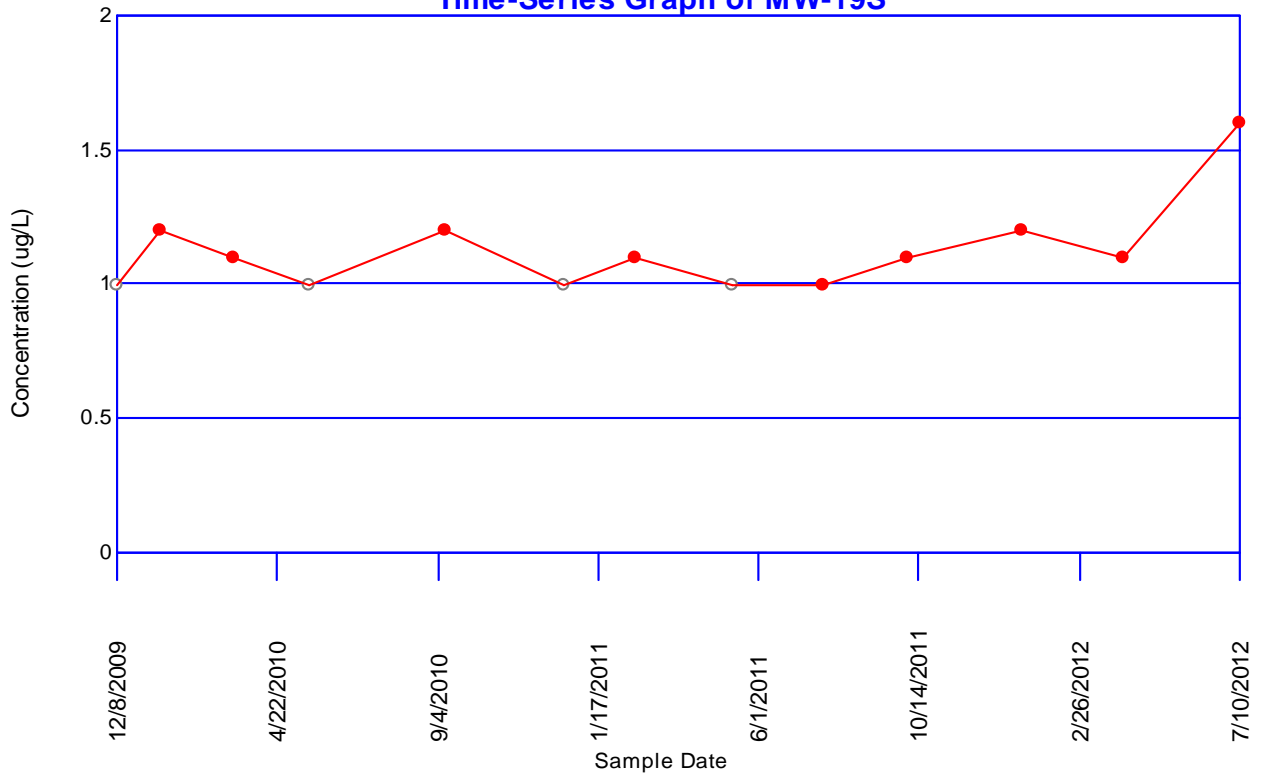


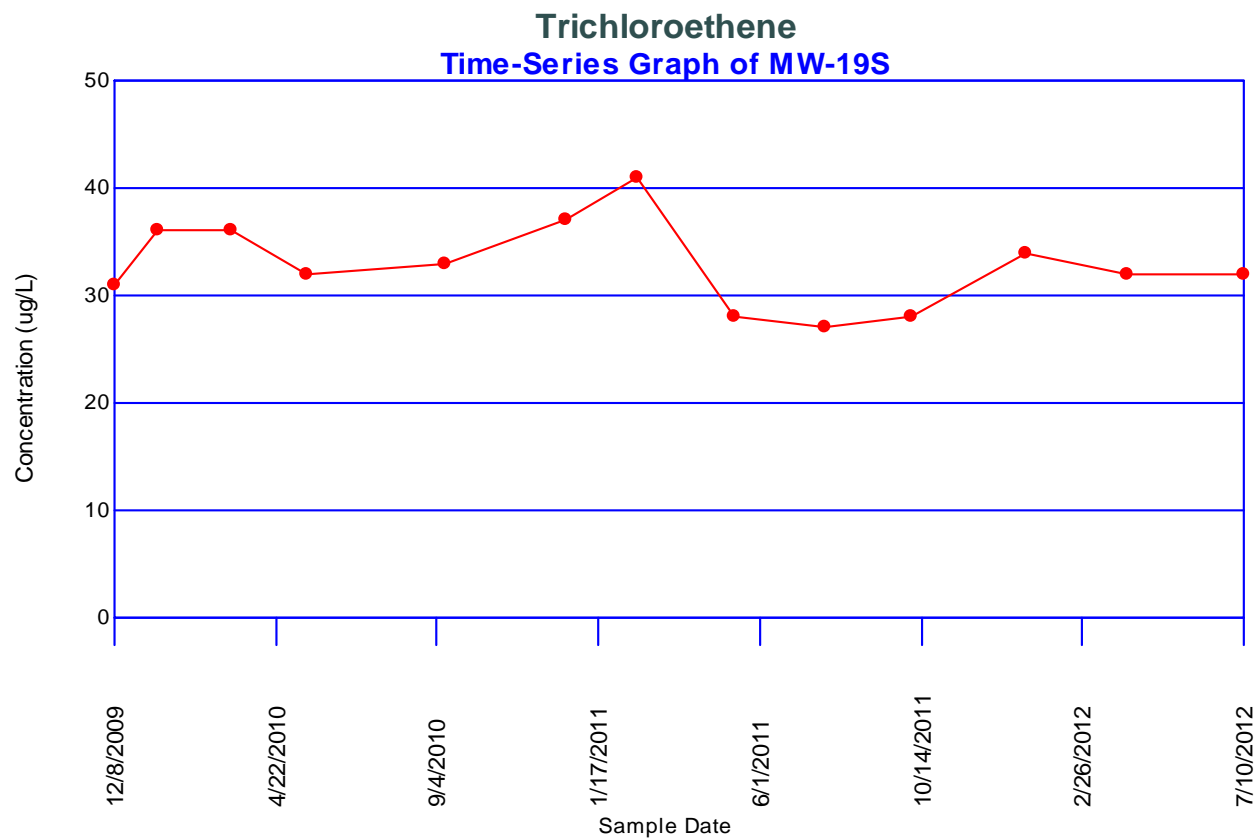


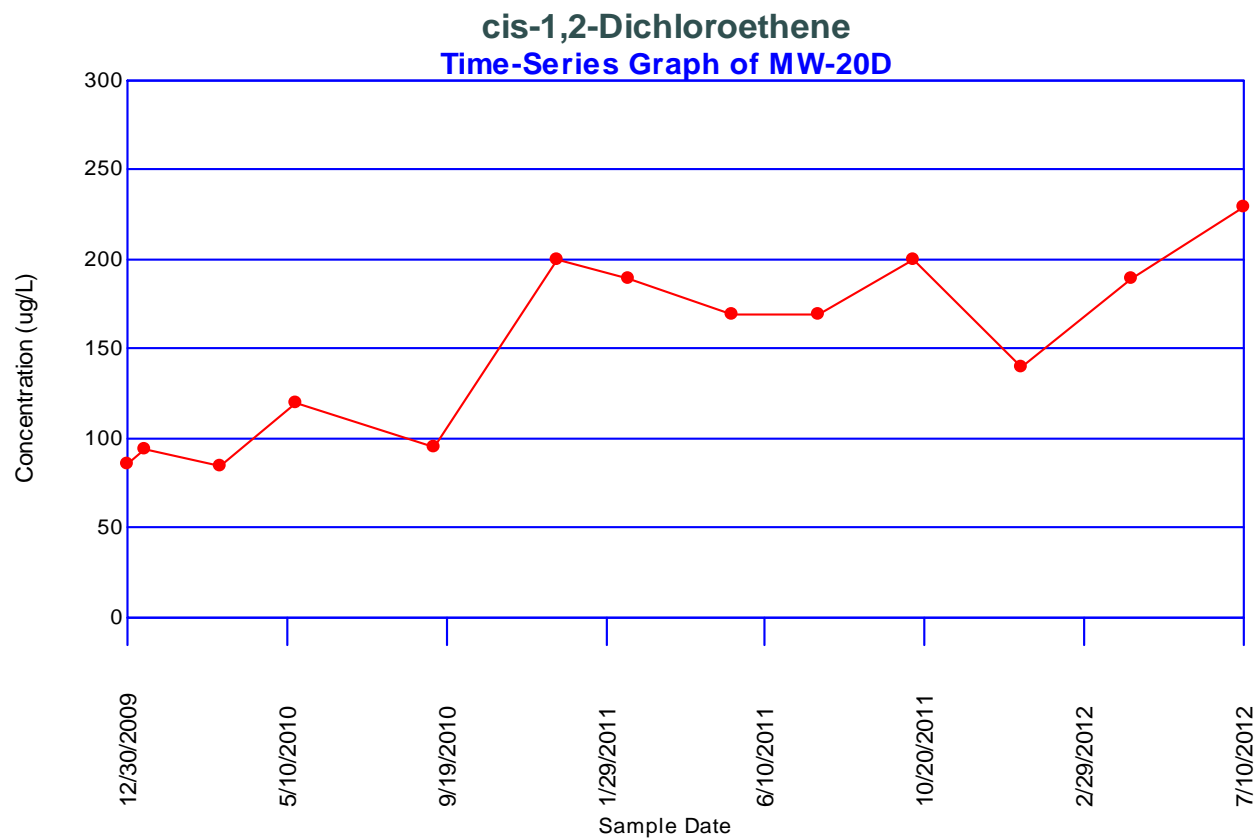
1,1,1-Trichloroethane Time-Series Graph of MW-19S

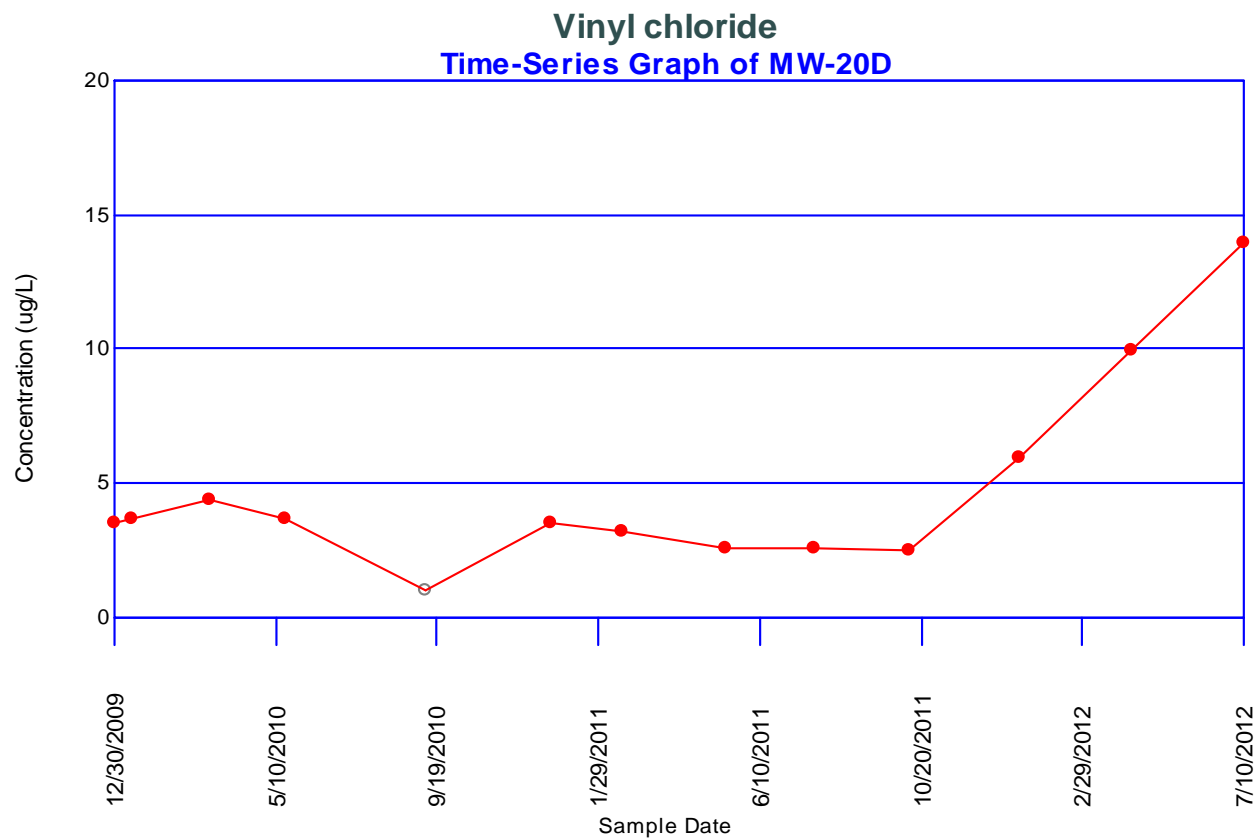


Tetrachloroethene Time-Series Graph of MW-19S

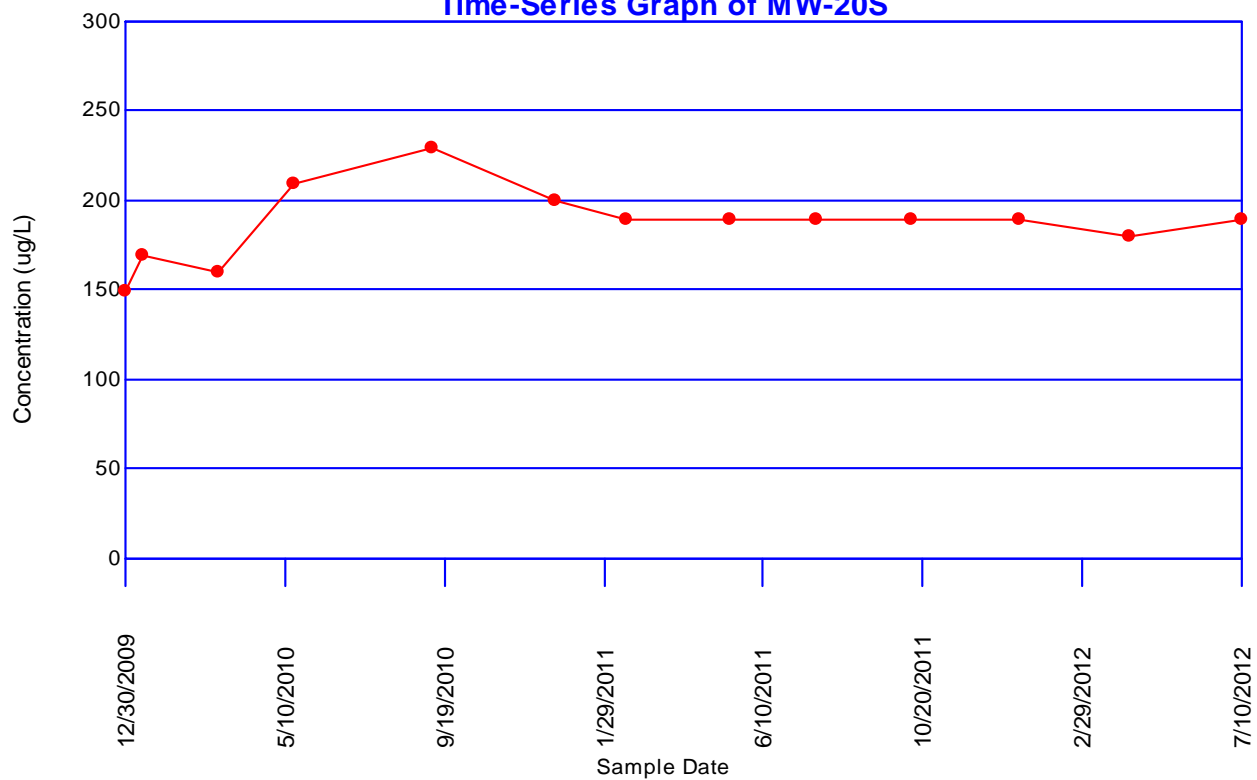


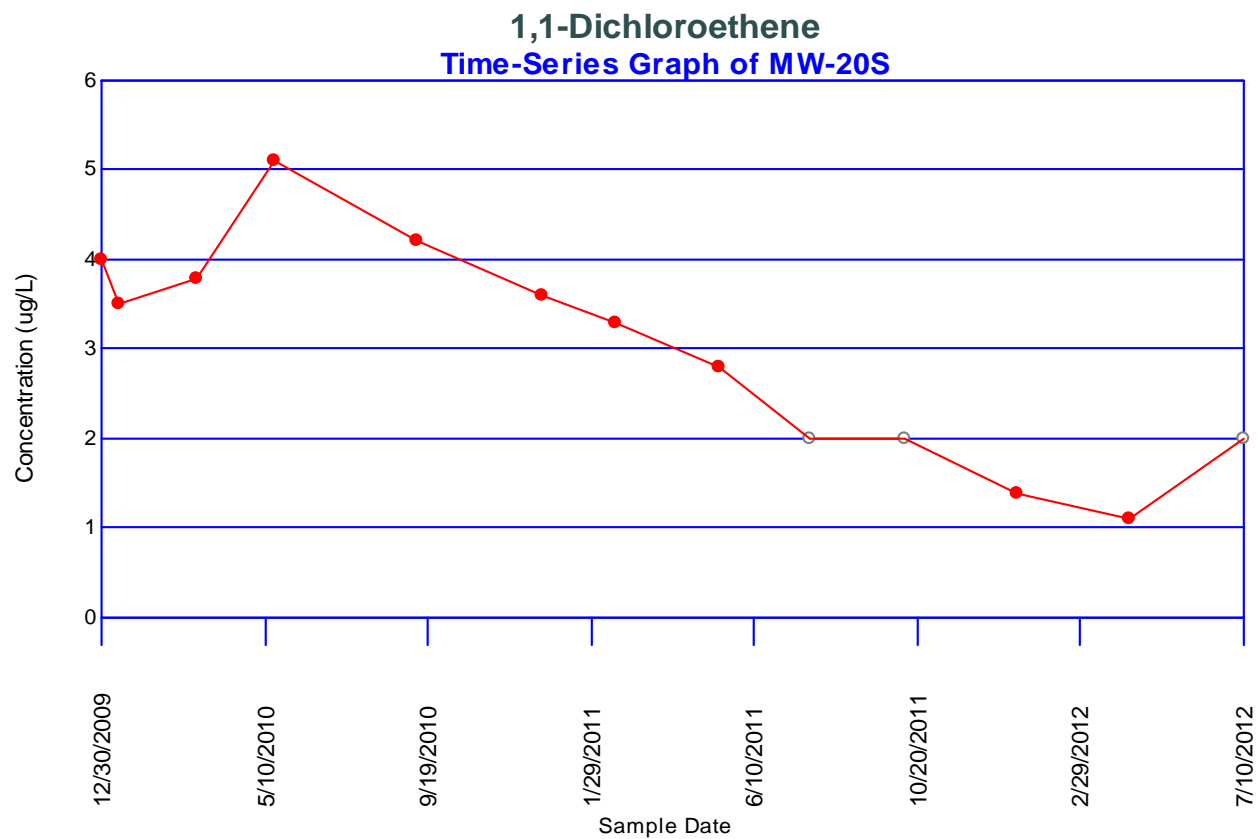


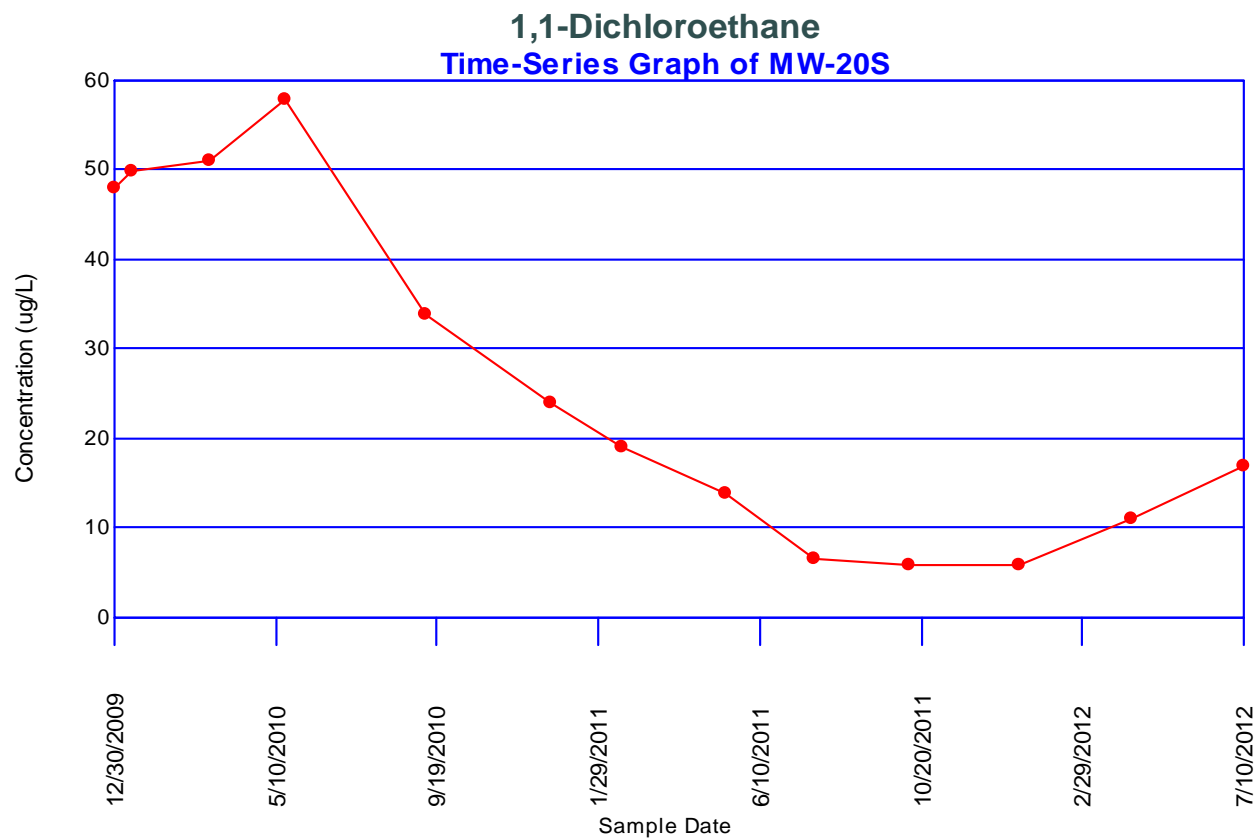




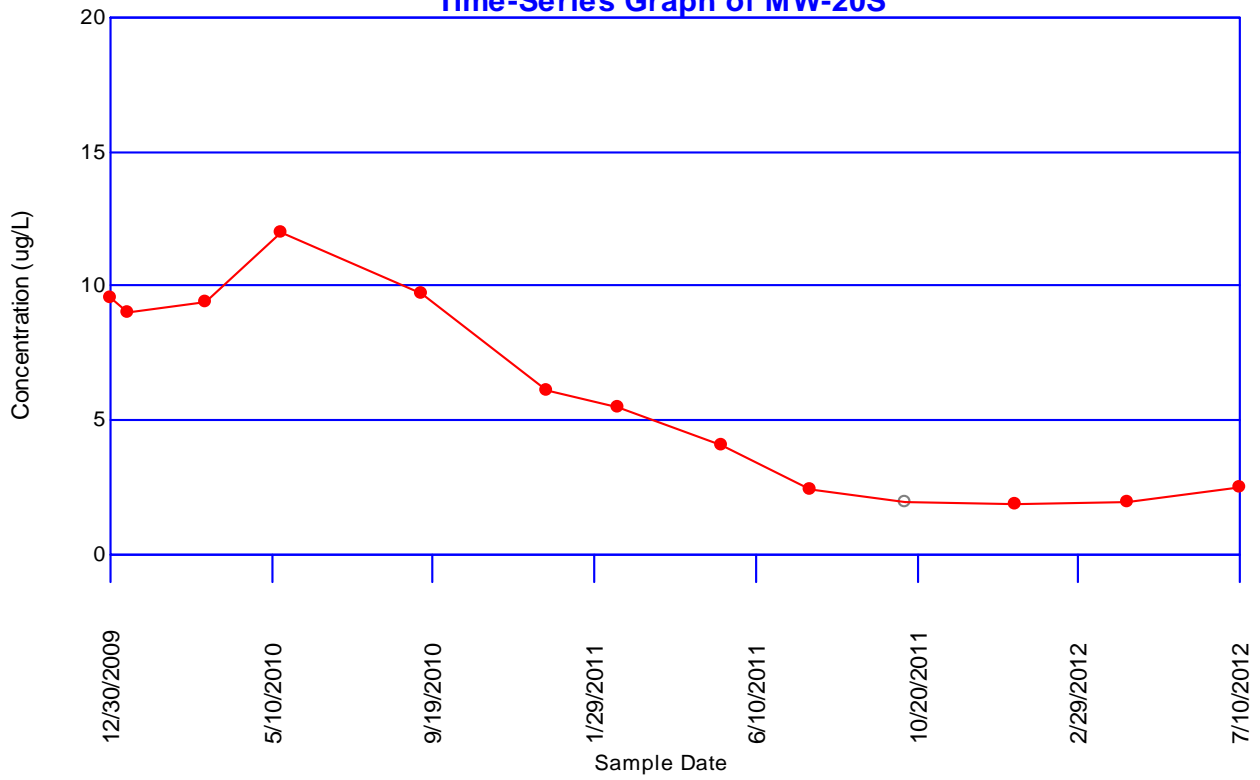
1,1,1-Trichloroethane Time-Series Graph of MW-20S

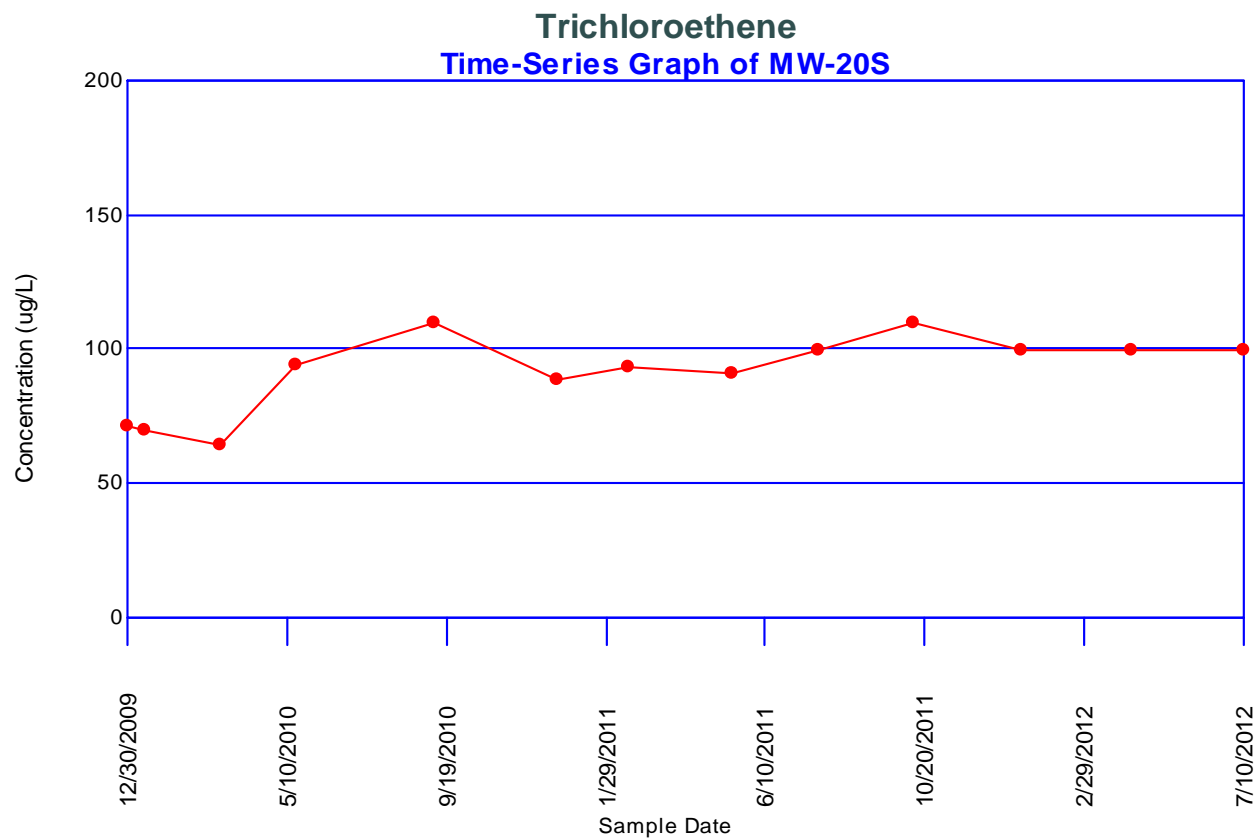




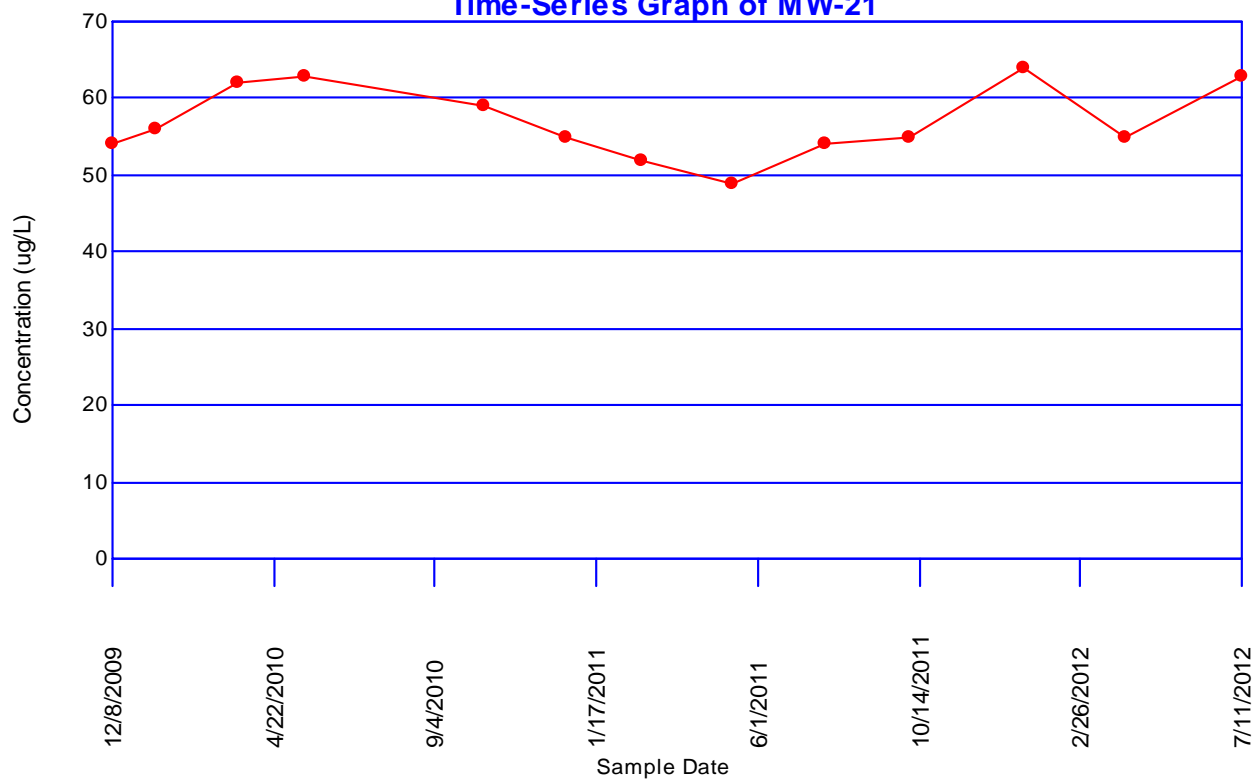


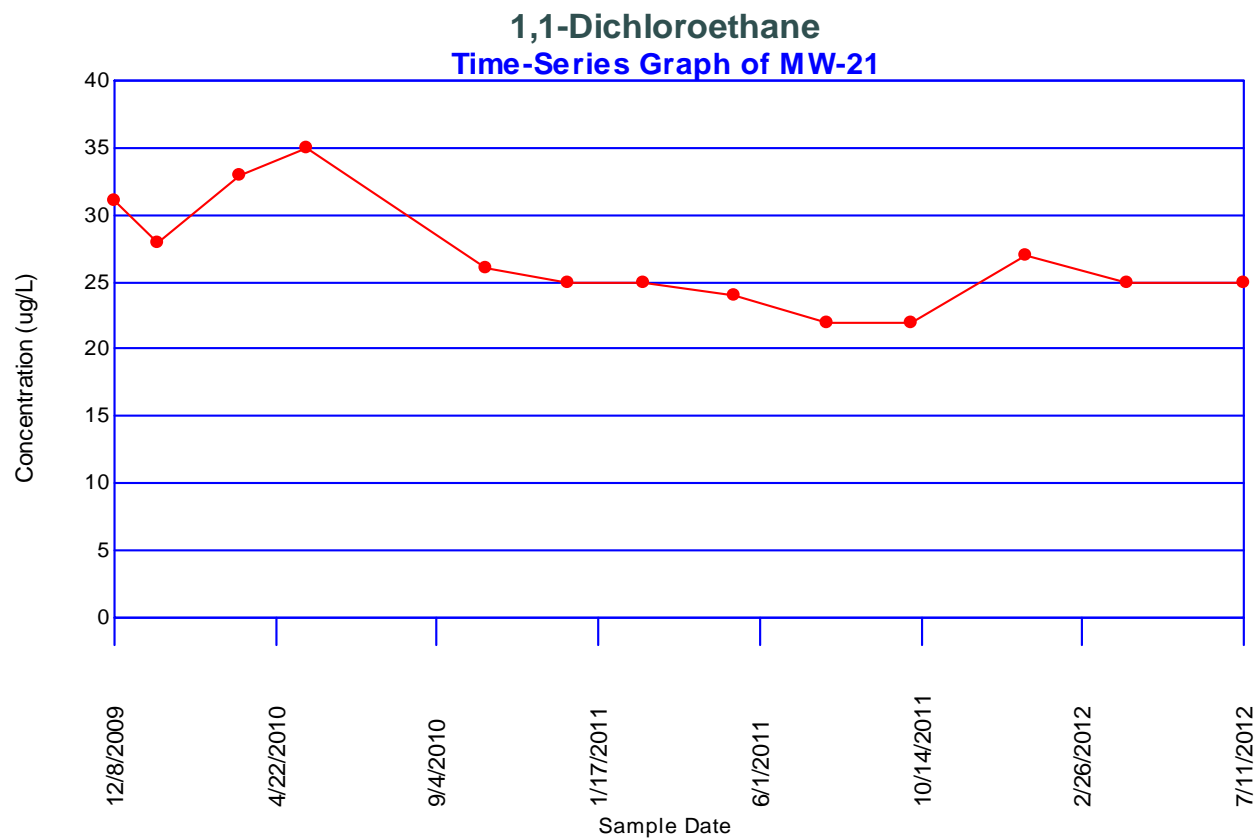
cis-1,2-Dichloroethene Time-Series Graph of MW-20S

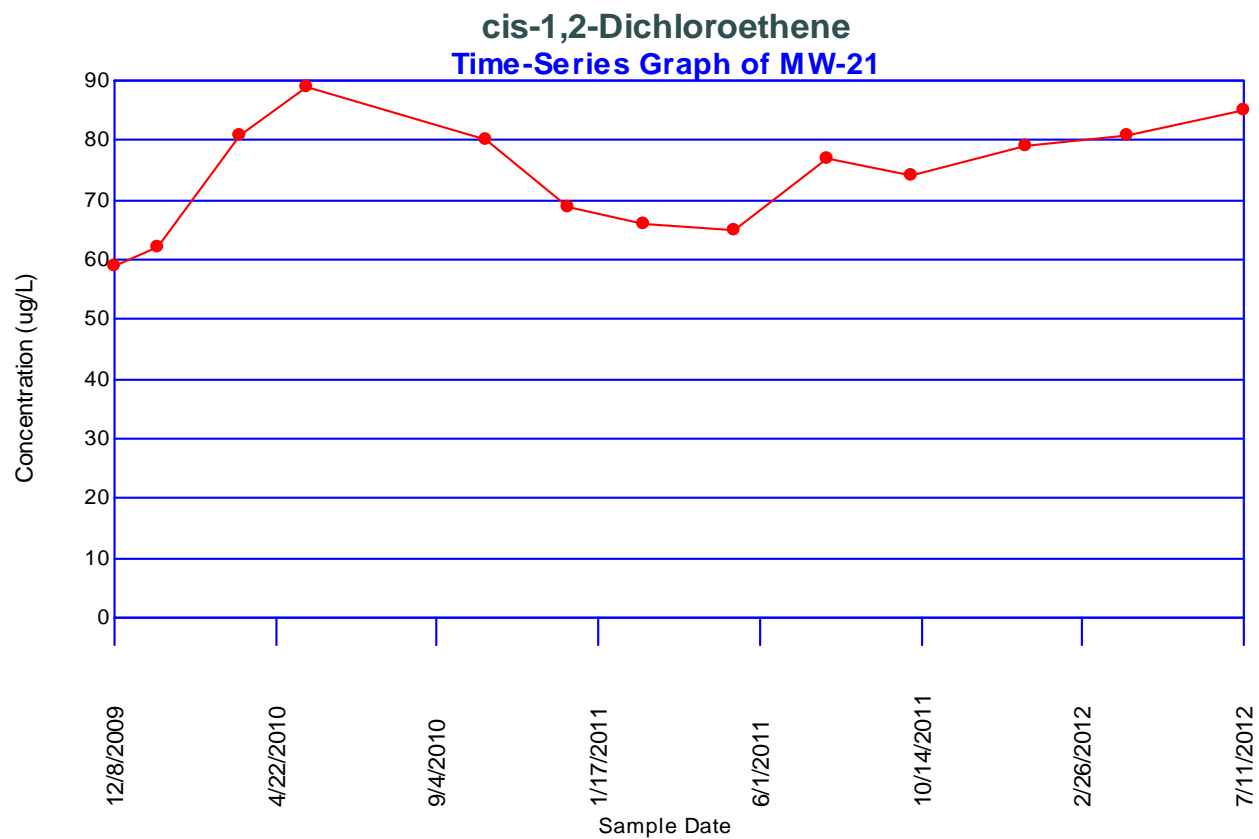


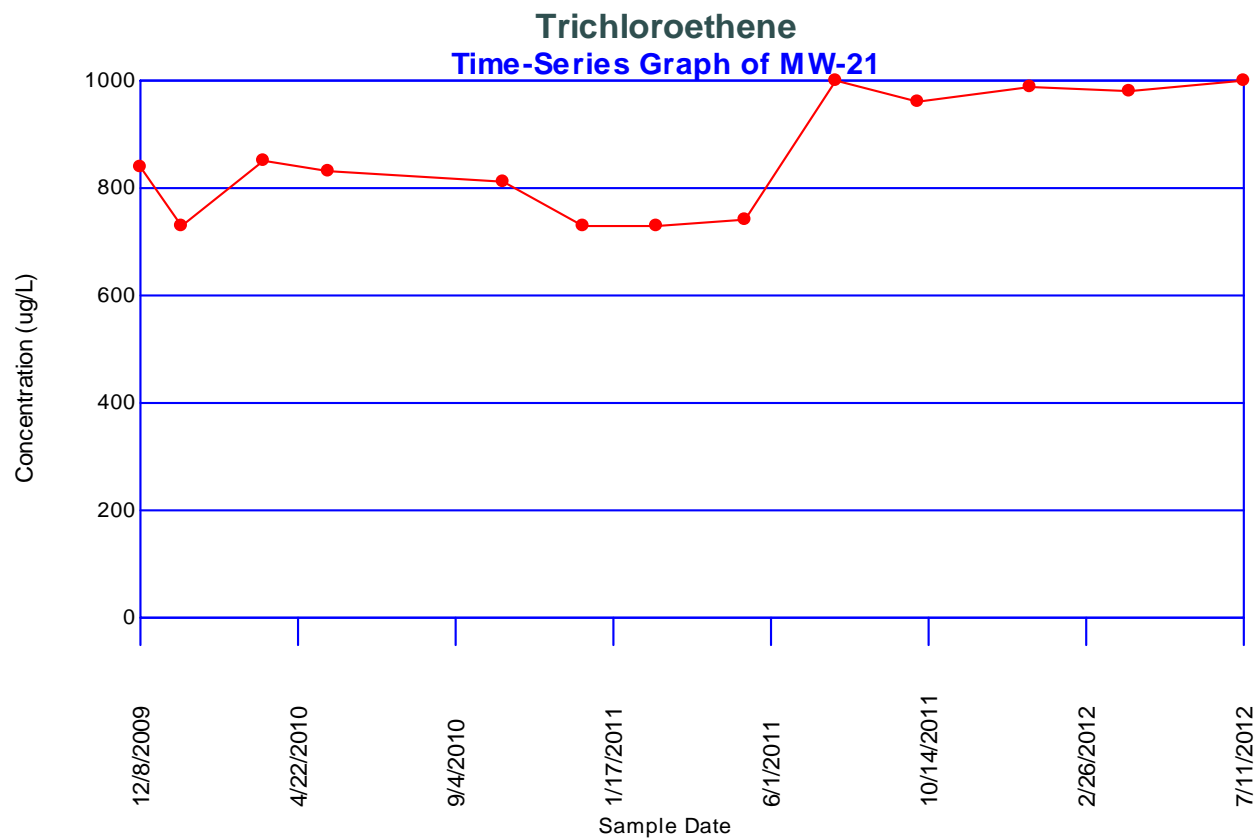


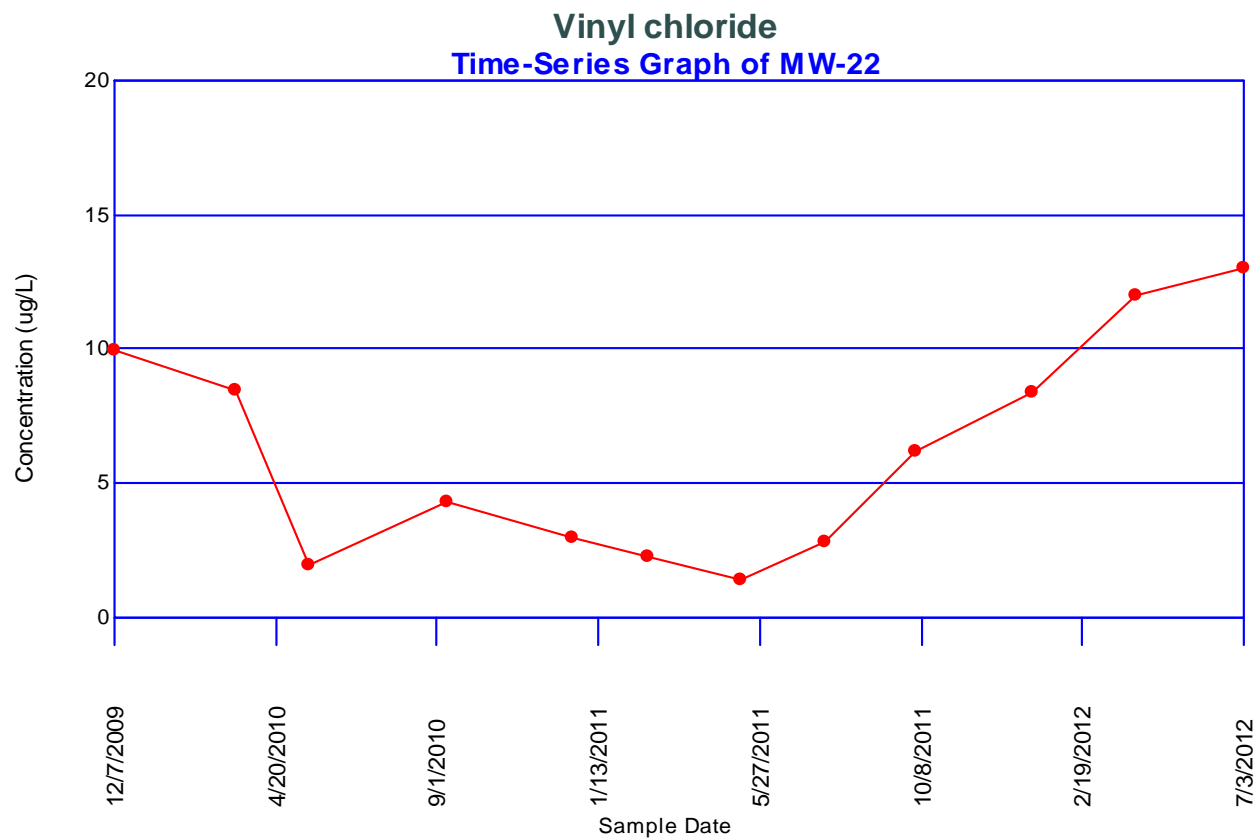
1,1,1-Trichloroethane Time-Series Graph of MW-21



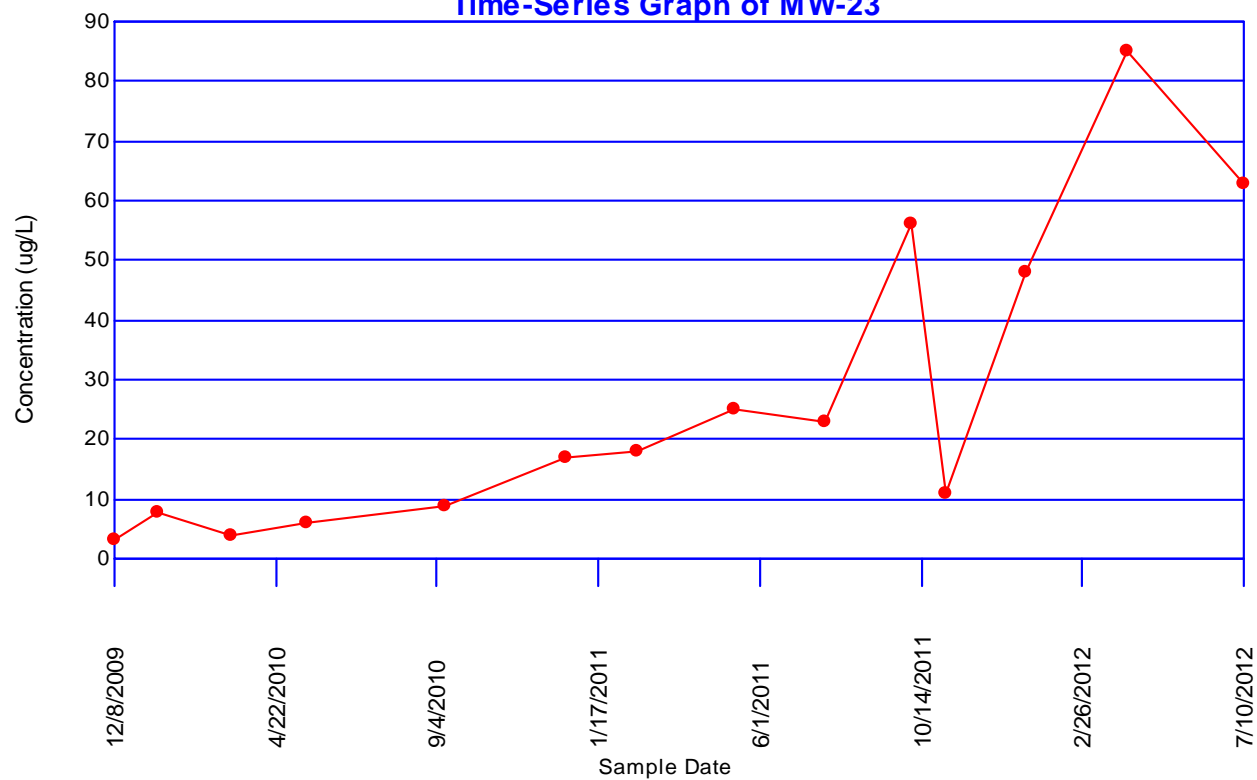


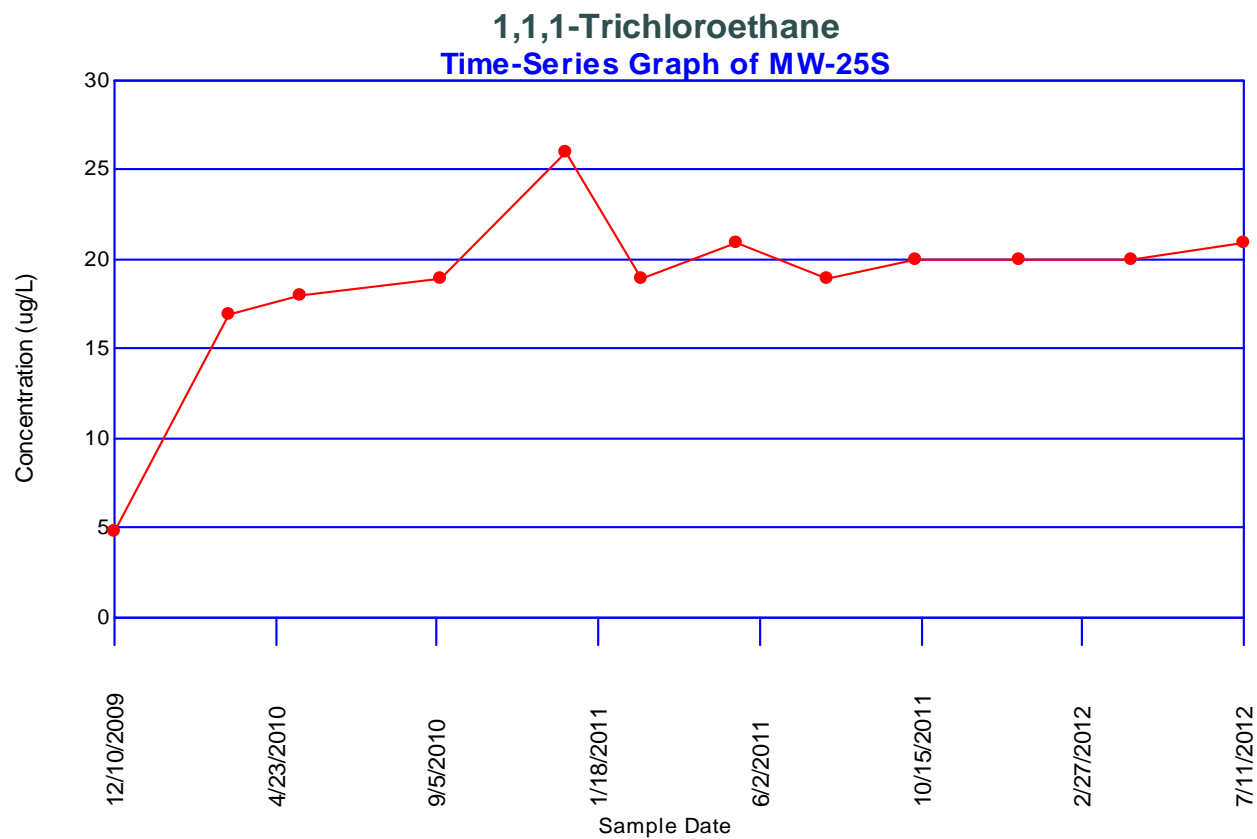




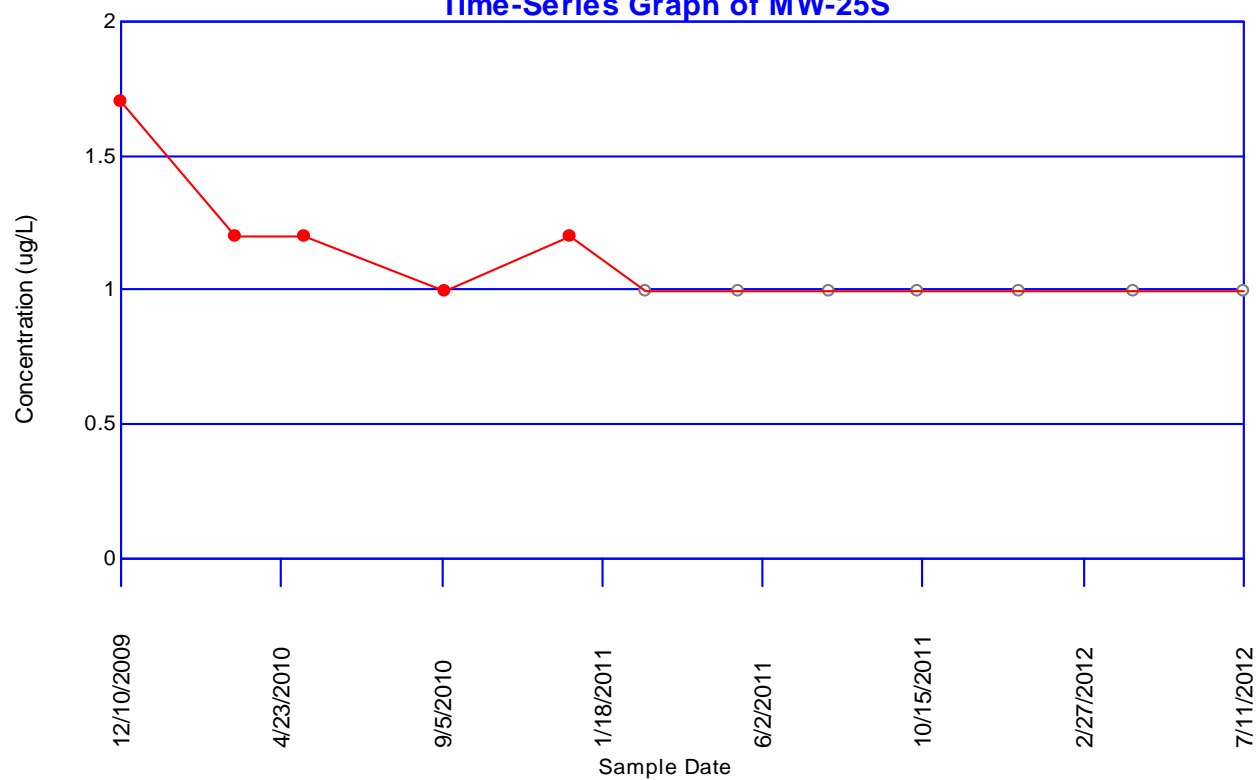


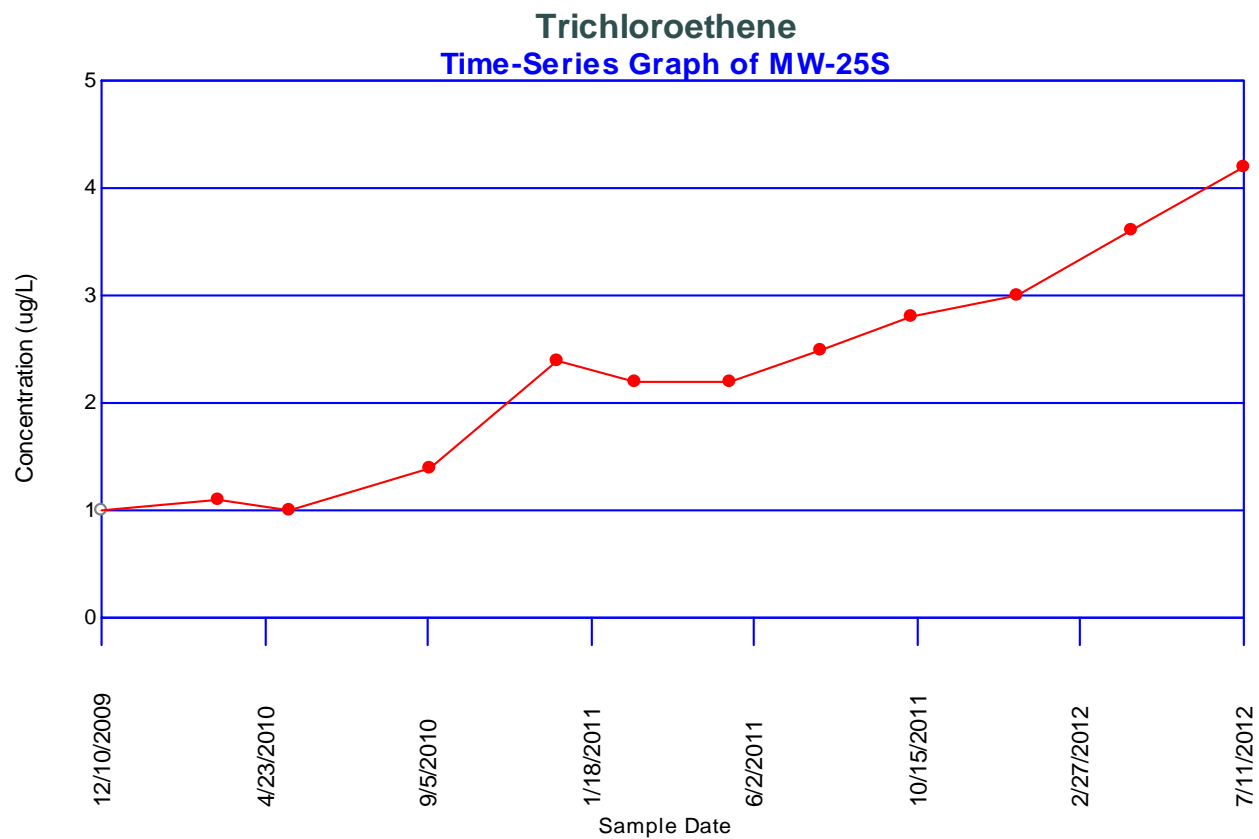
Vinyl chloride
Time-Series Graph of MW-23

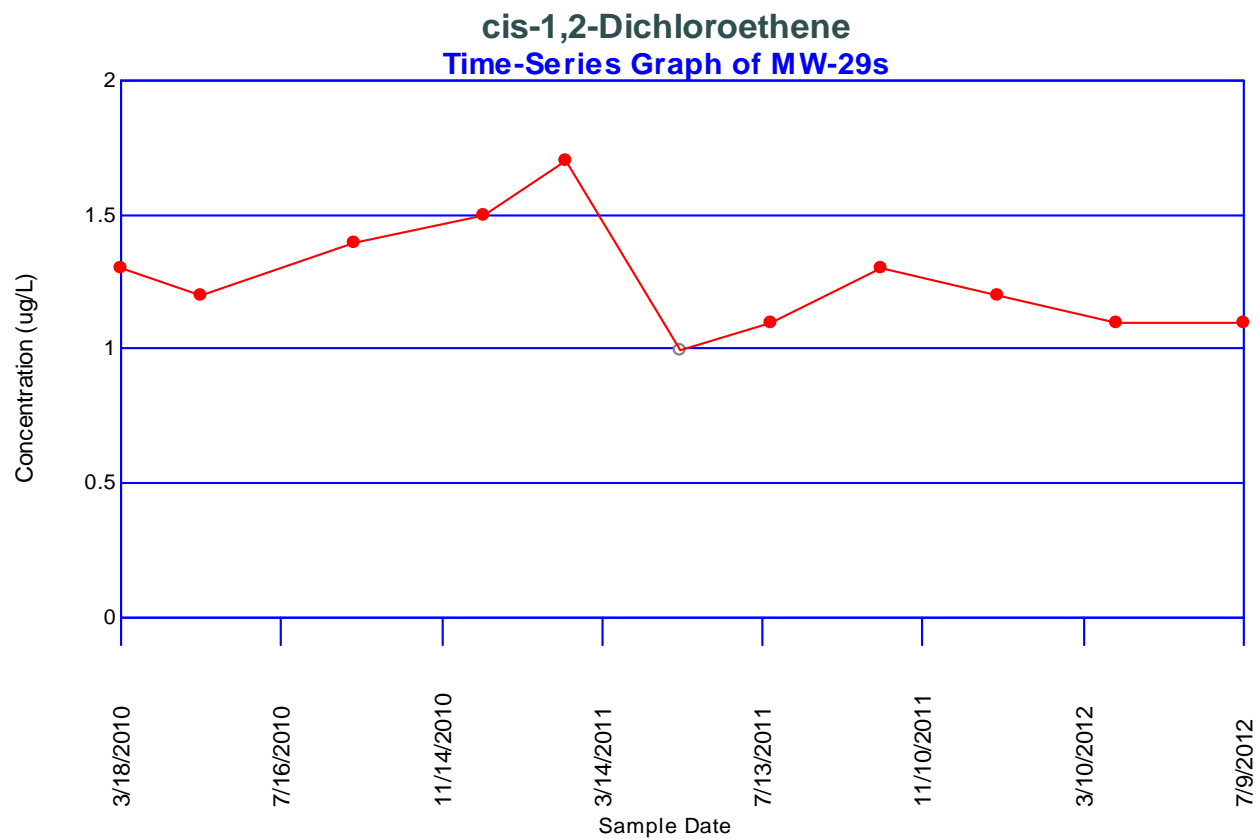




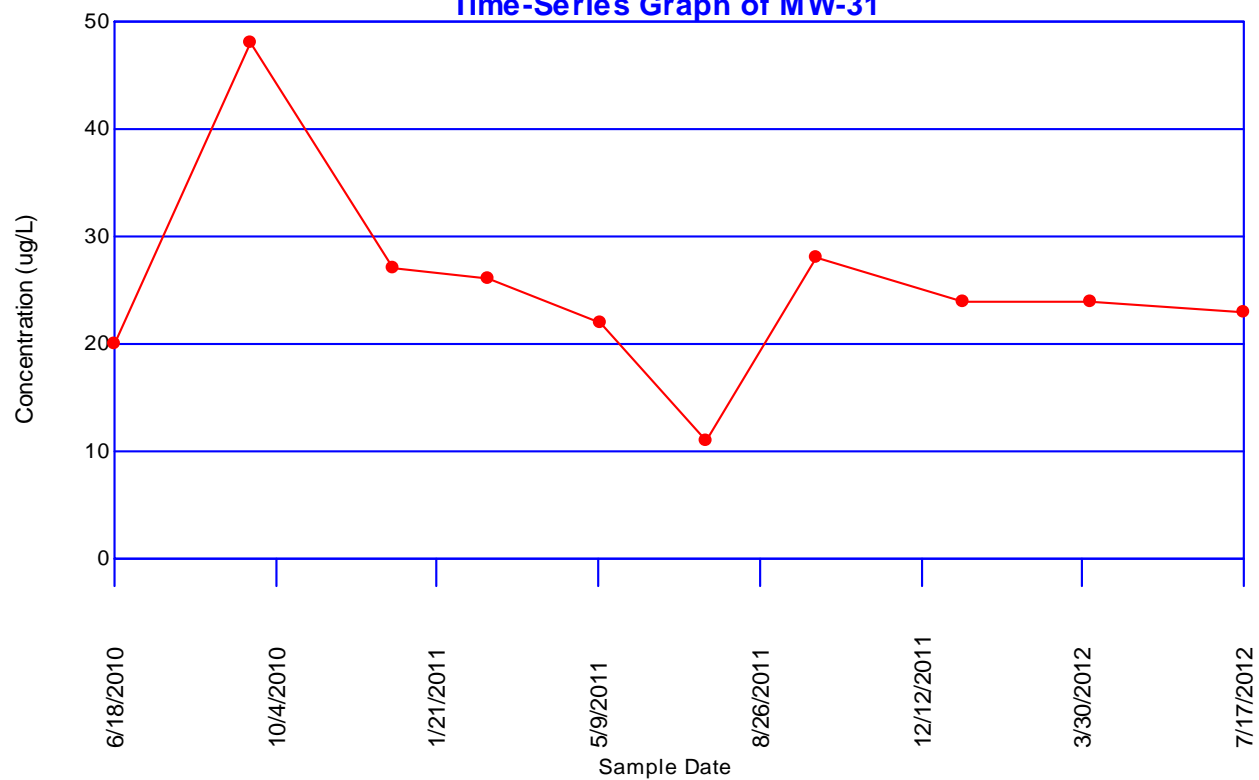
1,1-Dichloroethane Time-Series Graph of MW-25S

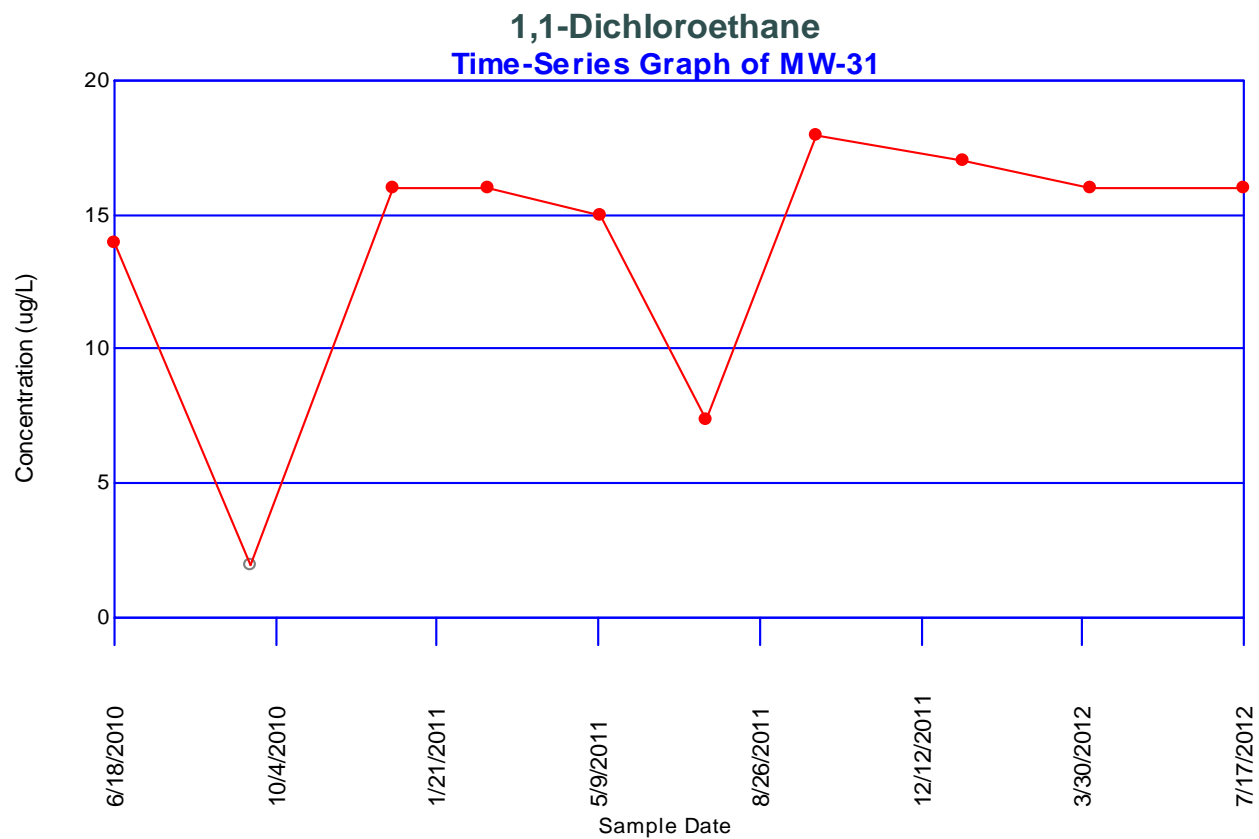


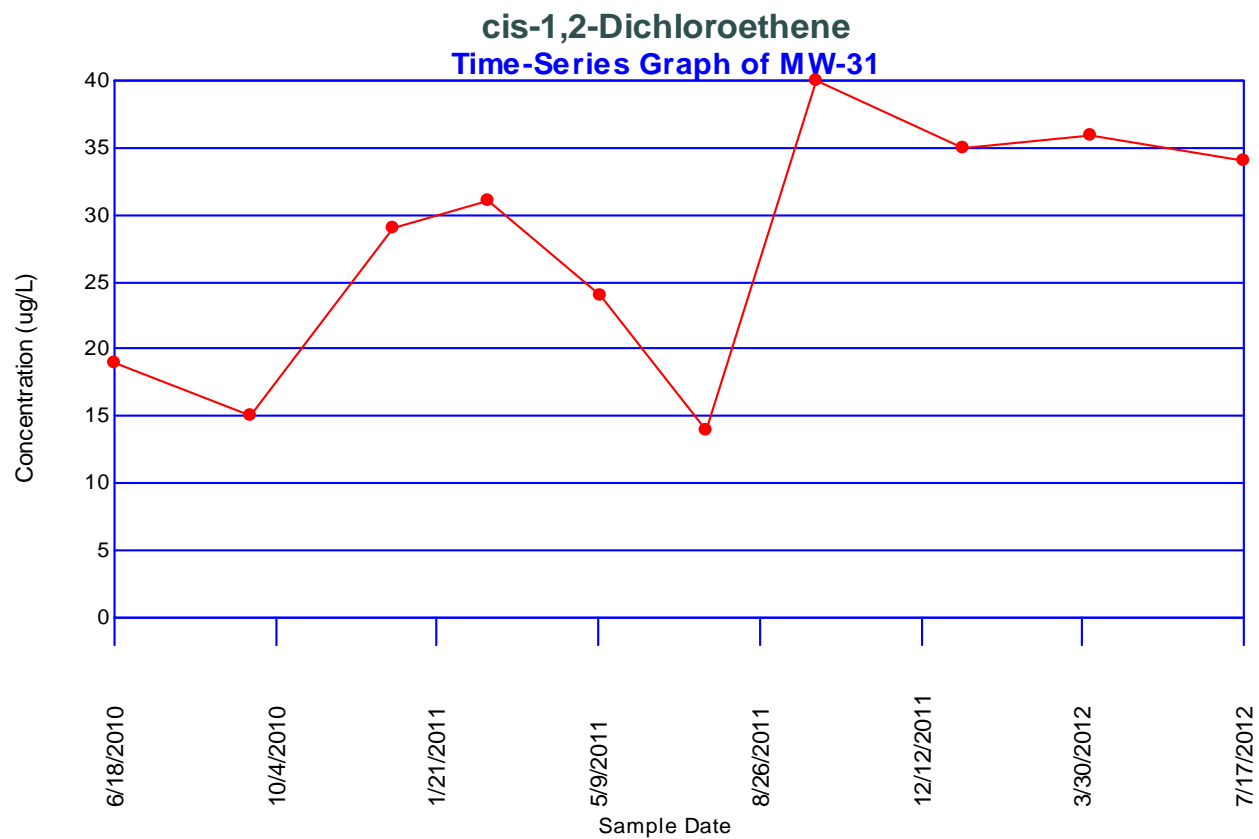


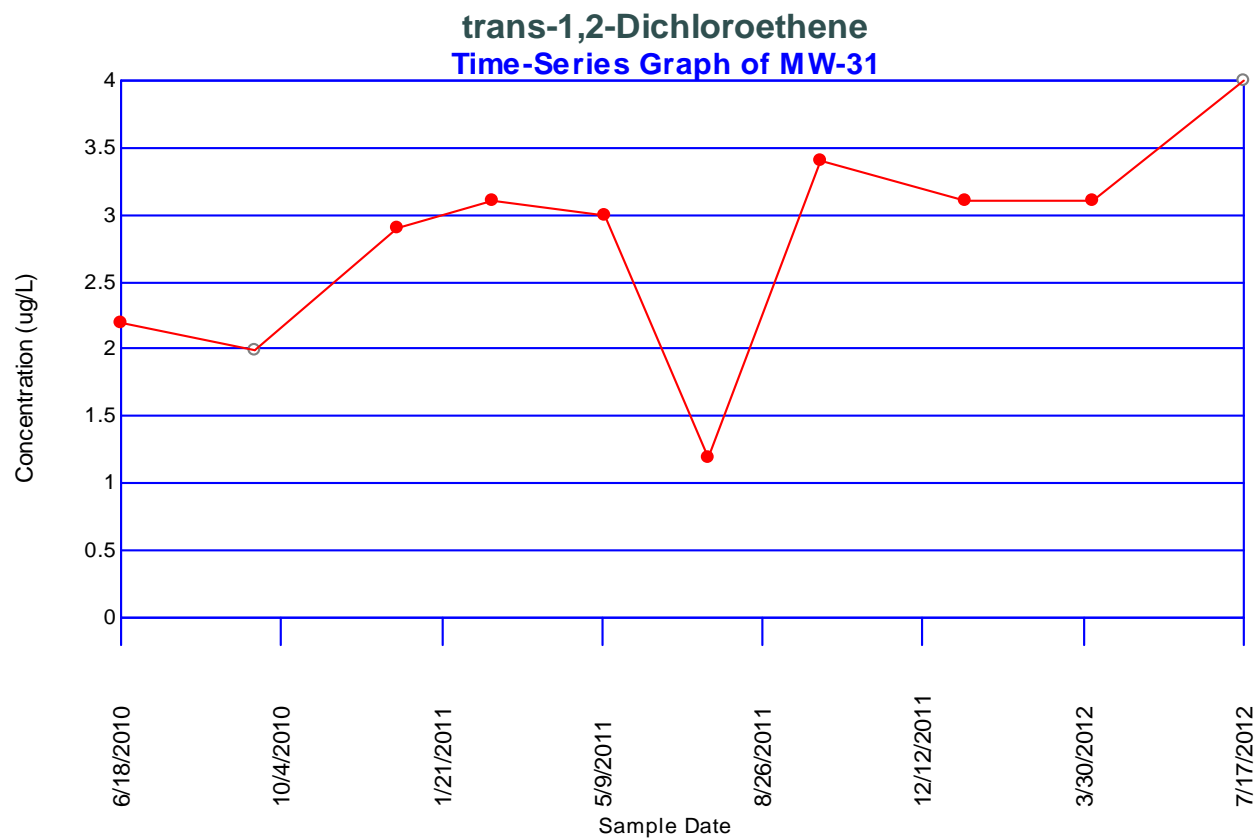


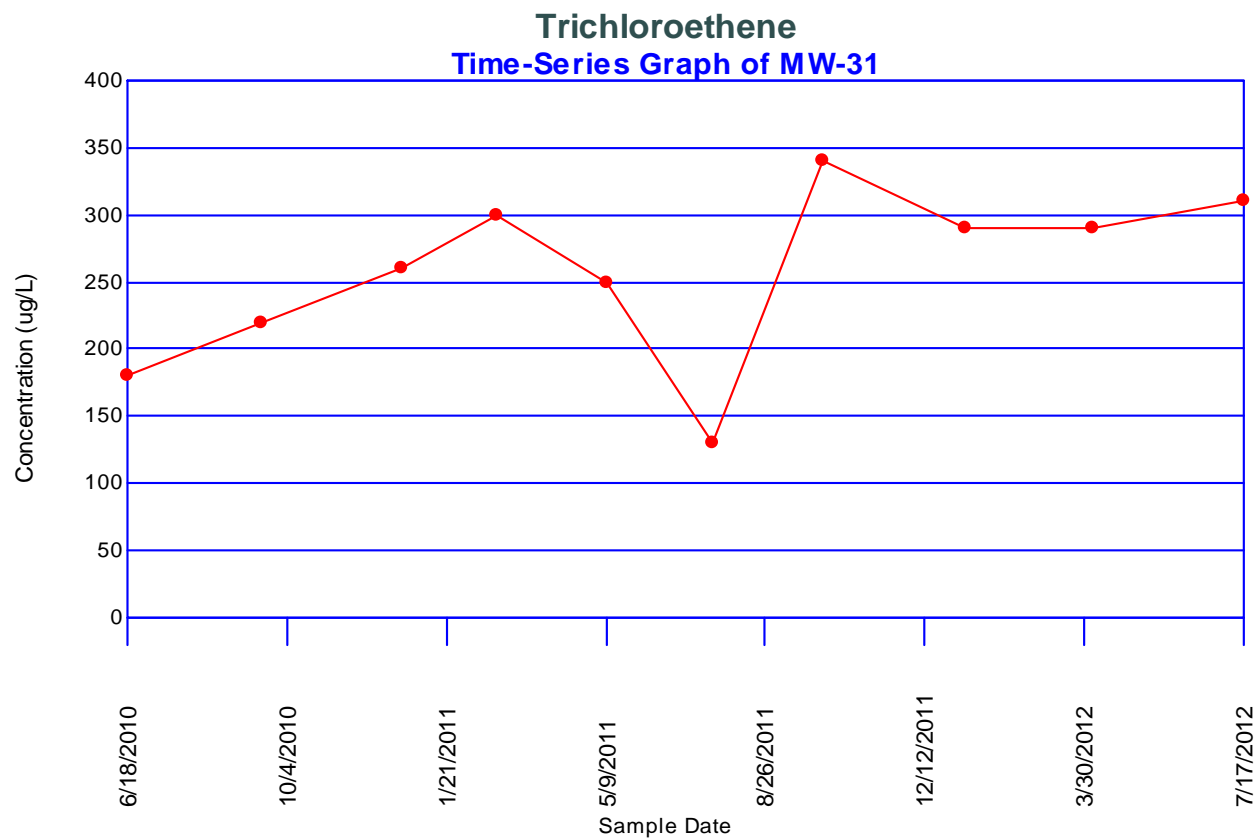
1,1,1-Trichloroethane Time-Series Graph of MW-31

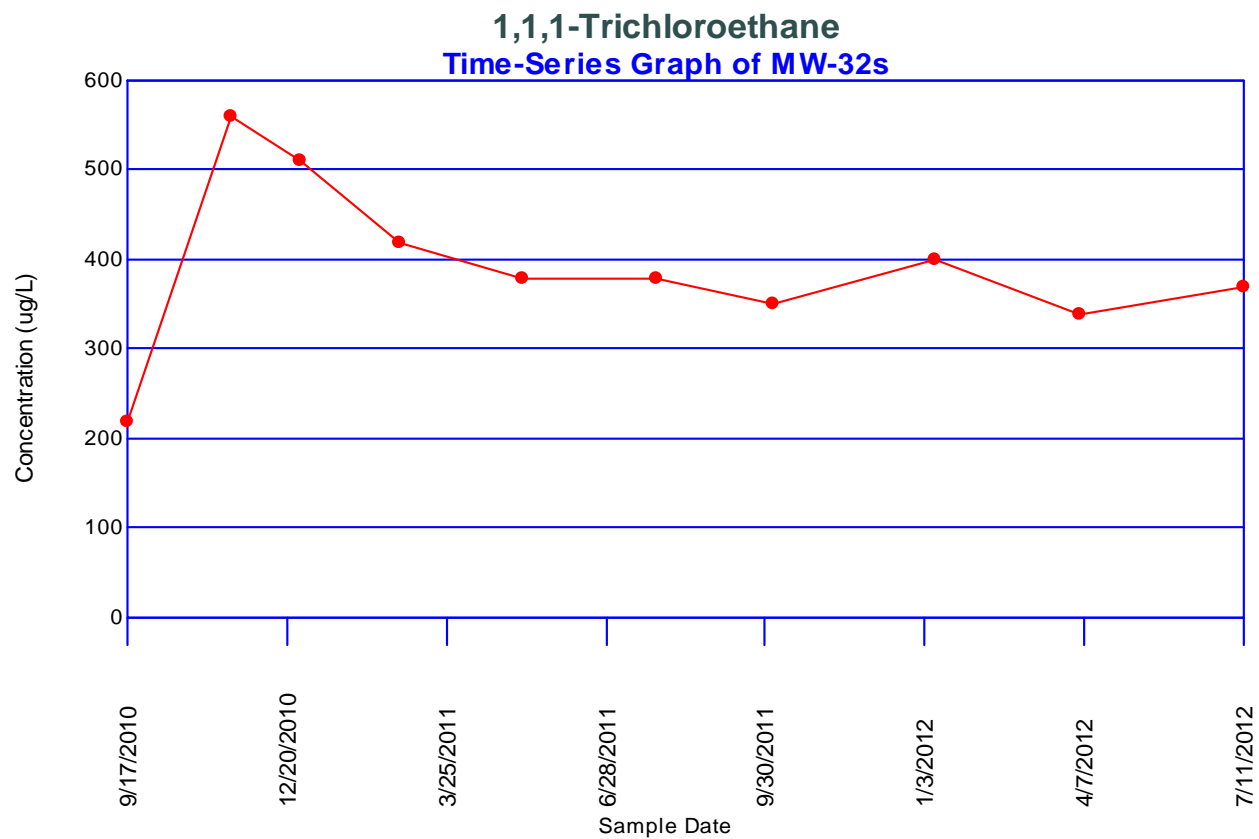


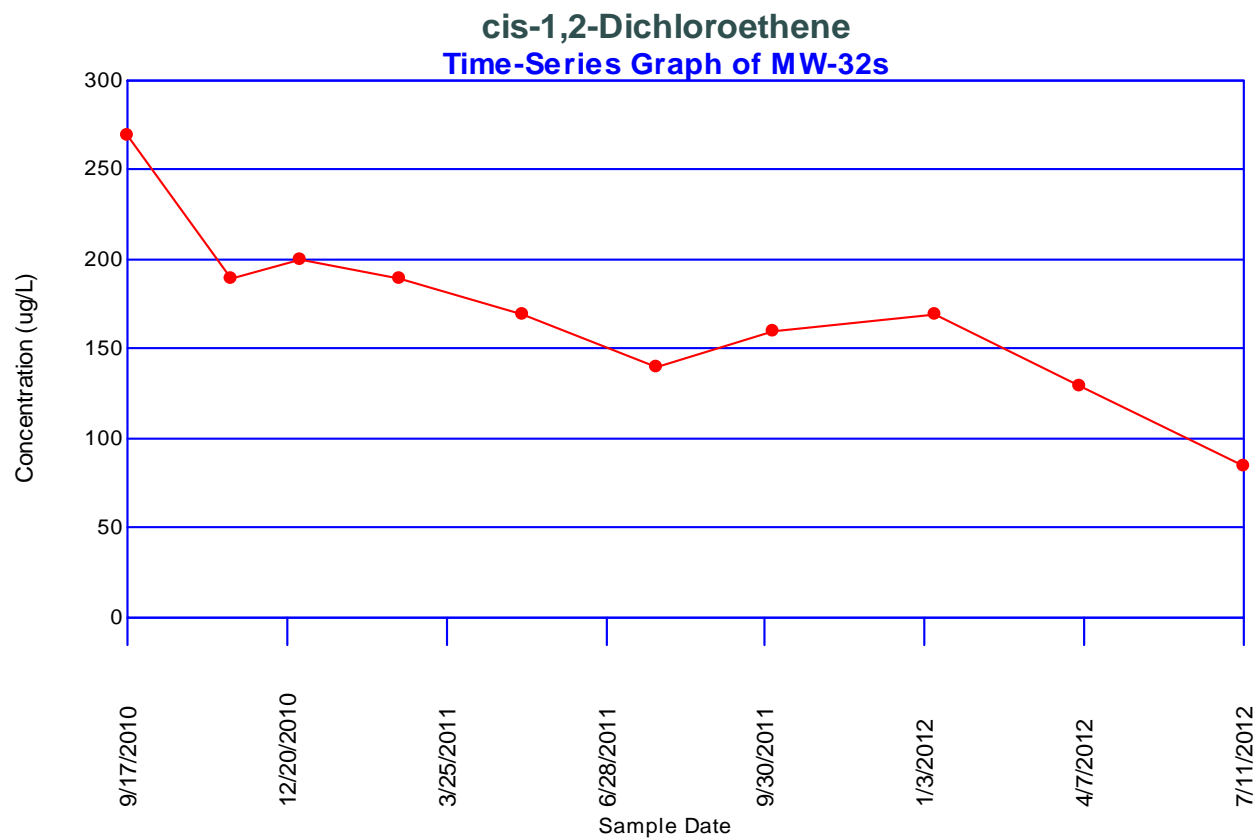


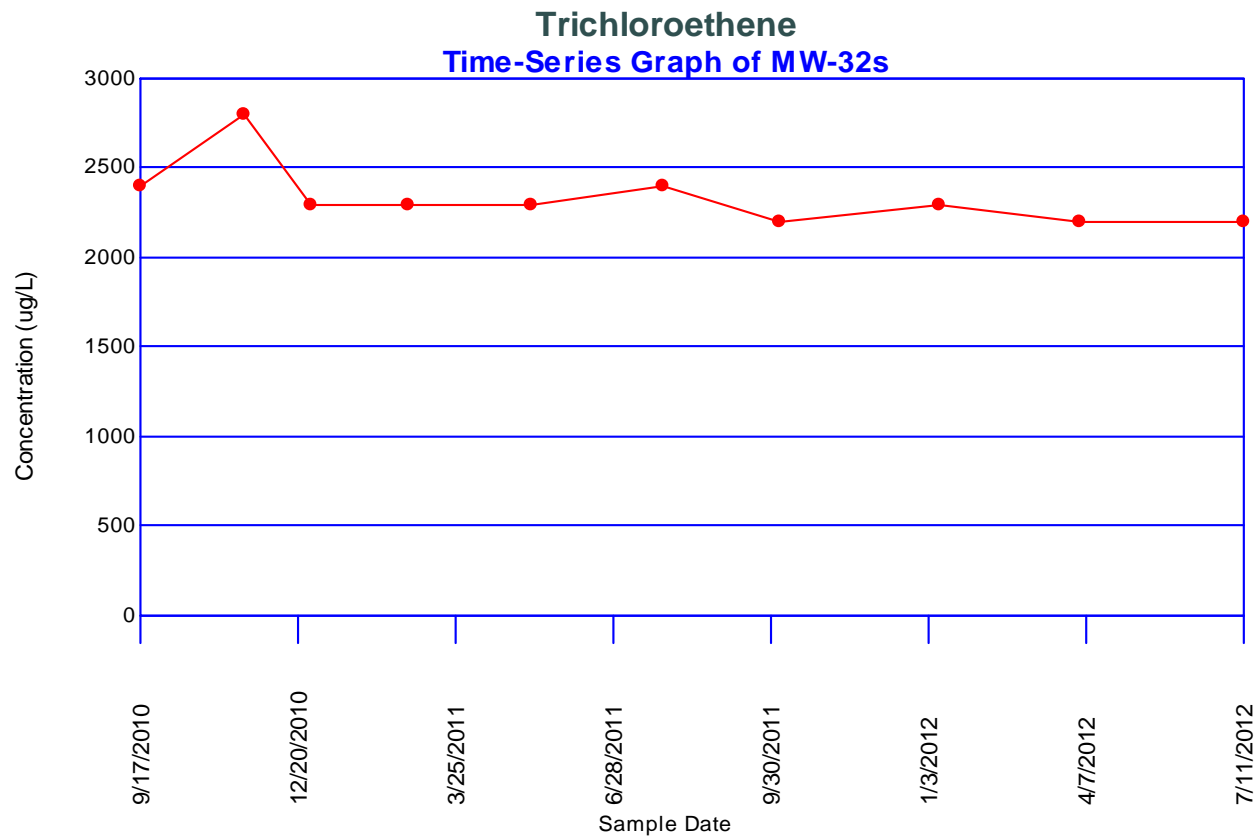


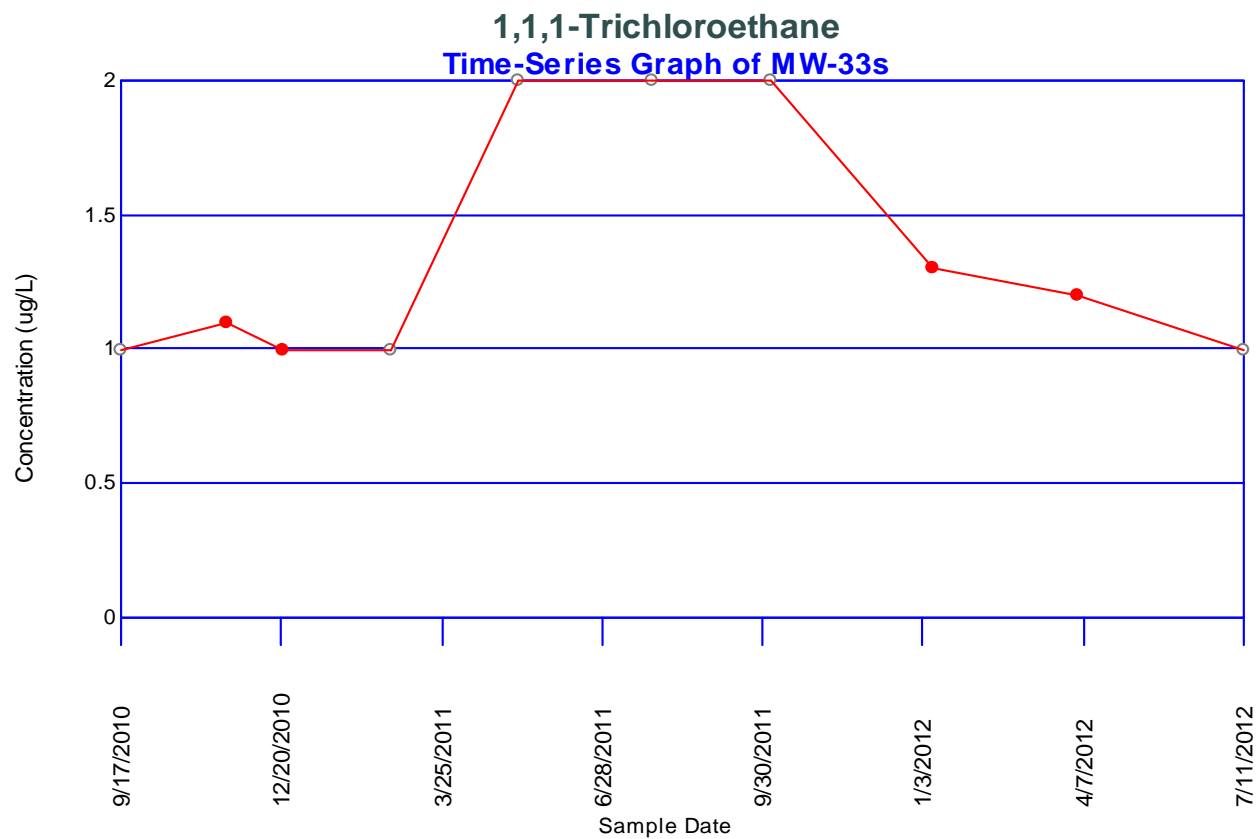












1,1-Dichloroethane Time-Series Graph of MW-33s

