National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020

May 4, 2026

Reply to Attn of: RE-26-051

Attn: Mr. JohnDavid Nance, Bureau Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report Final Submittal – Project Year 13

Enclosed is the *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report for Project Year 13*, submitted in accordance with the 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 5, approved by NMED August April 17, 2018. Requirements of the NMED-approved *600 Area Perched Groundwater Extraction Pilot Test Work Plan* (November 13, 2012) and subsequent correspondence are included in the report. A statistical analysis has been included in the Year 13 report to support groundwater and soil vapor data evaluations.

NASA submitted the *Proposal to Transition NASA White Sands Test Facility (WSTF) 600 Area Perched Groundwater Extraction Pilot Test (PGEPT) Annual Reporting into Projected Targeted Mobile Remediation Process (TMRP) Annual Reporting Following Submittal of the PGEPT – Project Year 12 Report* on February 19, 2025. NMED approved the request with comments on November 17, 2025. The PGEPT interim status reporting requirement at well 600-G-138 will be discontinued following the submittal of the PGEPT – Project Year 13 Report, and groundwater data will be incorporated as a component of TMRP interim status reporting. NASA's *Request for Extension of Time for Submittal of the Targeted Mobile Remediation Process Phase 2 Interim Status Report* on April 29, 2025 was approved by NMED on July 2, 2025. TMRP Phase 2 must be initiated in fiscal year 2027 and the first TMRP Phase 2 Interim Status Report must be submitted by August 31, 2028.

This submittal includes an Executive Summary as Enclosure 1. A printed copy of the report is Enclosure 2, and a CD-ROM with the PDF report, Excel Statistical Trend Input Files, and analytical data as Enclosure 3.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate,

and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions or comments concerning this submittal, please contact Antonette Doherty at 575-202-5406.

ANTONETT E Doherty
Digitally signed by ANTONETTE Doherty
Date: 2026.05.04 10:59:01 -07'00'

For: Amanda G. Skarsgard
Environmental Compliance Manager

3 Enclosures

cc: (w/enclosures)
Ms. Melissa Milner
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Executive Summary

The Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test (PGEPT) Project Year 13 summarizes the results of perched groundwater (PGW) extraction at the White Sands Test Facility (WSTF) 600 Area Closure (Closure). National Aeronautics and Space Administration (NASA) has extracted PGW for 13 years in accordance with the 600 Area PGEPT Work Plan, submitted by NASA on November 13, 2012, and subsequent directives by New Mexico Environment Department (NMED). The objective of the pilot test is to extract subsurface PGW at the bedrock-alluvium interface using groundwater monitoring well 600-G-138 and determine the impact of extraction on the concentrations of hazardous constituents in the groundwater and soil vapor beneath the Closure. Four quarters of PGW sampling and one quarter of soil vapor sampling was performed in Project Year 13 to monitor the impact of extraction.

Between April 2013 and March 2026, NASA has extracted 23,702 gallons of contaminated PGW from monitoring well 600-G-138. For Project Year 13, 566 gallons of extracted PGW were transported to and treated by the Mid-plume Interception and Treatment System. Field data and chemical analytical results obtained indicate that contaminated PGW prevails on top of the andesite bedrock and the source of soil vapor contaminants remain. Analytical data from PGW well 600-G-138 indicates that the concentrations of volatile organic compounds (VOCs) continue to decline at a similar rate to concentrations in contaminated groundwater at upgradient locations in the 200 Area. Groundwater extraction for the duration of the PGEPT has not significantly reduced the 3-foot (ft) thickness of PGW. Analytical data from soil vapor monitoring at adjacent soil vapor monitoring well 600-SGW-5 indicate that VOC concentrations in soil vapor have declined slightly over the 13-year duration of the pilot test.

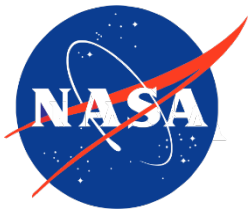
PGW chemical analytical data show that the concentrations of nitrate/nitrite and chloride exhibit slightly declining trends. The gradual declining trend in chloride and nitrate/nitrite concentrations may indicate a lessening in the impact of infiltration following the removal of standing water from the adjacent 600 Area Wastewater Lagoons by July 2017. Concentrations of trichloroethene (TCE) in PGW have declined from 110 micrograms per liter (µg/L) in November 2013 to 35 µg/L in January 2026 or approximately 68 percent over the 13-year duration of the PGEPT. Chloroform concentrations in PGW measured during the PGEPT contrast with the other VOCs and exhibit a statistically inconsistent trend.

The declining concentration of PGW VOCs have reduced the associated concentrations in soil vapor measured within four ports at depths between 7.5 ft and 137.5 ft at well 600-SGW-5. There is also a strong relationship of increasing concentrations with depth and proximity to the PGW source. Concentrations of chloroform trend downward in the upper three monitoring zones and are relatively stable in the lowest soil vapor monitoring zone. Soil vapor TCE concentrations in samples collected at 600-SGW-5 has statistically declined significantly over time in monitoring zones at all depths. Although groundwater extraction at well 600-G-138 has not significantly reduced the 3 ft thickness of PGW, it contributes to the removal of groundwater contaminant mass.

In accordance with NMED approvals and to streamline reporting, interim status reporting at well 600-G-138 will be discontinued following the submittal of the PGEPT – Project Year 13 report. Future groundwater data for well 600-G-138 will be incorporated into TMRP interim status reporting. The NASA WSTF Correction Action Projects; Proposal to Restructure Priorities and

Schedule, submitted to NMED on December 13, 2024, indicated that the start of TMRP Phase 2 activities commence in fiscal year 26 (September 28, 2025, through September 26, 2026). NASA submitted a Request for Extension of time for Submittal of the Targeted Mobile Remediation Process Phase 2 Interim Status Report on April 29, 2025. NMED approved the request on July 2, 2025, and requested that TMRP Phase 2 be initiated in government fiscal year 2027. Submittal of the first TMRP Phase 2 Interim Status Report is required by August 31, 2028.

National Aeronautics and Space Administration



Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test

Project Year 13

April 2026

NM8800019434

NASA Johnson Space Center White Sands Test Facility

Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test

Project Year 13

April 2026

NM8800019434

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

ANTONETTE Doherty Digitally signed by ANTONETTE Doherty Date: 2026.05.04 10:59:28 -07'00'

For: Amanda G. Skarsgard
Environmental Compliance Manager

See Electronic Signature
Date

National Aeronautics and Space Administration

Johnson Space Center
White Sands Test Facility
12600 NASA Road
Las Cruces, NM 88012
www.nasa.gov/white-sands-test-facility

www.nasa.gov

Executive Summary

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List of Acronyms

µg/L	Micrograms per liter
µg/m^3	Microgram per cubic meter
bgs	Below ground surface
AIWP	Abbreviated Investigation Work Plan
btoc	Below top of casing
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DL	Detection limit
DP	Discharge Plan
dtw	Depth to water
EPA	Environmental Protection Agency
ft	Feet/foot
GMP	Groundwater Monitoring Plan
gpm	Gallons Per Minute
GSA	Gardner Spring Arroyo
HHF	Hardscrabble Hill Fault
HWMU	Hazardous Waste Management Unit
IR	Investigation Report
ITRC	Interstate Technology and Regulatory Council
Mg/L	Milligrams Per Liter
M-K	Mann-Kendall
MPITS	Mid-plume Interception and Treatment System
MSVM	Multiport Soil Vapor Monitoring Well
NASA	National Aeronautics and Space Administration
ND	Non-detect
NDMA	N-Nitrosodimethylamine
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
OLS	Ordinary Least Squares
PCE	Tetrachloroethene
PGEPT	Perched Groundwater Extraction Pilot Test
PGEPTWP	Perched Groundwater Extraction Pilot Test Work Plan
PGW	Perched groundwater
ROS	Regression on Order Statistics
SGW	Soil Gas Well
SRT	Seismic refraction tomography
SVE	Soil Vapor Extraction
TCE	Trichloroethene
TMRP	Targeted Mobile Remediation Process
VISL	Vapor Intrusion Screening Levels
VOC	Volatile organic compound(s)
WSTF	White Sands Test Facility

1.0 Introduction

The National Aeronautics and Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) is located in Doña Ana County, 18 miles northeast of Las Cruces, New Mexico and 65 miles north of El Paso, Texas. Figure 1.1 provides a WSTF location map.

WSTF's primary activities in support of the space program are:

1. Development, qualification, refurbishment, and testing of spacecraft propulsion systems, subsystems, and ground support equipment.
2. Investigation of flight hardware anomalies.
3. Testing of materials and components.
4. Performance of hazard and failure analyses.

Hazardous waste is generated during the testing and evaluation processes at WSTF. Following the completion of construction of WSTF in 1964, many wastes were historically managed in surface impoundments within the WSTF industrial area which contributed to groundwater contamination. There are five closed hazardous waste management units (HWMUs) at WSTF, including the 600 Area impoundments. The 600 Area HWMU was closed by NASA in August 1989 and was managed under the WSTF Post-closure Care Permit between the time of closure and November 2009, when management of the HWMUs was incorporated into WSTF's Hazardous Waste Permit (Permit; NMED, 2009). Figure 1.2 provides an aerial photograph of the Closure (600 Area Closure) with pertinent features identified including the local well network.

1.1 Background

1.1.1 600 Area Closure Investigations and Perched Groundwater Identification (2009 – 2013)

NASA completed a comprehensive investigation to the depth of the vadose zone at the 600 Area Closure in early 2010. During the investigation, perched groundwater (PGW) was identified on the top of the poorly fractured andesite bedrock surface near the north and east corners of the Closure (Figure 1.2) in two of eight soil borings installed. Grab samples of the PGW indicated trichloroethene (TCE) concentrations in excess of groundwater cleanup levels. Nitrate/nitrite and chloride were also detected in the grab samples, indicating that the nearby 600 Area Wastewater Lagoons may contribute to the PGW. Specific information was provided in the *NASA White Sands Test Facility (WSTF) 600 Area Closure Investigation Report Provided in Response to a NMED Notice of Disapproval* submitted to the New Mexico Environment Department (NMED) on March 30, 2011 (NASA, 2011a). NMED approved the report on June 9, 2011 (NMED, 2011a).

In accordance with NMED's approval of the 600 Area Closure Investigation Report, NASA submitted the *600 Area Closure Soil Vapor Extraction (SVE) Pilot Test Work Plan* on September 1, 2011. NMED approved the *600 Area Closure Soil Vapor Extraction Pilot Test Work Plan* with a modification on October 28, 2011 (NMED, 2011b). NASA performed a soil vapor extraction (SVE) pilot test at the Closure in March 2012. In the final NMED-approved report on the SVE pilot test (NASA, 2012a), NASA proposed the development of an abbreviated work plan for extraction of contaminated PGW beneath the Closure. NASA submitted the *600 Area Perched Groundwater Extraction Pilot Test Work Plan* (PGEPTWP) on November 13, 2012 (NASA, 2012b). NMED approved the work plan on January 16, 2013 (NMED, 2013a) and directed NASA to begin extraction by February 22, 2013. NASA was unable to obtain approval from the New Mexico Office of the State Engineer to utilize groundwater monitoring well 600-G-138 as a pollution recovery well in time to meet the NMED deadline. This required NASA to request an extension of time for implementation of the pilot test (NASA, 2013), in which NASA proposed

to initiate extraction of PGW by April 19, 2013. NMED approved this extension request on March 1, 2013 (NMED, 2013b).

1.1.2 Perched Groundwater Extraction Pilot Testing and Reporting (2013 – Present)

NASA initiated extraction of PGW in accordance with the approved PGEPTWP on April 19, 2013, and provided the results of groundwater extraction and groundwater and soil vapor sampling in the *600 Area Perched Groundwater Extraction Pilot Test (PGEPT) Interim Status Report* on April 17, 2014 (NASA, 2014). In that report, NASA concluded that the presence of contaminated PGW beneath the Closure continued to contribute to volatile organic compounds (VOCs) in the soil vapor above the PGW and potentially throughout the 600 Area. NASA recommended continued extraction and monitoring of 600 Area PGW and soil vapor monitoring. NMED approved the report on August 14, 2014 (NMED, 2014) and directed NASA to continue PGW extraction and submit another project report within 30 days of the end of the second project year.

NASA continued the extraction of PGW from monitoring well 600-G-138 between April 2014 and March 2015 and presented the results of the second project year in the *600 Area PGEPT Interim Status Report – Project Year 2* on April 16, 2015 (NASA, 2015a). NASA again concluded that the extraction of PGW had not reduced the thickness of the PGW unit beneath the closure and that the presence of contaminated PGW continued to contribute to the presence of VOCs in the soil vapor of the vadose zone. NMED approved NASA's report on July 15, 2015, with modifications (NMED, 2015). NMED directed NASA to provide nitrate/nitrite analytical data in subsequent status reports and to develop and submit a potentiometric map of the area. The required information was included in subsequent interim status reports beginning with the *600 Area PGEPT Interim Status Report – Project Year 3*, submitted on April 14, 2016 (NASA, 2016a) and approved on November 17, 2016 (NMED, 2016a).

On April 26, 2017, NASA submitted the *600 Area PGEPT Interim Status Report – Project Year 4* (NASA, 2017a), in which NASA recommended discontinuing the extraction of PGW from monitoring well 600-G-138. NMED issued the *Approval with Modification Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test* on September 15, 2017 (NMED, 2017b). NMED directed NASA to revise the investigation report to continue PGW extraction at monitoring well 600-G-138. NASA submitted *600 Area PGEPT Interim Status Report – Project Year 5* on May 3, 2018 (NASA, 2018a), which was approved by NMED on August 17, 2018 (NMED, 2018). The 600 Area Wastewater Lagoons standing water was removed by July 2017, and all sludge was removed by December 2018 (NASA, 2019c). NASA submitted the *600 Area PGEPT Interim Status Report – Project Year 6* on April 30, 2019 (NASA, 2019a), which was approved by NMED on September 3, 2019 (NMED, 2019b). The Year 7 report was submitted on May 26, 2020 (NASA, 2020a) and approved by NMED on May 6, 2021 (NMED, 2021a). On April 29, 2021, NASA submitted the Year 8 report (NASA, 2021), which was approved on December 8, 2021 (NMED, 2021b). The Year 9 report was submitted on April 26, 2022 (NASA, 2022a) and was approved by NMED on January 6, 2023 (NMED, 2023a). The Year 10 report was submitted on April 19, 2023 (NASA, 2023b) and was approved by NMED on March 7, 2024 (NMED, 2024a). The Year 11 report was submitted on April 29, 2024 (NASA, 2024a) and was approved by NMED on November 5, 2024 (NMED, 2024c). Most recently, the Year 12 report was submitted on April 28, 2025 (NASA, 2025b).

1.1.3 Perched Groundwater Investigation (2019 – Present)

Following identification of the PGW unit at the 600 Area Closure, NMED requested that NASA develop and submit an investigation work plan by December 31, 2015 (NMED, 2015). NASA submitted the *Additional Work Plan Requirements to Evaluate Potential Source of 600 Area Contamination* on

November 25, 2015 (NASA, 2015b) and the required *Abbreviated Investigation Work Plan (AIWP) for the 600 Area Perched Groundwater* to NMED on July 7, 2016 (NASA, 2016b). NMED disapproved the work plan on November 30, 2016 (NMED, 2016b). NASA submitted the *Response to Disapproval of Abbreviated Investigation Work Plan for 600 Area Perched Groundwater* on December 22, 2016 (NASA, 2016c). NMED approved the revised version of the work plan on March 31, 2017 (NMED, 2017a). The revised work plan included a geophysical seismic refraction/reflection survey to image the bedrock surface below the Closure and the installation of PGW soil borings/wells based on the survey.

On August 7, 2019, NASA submitted the *Request to Remove Electrical Resistivity Component of the 600 Area Perched Groundwater Geophysical Survey based on Geophysical Subcontractor Input Received during the Procurement Process* (NASA, 2019b). NMED approved the work scope modification request on August 23, 2019 (NMED, 2019a). NASA submitted the *Synopsis of the Findings of the 600 Area Closure Geophysical Seismic Refraction Tomography and Reflection Surveys with Revised Soil Boring Locations* on December 19, 2019 (NASA, 2019d). NMED approved the submittal with modifications on December 22, 2020 (NMED, 2020). The objective of the seismic survey was to image the bedrock surface to support optimal soil boring placement relative to depressions in the bedrock surface that preferentially channelize the PGW. Attempts to define the elevation of the bedrock-alluvial interface using seismic refraction tomography (SRT) and reflection methods to the level of accuracy required to meet the objective were not successful. The inability of the seismic survey to predict the elevation of bedrock in an area with a considerable amount of available soil boring and well borehole bedrock tags indicated that further expanding the existing geophysical seismic survey would not be beneficial.

The 600 Area PGW field investigation was conducted between October 2019 and May 2022. In addition to the seismic survey, the investigation included: the installation of six soil borings, one of which was subsequently converted into a PGW unit monitoring well screened across the alluvial-andesite bedrock interface; a colloidal borescope flow vector evaluation; and the groundwater sampling of existing PGW wells. The six exploratory PGW soil borings (600-PGW-1 through 600-PGW-6) were installed at locations either where PGW had been previously identified or was inferred based on the results of the seismic survey. The bedrock elevations encountered at soil boring locations did not correlate with the predicted elevations from the seismic survey (SRT and reflection) with discrepancies up to 50 feet (ft). The only location with acceptable correlation between the actual and predicted bedrock elevations to the required level of resolution for the survey (ability to detect ≤ 5 ft channels) was soil boring 600-PGW-2 at the north corner of the 600 Area Closure. This was located adjacent to previously identified multiport soil vapor monitoring well (MSVM) well 600-SGW-8 where a ground truth bedrock elevation was available. Monitoring well 600A-001-GW was subsequently completed at this location (Figure 1.2).

The colloidal borescope flow vector evaluation was performed to evaluate the two available PGW wells (600-G-138 and 600A-001-GW) and 12 conventional monitoring wells screened within the adjacent fractured bedrock aquifer. Southwest flow vectors generally conformed to the local pattern of groundwater bedrock aquifer and overlying PGW unit flow hypothesized for the 600 Area Closure and suggested groundwater movement from the 200 Area along the strike of bedding plane solution channels in limestone southwest toward the 600 Area in the vicinity of Gardner Spring Arroyo (GSA). West of the Hardscrabble Hill Fault (HHF) located adjacent and west of well 100-HG-139 (Figure 1.2), flow onto the poorly fractured andesite bedrock is inferred to be predominantly toward the west under the influence of the strong hydraulic gradient on the bedrock pediment. A tangential south-southwest flow component on the bedrock interface was reflected by the vector in PGW well 600-G-138, which is consistent with a 200 Area/GSA source (NASA, 2022b).

Groundwater sampling was performed at the two PGW locations (wells 600-G-138 and 600A-001-GW). Preliminary groundwater analytical results for PGW well 600A-001-GW were not compatible with the suite of contaminants and higher concentrations identified within PGW well 600-G-138.. Direct flow

between the two existing PGW wells is unlikely based on available data due to: the shallow bedrock high identified between the two at well 600-SGW-3 (Figure 1.2); the preliminary colloidal borescope flow direction at well 600-G-138 toward the southwest; and differences in the groundwater analytical results (NASA, 2022b).

On June 29, 2022, NASA submitted the 600 Area Perched Groundwater Investigation Report (IR; NASA, 2022b). NMED approved the IR with modifications on June 28, 2023 (NMED, 2023c). Following NMED's approval of the 600 Area PGW IR (NMED, 2023c), NASA submitted the *600 Area Perched Groundwater Phase II Abbreviated Investigation Work Plan* (AIWP) on November 27, 2023 (NASA, 2023d). The AIWP was approved by NMED on November 11, 2024 (NMED, 2024b). The purpose of the Phase II AIWP is to continue characterizing the nature, source, and migration pathways of the PGW unit in the vicinity of the 600 Area Closure. Phase II was divided into two components; Phase IIa comprised a comprehensive hydrogeological investigation of the existing PGW network based on the investigation of four conventional monitoring wells installed in the 600 Area that have encountered PGW (NASA, 2025d). Phase IIb comprises the potential installation of additional soil borings and/or wells at locations deemed to have the best opportunity for PGW interception based on Phase IIa and conform to the requests of NMED (2023b).

1.1.4 Transition to Targeted Mobile Remediation Process Reporting following PGEPT Year 12

NASA is currently implementing the Targeted Mobile Remediation Process (TMRP) program at WSTF, which is designed to extract additional contaminated groundwater from specific target concentrations within the contaminant plume. The *Targeted Mobile Remediation Process Phase 2 Pilot Test Work Plan* was submitted to NMED on April 25, 2023, and approved by NMED on May 15, 2024. PGEPT monitoring well 600-G-138 was included as one of seven additional primary wells in the Work Plan. The *NASA WSTF Correction Action Projects; Proposal to Restructure Priorities and Schedule* submitted to NMED on December 13, 2024, proposed that the start of TMRP Phase 2 activities commence in fiscal year 26 (September 28, 2025, through September 26, 2026). NASA submitted a *Request for Extension of time for Submittal of the Targeted Mobile Remediation Process Phase 2 Interim Status Report* on April 29, 2025, based on conflicts with other scheduled corrective action projects. NMED approved the request on July 2, 2025, directing that TMRP Phase 2 be initiated in fiscal year 2027 (commencing October 1, 2026). Submittal of the first TMRP Phase 2 Interim status Report is required by August 31, 2028.

NASA submitted the *Proposal to Transition NASA White Sands Test Facility (WSTF) 600 Area Perched Groundwater Extraction Pilot Test (PGEPT) Annual Reporting into Projected Targeted Mobile Remediation Process (TMRP) Annual Reporting Following Submittal of the PGEPT – Project Year 12 Report* on February 19, 2025 (NASA, 2025b). NMED approved the request with comments on November 17, 2025 (NMED, 2025). Justification to transition Well 600-G-138 reporting from PGEPT to TMRP included that the data collected over the 11-year duration of the PGEPT supports the primary conclusions presented in the original Year 1 Report. In addition, elements of the TMRP reporting process for well 600-G-138 correspond to the ongoing PGEPT interim status reporting requirements. These include: 1) records of monthly groundwater elevations and well performance data; 2) monthly volume of groundwater extracted; 3) systematic collection of groundwater indicator parameters; 4) collection of quarterly groundwater chemical analytical samples and evaluation of data; and 5) a summary of investigation-derived waste management and processing at the Mid-plume Interception and Treatment System (MPITS) in accordance with established regulatory requirements.

In order to streamline NASA's reporting to NMED, the PGEPT interim status reporting requirement at well 600-G-138 will be discontinued following the submittal of the PGEPT – Project Year 13 Report, and groundwater data presented in the PGEPT will be incorporated as a component of TMRP interim status

reporting that is required within two months of the completion of each project year as defined in the approved TMRP Work Plan.

1.2 Objective and Scope

The objective of the PGEPT is to extract contaminated PGW using existing monitoring well 600-G-138 and to evaluate the impact of groundwater extraction on concentrations of VOCs in the vadose zone near that groundwater monitoring well. To achieve this objective, NASA has collected and managed groundwater and soil vapor samples from 600-G-138 and adjacent twinned MSVM well 600-SGW-5 (Figure 1.2), respectively. The scope of the pilot test is limited to extracting PGW from existing monitoring well 600-G-138, treating the extracted PGW as indicated in the MPITS Interim Measure Work Plan (NASA, 2008) and Discharge Permit (DP)-1255 (NMED, 2023b), and evaluating PGW samples from well 600-G-138 and soil vapor samples from well 600-SGW-5.

1.3 Contaminants of Concern

The potential groundwater contaminants of concern (COCs) for this investigation consist of TCE, tetrachloroethene (PCE), chloroform, N-Nitrosodimethylamine (NDMA), nitrate/nitrite, and chloride. TCE, PCE, chloroform, and NDMA were identified as COCs for this investigation because treatment standards for these constituents are stipulated in DP-1255 (NMED, 2023b), which provides the requirements for discharging groundwater treated by the MPITS, including groundwater extracted from 600-G-138. Nitrate/nitrite and chloride were identified as COCs because of their presence in grab samples collected from 600-G-138 during the initial 600 Area Investigation. The primary COC for soil vapor has been identified as TCE because concentrations in groundwater beneath the Closure exceed NMED regulatory cleanup levels for this specific contaminant (NASA, 2012b).

2.0 Scope of Activities

2.1 Perched Groundwater Extraction and Management

Historically, PGW was pumped from well 600-G-138 twice each WSTF working day through the submittal of PGEPT Year 12 on April 30, 2025. To extract groundwater, the pump is activated and operated until it breaks suction when the water level draws down to the pump intake depth, generally located at approximately 148 ft below top of casing (btoc), which is coincidental with the depth of the bedrock surface. On average for two pumping cycles, 12 to 15 gallons of PGW are removed each pumping day through the two purging events, one in the morning and one in the afternoon. PGW recovery is not monitored on a regular basis, although well 600-G-138 is observed to recover fully between the morning purge event and the afternoon purge event, which are separated by approximately four to six hours. A field evaluation performed at well 600-G-138 in August 2022 indicated that PGW recovers at approximately 0.23 gallons per minute (gpm) over a period of 30 minutes.

NASA manages extracted groundwater in accordance with 40 Code of Federal Regulations (CFR) 262.17 and 20.4.1.300 New Mexico Administrative Code (NMAC) prior to transfer to the MPITS, where it is treated in accordance with the MPITS Interim Measure Work Plan (NASA, 2008) and discharged in accordance with DP-1255 (NMED, 2023b).

2.2 Groundwater Monitoring

Throughout the pilot test, groundwater samples have been collected quarterly from PGW monitoring well 600-G-138 (Figure 1.2) in accordance with the requirements of site-specific sampling procedures and the WSTF Groundwater Monitoring Plan (GMP) in effect at the time of each sampling (NASA, 2023e;

NMED, 2023d). Prior to every PGW sample collection event for Project Year 13 (5/7/2025, 7/15/2025, 10/15/2025, and 1/23/2026), the standing water in the well casing was evacuated and the non-dedicated purge pump was removed. The water level was allowed to recover before groundwater samples were collected with a decontaminated Teflon®[1] bailer. Groundwater indicator parameters (pH, temperature, conductivity, and turbidity) were measured and recorded in the appropriate field logbook. The PGW was then dispensed into laboratory-provided sample containers, which were appropriately labeled and placed in cold storage. Samples were shipped to NASA's contracted off-site analytical laboratories for analysis. Samples were analyzed quarterly for VOCs (by Environmental Protection Agency [EPA] Method 8260), chloride (by EPA Method 300.0), and nitrate/nitrite (by EPA Method 353.2) and annually for NDMA (by EPA Method 607; sampled 4/22/2024).

2.3 Soil Vapor Monitoring

For Project Year 13, soil vapor well 600-SGW-5 was sampled only for the first quarter (5/7/2025) at the same time as groundwater sampling performed at PGW monitoring well 600-G-138 as part of the PGEPT evaluation. Soil vapor sampling was not performed for the remaining three quarters (7/15/2025, 10/15/2025, and 1/13/2026) due to the approved transition to TMRP reporting following PGEPT Year 12 (NASA, 2025b; NMED 2025) and no TMRP reporting requirements for 600-SGW-05. The monitoring zones of soil vapor well 600-SGW-5 were sampled in accordance with WSTF-specific procedures for soil vapor sampling. The monitoring zones, sampling ports, and stainless-steel tubing were purged of entrained soil vapor with a non-dedicated surface vacuum pump to evacuate stagnant air from the soil vapor sampling implant and stainless-steel tubing connecting the implant to the surface sample collection fitting. Each MSVM well monitoring zone was purged for a minimum of five minutes per zone to evacuate at least three volumes of the ¼ inch tubing and soil vapor implant. Carbon dioxide, oxygen, and methane indicator parameters were monitored during the purging operation as these parameters are required to stabilize prior to sampling and recorded in the appropriate field logbook. Soil vapor samples were collected in 1-liter stainless-steel SUMMA canisters provided by the analytical laboratory. Samples were labeled and placed in controlled storage prior to shipment to the contracted off-site analytical laboratory. Samples were analyzed for VOCs by EPA Method TO-15.

2.4 WSTF Precipitation Monitoring

NASA currently monitors precipitation at WSTF via a rain gauge installed at the 700 Area closed landfill. As part of this PGW study, rain levels are evaluated with depth to PGW in well 600-G-138 to assess precipitation recharge effects on the PGW aquifer. Table 2.1 includes rain gauge results from 2013 through present (Project Year 1 through Project Year 13). The total annual rainfall for Project Year 13 between April 2025 and March 2026 was 12.02 inches. This is above the average annual rainfall of 10.19 inches over the 13-year duration of PGEPT pumping activities.

2.5 Statistical Evaluation

Both the well 600-G-138 groundwater and well 600-SGW-5 soil vapor COC data sets were used to perform ordinary least squares (OLS) regression or Mann-Kendall (M-K) trend tests using the most recent version of ProUCL software (Version 5.2) to determine if there was a statistically significant trend in COC concentrations from Project Year 1 to the present (Project Year 13). OLS is a parametric test and used to determine if a linear temporal trend in the data exists. A best-fit straight line is determined from the data with a positive slope indicating an increasing trend, and a negative slope indicating a decreasing trend. The correlation coefficient, titled Pearson's *r*, describes the relation between the observed and

[1] Teflon® is a registered trademark of The Chemours Company FC, LLC.

calculated concentrations. The sign of *r* equates to the type of trend (positive for increasing and negative for decreasing), with the magnitude of *r* indicating the strength of the trend. The closer the absolute value of *r* is to 1, the stronger the trend (ITRC, 2013; EPA, 2009).

M-K trend tests are non-parametric, meaning that there are no assumptions regarding data distribution. Each sample is ordered by earliest to latest date and then compared to every other sample in pairs for concentration change. The change is listed as a score, either -1, 0, or +1. The individual pair scores are summed to establish the M-K value (*S*), which will be negative, positive, or close to 0. The null hypothesis for the M-K trend test is no trend, meaning the concentrations randomly fluctuate around a constant population mean. In general, a positive *S* shows a potential increasing or upward trend, and a negative *S* shows a potential decreasing or downward trend (EPA, 2009; 2015; 2022). The level of confidence (expressed as a confidence coefficient) desired for the test is set prior to testing. The default confidence coefficient in ProUCL and accepted by NMED and EPA is 95 percent, or 0.95 with a significance level of 5 percent or 0.05, meaning that there is an error rate of no more than 5 percent. The *p*-value represents the probability that the M-K test results are false when they are true (i.e., when the M-K shows a statistically significant trend when there is no trend, but random fluctuations). If the *p*-value is less than or equal to 0.05 (the level of significance chosen), then the null hypothesis is rejected, meaning there is a statistically significant trend. The M-K *S*-value shows which trend (increasing for a positive *S* and decreasing for a negative *S*). If the *p*-value is greater than 0.05, then the null hypothesis is accepted, meaning there is not enough evidence of a trend at the significance level chosen (EPA, 2009). ProUCL, Version 5.2 software generates the graph, the statistical output, and the interpretation of the M-K test results.

3.0 Pilot Testing Results

3.1 Field Results

3.1.1 Perched Groundwater Extraction

The initial depth to groundwater (dtw) over the duration of pumping (Table 3.1) has ranged between a high of 144.80 ft btoc on January 19, 2022 and April 19, 2023 (3.18 ft thickness of PGW) and a low of 146.95 ft btoc on April 27, 2018 (1.03 ft thickness of PGW). Between April 2013 and March 2026, NASA has extracted an average of 160.2 gallons of contaminated PGW per month from 600-G-138 using a non-dedicated purge pump. Table 3.2 provides the PGW volume extracted each month between April 2013 and March 2026, listed by Project Year. During Project Year 13 between April 2025 and July 2025 a total of 556 gallons of PGW were extracted. The amount of gallons extracted for Project Year 13 was limited as pumping for PGEPT Year 13 was suspended in July 2025 due in part to NASA's transitioning to TMRP reporting following PGEPT Year 12 (NASA, 2025b; NMED, 2025), and based on NASA's proposal to restructure priorities and schedule for corrective action (NASA, 2024c). TMRP Phase II initiation is scheduled for fiscal year 2027. The total amount of PGW extracted since April 2013 is 23,702 gallons.

3.1.2 Groundwater Monitoring

Indicator parameters monitored during groundwater sampling events are provided in Table 3.1. For the four Project Year 13 groundwater monitoring events in May 2025, July 2025, October 2025, and January 2026, NASA observed that initial depth to groundwater in the 600-G-138 well casing was consistent at between 144.95 and 145.55 ft btoc, which is compatible with the depths reported during previous PGEPT monitoring years. With the depth to andesite below the closure identified as approximately148 ft btoc, the thickness of PGW on top of bedrock for Project Year 13 varied between 2.45 ft (5/7/2025) to 3.05 ft (1/13/2026).

Figure 3.1 shows total rainfall in inches for each project year as well as depth to PGW for each sampling event at 600-G-138 for comparison. Local precipitation at WSTF for Project Year 8 (4.88 inches), Project Year 11 (6.13 inches), and Project Year 12 (6.60 inches) was low (when compared to the average rainfall over the study) and high for Project Years 10 (13.47 inches) and 9 (14.11 inches; Table 2.1; Figure 3.1). However, as shown by depth to PGW in well 600-G-138, the observed variability in annual precipitation does not appear to significantly affect the measured thickness of the PGW. For Project Year 13, total rainfall was 12.02 inches. The largest monthly amount of rainfall was recorded in July (4.11 inches), which accounted for approximately 34 percent of the total annual rainfall based on WSTF rain gauge data at the 700 Area Landfill (Table 2.1). The elevated rainfall did not result in any significant change in the initial PGW elevation for the July 2025 measurement (145.40 ft btoc); however, groundwater was relatively higher in January 2026 (144.95 ft btoc).

3.1.3 Soil Vapor Monitoring

NASA performed PGEPTWP-required soil vapor monitoring at MSVM well 600-SGW-5 (Figure 1.2) in conjunction with groundwater sampling for the Project Year 13 first quarterly monitoring event on May 7, 2025. During this sampling event, soil vapor was purged from each monitoring port (7.5, 52.5, 102.5, and 137.5 ft below ground surface [bgs]) using a landfill gas monitoring instrument. Purged vapor for the sampling event ranged from 0.6 to 1.7 percent carbon dioxide, from 17.4 to 19.8 percent oxygen and was 0.0 percent for methane throughout.

3.2 Project Year 13 Chemical Analytical Results

3.2.1 Groundwater Monitoring Chemical Analytical Data

Chemical analytical results for the groundwater COCs from samples collected during the groundwater sampling events at monitoring well 600-G-138 for all project years including Project Year 13 are summarized in Table 3.3. All chemical analytical data for groundwater samples through Project Year 13 are provided in Enclosure 3.

3.2.2 Soil Vapor Monitoring Chemical Analytical Data

Chemical analytical results from soil vapor samples collected during the quarterly vapor sampling events at MSVM well 600-SGW-5 for all project years including the first quarter (5/7/2025) event for Project Year 13 are summarized in Table 3.4. The chemical analytical data from all 600-SGW-5 soil vapor samples associated with the PGEPT though Project Year 13 are provided separately as Enclosure 3 of this report submittal package.

3.2.3 Surface Water Chemical Analytical Data

In the July 15, 2015, *Approval with Modifications 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 2*, NMED directed NASA to "…include the nitrate/nitrite water sample data from the lagoon" in future reports (NMED, 2015). NASA ceased wastewater discharge to the lagoons in July 2015 and collected the final set of water samples for waste characterization purposes in September 2015. No further chemical analytical data are available for the wastewater lagoons and NASA no longer reports surface water chemical analytical data from the lagoons.

3.3 Statistical Trends

Appendix A contains statistical data output files and the OLS and M-K graphs performed as part of this evaluation. Enclosure 3 of this submittal includes the data input files in Excel spreadsheets.

3.3.1 Groundwater Trends

Due to normally distributed data and constant variance, OLS regression was performed for groundwater concentrations in well 600-G-138 for COCs chloroform, chloride, and nitrate/nitrite. TCE was not distributed normally, so only M-K trend tests were completed. PCE and NDMA were not detected frequently enough in groundwater at well 600-G-138 during the PGW pilot study to perform statistics, and therefore neither OLS regression nor M-K were performed for those COCs. One outlier was removed for chloroform, and two outliers were removed for nitrate/nitrite. Rosner's outlier tests are provided in Appendix A, and Table 3.5 provides a summary of statistics for both groundwater and soil vapor.

All four COCs (TCE, chloride, nitrate/nitrite, and chloroform) tested displayed statistically significant decreasing or downward trends in COC concentrations. Chloride showed a moderate decreasing trend with a negative *r*-value (-0.5216 and a *p*-value of 0.0001), while chloroform and Nitrate/Nitrite showed smaller magnitude decreasing trends (*r*-value of -0.3824 with a *p*-value of 0.0051 and *r*-value of -0.3070 with a *p*-value of 0.0301, respectively). M-K trend results for TCE showed a strongly decreasing trend (S-values of -1,004). M-K trend tests were also completed for chloride, chloroform, and nitrate/nitrite for comparison purposes. The M-K trends agreed with OLS regression results (*S*-values of -524, -317, and -248). This indicates that COC concentrations within the PGW are decreasing over time (Appendix A).

3.3.2 Soil Vapor Trends

OLS regression (for normally distributed data) or M-K trend tests (for non-normally distributed data) were performed for chloroform and TCE soil vapor concentrations within well 600-SGW-05. Since the regression line in OLS regression represents the population mean and M-K hypothesizes no trend (that concentrations will fluctuate around a constant population mean) it is important that the mean (or median) be determined by detections and not influenced by NDs (EPA, 2009). To ensure this, NASA did not perform OLS regression or M-K trend tests on data sets with greater than 50 percent non-detect (NDs). Therefore, no OLS regression or M-K trend tests were completed for PCE at all depths (with percent NDs of 58, 56, 54, and 78). For use in OLS regression and M-K trend tests, NDs cannot be replaced using Kaplan-Meier or regression on order statistics (ROS) censoring methods. This is because both Kaplan-Meier and ROS assume a stable population, and a trend test may not have a stable population. Therefore, a form of simple substitution or not using NDs are the only options for use in trend tests with NDs (EPA, 2009, 2022; ITRC, 2013). ProUCL guidance recommends replacing all NDs for use in trend tests with a single value lower than the lowest DL. Multiple DLs cannot be input, or the trend test is invalid (it would be seeing trends in DLs instead of detected values; EPA, 2015; 2022). However, this method only works for NDs with low DLs. NDs with elevated DLs may be outliers from errors or dilution effects. It is recommended that high concentration outliers be deleted from the data set for use in M-K tests (Cameron, 2017). The OLS regression method is similar and is sensitive to outliers. Since it is important to have a regression that is representative of the data (and not NDs), outliers should be removed (EPA, 2009). Rosner's outlier tests are provided in Appendix A.

For chloroform at 7.5 ft, three NDs with high DLs (7.7, 16 and 31) were removed as well as a high detection outlier (89 micrograms per cubic meter ($\mu g/m^3$) from April 2024, believed to be a result of a potential transposition of results between the 7.5 ft and 137.5 ft ports for that sampling event). For the 137.5 ft depth for chloroform, there was one large, detected outlier (20,000 $\mu g/m^3$) which was removed and 17 high NDs (where the DL was larger than the adjacent detections at concentrations between 110 and 600 $\mu g/m^3$). For TCE at 7.5 ft depth, two outliers were removed (7,300 $\mu g/m^3$ and 170 $\mu g/m^3$; Table 3.5). The 20,000 $\mu g/m^3$ concentration is believed to be a potential transposition of results between the 7.5 ft and the 137.5 ft ports. All NDs for trend testing were replaced with DLs less than any detections. Chloroform NDs at 7.5 ft and 137.5 ft were replaced with 0.31 $\mu g/m^3$. For TCE there was only one ND in

all the data (at 137.5 ft bgs). This value was replaced with 0.3 µg/m^3, a value lower than the lowest detection (Enclosure 3, Excel input file).

A goodness-of-fit test was performed for soil vapor COCs chloroform and TCE (Appendix A). Chloroform was normally distributed at 52.5 ft, 102.5 ft, and 137.5 ft. At 7.5 ft and 102.5 ft, TCE was also normally distributed. OLS regression was performed for those COCs/depths. M-K trend tests were completed for chloroform and TCE at all depths. For chloroform in soil vapor at 137.5 ft bgs, the OLS and M-K graphs show a slightly downward trend (*r*-value of -0.1325); however, there was insufficient statistical evidence of a significant trend in the M-K graph (S-value of -84 and *p*-value greater than 0.05 [0.4699]; Table 3.5; Appendix A). The null hypothesis was accepted, meaning that there was no trend. However, chloroform at 7.5 ft, 52.5 ft, and 102.5 ft bgs resulted in statistically significant decreasing trends. For chloroform at 7.5 ft, the S-value was -266, a mildly decreasing trend. At 52.5 ft, the *r*-value was -0.6012, showing a moderate decreasing trend. M-K results for that depth also indicate a moderate decreasing trend with an *S*-value of -683 and a *p*-value of zero. For chloroform at 102.5 ft bgs, the OLS regression shows a decreasing trend as well (*r*-value of -0.4886, *S*-value of -487 and a *p*-value of 0.0004 [less than 0.05 shows a trend]; Appendix A).

As shown on the TCE soil vapor OLS and M-K plots (Appendix A) and Table 3.5, a statistically significant moderate to strong decreasing or downward trend was present at all depths (with negative OLS and M-K test values and *p*-values less than 0.05). Values at 7.5 ft showed an *r*-value of -0.3941, *S*-value of -422, and a *p*-value of 0.0046. At 52.5 ft, values showed an *S*-value of -815, and *p*-value of zero. The 102.5 ft depth showed an *r*-value of -0.7660, an *S*-value of -805 and *p*-value of zero, and at 137.5 ft, values showed an *S*-value of -378 and *p*-value of 0.0008.

4.0 Recent Developments

The 600 Area PGW field investigation conducted between October 2019 and May 2022 included the installation of PGW monitoring well 600A-001-GW screened across the alluvial-andesite bedrock interface (NASA, 2022b). Recent fieldwork for the sewage lagoons soil boring investigation performed in early February through March 22, 2023, subsequently improved conceptualization of the 600 Area PGW unit. During the installation of deep soil borings to bedrock, two locations positively identified PGW on top of the andesite bedrock surface and were subsequently converted to PGW monitoring wells (600A-003-GW was installed on the west side of the 600 Area Overflow Lagoons, and 600A-004-GW was installed within the north cell of the 100 Area Lagoons [Figure 1.2]). Well 600A-004-GW represents as significant location on the southwest downthrow side of a northwest striking normal fault where andesite bedrock is displaced downward by approximately 40 ft. PGW may preferentially flow into this area from the north based on the lower bedrock elevation and evidence from borescope flow vectors in well 600-G-138 (NASA, 2025d). The 600 Area PGW unit is currently available for study in four monitoring wells (600-G-136, 600A-001-GW, 600A-003-GW, and 600A-004-GW). The channelized PGW unit and distribution of PGW wells in the 600 Area is hypothesized to reflect preferential flow along depressions carved by erosion.

NASA proposed additional strategies that may be utilized to further evaluate and conceptualize the 600 Area PGW unit in the *600 Area Perched Groundwater Phase II AIWP* on November 27, 2023 (NASA, 2023d). The AIWP was approved by NMED on November 5, 2024 (NMED, 2024d). The *600 Area Perched Groundwater Phase IIa Status Report* was submitted on June 30, 2025 (NASA, 2025d) to identify soil boring targets for Phase IIb fieldwork. The four existing PGW locations were evaluated during Phase IIa. Objectives of the Phase IIa investigation were to enhance conceptualization of the PGW unit, evaluate PGW inter-well relationships, assess groundwater geochemical correlations, and use flow vectors to support the selection of optimal soil boring locations.

Two additional Phase IIb downgradient soil borings with potential conversion to monitoring wells were recommended in the vicinity of the southern andesite bedrock depression below the 100 Area wastewater lagoon. Soil borings 600-PGW-7 and 600-PGW-8 are planned to evaluate the depth to bedrock and presence of PGW to the east and west of well 600A-004-GW, respectively. The two soil borings in conjunction with the downgradient PGW monitoring wells installed at 600A-003-GW and 600A-004-GW will potentially provide a total of four downgradient PGW monitoring locations. The schedule for installation of the additional Phase IIb soil borings is dependent on NASA's *Request for Extension of time for Submittal of 600 Area Perched Groundwater Phase II Investigation Report* submitted to NMED on April 29, 2025 (NASA, 2025c).

5.0 Conclusions

5.1 PGEPT Project Year 13 Report

Field measurements of the PGW depth in monitoring well 600-G-138 (Table 3.1) over the 13-year project duration of the PGEPT show that groundwater extraction has not significantly reduced the average thickness of PGW on top of andesite bedrock at approximately 3 ft over the evaluation period. The adjacent 600 Area Wastewater Lagoons were drained by July 2017 (NASA, 2019c) and these no longer contribute to potential infiltration to the area. Rainfall also does not significantly affect the thickness of the PGW even during the periods of highest precipitation.

Chemical analytical data presented in Section 3.2 and the M-K trends and OLS regressions show that the concentrations of TCE, chloride, nitrate/nitrite and chloroform in groundwater have been declining over the 13 project years of the PGEPT. Concentrations of nitrate/nitrite in PGW samples from 600-G-138 (Table 3.3) for Project Year 13 currently approximate the New Mexico maximum concentration limit of 10 milligrams per liter (mg/L) (varying between 9.49 mg/L [10/15/2025] and 12.6 mg/L [5/7/2025]). The nearby former 600 Area Wastewater Lagoons may have contributed to the existence and composition of PGW in the area. Overall declining trends in both chloride and nitrate/nitrite concentrations (Table 3.3) over the 13 PGEPT project years and the statistically significant decreasing trends shown by the OLS regression and M-K graphs indicate a lessening in the impact of infiltration from the 600 Area Wastewater Lagoons following their removal.

The TCE concentrations in PGW at 600-G-138 have shown declines of approximately 68 percent over the 13-year duration of the PGEPT (from approximately 100 to 110 micrograms per liter (µg/L) in Project Year 1 to 33 to 35 µg/L in Project Year 13), and a statistically significant decreasing OLS regression and M-K trend. The lower the *p*-value, the more confidence in the result, and the TCE OLS regressions (and M-K trend test) had *p*-values at or near zero. Concentrations of TCE in the upgradient aquifer of the 200 Area theorized to be a source of the 600 Area PGW have also declined significantly over time. As calculated from concentrations listed in the 4th quarter 2025 Periodic Monitoring Report (NASA, 2026), significant reduction of TCE of approximately 87 percent between 1990 through 2025 has been observed within well 200-D-240, and approximately 74 percent between 2007 through 2025 at adjacent well 200-SG-1. Chloroform, chloride, and nitrate/nitrite concentrations in PGW measured during the PGEPT also show a decreasing trend over the 13 years of the PGEPT. PCE and NDMA have remained undetected in groundwater at well 600-G-138 throughout the project.

Continued PGW extraction at well 600-G-138 over 13 years has not significantly affected the volume of groundwater migrating through the well. The reduction in the COC concentrations in groundwater samples is inferred to be the result of reduced infiltration of nitrates/nitrites following removal of the 600 Area Wastewater Lagoons, in conjunction with declining VOC concentrations associated with the migrating contaminated groundwater from upgradient locations in the 200 Area (NASA, 2023a). The extraction of PGW from well 600-G-138 is contributing to the removal of contaminant mass from the 600

Area local aquifer. Although the contaminant mass removed over the duration of the pilot test is relatively low compared to other wells in the network, data obtained during this pilot test supported the development of NASA's November 1, 2018, *Targeted Mobile Remediation Process Pilot Test Work Plan* (NASA, 2018b).

Declining concentrations of the PGW COCs appear to be related to a reduction of the concentrations of COC in soil vapor measured in four ports at depths of 7.5 ft, 52.5 ft, 102.5 ft, and 137.5 ft bgs at adjacent MSVM well 600-SGW-5 (Table 3.4, Figure 4.1). The declining concentration trends are shown in the Appendix A soil vapor OLS and M-K graphs. For these two contaminants, well 600-SGW-5 also shows a relationship for increasing soil vapor contaminant concentrations with depth (Appendix A). This trend would be anticipated due to the confirmed presence of contaminated shallow PGW at this location. Over the 13 project years of the PGEPT, concentrations of TCE, the primary VOC in soil vapor, trend downward in the monitoring zones at 7.5, 52.5, 102.5, and 137.5 ft bgs (Table 3.4, Table 3.5, Figure 4.1). Concentrations of chloroform trend downward in the upper three monitoring zones of MSVM well 600-SGW-05 and are relatively stable in the lowest soil vapor monitoring zone. Soil vapor chemical analytical data from samples collected at 600-SGW-5 has statistically significantly declined over time for TCE in monitoring zones at all depths (Enclosure 3; Appendix A). PCE has been detected less than 55 percent of the time and is below the most conservative cleanup level (residential vapor intrusion screening levels [VISL] 1,390 µg/m^3) in all four monitoring zones in soil vapor at well 600-SGW-5.

NASA concludes that the presence of contaminated PGW with declining concentrations of the COCs beneath the Closure continues to contribute to overlying soil vapor in the vadose zone. The reduction in groundwater concentrations within the upgradient 200 Area that is hypothesized to source the 600 Area PGW have had an impact on declining COC concentrations in groundwater at well 600-G-138 and the soil vapor concentrations at well 600-SGW-5.

5.2 Future Reporting

For the purpose of streamlining reporting to NMED, the PGEPT interim status reporting requirement at well 600-G-138 will be discontinued following the submittal of the PGEPT – Project Year 13 report. Future groundwater data reporting for well 600-G-138 will be incorporated as a component of TMRP interim status reporting, which will commence following initiation of the Phase II TMRP project in fiscal year 2027. As approved by NMED, the first Phase II TMRP report will be submitted to NMED by August 31, 2028.

6.0 References

Adoption of 40 CFR Part 262, Environmental Improvement Board, 20.4.1.300 NMAC (12-1-18).

Cameron, Kirk. (2017, May 5). *Treating Non-Detects*. MacStat Consulting, Ltd. Colorado Springs, CO.

EPA. (2009, March). *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance*. Washington D.C.

EPA. (2015, October). *ProUCL Version 5.1 Technical Guide*. Washington D.C.

EPA. (2022, June 14). *ProUCL Version 5.2 Technical Guide*. Washington D.C.

Interstate Technology & Regulatory Council (ITRC). (2013, December). *Groundwater Statistics and Monitoring Compliance*. From www.itrcweb.org.

NASA Johnson Space Center White Sands Test Facility. (2008, March 7). *Submittal of Mid-plume Interception and Treatment System (MPITS) Interim Corrective Measures Work Plan (IMWP)*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility, (2011a, March 30). *NASA White Sands Test Facility (WSTF) 600 Area Closure Investigation Report Provided in Response to a NMED Notice of Disapproval*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2012a, June 14). *600 Area Closure Soil Vapor Extraction (SVE) Pilot Test Investigation Report*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2012b, November 13). *600 Area Perched Groundwater Extraction Pilot Test Work Plan*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2013, February 22). *Request for Extension of Time for Implementation of Perched Groundwater Extraction Pilot Test at NASA WSTF 600 Area*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2014, April 17). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2015a, April 16). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report - Project Year 2*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2015b, November 25). *Additional Work Plan Requirement to Evaluate Potential Source of 600 Area Contamination*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2016a, April 14). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report - Project Year 3*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2016b, July 7). *Abbreviated Investigation Work Plan for the 600 Area Perched Groundwater*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2016c, December 22). *Response to Disapproval of Abbreviated Investigation Work Plan for 600 Area Perched Groundwater*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2017a, April 26). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report - Project Year 4*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2018a, May 3). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 5*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2018b, November 1). *Targeted Mobile Remediation Process Pilot Test Work Plan*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2019a, April 30). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 6*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2019b, August 7). *Request to Remove Electrical Resistivity Component of the 600 Area Perched Groundwater Geophysical Survey based on Geophysical Subcontractor Input Received during the Procurement Process*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2019c, November 26). *NASA White Sands Test Facility (WSTF) 600 Area Wastewater Lagoons Closure (SWMU 34) Investigation Report*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2019d, December 19). *Synopsis of the Findings of the 600 Area Closure Geophysical Seismic Refraction Tomography and Reflection Surveys with Revised Soil Boring Locations Submitted for NMED Approval*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2020a, May 26). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 7*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2021, April 29). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 8*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2022a, April 26). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 9*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2022b, June 29). *600 Area Perched Groundwater Investigation Report*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2023a, April 10). *Targeted Mobile Remediation Process (TMRP) Phase 2 Pilot Test Work Plan*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2023b, April 19). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 10*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2023c, April 25). *Targeted Mobile Remediation Process Pilot Test Work Plan, Phase 2.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2023d, November 27). *NASA White Sands Test Facility (WSTF) 600 Area Perched Groundwater Phase II Abbreviated Investigation Work Plan.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2023e, December 8). *Response to Approval with Modifications of NASA WSTF Groundwater Monitoring Plan Update for 2023.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2024a, April 29). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 11.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2024b, September 11). *NASA White Sands Test Facility (WSTF) 2024 Soil Vapor Risk Based Concentrations (RBCs) Memorandum.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2024c, December 13). *NASA White Sands Test Facility (WSTF) Corrective Action Projects; Proposal to Restructure Priorities and Schedule*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2025a, February 19). *PGEPT 2025 Transition to TMRP Reporting Proposal.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2025b, April 28). *600 Area Perched Groundwater Extraction Pilot Test Interim Status Report – Project Year 12.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2025c, April 29). *Request for Extension of Time for Submittal of 600 Area Perched Groundwater Phase II Investigation Report*. Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2025d, June 30). *NASA White Sands Test Facility (WSTF) 600 Area Perched Groundwater Phase IIa Status Report.* Las Cruces, NM.

NASA Johnson Space Center White Sands Test Facility. (2026, February 19). *NASA WSTF Periodic Monitoring Report – Fourth Quarter 2025.* Las Cruces, NM.

NMED Hazardous Waste Bureau. (2009, November 3). *Hazardous Waste Permit No. NM8800019434 (modified December 2019)*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2011a, June 9). *Approval with Modifications 600 Area Closure Investigation Report and 200/600 Area Soil Gas and Groundwater Data Evaluation Report*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2011b, October 28). *Approval with Modification 600 Area Closure Soil Vapor Extraction Pilot Test Work Plan*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2013a, January 16). *Approval 600 Area Perched Groundwater Extraction Pilot Test Work Plan*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2013b, March 1). *Approval Time Extension for Implementation of the Perched Groundwater Extraction Pilot Test at the 600 Area*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2014, August 14). *Approval with Modifications Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2015, July 15). *Approval with Modifications 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report - Project Year 2*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2016a, November 17). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 3*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2016b, November 30). *Disapproval Abbreviated Investigation Work Plan for 600 Area Perched Groundwater*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2017a, March 31). *Approval Abbreviated Investigation Work Plan for 600 Area Perched Groundwater*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2017b, September 15). *Approval with Modifications Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2018, August 17). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 5*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2019a, August 23). *Work Scope Modification Request Abbreviated Investigation Work Plan for 600 Area Perched Groundwater*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2019b, September 3). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 6*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2020, December 22). *Approval with Modifications 600 Area Closure Geophysical Survey Status Report*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2021a, May 6). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 7.* Santa Fe, NM.

NMED Hazardous Waste Bureau. (2021b, December 8). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Year 8*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2023a, January 6). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 9*. Santa Fe, NM.

NMED Ground Water Quality Bureau. (2023b, May 17). *Discharge Permit Renewal and Invoice, DP-1255, NASA White Sands Test Facility, Plume Front Treatment System (PFTS) and Mid-plume Interception and Treatment System (MPITS).* Santa Fe, NM.

NMED Hazardous Waste Bureau. (2023c, June 28). *Approval with Modifications 600 Area Perched Groundwater Investigation Report.* Santa Fe, NM.

NMED Hazardous Waste Bureau. (2023d, November 1). *Approval with Modifications White Sands Test Facility Groundwater Monitoring Plan.* Santa Fe, NM.

NMED Hazardous Waste Bureau. (2024a, March 7). *Approval of the Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 10*. Santa Fe, NM.

NMED Hazardous Waste Bureau. (2024b, May 15). *Approval Targeted Mobile Remediation Process Phase 2 Pilot Test Work Plan.* Santa Fe, NM.

NMED Hazardous Waste Bureau. (2024c, November 5). *Approval Interim Status Report for 600 Area Perched Groundwater Extraction Pilot Test Project Year 11.* Santa Fe, NM.

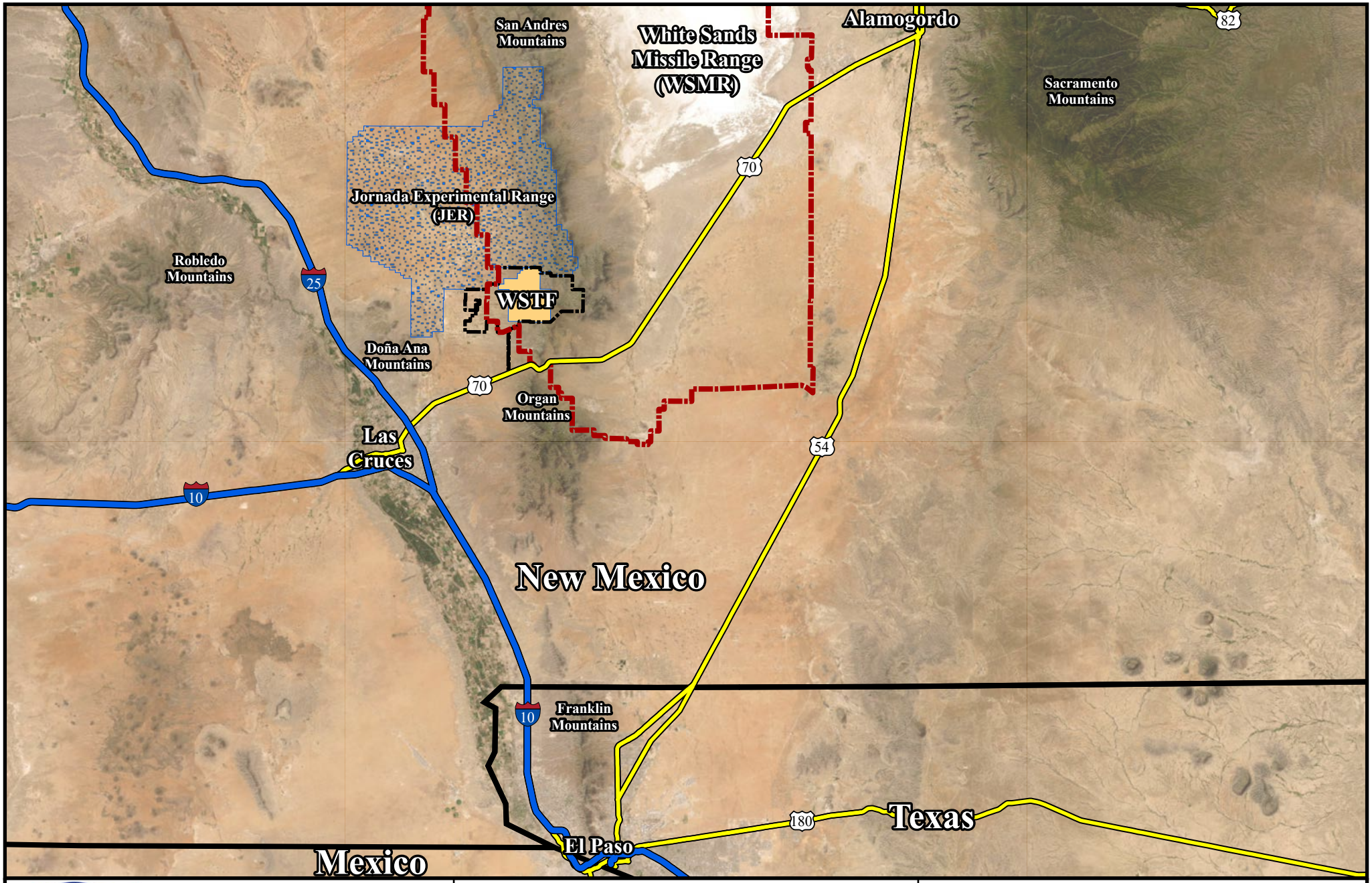
NMED Hazardous Waste Bureau. (2024d, November 5). *Approval 600 Area Perched Groundwater Phase II Abbreviated Investigation Work Plan.* Santa Fe, NM.

NMED Hazardous Waste Bureau. (2025, November 17). *Approval with Comments 600 Area Perched Groundwater Extraction Pilot Test (PGEPT) Annual Reporting into Projected Targeted Mobile Remediation Process (TMRP) Annual Reporting.* Santa Fe, NM.

Figures

Figure 1.1 **WSTF Location Map**

SEE NEXT PAGE



N
W E
S

1:750,000

April 2026

0 6 12 24 Miles

- WSMR Boundary
- WSTF Boundary
- Jornada Experimental Range (JER)
- WSTF Industrial Area

WSTF Location Map

NASA Johnson Space Center
White Sands Test Facility
Las Cruces, New Mexico

Coordinate System:
NAD 1983 StatePlane New Mexico Central FIPS 3002 Feet

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Figure 1.2 **Map of 600 Area Closure**

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N
W E
S

April 2026

0 75 150 300 450 Feet

- Conventional Monitoring Well
- Multiport Monitoring Well
- Perched Monitoring Well
- Exploration Well
- Extraction Well
- Injection Well
- Piezometer
- Production Well
- MSVGM Well
- Soil Vapor Well
- Soil Vapor Extraction Well
- Abandoned Phase 1 Perched Groundwater Boring
- Perched Groundwater Identified
- RCRA Area
- Post Closure Care
- Fault, Uncertain
- Fault

600 Area Closure Perched Groundwater Project Area

NASA Johnson Space Center
White Sands Test Facility Las Cruces, New Mexico

G:\Projects\environmental\600AreaProjects\600_PerchedGW\PhaseIIa

Coordinate System: NAD 1983 StatePlane New Mexico Central FIPS 3002 Feet

Figure 3.1 **Rainfall in Inches During PGW Pilot Study**

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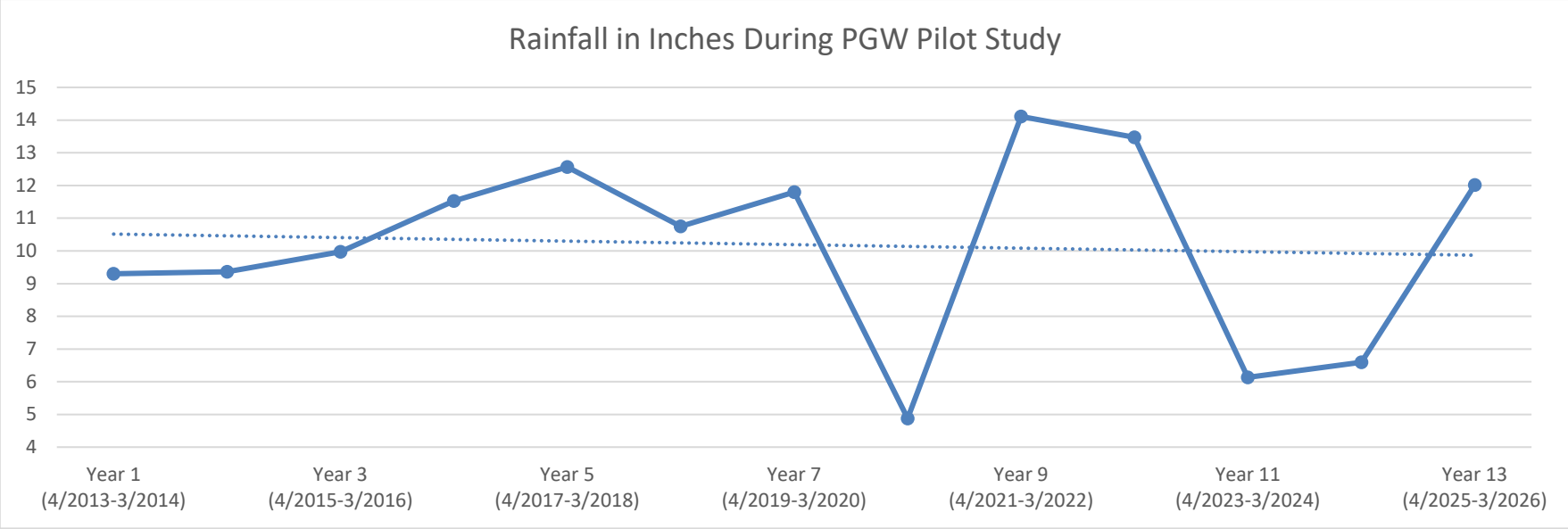

Rainfall in Inches During PGW Pilot Study
15
14
13
12
11
10
9
8
7
6
5
4
Year 1 (4/2013-3/2014)
Year 3 (4/2015-3/2016)
Year 5 (4/2017-3/2018)
Year 7 (4/2019-3/2020)
Year 9 (4/2021-3/2022)
Year 11 (4/2023-3/2024)
Year 13 (4/2025-3/2026)

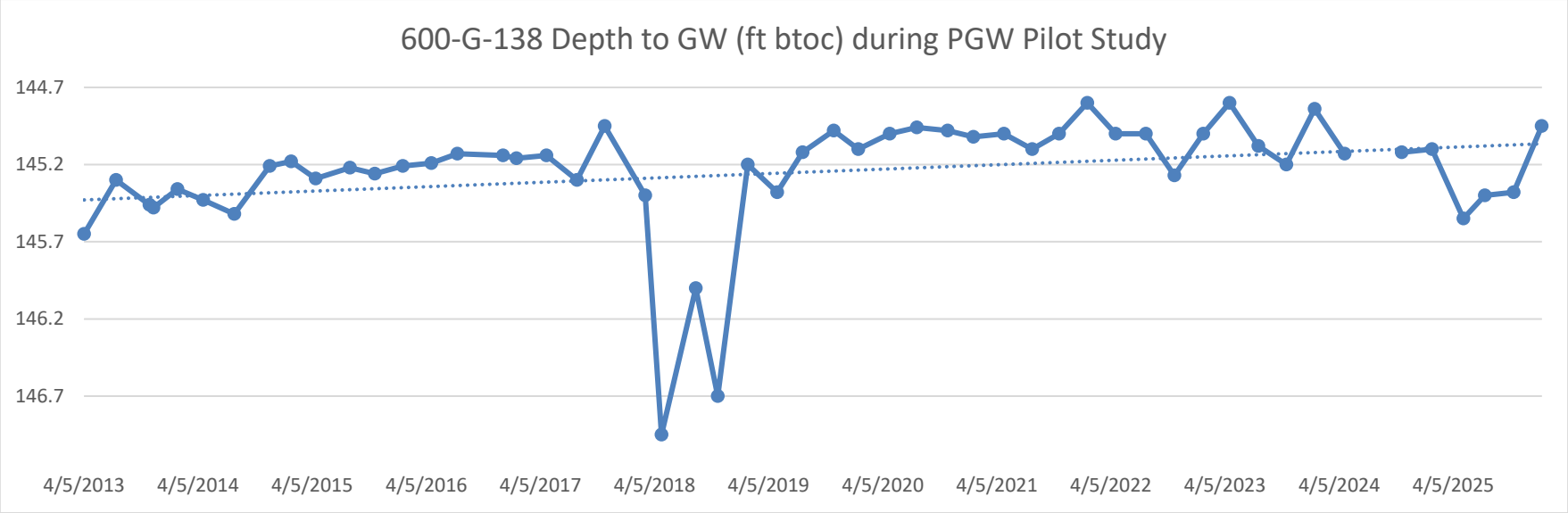
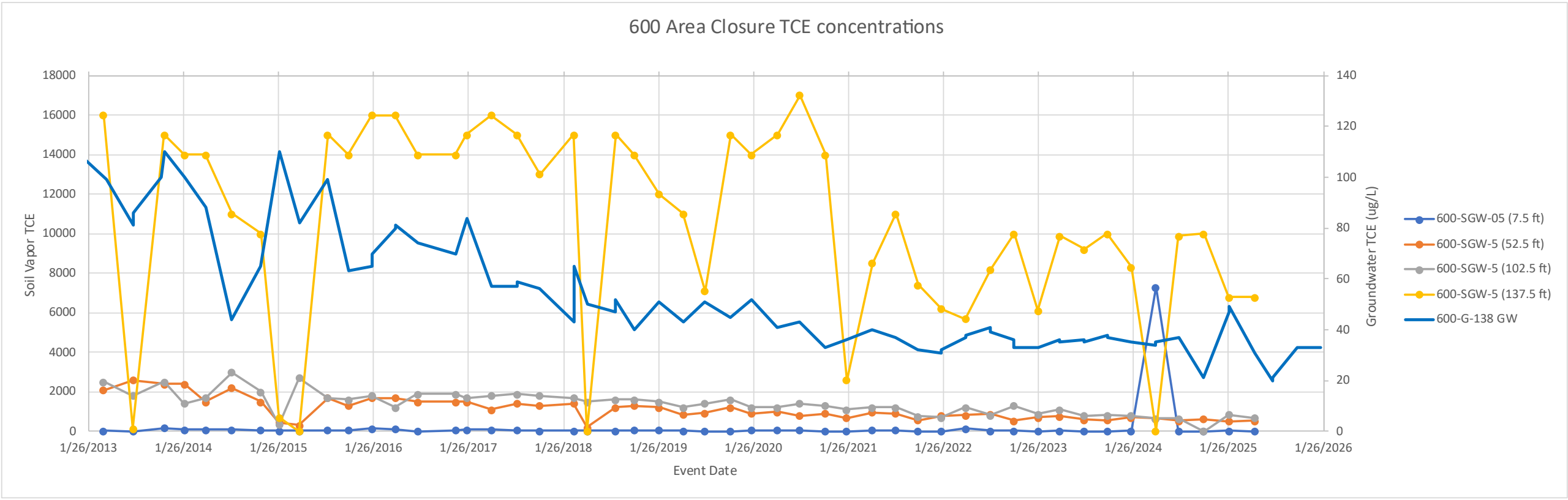
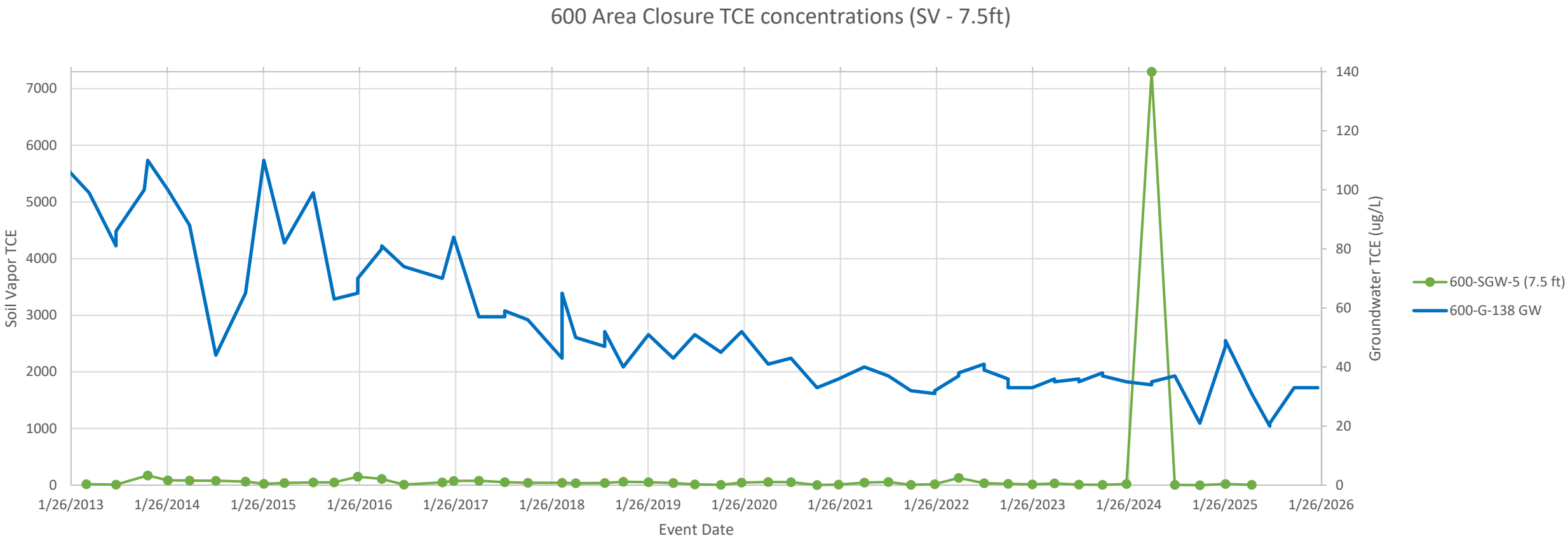
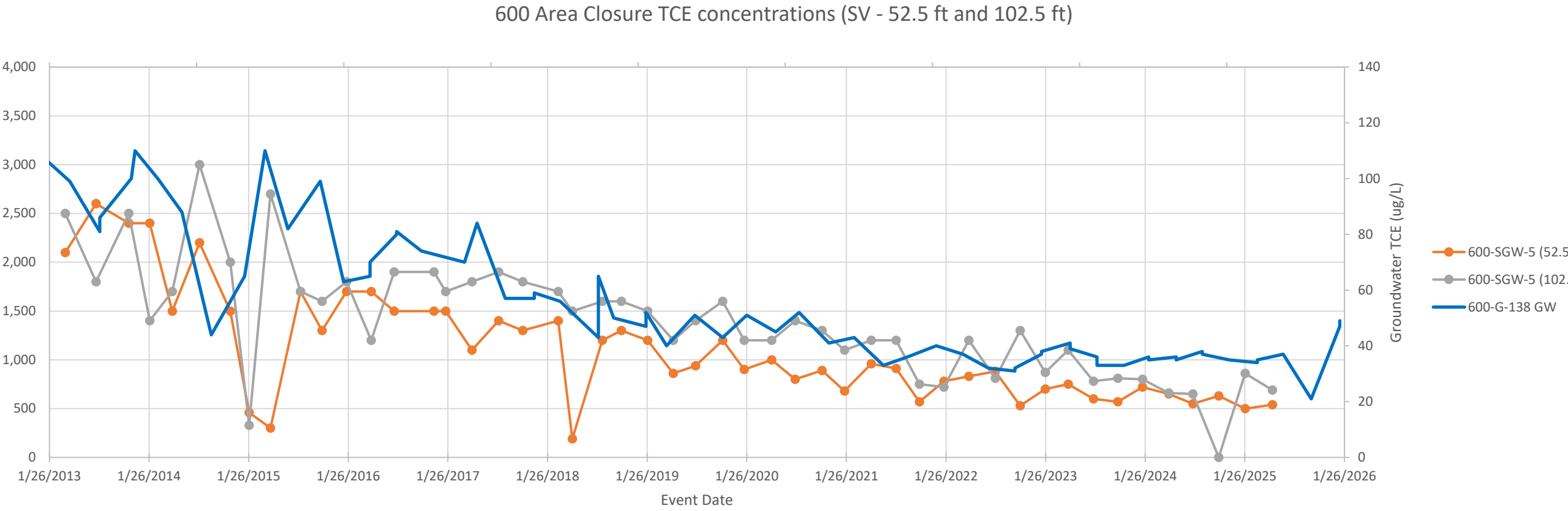

600-G-138 Depth to GW (ft btoc) during PGW Pilot Study
144.7
145.2
145.7
146.2
146.7
4/5/2013
4/5/2014
4/5/2015
4/5/2016
4/5/2017
4/5/2018
4/5/2019
4/5/2020
4/5/2021
4/5/2022
4/5/2023
4/5/2024
4/5/2025

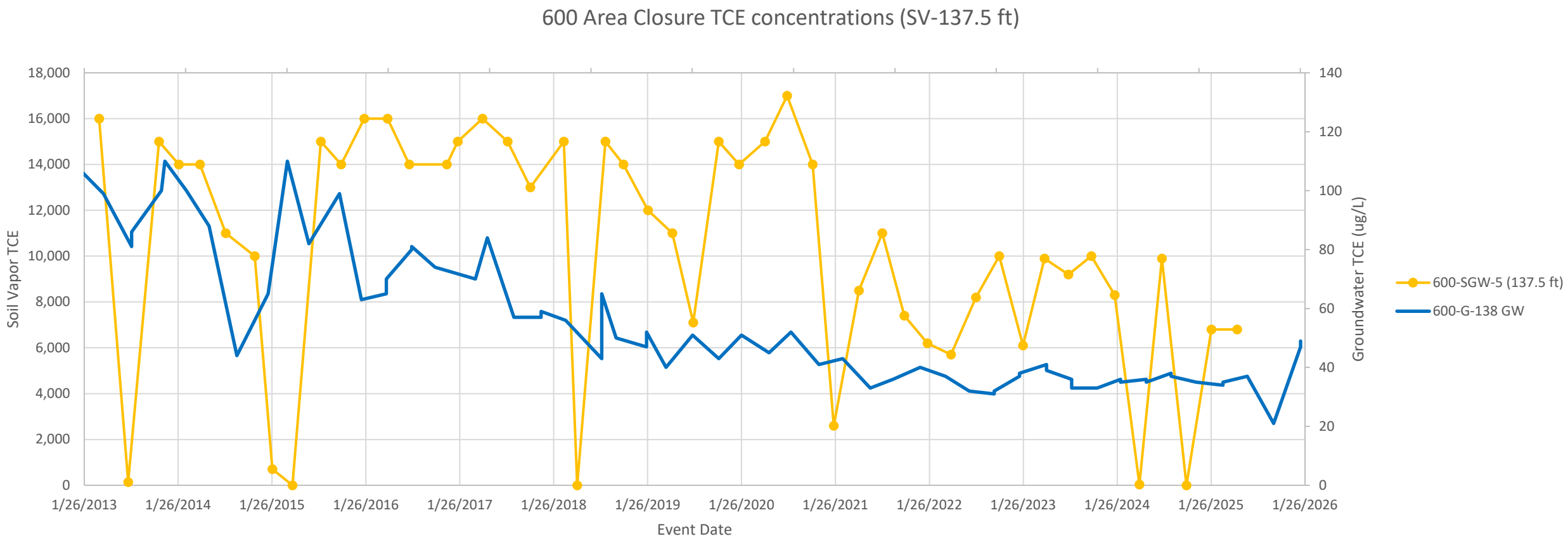
Figure 4.1 **600 Area Closure TCE Concentrations**

SEE NEXT PAGE


600 Area Closure TCE concentrations
Soil Vapor TCE
Groundwater TCE (ug/L)
Event Date
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
140
120
100
80
60
40
20
0
1/26/2013
1/26/2014
1/26/2015
1/26/2016
1/26/2017
1/26/2018
1/26/2019
1/26/2020
1/26/2021
1/26/2022
1/26/2023
1/26/2024
1/26/2025
1/26/2026
600-SGW-05 (7.5 ft)
600-SGW-5 (52.5 ft)
600-SGW-5 (102.5 ft)
600-SGW-5 (137.5 ft)
600-G-138 GW


600 Area Closure TCE concentrations (SV - 7.5ft)
Soil Vapor TCE
Groundwater TCE (ug/L)
Event Date
7000
6000
5000
4000
3000
2000
1000
0
140
120
100
80
60
40
20
0
1/26/2013
1/26/2014
1/26/2015
1/26/2016
1/26/2017
1/26/2018
1/26/2019
1/26/2020
1/26/2021
1/26/2022
1/26/2023
1/26/2024
1/26/2025
1/26/2026
600-SGW-5 (7.5 ft)
600-G-138 GW


600 Area Closure TCE concentrations (SV - 52.5 ft and 102.5 ft)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
140
120
100
80
60
40
20
0
Groundwater TCE (ug/L)
1/26/2013
1/26/2014
1/26/2015
1/26/2016
1/26/2017
1/26/2018
1/26/2019
1/26/2020
1/26/2021
1/26/2022
1/26/2023
1/26/2024
1/26/2025
1/26/2026
Event Date
600-SGW-5 (52.5
600-SGW-5 (102.
600-G-138 GW


600 Area Closure TCE concentrations (SV-137.5 ft)
Soil Vapor TCE
Groundwater TCE (ug/L)
Event Date
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
140
120
100
80
60
40
20
0
1/26/2013
1/26/2014
1/26/2015
1/26/2016
1/26/2017
1/26/2018
1/26/2019
1/26/2020
1/26/2021
1/26/2022
1/26/2023
1/26/2024
1/26/2025
1/26/2026
600-SGW-5 (137.5 ft)
600-G-138 GW

Tables

Table 2.1 WSTF Rainfall (inches) Recorded at the 700 Area Landfill

	Project Year 1 (4/2013-3/2014)	Project Year 2 (4/2014-3/2015)	Project Year 3 (4/2015-3/2016)	Project Year 4 (4/2016-3/2017)	Project Year 5 (4/2017-3/2018)	Project Year 6 (4/2018-3/2019)	Project Year 7 (4/2019-3/2020)	Project Year 8 (4/2020-3/2021)	Project Year 9 (4/2021-3/2022)	Project Year 10 (4/2022-3/2023)	Project Year 11 (4/2023-3/2024)	Project Year 12 (4/2024-3/2025)	Project Year 13 (4/2025-3/2026)
April	0.00	0.00	0.68	0.50	0.00	0.00	0.34	0.00	0.11	0.00	0.00	0.12	0.10
May	0.00	0.00	1.31	0.35	0.59	0.00	0.17	0.00	0.00	0.00	0.59	0.00	0.11
June	0.00	0.00	0.15	0.97	0.52	0.63	1.28	0.64	1.36	1.63	0.02	0.17	0.87
July	4.37	1.33	2.60	0.20	3.44	2.27	0.13	2.14	5.48	1.47	0.95	3.17	4.11
August	1.94	2.74	0.96	2.99	5.35	0.52	1.71	0.36	4.49	4.77	1.36	1.24	1.11
September	2.45	2.71	0.75	1.50	0.36	1.51	0.84	0.86	0.85	1.40	0.55	0.00	2.77
October	0.00	0.00	1.44	0.09	0.24	3.68	1.29	0.32	0.21	2.50	0.40	0.45	0.31
November	0.02	0.51	1.36	0.66	0.37	0.05	1.82	0.04	0.38	0.03	0.21	1.38	0.69
December	0.12	0.08	0.28	0.05	0.14	1.12	0.48	0.21	0.00	0.40	0.75	0.00	0.24
January	0.00	0.83	0.44	2.92	0.09	0.12	0.16	0.14	0.60	0.99	0.58	0.07	1.71
February	0.00	0.71	0.00	1.17	1.43	0.04	1.20	0.12	0.10	0.22	0.68	0.00	0.00
March	0.40	0.45	0.00	0.13	0.04	0.81	2.38	0.05	0.53	0.06	0.04	0.00	0.00
Total Rainfall per Project Year	**9.30**	**9.36**	**9.97**	**11.53**	**12.57**	**10.75**	**11.80**	**4.88**	**14.11**	**13.47**	**6.13**	**6.60**	**12.02**

Table 3.1 Groundwater Indicator Parameters Measured at 600-G-138

	Date	DTW (ft btoc)		pH		Conductivity (µS/cm)		Temperature (°C)		Turbidity (NTU)	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
Project Year 1	4/5/2013	145.65	NA	7.63	7.71	2,120	2,110	21.3	22.8	5.73	4.53
	7/16/2013	145.3	NA	6.96	6.94	2,180	2,210	20.8	20.7	0.89	0.96
	10/31/2013	145.46	NA	7.70	7.76	1,959	1,975	20.8	20.2	1.62	13.3
	11/13/2013	145.48	NA	7.68	7.81	2,270	2,320	19.3	19.8	1.59	1.30
	1/29/2014	145.36	NA	7.18	7.26	1,849	1,837	19.5	19.6	18	17.2
Project Year 2	4/21/2014	145.43	148.12	7.54	7.37	897	913	21.2	21.5	0.98	0.67
	7/30/2014	145.52	147.50	6.71	6.76	2,200	2,220	28.4	28.1	5.81	4.65
	11/20/2014	145.21	147.87	8.49	8.31	2,200	2,240	18.3	18.1	2.51	1.71
	1/28/2015	145.18	147.93	8.29	8.16	1,936	1,922	21.0	21.3	0.68	1.00
Project Year 3	4/16/2015	145.29	147.81	7.58	7.67	1,941	1,959	23.3	23.6	7.45	6.13
	8/4/2015	145.22	147.89	8.19	8.07	1,915	1,928	28.1	27.9	1.96	1.10
	10/22/2015	145.26	147.85	7.66	7.58	1,896	1,909	19.0	19.4	1.10	1.18
	1/20/2016	145.21	148.00	8.25	8.36	1,856	1,844	18.7	18.6	1.75	0.93
Project Year 4	4/20/2016	145.19	147.48	7.61	7.57	1,867	1,873	18.9	17.1	1.54	1.49
	7/13/2016	145.13	147.68	7.23	7.38	1,922	1,908	26.2	26.5	0.93	0.74
	12/6/2016	145.14	146.85	8.41	8.3	2,080	2,140	17.4	18.0	6.67	4.80
	1/18/2017	145.16	147.63	7.74	7.64	2,000	2,020	16.2	16.5	0.98	0.80

	Date	DTW (ft btoc)		pH		Conductivity (µS/cm)		Temperature (°C)		Turbidity (NTU)	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
Project Year 5	4/24/2017	145.14	147.22	7.50	7.38	1,861	1,890	27.4	26.8	5.78	2.90
	7/31/2017	145.30	147.64	7.52	7.70	1,843	1,851	26.7	27.3	2.46	2.35
	10/27/2017	144.95	147.33	7.10	6.86	1,774	1,791	17.6	17.9	2.35	1.94
	3/6/2018	145.40	146.57	7.84	7.70	1,840	1,852	21.6	21.9	3.23	2.89
Project Year 6	4/27/2018	146.95	NR	8.27	8.11	1,850	1,868	19.6	19.4	2.42	2.02
	8/15/2018	146.00	147.67	7.02	6.97	1,873	1,876	26.4	26.3	3.45	3.62
	10/24/2018	146.70	NR	7.65	7.78	1,920	1,911	19.9	20.4	28.6	26.4
	1/28/2019	145.20	147.48	7.28	7.35	1,647	1,652	21.7	21.7	8.56	9.02
Project Year 7	5/2/2019	145.38	147.96	7.74	7.62	1728	1750	23.2	23.8	14.7	8.6
	7/23/2019	145.12	147.13	7.58	7.51	1769	1780	20.1	19.8	2.67	1.94
	10/30/2019	144.98	145.16	7.5	7.43	1704	1692	19.6	19.4	3.74	2.75
	1/17/2020	145.10	145.47	7.87	7.68	1698	1709	14.4	14.9	1.98	1.4
Project Year 8	4/27/2020	145.00	146.12	7.70	7.63	1805	1815	23.0	23.2	2.51	1.94
	7/22/2020	144.96	145.38	7.65	7.49	1744	1765	22.4	22.7	1.79	1.48
	10/29/2020	144.98	145.50	7.59	7.41	1780	1750	20.8	21.0	1.17	1.13
	1/19/2021	145.02	145.36	8.00	7.91	1865	1876	18.3	18.0	13.20	11.80
Project Year 9	4/27/2021	145.00	145.61	7.76	7.68	2420	2440	20.1	19.8	17.6	8.75
	7/27/2021	145.10	147.10	7.81	7.90	1976	1964	23.5	23.4	13.10	10.20
	10/21/2021	145.00	145.60	7.85	7.95	1699	1714	18.6	18.8	1.71	1.64
	1/19/2022	144.80	145.27	7.82	7.94	1651	1658	20.9	21.2	4.23	3.13

	Date	DTW (ft btoc)		pH		Conductivity (µS/cm)		Temperature (°C)		Turbidity (NTU)	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
Project Year 10	4/20/2022	145.00	145.00	7.73	7.58	2260	2260	18.2	18.8	0.59	1.49
	7/26/2022	145.00	145.19	7.75	7.70	2130	2130	22.5	23.1	0.70	0.74
	10/25/2022	145.27	145.35	7.85	7.92	1972	1979	20.4	20.6	1.57	1.34
	1/25/2023	145.00	144.90	8.12	8.33	1653	1633	17.0	16.8	1.35	5.86
Project Year 11	4/19/2023	144.80	146.40	7.94	7.87	1683	1702	20.3	20.1	1.88	2.12
	7/21/2023	145.08	145.33	7.94	8.01	1963	1960	25.2	25.4	3.77	2.94
	10/18/2023	145.20	145.38	7.92	7.99	1813	1819	19.5	19.7	1.37	1.23
	1/17/2024	144.84	145.08	8.38	8.46	2430	2440	17.7	17.9	4.14	3.76
Project Year 12	4/22/2024	145.13	145.89	8.27	8.15	1792	1852	21.1	21.9	2.68	2.56
	7/19/2024	NR	NR	8.30	8.39	1857	1846	25.2	24.9	1.08	1.16
	10/22/2024	145.12	145.46	8.18	8.23	1895	1884	24.5	24.8	2.10	1.78
	1/27/2025	145.10	NR	8.87	NR	1840	NR	11.8	NR	NR	NR
Project Year 13	5/7/2025	145.55	145.73	8.65	8.70	1876	1891	19.8	20.3	4.16	2.92
	7/15/2025	145.40	145.60	7.54	7.52	2420	2380	25.2	24.9	2.10	1.96
	10/15/2025	145.38	145.76	7.42	7.36	1510	1503	23.5	23.0	1.67	1.53
	1/13/2026	144.95	145.79	7.97	8.03	1590	1587	20.1	20.3	3.78	4.52

Notes:
Well 600-G-138 top of casing stickup = 1.98 ft above ground surface.
NR = Not Recorded.

Table 3.2 Volume of Perched Groundwater Extracted from 600-G-138 (gallons)

	Project Year 1 (4/2013-3/2014)	Project Year 2 (4/2014-3/2015)	Project Year 3 (4/2015-3/2016)	Project Year 4 (4/2016-3/2017)	Project Year 5 (4/2017-3/2018)	Project Year 6 (4/2018-3/2019)	Project Year 7 (4/2019-3/2020)	Project Year 8 (4/2020-3/2021)	Project Year 9 (4/2021-3/2022)	Project Year 10 (4/2022-3/2023)	Project Year 11 (4/2023-3/2024)	Project Year 12 (4/2024-3/2025)	Project Year 13 (4/2025-3/2026)
April	85	191	132	208	125	188	217	201	210	100	98	197	253
May	319	197	161	249	207	48	172	195	191	175	156	244	144
June	255	283	201	219	194	0	86	246	238	167	130	164	88
July	146	285	271	167	166	0	0	227	182	135	78	212	81
August	142	275	210	230	158	42	0	267	222	205	194	238	0[1]
September	65	199	226	149	205	161	0	235	135	154	196	165	0[1]
October	29	236	179	171	250	229	0	180	223	168	72	241	0[1]
November	74	197	155	144	0	120	69	186	230	117	120	169	0[1]
December	76	203	120	91	0	151	140	172	283	133	195	95	0[1]
January	215	164	141	130	0	115	158	101	27	72	148	89	0[1]
February	170	164	143	182	0	174	104	183	110	83	210	196	0[1]
March	294	216	205	140	203	198	218	180	229	163	185	217	0[1]
Total Extracted per Year	**1,870**	**2,610**	**2,144**	**2,080**	**1,508**	**1,426**	**1,164**	**2,373**	**2,280**	**1,672**	**1,782**	**2,227**	**566**
Cumulative Total	**1,870**	**4,480**	**6,624**	**8,704**	**10,212**	**11,638**	**12,802**	**15,175**	**17,455**	**19,127**	**20,909**	**23,136**	**23,702**

Notes:

[1] = PGW extraction placed on hold on July 15, 2025, due to the approved transition to TMRP reporting following PGEPT Year 12 (NASA, 2025b; NMED, 2025) and based on NASA's proposal to restructure priorities and schedule for corrective action (NASA, 2024c). Resumed extraction through TMRP Phase II initiation is scheduled for fiscal year 2027.

Table 3.3 Summary of Groundwater Chemical Analytical Results at 600-G-138

	Date	TCE (µg/L)	PCE (µg/L)	Chloroform (µg/L)	NDMA (µg/L)	NO2/NO3 (mg/L)	Chloride (mg/L)
Project Year 1	4/5/2013	**99**	<0.3	0.63 J	<0.0044	**12.3**	266
	7/16/2013	**81/86**	<0.3/<0.3	0.5/0.54 J	<0.0044	**13.5**	281
	10/31/2013	**100**	<0.3	0.73 J	**<0.019**	**12.9**	292
	11/13/2013	**110**	<0.3	0.68 J	+	+	+
	1/29/2014	**100/100**	<0.3/<0.3	0.61/0.65 J	**<0.019**	**12**	238
Project Year 2	4/21/2014	**88**	<0.3	0.61 J	<0.0047	**12**	242
	7/30/2014	**44**	<0.3	0.51 J	NA	**12.8**	265
	11/20/2014	**65**	<0.3	0.56 J	NA	**12.6**	282
	1/28/2015	**110**	<0.3	0.83 J	NA	**11.3**	221
Project Year 3	4/16/2015	**82**	<0.3	0.54 J	**<0.019**	**11.8**	226
	8/4/2015	**99**	<0.3	0.77 J	NA	**11.2**	238
	10/22/2015	**63/63**	<0.3/<0.3	0.7/0.64 J	NA	**11.1**	233
	1/20/2016	**65/70**	<0.3/<0.3	0.7/0.73 J	NA	**10.1**	232
Project Year 4	4/20/2016	**80/81**	<0.3/<0.3	0.67/0.76 J	<0.0048	**11.2**	214
	7/13/2016	**74**	<0.3	0.72 J	NA	**11.4**	238
	12/6/2016	**70**	<0.3	0.6 J	NA	**11.3**	253
	1/18/2017	**84**	<0.3	0.68 J	NA	9.98	251/249
Project Year 5	4/24/2017	**57**	<0.3	0.65 J	**<0.0097**	**12**	241
	7/31/2017	**57/59**	<0.3/<0.3	0.81/0.74 J	NA	**12.5**	141
	10/27/2017	**56**	<0.3	0.65 J	NA	6.81	169
	3/6/2018	**63/65**	<0.3/<0.3	0.77/0.65 J	NA	**11**	205

	Date	TCE (µg/L)	PCE (µg/L)	Chloroform (µg/L)	NDMA (µg/L)	NO2/NO3 (mg/L)	Chloride (mg/L)
Project Year 6	4/27/2018	**50**	<0.3	0.83 J	<0.0048	**11.1**	207
	8/15/2018	**47/52**	<0.28/<0.28	1.2/1.2	NA	**10.2**	236
	10/24/2018	**40**	<0.28	0.57 J	NA	**10.6**	212
	1/28/2019	**51**	<0.28	0.71 J	NA	**10.8**	164
Project Year 7	5/2/2019	**43**	<0.21	0.58 J	**<0.019**	**10.7**	171
	7/23/2019	**51**	<0.21	0.63 J	NA	**11.9**	177
	10/30/2019	**45**	<0.21	0.47 J	NA	9.09	214
	1/17/2020	**52**	<0.21	0.68 J	NA	**10.2**	185/182
Project Year 8	4/27/2020	**41**	<0.21	0.64 J	<0.0048	9.43	182
	7/22/2020	**43**	<0.21	0.45 J	NA	**12.3**	179
	10/29/2020	**33**	<0.21	0.27 J	NA	**11.1**	168
	1/19/2021	**36**	<0.21	0.50 J	NA	**11.0**	173
Project Year 9	4/27/2021	**40**	<0.21	0.51 J	**<0.1**	**11.5**	205
	7/27/2021	**37**	<0.21	0.26 J	NA	**12.4**	221
	10/21/2021	**32**	<0.21	0.52 J	NA	9.43	161
	1/19/2022	**31/32**	<0.21/<0.21	0.27/0.28 J	NA	**11.2**	166
Project Year 10	4/20/2022	**37/38**	<0.21/<0.21	<0.24/<0.24	<0.0047	**11.2**	177
	7/26/2022	**41/39**	<0.21/<0.21	0.48 J/0.48 J	NA	**11.8**	188
	10/25/2022	**36/33**	<0.21/<0.21	0.60 J/0.52 J	NA	**10.9**	159
	1/25/2023	**33**	<0.21	<0.51	NA	5.32	137
	4/19/2023	**36/35**	<0.21/<0.21	0.57/<0.51	<0.0048	**10.4**	171

	Date	TCE (µg/L)	PCE (µg/L)	Chloroform (µg/L)	NDMA (µg/L)	NO2/NO3 (mg/L)	Chloride (mg/L)
Project Year 11	7/21/2023	**36/35**	<0.21/<0.21	0.52/0.57	NA	**12.3**	170
	10/18/2023	**38/37**	<0.21/<0.21	<0.51/<0.51	NA	**11.0**	191
	1/17/2024	**35**	<0.21	<0.51	NA	**11.9**	204
Project Year 12	4/22/2024	**34/35**	<0.21/<0.21	0.53/0.58	NA	**11.9**	200
	7/19/2024	**37/37**	<0.21/<0.21	0.63/0.63	NA	**10.8**	245
	10/22/2024	**21**	<0.21	<0.51	NA	**11.4**	196
	1/27/2025	**47/49**	<0.21/<0.21	0.59/0.64	NA	**10.9**	181
Project Year 13	5/7/2025	**31/31**	<0.21/<0.21	<0.51/<0.51	<0.0048	**12.6**	203
	7/15/2025	**21/20**	<0.21/<0.21	<0.51/<0.51	NA	**12.5**	201
	10/15/2025	**33**	<0.21	0.70	NA	9.49	131
	1/13/2026	**35/33**	<0.21/<0.21	0.75/0.71	NA	9.53	**329**

Note: Two values in the results column indicate that a field duplicate sample was collected, analyzed, and presented as the second result.

J – Indicates the result is an estimated value less than the quantitation limit, but greater than or equal to the detection limit.

NA – Indicates that the analyte was not monitored for the event. NDMA samples are collected annually in accordance with the approved GMP (NASA, 2023e; NMED, 2023d).

< – Indicates that the analyte was not detected above the detection limit.

+ – Indicates that samples were not collected for the specified analysis during this event. The 11/13/13 sampling event was performed in order to obtain results for VOCs that could be used in conjunction with soil vapor analytical results from sampling performed the same day. Additional results for NDMA, NO2/NO3, and chloride were not required for this comparison, so additional samples were not collected.

Groundwater cleanup levels: TCE 4.9 µg/L; PCE 5 µg/L; Chloroform 2.2 µg/L; NDMA 0.0049 µg/L; and Nitrite/Nitrate 10 mg/L (from the GMP; NASA, 2023e; NMED, 2023d); and chloride 250 mg/L (WQCC MCL).

Bold indicates exceedance of groundwater regulatory limit.

Table 3.4 Summary of Soil Vapor Chemical Analytical Results at 600-SGW-5 (all results in µg/m³)

WSTF RBC		**380**	**10,000**	**210**	**3,400**	**93,000**	**1,800**	**6,800**	**180,000**	**3,600**	**6,800**	**180,000**	**6,800**
Residential VISL_sg[1] NC/C		**69.5 / 147**	**1,390 / 3,600**		**3,410 / 40.7**	**---**	**---**		**---**	**---**	**---**	**---**	**---**
		600-SGW-5-7.5			**600-SGW-5-52.5**			**600-SGW-5-102.5**			**600-SGW-5-137.5**		
	Date	**TCE**	**PCE**	**Chloro-form**	**TCE**	**PCE**	**Chloro-form**	**TCE**	**PCE**	**Chloro-form**	**TCE**	**PCE**	**Chloro-form**
Project Year 1	3/25/13	17	<0.46	0.63 J	2,100	<14	88	2,500	<26	100 J	**16,000**	<460	<540
	7/16/13	8.7 FB	<0.54	<0.65	2,600 D	1.8 J	94 A	650/ 1,800 D	2.8/2.8	110/ 110 A	140	1.3 J FB	5.8 A
	11/13/13	170	<2.7	5.4 J	2,400	<14	100	2,500	<27	100	**15,000**	<380	<460
	1/29/14	85	<0.49	2.2	2,400	<7.1	90	1,400	<4.9	58	**14,000**	<64	110 J
Project Year 2	4/21/14	82	<1.6	3 J	1,500	<3.3	67	1,700 D	2.5 J	82	**14,000**	<410	<490
	7/30/14	77	6.1 FB	3.3	2,200	<9.4	99	3,000	<15	120	**11,000**	<210	<260
	11/20/14	65	<6.3	2.2 J	1,500	<12	72	2,000	<13	86	**10,000**	<350	<430
	1/28/15	25	<1.1	<1.4	460	<1.2	22	330	<2.3	15	710	<12	<14
Project Year 3	4/16/15	37	<2	<2.4	300[R]	<0.56[R]	13[R]	2,700[R]	<15[R]	110[R]	<1.9	<1.9	<2.3
	8/4/15	48	0.77 J FB	1.7 J	1,700 D	<4.4	85	1,700 D	<4.6	100	**13,000/ 15,000**	<45/ <92	120/ 140 J
	10/22/15	50	<0.71	1.5 J	1,300	<9	54	1,600	<3.8	68	**14,000**	<170	<210
	1/20/16	150	<0.57	5.4	1,600/ 1,700	<11/ <9	77/84	1,800	<15	81	**16,000**	<240	<290
Project Year 4	4/20/16	110/ 100	<1.2/ <1.1	4.2/3.9	1,700	<2.3	78	1,200	<2.1	54	**16,000 D**	<15	130
	7/13/16	11 FB	<0.57	<0.69	1,500	<2.4	82	1,900	<16	91	**14,000**	<490	<600
	12/6/16	49	<0.54	1.7 J	1,500	<4.4	73	1,900	<7.3	82	**12,000/ 14,000**	<380/ <340	<460/ <410
	1/18/17	75	10 FB	3.7 J	1,500	<9	76	1,700	<12	79	**15,000**	<370	<450

WSTF RBC		**380**	**10,000**	**210**	**3,400**	**93,000**	**1,800**	**6,800**	**180,000**	**3,600**	**6,800**	**180,000**	**6,800**
Residential VISL_sg[1] NC/C		**69.5 / 147**	**1,390 / 3,600**		**3,410 / 40.7**	**---**	**---**		**---**	**---**	**---**	**---**	**---**
		600-SGW-5-7.5			**600-SGW-5-52.5**			**600-SGW-5-102.5**			**600-SGW-5-137.5**		
	Date	**TCE**	**PCE**	**Chloro-form**	**TCE**	**PCE**	**Chloro-form**	**TCE**	**PCE**	**Chloro-form**	**TCE**	**PCE**	**Chloro-form**
Project Year 5	4/24/17	77	<0.59	3.0	1,100 D	16	84	1,800 D	2.6 J	86	**16,000/ 16,000**	<24/ <25	110/ 110
	7/31/17	54	<13	<16	1,200/ 1,400	<11/ <11	66/80	1,900	<12	98	**15,000**	<33	110 J
	10/27/17	43	2.5 FB	1.4 J	1,300	3.1 J	73	1,800	<15	87	**13,000**	<280	<340
	3/6/18	44	2.0 FB	1.3 J	1,400/ 1,400	<7/ <4.2	70/69	1,700	<14	87	**15,000**	<150	<180
Project Year 6	4/27/18	34	1.2 J FB	1.7 J	190	2.3	11	1,500	3.2 J	83	1.3 J FB	<0.55	0.67
	8/15/18	39	1.2 J FB	1.4 J	1,200	<2.3	59	1,600	<4	77	**15,000**	230 J	<150
	10/24/18	61	0.47 J FB	2.1	1,300	<2.4	65	1,600/ 1,600	<5.3/ <4.6	80/ 78	**14,000**	<120	<120
	1/28/19	53	<0.29	2.1	1,200	1.3 J	68	1,500	<3.7	79	**12,000**	<44	81 J
Project Year 7	5/2/19	40	0.95 J FB	1.6 J	860 D	2.9	57	1,200 D	2.1	69	**11,000**	<59	67 J
	7/23/19	14 FB	0.68 J FB	0.67 J	940 D	1.8 J	62	1,400 D	2.4	78	**7,100 D**	<6.1	74
	10/30/19	7 FB	3.4	0.36 J	1,200	<2.4	70	1,600	<4.4	86	**15,000**	<140	200 J
	1/17/20	45	<0.28	1.5 J	900 D	1.8 J	58	1,200 D	2.5	76	**14,000**	<49	87 J
Project Year 8	4/27/20	57	0.43 J	2.5	1,000	<2.8	54	1,200	<3	64	**15,000**	<36	91 J
	7/22/20	53	0.93 J	2.3	800 D	1.5 J	49	1,400 D	3.1 J	80	**17,000**	810 J	120 J
	10/29/20	2.3 FB	<0.3	<0.31	890	2.3 J	61	1,300	2.6 J	82	**14,000**	200 J	<130
	1/19/21	9.2	<0.27	0.52 J	680 D	1.5 J	56	1,100 D	2.0 J	78	2,600 D	0.95 J	24

WSTF RBC		380	10,000	210	3,400	93,000	1,800	6,800	180,000	3,600	6,800	180,000	6,800
Residential VISL_sg[1] NC/C		69.5 / 147	1,390 / 3,600		3,410 / 40.7	---	---		---	---	---	---	---
		600-SGW-5-7.5			600-SGW-5-52.5			600-SGW-5-102.5			600-SGW-5-137.5		
	Date	TCE	PCE	Chloro-form	TCE	PCE	Chloro-form	TCE	PCE	Chloro-form	TCE	PCE	Chloro-form
Project Year 9	4/27/21	47	2.7	2.4	960	<1.9*	56	1,200	<2.3*	67	**8,500**	19 J	67
	7/27/21	55	0.49 J	2.5	910 D	1.5 J	61	1,200 D	2.0 J	78	**11,000 D**	<7.5*	100
	10/21/21	7.4	1.2 J	0.36 J	570 D	1.1 J	35	750	1.5 J	54	**7,400**	<24*	59 J
	1/19/22	16	0.64 J	0.74 J	780	0.86 J	38	720	0.98 J	46	6,200	84 J	44 J
Project Year 10	4/20/22	130	<0.37	4.2 FB	830	<1.6	50 FB	1,200	<7.6	61 FB	5,700	<62	<64
	7/26/22	34	0.4 J	1.7 J	880	<2.4	56	810	2.7 J	51	**8,200**	<25	67
	10/25/22	25	0.71 J	1.0 J	530 D	2.5	28	1,300 D	3.0	62	**10,000**	<11	70 J
	1/25/23	14	<0.28	0.54 J	700 D	1.4 J	36	870 D	1.6 J	44	6,100	<7.7	92
Project Year 11	4/19/23	33	<0.30	<0.31	750	<1.3	47	1,100	<3.1	68	**9,900**	<12	<13
	7/21/23	11	<0.31	0.74 J	600 D	0.92 J	41	780 D	1.1 J	53	**9,200**	1,100	94 J
	10/18/23	6.3	<0.29	2.0 J RB	570	<1.4	40 J RB	810	2.2 J	94 J RB	**10,000**	670	20,000 J RB
	1/17/24	19	<0.27	1.0 J	720	<2.2	52	800	2.3 J	57	**8,300**	1,300	<110

WSTF RBC		380	10,000	210	3,400	93,000	1,800	6,800	180,000	3,600	6,800	180,000	6,800
Residential VISL_sg[1] NC/C		69.5 / 147	1,390 / 3,600		3,410 / 40.7	---	---		---	---	---	---	---
		600-SGW-5-7.5			600-SGW-5-52.5			600-SGW-5-102.5			600-SGW-5-137.5		
	Date	TCE	PCE	Chloro-form	TCE	PCE	Chloro-form	TCE	PCE	Chloro-form	TCE	PCE	Chloro-form
Project Year 12	4/22/24[2]	**7,300**	3.7	89	650	1.6	53	660	3.7	130	30	0.4	1.7
	7/19/24	6.4	0.54	0.48	550	1.5	44	650	1.6	55	**9,900**	<8.2	82
	10/22/24	<0.3	<0.28	<0.29	630	2.7	46	0.4	<0.3	<0.31	**10,000**	<7.8	73
	1/27/25	21	<0.28	<0.29	500	1.2	41	860	1.6	59	**6,800**	<59	<61
Project Year 13	5/7/25	5.1	<0.29	0.36	540	1.1	47	690	1.2	59	**6,800**	<17	60
	7/15/25	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	10/15/25	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	1/13/26	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
NC – Not collected, sampling placed on hold at time of corresponding groundwater sampling.
Two values in the results column indicate that a field duplicate sample was collected, analyzed, and presented as the second result.
A – Indicates that the result of an analyte for a laboratory control sample (LCS), initial calibration verification (ICV) or continuing calibration verification (CCV) was outside standard limits.
D – Indicates that the reported result is from a dilution.
FB – Indicates that the analyte was detected in the field blank.
J – Indicates that the result is an estimated value less than the quantitation limit, but greater than or equal to the detection limit.
RB – The analyte was detected in the method blank.
[R] – The result provided is from replacement samples collected on May 20, 2015.
* – Indicates that the analyte was reported as non-detect with an elevated detection limit and dilution factor.

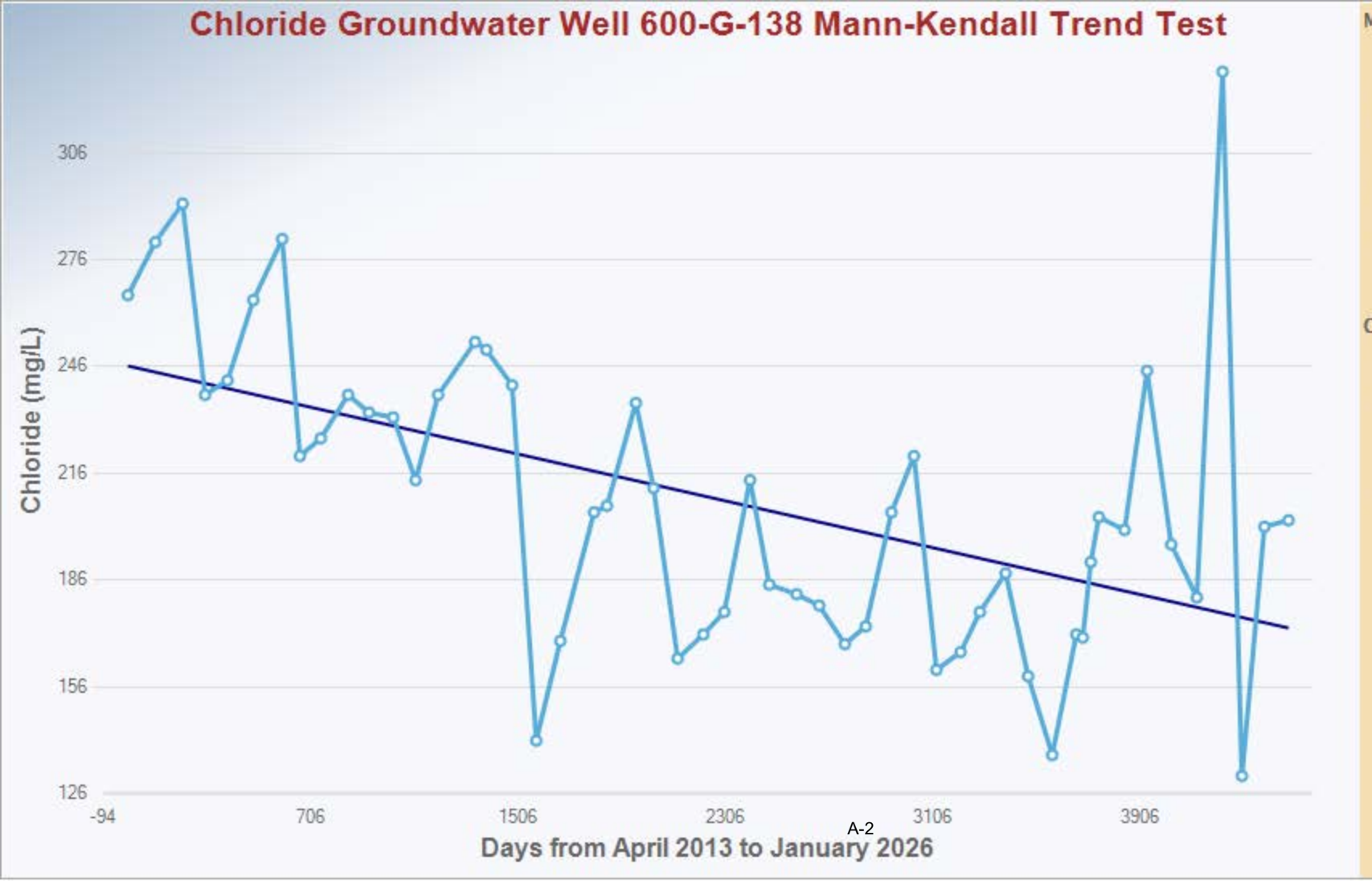
< – Indicates result is non-detect at reported detection limit.
[1] Residential VISL for soil vapor used. The values are listed as noncancer / cancer.
[2] The data for the 4/22/24 soil vapor sampling event for 600-SGW-5 represents an unconfirmed exceedance of the RBC for the 7.5-ft port. NASA suspects the 7.5-ft and 137.5-ft ports were transposed for the April 2024 event; however, QA reviews of the available records cannot confirm this. The dataset represents a single event outlier for the two ports relative to the 12-year duration of the PGEPT. If transposed, the results are representative of the historical values for all TO-15 analytes.
Bold indicates exceedance of current residential RBC in Table 3b (NASA, 2024b).

Table 3.5 Summary of Groundwater and Soil Vapor Statistics

Parameter	Outliers Removed	Distribution	OLS Trend	OLS *r*-Value	OLS *p*-Value	M-K Trend	M-K *S*-Value	Interpretation
Groundwater								
Chloride	None	Normal	Decreasing	-0.5216	0.0001	Decreasing	-524	Significant decreasing moderate trend
Chloroform	1.2	Normal	Decreasing	-0.3824	0.0051	Decreasing	-317	Significant decreasing mild trend
Nitrate/Nitrite	5.32, 6.81	Normal	Decreasing	-0.3070	0.0301	Decreasing	-248	Significant decreasing mild trend
Trichloroethene	None	Lognormal	NA	NA	0.0000	Decreasing	-1,004	Significant decreasing very strong trend
Soil Vapor (7.5 ft)								
Chloroform	89 and 3 high NDs (7.7, 16, and 31)	Gamma	NA	NA	0.0074	Decreasing	-266	Significant decreasing mild trend
Trichloroethene	7300, 170	Normal	Decreasing	-0.3941	0.0046	Decreasing	-422	Significant decreasing moderate trend
Soil Vapor (52.5 ft)								
Chloroform	None	Normal	Decreasing	-0.6012	0.0000	Decreasing	-683	Significant decreasing moderate trend
Trichloroethene	None	Gamma	NA	NA	0.0000	Decreasing	-815	Significant decreasing strong trend
Soil Vapor (102.5 ft)								
Chloroform	None	Normal	Decreasing	-0.4886	0.0004	Decreasing	-487	Significant decreasing moderate trend
Trichloroethene	None	Normal	Decreasing	-0.7660	0.0000	Decreasing	-805	Significant decreasing strong trend
Soil Vapor (137.5 ft)								
Chloroform	20,000 and 17 high NDs	Normal	Decreasing	-0.1325	0.4699	Decreasing	-84	Insufficient statistical evidence of a significant trend
Trichloroethene	None	Nonparametric	NA	NA	0.0008	Decreasing	-378	Significant decreasing mild trend

Notes:
ft – feet
M-K – Mann-Kendall
NA – Not applicable
OLS – Ordinary Least Squares Regression

Appendix A
Mann-Kendall Calculations



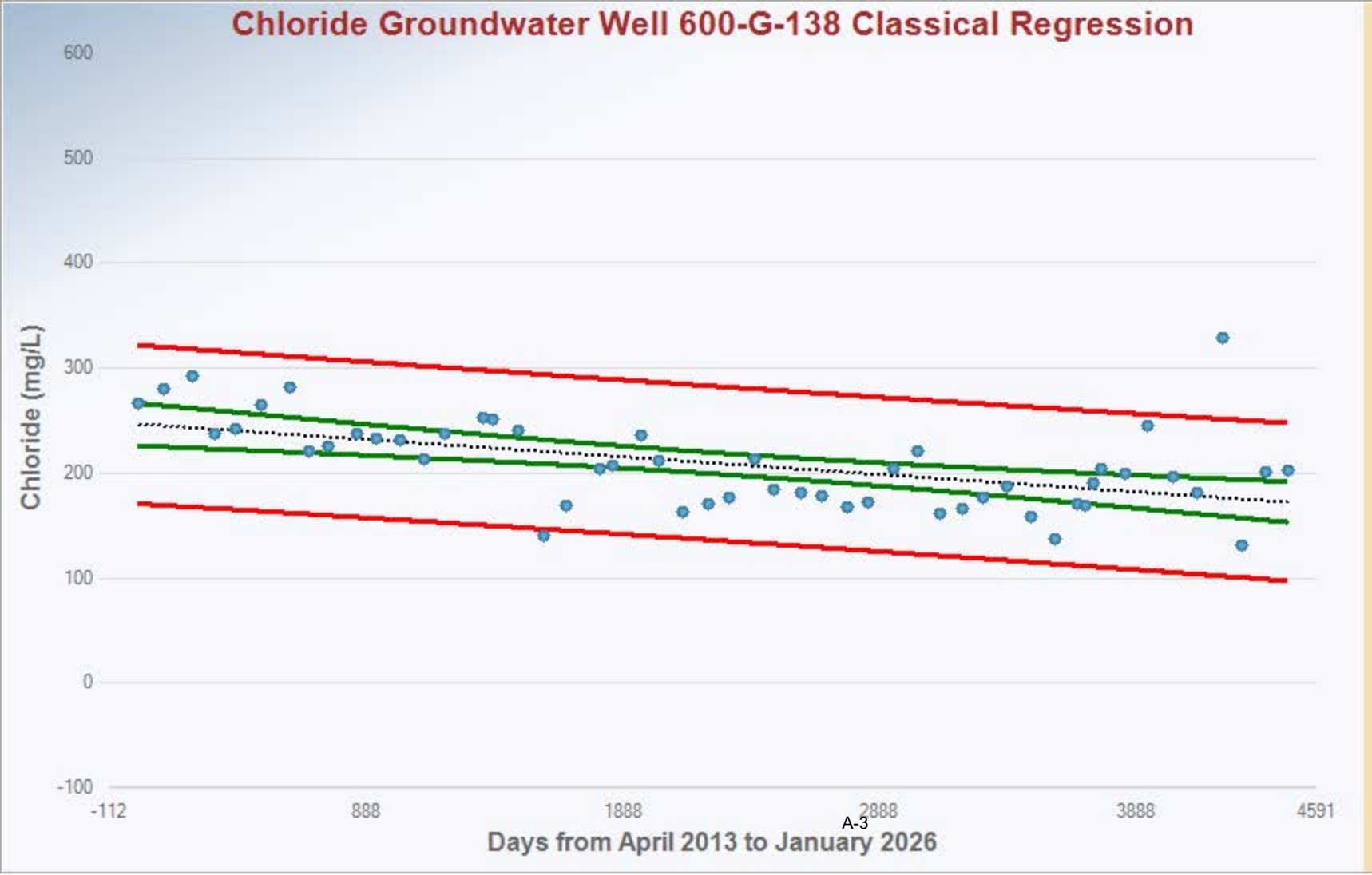
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6912
Standardized Value of S	-4.1281
M-K Test Value (S)	-524
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0165
OLS Regression Intercept	246.3891

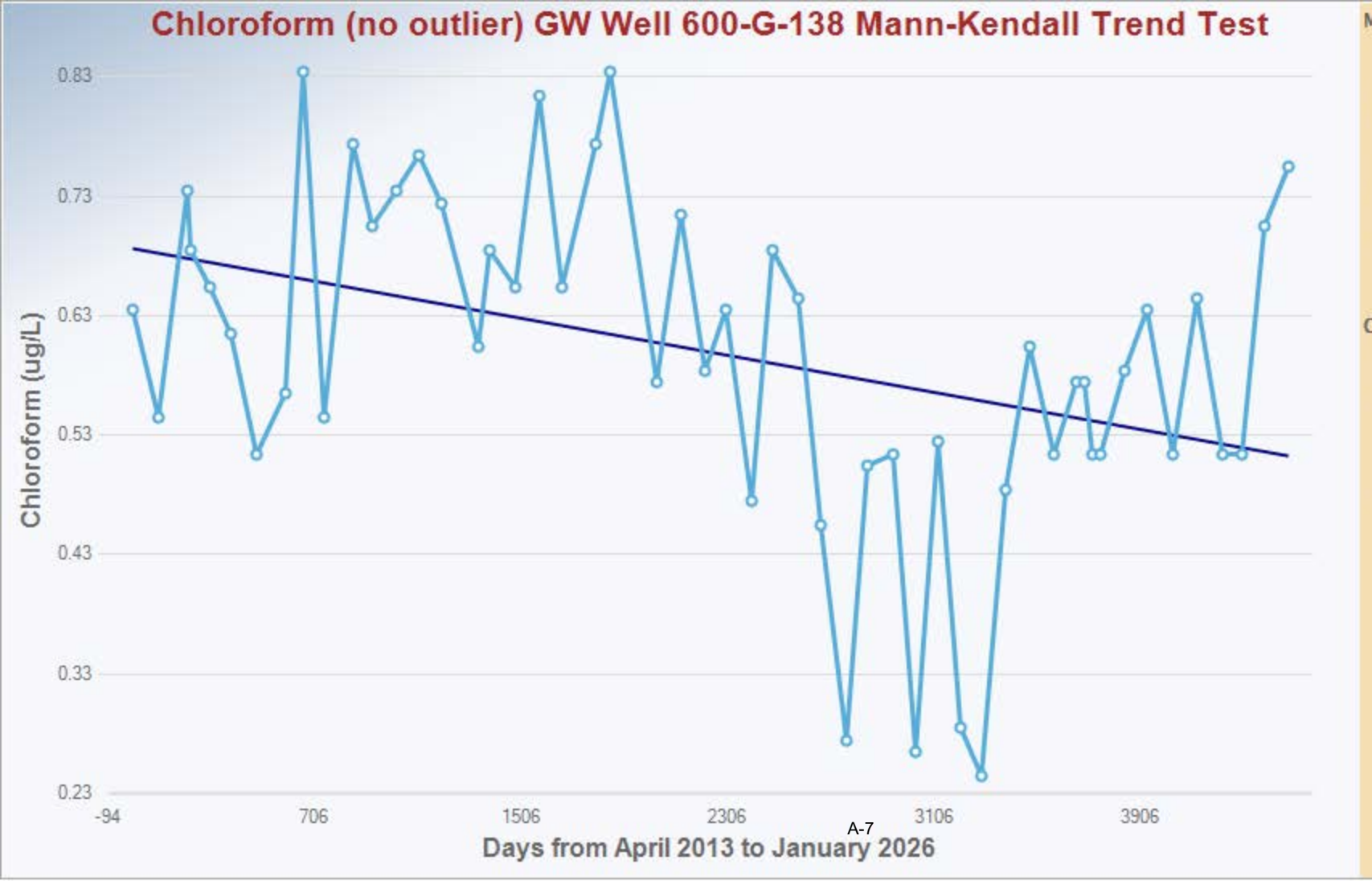
Statistically significant evidence of a decreasing trend at the specified level of significance.


Chloride Groundwater Well 600-G-138 Classical Regression
600
500
400
300
200
100
0
-100
Chloride (mg/L)
-112
888
1888
2888
3888
4591
Days from April 2013 to January 2026
OLS
n 52
Slope -0.0165
Intercept 246.3891
R-sq 0.2720
R -0.5216
Scale Estimate 36.2049
P-value (Reg) 0.0001
P-value (Slope) 0.0001
Mann-Kendall
S -524.0000
SD of S 126.6912
Standardized S -4.1281
Approximate p-value 0.0000
Confidence Coefficient 0.9500
Red = Prediction Interval
Green = Confidence Interval

	A	B	C	D	E	F	G	H
1	**Ordinary Least Squares Linear Regression Output Sheet**							
2			User Selected Options					
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 7:09:11 PM				
4			From File	600-G-138_GW_2026_Input.xls				
5			Full Precision	OFF				
6								
7			Display Limits	False				
8			Display Regresion Diagnostics	False				
9			Display Regresion Tables	True				
10			Title For Y vs X Plots	Classical Regression				
11			Confidence Level for Regression Line	0.95				
12			Display Confidence Band	True				
13			Display Prediction Band	True				
14								
15								
16				Dependendant Variable (Y-Data)	Chloride			
17				Number Reported (Y values)	52			
18				Independent Variable (x-data)	Date_Chloride			
19				Number Reported (x-values)	52			
20								
21								
22	**Regression Estimates and Inference Table**							
23	Parameter	Estimates	Std. Error	T-values	p-values			
24	intercept	246.4	10.14	24.3	2.395E-29			
25	Date_Chloride	-0.0165	0.00381	-4.323	7.3352E-5			
26								
27	**OLS ANOVA Table**							
28	**Source of Variation**			**SS**	**DOF**	**MS**	**F-Value**	**P-Value**
29			**Regression**	24493	1	24493	18.69	0.0001
30			**Error**	65540	50	1311		
31			**Total**	90033	51			
32								
33					R Square	0.272		
34					Adjusted R Square	0.257		
35					Sqrt(MSE) = Scale	36.2		
36								
37	**Regression Table**							
38	Obs	Y Vector	Yhat	Residuals	Res/Scale			
39	1	266	246.4	19.61	0.542			
40	2	281	244.7	36.29	1.002			
41	3	292	242.9	49.05	1.355			
42	4	238	241.5	-3.463	-0.0957			
43	5	242	240.1	1.888	0.0521			
44	6	265	238.5	26.54	0.733			
45	7	282	236.6	45.4	1.254			
46	8	221	235.5	-14.47	-0.4			
47	9	226	234.2	-8.181	-0.226			
48	10	238	232.4	5.631	0.156			
49	11	233	231.1	1.932	0.0534			
50	12	232	229.6	2.415	0.0667			
51	13	214	228.1	-14.09	-0.389			
52	14	238	226.7	11.3	0.312			
53	15	253	224.3	28.7	0.793			
54	16	251	223.6	27.41	0.757			
55	17	241	222	18.99	0.525			
56	18	141	220.4	-79.39	-2.193			
57	19	169	218.9	-49.94	-1.379			
58	20	205	216.8	-11.8	-0.326			
59	21	207	215.9	-8.944	-0.247			
60	22	236	214.1	21.87	0.604			

	A	B	C	D	E	F	G	H
61	23	212	213	-0.978	-0.027			
62	24	164	211.4	-47.4	-1.309			
63	25	171	209.8	-38.85	-1.073			
64	26	177	208.5	-31.5	-0.87			
65	27	214	206.9	7.134	0.197			
66	28	185	205.6	-20.56	-0.568			
67	29	182	203.9	-21.9	-0.605			
68	30	179	202.5	-23.48	-0.649			
69	31	168	200.9	-32.85	-0.907			
70	32	173	199.5	-26.5	-0.732			
71	33	205	197.9	7.113	0.196			
72	34	221	196.4	24.61	0.68			
73	35	161	195	-33.97	-0.938			
74	36	166	193.5	-27.49	-0.759			
75	37	177	192.2	-15.22	-0.42			
76	38	188	190.6	-2.622	-0.0724			
77	39	159	189.1	-30.12	-0.832			
78	40	137	187.6	-50.61	-1.398			
79	41	171	186.1	-15.09	-0.417			
80	42	170	185.6	-15.65	-0.432			
81	43	191	185.1	5.864	0.162			
82	44	204	184.6	19.39	0.536			
83	45	200	183	16.97	0.469			
84	46	245	181.6	63.42	1.752			
85	47	196	180	15.99	0.442			
86	48	181	178.4	2.586	0.0714			
87	49	329	176.8	152.2	4.205			
88	50	131	175.6	-44.6	-1.232			
89	51	201	174.1	26.92	0.744			
90	52	203	172.6	30.4	0.84			
91								

	A	B	C	D	E	F	G	H	I
1				Mann-Kendall Trend Test Analysis					
2			User Selected Options						
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 7:03:14 PM					
4			From File	600-G-138_GW_2026_Input.xls					
5			Full Precision	OFF					
6			Confidence Coefficient	0.95					
7			Level of Significance	0.05					
8									
9			**Chloride**						
10									
11			**General Statistics**						
12			Number of Events Reported (m)		52				
13			Number of Missing Events		0				
14			Number or Reported Events Used		52				
15			Number Values Reported (n)		52				
16			Minimum		131				
17			Maximum		329				
18			Mean		208.3				
19			Geometric Mean		204.3				
20			Median		204.5				
21			Standard Deviation		42.02				
22			Coefficient of Variation		0.202				
23									
24			**Mann-Kendall Test**						
25			M-K Test Value (S)		-524				
26			Critical Value (0.05)		-1.645				
27			Standard Deviation of S		126.7				
28			Standardized Value of S		-4.128				
29			Approximate p-value		1.8285E-5				
30									
31	**Statistically significant evidence of a decreasing**								
32	**trend at the specified level of significance.**								



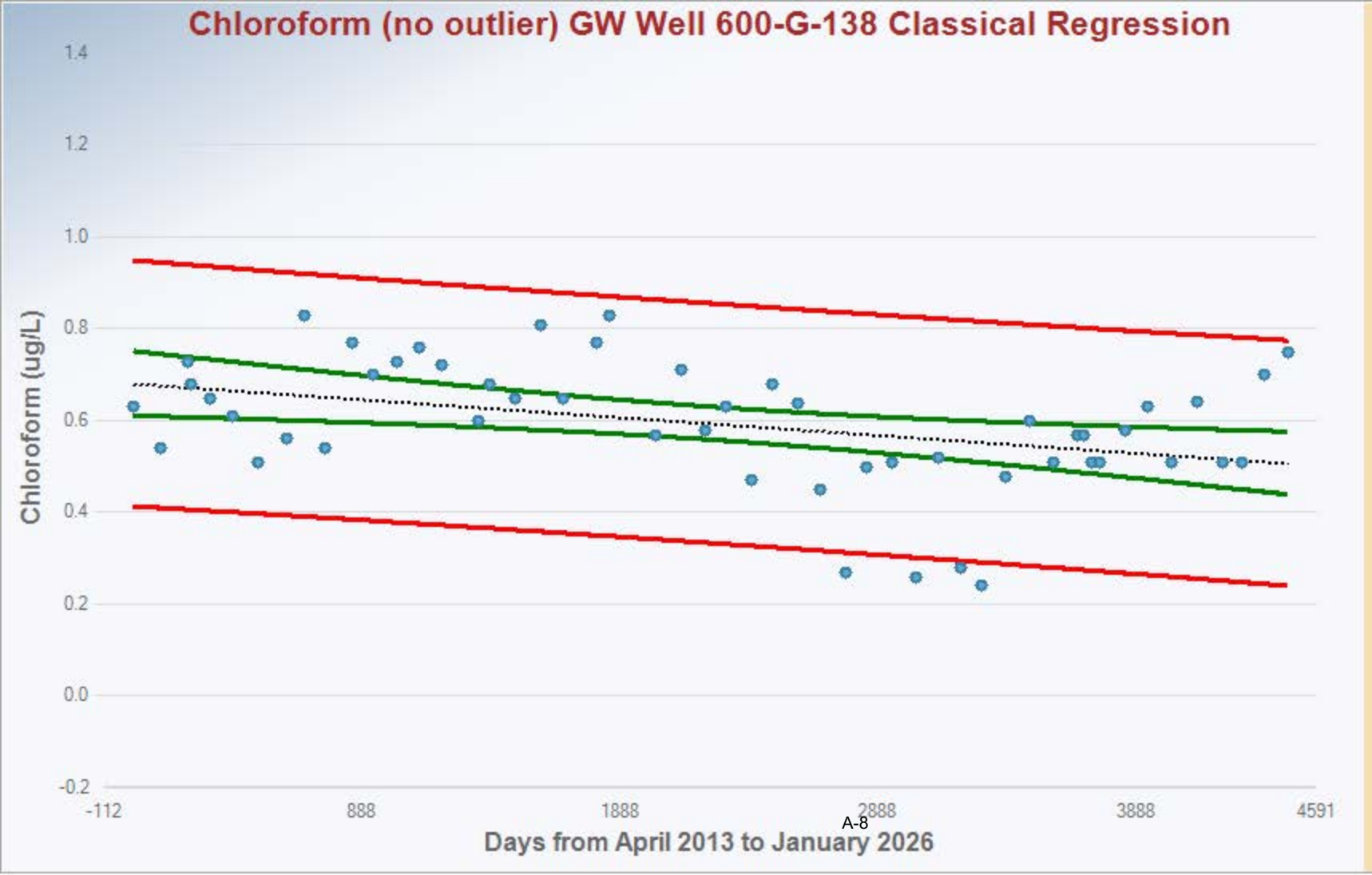
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.4977
Standardized Value of S	-2.4981
M-K Test Value (S)	-317
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0062

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.6814

Statistically significant evidence of a decreasing trend at the specified level of significance.



OLS	
n	52
Slope	0.0000
Intercept	0.6814
R-sq	0.1462
R	-0.3824
Scale Estimate	0.1287
P-value (Reg)	0.0051
P-value (Slope)	0.0051

Mann-Kendall	
S	-317.0000
SD of S	126.4977
Standardized S	-2.4981
Approximate p-value	0.0062

Confidence Coefficient	0.9500

Red = Prediction Interval
Green = Confidence Interval

	A	B	C	D	E	F	G	H
1	Ordinary Least Squares Linear Regression Output Sheet							
2				User Selected Options				
3				Date/Time of Computation	ProUCL 5.2 4/1/2026 7:20:06 PM			
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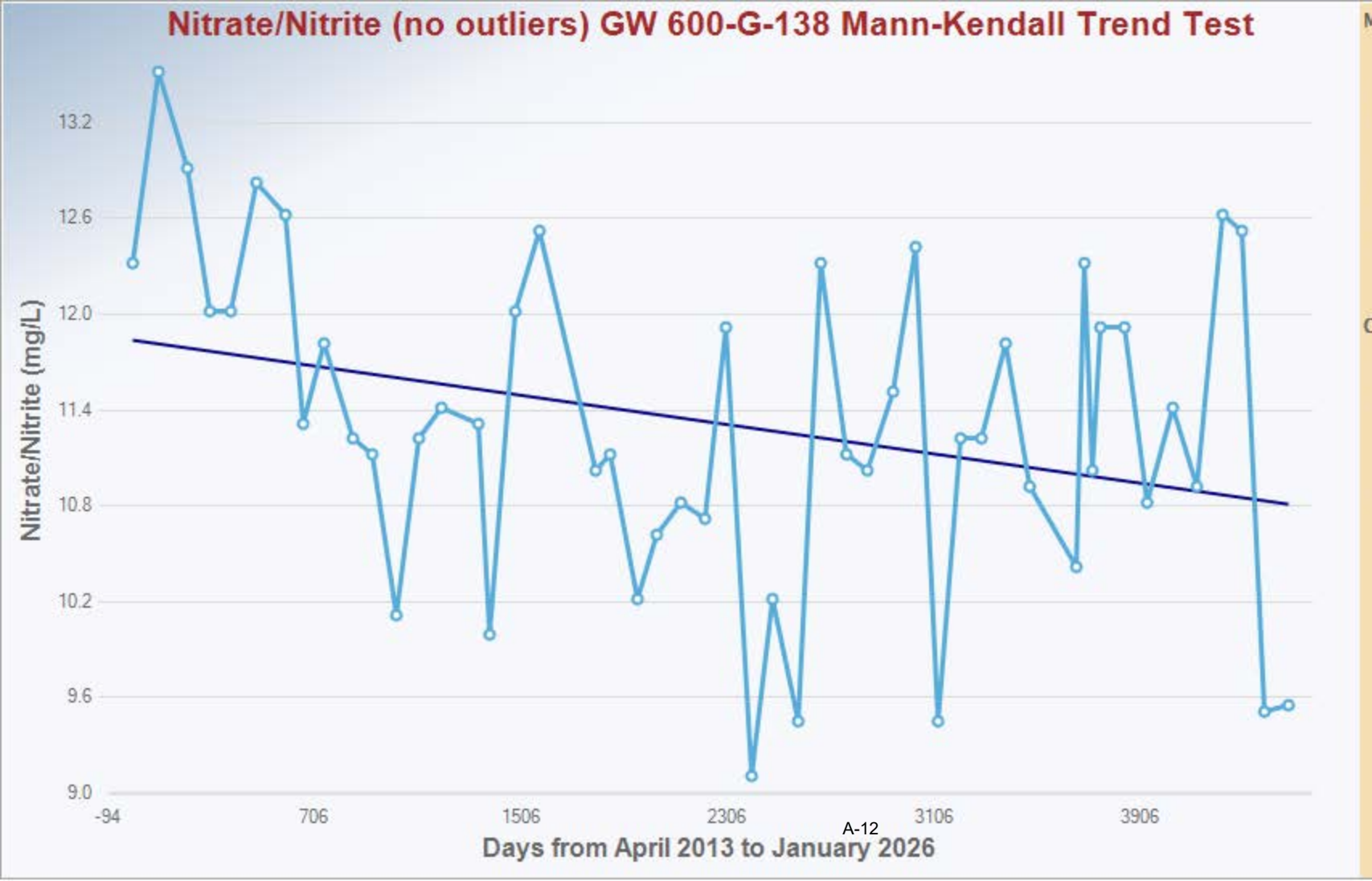
7				Display Limits	False			
8				Display Regresion Diagnostics	False			
9				Display Regresion Tables	True			
10				Title For Y vs X Plots	Classical Regression			
11				Confidence Level for Regression Line	0.95			
12				Display Confidence Band	True			
13				Display Prediction Band	True			
14								
15								
16				Dependendant Variable (Y-Data)	Chloroform_no_outlier			
17				Number Reported (Y values)	52			
18				Independent Variable (x-data)	Date_Chloroform_no_outlier			
19				Number Reported (x-values)	52			
20								
21								
22	Regression Estimates and Inference Table							
23	Parameter	Estimates	Std. Error	T-values	p-values			
24	intercept	0.681	0.0351	19.44	5.890E-25			
25	Date_Chloroform_no_outlier	-3.876E-5	1.3245E-5	-2.926	0.00515			
26								
27	OLS ANOVA Table							
28	Source of Variation			SS	DOF	MS	F-Value	P-Value
29			Regression	0.142	1	0.142	8.564	0.0051
30			Error	0.828	50	0.0166		
31			Total	0.97	51			
32								
33					R Square	0.146		
34					Adjusted R Square	0.129		
35					Sqrt(MSE) = Scale	0.129		
36								
37	Regression Table							
38	Obs	Y Vector	Yhat	Residuals	Res/Scale			
39	1	0.63	0.681	-0.0514	-0.399			
40	2	0.54	0.677	-0.137	-1.068			
41	3	0.73	0.673	0.0567	0.441			
42	4	0.68	0.673	0.00723	0.0561			
43	5	0.65	0.67	-0.0198	-0.154			
44	6	0.61	0.667	-0.0566	-0.44			
45	7	0.51	0.663	-0.153	-1.187			
46	8	0.56	0.658	-0.0984	-0.764			
47	9	0.83	0.656	0.174	1.354			
48	10	0.54	0.653	-0.113	-0.875			
49	11	0.77	0.648	0.122	0.945			
50	12	0.7	0.645	0.0547	0.425			
51	13	0.73	0.642	0.0882	0.685			
52	14	0.76	0.638	0.122	0.945			
53	15	0.72	0.635	0.0849	0.66			
54	16	0.6	0.629	-0.0294	-0.228			
55	17	0.68	0.628	0.0523	0.406			
56	18	0.65	0.624	0.026	0.202			
57	19	0.81	0.62	0.19	1.475			
58	20	0.65	0.617	0.0332	0.258			
59	21	0.77	0.612	0.158	1.229			
60	22	0.83	0.61	0.22	1.711			

	A	B	C	D	E	F	G	H
61	23	0.57	0.603	-0.0328	-0.255			
62	24	0.71	0.599	0.111	0.862			
63	25	0.58	0.595	-0.0154	-0.12			
64	26	0.63	0.592	0.0378	0.293			
65	27	0.47	0.588	-0.118	-0.92			
66	28	0.68	0.585	0.0947	0.736			
67	29	0.64	0.581	0.0586	0.455			
68	30	0.45	0.578	-0.128	-0.995			
69	31	0.27	0.574	-0.304	-2.364			
70	32	0.5	0.571	-0.0711	-0.552			
71	33	0.51	0.567	-0.0573	-0.445			
72	34	0.26	0.564	-0.304	-2.36			
73	35	0.52	0.56	-0.0404	-0.314			
74	36	0.28	0.557	-0.277	-2.152			
75	37	0.24	0.554	-0.314	-2.439			
76	38	0.48	0.55	-0.0702	-0.545			
77	39	0.6	0.547	0.0534	0.415			
78	40	0.51	0.543	-0.0331	-0.257			
79	41	0.57	0.54	0.0305	0.237			
80	42	0.57	0.538	0.0315	0.245			
81	43	0.51	0.537	-0.0273	-0.212			
82	44	0.51	0.536	-0.026	-0.202			
83	45	0.58	0.532	0.0477	0.371			
84	46	0.63	0.529	0.101	0.786			
85	47	0.51	0.525	-0.0152	-0.118			
86	48	0.64	0.521	0.119	0.921			
87	49	0.51	0.518	-0.00758	-0.0589			
88	50	0.51	0.515	-0.00482	-0.0375			
89	51	0.7	0.511	0.189	1.466			
90	52	0.75	0.508	0.242	1.882			
91								

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2		User Selected Options								
3		Date/Time of Computation		ProUCL 5.2 4/1/2026 7:28:14 PM						
4		From File		600-G-138_GW_2026_Input.xls						
5		Full Precision		OFF						
6		Confidence Coefficient		0.95						
7		Level of Significance		0.05						
8										
9				**Chloroform_no_outlier**						
10										
11				**General Statistics**						
12				Number of Events Reported (m)	52					
13				Number of Missing Events	0					
14				Number or Reported Events Used	52					
15				Number Values Reported (n)	52					
16				Minimum	0.24					
17				Maximum	0.83					
18				Mean	0.593					
19				Geometric Mean	0.574					
20				Median	0.6					
21				Standard Deviation	0.138					
22				Coefficient of Variation	0.233					
23										
24				**Mann-Kendall Test**						
25				M-K Test Value (S)	-317					
26				Critical Value (0.05)	-1.645					
27				Standard Deviation of S	126.5					
28				Standardized Value of S	-2.498					
29				Approximate p-value	0.00624					
30										
31	**Statistically significant evidence of a decreasing**									
32	**trend at the specified level of significance.**									



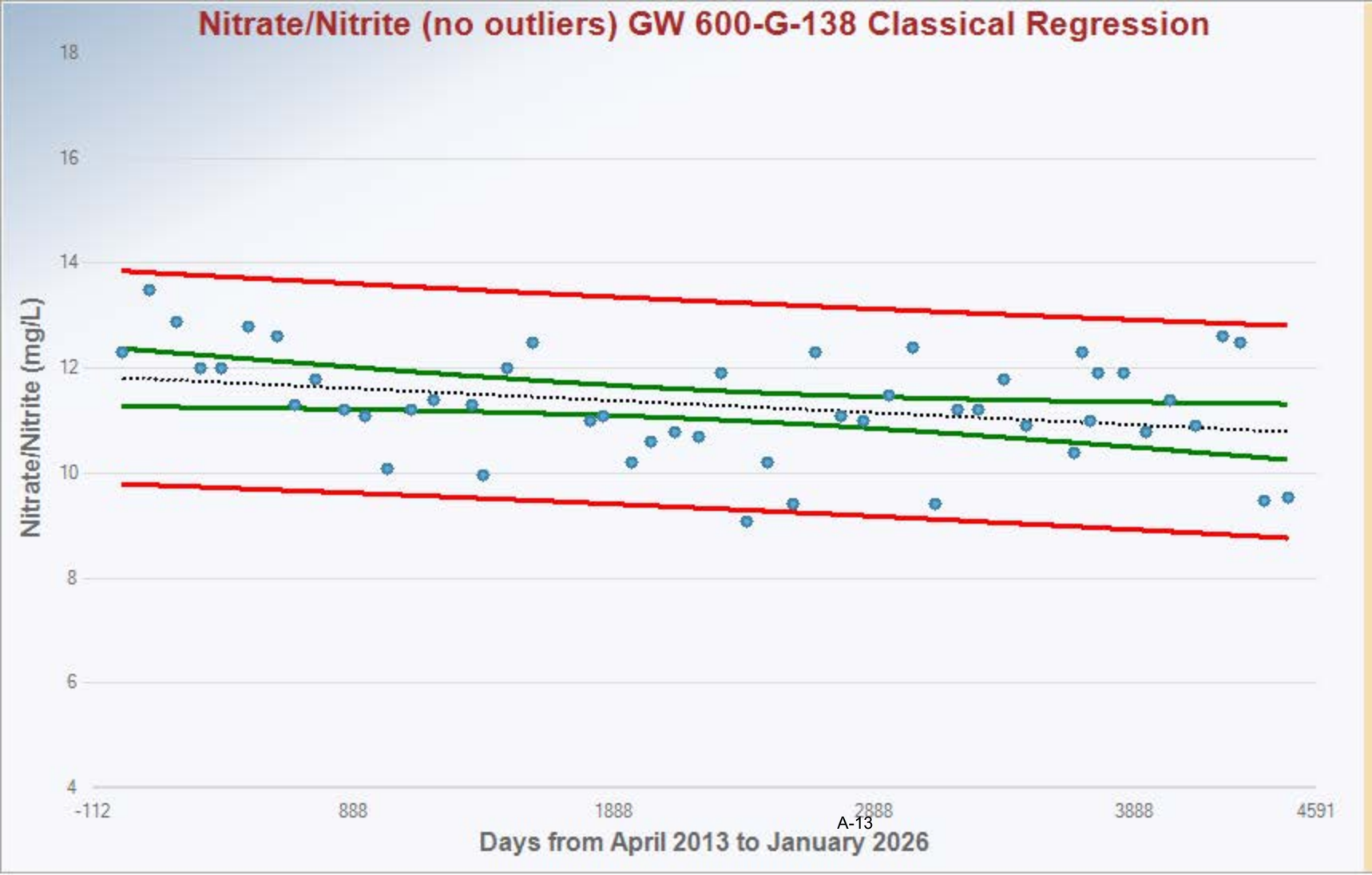
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.4683
Standardized Value of S	-2.0675
M-K Test Value (S)	-248
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0193

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	11.8224

Statistically significant evidence of a decreasing trend at the specified level of significance.



OLS	
n	50
Slope	-0.0002
Intercept	11.8224
R-sq	0.0942
R	-0.3070
Scale Estimate	0.9716
P-value (Reg)	0.0301
P-value (Slope)	0.0301

Mann-Kendall	
S	-248.0000
SD of S	119.4683
Standardized S	-2.0675
Approximate p-value	0.0193

Confidence Coefficient	0.9500

Red = Prediction Interval
Green = Confidence Interval

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 7:40:14 PM						
4			From File	600-G-138_GW_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**NO2NO3_No_Outlier2**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)	50						
13			Number of Missing Events	0						
14			Number or Reported Events Used	50						
15			Number Values Reported (n)	50						
16			Minimum	9.09						
17			Maximum	13.5						
18			Mean	11.29						
19			Geometric Mean	11.25						
20			Median	11.2						
21			Standard Deviation	1.01						
22			Coefficient of Variation	0.0895						
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)	-248						
26			Critical Value (0.05)	-1.645						
27			Standard Deviation of S	119.5						
28			Standardized Value of S	-2.067						
29			Approximate p-value	0.0193						
30										
31	**Statistically significant evidence of a decreasing**									
32	**trend at the specified level of significance.**									

	A	B	C	D	E	F	G	H
1	**Ordinary Least Squares Linear Regression Output Sheet**							
2				User Selected Options				
3				Date/Time of Computation	ProUCL 5.2 4/1/2026 7:47:16 PM			
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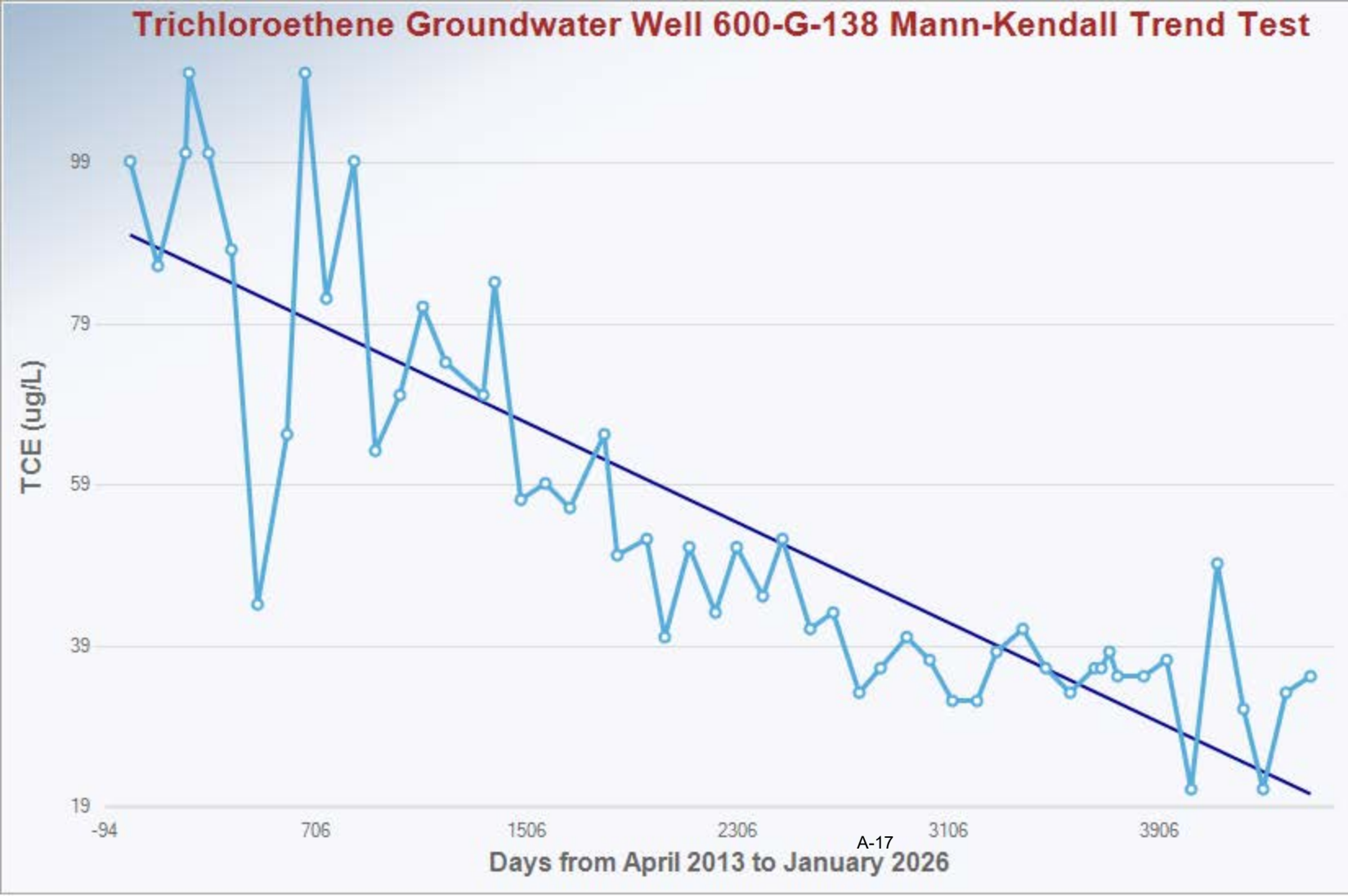
6								
7				Display Limits	False			
8				Display Regresion Diagnostics	False			
9				Display Regresion Tables	True			
10				Title For Y vs X Plots	Classical Regression			
11				Confidence Level for Regression Line	0.95			
12				Display Confidence Band	True			
13				Display Prediction Band	True			
14								
15								
16				Dependendant Variable (Y-Data)	NO2NO3_No_Outlier2			
17				Number Reported (Y values)	50			
18				Independent Variable (x-data)	Date_NO2NO3_No_Outlier2			
19				Number Reported (x-values)	50			
20								
21								
22	**Regression Estimates and Inference Table**							
23	Parameter	Estimates	Std. Error	T-values	p-values			
24	intercept	11.82	0.275	43.04	5.244E-40			
25	Date_NO2NO3_No_Outlier2	-2.311E-4	1.0343E-4	-2.235	0.0301			
26								
27	**OLS ANOVA Table**							
28	**Source of Variation**			**SS**	**DOF**	**MS**	**F-Value**	**P-Value**
29			**Regression**	4.714	1	4.714	4.993	0.0301
30			**Error**	45.31	48	0.944		
31			**Total**	50.03	49			
32								
33					R Square	0.0942		
34					Adjusted R Square	0.0754		
35					Sqrt(MSE) = Scale	0.972		
36								
37	**Regression Table**							
38	Obs	Y Vector	Yhat	Residuals	Res/Scale			
39	1	12.3	11.82	0.478	0.492			
40	2	13.5	11.8	1.701	1.751			
41	3	12.9	11.77	1.126	1.159			
42	4	12	11.75	0.247	0.254			
43	5	12	11.73	0.266	0.273			
44	6	12.8	11.71	1.089	1.121			
45	7	12.6	11.69	0.915	0.942			
46	8	11.3	11.67	-0.369	-0.38			
47	9	11.8	11.65	0.149	0.153			
48	10	11.2	11.63	-0.426	-0.438			
49	11	11.1	11.61	-0.507	-0.522			
50	12	10.1	11.59	-1.487	-1.53			
51	13	11.2	11.57	-0.366	-0.376			
52	14	11.4	11.55	-0.146	-0.151			
53	15	11.3	11.51	-0.212	-0.219			
54	16	9.98	11.5	-1.523	-1.567			
55	17	12	11.48	0.52	0.535			

	A	B	C	D	E	F	G	H
56	18	12.5	11.46	1.042	1.073			
57	19	11	11.41	-0.407	-0.419			
58	20	11.1	11.4	-0.295	-0.304			
59	21	10.2	11.37	-1.17	-1.204			
60	22	10.6	11.35	-0.754	-0.776			
61	23	10.8	11.33	-0.532	-0.547			
62	24	10.7	11.31	-0.61	-0.628			
63	25	11.9	11.29	0.609	0.627			
64	26	9.09	11.27	-2.178	-2.242			
65	27	10.2	11.25	-1.05	-1.08			
66	28	9.43	11.23	-1.796	-1.849			
67	29	12.3	11.21	1.094	1.126			
68	30	11.1	11.18	-0.0836	-0.086			
69	31	11	11.16	-0.165	-0.169			
70	32	11.5	11.14	0.358	0.368			
71	33	12.4	11.12	1.279	1.316			
72	34	9.43	11.1	-1.671	-1.72			
73	35	11.2	11.08	0.12	0.123			
74	36	11.2	11.06	0.138	0.142			
75	37	11.8	11.04	0.76	0.782			
76	38	10.9	11.02	-0.119	-0.123			
77	39	10.4	10.98	-0.576	-0.593			
78	40	12.3	10.97	1.33	1.369			
79	41	11	10.96	0.0369	0.038			
80	42	11.9	10.96	0.944	0.972			
81	43	11.9	10.93	0.966	0.995			
82	44	10.8	10.91	-0.113	-0.116			
83	45	11.4	10.89	0.509	0.524			
84	46	10.9	10.87	0.0312	0.0321			
85	47	12.6	10.85	1.754	1.806			
86	48	12.5	10.83	1.671	1.72			
87	49	9.49	10.81	-1.318	-1.357			
88	50	9.53	10.79	-1.257	-1.294			
89								

Trichloroethene Groundwater Well 600-G-138 Mann-Kendall Trend Test



Mann-Kendall Trend Analysis

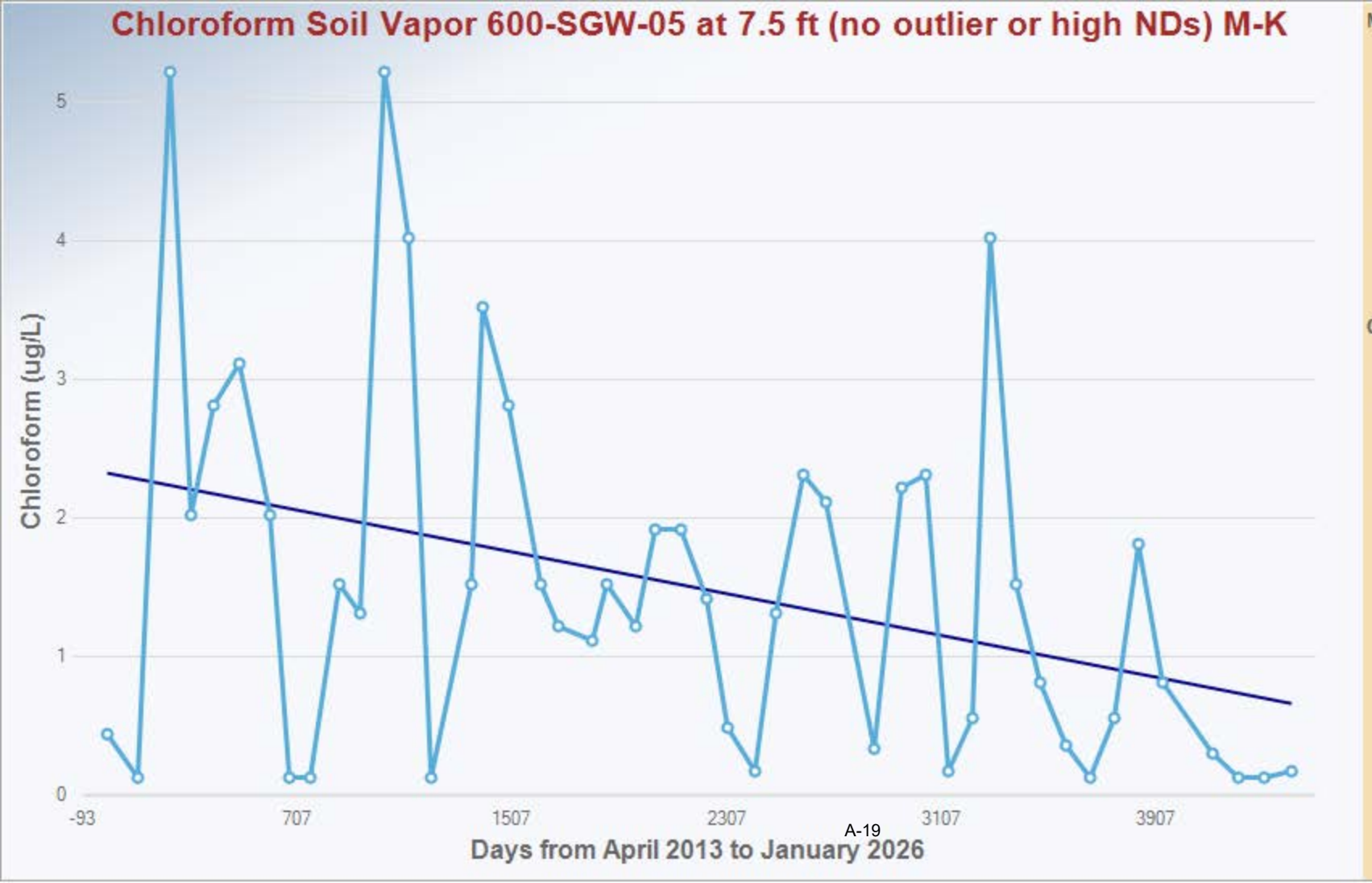
n	53
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	130.2510
Standardized Value of S	-7.7005
M-K Test Value (S)	-1,004
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0155
OLS Regression Intercept	89.7912

Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 7:49:30 PM						
4			From File	600-G-138_GW_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			TCE							
10										
11			General Statistics							
12			Number of Events Reported (m)	53						
13			Number of Missing Events	0						
14			Number or Reported Events Used	53						
15			Number Values Reported (n)	53						
16			Minimum	21						
17			Maximum	110						
18			Mean	54.62						
19			Geometric Mean	50						
20			Median	45						
21			Standard Deviation	24.05						
22			Coefficient of Variation	0.44						
23										
24			Mann-Kendall Test							
25			M-K Test Value (S)	-1004						
26			Critical Value (0.05)	-1.645						
27			Standard Deviation of S	130.3						
28			Standardized Value of S	-7.701						
29			Approximate p-value	6.776E-15						
30										
31	Statistically significant evidence of a decreasing									
32	trend at the specified level of significance.									



Mann-Kendall Trend Analysis

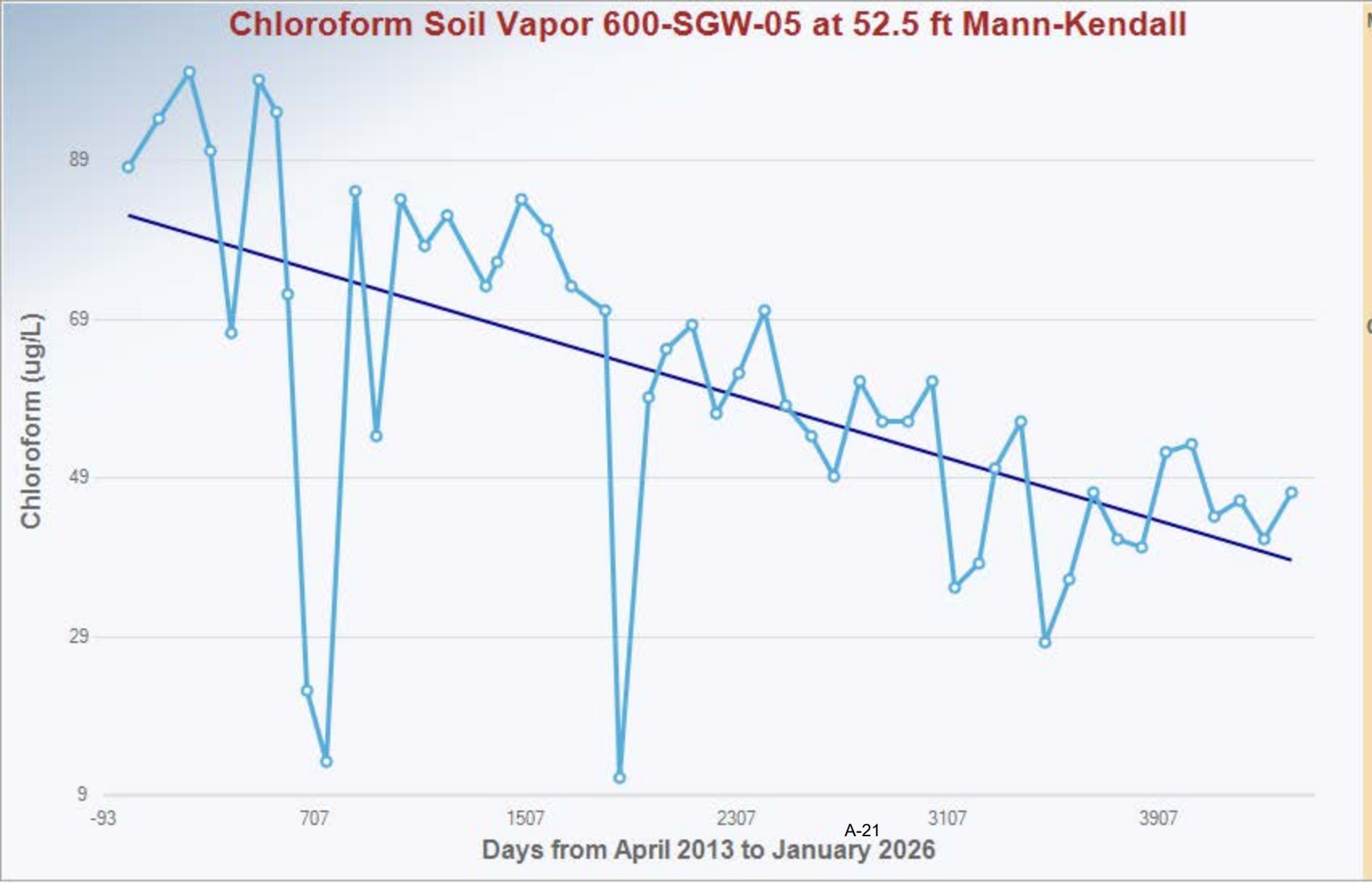
n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	108.7566
Standardized Value of S	-2.4366
M-K Test Value (S)	-266
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0074

OLS Regression Line (Blue)

OLS Regression Slope	-0.0004
OLS Regression Intercept	2.5047

Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/6/2026 4:09:22 AM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**Chloroform_7.5_M-K_noOutlierOrHighNDs**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)		47					
13			Number of Missing Events		0					
14			Number or Reported Events Used		47					
15			Number Values Reported (n)		47					
16			Minimum		0.31					
17			Maximum		5.4					
18			Mean		1.687					
19			Geometric Mean		1.195					
20			Median		1.5					
21			Standard Deviation		1.331					
22			Coefficient of Variation		0.789					
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)		-266					
26			Critical Value (0.05)		-1.645					
27			Standard Deviation of S		108.8					
28			Standardized Value of S		-2.437					
29			Approximate p-value		0.00741					
30										
31	Statistically significant evidence of a decreasing									
32	trend at the specified level of significance.									



Mann-Kendall Trend Analysis

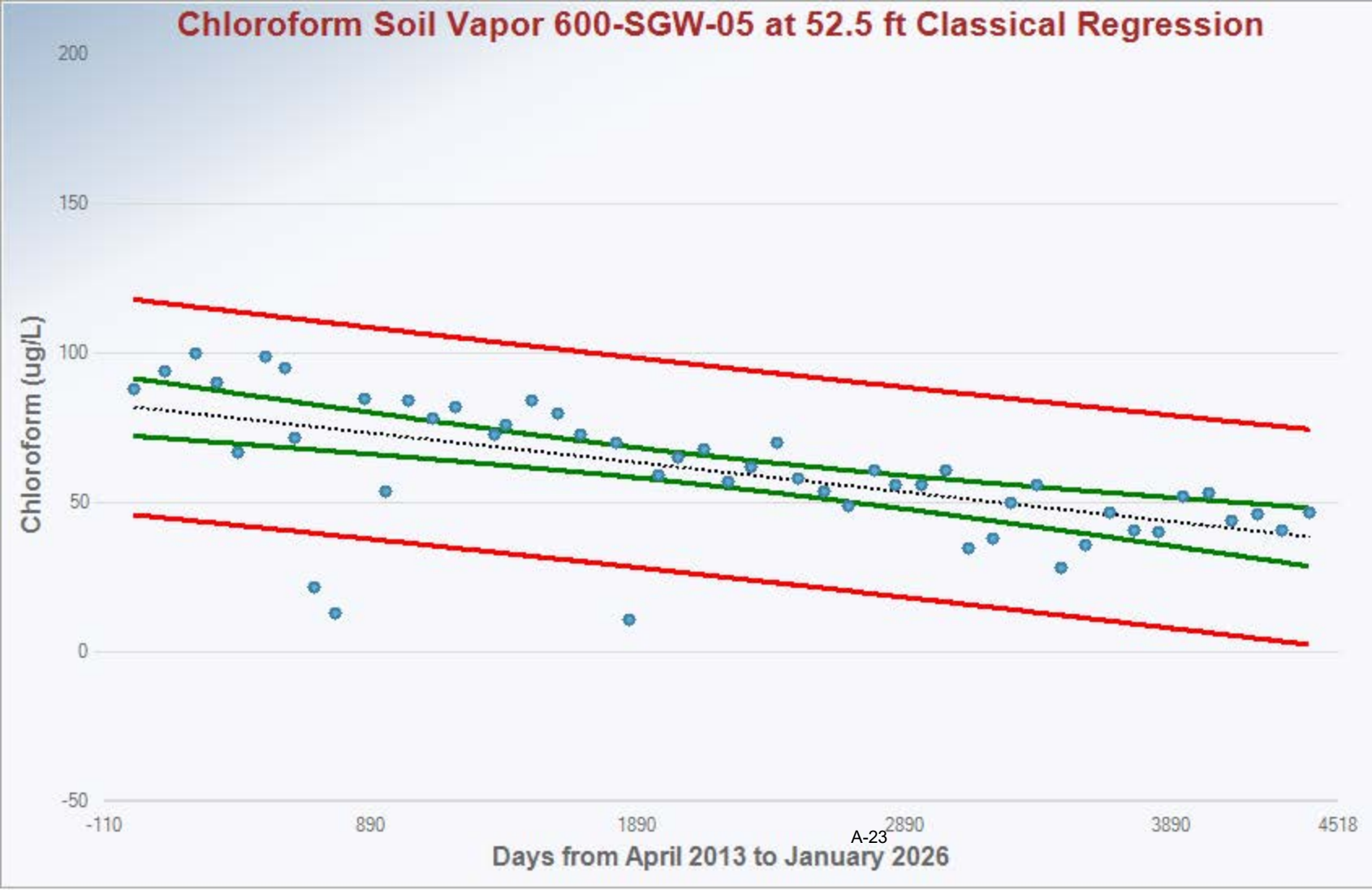
n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5031
Standardized Value of S	-5.7070
M-K Test Value (S)	-683
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0099
OLS Regression Intercept	81.9272

Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/2/2026 11:50:27 AM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**Chloro_52.5**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)	50						
13			Number of Missing Events	0						
14			Number or Reported Events Used	50						
15			Number Values Reported (n)	50						
16			Minimum	11						
17			Maximum	100						
18			Mean	60.4						
19			Geometric Mean	55.6						
20			Median	58.5						
21			Standard Deviation	21.38						
22			Coefficient of Variation	0.354						
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)	-683						
26			Critical Value (0.05)	-1.645						
27			Standard Deviation of S	119.5						
28			Standardized Value of S	-5.707						
29			Approximate p-value	5.7505E-9						
30										
31	**Statistically significant evidence of a decreasing**									
32	**trend at the specified level of significance.**									



OLS	
n	50
Slope	-0.0099
Intercept	81.9272
R-sq	0.3614
R	-0.6012
Scale Estimate	17.2579
P-value (Reg)	0.0000
P-value (Slope)	0.0000

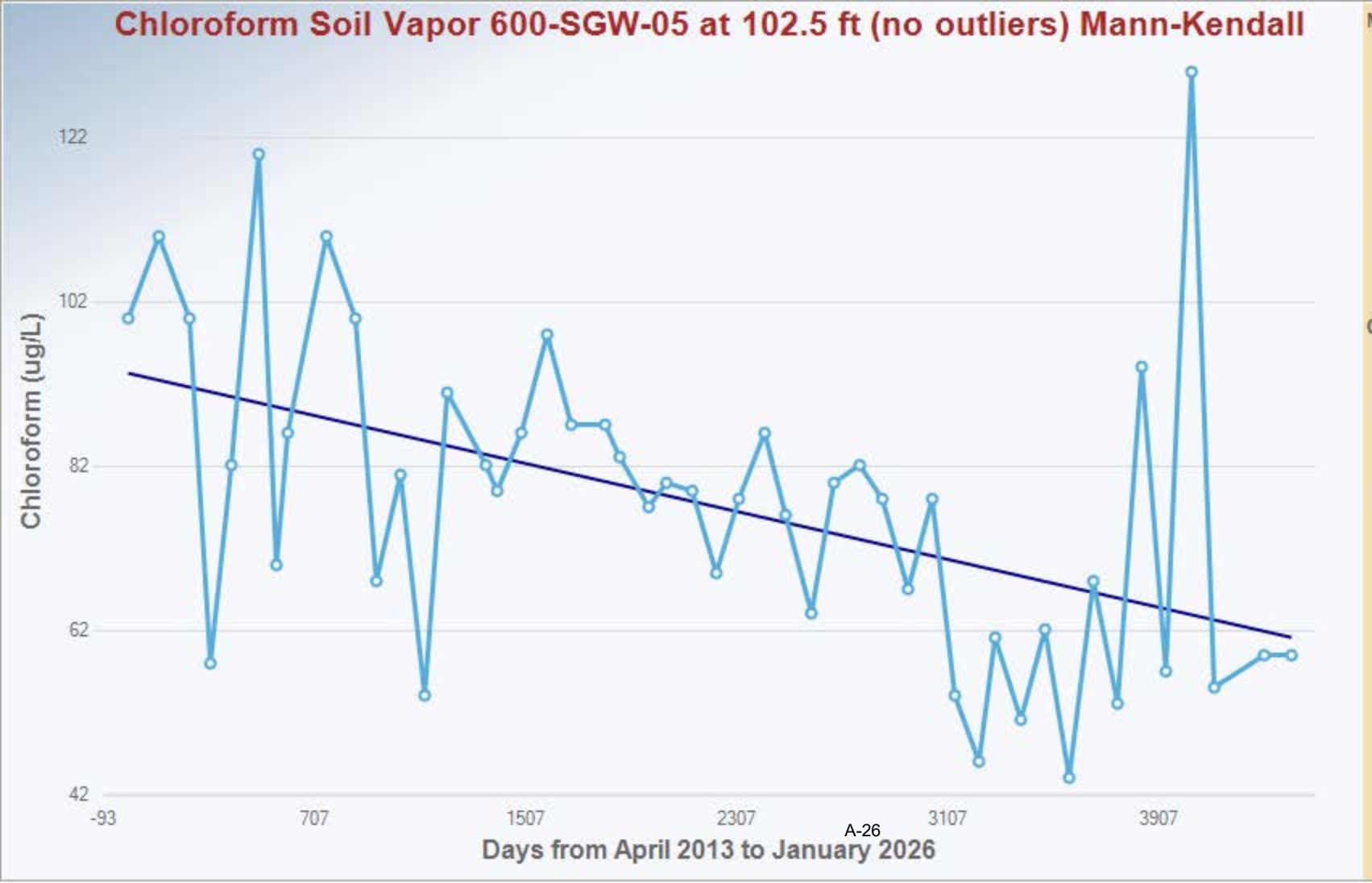
Mann-Kendall	
S	-683.0000
SD of S	119.5031
Standardized S	-5.7070
Approximate p-value	0.0000

Confidence Coefficient	0.9500

Red = Prediction Interval
Green = Confidence Interval

	A	B	C	D	E	F	G	H	I
1	**Ordinary Least Squares Linear Regression Output Sheet**								
2				User Selected Options					
3				Date/Time of Computation	ProUCL 5.2 4/2/2026 11:29:31 AM				
4				From File	600-SGW-05_Vapor_2026_Input.xls				
5				Full Precision	OFF				
6									
7				Display Limits	False				
8				Display Regresion Diagnostics	False				
9				Display Regresion Tables	True				
10				Title For Y vs X Plots	Classical Regression				
11				Confidence Level for Regression Line	0.95				
12				Display Confidence Band	True				
13				Display Prediction Band	True				
14									
15									
16				Dependendant Variable (Y-Data)	Chloro_52.5				
17				Number Reported (Y values)	50				
18				Independent Variable (x-data)	Date_Chloro_52.5				
19				Number Reported (x-values)	50				
20									
21									
22	**Regression Estimates and Inference Table**								
23	Parameter	Estimates	Std. Error	T-values	p-values				
24	intercept	81.93	4.797	17.08	4.962E-22				
25	Date_Chloro_52.5	-0.00985	0.00189	-5.212	3.8967E-6				
26									
27	**OLS ANOVA Table**								
28	**Source of Variation**			**SS**	**DOF**	**MS**	**F-Value**	**P-Value**	
29			**Regression**	8092	1	8092	27.17	0.0000	
30			**Error**	14296	48	297.8			
31			**Total**	22388	49				
32									
33					R Square	0.361			
34					Adjusted R Square	0.348			
35					Sqrt(MSE) = Scale	17.26			
36									
37	**Regression Table**								
38	Obs	Y Vector	Yhat	Residuals	Res/Scale				
39	1	88	81.93	6.073	0.352				
40	2	94	80.81	13.19	0.764				
41	3	100	79.63	20.37	1.18				
42	4	90	78.87	11.13	0.645				
43	5	67	78.07	-11.07	-0.641				
44	6	99	77.08	21.92	1.27				
45	7	95	76.38	18.62	1.079				
46	8	72	75.97	-3.968	-0.23				
47	9	22	75.29	-53.29	-3.088				
48	10	13	74.52	-61.52	-3.565				
49	11	85	73.44	11.56	0.67				
50	12	54	72.66	-18.66	-1.081				
51	13	84	71.77	12.23	0.709				

	A	B	C	D	E	F	G	H	I
52	14	78	70.88	7.125	0.413				
53	15	82	70.05	11.95	0.693				
54	16	73	68.61	4.39	0.254				
55	17	76	68.19	7.814	0.453				
56	18	84	67.24	16.76	0.971				
57	19	80	66.28	13.72	0.795				
58	20	73	65.41	7.592	0.44				
59	21	70	64.13	5.872	0.34				
60	22	11	63.62	-52.62	-3.049				
61	23	59	62.53	-3.532	-0.205				
62	24	65	61.84	3.157	0.183				
63	25	68	60.9	7.103	0.412				
64	26	57	59.97	-2.971	-0.172				
65	27	62	59.16	2.837	0.164				
66	28	70	58.19	11.81	0.684				
67	29	58	57.41	0.59	0.0342				
68	30	54	56.42	-2.415	-0.14				
69	31	49	55.57	-6.568	-0.381				
70	32	61	54.59	6.407	0.371				
71	33	56	53.79	2.215	0.128				
72	34	56	52.82	3.18	0.184				
73	35	61	51.92	9.077	0.526				
74	36	35	51.08	-16.08	-0.932				
75	37	38	50.19	-12.19	-0.706				
76	38	50	49.54	0.46	0.0267				
77	39	56	48.58	7.416	0.43				
78	40	28	47.69	-19.69	-1.141				
79	41	36	46.78	-10.78	-0.625				
80	42	47	45.89	1.115	0.0646				
81	43	41	44.97	-3.969	-0.23				
82	44	40	44.09	-4.093	-0.237				
83	45	52	43.2	8.804	0.51				
84	46	53	42.25	10.75	0.623				
85	47	44	41.38	2.616	0.152				
86	48	46	40.45	5.552	0.322				
87	49	41	39.49	1.507	0.0873				
88	50	47	38.51	8.492	0.492				
89									



Mann-Kendall Trend Analysis

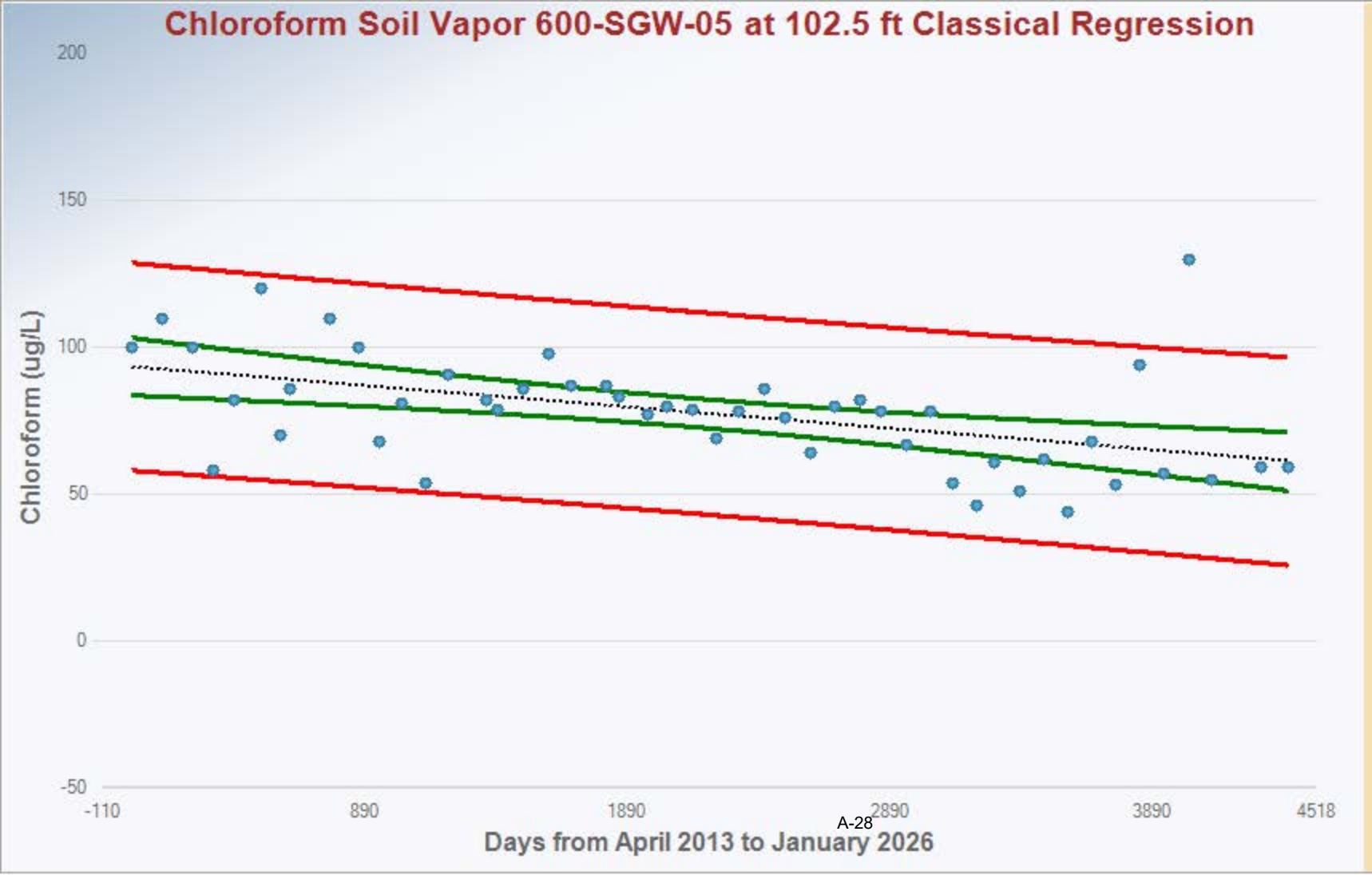
n	48
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	112.4144
Standardized Value of S	-4.3233
M-K Test Value (S)	-487
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0073
OLS Regression Intercept	93.3661

Statistically significant evidence of a decreasing trend at the specified level of significance.

1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/2/2026 12:17:28 PM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**Chloroform_102.5_No_Outliers**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)	48						
13			Number of Missing Events	0						
14			Number or Reported Events Used	48						
15			Number Values Reported (n)	48						
16			Minimum	44						
17			Maximum	130						
18			Mean	77.48						
19			Geometric Mean	75.2						
20			Median	78.5						
21			Standard Deviation	19.14						
22			Coefficient of Variation	0.247						
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)	-487						
26			Critical Value (0.05)	-1.645						
27			Standard Deviation of S	112.4						
28			Standardized Value of S	-4.323						
29			Approximate p-value	7.6860E-6						
30										
31	**Statistically significant evidence of a decreasing**									
32	**trend at the specified level of significance.**									



OLS	
n	48
Slope	-0.0073
Intercept	93.3661
R-sq	0.2387
R	-0.4886
Scale Estimate	16.8797
P-value (Reg)	0.0004
P-value (Slope)	0.0004

Mann-Kendall	
S	-487.0000
SD of S	112.4144
Standardized S	-4.3233
Approximate p-value	0.0000

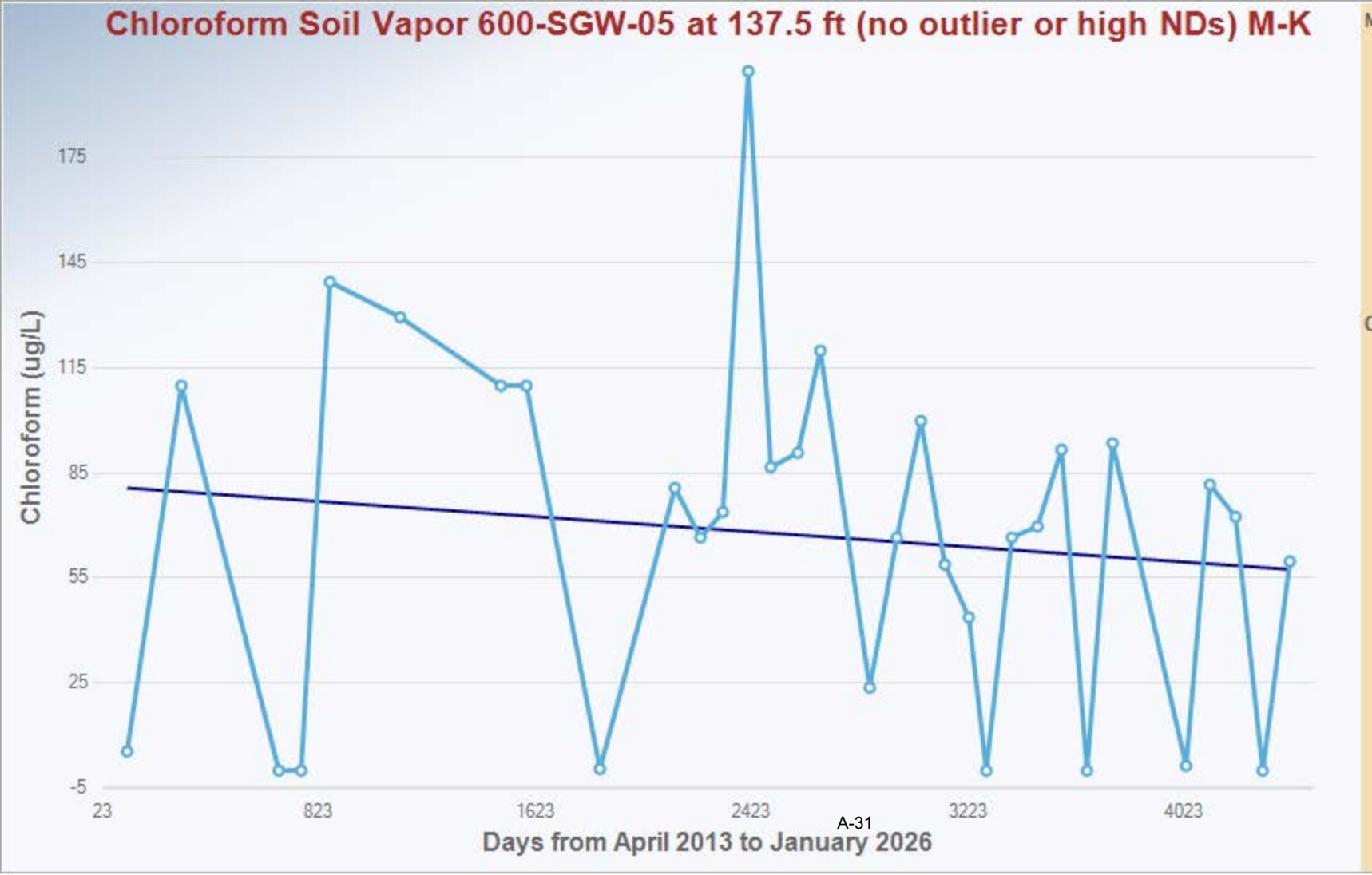
Confidence Coefficient	0.9500

Red = Prediction Interval

Green = Confidence Interval

	A	B	C	D	E	F	G	H
1	**Ordinary Least Squares Linear Regression Output Sheet**							
2				User Selected Options				
3				Date/Time of Computation	ProUCL 5.2 4/2/2026 12:23:10 PM			
4				From File	600-SGW-05_Vapor_2026_Input.xls			
5				Full Precision	OFF			
6								
7				Display Limits	False			
8				Display Regresion Diagnostics	False			
9				Display Regresion Tables	True			
10				Title For Y vs X Plots	Classical Regression			
11				Confidence Level for Regression Line	0.95			
12				Display Confidence Band	True			
13				Display Prediction Band	True			
14								
15								
16				Dependendant Variable (Y-Data)	Chloroform_102.5_No_Outliers			
17				Number Reported (Y values)	48			
18				Independent Variable (x-data)	Date_Chloro_102.5_No_outlier			
19				Number Reported (x-values)	48			
20								
21								
22	**Regression Estimates and Inference Table**							
23	Parameter	Estimates	Std. Error	T-values	p-values			
24	intercept	93.37	4.841	19.29	1.121E-23			
25	Date_Chloro_102.5_No_outlier	-0.00731	0.00192	-3.798	4.2637E-4			
26								
27	**OLS ANOVA Table**							
28	**Source of Variation**			**SS**	**DOF**	**MS**	**F-Value**	**P-Value**
29			**Regression**	4109	1	4109	14.42	0.0004
30			**Error**	13107	46	284.9		
31			**Total**	17216	47			
32								
33					R Square	0.239		
34					Adjusted R Square	0.222		
35					Sqrt(MSE) = Scale	16.88		
36								
37	**Regression Table**							
38	Obs	Y Vector	Yhat	Residuals	Res/Scale			
39	1	100	93.37	6.634	0.393			
40	2	110	92.54	17.46	1.034			
41	3	100	91.66	8.336	0.494			
42	4	58	91.1	-33.1	-1.961			
43	5	82	90.5	-8.502	-0.504			
44	6	120	89.77	30.23	1.791			
45	7	70	89.25	-19.25	-1.141			
46	8	86	88.95	-2.946	-0.175			
47	9	110	87.87	22.13	1.311			
48	10	100	87.07	12.93	0.766			
49	11	68	86.49	-18.49	-1.096			
50	12	81	85.83	-4.834	-0.286			
51	13	54	85.17	-31.17	-1.847			
52	14	91	84.56	6.444	0.382			
53	15	82	83.49	-1.49	-0.0882			
54	16	79	83.18	-4.175	-0.247			
55	17	86	82.47	3.526	0.209			
56	18	98	81.76	16.24	0.962			
57	19	87	81.12	5.885	0.349			

	A	B	C	D	E	F	G	H
58	20	87	80.17	6.834	0.405			
59	21	83	79.79	3.214	0.19			
60	22	77	78.98	-1.982	-0.117			
61	23	80	78.47	1.529	0.0906			
62	24	79	77.77	1.23	0.0729			
63	25	69	77.08	-8.083	-0.479			
64	26	78	76.48	1.516	0.0898			
65	27	86	75.76	10.24	0.607			
66	28	76	75.18	0.816	0.0484			
67	29	64	74.45	-10.45	-0.619			
68	30	80	73.82	6.183	0.366			
69	31	82	73.09	8.906	0.528			
70	32	78	72.5	5.505	0.326			
71	33	67	71.78	-4.779	-0.283			
72	34	78	71.11	6.885	0.408			
73	35	54	70.49	-16.49	-0.977			
74	36	46	69.83	-23.83	-1.412			
75	37	61	69.35	-8.347	-0.494			
76	38	51	68.64	-17.64	-1.045			
77	39	62	67.97	-5.973	-0.354			
78	40	44	67.3	-23.3	-1.38			
79	41	68	66.64	1.364	0.0808			
80	42	53	65.96	-12.96	-0.768			
81	43	94	65.31	28.69	1.7			
82	44	57	64.64	-7.642	-0.453			
83	45	130	63.94	66.06	3.914			
84	46	55	63.3	-8.298	-0.492			
85	47	59	61.9	-2.895	-0.172			
86	48	59	61.16	-2.165	-0.128			
87								



Mann-Kendall Trend Analysis

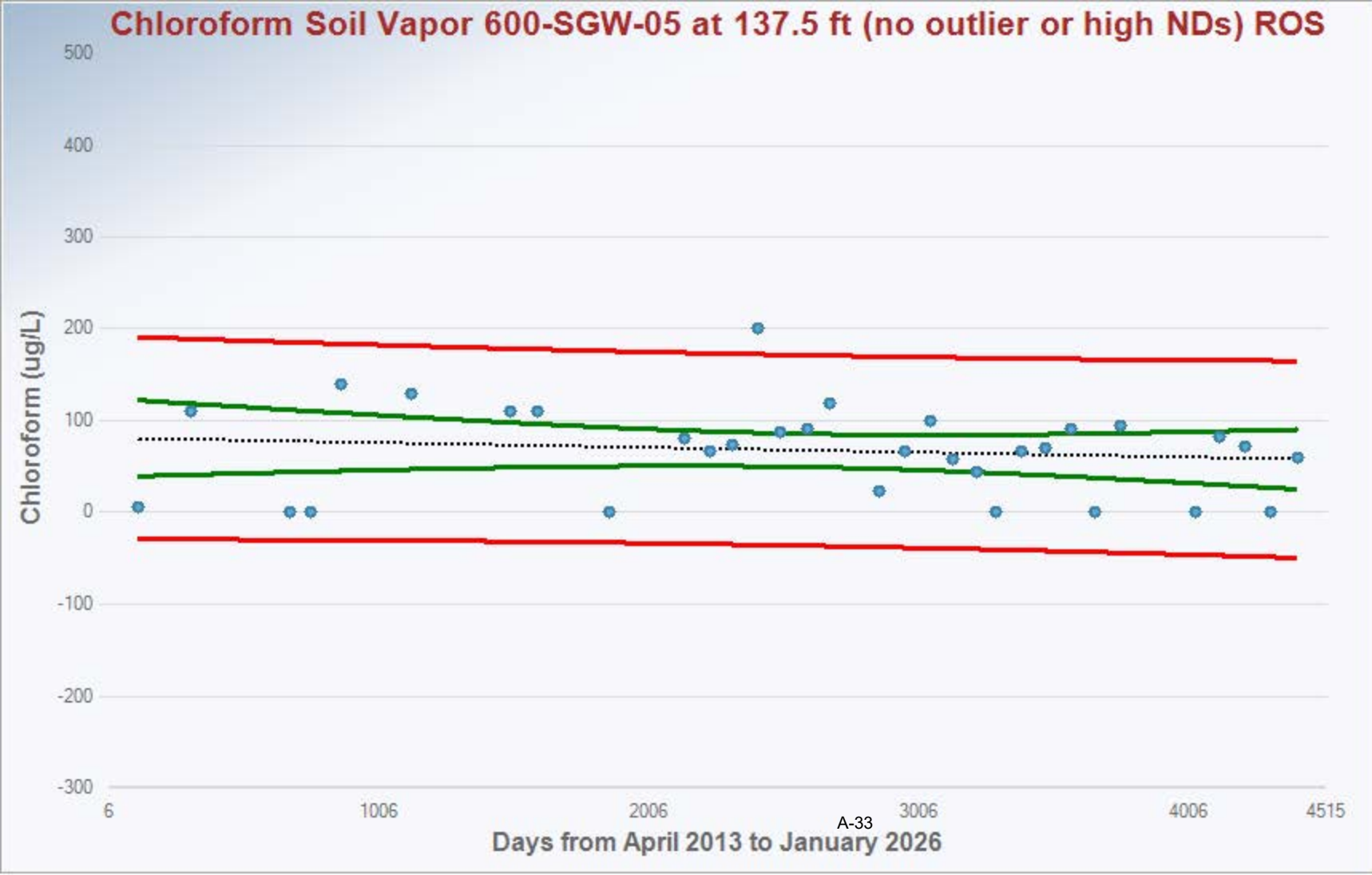
n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.4709
Standardized Value of S	-1.3502
M-K Test Value (S)	-84
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0885

OLS Regression Line (Blue)

OLS Regression Slope	-0.0054
OLS Regression Intercept	81.4875

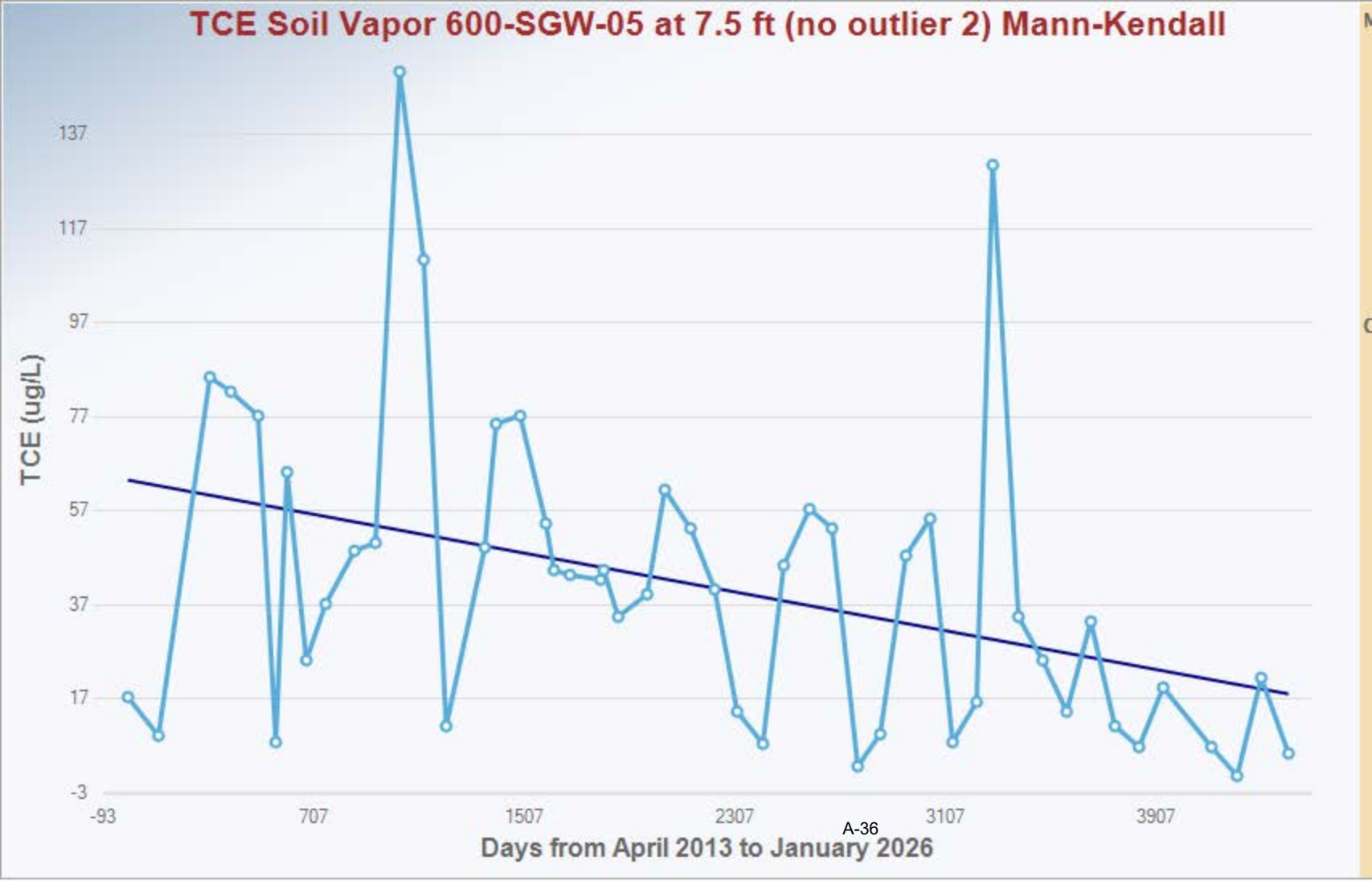
Insufficient statistical evidence of a significant trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/6/2026 1:49:51 AM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**Chloro_137.5_noOutlierHighNDs**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)	33						
13			Number of Missing Events	1						
14			Number or Reported Events Used	32						
15			Number Values Reported (n)	33						
16			Number Values Missing	1						
17			Number Values Used	32						
18			Minimum	0.31						
19			Maximum	200						
20			Mean	67.55						
21			Geometric Mean	24.28						
22			Median	71.5						
23			Standard Deviation	49.65						
24			Coefficient of Variation	0.735						
25										
26			**Mann-Kendall Test**							
27			M-K Test Value (S)	-84						
28			Critical Value (0.05)	-1.645						
29			Standard Deviation of S	61.47						
30			Standard Deviation of S	-1.35						
31			Approximate p-value	0.0885						
32										
33	**Insufficient evidence to identify a significant**									
34	**trend at the specified level of significance.**									


Chloroform Soil Vapor 600-SGW-05 at 137.5 ft (no outlier or high NDs) ROS
Chloroform (ug/L)
500
400
300
200
100
0
-100
-200
-300
6
1006
2006
3006
4006
4515
Days from April 2013 to January 2026
OLS
n 32
Slope -0.0054
Intercept 81.4875
R-sq 0.0175
R -0.1325
Scale Estimate 50.0216
P-value (Reg) 0.4699
P-value (Slope) 0.4699
Mann-Kendall
S -84.0000
SD of S 61.4709
Standardized S -1.3502
Approximate p-value 0.0885
Confidence Coefficient 0.9500
Red = Prediction Interval
Green = Confidence Interval

	A	B	C	D	E	F	G	H
1	Ordinary Least Squares Linear Regression Output Sheet							
2	User Selected Options							
3	Date/Time of Computation			ProUCL 5.2 4/6/2026 1:44:32 AM				
4	From File			600-SGW-05_Vapor_2026_Input.xls				
5	Full Precision			OFF				
6								
7	Display Limits			False				
8	Display Regresion Diagnostics			False				
9	Display Regresion Tables			True				
10	Title For Y vs X Plots			Classical Regression				
11	Confidence Level for Regression Line			0.95				
12	Display Confidence Band			True				
13	Display Prediction Band			True				
14								
15								
16	Dependendant Variable (Y-Data)				Chloro_137.5_noOutlierHighNDs			
17	Number Observations (Y-Data)				33			
18	Number Missing Y-Data				1			
19	Number Reported (Y values)				32			
20	Independent Variable (x-data)				Date_Chloro_137.5_noOutlierHighNDs			
21	Observations (x-data)				33			
22	Number Missing x-data				1			
23	Number Reported (x-values)				32			
24								
25								
26	There were missing value(s) in the selected Dependendant Variable!							
27	There were missing value(s) in the selected Independent Variable!							
28	Any row with a missing value has been removed from the data to be processed!							
29	Information is lost when there are valid values in one variable but not the other!							
30								
31								
32	Regression Estimates and Inference Table							
33	Parameter	Estimates	Std. Error	T-values	p-values			
34	intercept	81.49	20.99	3.882	5.2746E-4			
35	Date_Chloro_137.5_noOutlierHighNDs	-0.00537	0.00734	-0.732	0.47			
36								
37	OLS ANOVA Table							
38	Source of Variation			SS	DOF	MS	F-Value	P-Value
39	Regression			1340	1	1340	0.536	0.4699
40	Error			75065	30	2502		
41	Total			76405	31			
42								
43	R Square				0.0175			
44	Adjusted R Square				0			
45	Sqrt(MSE) = Scale				50.02			
46								
47	Regression Table							
48	Obs	Y Vector	Yhat	Residuals	Res/Scale			
49	1	5.8	80.88	-75.08	-1.501			
50	2	110	79.82	30.18	0.603			
51	3	0.31	77.87	-77.56	-1.55			
52	4	0.31	77.45	-77.14	-1.542			
53	5	140	76.86	63.14	1.262			
54	6	130	75.46	54.54	1.09			
55	7	110	73.48	36.52	0.73			
56	8	110	72.95	37.05	0.741			
57	9	0.67	71.5	-70.83	-1.416			
58	10	81	70.02	10.98	0.219			
59	11	67	69.52	-2.517	-0.0503			
60	12	74	69.08	4.924	0.0984			

	A	B	C	D	E	F	G	H
61	13	200	68.54	131.5	2.628			
62	14	87	68.12	18.88	0.377			
63	15	91	67.58	23.42	0.468			
64	16	120	67.12	52.88	1.057			
65	17	24	66.14	-42.14	-0.843			
66	18	67	65.62	1.383	0.0276			
67	19	100	65.13	34.87	0.697			
68	20	59	64.67	-5.667	-0.113			
69	21	44	64.18	-20.18	-0.403			
70	22	0.31	63.83	-63.52	-1.27			
71	23	67	63.31	3.692	0.0738			
72	24	70	62.82	7.181	0.144			
73	25	92	62.33	29.67	0.593			
74	26	0.31	61.84	-61.53	-1.23			
75	27	94	61.34	32.66	0.653			
76	28	1.7	59.85	-58.15	-1.163			
77	29	82	59.38	22.62	0.452			
78	30	73	58.87	14.13	0.282			
79	31	0.31	58.35	-58.04	-1.16			
80	32	60	57.81	2.186	0.0437			
81								



Mann-Kendall Trend Analysis

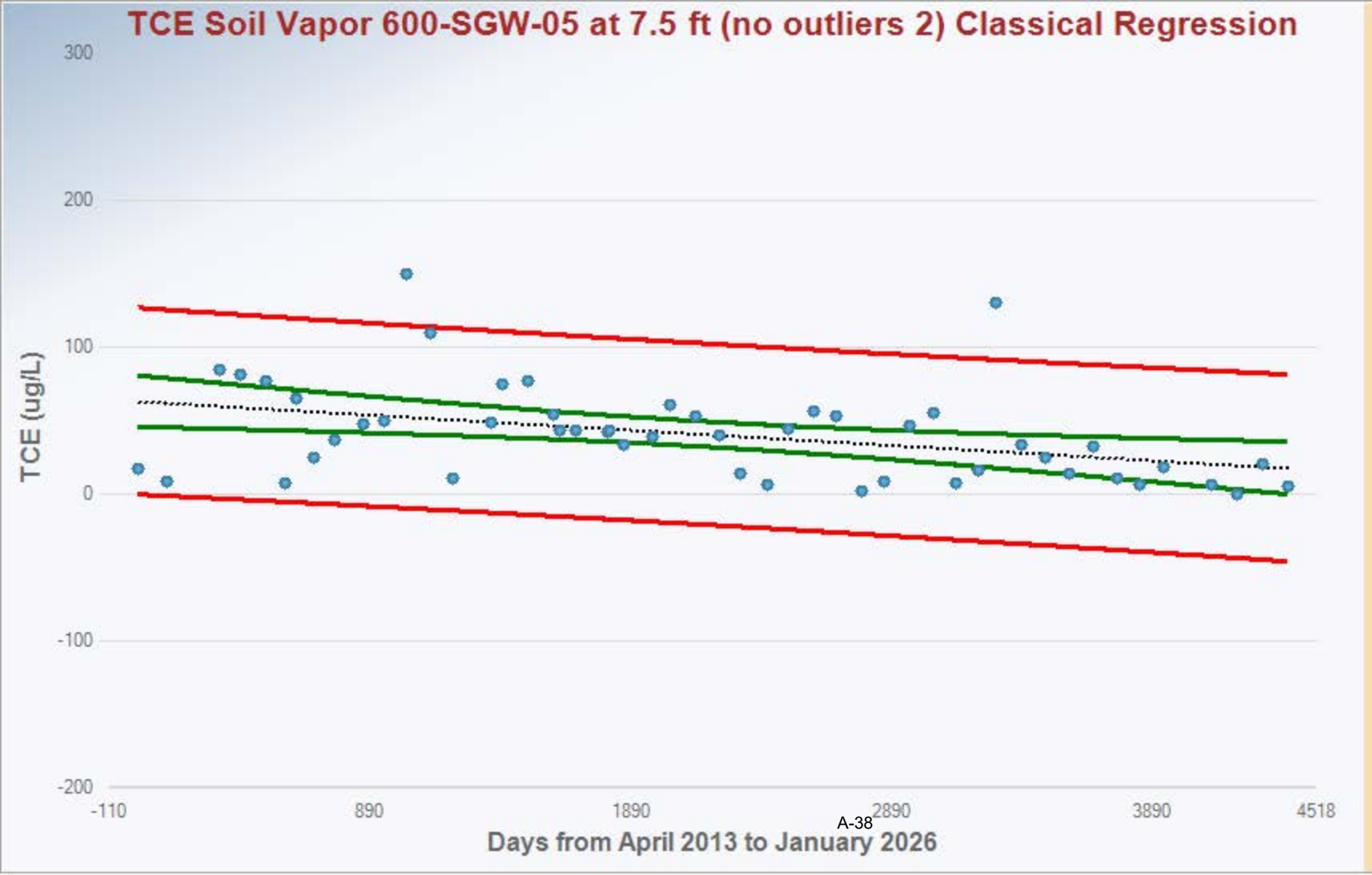
n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5185
Standardized Value of S	-3.5225
M-K Test Value (S)	-422
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	-0.0103
OLS Regression Intercept	63.2758

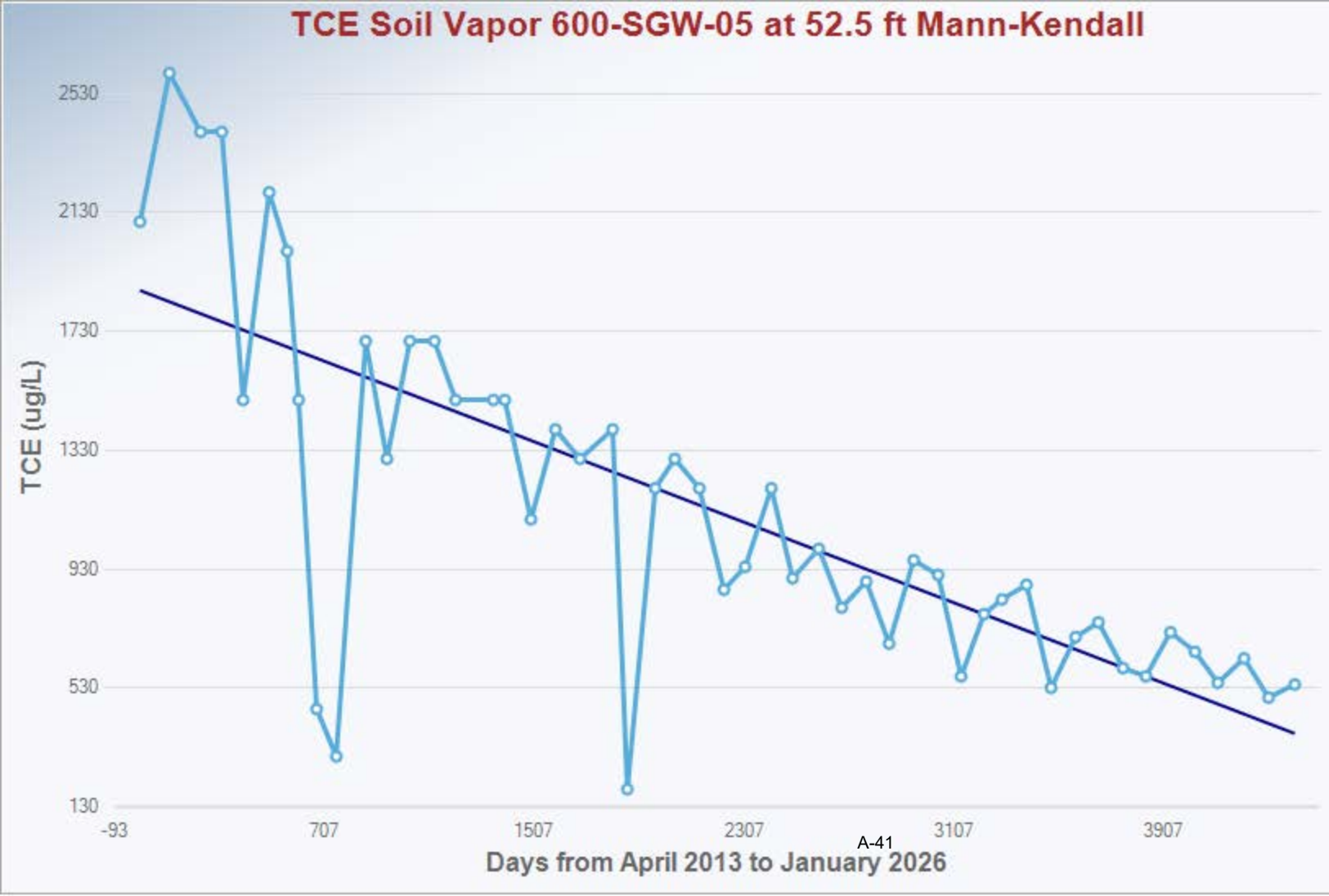
Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/6/2026 12:24:50 AM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**TCE_7.5_No_outlier2**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)	50						
13			Number of Missing Events	0						
14			Number or Reported Events Used	50						
15			Number Values Reported (n)	50						
16			Minimum	0.3						
17			Maximum	150						
18			Mean	40.92						
19			Geometric Mean	26.58						
20			Median	39.5						
21			Standard Deviation	32.71						
22			Coefficient of Variation	0.799						
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)	-422						
26			Critical Value (0.05)	-1.645						
27			Standard Deviation of S	119.5						
28			Standardized Value of S	-3.522						
29			Approximate p-value	2.1377E-4						
30										
31	Statistically significant evidence of a decreasing									
32	trend at the specified level of significance.									


TCE Soil Vapor 600-SGW-05 at 7.5 ft (no outliers 2) Classical Regression
300
200
100
0
-100
-200
TCE (ug/L)
-110
890
1890
2890
3890
4518
Days from April 2013 to January 2026
OLS
n 50
Slope -0.0103
Intercept 63.2758
R-sq 0.1553
R -0.3941
Scale Estimate 30.3732
P-value (Reg) 0.0046
P-value (Slope) 0.0046
Mann-Kendall
S -422.0000
SD of S 119.5185
Standardized S -3.5225
Approximate p-value 0.0002
Confidence Coefficient 0.9500
Red = Prediction Interval
Green = Confidence Interval

	A	B	C	D	E	F	G	H
1	**Ordinary Least Squares Linear Regression Output Sheet**							
2				User Selected Options				
3				Date/Time of Computation	ProUCL 5.2 4/6/2026 12:21:13 AM			
4				From File	600-SGW-05_Vapor_2026_Input.xls			
5				Full Precision	OFF			
6								
7				Display Limits	False			
8				Display Regresion Diagnostics	False			
9				Display Regresion Tables	True			
10				Title For Y vs X Plots	Classical Regression			
11				Confidence Level for Regression Line	0.95			
12				Display Confidence Band	True			
13				Display Prediction Band	True			
14								
15								
16				Dependendant Variable (Y-Data)	TCE_7.5_No_outlier2			
17				Number Reported (Y values)	50			
18				Independent Variable (x-data)	Date_TCE_7.5_No_outlier2			
19				Number Reported (x-values)	50			
20								
21								
22	**Regression Estimates and Inference Table**							
23	Parameter	Estimates	Std. Error	T-values	p-values			
24	intercept	63.28	8.663	7.304	2.5152E-9			
25	Date_TCE_7.5_No_outlier2	-0.0103	0.00347	-2.971	0.00462			
26								
27	**OLS ANOVA Table**							
28	**Source of Variation**			**SS**	**DOF**	**MS**	**F-Value**	**P-Value**
29	**Regression**			8144	1	8144	8.828	0.0046
30	**Error**			44282	48	922.5		
31	**Total**			52426	49			
32								
33				R Square	0.155			
34				Adjusted R Square	0.138			
35				Sqrt(MSE) = Scale	30.37			
36								
37	**Regression Table**							
38	Obs	Y Vector	Yhat	Residuals	Res/Scale			
39	1	17	63.28	-46.28	-1.524			
40	2	8.7	62.11	-53.41	-1.758			
41	3	85	60.08	24.92	0.82			
42	4	82	59.24	22.76	0.75			
43	5	77	58.2	18.8	0.619			
44	6	7.5	57.47	-49.97	-1.645			
45	7	65	57.04	7.96	0.262			
46	8	25	56.33	-31.33	-1.031			
47	9	37	55.52	-18.52	-0.61			
48	10	48	54.39	-6.391	-0.21			

	A	B	C	D	E	F	G	H
49	11	50	53.58	-3.576	-0.118			
50	12	150	52.65	97.35	3.205			
51	13	110	51.71	58.29	1.919			
52	14	11	50.84	-39.84	-1.312			
53	15	49	49.34	-0.34	-0.0112			
54	16	75	48.9	26.1	0.859			
55	17	77	47.91	29.09	0.958			
56	18	54	46.9	7.103	0.234			
57	19	44	46.63	-2.629	-0.0866			
58	20	43	45.99	-2.99	-0.0984			
59	21	42	44.75	-2.753	-0.0906			
60	22	44	44.65	-0.65	-0.0214			
61	23	34	44.11	-10.11	-0.333			
62	24	39	42.98	-3.98	-0.131			
63	25	61	42.26	18.74	0.617			
64	26	53	41.27	11.73	0.386			
65	27	40	40.3	-0.3	-0.00988			
66	28	14	39.45	-25.45	-0.838			
67	29	7	38.43	-31.43	-1.035			
68	30	45	37.62	7.38	0.243			
69	31	57	36.58	20.42	0.672			
70	32	53	35.69	17.31	0.57			
71	33	2.3	34.67	-32.37	-1.066			
72	34	9.2	33.83	-24.63	-0.811			
73	35	47	32.82	14.18	0.467			
74	36	55	31.88	23.12	0.761			
75	37	7.4	30.99	-23.59	-0.777			
76	38	16	30.06	-14.06	-0.463			
77	39	130	29.38	100.6	3.313			
78	40	34	28.38	5.615	0.185			
79	41	25	27.45	-2.447	-0.0806			
80	42	14	26.5	-12.5	-0.411			
81	43	33	25.56	7.44	0.245			
82	44	11	24.6	-13.6	-0.448			
83	45	6.3	23.68	-17.38	-0.572			
84	46	19	22.75	-3.746	-0.123			
85	47	6.4	20.85	-14.45	-0.476			
86	48	0.3	19.87	-19.57	-0.644			
87	49	21	18.87	2.129	0.0701			
88	50	5.1	17.84	-12.74	-0.419			
89								



Mann-Kendall Trend Analysis

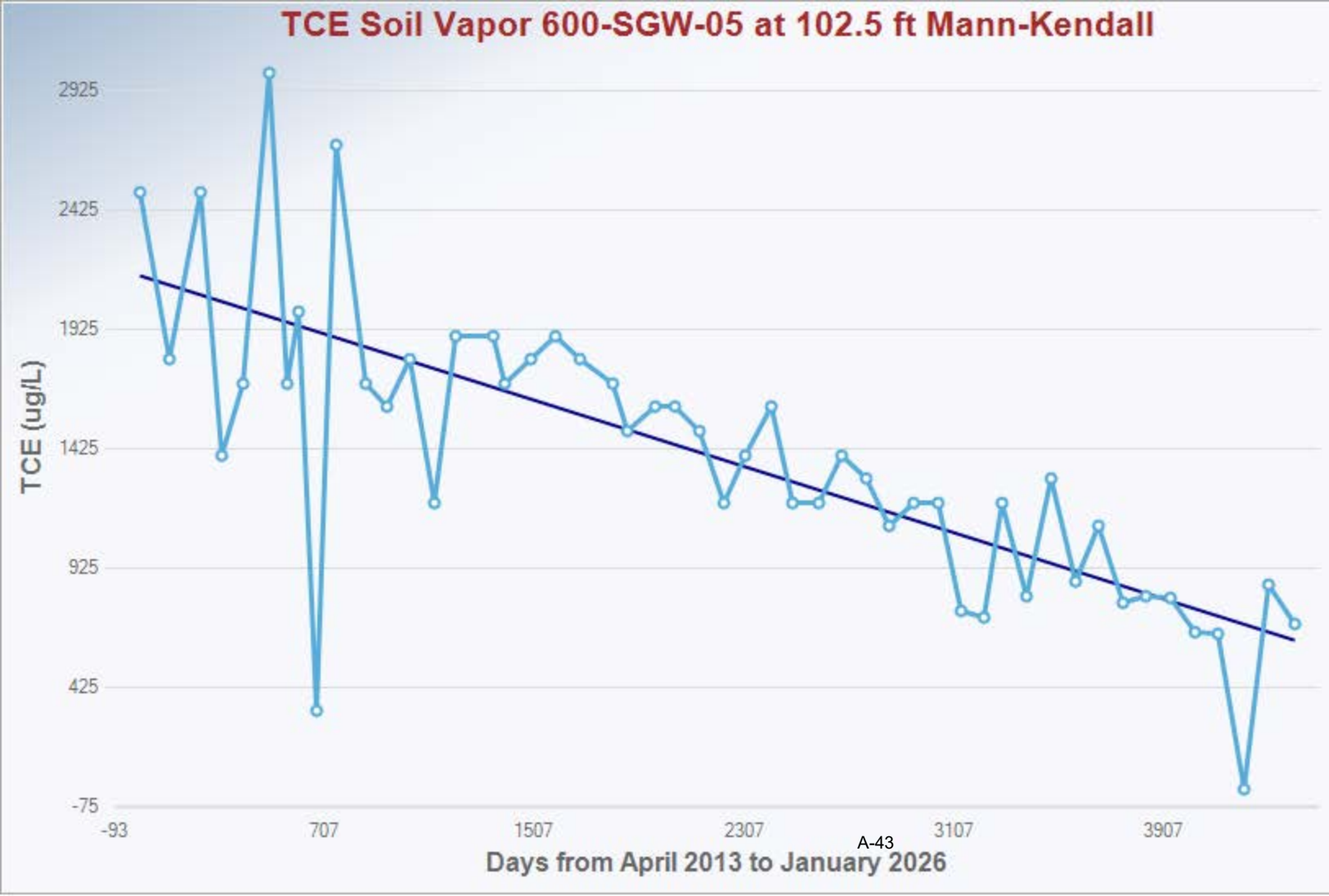
n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.4194
Standardized Value of S	-6.8163
M-K Test Value (S)	-815
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3383
OLS Regression Intercept	1,867.1858

Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I
1	**Mann-Kendall Trend Test Analysis**								
2			User Selected Options						
3			Date/Time of Computation	ProUCL 5.2 4/2/2026 12:58:20 PM					
4			From File	600-SGW-05_Vapor_2026_Input.xls					
5			Full Precision	OFF					
6			Confidence Coefficient	0.95					
7			Level of Significance	0.05					
8									
9			**TCE_52.5**						
10									
11			**General Statistics**						
12			Number of Events Reported (m)		50				
13			Number of Missing Events		0				
14			Number or Reported Events Used		50				
15			Number Values Reported (n)		50				
16			Minimum		190				
17			Maximum		2600				
18			Mean		1128				
19			Geometric Mean		984.6				
20			Median		950				
21			Standard Deviation		578.3				
22			Coefficient of Variation		0.513				
23									
24			**Mann-Kendall Test**						
25			M-K Test Value (S)		-815				
26			Critical Value (0.05)		-1.645				
27			Standard Deviation of S		119.4				
28			Standardized Value of S		-6.816				
29			Approximate p-value		4.670E-12				
30									
31	Statistically significant evidence of a decreasing								
32	trend at the specified level of significance.								



Mann-Kendall Trend Analysis

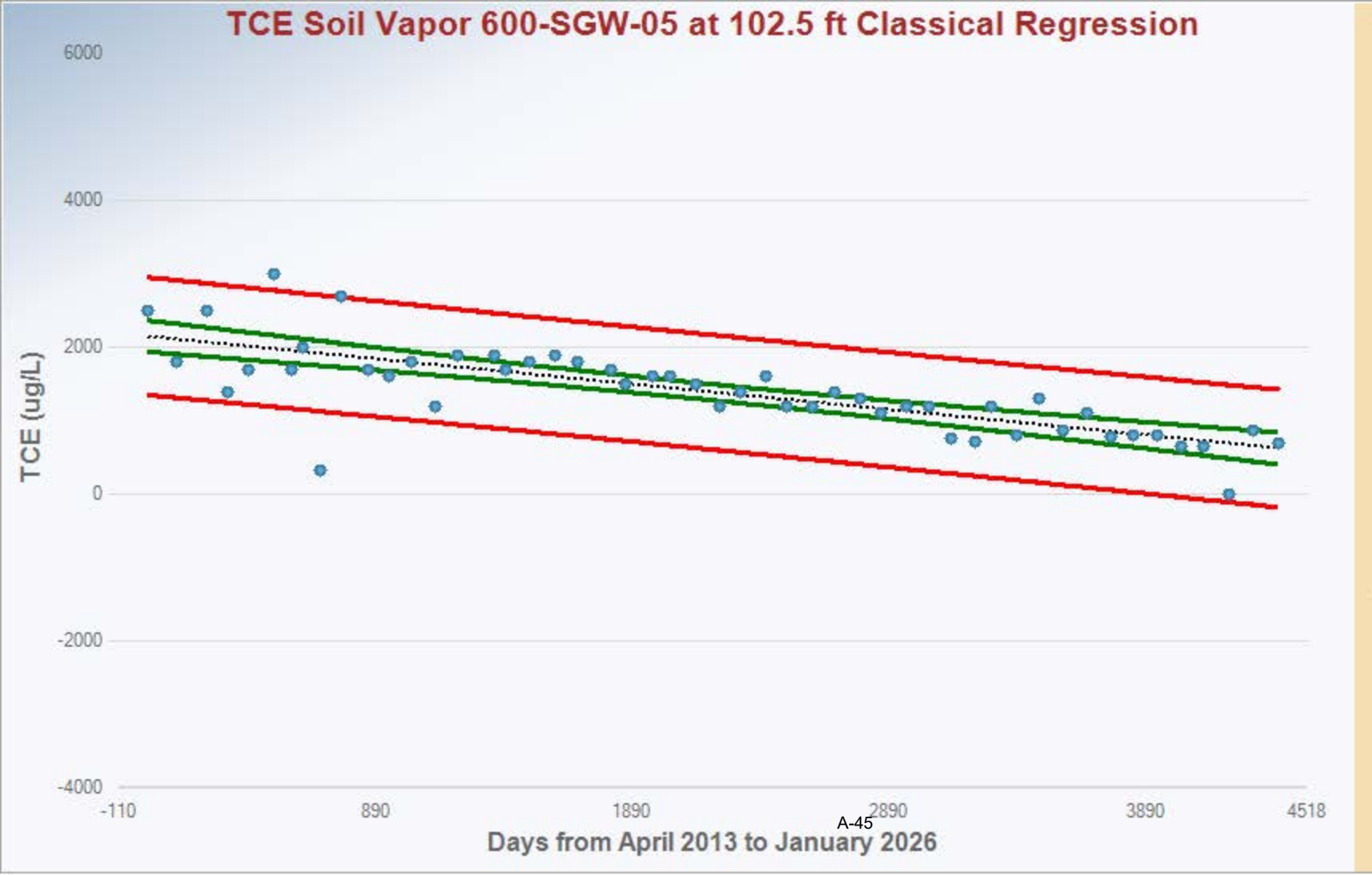
n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.1679
Standardized Value of S	-6.7468
M-K Test Value (S)	-805
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3473
OLS Regression Intercept	2,151.5557

Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/2/2026 1:16:26 PM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**TCE_102.5**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)		50					
13			Number of Missing Events		0					
14			Number or Reported Events Used		50					
15			Number Values Reported (n)		50					
16			Minimum		0.4					
17			Maximum		3000					
18			Mean		1393					
19			Geometric Mean		1112					
20			Median		1400					
21			Standard Deviation		591.5					
22			Coefficient of Variation		0.425					
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)		-805					
26			Critical Value (0.05)		-1.645					
27			Standard Deviation of S		119.2					
28			Standardized Value of S		-6.747					
29			Approximate p-value		7.558E-12					
30										
31	**Statistically significant evidence of a decreasing**									
32	**trend at the specified level of significance.**									



OLS	
n	50
Slope	-0.3473
Intercept	2,151.5557
R-sq	0.5867
R	-0.7660
Scale Estimate	384.2099
P-value (Reg)	0.0000
P-value (Slope)	0.0000

Mann-Kendall	
S	-805.0000
SD of S	119.1679
Standardized S	-6.7468
Approximate p-value	0.0000

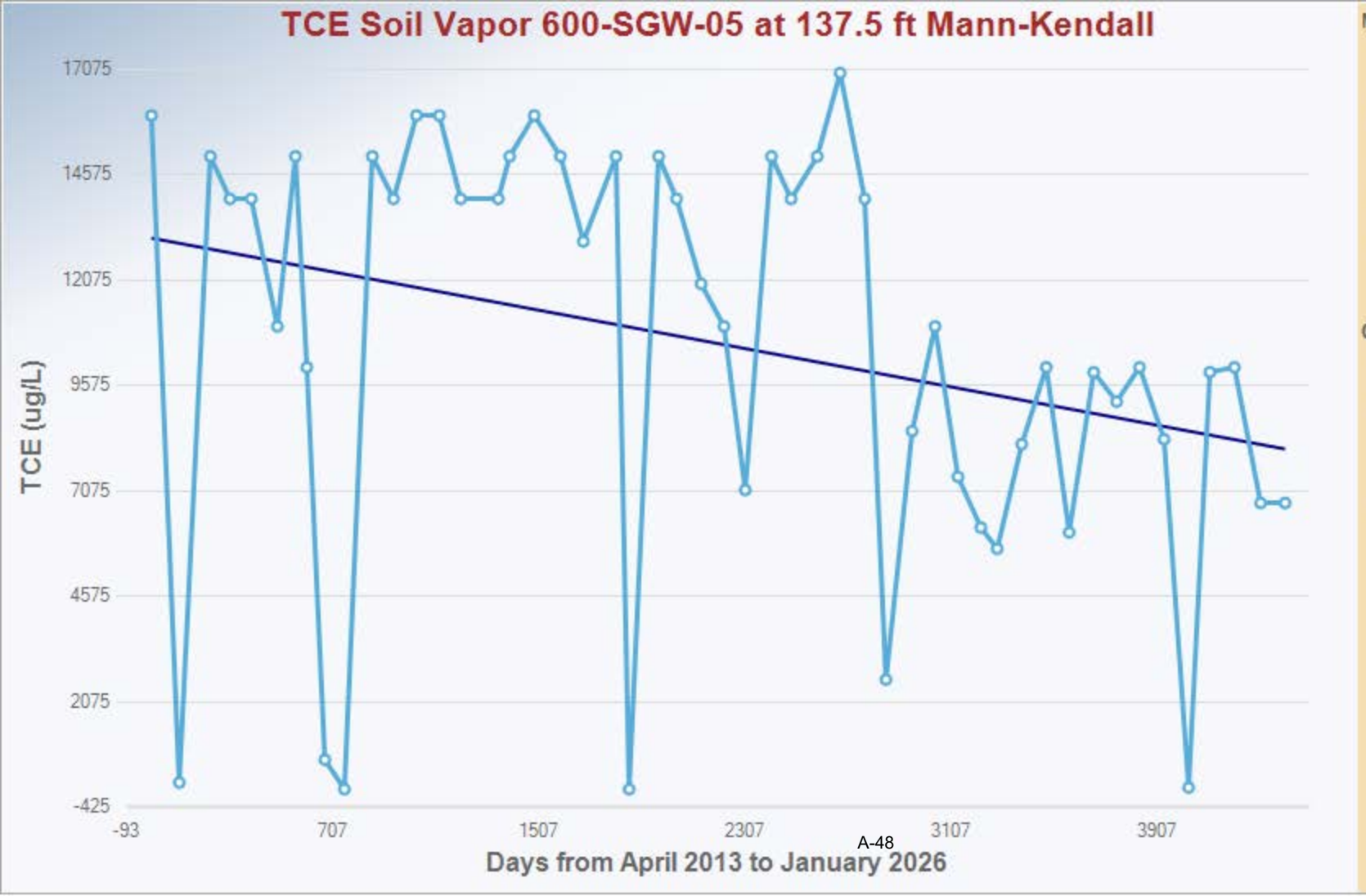
Confidence Coefficient	0.9500

Red = Prediction Interval

Green = Confidence Interval

	A	B	C	D	E	F	G	H	I
1	**Ordinary Least Squares Linear Regression Output Sheet**								
2			User Selected Options						
3			Date/Time of Computation	ProUCL 5.2 4/2/2026 1:09:36 PM					
4			From File	600-SGW-05_Vapor_2026_Input.xls					
5			Full Precision	OFF					
6									
7			Display Limits	False					
8			Display Regresion Diagnostics	False					
9			Display Regresion Tables	True					
10			Title For Y vs X Plots	Classical Regression					
11			Confidence Level for Regression Line	0.95					
12			Display Confidence Band	True					
13			Display Prediction Band	True					
14									
15									
16				Dependendant Variable (Y-Data)	TCE_102.5				
17				Number Reported (Y values)	50				
18				Independent Variable (x-data)	Date_TCE_102.5				
19				Number Reported (x-values)	50				
20									
21									
22	**Regression Estimates and Inference Table**								
23	Parameter	Estimates	Std. Error	T-values	p-values				
24	intercept	2152	106.8	20.15	4.639E-25				
25	Date_TCE_102.5	-0.347	0.0421	-8.254	9.115E-11				
26									
27	**OLS ANOVA Table**								
28	**Source of Variation**			**SS**	**DOF**	**MS**	**F-Value**	**P-Value**	
29			**Regression**	10057621	1	10057621	68.13	0.0000	
30			**Error**	7085627	48	147617			
31			**Total**	17143248	49				
32									
33					R Square	0.587			
34					Adjusted R Square	0.578			
35					Sqrt(MSE) = Scale	384.2			
36									
37	**Regression Table**								
38	Obs	Y Vector	Yhat	Residuals	Res/Scale				
39	1	2500	2152	348.4	0.907				
40	2	1800	2112	-312.3	-0.813				
41	3	2500	2071	429.4	1.118				
42	4	1400	2044	-643.9	-1.676				
43	5	1700	2015	-315.4	-0.821				
44	6	3000	1981	1019	2.653				
45	7	1700	1956	-256	-0.666				
46	8	2000	1941	58.54	0.152				
47	9	330	1917	-1587	-4.132				
48	10	2700	1890	809.6	2.107				
49	11	1700	1852	-152.2	-0.396				
50	12	1600	1825	-224.8	-0.585				
51	13	1800	1794	6.481	0.0169				
52	14	1200	1762	-561.9	-1.463				
53	15	1900	1733	167.3	0.435				
54	16	1900	1682	218	0.567				
55	17	1700	1667	32.89	0.0856				
56	18	1800	1634	166.2	0.433				
57	19	1900	1600	300.3	0.781				
58	20	1800	1569	230.8	0.601				
59	21	1700	1524	176	0.458				
60	22	1500	1506	-5.978	-0.0156				

	A	B	C	D	E	F	G	H	I
61	23	1600	1468	132.2	0.344				
62	24	1600	1443	156.5	0.407				
63	25	1500	1410	89.87	0.234				
64	26	1200	1377	-177.5	-0.462				
65	27	1400	1349	50.99	0.133				
66	28	1600	1315	285.4	0.743				
67	29	1200	1287	-87.2	-0.227				
68	30	1200	1252	-52.12	-0.136				
69	31	1400	1222	177.7	0.463				
70	32	1300	1188	112.1	0.292				
71	33	1100	1159	-59.4	-0.155				
72	34	1200	1125	74.63	0.194				
73	35	1200	1094	106.2	0.276				
74	36	750	1064	-313.9	-0.817				
75	37	720	1033	-312.6	-0.814				
76	38	1200	1010	190.3	0.495				
77	39	810	976	-166	-0.432				
78	40	1300	944.4	355.6	0.925				
79	41	870	912.5	-42.49	-0.111				
80	42	1100	880.9	219.1	0.57				
81	43	780	848.6	-68.59	-0.179				
82	44	810	817.7	-7.686	-0.02				
83	45	800	786.1	13.92	0.0362				
84	46	660	752.7	-92.75	-0.241				
85	47	650	722.2	-72.19	-0.188				
86	48	0.4	689.2	-688.8	-1.793				
87	49	860	655.5	204.5	0.532				
88	50	690	620.8	69.22	0.18				
89									



Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	118.7911
Standardized Value of S	-3.1736
M-K Test Value (S)	-378
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0008

OLS Regression Line (Blue)

OLS Regression Slope	-1.1353
OLS Regression Intercept	13,072.8829

Statistically significant evidence of a decreasing trend at the specified level of significance.

	A	B	C	D	E	F	G	H	I	J
1				Mann-Kendall Trend Test Analysis						
2			User Selected Options							
3			Date/Time of Computation	ProUCL 5.2 4/2/2026 1:20:14 PM						
4			From File	600-SGW-05_Vapor_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7			Level of Significance	0.05						
8										
9			**TCE_137.5**							
10										
11			**General Statistics**							
12			Number of Events Reported (m)		50					
13			Number of Missing Events		0					
14			Number or Reported Events Used		50					
15			Number Values Reported (n)		50					
16			Minimum		0.3					
17			Maximum		17000					
18			Mean		10592					
19			Geometric Mean		5764					
20			Median		11000					
21			Standard Deviation		4897					
22			Coefficient of Variation		0.462					
23										
24			**Mann-Kendall Test**							
25			M-K Test Value (S)		-378					
26			Critical Value (0.05)		-1.645					
27			Standard Deviation of S		118.8					
28			Standardized Value of S		-3.174					
29			Approximate p-value		7.5271E-4					
30										
31	Statistically significant evidence of a decreasing									
32	trend at the specified level of significance.									

	A	B	C	D	E	F	G	H	I	J
1	**Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects**									
2			**User Selected Options**							
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 6:53:30 PM						
4			From File	600-G-138_GW_2026_Input.xls						
5			Full Precision	OFF						
6			Confidence Coefficient	0.95						
7										
8										
9	**Chloride**									
10										
11				**Raw Statistics**						
12				Number of Valid Observations		52				
13				Number of Distinct Observations		45				
14				Minimum		131				
15				Maximum		329				
16				Mean of Raw Data		208.3				
17				Standard Deviation of Raw Data		42.02				
18				Khat		25.62				
19				Theta hat		8.131				
20				Kstar		24.15				
21				Theta star		8.624				
22				Mean of Log Transformed Data		5.319				
23				Standard Deviation of Log Transformed Data		0.2				
24										
25				**Normal GOF Test Results**						
26										
27				Correlation Coefficient R		0.987				
28				Approximate Shapiro Wilk Test Statistic		0.971				
29				Approximate Shapiro Wilk P Value		0.389				
30				Lilliefors Test Statistic		0.0805				
31				Lilliefors Critical (0.05) Value		0.122				
32	**Data appear Normal at (0.05) Significance Level**									
33										
34				**Gamma GOF Test Results**						
35										
36				Correlation Coefficient R		0.995				
37				A-D Test Statistic		0.26				
38				A-D Critical (0.05) Value		0.748				
39				K-S Test Statistic		0.0725				
40				K-S Critical(0.05) Value		0.123				
41	**Data appear Gamma Distributed at (0.05) Significance Level**									
42										
43				**Lognormal GOF Test Results**						
44										
45				Correlation Coefficient R		0.995				
46				Approximate Shapiro Wilk Test Statistic		0.985				
47				Approximate Shapiro Wilk P Value		0.873				
48				Lilliefors Test Statistic		0.0647				
49				Lilliefors Critical (0.05) Value		0.122				
50	**Data appear Lognormal at (0.05) Significance Level**									
51										

	A	B	C	D	E	F	G	H	I	J
52	**Chloroform**									
53										
54				**Raw Statistics**						
55					Number of Valid Observations	53				
56					Number of Distinct Observations	37				
57					Minimum	0.24				
58					Maximum	1.2				
59					Mean of Raw Data	0.605				
60					Standard Deviation of Raw Data	0.16				
61					Khat	13.19				
62					Theta hat	0.0458				
63					Kstar	12.46				
64					Theta star	0.0485				
65					Mean of Log Transformed Data	-0.542				
66					Standard Deviation of Log Transformed Data	0.294				
67										
68				**Normal GOF Test Results**						
69										
70					Correlation Coefficient R	0.957				
71					Approximate Shapiro Wilk Test Statistic	0.937				
72					Approximate Shapiro Wilk P Value	0.011				
73					Lilliefors Test Statistic	0.126				
74					Lilliefors Critical (0.05) Value	0.121				
75	**Data not Normal at (0.05) Significance Level**									
76										
77				**Gamma GOF Test Results**						
78										
79					Correlation Coefficient R	0.958				
80					A-D Test Statistic	1.44				
81					A-D Critical (0.05) Value	0.75				
82					K-S Test Statistic	0.155				
83					K-S Critical(0.05) Value	0.122				
84	**Data not Gamma Distributed at (0.05) Significance Level**									
85										
86				**Lognormal GOF Test Results**						
87										
88					Correlation Coefficient R	0.933				
89					Approximate Shapiro Wilk Test Statistic	0.885				
90					Approximate Shapiro Wilk P Value	2.7273E-5				
91					Lilliefors Test Statistic	0.176				
92					Lilliefors Critical (0.05) Value	0.121				
93	**Data not Lognormal at (0.05) Significance Level**									
94										
95	**Non-parametric GOF Test Results**									
96										
97	**Data do not follow a discernible distribution at (0.05) Level of Significance**									
98										

	A	B	C	D	E	F	G	H	I	J
99	**Chloroform_no_outlier**									
100										
101				**Raw Statistics**						
102					Number of Valid Observations	52				
103					Number of Distinct Observations	36				
104					Minimum	0.24				
105					Maximum	0.83				
106					Mean of Raw Data	0.593				
107					Standard Deviation of Raw Data	0.138				
108					Khat	15.23				
109					Theta hat	0.0389				
110					Kstar	14.37				
111					Theta star	0.0413				
112					Mean of Log Transformed Data	-0.556				
113					Standard Deviation of Log Transformed Data	0.278				
114										
115				**Normal GOF Test Results**						
116										
117					Correlation Coefficient R	0.973				
118					Approximate Shapiro Wilk Test Statistic	0.937				
119					Approximate Shapiro Wilk P Value	0.0116				
120					Lilliefors Test Statistic	0.12				
121					Lilliefors Critical (0.05) Value	0.122				
122	**Data appear Approximate Normal at (0.05) Significance Level**									
123										
124				**Gamma GOF Test Results**						
125										
126					Correlation Coefficient R	0.951				
127					A-D Test Statistic	1.588				
128					A-D Critical (0.05) Value	0.749				
129					K-S Test Statistic	0.159				
130					K-S Critical(0.05) Value	0.123				
131	**Data not Gamma Distributed at (0.05) Significance Level**									
132										
133				**Lognormal GOF Test Results**						
134										
135					Correlation Coefficient R	0.917				
136					Approximate Shapiro Wilk Test Statistic	0.84				
137					Approximate Shapiro Wilk P Value	2.4942E-7				
138					Lilliefors Test Statistic	0.182				
139					Lilliefors Critical (0.05) Value	0.122				
140	**Data not Lognormal at (0.05) Significance Level**									
141										

	A	B	C	D	E	F	G	H	I	J
142	NO2NO3									
144				Raw Statistics						
145					Number of Valid Observations	52				
146					Number of Distinct Observations	38				
147					Minimum	5.32				
148					Maximum	13.5				
149					Mean of Raw Data	11.09				
150					Standard Deviation of Raw Data	1.426				
151					Khat	49.71				
152					Theta hat	0.223				
153					Kstar	46.86				
154					Theta star	0.237				
155					Mean of Log Transformed Data	2.396				
156					Standard Deviation of Log Transformed Data	0.153				
157										
158				Normal GOF Test Results						
159										
160					Correlation Coefficient R	0.926				
161					Approximate Shapiro Wilk Test Statistic	0.877				
162					Approximate Shapiro Wilk P Value	1.3741E-5				
163					Lilliefors Test Statistic	0.15				
164					Lilliefors Critical (0.05) Value	0.122				
165	Data not Normal at (0.05) Significance Level									
166										
167				Gamma GOF Test Results						
168										
169					Correlation Coefficient R	0.908				
170					A-D Test Statistic	2.277				
171					A-D Critical (0.05) Value	0.748				
172					K-S Test Statistic	0.176				
173					K-S Critical(0.05) Value	0.123				
174	Data not Gamma Distributed at (0.05) Significance Level									
175										
176				Lognormal GOF Test Results						
177										
178					Correlation Coefficient R	0.861				
179					Approximate Shapiro Wilk Test Statistic	0.77				
180					Approximate Shapiro Wilk P Value	2.432E-10				
181					Lilliefors Test Statistic	0.188				
182					Lilliefors Critical (0.05) Value	0.122				
183	Data not Lognormal at (0.05) Significance Level									
184										
185	Non-parametric GOF Test Results									
186										
187	Data do not follow a discernible distribution at (0.05) Level of Significance									
188										

	A	B	C	D	E	F	G	H	I	J
189	**NO2NO3_No_Outlier1**									
190										
191				**Raw Statistics**						
192					Number of Valid Observations	51				
193					Number of Distinct Observations	37				
194					Minimum	6.81				
195					Maximum	13.5				
196					Mean of Raw Data	11.2				
197					Standard Deviation of Raw Data	1.181				
198					Khat	83				
199					Theta hat	0.135				
200					Kstar	78.13				
201					Theta star	0.143				
202					Mean of Log Transformed Data	2.41				
203					Standard Deviation of Log Transformed Data	0.114				
204										
205				**Normal GOF Test Results**						
206										
207					Correlation Coefficient R	0.966				
208					Approximate Shapiro Wilk Test Statistic	0.948				
209					Approximate Shapiro Wilk P Value	0.0461				
210					Lilliefors Test Statistic	0.111				
211					Lilliefors Critical (0.05) Value	0.123				
212	**Data appear Approximate Normal at (0.05) Significance Level**									
213										
214				**Gamma GOF Test Results**						
215										
216					Correlation Coefficient R	0.957				
217					A-D Test Statistic	0.894				
218					A-D Critical (0.05) Value	0.748				
219					K-S Test Statistic	0.129				
220					K-S Critical(0.05) Value	0.124				
221	**Data not Gamma Distributed at (0.05) Significance Level**									
222										
223				**Lognormal GOF Test Results**						
224										
225					Correlation Coefficient R	0.934				
226					Approximate Shapiro Wilk Test Statistic	0.895				
227					Approximate Shapiro Wilk P Value	1.2330E-4				
228					Lilliefors Test Statistic	0.14				
229					Lilliefors Critical (0.05) Value	0.123				
230	**Data not Lognormal at (0.05) Significance Level**									
231										

	A	B	C	D	E	F	G	H	I	J
232	**NO2NO3_No_Outlier2**									
233										
234				**Raw Statistics**						
235					Number of Valid Observations	50				
236					Number of Distinct Observations	36				
237					Minimum	9.09				
238					Maximum	13.5				
239					Mean of Raw Data	11.29				
240					Standard Deviation of Raw Data	1.01				
241					Khat	124.8				
242					Theta hat	0.0905				
243					Kstar	117.3				
244					Theta star	0.0963				
245					Mean of Log Transformed Data	2.42				
246					Standard Deviation of Log Transformed Data	0.0911				
247										
248				**Normal GOF Test Results**						
249										
250					Correlation Coefficient R	0.991				
251					Shapiro Wilk Test Statistic	0.973				
252					Shapiro Wilk Critical (0.05) Value	0.947				
253					Approximate Shapiro Wilk P Value	0.485				
254					Lilliefors Test Statistic	0.0735				
255					Lilliefors Critical (0.05) Value	0.125				
256	**Data appear Normal at (0.05) Significance Level**									
257										
258				**Gamma GOF Test Results**						
259										
260					Correlation Coefficient R	0.988				
261					A-D Test Statistic	0.457				
262					A-D Critical (0.05) Value	0.748				
263					K-S Test Statistic	0.0817				
264					K-S Critical(0.05) Value	0.125				
265	**Data appear Gamma Distributed at (0.05) Significance Level**									
266										
267				**Lognormal GOF Test Results**						
268										
269					Correlation Coefficient R	0.987				
270					Shapiro Wilk Test Statistic	0.964				
271					Shapiro Wilk Critical (0.05) Value	0.947				
272					Approximate Shapiro Wilk P Value	0.231				
273					Lilliefors Test Statistic	0.0885				
274					Lilliefors Critical (0.05) Value	0.125				
275	**Data appear Lognormal at (0.05) Significance Level**									
276										

	A	B	C	D	E	F	G	H	I	J
277	**TCE**									
278										
279				**Raw Statistics**						
280					Number of Valid Observations	53				
281					Number of Distinct Observations	32				
282					Minimum	21				
283					Maximum	110				
284					Mean of Raw Data	54.62				
285					Standard Deviation of Raw Data	24.05				
286					Khat	5.811				
287					Theta hat	9.399				
288					Kstar	5.495				
289					Theta star	9.94				
290					Mean of Log Transformed Data	3.912				
291					Standard Deviation of Log Transformed Data	0.42				
292										
293				**Normal GOF Test Results**						
294										
295					Correlation Coefficient R	0.945				
296					Approximate Shapiro Wilk Test Statistic	0.876				
297					Approximate Shapiro Wilk P Value	9.2472E-6				
298					Lilliefors Test Statistic	0.166				
299					Lilliefors Critical (0.05) Value	0.121				
300	**Data not Normal at (0.05) Significance Level**									
301										
302				**Gamma GOF Test Results**						
303										
304					Correlation Coefficient R	0.974				
305					A-D Test Statistic	1.372				
306					A-D Critical (0.05) Value	0.753				
307					K-S Test Statistic	0.132				
308					K-S Critical(0.05) Value	0.122				
309	**Data not Gamma Distributed at (0.05) Significance Level**									
310										
311				**Lognormal GOF Test Results**						
312										
313					Correlation Coefficient R	0.977				
314					Approximate Shapiro Wilk Test Statistic	0.939				
315					Approximate Shapiro Wilk P Value	0.0137				
316					Lilliefors Test Statistic	0.116				
317					Lilliefors Critical (0.05) Value	0.121				
318	**Data appear Approximate_Lognormal at (0.05) Significance Level**									

	A	B	C	D	E	F	G	H	I	J	K
1					**Outlier Tests for Selected Uncensored Variables**						
2				**User Selected Options**							
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 5:13:59 PM							
4				From File	600-G-138_GW_2026_Input.xls						
5				Full Precision	OFF						
6											
7											
8				**Rosner's Outlier Test for Chloride**							
9											
10											
11				**Mean**	**208.3**						
12				**Standard Deviation**	**42.02**						
13				**Number of data**	**52**						
14				**Number of suspected outliers**	**1**						
15											
16				Potential	Obs.	Test	Critical	Critical			
17	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
18	1	208.3	41.61	329	49	2.901	3.144	3.496			
19											
20	For 5% Significance Level, there is no Potential Outlier										
21											
22	For 1% Significance Level, there is no Potential Outlier										
23											
24											
25				**Rosner's Outlier Test for Chloroform**							
26											
27											
28				**Mean**	**0.605**						
29				**Standard Deviation**	**0.16**						
30				**Number of data**	**53**						
31				**Number of suspected outliers**	**1**						
32											
33				Potential	Obs.	Test	Critical	Critical			
34	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
35	1	0.605	0.159	1.2	23	3.757	3.151	3.504			
36											
37	For 5% Significance Level, there is 1 Potential Outlier										
38	Potential outliers is: 1.2										
39											
40	For 1% Significance Level, there is 1 Potential Outlier										
41	Potential outliers is: 1.2										
42											
43											
44				**Rosner's Outlier Test for NO2NO3**							
45											
46											
47				**Mean**	**11.09**						
48				**Standard Deviation**	**1.426**						
49				**Number of data**	**52**						
50				**Number of suspected outliers**	**1**						
51											
52				Potential	Obs.	Test	Critical	Critical			
53	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
54	1	11.09	1.412	5.32	40	4.087	3.144	3.496			
55											
56	For 5% Significance Level, there is 1 Potential Outlier										
57	Potential outliers is: 5.32										
58											
59	For 1% Significance Level, there is 1 Potential Outlier										
60	Potential outliers is: 5.32										

	A	B	C	D	E	F	G	H	I	J	K
61											
62											
63	**Rosner's Outlier Test for TCE**										
64											
65											
66				**Mean**	**54.62**						
67				**Standard Deviation**	**24.05**						
68				**Number of data**	**53**						
69				**Number of suspected outliers**	**1**						
70											
71				Potential	Obs.	Test	Critical	Critical			
72	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
73	1	54.62	23.83	110	4	2.324	3.151	3.504			
74											
75	For 5% Significance Level, there is no Potential Outlier										
76											
77	For 1% Significance Level, there is no Potential Outlier										
78											

	A	B	C	D	E	F	G	H	I	J	K	L
1					**Outlier Tests for Selected Uncensored Variables**							
2				**User Selected Options**								
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 6:45:01 PM								
4				From File	600-G-138_GW_2026_Input.xls							
5				Full Precision	OFF							
6												
7												
8				**Rosner's Outlier Test for Chloroform_no_outlier**								
9												
10												
11				**Mean**	**0.593**							
12				**Standard Deviation**	**0.138**							
13				**Number of data**	**52**							
14				**Number of suspected outliers**	**1**							
15												
16				Potential	Obs.	Test	Critical	Critical				
17	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
18	1	0.593	0.137	0.24	37	2.585	3.144	3.496				
19												
20	For 5% Significance Level, there is no Potential Outlier											
21												
22	For 1% Significance Level, there is no Potential Outlier											
23												
24												
25				**Rosner's Outlier Test for NO2NO3_No_Outlier**								
26												
27												
28				**Mean**	**11.2**							
29				**Standard Deviation**	**1.181**							
30				**Number of data**	**51**							
31				**Number of suspected outliers**	**1**							
32												
33				Potential	Obs.	Test	Critical	Critical				
34	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
35	1	11.2	1.169	6.81	19	3.758	3.137	3.488				
36												
37	For 5% Significance Level, there is 1 Potential Outlier											
38	Potential outliers is: 6.81											
39												
40	For 1% Significance Level, there is 1 Potential Outlier											
41	Potential outliers is: 6.81											
42												

	A	B	C	D	E	F	G	H	I	J	K
1					**Outlier Tests for Selected Uncensored Variables**						
2				**User Selected Options**							
3			Date/Time of Computation	ProUCL 5.2 4/1/2026 6:50:02 PM							
4				From File	600-G-138_GW_2026_Input.xls						
5				Full Precision	OFF						
6											
7											
8				**Rosner's Outlier Test for NO2NO3_No_Outlier2**							
9											
10											
11				**Mean**	**11.29**						
12				**Standard Deviation**	**1.01**						
13				**Number of data**	**50**						
14				**Number of suspected outliers**	**1**						
15											
16				Potential	Obs.	Test	Critical	Critical			
17	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
18	1	11.29	1	13.5	2	2.208	3.13	3.48			
19											
20	For 5% Significance Level, there is no Potential Outlier										
21											
22	For 1% Significance Level, there is no Potential Outlier										
23											

	A	B	C	D	E	F	G	H	I	J	K
1				**Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects**							
2			**User Selected Options**								
3			Date/Time of Computation	ProUCL 5.2 4/6/2026 4:03:40 AM							
4			From File	600-SGW-05_Vapor_2026_Input.xls							
5			Full Precision	OFF							
6			Confidence Coefficient	0.95							
7											
8											
9	**Chloroform_7.5_M-K_noOutlierOrHighNDs**										
10											
11					**Raw Statistics**						
12					Number of Valid Observations	47					
13					Number of Distinct Observations	28					
14					Minimum	0.31					
15					Maximum	5.4					
16					Mean of Raw Data	1.687					
17					Standard Deviation of Raw Data	1.331					
18					Khat	1.598					
19					Theta hat	1.056					
20					Kstar	1.51					
21					Theta star	1.117					
22					Mean of Log Transformed Data	0.178					
23					Standard Deviation of Log Transformed Data	0.893					
24											
25					**Normal GOF Test Results**						
26											
27					Correlation Coefficient R	0.94					
28					Shapiro Wilk Test Statistic	0.871					
29					Shapiro Wilk Critical (0.05) Value	0.946					
30					Approximate Shapiro Wilk P Value	2.5120E-5					
31					Lilliefors Test Statistic	0.15					
32					Lilliefors Critical (0.05) Value	0.128					
33	**Data not Normal at (0.05) Significance Level**										
34											
35					**Gamma GOF Test Results**						
36											
37					Correlation Coefficient R	0.988					
38					A-D Test Statistic	0.835					
39					A-D Critical (0.05) Value	0.766					
40					K-S Test Statistic	0.111					
41					K-S Critical(0.05) Value	0.131					
42	**Data follow Appr. Gamma Distribution at (0.05) Significance Level**										
43											
44					**Lognormal GOF Test Results**						
45											
46					Correlation Coefficient R	0.967					
47					Shapiro Wilk Test Statistic	0.908					
48					Shapiro Wilk Critical (0.05) Value	0.946					
49					Approximate Shapiro Wilk P Value	0.00107					
50					Lilliefors Test Statistic	0.145					
51					Lilliefors Critical (0.05) Value	0.128					
52	**Data not Lognormal at (0.05) Significance Level**										
53											

	A	B	C	D	E	F	G	H	I	J	K
54	**Chloro_52.5**										
55											
56					**Raw Statistics**						
57					Number of Valid Observations	50					
58					Number of Distinct Observations	41					
59					Minimum	11					
60					Maximum	100					
61					Mean of Raw Data	60.4					
62					Standard Deviation of Raw Data	21.38					
63					Khat	6.2					
64					Theta hat	9.742					
65					Kstar	5.842					
66					Theta star	10.34					
67					Mean of Log Transformed Data	4.018					
68					Standard Deviation of Log Transformed Data	0.457					
69											
70					**Normal GOF Test Results**						
71											
72					Correlation Coefficient R	0.995					
73					Shapiro Wilk Test Statistic	0.976					
74					Shapiro Wilk Critical (0.05) Value	0.947					
75					Approximate Shapiro Wilk P Value	0.585					
76					Lilliefors Test Statistic	0.0502					
77					Lilliefors Critical (0.05) Value	0.125					
78	**Data appear Normal at (0.05) Significance Level**										
79											
80					**Gamma GOF Test Results**						
81											
82					Correlation Coefficient R	0.97					
83					A-D Test Statistic	0.74					
84					A-D Critical (0.05) Value	0.753					
85					K-S Test Statistic	0.0899					
86					K-S Critical(0.05) Value	0.125					
87	**Data appear Gamma Distributed at (0.05) Significance Level**										
88											
89					**Lognormal GOF Test Results**						
90											
91					Correlation Coefficient R	0.929					
92					Shapiro Wilk Test Statistic	0.867					
93					Shapiro Wilk Critical (0.05) Value	0.947					
94					Approximate Shapiro Wilk P Value	8.3684E-6					
95					Lilliefors Test Statistic	0.122					
96					Lilliefors Critical (0.05) Value	0.125					
97	**Data appear Approximate_Lognormal at (0.05) Significance Level**										
98											

	A	B	C	D	E	F	G	H	I	J	K
99	**Chloro_102.5**										
100											
101					**Raw Statistics**						
102					Number of Valid Observations	50					
103					Number of Distinct Observations	35					
104					Minimum	0.31					
105					Maximum	130					
106					Mean of Raw Data	74.69					
107					Standard Deviation of Raw Data	23.34					
108					Khat	3.857					
109					Theta hat	19.36					
110					Kstar	3.639					
111					Theta star	20.52					
112					Mean of Log Transformed Data	4.178					
113					Standard Deviation of Log Transformed Data	0.841					
114											
115					**Normal GOF Test Results**						
116											
117					Correlation Coefficient R	0.975					
118					Shapiro Wilk Test Statistic	0.964					
119					Shapiro Wilk Critical (0.05) Value	0.947					
120					Approximate Shapiro Wilk P Value	0.218					
121					Lilliefors Test Statistic	0.102					
122					Lilliefors Critical (0.05) Value	0.125					
123	**Data appear Normal at (0.05) Significance Level**										
124											
125					**Gamma GOF Test Results**						
126											
127					Correlation Coefficient R	0.936					
128					A-D Test Statistic	4.263					
129					A-D Critical (0.05) Value	0.754					
130					K-S Test Statistic	0.222					
131					K-S Critical(0.05) Value	0.126					
132	**Data not Gamma Distributed at (0.05) Significance Level**										
133											
134					**Lognormal GOF Test Results**						
135											
136					Correlation Coefficient R	0.636					
137					Shapiro Wilk Test Statistic	0.453					
138					Shapiro Wilk Critical (0.05) Value	0.947					
139					Approximate Shapiro Wilk P Value	0					
140					Lilliefors Test Statistic	0.305					
141					Lilliefors Critical (0.05) Value	0.125					
142	**Data not Lognormal at (0.05) Significance Level**										
143											

	A	B	C	D	E	F	G	H	I	J	K
144	**Chloro_137.5_noOutlierHighNDs**										
145											
146					**Raw Statistics**						
147					Number of Valid Observations	32					
148					Number of Missing Observations	1					
149					Number of Distinct Observations	24					
150					Minimum	0.31					
151					Maximum	200					
152					Mean of Raw Data	67.55					
153					Standard Deviation of Raw Data	49.65					
154					Khat	0.603					
155					Theta hat	112					
156					Kstar	0.568					
157					Theta star	119					
158					Mean of Log Transformed Data	3.19					
159					Standard Deviation of Log Transformed Data	2.253					
160											
161					**Normal GOF Test Results**						
162											
163					Correlation Coefficient R	0.964					
164					Shapiro Wilk Test Statistic	0.923					
165					Shapiro Wilk Critical (0.05) Value	0.93					
166					Approximate Shapiro Wilk P Value	0.0302					
167					Lilliefors Test Statistic	0.143					
168					Lilliefors Critical (0.05) Value	0.154					
169	**Data appear Approximate Normal at (0.05) Significance Level**										
170											
171					**Gamma GOF Test Results**						
172											
173					Correlation Coefficient R	0.879					
174					A-D Test Statistic	3.488					
175					A-D Critical (0.05) Value	0.801					
176					K-S Test Statistic	0.318					
177					K-S Critical(0.05) Value	0.163					
178	**Data not Gamma Distributed at (0.05) Significance Level**										
179											
180					**Lognormal GOF Test Results**						
181											
182					Correlation Coefficient R	0.841					
183					Shapiro Wilk Test Statistic	0.693					
184					Shapiro Wilk Critical (0.05) Value	0.93					
185					Approximate Shapiro Wilk P Value	7.1791E-8					
186					Lilliefors Test Statistic	0.341					
187					Lilliefors Critical (0.05) Value	0.154					
188	**Data not Lognormal at (0.05) Significance Level**										
189											

	A	B	C	D	E	F	G	H	I	J	K
190	**TCE_7.5_No_outlier2**										
191											
192					**Raw Statistics**						
193					Number of Valid Observations	50					
194					Number of Distinct Observations	43					
195					Minimum	0.3					
196					Maximum	150					
197					Mean of Raw Data	40.92					
198					Standard Deviation of Raw Data	32.71					
199					Khat	1.3					
200					Theta hat	31.47					
201					Kstar	1.236					
202					Theta star	33.12					
203					Mean of Log Transformed Data	3.28					
204					Standard Deviation of Log Transformed Data	1.144					
205											
206					**Normal GOF Test Results**						
207											
208					Correlation Coefficient R	0.945					
209					Shapiro Wilk Test Statistic	0.892					
210					Shapiro Wilk Critical (0.05) Value	0.947					
211					Approximate Shapiro Wilk P Value	1.1250E-4					
212					Lilliefors Test Statistic	0.113					
213					Lilliefors Critical (0.05) Value	0.125					
214	**Data appear Approximate Normal at (0.05) Significance Level**										
215											
216					**Gamma GOF Test Results**						
217											
218					Correlation Coefficient R	0.989					
219					A-D Test Statistic	0.593					
220					A-D Critical (0.05) Value	0.772					
221					K-S Test Statistic	0.125					
222					K-S Critical(0.05) Value	0.128					
223	**Data appear Gamma Distributed at (0.05) Significance Level**										
224											
225					**Lognormal GOF Test Results**						
226											
227					Correlation Coefficient R	0.939					
228					Shapiro Wilk Test Statistic	0.896					
229					Shapiro Wilk Critical (0.05) Value	0.947					
230					Approximate Shapiro Wilk P Value	1.7844E-4					
231					Lilliefors Test Statistic	0.175					
232					Lilliefors Critical (0.05) Value	0.125					
233	**Data not Lognormal at (0.05) Significance Level**										
234											

	A	B	C	D	E	F	G	H	I	J	K
235	**TCE_52.5**										
236											
237					**Raw Statistics**						
238					Number of Valid Observations	50					
239					Number of Distinct Observations	37					
240					Minimum	190					
241					Maximum	2600					
242					Mean of Raw Data	1128					
243					Standard Deviation of Raw Data	578.3					
244					Khat	3.842					
245					Theta hat	293.5					
246					Kstar	3.625					
247					Theta star	311.1					
248					Mean of Log Transformed Data	6.892					
249					Standard Deviation of Log Transformed Data	0.548					
250											
251					**Normal GOF Test Results**						
252											
253					Correlation Coefficient R	0.97					
254					Shapiro Wilk Test Statistic	0.93					
255					Shapiro Wilk Critical (0.05) Value	0.947					
256					Approximate Shapiro Wilk P Value	0.0066					
257					Lilliefors Test Statistic	0.134					
258					Lilliefors Critical (0.05) Value	0.125					
259	**Data not Normal at (0.05) Significance Level**										
260											
261					**Gamma GOF Test Results**						
262											
263					Correlation Coefficient R	0.991					
264					A-D Test Statistic	0.297					
265					A-D Critical (0.05) Value	0.754					
266					K-S Test Statistic	0.0735					
267					K-S Critical(0.05) Value	0.126					
268	**Data appear Gamma Distributed at (0.05) Significance Level**										
269											
270					**Lognormal GOF Test Results**						
271											
272					Correlation Coefficient R	0.986					
273					Shapiro Wilk Test Statistic	0.971					
274					Shapiro Wilk Critical (0.05) Value	0.947					
275					Approximate Shapiro Wilk P Value	0.405					
276					Lilliefors Test Statistic	0.081					
277					Lilliefors Critical (0.05) Value	0.125					
278	**Data appear Lognormal at (0.05) Significance Level**										
279											

	A	B	C	D	E	F	G	H	I	J	K
280	**TCE_102.5**										
281											
282					**Raw Statistics**						
283					Number of Valid Observations	50					
284					Number of Distinct Observations	25					
285					Minimum	0.4					
286					Maximum	3000					
287					Mean of Raw Data	1393					
288					Standard Deviation of Raw Data	591.5					
289					Khat	2.372					
290					Theta hat	587.1					
291					Kstar	2.243					
292					Theta star	620.9					
293					Mean of Log Transformed Data	7.014					
294					Standard Deviation of Log Transformed Data	1.222					
295											
296					**Normal GOF Test Results**						
297											
298					Correlation Coefficient R	0.984					
299					Shapiro Wilk Test Statistic	0.973					
300					Shapiro Wilk Critical (0.05) Value	0.947					
301					Approximate Shapiro Wilk P Value	0.46					
302					Lilliefors Test Statistic	0.0955					
303					Lilliefors Critical (0.05) Value	0.125					
304	**Data appear Normal at (0.05) Significance Level**										
305											
306					**Gamma GOF Test Results**						
307											
308					Correlation Coefficient R	0.966					
309					A-D Test Statistic	2.987					
310					A-D Critical (0.05) Value	0.761					
311					K-S Test Statistic	0.199					
312					K-S Critical(0.05) Value	0.127					
313	**Data not Gamma Distributed at (0.05) Significance Level**										
314											
315					**Lognormal GOF Test Results**						
316											
317					Correlation Coefficient R	0.628					
318					Shapiro Wilk Test Statistic	0.444					
319					Shapiro Wilk Critical (0.05) Value	0.947					
320					Approximate Shapiro Wilk P Value	0					
321					Lilliefors Test Statistic	0.29					
322					Lilliefors Critical (0.05) Value	0.125					
323	**Data not Lognormal at (0.05) Significance Level**										
324											

	A	B	C	D	E	F	G	H	I	J	K
325	**TCE_137.5**										
326											
327					**Raw Statistics**						
328					Number of Valid Observations	50					
329					Number of Distinct Observations	25					
330					Minimum	0.3					
331					Maximum	17000					
332					Mean of Raw Data	10592					
333					Standard Deviation of Raw Data	4897					
334					Khat	0.954					
335					Theta hat	11103					
336					Kstar	0.91					
337					Theta star	11639					
338					Mean of Log Transformed Data	8.659					
339					Standard Deviation of Log Transformed Data	2.209					
340											
341					**Normal GOF Test Results**						
342											
343					Correlation Coefficient R	0.946					
344					Shapiro Wilk Test Statistic	0.875					
345					Shapiro Wilk Critical (0.05) Value	0.947					
346					Approximate Shapiro Wilk P Value	1.9577E-5					
347					Lilliefors Test Statistic	0.197					
348					Lilliefors Critical (0.05) Value	0.125					
349	**Data not Normal at (0.05) Significance Level**										
350											
351					**Gamma GOF Test Results**						
352											
353					Correlation Coefficient R	0.747					
354					A-D Test Statistic	7.828					
355					A-D Critical (0.05) Value	0.782					
356					K-S Test Statistic	0.306					
357					K-S Critical(0.05) Value	0.129					
358	**Data not Gamma Distributed at (0.05) Significance Level**										
359											
360					**Lognormal GOF Test Results**						
361											
362					Correlation Coefficient R	0.679					
363					Shapiro Wilk Test Statistic	0.481					
364					Shapiro Wilk Critical (0.05) Value	0.947					
365					Approximate Shapiro Wilk P Value	0					
366					Lilliefors Test Statistic	0.378					
367					Lilliefors Critical (0.05) Value	0.125					
368	**Data not Lognormal at (0.05) Significance Level**										
369											
370	**Non-parametric GOF Test Results**										
371											
372	**Data do not follow a discernible distribution at (0.05) Level of Significanc**										

	A	B	C	D	E	F	G	H	I	J	K
1					**Outlier Tests for Selected Uncensored Variables**						
2				**User Selected Options**							
3			Date/Time of Computation	ProUCL 5.2 4/5/2026 11:32:12 PM							
4				From File	600-SGW-05_Vapor_2026_Input.xls						
5				Full Precision	OFF						
6											
7											
8				**Rosner's Outlier Test for Chloro_52.5**							
9											
10											
11				**Mean**	**60.4**						
12				**Standard Deviation**	**21.38**						
13				**Number of data**	**50**						
14				**Number of suspected outliers**	**1**						
15											
16				Potential	Obs.	Test	Critical	Critical			
17	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
18	1	60.4	21.16	11	22	2.335	3.13	3.48			
19											
20	For 5% Significance Level, there is no Potential Outlier										
21											
22	For 1% Significance Level, there is no Potential Outlier										
23											
24											
25				**Rosner's Outlier Test for TCE_52.5**							
26											
27											
28				**Mean**	**1128**						
29				**Standard Deviation**	**578.3**						
30				**Number of data**	**50**						
31				**Number of suspected outliers**	**1**						
32											
33				Potential	Obs.	Test	Critical	Critical			
34	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
35	1	1128	572.5	2600	2	2.572	3.13	3.48			
36											
37	For 5% Significance Level, there is no Potential Outlier										
38											
39	For 1% Significance Level, there is no Potential Outlier										
40											
41											
42				**Rosner's Outlier Test for TCE_102.5**							
43											
44											
45				**Mean**	**1393**						
46				**Standard Deviation**	**591.5**						
47				**Number of data**	**50**						
48				**Number of suspected outliers**	**1**						
49											
50				Potential	Obs.	Test	Critical	Critical			
51	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
52	1	1393	585.5	3000	6	2.745	3.13	3.48			
53											
54	For 5% Significance Level, there is no Potential Outlier										
55											
56	For 1% Significance Level, there is no Potential Outlier										
57											
58											

	A	B	C	D	E	F	G	H	I	J	K
59	**Rosner's Outlier Test for TCE_137.5**										
60											
61											
62				**Mean**	**10592**						
63				**Standard Deviation**	**4897**						
64				**Number of data**	**50**						
65				**Number of suspected outliers**	**1**						
66											
67				Potential	Obs.	Test	Critical	Critical			
68	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
69	1	10592	4848	0.3	10	2.185	3.13	3.48			
70											
71	For 5% Significance Level, there is no Potential Outlier										
72											
73	For 1% Significance Level, there is no Potential Outlier										
74											

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	ProUCL 5.2 4/6/2026 1:38:51 AM
From File	600-SGW-05_Vapor_2026_Input.xls
Full Precision	OFF

Rosner's Outlier Test for 1 Outliers in Chloroform_7.5_M-K

Total N	**50**
Number NDs	**9**
Number Detects	**41**
Mean of Detects	**4.051**
SD of Detects	**13.66**
Number of data	**41**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.051	13.49	89	39	6.297	3.05	3.39

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 89 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in Chloroform_7.5_M-K_noOutlier1

Total N	**49**
Number NDs	**9**
Number Detects	**40**
Mean of Detects	**1.927**
SD of Detects	**1.3**
Number of data	**40**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.927	1.283	5.4	2	2.706	3.04	3.38

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

	A	B	C	D	E	F	G	H	I	J	K	L
51	**Rosner's Outlier Test for 1 Outliers in Chloro_102.5**											
52												
53												
54				**Total N**	**50**							
55				**Number NDs**	**1**							
56				**Number Detects**	**49**							
57				**Mean of Detects**	**76.2**							
58				**SD of Detects**	**20.94**							
59				**Number of data**	**49**							
60				**Number of suspected outliers**	**1**							
61				**NDs not included in the following:**								
62												
63				Potential	Obs.	Test	Critical	Critical				
64	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
65	1	76.2	20.72	15	9	2.954	3.12	3.47				
66												
67	For 5% Significance Level, there is no Potential Outlier											
68												
69	For 1% Significance Level, there is no Potential Outlier											
70												
71												
72	**Rosner's Outlier Test for 1 Outliers in Chloro_137.5**											
73												
74												
75				**Total N**	**50**							
76				**Number NDs**	**22**							
77				**Number Detects**	**28**							
78				**Mean of Detects**	**791.4**							
79				**SD of Detects**	**3765**							
80				**Number of data**	**28**							
81				**Number of suspected outliers**	**1**							
82				**NDs not included in the following:**								
83												
84				Potential	Obs.	Test	Critical	Critical				
85	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
86	1	791.4	3697	20000	24	5.196	2.88	3.2				
87												
88	For 5% Significance Level, there is 1 Potential Outlier											
89	Therefore, Observation 20000 is a Potential Statistical Outlier											
90												
91	For 1% Significance Level, there is 1 Potential Outlier											
92												
93												
94	**Rosner's Outlier Test for 1 Outliers in Chloro_137.5_NoOutlier**											
95												
96												
97				**Total N**	**49**							
98				**Number NDs**	**22**							
99				**Number Detects**	**27**							
100				**Mean of Detects**	**80.01**							
101				**SD of Detects**	**43.68**							
102				**Number of data**	**27**							
103				**Number of suspected outliers**	**1**							
104				**NDs not included in the following:**								
105												
106				Potential	Obs.	Test	Critical	Critical				
107	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
108	1	80.01	42.86	200	11	2.799	2.86	3.18				
109												
110	For 5% Significance Level, there is no Potential Outlier											
111												
112	For 1% Significance Level, there is no Potential Outlier											

Rosner's Outlier Test for 1 Outliers in Chloro_137.5_noOutlierHighNDs

Total N	**32**
Number NDs	**5**
Number Detects	**27**
Mean of Detects	**80.01**
SD of Detects	**43.68**
Number of data	**27**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	80.01	42.86	200	11	2.799	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in TCE_7.5

Total N	**52**
Number NDs	**1**
Number Detects	**51**
Mean of Detects	**186.6**
SD of Detects	**1017**
Number of data	**51**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	186.6	1007	7300	48	7.066	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 7300 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in TCE_7.5_No_outlier1

Total N	**51**
Number NDs	**1**
Number Detects	**50**
Mean of Detects	**44.32**
SD of Detects	**36.94**
Number of data	**50**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	44.32	36.57	170	3	3.437	3.13	3.48

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 170 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

	A	B	C	D	E	F	G	H	I	J	K	L
178												
179												
180	**Rosner's Outlier Test for 1 Outliers in TCE_7.5_No_outlier2**											
181												
182												
183			**Total N**	**50**								
184			**Number NDs**	**1**								
185			**Number Detects**	**49**								
186			**Mean of Detects**	**41.75**								
187			**SD of Detects**	**32.51**								
188			**Number of data**	**49**								
189			**Number of suspected outliers**	**1**								
190	**NDs not included in the following:**											
191												
192				Potential	Obs.	Test	Critical	Critical				
193	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
194	1	41.75	32.18	150	12	3.364	3.12	3.47				
195												
196	For 5% Significance Level, there is 1 Potential Outlier											
197	Therefore, Observation 150 is a Potential Statistical Outlier											
198												
199	For 1% Significance Level, there is no Potential Outlier											
200												