2025 ANNUAL GROUNDWATER MONITORING REPORT

GRAND TOWER ENERGY CENTER
CLOSED CCR RESIDUALS IMPOUNDMENT
1820 POWER PLANT ROAD
GRAND TOWER, IL 62942

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EXECUTIVE SUMMARY

This Annual Groundwater Monitoring Report presents the results and findings from the 2025 post-closure groundwater monitoring program at the Grand Tower Energy Center (GTEC) facility, located at 1820 Power Plant Rd, Grand Tower, Illinois. The report summarizes the four quarterly groundwater sampling events conducted during 2025 in accordance with the post-closure groundwater monitoring program presented within the Grand Tower Operating Permit Application (OPA) and approved by the Illinois Environmental Protection Agency (IEPA).

The GTEC closed coal combustion residuals (CCR) impoundment is currently in Corrective Action Monitoring (CAM). Groundwater monitoring was performed at 12 monitoring wells during 2025 to evaluate the concentration and areal distribution of impacts related to the closed CCR impoundment. The impoundment was capped and closed in 2020.

Key Findings

Groundwater Protection Standards (GWPS) Exceedances:

During the 2025 monitoring period, statistical evaluation of downgradient groundwater data using 95% upper and lower confidence limits, based on distribution-specific ProUCL analyses, identified the following constituents that exceeded either background concentrations alone or both background and the Groundwater Protection Standards (GWPS) established in 35 IAC 845.600:

- **Arsenic** – Exceeded both background and GWPS at wells APW-02 and APW-10S; exceeded background only at APW-06D. Arsenic shows the most significant regulatory concern, with concentrations above the GWPS of 0.01 milligrams per liter (mg/L).
- **Boron** – Exceeded both background and GWPS at wells APW-02, APW-03, APW-05, APW-05R, APW-06D, and APW-06S. Boron continues to be the key indicator constituent for corrective action monitoring, with consistent exceedances of the GWPS of 2.0 mg/L.
- **Calcium** – Exceeded the background-based GWPS of 103.21 mg/L at wells APW-02, APW-03, APW-05, APW-06D, APW-07, APW-10D, and APW-10S. Calcium background exceeded the generic Class I standard; therefore, background is used as the GWPS per 35 IAC 845.600.
- **Lithium** – Exceeded both background and GWPS at wells APW-02, APW-05, and APW-06S, with concentrations above the GWPS of 0.04 mg/L.
- **Molybdenum** – Exceeded both background and GWPS at wells APW-02, APW-05, APW-05R, and APW-06S, with concentrations above the GWPS of 0.1 mg/L.
- **Sulfate** – Exceeded both background and GWPS at wells APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S, APW-07, APW-08, and APW-10D, with concentrations above the GWPS of 400 mg/L. Well APW-02 showed the highest and most consistent sulfate exceedances.
- **Lead** – Exceeded GWPS at well APW-02 during the second quarter of 2025, with concentration above the GWPS of 0.0075 mg/L.
- **Barium, Chloride, and Cobalt** – Exceeded background concentrations at selected downgradient wells but remained below applicable GWPS values.
- **Turbidity** – Exceeded the background-based field parameter threshold (UTL of 17.96 NTU) at multiple wells across all quarters, including upgradient well APW-01R. Elevated turbidity in upgradient wells suggests that turbidity is not exclusively related to CCR impacts.

Spatial Distribution:

Wells located immediately downgradient of the closed impoundment (APW-02, APW-05, APW-05R, APW-06D, APW-06S) and in the interpreted flow path toward the southwest (APW-07, APW-10D, APW-10S) exhibited the most frequent and highest-magnitude exceedances. Well APW-02, located directly downgradient of the impoundment, exhibited the broadest suite of constituent exceedances.

Trend Analysis:

Incorporating data from pre-closure groundwater sampling (2017-2018) and post-closure monitoring events (2022-2025), temporal trend analysis using Mann-Kendall statistics indicates that most analytes in background wells exhibit no statistically significant monotonic trends, supporting the continued use of established background concentrations. At downgradient wells, trends vary by analyte and location, with some constituents showing statistically significant changes and others showing stable concentration. Continued quarterly monitoring and trend evaluation will be essential to assess the effectiveness of the closed impoundment cover system and the trajectory of groundwater impacts over time.

Regulatory Status:

The GTEC closed CCR impoundment remains in Corrective Action Monitoring (CAM) status. The site continues to be monitored under the approved Groundwater Management Zone (GMZ) and Post-Closure Plan. Quarterly monitoring will continue through the remainder of the five-year post-closure monitoring period (through 2027), with a comprehensive performance evaluation report due to IEPA at the conclusion of the initial five-year period.

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1.0 INTRODUCTION

Pennoni Associates, Inc. (**Pennoni**) has prepared this 2025 Annual Groundwater Monitoring Report for the **GTEC, LLC (Client)** in general accordance 35 Illinois Administrative Code (IAC) Section 845.550(a)(3) and 35 IAC Section 845.610(e) for the Grand Tower Energy Center (GTEC) facility located at 1820 Power Plant Rd, Grand Tower, Jackson County, Illinois, hereafter referred to as the "Subject Property" or "Site". *Figure 1 – Topographic Map* in Appendix A, shows the Subject Property location on a portion of the United States Geological Survey (USGS) 7.5-minute topographic quadrangle for Gorham, Illinois. The boundaries of the Subject Property as well as the general Site's features are depicted on *Figure 2 – Site Map* in Appendix A.

This report summarizes the results and findings of the GTEC quarterly post-closure groundwater sampling events conducted during 2025 by Environmental Resource Management (ERM) of Springfield, IL, and relies on information provided by the Client, as well as data included in the Quarterly Post-Closure Groundwater Monitoring Reports for the first through fourth quarters of 2025.

1.1 Background

GTEC previously operated as a merchant power facility, supplying electricity to the Midcontinent Independent System Operator (MISO) distribution network, but has been inactive since late 2020. The project area, located south of the idled power generation building, encompasses approximately 21 acres, including a coal combustion residual (CCR) impoundment and its associated drainage basin. The CCR impoundment was closed and capped in 2020 in accordance with USEPA 40 CFR Part 257 and IEPA 35 IAC Part 845. Approximately 235,000 cubic yards of CCR material remain within the impoundment. These materials were excavated, consolidated, and covered with a 40-mil LLDPE liner, soil cover, and geotextile layer, resulting in a capped area of approximately 14 acres.

Groundwater sampling conducted in 2025 was performed in accordance with the post-closure monitoring program described in the Grand Tower Operating Permit Application submitted to the IEPA on October 28, 2021, and updated in response to Consolidated IEPA Comments dated March 17, 2022.

The 2025 sampling was conducted to continue a post-closure five-year program of quarterly monitoring, aimed at evaluating the levels and spatial patterns of potential impacts to groundwater resulting from the closed CCR impoundment.

Analytical data indicates that groundwater quality at several downgradient monitoring wells is consistent with impacts from the closed CCR impoundment, as evidenced by exceedances of background concentrations and applicable Groundwater Protection Standards (GWPS) for key indicator constituents. This report presents a comprehensive overview of the field activities, laboratory results, statistical evaluations, and supporting documentation associated with the quarterly groundwater sampling events conducted during 2025.

1.2 Key Actions Completed – 2025

The following key actions relative to groundwater monitoring were completed at the Site in 2025:

- ✓ Quarterly inspection of the closed CCR impoundment cover system completed in January, June, September, and November of 2025.
- ✓ Quarterly inspection of the onsite groundwater monitoring wells network conducted in January, June, September, and November of 2025.
- ✓ Quarterly groundwater sampling conducted in January, June, September, and November of 2025.

2.0 GROUNDWATER MONITORING PROGRAM

The groundwater monitoring program defines the requirements for the CCR impoundment groundwater monitoring network, inspection and maintenance activities, sampling and analytical protocols, data evaluation, and reporting obligations during the post-closure period.

2.1 Monitoring Well Network

The groundwater monitoring network at GTEC consists of 12 monitoring wells designed to monitor shallow and deep groundwater zones both upgradient and downgradient of the closed CCR impoundment.

Well ID	Total Depth (Actual) (ft BTOC)	Screen Interval (ft bsg)	Screened Zone	Location
APW-01R	58.3	48.3 - 58.3	Shallow	Upgradient
APW-02	58.75	47.2 - 57.2	Shallow	Downgradient
APW-03	54.65	45.7 - 55.7	Shallow	Downgradient
APW-04	60.4	45.7 - 55.7	Shallow	Upgradient
APW-05R	56.9	Not Available	Shallow	Downgradient
APW-06D	152.57	140 - 150	Deep	Downgradient
APW-06S	63.98	50 - 60	Shallow	Downgradient
APW-07	63.35	50 - 60	Shallow	Downgradient
APW-08	61.89	50 - 60	Shallow	Downgradient
APW-09	63.4	50 - 60	Shallow	Upgradient
APW-10D	98.19	86 - 96	Deep	Downgradient
APW-10S	62.84	50 - 60	Shallow	Downgradient

Notes:
ft – feet
BTOC – Below Top of Casing
bsg – below surface grade

The locations of the monitoring wells are depicted on *Figure 2* in Appendix A.

2.2 Well Inspection and Maintenance

All groundwater monitoring wells in the CCR monitoring network are required to be inspected quarterly during each sampling event to confirm that they remain in good condition and provide representative groundwater samples.

At a minimum, the inspection program must:

- Record the total depth of each well during sampling or water-level measurement to identify any sediment accumulation; if sediment buildup is observed, sediment must be removed by pumping or bailing and the cause of accumulation must be investigated.
- Require redevelopment of wells for which turbid samples are persistently collected.
- Include visual inspection of aboveground protective casings, lockable covers, and locks for structural integrity and evidence of damage or corrosion, with repair or replacement as necessary.
- Include inspection of surface seals for settlement, cracking, or other damage, with replacement or repair as needed to maintain integrity.
- Include inspection of well casings and caps for cracks, corrosion, or other damage, and removal of debris around the wellhead to prevent material from entering the well.

The condition of each monitoring well and any associated maintenance or repairs is required to be documented on a standardized inspection form following each sampling event and maintained in the facility's post-closure logbook and operating record.

2.3 Sampling Frequency and Methodology

Groundwater monitoring of the CCR impoundment well network is required for a minimum of five (5) years following completion of CCR impoundment closure, with potential extension (up to thirty years) consistent with the approved Groundwater Management Zone (GMZ) and regulatory requirements.

- Sampling frequency:
  - Groundwater must be sampled quarterly from all wells in the CCR monitoring network.
- Sampling methodology:
  - Wells must be developed and sampled using low-flow peristaltic pumps or equivalent low-flow equipment in accordance with standard groundwater sampling protocols.
  - Samples must be collected into laboratory-supplied containers, properly preserved, and handled under a documented chain-of-custody procedure.
  - Samples must be packed in laboratory-supplied coolers and shipped to an IEPA-approved analytical laboratory for analysis.

2.3 Analytical Parameters and Field Measurements

Each quarterly groundwater monitoring event is required to include analysis of parameters specified in 35 Ill. Adm. Code 845.650(a), unless otherwise modified in accordance with 35 Ill. Adm. Code 845.650(b) and subsequent IEPA approvals.

At a minimum, the analytical program must include:

- General chemistry and major ions: Calcium, Chloride, Fluoride, Sulfate, and Total Dissolved Solids (TDS).
- Metals and radionuclides: Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Lead, Lithium, Mercury, Molybdenum, Selenium, Thallium, Radium-226, and Radium-228.
- Additional parameter: Turbidity.

Furthermore, field parameters are required to include, at a minimum:

- pH, Specific conductivity, and Temperature.

2.4 Data Evaluation and Trend Analysis

Quarterly groundwater data must be evaluated to assess the concentration and areal distribution of potential impacts associated with the closed CCR impoundment.

At a minimum, the evaluation is required to:

- Compare constituent concentrations to applicable regulatory standards.
- Assess temporal trends for key indicator constituents to identify increasing, stable, or decreasing trends.
- Compare observed concentrations to model-predicted concentrations for the CCR impoundment to determine whether a decreasing trend is occurring as predicted.
- Trigger additional model calibration and reassessment of expected future concentrations if significant deviations from modeled trends are identified.

2.5 Reporting

Quarterly reporting requirements:

- Quarterly groundwater monitoring results must be submitted to IEPA and must include a summary of field activities and sampling methods, tabulated analytical results, and a brief interpretation of significant findings.

Annual Groundwater Monitoring Report requirements:

- An Annual Groundwater Monitoring Report must be submitted to IEPA that compiles and evaluates all quarterly data for the reporting year and must include, at a minimum:
  - A description of field activities and sampling rounds;
  - Tabulated and, where appropriate, graphical presentation of groundwater analytical results;
  - Trend analyses for key constituents;
  - Identification and evaluation of any statistically significant increases in constituent concentrations; and;
  - A discussion comparing observed concentrations to model-predicted concentrations and any recommended changes to the monitoring program.

Five-year performance evaluation requirements:

- At the end of the initial five-year post-closure monitoring period, a Groundwater Performance Monitoring Report is required to be submitted to IEPA that either:
  - Demonstrates restoration of groundwater quality to Class I standards and supports reduction or termination of monitoring, or
  - Proposes a continued groundwater monitoring plan (for example, an additional five-year monitoring period) based on observed trends and model comparisons.

All groundwater sampling, analysis, and reporting must be conducted in accordance with 35 Ill. Adm. Code 845.600, the CCR Closure/Post-Closure Plan, prepared by ERM, dated January 23, the approved GMZ, and applicable IEPA permit conditions.

This report presents a summary of the required quarterly groundwater monitoring events (12th through 15th post-closure) for the closed CCR impoundment completed in 2025.

3.0 GROUNDWATER MONITORING PROGRAM RESULTS

This report summarizes the results and findings of the GTEC quarterly post-closure groundwater sampling events conducted during 2025 by ERM of Springfield, IL, and relies on information provided by the Client, as well as data included in the Quarterly Post-Closure Groundwater Monitoring Reports for the first through fourth quarters of 2025.

3.1 Monitoring Well Inspection and Gauging

Routine monitoring wells inspection, and groundwater level gauging were conducted during the first through fourth quarters of 2025 in accordance with the well inspection and maintenance requirements outlined in Section 2.2 of this Report.

Groundwater gauging activities included measurement of total well depths and static groundwater elevations at each monitoring location. All measurements were collected relative to the top of casing (TOC) using a water level meter with an accuracy of 0.01 feet. Groundwater elevation data obtained during the quarterly monitoring events were used to generate shallow groundwater contour maps for the Site for each quarter of 2025. Monitoring Wells Inspection Forms are included in Appendix B of this Report.

Figure 3 through *6* show Groundwater Contour Maps for the First, Second, Third, and Fourth Quarter of 2025, respectively.

Based on review of the groundwater contour maps for the first through fourth quarters of 2025, groundwater flow is generally toward the west and southwest from the upland area beneath the landfill toward the Mississippi River, consistent with the interpreted regional gradient. During the fourth quarter of 2025, however, the contours appear to flatten and locally reverse between the river and the landfill, which could indicate a short-term condition in which groundwater levels adjacent to the river were potentially higher than those inland and suggest a localized, temporary reverse flow component from west to east in that quarter.

3.2 2025 Groundwater Sampling

During 2025, groundwater monitoring was conducted on a quarterly basis at the Site in accordance with the requirements of the Closure/Post-Closure Plan, and in accordance with 35 Ill. Adm. Code 845.600 and 845.650. During the initial five-year post-closure period (2022-2027), sampling occurs at a frequency of four times per year, approximately every three months.

The following table summarizes the quarterly sampling conducted in 2025:

Quarter	Sampling Dates	# of Wells Sampled
First Quarter 2025	January 14-16, 2025	11*
First Quarter 2025	June 24-26, 2025	12
First Quarter 2025	September 3-5, 2025	12
First Quarter 2025	November 19-20, 2025	12

* APW-07 was not sampled during the first quarter of 2025 due to access limitations caused by downed trees along the access road, which prevented the sampling vehicle from reaching the well. Although a portable generator was used to sample other wells affected by the access constraints, it did not have sufficient capacity to adequately purge APW-07. Access road maintenance was completed prior to the second quarter of 2025, and full vehicle access to all monitoring wells was restored.

Prior to sample collection during each quarterly monitoring event, monitoring wells were purged using a submersible pump in accordance with United States Environmental Protection Agency (USEPA) low-flow purging and sampling procedures as outlined in *Low Stress Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (revised September 19, 2017). The pump intake was positioned within the screened interval of each monitoring well.

During purging, field parameter stabilization was monitored using a calibrated YSI ProDSS meter to measure pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential (ORP), consistent with the Post-Closure Plan requirements. Turbidity measurements were also collected from each monitoring well using a Hach 2100Q turbidimeter. Purging was continued until stabilization of field parameters was achieved in accordance with USEPA low-flow sampling criteria. Upon stabilization, the YSI meter was removed and groundwater samples were collected for laboratory analysis using the same dedicated polyethylene tubing utilized during purging. Field parameter measurements collected during the 2025 sampling events were documented on Low-Flow Sampling Forms; copies of these forms are provided in Appendix D of this Report.

During each quarterly sampling event, upon collection the groundwater samples were containerized into laboratory-prepared glassware and placed into laboratory-provided coolers with ice. Upon completion of sampling activities, sample coolers were transported under chain-of-custody procedures to Pace Analytical (Pace) in Mt. Juliet, Tennessee, an Illinois Environmental Protection Agency (IEPA)-approved laboratory.

Consistent with the Post-Closure Plan and 35 Ill. Adm. Code 845.650, groundwater samples were analyzed on a quarterly basis for calcium, chloride, fluoride, sulfate, total dissolved solids (TDS), pH (lab), metals including antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, lead, lithium, mercury, molybdenum, selenium, and thallium, radionuclides including radium-226 and radium-228, and turbidity.

The results from the 2025 groundwater sampling events were compared to the Groundwater Protection Standards (GWPS) included in 35 Ill. Adm. Code 845.600(a).

Analytical summary tables and laboratory analytical reports for the four quarterly groundwater monitoring events conducted in 2025 are included in Appendix C and Appendix D, respectively.

Below is a summary of each groundwater sampling event.

3.2.1. Groundwater Analytical Results – First Quarter 2025

A review of the analytical results for the sample collected is summarized below:

- **APW-01R:** A review of the analytical data did not detect target Contaminants of Concern (COCs) above the applicable IEPA's GWPS.
- **APW-02:** A review of the analytical data detected sulfate, boron, calcium, lithium and molybdenum above the applicable IEPA's GWPS. Turbidity was recorded at 127 NTU, exceeding the threshold derived from the Upper Tolerance Limit (UTL).
- **APW-03:** A review of the analytical data detected boron and calcium above the applicable IEPA's GWPS.
- **APW-04:** A review of the analytical data detected calcium above the applicable IEPA's GWPS.
- **APW-05R:** A review of the analytical data detected boron, calcium and molybdenum above the applicable IEPA's GWPS. Turbidity was recorded at 27.2 NTU, exceeding the threshold derived from the UTL.
- **APW-06D:** A review of the analytical data detected boron and calcium above the applicable IEPA's GWPS.
- **APW-06S:** A review of the analytical data detected boron, calcium, lithium and molybdenum above the applicable IEPA's GWPS.
- **APW-07:** A review of the analytical data did not detect target COCs above the applicable IEPA's GWPS.
- **APW-08:** A review of the analytical data detected calcium above the applicable IEPA's GWPS.
- **APW-09:** A review of the analytical data did not detect target COCs above the applicable IEPA's GWPS. Turbidity was recorded at 19.4 NTU, exceeding the threshold derived from the UTL.
- **APW-10D:** A review of the analytical data detected calcium above the applicable IEPA's GWPS. Furthermore, Turbidity was recorded at 169 NTU, exceeding the threshold derived from the UTL.
- **APW-10S:** A review of the analytical data detected arsenic and calcium above the applicable

IEPA's GWPS.

3.2.2. Groundwater Analytical Results – Second Quarter 2025

A review of the analytical results for the sample collected is summarized below:

- **APW-01R:** A review of the analytical data did not detect target COCs above the applicable IEPA's GWPS. Turbidity was recorded at 47.6 NTU, exceeding the threshold derived from the UTL.
- **APW-02:** A review of the analytical data detected sulfate, arsenic, boron, calcium, lead, lithium, and molybdenum above the applicable IEPA's GWPS. Turbidity was recorded at 115 NTU, exceeding the threshold derived from the UTL.
- **APW-03:** A review of the analytical data detected boron and calcium above the applicable IEPA's GWPS.
- **APW-04:** A review of the analytical data detected calcium above the applicable IEPA's GWPS. Turbidity was recorded at 61.5 NTU, exceeding the threshold derived from the UTL.
- **APW-05R:** A review of the analytical data detected boron, calcium and molybdenum above the applicable IEPA's GWPS.
- **APW-06D:** A review of the analytical data detected arsenic, boron and calcium above the applicable IEPA's GWPS.
- **APW-06S:** A review of the analytical data detected boron, calcium, and molybdenum above the applicable IEPA's GWPS. Turbidity was recorded at 22.9 NTU, exceeding the threshold derived from the UTL.
- **APW-07:** A review of the analytical data detected calcium above the applicable IEPA's GWPS.
- **APW-08:** A review of the analytical data detected calcium above the applicable IEPA's GWPS.
- **APW-09:** A review of the analytical data did not detect target COCs above the applicable IEPA's GWPS. Turbidity was recorded at 31.8 NTU, exceeding the threshold derived from the UTL.
- **APW-10D:** A review of the analytical data detected calcium above the applicable IEPA's GWPS. Turbidity was recorded at 59.9 NTU, exceeding the threshold derived from the UTL.
- **APW-10S:** A review of the analytical data detected arsenic and calcium above the applicable IEPA's GWPS. Turbidity was recorded at 60.1 NTU, exceeding the threshold derived from the UTL.

3.2.3. Groundwater Analytical Results – Third Quarter 2025

A review of the analytical results for the sample collected is summarized below:

- **APW-01R:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS. Turbidity was recorded at 30.5 NTU, exceeding the threshold derived from the UTL.
- **APW-02:** A review of the analytical data detected sulfate, boron, calcium, lithium and molybdenum, above the applicable IEPA GWPS. Turbidity was recorded at 78.6 NTU, exceeding the threshold derived from the UTL.
- **APW-03:** A review of the analytical data detected boron and calcium above the applicable IEPA GWPS.
- **APW-04:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS. Turbidity was recorded at 21.7 NTU, exceeding the threshold derived from the UTL.
- **APW-05R:** A review of the analytical data detected boron, calcium and molybdenum above the applicable IEPA GWPS.
- **APW-06D:** A review of the analytical data detected arsenic, boron, and calcium above the applicable IEPA GWPS.
- **APW-06S:** A review of the analytical data detected boron, and molybdenum above the applicable IEPA GWPS. Turbidity was recorded at 38.25 NTU, exceeding the threshold derived from the UTL.
- **APW-07:** A review of the analytical data detected calcium above the applicable IEPA GWPS.
- **APW-08:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS.

- **APW-09:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS.
- **APW-10D:** A review of the analytical data detected calcium above the applicable IEPA GWPS.
- **APW-10S:** A review of the analytical data detected arsenic and calcium above the applicable IEPA GWPS.

3.2.4. Groundwater Analytical Results – Fourth Quarter 2025

A review of the analytical results for the sample collected is summarized below:

- **APW-01R:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS. Turbidity was recorded at 47.8 NTU, exceeding the threshold derived from the UTL.
- **APW-02:** A review of the analytical data detected sulfate, boron, calcium, lithium and molybdenum, above the applicable IEPA GWPS. Turbidity was recorded at 72 NTU, exceeding the threshold derived from the UTL.
- **APW-03:** A review of the analytical data detected boron and calcium above the applicable IEPA GWPS.
- **APW-04:** A review of the analytical data detected turbidity above the applicable IEPA GWPS.
- **APW-05R:** A review of the analytical data detected boron, calcium, lithium and molybdenum above the applicable IEPA GWPS. Turbidity was recorded at 32.8 NTU, exceeding the threshold derived from the UTL.
- **APW-06D:** A review of the analytical data detected arsenic, boron, and calcium above the applicable IEPA GWPS.
- **APW-06S:** A review of the analytical data detected boron, and molybdenum above the applicable IEPA GWPS. Turbidity was recorded at 87 NTU, exceeding the threshold derived from the UTL.
- **APW-07:** A review of the analytical data detected calcium above the applicable IEPA GWPS.
- **APW-08:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS. Turbidity was recorded at 172 NTU, exceeding the threshold derived from the UTL
- **APW-09:** A review of the analytical data did not detect target COCs above the applicable IEPA GWPS. Turbidity was recorded at 23.7 NTU, exceeding the threshold derived from the UTL.
- **APW-10D:** A review of the analytical data detected calcium above the applicable IEPA GWPS. Turbidity was recorded at 121 NTU, exceeding the threshold derived from the UT
- **APW-10S:** A review of the analytical data detected arsenic and calcium above the applicable IEPA GWPS. Turbidity was recorded at 44 NTU, exceeding the threshold derived from the UTL.

Based on analytical data from the 2025 sampling period, several COCs, specifically sulfate, arsenic, boron, calcium, lead, lithium, and molybdenum, exceeded the IEPA's GWPS. Turbidity measurements also exceeded the threshold derived from the UTL. A summary of these exceedances are provided in the table below.

Groundwater Protection Standard (GWPS) Exceedances – 2025					
COCs	IEPA GWPS (mg/L)	Exceedance Well #			
		Q1 2025	Q2 2025	Q3 2025	Q4 2025
Sulfate	400	APW-02	APW-02	APW-02	APW-02
Arsenic	0.01	APW-10S	APW-02, APW-06D, APW-10S	APW-06D, APW-10S	APW-06D, APW-10S
Boron	2	APW-02, APW-03, APW-05R, APW-06D, APW-06S	APW-02, APW-03, APW-05R, APW-06D, APW-06S	APW-02, APW-03, APW-05R, APW-06D, APW-06S	APW-02, APW-03, APW-05R, APW-06D, APW-06S
Calcium	103.2[1]	APW-02, APW-03, APW-04, APW-05R, APW-06D, APW-06S, APW-08, APW-10D, APW-10S	APW-02, APW-03, APW-04, APW-05R, APW-06D, APW-06S, APW-07, APW-08, APW-10D, APW-10S	APW-02, APW-03, APW-05R, APW-06D, APW-07, APW-10D, APW-10S	APW-02, APW-03, APW-05R, APW-06D, APW-07, APW-10D, APW-10S

Groundwater Protection Standard (GWPS) Exceedances – 2025					
COCs	IEPA GWPS (mg/L)	Exceedance Well #			
		Q1 2025	Q2 2025	Q3 2025	Q4 2025
Turbidity (UTL)	17.96 NTU	APW-02, APW-05R, APW-09, APW-10D	APW-01R, APW-02, APW-04, APW-06S, APW-09, APW-10D, APW-10S	APW-01R, APW-02, APW-04, APW-06S	APW-01R, APW-02, APW-04, APW-05R, APW-06S, APW-08, APW-09, APW-10D, APW-10S
Lead	0.0075	–	APW-02	–	–
Lithium	0.04	APW-02, APW-06S	APW-02	APW-02	APW-02, APW-05R
Molybdenum	0.1	APW-02, APW-05R, APW-06S	APW-02, APW-05R, APW-06S	APW-02, APW-05R, APW-06S	APW-02, APW-05R, APW-06S

Notes:

[1] background concentration at the waste boundary

4.0 STATISTICAL ANALYSIS

Exploratory data analysis (EDA) was completed to evaluate key assumptions underlying the statistical methods used to establish background concentrations and screen downgradient wells. Consistent with the previous evaluations, the EDA included generation of summary statistics in Excel, outlier identification, goodness-of-fit (GOF) distribution testing, temporal trend analysis, and assessment of spatial variability for both upgradient/background and downgradient wells using ProUCL Version 5.2 and supporting Excel plots and tables. These steps were used to guide selection of appropriate statistical distributions and upper tolerance limits (UTLs) for each analyte.

4.1 Data Processing Steps

Descriptive statistics were developed for each well–constituent pair and for the pooled upgradient dataset. The summary statistics include the number of detects, percent detects, minimum, maximum, median, mean, and standard deviation. These statistics provide a high-level overview of data variability and central tendency and were used to inform subsequent outlier evaluation, goodness-of-fit testing, and calculation of upper tolerance limits (UTLs).

Review of the descriptive statistics indicated that antimony, beryllium, cadmium, lead, and mercury were predominantly non-detect in upgradient wells. Thallium was not detected in any of the downgradient wells. Several analytes—barium, calcium, chloride, lithium, sulfate, and turbidity—were detected in 100 percent of samples from downgradient wells, indicating persistent impacts relative to background conditions. In addition, dissolved solids and pH were reported for all samples from upgradient and downgradient wells.

4.2 Exploratory Data Analysis

Exploratory data analysis (EDA) was completed to evaluate key assumptions underlying the statistical methods used to establish background concentrations and screen downgradient wells. Consistent with the previous evaluations**,** the EDA included generation of summary statistics in Excel, outlier identification, GOF distribution testing, temporal trend analysis, and assessment of spatial variability for both upgradient/background and downgradient wells using ProUCL Version 5.2 and supporting Excel plots and tables. These steps were used to guide selection of appropriate statistical distributions and UTLs for each analyte**.**

4.2.1. Descriptive Statistics

Descriptive statistics were developed for each well–constituent pair and for the pooled upgradient dataset. The summary statistics include the number of detects, percent detects, minimum, maximum, median, mean, and standard deviation. These statistics provide a high-level overview of data variability and central tendency and were used to inform subsequent outlier evaluation, goodness-of-fit testing, and calculation of UTLs.

Review of the descriptive statistics indicated that three analytes (barium, cadmium, and mercury) were not detected in any of the upgradient wells. Thallium was not detected in any of the downgradient wells. Six analytes (barium, calcium, iron, lithium, manganese, and turbidity) were detected in 100 percent of samples from both upgradient and downgradient wells. In addition, dissolved solids and pH were reported for all samples from upgradient and downgradient wells.

Descriptive Statistics are summarized in *Table F1* in Appendix F.

4.2.2. Outlier Evaluation

Outlier evaluation is a critical step in groundwater statistical analysis because unusually high or low results can heavily influence summary statistics, trend tests, and compliance decisions if they are not understood and handled appropriately. Environmental monitoring data often exhibit natural variability, spatial heterogeneity, and occasional sampling or laboratory issues, so apparent “outliers” may represent either true contaminant behavior or non-representative artifacts. Current guidance from the Interstate

Technology and Regulatory Council (ITRC) and the USEPA emphasizes that statistical outlier tests alone are not sufficient grounds for discarding data; instead, flagged results must be evaluated in the context of field conditions, analytical quality, and the conceptual site model to distinguish between legitimate extreme values and measurements compromised by error or elevated reporting limits. Conducting a structured outlier evaluation, therefore helps ensure that the dataset used for groundwater protection standard comparisons and trend evaluations is both scientifically defensible and protective, capturing real variability while avoiding bias from clearly invalid results.

Tukey boxplot analysis identified 181 potential statistical outliers across 23 analytes in the groundwater monitoring dataset. In accordance with ITRC guidance for groundwater statistics (ITRC 2013), boxplot screening results were not used as the sole basis for data exclusion. Rather, each flagged value underwent a weight-of-evidence evaluation incorporating temporal trend analysis, spatial patterns, well type and position relative to the conceptual site model (CSM), laboratory qualifiers, and documented quality assurance/quality control (QA/QC) conditions. Tukey boxplots are included in *Figure F1* in Appendix F

Time-series plots were generated for each analyte to assess temporal context of flagged values. Values were evaluated for consistency with intrawell trends (e.g., stable, increasing, or decreasing concentrations), occurrence as isolated spikes versus part of sustained patterns, and position within the monitoring record (e.g., early pre-closure period versus recent post-closure data). Spatial evaluation considered well classifications (upgradient background versus downgradient/source area monitoring locations) and expected concentration gradients based on site hydrogeology and known impacts. Time-series plots are included in *Figure F2* in Appendix F.

Of the 181 initially flagged values, 103 (57%) were retained as valid measurements representative of actual site conditions. These included values that: (1) were consistent with adjacent temporal measurements within the same well, (2) occurred in downgradient or source-area wells where elevated concentrations are expected based on the CSM, (3) represented early monitoring data establishing baseline or pre-closure conditions, or (4) showed no documented QA/QC or field collection anomalies. An additional 14 outliers (8%) were retained with notation as potentially valid but extreme measurements, primarily isolated spikes in upgradient wells that could not be attributed to specific analytical or sampling errors.

Summary of Potential Statistical Outliers is included in *Table F2* in Appendix F.

4.2.3. Goodness-of-Fit Distribution (GOF) Testing

Goodness-of-fit (GOF) testing was performed on detected concentrations using ProUCL Version 5.2 for all downgradient well groups and analytes with at least three detections. GOF tests were used to evaluate whether the data were consistent with normal, lognormal, or gamma distributions or whether a nonparametric approach was warranted. For each analyte and well group, ProUCL computed Shapiro-Wilk and Lilliefors statistics for normal or lognormal distributions (evaluated at significance levels of 0.01 and 0.10, respectively) and Anderson–Darling and Kolmogorov–Smirnov statistics for gamma distributions (evaluated at a 0.05 significance level). The GOF test results, in combination with graphical diagnostics and measures of skewness and variability, were used to select the most appropriate distributional form for computing upper and lower confidence limits (UCLs and LCLs) for evaluation of temporal trends and intra-well comparisons. Where the data did not adequately follow any parametric distribution, nonparametric methods were applied; for analytes with only non-detect results at a common reporting limit, the comparison value was set equal to the reporting limit.

The results of the GOF distribution testing are provided in Appendix F.

4.2.4. Trend Analysis

Temporal trend analysis was performed to evaluate whether groundwater concentrations exhibit statistically meaningful increases or decreases over the monitoring period. Time-series plots were prepared for each well–constituent pair using the combined pre-closure background and post-closure

monitoring data set to visually assess monotonic trends, step changes, and variability. Non-detect results were set equal to the minimum reporting limit for each well–constituent group.

Furthermore, Mann–Kendall (M-K) trend tests were then applied using ProUCL Version 5.2 for well–constituent pairs with at least five detected values and detections in at least 50 percent of samples. Well–constituent pairs that did not meet these criteria, or that were dominated by non-detects at varying reporting limits, were classified as having insufficient data for reliable trend evaluation and are identified as such in the trend summary table. For well–constituent pairs with sufficient data, statistically significant trends were identified where the two-sided M-K p-value was less than 0.05; the direction of the trend (increasing or decreasing) was determined from the sign of the M-K statistic and the associated regression slope

Based on the M-K results, the most analytes at background wells either exhibit no statistically significant monotonic trend or only weak, non-significant changes over time, supporting the use of background data for UTL development. At downgradient wells, statistically significant increasing trends were confirmed for selected constituents with persistent detections, while other analytes displayed no significant trends or had insufficient data for evaluation due to high censoring or variable reporting limits.

The direction and significance of trends for each analyte and well are illustrated in the time-series plots in *Figure F2* and the Mann–Kendall trend plots in *Figure F3* in Appendix F. The detailed ProUCL Mann–Kendall output for each well–constituent pair is included in Appendix F.

4.2.5. Evaluation of Spatial Variability

Spatial variability was evaluated by comparing upgradient/background and downgradient wells within the same hydrostratigraphic unit and screened interval using descriptive statistics and graphical review. Differences in concentration ranges, central tendencies, and variability across wells were examined with box plots, time-series plots, and summary statistics to assess whether any wells behaved distinctly from the rest of the network. This evaluation confirmed that the designated background wells reasonably represent upgradient groundwater quality and that observed spatial differences among downgradient wells are consistent with expected hydrogeologic conditions rather than statistical anomalies. Where spatial variability among background wells was limited and concentration ranges overlapped, background data were pooled by analyte to increase the robustness of distribution testing and UTL estimation

4.3 Background Concentrations

UTLs were calculated for each analyte to define the background concentrations. A confidence level of 95 percent and coverage of 95 percent was used for all parametric calculations. The maximum reporting limit was set as the background concentration for analytes with 100 percent non-detects. Final background concentrations are summarized in *Table F3 – Summary of Background Concentrations* in Appendix F. For the 2025 reporting period, these previously established background concentrations from the 2024 Annual Report are carried forward without modification for comparison to downgradient monitoring results.

4.4 Downgradient Well Screening

Downgradient groundwater data were evaluated on a well- and analyte-specific basis to identify appropriate statistical distributions for use in upper and lower confidence limit calculations. For each well–analyte pair, candidate distributions (normal, lognormal, gamma, and nonparametric) were first screened using formal goodness-of-fit tests, and then confirmed or rejected based on visual inspection of histograms and Q-Q plots. This approach ensures that the selected distribution reflects the empirical shape of the monitoring data and supports defensible downgradient well screening decisions.

Using the selected distributions, 95-percent UCLs and corresponding LCLs were calculated for each analyte at each downgradient well and compared to both pooled background concentrations and GWPS. Exceedances were identified where the LCL exceeded background and/or the applicable GWPS, and where sufficient data were not

available to support confidence-limit calculations, the well–analyte pair was categorized as having insufficient data. Summary of downgradient confidence limits is included in *Table F4* in Appendix F.

As summarized in the table below, a number of constituents exhibited statistical exceedances of background at one or more downgradient wells, including arsenic, barium, boron, calcium, chloride, cobalt, dissolved solids, lithium, molybdenum, sulfate, turbidity, and several other indicator parameters. Several of these analytes also showed cases where LCLs exceeded both background and the GWPS, most notably arsenic, barium, boron, calcium, lead, lithium, molybdenum, sulfate, and turbidity at selected downgradient wells. No downgradient wells showed statistical exceedances for antimony, beryllium, cadmium, chromium, fluoride, iron, manganese, mercury, selenium, thallium, or pH under the adopted screening criteria; many of these analytes were classified as having insufficient data for formal confidence-limit evaluation.

The detailed exceedance calculations are presented in *Table F5*, and the results are summarized in the tables titled "COCs that Exceeded Background Only" and "COCs that Exceeded Background and/or GWPS."

COCs that Exceeded Background Only	
COCs	**Monitoring Well(s)**
Arsenic	APW-06D
Barium	APW-02, APW-07, APW-10D, APW-10S
Boron	APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S
Chloride	APW-02, APW-05, APW-05R, APW-06D, APW-06S, APW, 10D
Cobalt	APW-02
Lithium	APW-05, APW-06S
Molybdenum	APW-03, APW-06D
Sulfate	APW-03, APW-05, APW-05R, APW-06D, APW-06S, APW-07, APW-08, APW-10D
COCs that Exceeded Background and/or GWPS	
COCs	**Monitoring Well(s)**
Arsenic	APW-02, APW-10S
Barium	APW-07, APW-10D, APW-10S
Boron	APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S
Calcium	APW-02, APW-03, APW-05, APW-06D, APW-07, APW-10D, APW-10S
Lead	APW-02
Lithium	APW-02, APW-05, APW-06S
Molybdenum	APW-02, APW-05, APW-05R, APW06S
Sulfate	APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S, APW-07, APW-08, APW-10D

5.0 CONCLUSION

The 2025 Annual Groundwater Monitoring Report for the Grand Tower Energy Center (GTEC) closed CCR impoundment documents the fourth full year of post-closure groundwater monitoring conducted in accordance with 35 Ill. Adm. Code Part 845 and the approved Post-Closure Plan. Groundwater monitoring was performed at 12 monitoring wells (three upgradient background wells and nine downgradient compliance wells) during four quarterly sampling events in 2025 to evaluate the concentration and areal distribution of impacts related to the closed CCR impoundment.

Key Findings

Background Concentrations:

Background groundwater quality was established using pooled upgradient well data (APW-01R, APW-04, and APW-09) from the pre-closure and early post-closure monitoring periods. UTLs were calculated using ProUCL Version 5.2 following EPA guidance, applying normal, lognormal, gamma, or nonparametric UTL methods based on goodness-of-fit test results and graphical diagnostics. The previously established background concentrations from the 2024 Annual Report were carried forward without modification for the 2025 evaluation, consistent with Illinois CCR rule requirements for established background.

Downgradient Exceedances:

Statistical evaluation of downgradient groundwater data, using distribution-specific 95% upper and lower confidence limits of the mean, identified multiple constituents where the LCL exceeded background concentrations and/or Groundwater Protection Standards (GWPS) established in 35 Ill. Adm. Code 845.600.

Constituents that exceeded background only at one or more downgradient wells included:

- Arsenic (APW-06D)
- Barium (APW-02, APW-07, APW-10D, APW-10S)
- Boron (APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S)
- Chloride (APW-02, APW-05, APW-05R, APW-06D, APW-06S, APW-10D)
- Cobalt (APW-02)
- Lithium (APW-05, APW-06S)
- Molybdenum (APW-03, APW-06D)
- Sulfate (APW-03, APW-05, APW-05R, APW-06D, APW-06S, APW-07, APW-08, APW-10D)

Constituents that exceeded both background and GWPS at one or more downgradient wells included:

- Arsenic (APW-02, APW-10S) – Exceeds GWPS of 0.01 mg/L
- Boron (APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S) – Exceeds GWPS of 2.0 mg/L; continues as primary indicator
- Calcium (APW-02, APW-03, APW-05, APW-06D, APW-07, APW-10D, APW-10S) – Exceeds background-based GWPS of 103.21 mg/L
- Lead (APW-02) – Exceeds GWPS of 0.0075 mg/L
- Lithium (APW-02, APW-05, APW-06S) – Exceeds GWPS of 0.04 mg/L
- Molybdenum (APW-02, APW-05, APW-05R, APW-06S) – Exceeds GWPS of 0.1 mg/L
- Sulfate (APW-02, APW-03, APW-05, APW-05R, APW-06D, APW-06S, APW-07, APW-08, APW-10D) – Exceeds GWPS of 400 mg/L

Based on the review of the analytical data, the following conclusions were made:

- **Boron -** remains the primary indicator constituent for corrective action monitoring, with persistent exceedances of the GWPS (2.0 mg/L) at six downgradient wells.
- **Arsenic** - shows the most significant regulatory concern, with LCLs exceeding both background and the GWPS at wells APW-02 and APW-10S.
- **Turbidity -** Field turbidity measurements exceeded the background-based UTL of 17.96 NTU at multiple wells across all four quarters of 2025, including upgradient well APW-01R in Quarters 2, 3, and 4. Elevated turbidity in upgradient wells suggests that turbidity is not exclusively related to CCR impacts and may reflect well construction, development status, or natural aquifer characteristics.
- **Spatial Distribution - T**he spatial pattern of exceedances is consistent with the conceptual site model. Wells immediately downgradient of the closed impoundment (APW-02, APW-05, APW-05R, APW-06D, APW-06S) and in the interpreted flow path toward the southwest (APW-07, APW-10D, APW-10S) exhibit the most frequent and highest-magnitude exceedances. Well APW-02, located directly downgradient of the impoundment, exhibited the broadest suite of exceedances, including arsenic, barium, boron, calcium, cobalt, lead, lithium, molybdenum, and sulfate.
- **Temporal Trends -** Mann-Kendall trend analysis indicates that most analytes at background wells exhibit no statistically significant monotonic trends, supporting the continued use of established background concentrations. At downgradient wells, trends vary by analyte and well location, with some constituents showing statistically significant increasing trends and others showing stable or decreasing trends. Continued quarterly monitoring and trend evaluation will be essential to assess the effectiveness of the closed impoundment cover system and the trajectory of groundwater impacts over time.
- **Regulatory Status -** The GTEC closed CCR impoundment remains in Corrective Action Monitoring (CAM) status due to exceedances of GWPS for multiple constituents. The site continues to be monitored under the approved Groundwater Management Zone (GMZ) and Post-Closure Plan. Quarterly monitoring will continue through the remainder of the five-year post-closure monitoring period (through 2027), with a comprehensive performance evaluation report due to IEPA at the conclusion of the initial five-year period.

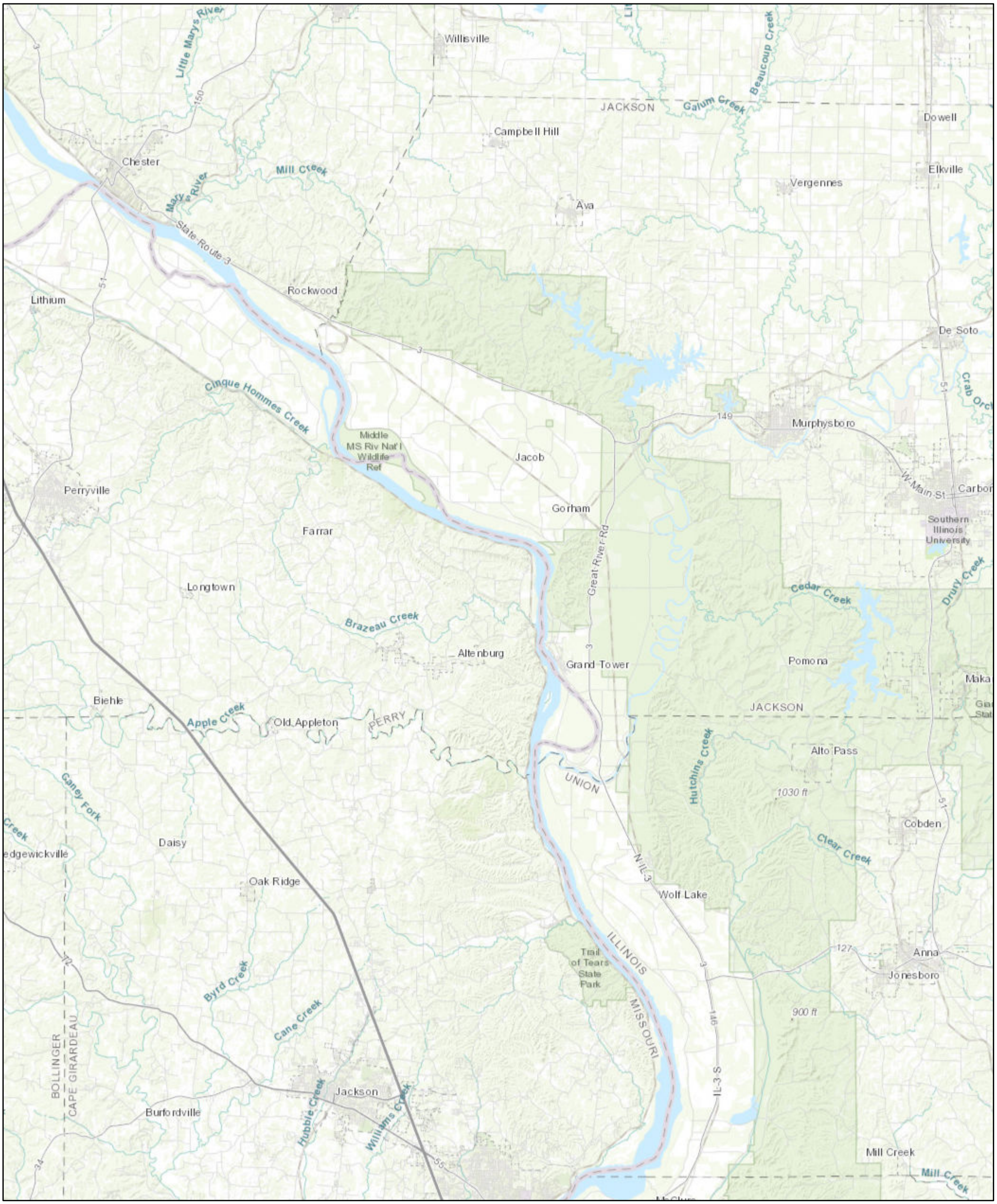
Recommendations

1. **Continue Quarterly Monitoring:** Maintain the current quarterly groundwater monitoring program through the remainder of the five-year post-closure period in accordance with 35 Ill. Adm. Code 845.650 and the approved Post-Closure Plan.
2. **Trend Evaluation:** Continue temporal trend analysis using Mann-Kendall and other appropriate statistical methods to evaluate whether observed concentrations are consistent with predicted rates of decrease from the groundwater fate and transport model developed for the site.
3. **Well Maintenance:** Address persistent elevated turbidity at specific wells (APW-02, APW-01R, APW-04, APW-05R, APW-06S, APW-08, APW-09, APW-10D) through redevelopment or other maintenance activities to ensure representative sample collection.
4. **Five-Year Performance Evaluation:** Prepare a comprehensive Groundwater Performance Monitoring Report at the conclusion of the initial five-year post-closure monitoring period (2027) that evaluates the effectiveness of the closure system, compares observed trends to model predictions, and proposes any necessary adjustments to the monitoring program or corrective action measures.
5. **Groundwater Management Zone (GMZ) Compliance:** Continue monitoring in accordance with the approved GMZ and provide documentation that impacts remain within the approved zone boundaries.

APPENDIX A

Figures

Figure 1 - Topographic Map



2/5/2026, 11:54:13 AM

1:288,895

0 2.5 5 10 mi

0 4.25 8.5 17 km

Perry County, Missouri Dept. of Conservation, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

Web AppBuilder for ArcGIS

DPWS, BOL, IEPA | Illinois State Geological Survey | Illinois EPA, Bureau of and Leaking UST | Illinois EPA, DoIT | not to be used for commercial profit | Perry County, Missouri Dept. of Conservation, Esri, HERE,

Figure 2 - Site Map

Legend:

APW-# Monitoring Well Location

1:4,514

0 0.04 0.08 0.16 mi

0 0.05 0.1 0.2 km

Esri, HERE, Garmin, iPC, State of Missouri, Vantor

Web AppBuilder for ArcGIS

DPWS, BOL, IEPA | Illinois State Geological Survey | Illinois EPA, Bureau of and Leaking UST | Illinois EPA, DoIT | not to be used for commercial profit | State of Missouri, Vantor | Esri, HERE, Garmin, iPC |

DRAWN BY: ECLW

APW-1R
332.10

APW-05R
329.30

APW-02
328.31

APW-04
331.23

APW-06S
329.95

APW-06D
330.27

APW-03
331.12

APW-09
331.71

APW-07
330.26

APW-08
331.58

APW-10D
332.17

APW-10S
330.52

329

329.5

330

330.5

331

331.5

332

*Mississippi River
Elevation = 331.03 Ft

Mississippi River

N

0 240 480 Feet

0 0.425 0.85 Miles

Power P

3rd Ave

Legend

- Monitoring Well Location
- Groundwater Contour (0.5 Ft. Interval) - Dashed where inferred
- Groundwater Flow Direction
- 328.84 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging - January 14, 2025
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Designated Wells not used in contouring
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. BING Imagery, 2022

Figure 2: First Quarter 2025 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

FILE: \\SCUSPRDGISFS01\Data\US\Projects\G-L\Grand Tower Energy Center\GrandTower_IL_MXDPRO\GROUNDWATER\2025\GTEC_2025_GWC.aprx | REVISED: 03/28/2025 | SCALE: 1:3,331 when printed at 11x17

DRAWN BY: ECLW

APW-1R
342.17

342

APW-05R
341.39

APW-02
341.90

APW-04
341.74

APW-06S
341.80

APW-06D
341.82*

APW-03
341.92

APW-09
341.75

APW-07
341.69

341.8

APW-08
341.76

Mississippi River

341.6

*Mississippi River
Elevation = 342.55 Ft

APW-10D
341.82

APW-10S
341.43

0 240 480 Feet

N

0 0.425 0.85 Miles

Legend

- Monitoring Well Location
- Groundwater Contour (0.25 Ft. Interval) - Dashed where inferred
- Groundwater Flow Direction
- 328.84 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging - June 24, 2025
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Designated Wells not used in contouring
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. BING Imagery, 2022
7. APW-06D not used in contouring.

Figure 2: Second Quarter 2025 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

FILE: \\SCUSPRDGISFS01\Data\US\Projects\G-L\Grand Tower Energy Center\GrandTower_IL\ MXDPRO\GROUNDWATER\2025\GTEC_2025_GWC.aprx | REVISED: 07/14/2025 | SCALE: 1:3,331 when printed at 11x17

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

DRAWN BY: ECLW

APW-1R
339.02

APW-05R
337.06

APW-02
339.00

APW-04
340.04

339.5

339

APW-06S
338.06

APW-06D
338.01

APW-03
338.18

338.5

APW-09
339.05

APW-07
336.26

337

337.5

338

APW-08
338.26

Mississippi River

*Mississippi River
Elevation = 345.80 Ft

APW-10D
338.61

APW-10S
338.52

0 240 480 Feet

N

0 0.425 0.85 Miles

Legend

- Monitoring Well Location
- Groundwater Contour (0.5 Ft. Interval) - Dashed where inferred
- Groundwater Flow Direction
- 328.84 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging - June 24, 2025
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Designated Wells not used in contouring
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. BING Imagery, 2022

Figure 2: Third Quarter 2025 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

FILE: \\VMSCUSPGISFS01\Data\US\Projects\G-L\Grand Tower Energy Center\GrandTower_IL_MXDPRO\GROUNDWATER\2025\GTEC_2025_GWC.aprx | REVISED: 09/17/2025 | SCALE: 1:3,331 when printed at 11x17

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

DRAWN BY: ECLW

APW-01R
330.94

APW-05R
329.59

APW-02
330.51

APW-04
330.84

APW-06S
330.09

APW-06D
330.22

APW-03
330.79

APW-09
331.20

APW-07
330.10

APW-08
327.26

Mississippi River

*Mississippi River
Elevation = 328.50 Ft

APW-10D
331.45

APW-10S
330.05

330
330.5
331
327.5
328
328.5
329
329.5

0 240 480 Feet

N

0 0.425 0.85 Miles

Legend

- Monitoring Well Location
- Groundwater Contour (0.5 Ft. Interval) - Dashed where inferred
- Groundwater Flow Direction
- 328.84 Groundwater Elevation

Notes:
1. CCR Surface Impoundment Closed Prior to July 31, 2021
2. Date of gauging - November 19, 2025
3. Ft AMSL - Feet Above Mean Sea Level
4. (D) - Designated Wells not used in contouring
5. * River stage at Mississippi River Gauge at Grand Tower, IL (NGVD29) (https://rivergages.mvr.usace.army.mil/WaterControl/shefdata2.cfm?sid=CE358576&d=31&dt=E)
6. BING Imagery, 2022

Figure 2: Fourth Quarter 2025 Groundwater Contour Map
Grand Tower Energy Center, LLC
Grand Tower, Illinois
Jackson County

ERM

Source: Esri - World Topoographic Map; NAD 1983 StatePlane Illinois West FIPS 1202 Feet

FILE: Z:\US\Projects\G-L\Grand Tower Energy Center\GrandTower_ILL_MXD\PRO\GROUNDWATER\2025\GTEC_2025_GWC.aprx | REVISED: 12/09/2025 | SCALE: 1:3,331 when printed at 11x17

APPENDIX B

Monitoring Wells Inspection Forms

1st Quarter, 2025 - Monitoring Wells Inspection Forms

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R		Date:	1/14/2025
Total Depth (Actual):	58.30	(BTOC)	Time:	12:15 PM
Total Depth (Measured):	58.25	(BTOC)	Collection Order:	6
Depth to Water (Measured):	34.72	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02		Date:	1/14/2025
Total Depth (Actual):	58.75	(BTOC)	Time:	11:25 AM
Total Depth (Measured):	58.19	(BTOC)	Collection Order:	3
Depth to Water (Measured):	34.18	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03		Date:	1/14/2025
Total Depth (Actual):	54.65	(BTOC)	Time:	1:45 PM
Total Depth (Measured):	59.45	(BTOC)	Collection Order:	12
Depth to Water (Measured):	33.90	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	No
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04		Date:	1/14/2025
Total Depth (Actual):	60.40	(BTOC)	Time:	12:20 PM
Total Depth (Measured):	60.28	(BTOC)	Collection Order:	7
Depth to Water (Measured):	35.54	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	2 ballards are very lose.

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	No
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R		Date:	1/14/2025
Total Depth (Actual):	56.90	(BTOC)	Time:	11:40 AM
Total Depth (Measured):	62.80	(BTOC)	Collection Order:	4
Depth to Water (Measured):	33.35	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	No ballards present.

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D		Date:	1/14/2025
Total Depth (Actual):	152.57	(BTOC)	Time:	11:15 AM
Total Depth (Measured):	151.96	(BTOC)	Collection Order:	1
Depth to Water (Measured):	32.03	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S		Date:	1/14/2025
Total Depth (Actual):	63.98	(BTOC)	Time:	11:20 AM
Total Depth (Measured):	63.75	(BTOC)	Collection Order:	2
Depth to Water (Measured):	32.21	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07		Date:	1/14/2025
Total Depth (Actual):	63.35	(BTOC)	Time:	1:30 PM
Total Depth (Measured):	63.22	(BTOC)	Collection Order:	10
Depth to Water (Measured):	29.17	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well was pressurized.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08		Date:	1/14/2025
Total Depth (Actual):	61.89	(BTOC)	Time:	1:40 PM
Total Depth (Measured):	62.11	(BTOC)	Collection Order:	11
Depth to Water (Measured):	30.68	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09		Date:	1/14/2025
Total Depth (Actual):	63.40	(BTOC)	Time:	12:05 PM
Total Depth (Measured):	63.17	(BTOC)	Collection Order:	5
Depth to Water (Measured):	34.70	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D		Date:	1/14/2025
Total Depth (Actual):	98.19	(BTOC)	Time:	1:05 PM
Total Depth (Measured):	98.05	(BTOC)	Collection Order:	8
Depth to Water (Measured):	27.10	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S		Date:	1/14/2025
Total Depth (Actual):	62.84	(BTOC)	Time:	1:10 PM
Total Depth (Measured):	62.71	(BTOC)	Collection Order:	9
Depth to Water (Measured):	28.05	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	
DNAPL Present:	No
If Yes, measured thickness =	

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

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Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R	Date:	6/24/2025
Total Depth (Actual):	58.30 (BTOC)	Time:	1046
Total Depth (Measured):	58.9	Collection Order:	5
Depth to Water (Measured):	24.65		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02	Date:	6/24/2025
Total Depth (Actual):	58.75 (BTOC)	Time:	1420
Total Depth (Measured):	58.15	Collection Order:	11
Depth to Water (Measured):	22.71		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Water in casing almost to well level

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03	Date:	6/24/2025
Total Depth (Actual):	59.65 (BTOC)	Time:	1322
Total Depth (Measured):	59.7	Collection Order:	6
Depth to Water (Measured):	23.87		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04	Date:	6/24/2025
Total Depth (Actual):	60.40 (BTOC)	Time:	1108
Total Depth (Measured):	60.39	Collection Order:	3
Depth to Water (Measured):	25.7		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R	Date:	6/24/2025
Total Depth (Actual):	56.90 (BTOC)	Time:	1425
Total Depth (Measured):	62.8	Collection Order:	12
Depth to Water (Measured):	22.41		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Silty/sandy bottom - sediment present in bottom of tubing

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S	Date:	6/24/2025
Total Depth (Actual):	63.98 (BTOC)	Time:	1020
Total Depth (Measured):	64.62	Collection Order:	1
Depth to Water (Measured):	21.71		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D	Date:	6/24/2025
Total Depth (Actual):	152.57 (BTOC)	Time:	1015
Total Depth (Measured):	156.44	Collection Order:	2
Depth to Water (Measured):	21.74		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07	Date:	6/24/2025
Total Depth (Actual):	63.35 (BTOC)	Time:	1137
Total Depth (Measured):	63.18	Collection Order:	8
Depth to Water (Measured):	18.72		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Ants in well protector and tubing.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08	Date:	6/24/2025
Total Depth (Actual):	61.89 (BTOC)	Time:	1312
Total Depth (Measured):	62.2	Collection Order:	7
Depth to Water (Measured):	20.95		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09	Date:	6/24/2025
Total Depth (Actual):	63.40 (BTOC)	Time:	1254
Total Depth (Measured):	63.1	Collection Order:	4
Depth to Water (Measured):	25.09		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S	Date:	6/24/2025
Total Depth (Actual):	62.84 (BTOC)	Time:	1159
Total Depth (Measured):	62.9	Collection Order:	10
Depth to Water (Measured):	18.04		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D	Date:	6/24/2025
Total Depth (Actual):	98.19 (BTOC)	Time:	1156
Total Depth (Measured):	98.93	Collection Order:	9
Depth to Water (Measured):	17.59		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Ants in well protector and on tubing.

3rd Quarter, 2025 - Monitoring Wells Inspection Forms

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R		Date:	9/3/2025
Total Depth (Actual):	58.30	(BTOC)	Time:	1120
Total Depth (Measured):	58.20	(BTOC)	Collection Order:	5
Depth to Water (Measured):	27.80	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		Yes
Well cap in place:		Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02		Date:	9/3/2025
Total Depth (Actual):	58.75	(BTOC)	Time:	1050
Total Depth (Measured):	58.05	(BTOC)	Collection Order:	3
Depth to Water (Measured):	25.61	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

Water in casing almost to well level

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03		Date:	9/3/2025
Total Depth (Actual):	59.65	(BTOC)	Time:	1220
Total Depth (Measured):	60.25	(BTOC)	Collection Order:	12
Depth to Water (Measured):	27.61	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04		Date:	9/3/2025
Total Depth (Actual):	60.40	(BTOC)	Time:	1140
Total Depth (Measured):	60.61	(BTOC)	Collection Order:	7
Depth to Water (Measured):	27.40	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches

Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R		Date:	9/3/2025
Total Depth (Actual):	56.90	(BTOC)	Time:	1100
Total Depth (Measured):	62.83	(BTOC)	Collection Order:	4
Depth to Water (Measured):	26.74	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S		Date:	9/3/2025
Total Depth (Actual):	63.98	(BTOC)	Time:	1037
Total Depth (Measured):	63.81	(BTOC)	Collection Order:	2
Depth to Water (Measured):	25.45	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D		Date:	9/3/2025
Total Depth (Actual):	152.57	(BTOC)	Time:	1030
Total Depth (Measured):	154.08	(BTOC)	Collection Order:	1
Depth to Water (Measured):	25.55	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07		Date:	9/3/2025
Total Depth (Actual):	63.35	(BTOC)	Time:	1205
Total Depth (Measured):	64.30	(BTOC)	Collection Order:	10
Depth to Water (Measured):	24.35	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Ants in well protector and tubing.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08		Date:	9/3/2025
Total Depth (Actual):	61.89	(BTOC)	Time:	1210
Total Depth (Measured):	62.85	(BTOC)	Collection Order:	11
Depth to Water (Measured):	24.48	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09		Date:	9/3/2025
Total Depth (Actual):	63.40	(BTOC)	Time:	1130
Total Depth (Measured):	64.10	(BTOC)	Collection Order:	6
Depth to Water (Measured):	27.79	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S		Date:	9/3/2025
Total Depth (Actual):	62.84	(BTOC)	Time:	1153
Total Depth (Measured):	62.76	(BTOC)	Collection Order:	8
Depth to Water (Measured):	20.95	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A

Comments:

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes

Comments:

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D		Date:	9/3/2025
Total Depth (Actual):	98.19	(BTOC)	Time:	1156
Total Depth (Measured):	98.10	(BTOC)	Collection Order:	9
Depth to Water (Measured):	20.80	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Ants in well protector and on tubing.

4th Quarter, 2025 - Monitoring Wells Inspection Forms

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-01R		Date:	11/19/2025
Total Depth (Actual):	58.30	(BTOC)	Time:	1015
Total Depth (Measured):	59.19	(BTOC)	Collection Order:	8
Depth to Water (Measured):	35.88	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-02		Date:	11/19/2025
Total Depth (Actual):	58.75	(BTOC)	Time:	938
Total Depth (Measured):	57.7	(BTOC)	Collection Order:	3
Depth to Water (Measured):	30.5	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	Yes
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Water in casing almost to well level

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-03		Date:	11/19/2025
Total Depth (Actual):	59.65	(BTOC)	Time:	1020
Total Depth (Measured):	59.41	(BTOC)	Collection Order:	9
Depth to Water (Measured):	35	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		Yes
Well cap in place:		Yes
Comments:		

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-04		Date:	11/1/1925
Total Depth (Actual):	60.40	(BTOC)	Time:	1010
Total Depth (Measured):	60.65	(BTOC)	Collection Order:	7
Depth to Water (Measured):	36.60	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-05R		Date:	11/19/2025
Total Depth (Actual):	56.90	(BTOC)	Time:	940
Total Depth (Measured):	62.75	(BTOC)	Collection Order:	4
Depth to Water (Measured):	34.21	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) = 2 inches	
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06S		Date:	11/19/2025
Total Depth (Actual):	63.98	(BTOC)	Time:	930
Total Depth (Measured):	63.72	(BTOC)	Collection Order:	1
Depth to Water (Measured):	36.33	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-06D		Date:	11/19/2025
Total Depth (Actual):	152.57	(BTOC)	Time:	1030
Total Depth (Measured):	154.55	(BTOC)	Collection Order:	2
Depth to Water (Measured):	33.25	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	No
Locks intact:	Yes
Weep hole present:	No
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	No
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

No tubing present well. Replaced with new dedicated tubing during sampling.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-07		Date:	11/19/2025
Total Depth (Actual):	63.35	(BTOC)	Time:	1025
Total Depth (Measured):	63.18	(BTOC)	Collection Order:	10
Depth to Water (Measured):	30.31	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Ants in well protector and tubing.

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-08		Date:	11/19/2025
Total Depth (Actual):	61.89	(BTOC)	Time:	1030
Total Depth (Measured):	63.6	(BTOC)	Collection Order:	11
Depth to Water (Measured):	35.46	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		Yes
Well cap in place:		Yes
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-09		Date:	11/19/2025
Total Depth (Actual):	63.40	(BTOC)	Time:	1130
Total Depth (Measured):	63.12	(BTOC)	Collection Order:	12
Depth to Water (Measured):	35.64	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		Yes
Well cap in place:		Yes
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10S		Date:	11/19/2025
Total Depth (Actual):	62.84	(BTOC)	Time:	1153
Total Depth (Measured):	62.64	(BTOC)	Collection Order:	6
Depth to Water (Measured):	29.42	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2	inches
Marking point present:		Yes
Well cap in place:		Yes
Comments:		

General Comments:

Well Inspection Worksheet

Grand Tower Energy Center

Grand Tower, IL

Well ID:	APW-10D		Date:	11/19/2025
Total Depth (Actual):	98.19	(BTOC)	Time:	1156
Total Depth (Measured):	98.00	(BTOC)	Collection Order:	5
Depth to Water (Measured):	27.96	(BTOC)		

Is well screen occluded more than 10%?	No
If Yes, list steps for redevelopment:	
LNAPL Present:	No
If Yes, measured thickness =	N/A
DNAPL Present:	No
If Yes, measured thickness =	N/A

Well Completion Type:

Condition of protector: INTACT	Yes
Well ID present and readable:	Yes
Locks intact:	Yes
Weep hole present:	Yes
Water present in protector:	No
Are well "markers" (i.e.bumper posts) needed at this location:	No
If yes, are current well "markers" adequate around well:	N/A
Comments:	

Well Surface Seal: INTACT

Is surrounding area sloped away from well:	Yes
Any observed ponding:	No
Is surface run-off flow evident around well:	No

Well Casing Condition: INTACT

Size of well (diameter) =	2 inches
Marking point present:	Yes
Well cap in place:	Yes
Comments:	

General Comments:

Ants in well protector and on tubing.

APPENDIX C

Tables

Table 1
Groundwater Summary Table - APW-01
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment									Post-Closure Sampling								
Sample ID				APW-1R-20170907	APW-1R-20170927	APW-1R-20171018	APW-1R-20171108	APW-1R-20171127	APW-1R-20171228	APW-1R-20180117	APW-1R-20180207	APW-1R-WG-20220615	APW-01R-WG-20220915	APW-01R-WG-20221130	APW-01R-WG-20230202	APW-01R-WG-20230627	APW-01R-WG-20230920	APW-01R-WG-20231129	APW-01R-WG-20240110	APW-01R-WG-20240501	APW-01R-WG-20240905	APW-01R-WG-20241015	APW-01R-WG-20250115	APW-01R-WG-20250625	APW-01R-WG-20250904	APW-01R-WG-20251120
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R	APW-01R
Date				9/5/2017	9/27/2017	10/18/2017	11/8/2017	11/27/2017	12/28/2017	1/17/2018	2/7/2018	6/15/2022	9/15/2022	11/30/2022	2/2/2023	6/27/2023	9/20/2023	11/29/2023	1/10/2024	5/1/2024	9/5/2024	10/15/2024	1/15/2025	6/25/2025	9/4/2025	11/20/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																										
UNSPECIFIED																										
Fluoride	N	mg/L	4	0.15	0.17	0.16	0.12	0.14	0.15	0.18	0.16	0.21	0.15	0.18	0.17	0.14	0.17	0.17	0.183	0.326	0.201	0.15 U	0.15 U	0.199	0.155	0.194
Radium-226	N	pCi/L	NS	0.25 ± .12 U	0.18 ± .09 U	0.307 ± .220	0.13 ± 0.43 U	-0.07 ± 0.16 U	0.23 ± 0.1 U	0.03 ± 0.07 U	-0.04 ± 0.09 U	0.0333 ± 0.141 U	0.24 ± 0.1 U	0.4 ± 0.12 U	0.16 ± 0.169 J	0.27 ± 0.111 U	0.32 ± 0.11 U	0.24 ± 0.08 U	0.738 ± 0.354	0.383 ± 0.294	0.167 ± 0.164 J	0.126 ± 0.144 J	0.0217 ± 0.0838 U	0.213 ± 0.216 J	0.00715 ± 0.137 U	0.222 ± 0.267 J
Radium-228	N	pCi/L	NS	2.29 ± .98	0.51 ± .39 U	0.12 ± .332	0.57 ± 0.33 U	0.47 ± 0.54 U	0.04 ± 0.34 U	0.98 ± 0.62 J	0.22 ± 0.34 U	0.661 ± 0.257	0.43 ± 0.49 UQM-	0.41 ± 0.56 U	0.531 ± 0.284	0.85 ± 0.61 J	0.32 ± 0.56 U	0.97 ± 0.67 J	1.44 ± 0.229	0.671 ± 0.262	-0.199 ± 0.295 U	0.183 ± 0.206 J	0.924 ± 0.295	0.654 ± 0.609 J	0.852 ± 0.646 J	0.572 ± 0.456 J
Sulfate	N	mg/L	400	41	65	65	54	58	88	78	79	33	73 S	69	74	37	79	73	68.9	61.7	34	58.5	81.4	25.1	23.3	60.8
CALC																										
Radium-226/228	N	pCi/L	7.002	2.54 ± 1.1	0.69 ± 0.48 U	0.427 ± 0.652	0.7 ± 0.76 U	0.47 ± 0.7 U	0.27 ± 0.44 U	1.01 ± 0.69 U	0.22 ± 0.42 U	0.693 ± 0.293	0.67 ± 0.59 U	0.81 ± 0.68 U	0.691 ± 0.330	1.12 ± 0.72 U	0.64 ± 0.67 U	1.21 ± 0.75 U	2.18 ± 0.422	1.05 ± 0.394	0.167 ± 0.338 U	0.309 ± 0.251 J	0.946 ± 0.307	0.867 ± 0.646 J	0.859 ± 0.660 J	0.794 ± 0.528 J
FIELD PARAM																										
Turbidity, Field	N	NTU	17.96									33.9	31.7	31.7	89.5	83.2	133	95.6	25.6	71.3	19.2	16.8	8.95	47.6	30.5	48.2
GEN CHEM																										
Chloride	N	mg/L	200	5 U	5 U	5 U	5 U	5 U	9	11	10	2	7	7	7	4 U	5	7	9.07	7.19	1.97	6.15	9.52	1.1	1.1	6.33
Dissolved Solids, Total	N	mg/L	1200	400	428	376	358 R	412	474	434	392	342	420 H	385	384	228	355	300	385	439	372	384	395	307	324	383
pH, Lab	N	pH units	6.22-9.02	6.64	6.54	6.6	6.8	7.11	6.96	7.09	6.52	6.98	6.91	6.43	6.57	6.53 H	6.66 H	6.59 H	7.19 T8	7.04 T8	6.88 T8	6.85 T8	7.25 T8	7.18 T8	6.79 T8	6.92 T8
METALS																										
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0012	0.001 U	0.001 U	0.001	0.0011	0.0016	0.0015	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	mg/L	0.01	0.0012	0.0012	0.001 U	0.0012	0.0011	0.001 U	0.001 U	0.0011	0.0019	0.0019	0.0016	0.0021	0.0013	0.0029	0.0033	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Barium	D	mg/L	2									0.16	0.153	0.162 B	0.155	0.164	0.21	0.245	0.199	0.194 F1	0.154	0.162	0.163	0.135	0.135	0.175
Barium	T	mg/L	2	0.168	0.193	0.171	0.176	0.165	0.178	0.182	0.18	0.197	0.185	0.199	0.178	0.168	0.202	0.259	0.169	0.204	0.155	0.165	0.168	0.148	0.148	0.17
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									0.163	0.244	0.219	0.205	0.249	0.204	0.279		0.238 F1	0.205	0.238	0.261	0.2 U	0.2 U	0.224
Boron	T	mg/L	2	0.218	0.251	0.238	0.211	0.225	0.329	0.357	0.311	0.228	0.242	0.222	0.221	0.176	0.18	0.263		0.247	0.2 U	0.242	0.244	0.2 U	0.2 U	0.233
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									85.5	83.8	79.7	77.4	66.4	72.1	84.3	78.4	76.8	74.1	89.5	89.4	68.4	72.2	84.6
Calcium	T	mg/L	103.2	84.3 S	93 S	86.2 S	88.2	91.2 S	91	97.1	85.8 S	86.9	84.8	79.7	75.3 J	66.8 B	99.2 S	84.3	78.4	76.8	74.1	89.3	89.4	68.4	72.2	84.6
Chromium	D	mg/L	0.1									0.0009 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.0023	0.0021	0.0033	0.001 U	0.001 U	0.0018	0.0015	0.0015	0.0031	0.0034	0.0041	0.0022	0.0015 U	0.0085	0.0049	0.00248	0.00322	0.002 U	0.00206	0.002 U	0.00299	0.0027	0.00242
Cobalt	D	mg/L	0.006									0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0017	0.0017	0.0031	0.0013	0.0014	0.0041	0.0027	0.002 U	0.00225	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS																0.11 J							
Iron	T	mg/L	NS									1.42							0.405							
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.0062	0.0014	0.001 U	0.0026	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0127	0.0156	0.0139	0.0135	0.015	0.0211	0.0193	0.014	0.0143 F1	0.013	0.0145	0.0121	0.013	0.0114	0.0141
Lithium	T	mg/L	0.04	0.0155	0.018	0.0173	0.0175	0.018	0.0179	0.0164	0.0159	0.0171	0.0169	0.0155	0.0157	0.0142	0.0147	0.0189	0.0153	0.015	0.0133	0.0152	0.0154	0.0124	0.0136	0.0146
Manganese	D	mg/L	NS																0.0362							
Manganese	T	mg/L	NS									0.139							0.0791							
Mercury	D	mg/L	0.002										0.0002 U						0.0002 U	0.0002 U F1	0.0002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0053 J	0.005 U F1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Molybdenum	T	mg/L	0.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Nickel	D	mg/L	NS									0.0043		0.0061					0.00644							
Nickel	T	mg/L	NS	0.0044	0.0062	0.0054	0.004	0.0038	0.0046	0.005	0.0057	0.0083		0.012					0.00804							
Selenium	D	mg/L	0.05									0.0028	0.0032	0.0033	0.0032	0.0032	0.0037	0.0058	0.00435	0.00444 F1	0.00289	0.00341	0.0042	0.00289	0.00309	0.00403
Selenium	T	mg/L	0.05	0.0038	0.004	0.0034	0.0044	0.0041	0.004	0.004	0.0037	0.0028	0.0038	0.0035	0.0037	0.0033	0.0037	0.0054	0.00514	0.00437	0.00351	0.00327	0.00337	0.00316	0.00293	0.00406
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0014	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal/Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
J4 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 6 quarterly sampling events from 2017-2018
pH, Lab - Standard Value is 22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight exposes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-05. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

Values exceeded action level
NS = No Standard

Table 2
Groundwater Summary Table - APW-02
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

			Sampled prior to closure of CCR Impoundment														Post-Closure Sampling								
Sample ID			APW-2-20170907	APW-2-20170927	APW-2-20171030	APW-2-20171109	APW-2-20171129	APW-2-20171227	APW-2-20180119	APW-2-20180207	APW-02-WG-20220616	APW-02-WG-20220914	DUP-003-WG-20220901	APW-02-WG-20221129	DUP-03-WG-20221212	APW-02-WG-20230201	DUP-03-WG-20230301	APW-02-WG-20230627	DUP-03-WG-20230642	APW-02-WG-20230920	APW-02-WG-20231128	APW-02-WG-20240110	APW-02-WG-20240501	APW-02-WG-20240905	APW-02-WG-20241015	APW-02-WG-20250115	APW-02-WG-20250626	APW-02-WG-20250904	APW-02-WG-20251119
Location ID			APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02	APW-02
Date	**Total or Dissolved**	**Units**	**35 IAC 845.600**	**9/6/2017**	**9/28/2017**	**10/20/2017**	**11/9/2017**	**11/29/2017**	**12/27/2017**	**1/19/2018**	**2/7/2018**	**6/16/2022**	**9/14/2022**	**9/14/2022**	**11/29/2022**	**11/29/2022**	**2/1/2023**	**2/1/2023**	**4/27/2023**	**4/27/2023**	**9/20/2023**	**11/28/2023**	**1/10/2024**	**5/1/2024**	**8/5/2024**	**10/15/2024**	**1/15/2025**	**6/26/2025**	**9/4/2025**	**11/19/2025**
Sample Type				N	N	N	N	N	N	N	N	N	FD	N	FD	N	FD	N	FD	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																												
UNSPECIFIED																												
Fluoride	N	mg/L	4	0.24	0.24	0.25	0.24	0.24	0.25	0.26	0.24	0.25	0.22	0.25	0.24	0.22	0.32	0.22	0.22	0.24	0.26	0.25	0.25	0.197	1.53	0.234	0.264	0.318	0.75 U
Radium 226	N	pCi/L	NS	1.06 ± 0.21	0.33 ± 0.13 U	-0.132 ± 0.410	1.47 ± 0.26		0.33 ± 0.12 U	0.47 ± 0.15 U	0.97 ± 0.23 J	0.159 ± 0.181 J	0.27 ± 0.13 UJOR	0.27 ± 0.13 UJOR	0.35 ± 0.12 U	0.0757 ± 0.256 U	0.175 ± 0.279 J	0.21 ± 0.13 U	0.05 ± 0.072 U	0.388 ± 0.212 U	0.12 ± 0.06 U	0.0393 ± 0.186 U	0.326 ± 0.229	1.29 ± 0.47	0.401 ± 0.253	0.405 ± 0.284	0.0586 ± 0.159 U	0.526 ± 0.397
Radium 228	N	pCi/L	NS	1.69 ± 0.95	-0.01 ± 0.61 U	0.564 ± 0.578	0.91 ± 0.36 J		0.95 ± 0.52 J	1.68 ± 1.59	0.99 ± 0.5 J	0.308 ± 0.236 JSJ	0.41 ± 0.49 UJOR	0.81 ± 1.03	0.42 ± 0.44 U	1.67 ± 0.466	0.981 ± 0.290	0.42 ± 0.4 U	0.13 ± 0.52 U	1.71 ± 0.93	0.56 ± 1.04 U	0.243 ± 0.202 J	0.566 ± 0.329	1.15 ± 0.464	0.218 ± 0.460 U	1.69 ± 0.774	1.13 ± 0.673 J	0.94 ± 0.506 J	0.0438 ± 0.602 U
	N	mg/L	460	460	460	472	479	472	426	445	416	409	431	390	418	428	455	360	460	460	441	370	370	275	509	492	482	507
CAI-C																												
Radium 226+228	N	pCi/L	7.002	3.04 ± 1.16	0.33 ± 0.7 U	0.564 ± 0.788	2.38 ± 0.62		1.28 ± 0.64 U	1.55 ± 0.74 U	1.96 ± 0.73 U	0.467 ± 0.297 J	0.67 ± 0.58 U	2.95 ± 1.1	0.76 ± 0.58 U	0.62 ± 0.67 U	1.14 ± 0.532	1.16 ± 0.402	0.21 ± 0.7 U	0.13 ± 0.59 U	4.09 ± 1.05	0.68 ± 0.7 U	0.553 ± 0.275 J	1.29 ± 0.419	1.55 ± 0.519	1.51 ± 0.634	2.19 ± 0.814	1.62 ± 0.918	0.619 ± 0.714 J	0.587 ± 0.721 J
FIELD PARAM																												
Turbidity, Field	N	NTU	17.96								38	19.2		132		93.6		104.3		97	169	104	66.1	174	663	127	115	78.6	72
GEN CHEM																												
Chloride	N	mg/L	200	13	12	11	11	12	12	12	12	9	10	10	10	10	7	8	7	8	7.78	5.38	7.55	8.99	8.99	8.16	8.8	
Dissolved Solids, Total	N	mg/L	1000	858	880	934	916	870	848	836	888	930	852	864	870	845	920	820	845	920	820	845	783	816	861	801	799	775
pH, Lab	N	pH unit	6.22-9.02	7.09	7.05	7.08	7.07	7.05	7.14	7.06	6.96	7.21	7.32	7.25	7.01	7.02	6.98	7.05	6.9 H	7.03 H	7.15 H	7.11 H	7.52 T8	7.14 T8	7.18 T8	7.2 T8	7.67 T8	7.41 T8	7.26 T8	7.38 T8
METALS																												
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0041 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0001	0.0009 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0041 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0117	0.0046	0.0049	0.0012	0.0187	0.0116	0.011	0.0107	0.0072	0.0038	0.00409	0.00255 F1	0.00424	0.0028	0.00299	0.00342	0.00382	0.00405
Arsenic	T	mg/L	0.01	0.0199	0.0147	0.0212	0.017	0.0169	0.0157	0.0148	0.0243	0.0137	0.0126	0.0176	0.0022	0.0179	0.0116	0.0118	0.0107	0.0097	0.0112	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101	0.0101
Barium	D	mg/L	2									0.154	0.154	0.154	0.154	0.148	0.146	0.146	0.149	0.153	0.154	0.146	0.147 F1	0.134	0.141	0.137	0.133	0.133	0.138
Barium	T	mg/L	2	0.479	0.355	0.685	0.44	0.427	0.338	0.351	0.739	0.237	0.408	0.228	0.214	0.159	0.146	0.206	0.152	0.303	0.155	0.145	0.145	0.162	0.173	0.147	0.484	0.142	0.157
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									8.17	7.49 E	7.4	7.47	8.01	7.39	7.24	8.57	9.24	8.91	8.57 E	9.01 F1	8.38	8.23	9.15	10.4	9.36	9.13
Boron	T	mg/L	2	8.16	8.73	8.94 S	9	8.98	8.39	8.19	8.24	8.13	9.45	8.72	8.97 S	7.49	7.75	8.32 S	9.14	9.01 S	8.24	9.62	10.2	8.24	8.89	9.07	10.3	9.9	9.09
Cadmium	D	mg/L	0.005									0.0003 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0006 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00104	0.01 U	0.001 U
Calcium	D	mg/L	103.2									174	154 S	149	128	158	144	147	148	151	151	144	142 F1	156	155	151	145	145	149
Calcium	T	mg/L	103.2	148	145	171 S	157	158	135	134	175	189	156	176	140 S	149	144	149 S	161 B	167 S	132	151	146	161	156	170	165	185	151	150
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0021 U F1	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U
Chromium	T	mg/L	0.1	0.0374	0.0455	0.0503	0.0235	0.014	0.0566	0.127	0.112	0.0254	0.0148	0.0066	0.0064	0.0054	0.0052	0.0022	0.0024	0.0079	0.008	0.0092	0.0021 U	0.0021 U	0.00658	0.0191	0.00228	0.0361	0.02 U	0.0835
Cobalt	D	mg/L	0.006									0.0003 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.0057	0.0023	0.0097	0.0041	0.0038	0.0018	0.0028	0.011	0.0011	0.001 U	0.0044	0.0011	0.0015	0.001 U	0.001 U	0.001 U	0.0016	0.001 U	0.0027	0.002 U	0.0057	0.002 U	0.00232	0.0017	0.002 U	0.0036
Iron	D	mg/L	NS																				0.1 U						
Iron	T	mg/L	NS									1.7											0.1 U						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.003 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.0115	0.0034	0.0201	0.0096	0.0075	0.0031	0.0048	0.0239	0.0032	0.0118	0.0033	0.0033	0.0034	0.0027	0.0023	0.0025	0.002	0.0057	0.0025	0.0025 U	0.0042	0.0076	0.0025	0.0022	0.002 U	0.0048
Lithium	D	mg/L	0.04									0.037	0.0374	0.0464	0.038	0.0356	0.0425	0.0197	0.0442	0.0455	0.0583	0.0506	0.0396	0.0432 F1	0.038	0.0444	0.0462	0.0375	0.0417
Lithium	T	mg/L	0.04	0.05	0.0455	0.0647	0.0521	0.0542	0.0474	0.045	0.0604	0.0327	0.0359	0.0456	0.036	0.0411	0.0417	0.044	0.0459	0.048	0.0422	0.055	0.0416	0.045	0.0408	0.048	0.0427	0.0513	0.0408	0.0405
Manganese	D	mg/L	NS																				0.616						
Manganese	T	mg/L	NS									0.752											0.669						
Mercury	D	mg/L	0.002										0.0002 U										0.0002 U	0.0002 U F1	0.000214	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.00043	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U F1	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.201	0.139	0.156	0.0337	0.146	0.151	0.155	0.227	0.227	0.214	0.205	0.157	0.34 F1	0.172	0.163	0.193	0.207	0.201	0.174
Molybdenum	T	mg/L	0.1	0.172	0.147	0.214	0.175	0.165	0.111	0.0951	0.191	0.24	0.174	0.174	0.138	0.119	0.165	0.16	0.229	0.252	0.198	0.147	0.158	0.352	0.162	0.129	0.188	0.21	0.197	0.159
Nickel	D	mg/L	NS									0.0039				0.0022	0.0021 U						0.002 U							
Nickel	T	mg/L	NS	0.0288	0.0263	0.0412	0.0202	0.0135	0.0295	0.0631	0.0725	0.0142		0.0045	0.0047								0.00237							
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.0071	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U	0.002 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.02 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA= Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded

J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
J4 = The sample matrix interfered with the ability to make any accurate determination: spike value is low
U = Not Detected at the Reporting Limit
R = 60% outside accepted recovery limits
U- = Not Detected at the Reporting Limits
T8= Sample received past/ too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-0108 concentrations from 6 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-0108 concentrations from 6 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight quarters of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-0115 and APW-09. The Final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calpe taken from Table 6

NS = No Standard

Table 3
Groundwater Summary Table - APW-03
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment							Post-Closure Sampling										
Sample ID				APW-3-20170907	APW-3-20170929	APW-3-20171020	APW-3-20171110	APW-3-20171129	APW-3-20171228	APW-3-20180119	APW-3-20180208	APW-03-WG-20220616	APW-03-WG-20220915	APW-03-WG-20221130	APW-03-WG-20230130	APW-03-WG-20230626	APW-03-WG-20230919	APW-03-WG-20231127	APW-03-WG-20240111	APW-03-WG-20240430	APW-03-WG-20240904	APW-03-WG-20241016	APW-03-WG-20250116	APW-03-WG-20250625	APW-03-WG-20250903	APW-03-WG-20251120
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03	APW-03
Date				9/6/2017	9/29/2017	10/20/2017	11/10/2017	11/29/2017	12/28/2017	1/19/2018	2/8/2018	6/16/2022	9/15/2022	11/30/2022	1/30/2023	6/26/2023	9/19/2023	11/27/2023	1/11/2024	4/30/2024	9/4/2024	10/16/2024	1/16/2025	6/25/2025	9/3/2025	11/20/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																										
UNSPECIFIED																										
Fluoride	N	mg/L	4	0.28	0.29	0.29	0.31	0.27	0.29	0.29	0.34	0.26	0.2	0.26	0.23	0.23	0.25	0.24	0.202	0.37	0.285	0.15 U	0.254	0.263	0.75 U	0.289
Radium-226	N	pCi/L	NS	0.53 ± 1E U	0.04 ± 0.09 U	0.409 ± 0.426	0.18 ± 0.11 U	0.33 ± 0.17 U	0.2 ± 0.1 U	0.1 ± 0.1 U	0.31 ± 0.15 U	0.201 ± 0.155	0.56 ± 0.13 U	0.19 ± 0.1 U	0.293 ± 0.212	0.23 ± 0.11 U	0.2 ± 0.09 U	0.11 ± 0.05 U	3.18 ± 0.675	0.594 ± 0.383	0.493 ± 0.251	0.0651 ± 0.146 U	0.096 ± 0.120 J	0.451 ± 0.313	0.302 ± 0.356 J	0.469 ± 0.353
Radium-228	N	pCi/L	NS	2.05 ± .96	1.01 ± 0.57	0.492 ± 0.373	0.72 ± 0.37 J	0.31 ± 0.49 U	0.37 ± 0.44 U	1.32 ± 0.68	0.06 ± 0.36 U	1.89 ± 0.26 J	0.4 ± 0.5 UJQR	0.67 ± 0.39 U	0.119 ± 0.430 U	0.61 ± 0.54 U	0.85 ± 0.52 J	0.66 ± 0.58 JQR	-0.0217 ± 0.241 U	0.585 ± 0.256	1.4 ± 0.319	1.49 ± 0.261	0.498 ± 0.382	0.702 ± 0.515 J	0.597 ± 0.557	0.427 ± 0.529 J
Sulfate	N	mg/L	400	175	222	201	207	204	168	152	194	393	150	226	322	292	280	133	80.1	285	259	271	299	261	251	242
CALC																										
Radium-226/228	N	pCi/L	7.002	2.58 ± 1.14	1.05 ± 0.66 U	0.901 ± 0.799	0.9 ± 0.48 U	0.64 ± 0.66 U	0.57 ± 0.54 U	1.42 ± 0.78 U	0.37 ± 0.51 U	2.09 ± 0.303	0.96 ± 0.63 U	0.86 ± 0.69 U	0.412 ± 0.479 J	0.84 ± 0.65 U	1.05 ± 0.61 U	0.77 ± 0.63 U	3.18 ± 0.717	1.18 ± 0.461	1.9 ± 0.406	1.15 ± 0.299	0.794 ± 0.400	1.15 ± 0.603	0.899 ± 0.661	0.895 ± 0.636 J
FIELD PARAM																										
Turbidity, Field	N	NTU	17.96									40.3	56.1	103	50.7	6.04	2.72	4	7.12	2.53	1.94	4.48	7.69	7.34	8.17	12.6
GEN CHEM																										
Chloride	N	mg/L	200	22	21	21	22	19	20	16	23	20	16	20	21	17	16	11	8.04	15	11.6	10.5	10.4	6.54	6.03	8.41
Dissolved Solids, Total	N	mg/L	1200	464	514	486	490	554	524	498	456	724	602 H	610	524	614	636	556	489	627	567	587	577	536	540	541
pH, Lab	N	pH units	6.2J-9.0J	7.88	7.46	7.65	7.93	7.5	7.48	7.26	7.78	7.85	7.46	7.21	7.45	7.77 H	7.84 H	7.24 H	7.4 T8	7.8 T8	7.88 T8	7.94 T8	8.08 T8	8.11 T8	8.03 T8	7.75 T8
METALS																										
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0018	0.004 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0015	0.0014	0.0024	0.002	0.0016	0.0019	0.0013	0.002 U	0.00219 F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	mg/L	0.01	0.0022	0.0029	0.0021	0.0018	0.0023	0.0024	0.0028	0.0018	0.002	0.0046	0.0059	0.003	0.004	0.0017	0.002	0.002 U	0.00254	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Barium	D	mg/L	2									0.139	0.124	0.108 B	0.139	0.13	0.136	0.122	0.122	0.122 F1	0.114	0.103	0.102	0.0973	0.0998	0.118
Barium	T	mg/L	2	0.111	0.146	0.104	0.0814	0.121	0.1	0.15	0.0806	0.158	0.181	0.19	0.135	0.155	0.137	0.167	0.123	0.119	0.116	0.108	0.11	0.107	0.116	0.115
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									4.23	1.49	2.99	4.08	4.64	4.37	4.11	4.38	4.27 F1	4.07	4.37	4.74	4.49	4.19	4
Boron	T	mg/L	2	4.16	4.21 S	4.7	4.67	4.44 S	4.52	4.08	4.92	4.27	1.84	3.59	4.94	4.67	4.19 S	2.22		4.28	4.22	4.41	4.83	4.52	4.36	4.02
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									174	125	101	121	125	137	111	123	125 F1	122	121	116	115 V	107	122
Calcium	T	mg/L	103.2	86.3	104 S	88.1	74.9	116 S	95	101	77.1	152	143	115	121	139 B	124 S	115	122	121	125	123	124	116	115	116
Chromium	D	mg/L	0.1									0.0011 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.0081	0.0053	0.0026	0.001 U	0.001 U	0.005	0.0025	0.001 U	0.0044	0.0063	0.0118	0.0019 J	0.0041	0.0015 U	0.0015 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00203 J	0.002 U
Cobalt	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.001 U	0.0015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 J	0.0014	0.0021	0.001 U	0.0014	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS									0.044							0.1 U							
Iron	T	mg/L	NS									1.66							0.367							
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.0021	0.0042	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.0023	0.0029	0.001 U	0.0044	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0338	0.0288	0.0266	0.0275	0.0262	0.0245	0.0256	0.0281	0.0299 F1	0.0314	0.0305	0.0297	0.0314	0.0294	0.0304
Lithium	T	mg/L	0.04	0.0258	0.0262	0.0259	0.0245	0.0308	0.027	0.035	0.0239	0.0361	0.0329	0.029	0.0276	0.0352	0.0312	0.0324	0.0316	0.0277	0.0315	0.0328	0.0307	0.029	0.03	0.0276
Manganese	D	mg/L	NS																0.438							
Manganese	T	mg/L	NS									0.321							0.435							
Mercury	D	mg/L	0.002										0.0002 U						0.0002 U	0.0002 U F1	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.057	0.0342	0.0648	0.0521	0.0656	0.0487	0.0303	0.0274	0.0642 F1	0.0656	0.0626	0.0656	0.058	0.0596	0.0584
Molybdenum	T	mg/L	0.1	0.0778	0.0754	0.0761	0.0713	0.0684	0.0748	0.0824	0.0849	0.0601	0.0413	0.0621	0.0528	0.0553	0.0558	0.0319	0.0262	0.0608	0.0656	0.0608	0.0673	0.06	0.0628	0.0567
Nickel	D	mg/L	NS									0.0016		0.0031					0.002 U							
Nickel	T	mg/L	NS	0.0055	0.0051	0.0019	0.001 U	0.001 U	0.0026	0.0025	0.001	0.0033		0.01					0.002 U							
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0012	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0019	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J2 = The associated batch QC was outside the established quality control range per precision
J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight episones of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 4
Groundwater Summary Table - APW-04
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling									
Sample ID				APW-4-20170907	APW-4-20170929	APW-4-20171019	APW-4-20171108	APW-4-20171128	APW-4-20171228	APW-4-20180119	APW-4-20180208	APW-04-WG-20220615	APW-04-WG-20220915	APW-04-WG-20221128	APW-04-WG-20230202	APW-04-WG-20230627	APW-04-WG-20230920	APW-04-WG-20231129	APW-04-WG-20240110	APW-04-WG-20240501	APW-04-WG-20240904
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04
Date				9/8/2017	9/29/2017	10/19/2017	11/8/2017	11/28/2017	12/28/2017	1/19/2018	2/8/2018	6/15/2022	9/15/2022	11/28/2022	2/2/2023	6/27/2023	9/20/2023	11/30/2023	1/10/2024	5/1/2024	9/4/2024
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																					
UNSPECIFIED																					
Fluoride	N	mg/L	4	0.18	0.19	0.18	0.17	0.18	0.17	0.17	0.16	0.2	0.17	0.17	0.15	0.16	0.15	0.18	0.17	0.201	0.178
Radium-225	N	pCi/L	NS	0.38 ± 0.16 U	0.02 ± 0.08 U	-0.272 ± 0.328	0.15 ± 0.09 U	0.09 ± 0.13 U	0.17 ± 0.09 U	-0.05 ± 0.08 U	0.13 ± 0.11 U	0.245 ± 0.235 J	0.5 ± 0.13 U	0.11 ± 0.08 U	0.352 ± 0.232	0.33 ± 0.12 U	0.09 ± 0.07 U	0.19 ± 0.07 U	0.223 ± 0.242 J	0.146 ± 0.275 U	0.302 ± 0.252
Radium-228	N	pCi/L	NS	0.55 ± 0.64 J	-0.45 ± 0.68 U	0.53 ± 0.382	0.64 ± 0.31 U	0.88 ± 0.64 J	0.73 ± 0.36 J	0.34 ± 0.51 U	0.64 ± 0.48 U	0.245 ± 0.235 J	2.15 ± 0.78	1.47 ± 0.67	0.961 ± 0.296	0.92 ± 0.68 J	1.18 ± 0.67	0.64 ± 0.64 J	0.629 ± 0.280	0.451 ± 0.288 J	0.51 ± 0.309
Sulfate	N	mg/L	400	126	116	109	120	107	100	99	92	94	83	68	62	65	66	54	50.9 J6	53.9	86.2
CALC																					
Radium-225/228	N	pCi/L	7.002	1.33 ± 0.8 U	0.02 ± 0.76 U	0.53 ± 0.71	0.79 ± 0.4 U	0.97 ± 0.77 U	0.9 ± 0.45 U	0.34 ± 0.59 U	0.77 ± 0.59 U	0.348 ± 0.287 J	2.65 ± 0.91	1.58 ± 0.75 U	1.31 ± 0.376	1.25 ± 0.8 U	1.27 ± 0.74 U	0.85 ± 0.71 U	0.852 ± 0.370	0.597 ± 0.398 J	0.811 ± 0.327
FIELD PARAM																					
Turbidity, Field	N	NTU	17.96									19.1	18.3	26.5	37.3	38.7	21.6	22.8	29.8	91.7	30.2
GEN CHEM																					
Chloride	N	mg/L	200	12	11	11	11	11	11	10	11	12	10	11	10	12	9	11	9.21	11.6	9.98
Dissolved Solids, Total	N	mg/L	1200	460	484	452	472	492	514	424	528	430	436 H	446	416	432	476	430	418	404	
pH, Lab	N	pH units	6.22-9.02	7.31	7.33	7.31	7.42	7.32	7.33	7.25	7.2	7.41	7.51	7.34	7.21	7.39 H	7.56 H	7.31 H	8.17 T8	7.5 T8	7.65 T8
METALS																					
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0013	0.0013	0.0021	0.0011	0.0014	0.0016	0.002	0.002 U	0.002 U F1	0.002 U
Arsenic	T	mg/L	0.01	0.0025	0.0018	0.0016	0.0018	0.0016	0.0014	0.0016	0.0015	0.0015	0.0029	0.0016	0.0017	0.002	0.0019	0.0028	0.002 U	0.002 U	0.002 U
Barium	D	mg/L	2									0.116	0.132	0.13 B	0.116	0.122	0.138	0.165	0.13	0.128 F1	0.134
Barium	T	mg/L	2	0.145	0.139	0.123	0.13	0.128	0.141	0.155	0.144	0.143	0.165	0.133	0.134	0.138	0.131	0.153	0.139	0.12	0.14
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U F1	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									1.41	0.875	1.28	0.419	0.908	0.591	0.445		0.554 F1	1.85
Boron	T	mg/L	2	2.37	2.16	2.12	2.21	2.03	1.7	1.33	1.18	1.88	0.973	0.653	0.65	0.876	0.572	0.559		0.578	1.79
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									111	93.7	106	93.3 S	88.3	101 S	77.9	90.6	93.1 F1	110
Calcium	T	mg/L	103.2	101 S	105	89.4	97.5	107	107	113	113	97.8	106 S	102	100	97.5 S	87.9	124	94.1	93.4	102
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U
Chromium	T	mg/L	0.1	0.0041	0.0025	0.0017	0.001 U	0.001 U	0.0027	0.0037	0.001 U	0.0015 U	0.0251	0.0043	0.0016	0.0015 U	0.0023	0.0033	0.002 U	0.002 U	0.002 U
Cobalt	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U
Cobalt	T	mg/L	0.006	0.0013	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0006 J	0.0025	0.001 U	0.001 U	0.001 U	0.001 U	0.0012	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS																0.1 U		
Iron	T	mg/L	NS									0.563							0.709		
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0016	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0064	0.0283	0.0155	0.0292	0.0311	0.0401	0.0403	0.0096	0.0264 F1	0.0314
Lithium	T	mg/L	0.04	0.0454	0.0403	0.0412	0.0406	0.0424	0.0416	0.0411	0.0397	0.036	0.0322	0.0293	0.0326	0.0314	0.0299	0.0298	0.029	0.0277	0.0284
Manganese	D	mg/L	NS																0.177		
Manganese	T	mg/L	NS									0.192							0.21		
Mercury	D	mg/L	0.002										0.0002 U						0.0002 U	0.0002 U F1	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0653	0.0445	0.227	0.0383	0.0503	0.0367	0.0461	0.037	0.0511 F1	0.0543
Molybdenum	T	mg/L	0.1	0.0891	0.084	0.0793	0.0812	0.0748	0.0714	0.0592	0.057	0.0788	0.0494	0.0406	0.0377	0.0449	0.0299	0.0347	0.0332	0.0494	0.0517
Nickel	D	mg/L	NS									0.0019		0.0017					0.00313		
Nickel	T	mg/L	NS	0.0065	0.0034	0.0029	0.002	0.002	0.0026	0.0039	0.003	0.0045		0.0051					0.00557		
Selenium	D	mg/L	0.05									0.0134	0.0101	0.0101 U	0.009	0.0165	0.0096	0.0139	0.00962	0.0221 F1	0.0176
Selenium	T	mg/L	0.05	0.0158	0.015	0.0149	0.0161	0.014	0.013	0.0101	0.0102	0.0133	0.0111	0.0085	0.0099	0.0165	0.009	0.015	0.0105	0.0218	0.0186
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

				Post-Closure Sampling									
Sample ID				APW-04-WG-20241017	APW-04-WG-20250114	APW-04-WG-20250514	APW-04-WG-20250625	APW-04-WG-20250904	APW-04-WG-20251119
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-04	APW-04	APW-04	APW-04	APW-04	APW-04
Date				10/17/2024	1/14/2025		6/25/2025	9/4/2025	11/19/2025
Sample Type				N	N		N	N	N
Parameter/Analyte									
UNSPECIFIED									
Fluoride	N	mg/L	4	0.15 U	0.15 U		0.167	0.163	0.178
Radium-225	N	pCi/L	NS	0.116 ± 0.132 J	0.0629 ± 0.123 U		0.0133 ± 0.154 U	0.501 ± 0.285	0.282 ± 0.227
Radium-228	N	pCi/L	NS	0.379 ± 0.275 J	0.111 ± 0.567 U		1.08 ± 0.553	0.634 ± 0.648 J	0.683 ± 0.431 J
Sulfate	N	mg/L	400	53.9	86.2		68.4	69.1	67.3
CALC									
Radium-225/228	N	pCi/L	7.002	0.494 ± 0.305 J	0.174 ± 0.580 U		1.09 ± 0.574	1.14 ± 0.726 J	0.966 ± 0.487
FIELD PARAM									
Turbidity, Field	N	NTU	17.96	91.4	15.7		61.5	21.7	51.3
GEN CHEM									
Chloride	N	mg/L	200	10.1	10.4		11.1	9.92	10
Dissolved Solids, Total	N	mg/L	1200	418	440		445	436	438
pH, Lab	N	pH units	6.22-9.02	7.46 T8	7.77 T8		7.83 T8	7.55 T8	7.43 T8
METALS									
Antimony	D	mg/L	0.006	0.004 U	0.004 U		0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.004 U	0.004 U		0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Arsenic	T	mg/L	0.01	0.00219	0.002 U		0.002 U	0.002 U	0.002
Barium	D	mg/L	2	0.126	0.132		0.127	0.128	0.143
Barium	T	mg/L	2	0.142	0.139		0.133	0.131	0.15
Beryllium	D	mg/L	0.004	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2	1.1	0.71		1.16	1.16	0.654
Boron	T	mg/L	2	1.07	0.733		1.14	1.21	0.654
Cadmium	D	mg/L	0.005	0.001 U	0.001 U		0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U		0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2	110	105		102	97.7	109
Calcium	T	mg/L	103.2	102	110		99.8	102	106
Chromium	D	mg/L	0.1	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.00762	0.002 U		0.002 U	0.002 U	0.00293
Cobalt	D	mg/L	0.006	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS						
Iron	T	mg/L	NS	0.709					
Lead	D	mg/L	0.0075	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04	0.0096	0.0074		0.0063	0.0053	0.0276
Lithium	T	mg/L	0.04	0.0277	0.0284		0.0269	0.0297	0.0277
Manganese	D	mg/L	NS						
Manganese	T	mg/L	NS	0.171					
Mercury	D	mg/L	0.002	0.0002 U	0.0002 U		0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U		0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1	0.0511 F1	0.0543		0.0499	0.0549	0.0347
Molybdenum	T	mg/L	0.1	0.0458	0.0443		0.0535	0.0538	0.0301
Nickel	D	mg/L	NS						
Nickel	T	mg/L	NS	0.00557					
Selenium	D	mg/L	0.05	0.00962					
Selenium	T	mg/L	0.05	0.0105	0.0218		0.0186	0.0176	0.0117
Thallium	D	mg/L	0.002	0.002 U F1	0.002 U		0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.002 U	0.002 U		0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 6.0 is the regulatory standard
Eight episones of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 5
Groundwater Summary Table - APW-05
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling						
Sample ID				APW-S-20170907	APW-S-20170928	APW-S-20171019	APW-S-20171109	APW-S-20171129	APW-S-20171227	APW-S-20180118	APW-S-20180207	APW-05-WG-20220616	DUP-001-WG-20220616	APW-05-WG-20220914	DUP-001-WG-20220914	APW-05-WG-20221128	DUP-01-WG-20221128	APW-05-WG-20230201	DUP-01-WG-20230201
Location ID				APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05	APW-05
Date	**Total or Dissolved**	**Units**	**35 IAC 845.600**	9/6/2017	9/28/2017	10/19/2017	11/9/2017	11/29/2017	12/27/2017	1/18/2018	2/7/2018	6/16/2022	6/16/2022	9/14/2022	9/14/2022	11/28/2022	11/28/2022	2/1/2023	2/1/2023
Sample Type				N	N	N	N	N	N	N	N	N	FD	N	FD	N	FD	N	FD
Parameter/Analyte																			
UNSPECIFIED																			
Fluoride	N	mg/L	4	0.34	0.34	0.32	0.32	0.32	0.33	0.36	0.32	0.35	0.33	0.33	0.31	0.37	0.38	0.33	0.33
Radium-226	N	pCi/L	NS	0.37 ± 0.14 U	0.19 ± 0.1 U	0.133 ± 0.370	0.48 ± 0.15 U		0.35 ± 0.12 U	0.13 ± 0.1 U	0.26 ± 0.13 U	0.649 ± 0.316	0.259 ± 0.27 J	0.17 ± 0.08 U	0.11 ± 0.07 U	0.11 ± 0.11 U	0.17 ± 0.08 U	0.209 ± 0.245 J	0.205 ± 0.241 J
Radium-228	N	pCi/L	NS	1.07 ± 0.8	0.89 ± 0.55 J	0.663 ± 0.418	1.17 ± 0.33		0.49 ± 0.42 U	1.04 ± 0.56	0.35 ± 0.4 U	1.1 ± 0.282	0.715 ± 0.31	0.82 ± 0.88 J	0.27 ± 0.55 U	0.49 ± 0.49 U	1.24 ± 0.71	0.399 ± 0.422 J	0.249 ± 0.228 J
Sulfate	N	mg/L	400	407	460	399	413	381	394	439	378	224	239	379	403	324	338	325	305
CALC																			
Radium-226/228	N	pCi/L	7.002	1.44 ± 0.94 U	1.08 ± 0.65 U	0.794 ± 0.78	1.65 ± 0.48 U		0.84 ± 0.54 U	1.17 ± 0.66 U	0.61 ± 0.53 U	1.75 ± 0.424	0.973 ± 0.411	0.99 ± 0.96 U	0.38 ± 0.62 U	0.6 ± 0.6 U	1.41 ± 0.79 U	0.608 ± 0.488 J	0.454 ± 0.332 J
FIELD PARAM																			
Turbidity, Field	N	NTU	17.96									51.8		9.19		4.65		8.21	
GEN CHEM																			
Chloride	N	mg/L	200	15	15	15	14	16	16	16	16	19	19	15	15	19	19	18	18
Dissolved Solids, Total	N	mg/L	1,200	842	832	804	826	790	792	502	804	650	690	730 H	774 H	714	728 H	696	670
pH, Lab	N	pH units	6.22-9.02	7.37	7.3	7.26	7.3	7.26	7.31	7.23	7.18	7.35	7.49	7.55	7.57	7.24	7.27	7.31	7.33
METALS																			
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Arsenic	D	mg/L	0.01									0.002	0.0021	0.001	0.001 U	0.0019	0.0026	0.0026	0.0018
Arsenic	T	mg/L	0.01	0.0031	0.0026	0.0015	0.0016	0.0016	0.0019	0.0021	0.0019	0.0048	0.0041	0.0025	0.0023	0.0022	0.0023	0.0024	0.0025
Barium	D	mg/L	2									0.133	0.128	0.132	0.13	0.128	0.13 B	0.175	0.135
Barium	T	mg/L	2	0.226	0.233	0.183	0.216	0.193	0.214	0.214	0.195	0.187	0.174	0.154	0.152	0.14	0.136	0.145	0.148
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	D	mg/L	2									7.63	7.7	7.42	7.29	6.12	7.03 S	8.68 S	6.79
Boron	T	mg/L	2	9.3	10.3	8.89	9.98	9.1	9.83	9.25	8.73	7.67	8.24 S	7.76	7.62	7.48	7.97	7.35	7.09
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									139	141	119	131	87.4	110 S	106 S	111
Calcium	T	mg/L	103.2	136	142	119	131	123	125	121	124	127	129 S	127	137	117	112	118	114
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
Chromium	T	mg/L	0.1	0.0137	0.001 U	0.0041	0.001 U	0.001 U	0.0084	0.0033	0.001 U	0.0016 J	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0016	0.0015 U	0.0015 U
Cobalt	D	mg/L	0.006									0.0006 J	0.0005 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013 J	0.0011 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Iron	T	mg/L	NS									2.77	1.89						
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Lithium	D	mg/L	0.04									0.0282	0.029	0.0381	0.0373	0.0338	0.0365	0.046	0.0375
Lithium	T	mg/L	0.04	0.0363	0.0443	0.0393	0.0405	0.0415	0.0433	0.0404	0.0397	0.0331	0.0363	0.0408	0.0397	0.0373	0.0371	0.0399	0.0402
Manganese	T	mg/L	NS									0.9	0.904						
Mercury	D	mg/L	0.002											0.0002 U	0.0002 U				
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.172	0.17	0.213	0.206	0.209	0.211 S	0.187	0.199
Molybdenum	T	mg/L	0.1	0.172	0.195	0.201	0.168	0.193	0.246	0.244	0.249	0.203	0.195	0.235	0.224	0.223	0.226	0.217	0.212
Nickel	D	mg/L	NS									0.0036	0.0035			0.0011	0.0024		
Nickel	T	mg/L	NS	0.0074	0.0012	0.0023	0.001 U	0.001 U	0.0043	0.0021	0.001 U	0.0037	0.0039			0.002	0.0029		
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J2 = The associated batch QC was outside the established quality control range per precision
J4 = The sample matrix interfered with the ability to make any accurate determination: spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight episones of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 6
Groundwater Summary Table - APW-05R
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Post-Closure Sampling																				
Sample ID				APW-05R-WG-20230627	DUP-01-WG-20230627	APW-05R-WG-20230920	DUP-01-WG-20230920	APW-05R-WG-20231128	DUP-01-WG-20231128	APW-05R-WG-20240110	DUP-01-WG-20240110	APW-05R-WG-20240501	DUP-01-WG-20240501	APW-05R-WG-20240905	DUP-01-WG-20240905	APW-05R-WG-20241016	DUP-01-WG-20241016	APW-05R-WG-20250115	DUP-01-WG-20250115	APW-05R-WG-20250626	DUP-01-WG-20250626	APW-05R-WG-20250904	DUP-01-WG-20250904	APW-05R-WG-20251119	DUP-01-WG-20251119
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**	**APW-05**
Date				**6/27/2023**	**6/27/2023**	**9/20/2023**	**9/20/2023**	**11/28/2023**	**11/28/2023**	**1/10/2024**	**1/10/2024**	**5/1/2024**	**5/1/2024**	**9/5/2024**	**9/5/2024**	**10/16/2024**	**10/16/2024**	**1/15/2025**	**1/15/2025**	**6/26/2025**	**6/26/2025**	**9/4/2025**	**9/4/2025**	**11/19/2025**	**11/19/2025**
Sample Type				N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	N
Parameter/Analyte																									
UNSPECIFIED																									
Fluoride	N	mg/L	4	0.3	0.32	0.35	0.34	0.38	0.35	0.298	0.317	0.15 U	0.301	0.347	0.342	0.199	0.177	0.289	0.295	0.369	0.355	0.257	0.301	0.79 U	0.75 U
Radium-226	N	pCi/L	60	0.23 ± 0.1 U	0.11 ± 0.08 U	0.49 ± 0.13 U	0.36 ± 0.13 U	0.15 ± 0.06 U	0.05 ± 0.04 U	0.303 ± 0.271 J	0.297 ± 0.228	0.18 ± 0.189 J	0.427 ± 0.229	0.0135 ± 0.0835 U	1.33 ± 0.415	0.254 ± 0.188	0 ± 0.130 U	0.71 ± 0.394	0.356 ± 0.228	-0.014 ± 0.198 U	0.188 ± 0.232 J	0.234 ± 0.250 J	0.341 ± 0.283	0.674 ± 0.378	0.195 ± 0.308 J
Radium-228	N	pCi/L	NS	0.31 ± 0.3 UJDR	0.61 ± 0.67 U	5.85 ± 1.14 *	0.42 ± 0.71 U	0.73 ± 0.57 J	0.75 ± 0.67 J	3.55 ± 0.372	0.885 ± 0.244	0.94 ± 0.271	1.08 ± 0.284	0.46 ± 0.343 J	1.1 ± 0.203	0.468 ± 0.329 J	0.498 ± 0.226	1.4 ± 0.828	1.48 ± 0.434	0.879 ± 0.789 J	0.663 ± 0.367	0.463 ± 0.500 J	1.66 ± 0.734	0.287 ± 0.719 U	0.165 ± 0.659 JS U
Sulfate	N	mg/L	400	335	326	343	333	330	321	306	305	365	368	70.5	70.6	192	191	373	374	135	133	97.9	116	330	329
CALC																									
Radium-226/228	N	pCi/L	7.002	0.54 ± 0.6 U	0.72 ± 0.75 U	6.34 ± 1.53	0.78 ± 0.84 U	0.88 ± 0.63 U	0.8 ± 0.71 U	3.86 ± 0.460	1.18 ± 0.321	1.12 ± 0.330	1.5 ± 0.435	0.473 ± 0.353 J	2.43 ± 0.462	0.73 ± 0.379	0.498 ± 0.261	2.1 ± 0.917	1.83 ± 0.490	0.879 ± 0.813 J	0.85 ± 0.434	0.687 ± 0.559 J	2 ± 0.787	0.962 ± 0.812 J	0.36 ± 0.727 U
FIELD PARAM																									
Turbidity, Field	N	NTU	17.96	42.6		33.7		76.1		38.9		8.02		64.1		23.4		27.2		14.8		16.3		32.8	
GEN CHEM																									
Chloride	N	mg/L	200	17	18	14	14	16	16	16.9	17	15.8	16.1	28.1	28.1	18.9	18.7	16.1	16.2	24.1	23.6	20.2	24.1	15	15.5
Dissolved Solids, Total	N	mg/L	1200	740	695	680	710	705	690	677	691	764	740	354	359	560	543	700	688	504	509	485	479	700	703
pH, Lab	N	pH unit	6.22-9.02	7.27 H	7.3 H	7.36 H	7.36 H	7.33 H	7.34 H	7.42 T8	7.82 T8	7.6 T8	7.62 T8	7.56 T8	7.56 T8	7.53 T8	7.54 T8	7.77 T8	7.82 T8	8 T8	7.82 T8	7.56 T8	7.53 T8	7.66 T8	7.62 T8
METALS																									
Antimony	D	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 SU	0.004 U	0.004 U	0.004 U F1	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01	0.0024	0.0025	0.0023	0.0024	0.0029	0.0018	0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.00315	0.00201	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	mg/L	0.01	0.003	0.003	0.0028	0.0026	0.0042	0.0031	0.0022	0.00228	0.00228	0.0035	0.00305	0.003	0.00236	0.00374	0.00203	0.00206	0.00223	0.00227	0.00216	0.00218	0.00218	0.0025
Barium	D	mg/L	2	0.168	0.167	0.167	0.172	0.186	0.127	0.113	0.114	0.161 F1	0.151 F1	0.0718	0.072	0.116	0.117	0.144	0.137	0.102	0.103	0.105	0.101	0.156	0.149
Barium	T	mg/L	2	0.183	0.181	0.162	0.158	0.225	0.158	0.151	0.153	0.195	0.19	0.102	0.0999	0.158	0.166	0.194	0.198	0.147	0.146	0.139	0.141	0.181	0.185
Beryllium	D	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2	8.64	8.37	7.91	8.05	8.71	6.44 S	8.86	8.89 F1	2.23	2.22	6.29	6.28	8.2	8.17	5.58	5.47	4.02	4	8.72	8.74		
Boron	T	mg/L	2	8.76	8.68	7.12	8.33 S	9.62	6.77	9.26	9.28	2.18	2.17	6.19	6.23	8.37	8.38	5.49	5.53	4.18	4.2	8.5	8.54		
Cadmium	D	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2	129	129	118	119	99.4	91.8	114	113	142 F1	143 F1	74	75.3	111	112	142	141	104	103	103	104	130	128
Calcium	T	mg/L	103.2	136 S	133 S	126 S	126 S	99.4	91.8	114	113	142 F1	143 F1	74	75.3	111	112	142	141	104	103	103	104	130	128
Chromium	D	mg/L	0.1	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 SU	0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.0015 U	0.0015 U	0.0031	0.0016	0.002	0.0023	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00211	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00298	0.002 U	0.0026
Cobalt	D	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 SU	0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS							0.1 U															
Iron	T	mg/L	NS							5.89	5.91														
Lead	D	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.00111	0.001	0.0026	0.0021	0.002	0.0014	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00237	0.0003	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04	0.0394	0.0398	0.0524	0.0509	0.0455	0.0343	0.0377	0.039	0.0362 F1	0.0354 F1	0.0172	0.0175	0.0316	0.0303	0.0342	0.0326	0.0257	0.0253	0.0237	0.0229	0.0358	0.0352
Lithium	T	mg/L	0.04	0.0423	0.0415	0.0367	0.0425	0.0523	0.0371	0.0388	0.0404	0.0385	0.0377	0.0179	0.0176	0.0314	0.0304	0.0373	0.0361	0.0248	0.0258	0.0262	0.0269	0.035	0.0345
Manganese	D	mg/L	NS							0.548	0.537														
Manganese	T	mg/L	NS							0.554 V	0.553														
Mercury	D	mg/L	0.002							0.0002 U	0.0002 U	0.0002 U F3	0.0002 U F3	0.0002 U	0.000207	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1	0.213	0.204	0.226	0.233	0.282	0.192	0.216	0.215	0.215 F1	0.215 F1	0.111	0.111	0.168	0.163	0.182	0.172	0.139	0.14	0.134	0.122	0.208	0.2
Molybdenum	T	mg/L	0.1	0.212	0.21	0.223	0.235	0.203	0.215	0.227	0.231	0.221	0.214	0.109	0.107	0.164	0.165	0.185	0.185	0.147	0.146	0.13	0.132	0.185	0.189
Nickel	D	mg/L	NS							0.002 U	0.002 U														
Nickel	T	mg/L	NS							0.002 U	0.002 U														
Selenium	D	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U
Thallium	D	mg/L	0.002							0.002 U	0.002 U	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.003 U	0.002 U	0.002 U	0.002 U	0.003 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
JN = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value is 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight exposure of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-05. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC §45.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 7
Groundwater Summary Table - APW-06D
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling									
Sample ID				APW-6D-20170907	APW-6D-20170927	APW-6D-20171019	APW-6D-20171109	APW-6D-20171128	APW-6D-20171227	APW-6D-20180118	APW-6D-20180208	APW-06D-WG-20220913	APW-06D-WG-20221128	APW-06D-WG-20230201	APW-06D-WG-20230627	APW-06D-WG-20230920	APW-06D-WG-20231128	APW-06D-WG-20240110	APW-06D-WG-20240501	APW-06D-WG-20240905	APW-06D-WG-20241016	APW-06D-WG-20250115	APW-06D-WG-20250624	APW-06D-WG-20250904	APW-06D-WG-20251119
Location ID				APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D	APW-06D
Date	**Total or Dissolved**	**Units**	**35 IAC 845.600**	9/6/2017	9/28/2017	10/19/2017	11/9/2017	11/28/2017	12/27/2017	1/18/2018	2/8/2018	9/13/2022	11/28/2022	2/1/2023	6/27/2023	9/20/2023	11/28/2023	1/10/2024	5/1/2024	9/5/2024	10/16/2024	1/15/2025	6/24/2025	9/4/2025	11/19/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																									
UNSPECIFIED																									
Fluoride	N	mg/L	4	0.22	0.23	0.21	0.22	0.21	0.22	0.23	0.21	0.2	0.24	0.21	0.2	0.22	0.24	0.212	0.15 U	0.205	0.15 U	0.17	0.216	0.202	0.249
Radium-226	N	pCi/L	NS	0.62 ± 0.17 U	0.37 ± 0.11 U	1.22 ± 0.744	0.39 ± 0.15 U	0.38 ± 0.18 U	0.3 ± 0.12 U	0.03 ± 0.08 U	0.2 ± 0.13 U	0.31 ± 0.1 U	0.62 ± 0.15 U	0.355 ± 0.275	0.3 ± 0.12 U	0.18 ± 0.09 U	0.11 ± 0.05 U	0.582 ± 0.361	0.422 ± 0.235	0.447 ± 0.249	0.258 ± 0.255 J	0.227 ± 0.176	0.374 ± 0.274	0.548 ± 0.319	0.585 ± 0.407
Radium-228	N	pCi/L	NS	1.67 ± 0.65	0.83 ± 0.33 U	1.45 ± 0.77	0.86 ± 0.37 J	1.4 ± 0.71	0.78 ± 0.48 J	0.74 ± 0.57 J	0.24 ± 0.34 U	1.46 ± 0.71	0.28 ± 0.43 U	1.02 ± 0.451	0.74 ± 0.54 J	2.62 ± 0.76	0.76 ± 0.6 J	1.24 ± 0.276	1.1 ± 0.285	1.83 ± 0.372	0.642 ± 0.345	2.46 ± 0.606	0.586 ± 0.483 J	0.598 ± 0.534	1.03 ± 0.360
Sulfate	N	mg/L	400	215	228	206	222	230	236	211	189	272	254	269	270	218	184	180	184	242	214	266	211	201	136
CALC																									
Radium-226/228	N	pCi/L	7.002	1.69 ± 0.82 U	0.98 ± 0.44 U	1.77 ± 1.12	1.12 ± 0.51 U	1.78 ± 0.89 U	1.08 ± 0.6 U	0.77 ± 0.65 U	0.44 ± 0.47 U	1.77 ± 0.81 U	0.9 ± 0.58 U	1.38 ± 0.528	1.04 ± 0.66 U	2.8 ± 0.85	0.87 ± 0.65 U	1.82 ± 0.454	1.52 ± 0.369	2.27 ± 0.448	0.9 ± 0.429	2.68 ± 0.631	0.96 ± 0.555	1.55 ± 0.622	1.62 ± 0.543
FIELD PARAM																									
Turbidity, Field	N	NTU	17.96									18.5	74.4	26.9	181	65.5	3.02	18.2	35.8	21.8	8.39	11	4.81	3.78	1.12
GEN CHEM																									
Chloride	N	mg/L	200	17	17	16	16	16	16	17	17	14	17	16	15	16	22	21.2	21.5	15	14.7	20.5	17.5	17.3	35.3
Dissolved Solids, Total	N	mg/L	1200	558	560	562	564	590	516 R	482	584	670 H	580	582	735	565	560	536	549	634	568	549	584	712	680
pH, Lab	N	pH units	6.2?-9.0?	7.23	7.25	7.23	7.19	7.2	7.22	7.21	7.2	7.42	7.21	7.29	7.39 H	7.3 H	7.36 H	7.73 T8	7.54 T8	7.46 T8	7.42 T8	7.64 T8	7.72 T8	7.55 T8	7.5 T8
METALS																									
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.004	0.0115	0.012	0.0102	0.01	0.0161	0.00451	0.00585 F1	0.00479	0.00485	0.00414	0.0052	0.00457	0.00527
Arsenic	T	mg/L	0.01	0.0068	0.0101	0.0075	0.0074	0.009	0.0095	0.0106	0.0096	0.0104	0.0111	0.0107	0.0115	0.0109	0.0135	0.0102	0.0108	0.0103	0.0103	0.00988	0.0109	0.0107	0.0108
Barium	D	mg/L	2									0.129	0.118 B	0.152	0.13	0.121	0.185	0.106	0.115 F1	0.121	0.113	0.111	0.107	0.115	0.114
Barium	T	mg/L	2	0.173	0.172	0.142	0.153	0.155	0.163	0.166	0.148	0.143	0.142	0.134	0.145	0.128	0.151	0.115	0.119	0.129	0.119	0.124	0.123	0.123	0.109
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									5.32	4.14	4.39	3.77	4.67	5.01	3.74	3.98 F1	4.36	3.33	3.92	3.6	2.47	
Boron	T	mg/L	2	3.72	3.87	3.55	3.58	3.9	3.84	3.3	3.09	5.51	4.29	3.95	4.99	3.81	3.8	3.73	3.13	4.31	3.99	3.46	3.89	3.63	2.57
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									118	105	109	118	114	80.3	106	114 F1	130	114	118	118	118	115
Calcium	T	mg/L	103.2	99.9	110	96.7	100	110	107	105 S	105	123	110	116	128 B	106	98.4	111	114	124	120	119	98.4	121	110
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.001 U	0.0013	0.001 U	0.001 U	0.001 U	0.0017	0.003	0.0014	0.0015 U	0.0063	0.0015 U	0.0057	0.0727	0.0015 U	0.00861	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0945	0.002 U
Cobalt	D	mg/L	0.006									0.0013	0.0012	0.001	0.001 U	0.001 U	0.0012	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.0012	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0035	0.0013	0.0054	0.0035	0.0013	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00233	0.002 U
Iron	D	mg/L	NS															0.1 U							
Iron	T	mg/L	NS															3.65							
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0012	0.001 U	0.0076	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.001 U	0.002 U	0.002 U	0.001 U	0.002 U
Lithium	D	mg/L	0.04									0.0179	0.0155	0.0194	0.016	0.0197	0.0245	0.0151	0.0159 F1	0.0136	0.0136	0.0132	0.0131	0.0133	
Lithium	T	mg/L	0.04	0.016	0.0176	0.0161	0.0163	0.0178	0.0181	0.0165	0.0162	0.0185	0.0175	0.0172	0.0184	0.0169	0.0199	0.0173	0.0171	0.0163	0.0168	0.0167	0.0148	0.0167	0.0148
Manganese	D	mg/L	NS															0.611							
Manganese	T	mg/L	NS															0.622							
Mercury	D	mg/L	0.002									0.0002 U						0.0002 U	0.0002 U F1	0.000209	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0669	0.0796	0.0583	0.0643	0.0559	0.0949	0.0617	0.0748 F1	0.0647	0.0542	0.0524	0.0558	0.0598	0.0522
Molybdenum	T	mg/L	0.1	0.0646	0.0606	0.0582	0.0589	0.06	0.0584	0.0465	0.0463	0.0719	0.0696	0.0683	0.0602	0.0672	0.0557	0.0605	0.072	0.0628	0.0527	0.0553	0.0609	0.0658	0.0461
Nickel	D	mg/L	NS										0.002					0.00219							
Nickel	T	mg/L	NS	0.0032	0.0028	0.0018	0.002	0.0017	0.0022	0.0032	0.0025		0.0093					0.00825							
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 6.0 is the regulatory standard
Eight epoisones of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 8
Groundwater Summary Table - APW-06S
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling									
Sample ID				APW-6S-20170907	APW-6S-20172928	APW-6S-20171019	APW-6S-20171109	APW-6S-20171128	APW-6S-20171227	APW-6S-20180118	APW-6S-20180208	APW-6S-WG-20220615	APW-6S-WG-20220913	APW-06S-WG-20221128	APW-06S-WG-20230201	APW-06S-WG-20230627	APW-06S-WG-20230920	APW-06S-WG-20231128	APW-06S-WG-20240110	APW-06S-WG-20240501	APW-06S-WG-20240905	APW-06S-WG-20241016	APW-06S-WG-20250115	APW-06S-WG-20250624	APW-06S-WG-20250904	APW-06S-WG-20251119
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S	APW-06S
Date				9/6/2017	9/28/2017	10/19/2017	11/9/2017	11/28/2017	12/27/2017	1/18/2018	2/8/2018	6/16/2022	9/13/2022	11/28/2022	2/1/2023	6/27/2023	9/20/2023	11/28/2023	1/10/2024	5/1/2024	9/5/2024	10/16/2024	1/15/2025	6/24/2025	9/4/2025	11/19/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																										
UNSPECIFIED																										
Fluoride	N	mg/L	4	0.41	0.26	0.25	0.26	0.25	0.25	0.27	0.24	0.29	0.28	0.32	0.29	0.26	0.31	0.33	0.277	0.15 U	0.242	0.15 U	0.239	0.291	0.223	0.299
Radium-226	N	pCi/L	NS	0.36 ± 0.14 U	0.09 ± 0.08 U	0.317 ± 0.331	0.22 ± 0.11 U	0.18 ± 0.13 U	0.11 ± 0.09 U	0.09 ± 0.09 U	0.15 ± 0.11 U	0.269 ± 0.182	0.2 ± 0.08 U	0.19 ± 0.09 U	0.0283 ± 0.232 U	0.11 ± 0.08 U	0.32 ± 0.11 U	0.09 ± 0.05 U	1.25 ± 0.411	0.707 ± 0.335	0.31 ± 0.217	0.0841 ± 0.233 U	0.262 ± 0.188	0.291 ± 0.247 J	0.339 ± 0.283	0.418 ± 0.351
Radium-228	N	pCi/L	NS	0.56 ± 0.77 U	1.06 ± 0.53	0.481 ± 0.316	0.9 ± 0.4 J	0.92 ± 0.6 J	0.44 ± 0.44 U	0.71 ± 0.53 J	0.89 ± 0.38 J	0.228 ± 0.248 J	2.73 ± 0.9	0.41 ± 0.5 U	1.44 ± 0.518	-0.03 ± 0.59 U	0.41 ± 0.38 U	0.29 ± 0.51 U	0.688 ± 0.243	0.951 ± 0.345	0.667 ± 0.386 J	0.895 ± 0.221	2.23 ± 0.613	1.01 ± 0.805 J	0.8 ± 0.516 J	0.916 ± 0.386
Sulfate	N	mg/L	400	127	177	167	151	189	201	233	220	200	227	243	247	208	221	237	240	211	133	148	246	116	92.6	228
CALC																										
Radium-226/228	N	pCi/L	7.002	0.92 ± 0.91 U	1.15 ± 0.61 U	0.798 ± 0.647	1.25 ± 0.52 U	1.1 ± 0.73 U	0.55 ± 0.53 U	0.8 ± 0.62 U	1.04 ± 0.49 U	0.497 ± 0.308	2.93 ± 0.98	0.6 ± 0.59 U	1.47 ± 0.568	0.11 ± 0.67 U	0.73 ± 0.49 U	0.38 ± 0.56 U	1.93 ± 0.477	1.66 ± 0.481	0.977 ± 0.443	0.979 ± 0.321	2.49 ± 0.641	1.3 ± 0.842 J	1.14 ± 0.589	1.33 ± 0.496
FIELD PARAM																										
Turbidity, Field	N	NTU	17.96									30.5	15.1	5.56	6.67	9.06	8.99	1.26	3.32	3.81	5.09	5.72	8.11	22.9	38.25	87
GEN CHEM																										
Chloride	N	mg/L	200	31	28	27	27	26	27	26	25	24	25	24	24	23	20	22	21.2	21.6	21.1	19.4	21	27.2	36.1	20.1
Dissolved Solids, Total	N	mg/L	1200	500	546	574	528	566	588	598	666	600	630 H	605	638	615	565	635	644	678 G	599	599	673	528	481	692
pH, Lab	N	pH unit	6.22-9.02	7.16	7.06	7.18	7.23	7.09	7.13	7.09	7.02	7.24	7.38	7.04	7.12	7.05 H	7.21 H	7.12 H	7.67 T8	7.35 T8	7.2 T8	7.27 T8	7.39 T8	7.58 T8	7.65 T8	7.28 T8
METALS																										
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0009 J	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.0019	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	mg/L	0.01	0.0017	0.0016	0.0018	0.002	0.0013	0.0012	0.0011	0.0011	0.0009 J	0.0012	0.001	0.0011	0.001 U	0.0012	0.0016	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Barium	D	mg/L	2									0.233	0.146	0.19 B	0.219	0.21	0.216	0.269	0.155	0.199 F1	0.18	0.162	0.187	0.12	0.138	0.214
Barium	T	mg/L	2	0.222	0.237	0.205	0.226	0.214	0.213	0.224	0.205	0.235	0.202	0.19	0.202	0.224	0.206	0.205	0.204	0.23	0.232	0.233	0.262	0.23	0.197	0.267
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									4.92	5.95	6.88	7.12	5.83	6.65	8.41		5.36 F1	4.1	4.6	5.34	3.1	3.56	6.15
Boron	T	mg/L	2	4.65	5.93	5.83	5.64 S	5.8	6.93 S	7.42	6.66	4.77	6.61	6.31	6.94 S	5.84	5.79	9.19	4.77	5.54	4.85	4.58	5.34	3.66	3.78	6
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									154	168	169	169	150	144	160	130	137	139	134	134	148	165	152
Calcium	T	mg/L	103.2	101	97.2	87.5	96.8 S	99.5	98.1	98.7	97.4	154	168	169	171 S	150	144	160	130	137	139	134	134	148	165	152
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.0027	0.0173	0.0028	0.001 U	0.001 U	0.0048	0.0012	0.001 U	0.0028	0.0015 U	0.0022	0.0015 U	0.0019	0.0067	0.0015 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0326	0.00498
Cobalt	D	mg/L	0.006									0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS																0.1 U							
Iron	T	mg/L	NS									9.35							9.18							
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0028	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0355	0.0384	0.0386	0.0406	0.0401	0.0487	0.0498	0.0383	0.038 F1	0.0378	0.0393	0.0386	0.0261	0.0278	0.0432
Lithium	T	mg/L	0.04	0.0335	0.0413	0.04	0.0415	0.042	0.0458	0.0451	0.0417	0.0363	0.041	0.0393	0.0406	0.0412	0.0369	0.0564	0.0421	0.0408	0.032	0.037	0.0409	0.0295	0.0311	0.0391
Manganese	D	mg/L	NS																0.478							
Manganese	T	mg/L	NS									0.53							0.512							
Mercury	D	mg/L	0.002										0.0002 U						0.0002 U	0.0002 U F1	0.000221	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.229	0.235	0.24	0.244	0.232	0.234	0.309	0.26	0.24 F1	0.178	0.189	0.19	0.147	0.199	0.19
Molybdenum	T	mg/L	0.1	0.249	0.287	0.272	0.243	0.274	0.314	0.324	0.353	0.237	0.271	0.259	0.265	0.235	0.225	0.207	0.255	0.231	0.176	0.187	0.195	0.185	0.203	0.171
Nickel	D	mg/L	NS									0.0015		0.0031 U					0.002 U							
Nickel	T	mg/L	NS	0.0021	0.009	0.0021	0.0012	0.001 U	0.0031	0.0016	0.0012	0.0027		0.0023					0.002 U							
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.003 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
J4 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 6 quarterly sampling events from 2017-2018
pH, Lab - Standard Value is 22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight exposes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-05. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC §45.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 9
Groundwater Summary Table - APW-07
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling									
Sample ID				APW-7-20170907	APW-7-20170928	APW-7-20171019	APW-7-20171109	APW-7-20171128	APW-7-20171227	APW-7-20180118	APW-7-20180208	APW-07-WG-20220616	APW-07-WG-20220914	APW-07-WG-20221130	APW-07-WG-20230130	APW-07-WG-20230626	APW-07-WG-20230919	APW-07-WG-20231128	APW-07-WG-20240111	APW-07-WG-20240430	APW-07-WG-20240904	APW-07-WG-20241016	APW-07-WG-20250625	APW-07-WG-20250904	APW-07-WG-20251120
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07	APW-07
Date				9/7/2017	9/28/2017	10/19/2017	11/9/2017	11/28/2017	12/27/2017	1/18/2018	2/8/2018	6/14/2022	9/14/2022	11/30/2022	1/30/2023	6/26/2023	9/19/2023	11/28/2023	1/11/2024	4/30/2024	9/4/2024	10/16/2024	6/25/2025	9/4/2025	11/20/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																									
UNSPECIFIED																									
Fluoride	N	mo/L	4	0.35	0.21	0.19	0.2	0.2	0.19	0.2	0.18	0.18	0.17	0.18	0.19	0.17	0.18	0.2	0.172	0.15 U	0.199 PI	0.15 U	0.168	0.174	0.197
Radium-226	N	pCi/L	NS	0.47 ± 0.15 U	0 ± 0.06 U	0.505 ± 0.396	0.11 ± 0.08 U	0.16 ± 0.14 U	0.25 ± 0.1 U	0.14 ± 0.09 U	0.24 ± 0.14 U	0.333 ± 0.208	0.18 ± 0.09 U	0.2 ± 0.11 U	0.337 ± 0.265	-0.01 ± 0.06 U	0.11 ± 0.07 U	0.16 ± 0.06 U	0.775 ± 0.378	0.617 ± 0.356	0.197 ± 0.174	0.232 ± 0.212 J	0.127 ± 0.171 J	0.597 ± 0.399	0.362 ± 0.355 J
Radium-228	N	pCi/L	NS	-0.42 ± 0.79 U	0.76 ± 0.61 J	0.785 ± 0.412	1.13 ± 0.39	0.61 ± 0.51 U	0.14 ± 0.35 U	1.19 ± 0.55	0.53 ± 0.4 U	0.766 ± 0.234	1.45 ± 0.72	1.13 ± 0.66	1.77 ± 0.952	1.11 ± 0.74	0.99 ± 0.62 JOQR	0.45 ± 0.57 U	1.93 ± 0.264	0.803 ± 0.291	0.736 ± 0.361	1.77 ± 0.347	0.8 ± 0.410 J	1.32 ± 0.518	1.31 ± 0.435
Sulfate	N	mo/L	400	66	59	52	50	61	63	67	64	72	78	48	48	54	44	40	68.8	56.3	34.7 J6	46.3	39.4	37.4	48.7
CALC																									
Radium-226/228	N	pCi/L	7.002	0.47 ± 0.94 U	0.76 ± 0.67 U	1.29 ± 0.808	1.24 ± 0.47 U	0.77 ± 0.65 U	0.39 ± 0.45 U	1.33 ± 0.64 U	0.77 ± 0.54 U	1.1 ± 0.313	1.63 ± 0.81 U	1.33 ± 0.77 U	2.1 ± 0.441	1.11 ± 0.8 U	1.1 ± 0.69 U	0.61 ± 0.63 U	2.7 ± 0.461	1.42 ± 0.460	0.933 ± 0.401	2.01 ± 0.407	0.927 ± 0.634 J	1.91 ± 0.654	1.67 ± 0.561
FIELD PARAM																									
Turbidity, Field	N	NTU	17.96									66.2	34.8	10.5	79.2	14.8	42.9	21	4.36	3.34	5.27	6.88	5.5	8.77	15.5
GEN CHEM																									
Chloride	N	mg/L	200	15	15	14	15	16	15	15	15	11	12	12	14	10	9	11	11.5	9.63	11.5	9.63	9.38	8.97	9.77
Dissolved Solids, Total	N	mg/L	1200	762	786	624	730	742	736	720	740	780	815 H	800	824	665	740	790	734	737	673	741	683	729	706
pH, Lab	N	pH units	6.72-9.02	6.84	6.84	6.86	6.87	6.83	6.96	6.97	6.88	6.88	7.02	6.78	7.23	6.79 H	6.94 H	6.86 H	7.31 T8	7.02 T8	7.03 T8	6.93 T8	7.22 T8	7.08 T8	7.01 T8
METALS																									
Antimony	D	mo/L	0.006									0.001 U	0.001 U	0.001 U	0.0015	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mo/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mo/L	0.01									0.0011	0.001 U	0.001 U	0.001 U	0.0012	0.0013	0.0016	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	mo/L	0.01	0.0014	0.0012	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0023	0.0016	0.0011	0.0014	0.0014	0.0018	0.0022	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Barium	D	mo/L	2									0.334	0.255	0.354 B	0.411	0.303	0.336	0.465	0.256	0.28 F1	0.252	0.265	0.255	0.256	0.267
Barium	T	mo/L	2	0.465	0.448	0.394	0.401	0.37	0.374	0.38	0.359	0.374	0.381	0.371	0.363	0.312	0.303	0.522	0.36	0.349	0.309	0.351	0.31	0.337	0.335
Beryllium	D	mo/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mo/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mo/L	2									0.148	0.193	0.199	0.267	0.208	0.192	0.243		0.2 U F1	0.505	0.225	0.217	0.204	0.211
Boron	T	mo/L	2	0.235	0.308	0.302	0.3	0.278	0.342	0.298	0.318	0.168	0.208	0.217	0.246	0.237	0.181	0.274	0.26	0.2 U	0.215	0.226	0.204	0.215	0.212
Cadmium	D	mo/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mo/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mo/L	103.2									222	199	204	199	180 S	196	162	203	216 F1	185	171	195	201	217
Calcium	T	mo/L	103.2	192	204	171	187	196	193	191	185	238	210	209	200	193 B	161	177	209	213	192	219	199	212	213
Chromium	D	mo/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mo/L	0.1	0.0017	0.0063	0.0026	0.001 U	0.001 U	0.0329	0.001 U	0.001 U	0.0041	0.0021	0.0015 U	0.0034	0.0015 U	0.0057	0.0024	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	D	mo/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mo/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	D	mo/L	NS																0.1 U						
Iron	T	mo/L	NS									17.3							18.9						
Lead	D	mo/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mo/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0074	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mo/L	0.04									0.0126	0.0148	0.0158	0.0191	0.0136	0.0184	0.0212	0.0176	0.0167 F1	0.0151	0.0173	0.0138	0.0139	0.0152
Lithium	T	mo/L	0.04	0.0147	0.0181	0.0172	0.0176	0.0185	0.0191	0.0181	0.0178	0.0143	0.0161	0.0166	0.0181	0.0153	0.0141	0.0231	0.019	0.0174	0.0152	0.0169	0.0141	0.0154	0.0151
Manganese	D	mo/L	NS																1.16						
Manganese	T	mo/L	NS									1.11							1.19						
Mercury	D	mo/L	0.002										0.0002 U						0.0002 U	0.0002 U F1	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mo/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mo/L	0.1									0.0026	0.0026	0.0021	0.0027	0.0027	0.0029	0.004	0.005 U	0.005 U F1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Molybdenum	T	mo/L	0.1	0.0046	0.0036	0.0033	0.0023	0.003	0.0044	0.0037	0.0036	0.0035	0.003	0.0029	0.0031	0.0028	0.0029	0.0042	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Nickel	D	mo/L	NS									0.0008 J		0.001 U					0.002 U						
Nickel	T	mo/L	NS	0.0014	0.0033	0.0013	0.001 U	0.001 U	0.015	0.001 U	0.001 U	0.0042		0.001 U					0.002 U						
Selenium	D	mo/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	T	mo/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	D	mo/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mo/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J2 = The associated batch QC was outside the established quality control range per precision
J6 = The sample matrix interfered with the ability to make any accurate determination: spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight epicenes of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 10
Groundwater Summary Table - APW-08
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling									
Sample ID				APW-8-20170907	APW-8-20170928	APW-8-20171018	APW-8-20171108	APW-8-20171127	APW-8-20171227	APW-8-20180117	APW-8-20180208	APW-08-WG-20220616	APW-08-WG-20220915	APW-08-WG-20221130	APW-08-WG-20230202	APW-08-WG-20230626	APW-08-WG-20230919	APW-08-WG-20231128	APW-08-WG-20240111	APW-08-WG-20240430	APW-08-WG-20240904
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08	APW-08
Date				9/7/2017	9/28/2017	10/18/2017	11/8/2017	11/27/2017	12/27/2017	1/17/2018	2/8/2018	6/16/2022	9/15/2022	11/30/2022	2/2/2023	6/26/2023	9/19/2023	11/28/2023	1/11/2024	4/30/2024	9/4/2024
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																					
UNSPECIFIED																					
Fluoride	N	mg/L	4	0.3	0.3	0.29	0.29	0.28	0.28	0.3	0.28	0.29	0.26	0.26	0.26	0.26	0.29	0.232	0.336	0.254	0.15 U
Radium-226	N	pCi/L	NS	0.22 ± 0.12 U	0.12 ± 0.08 U	0.2 ± 0.393	0.11 ± 0.1 U	0.35 ± 0.16 U	0.14 ± 0.08 U	0.21 ± 0.11 U	0.39 ± 0.15 U	0.208 ± 0.236 J	0.27 ± 0.1 U	0.4 ± 0.13 U	0.247 ± 0.244 J	0.34 ± 0.12 U	0.23 ± 0.09 U	0.1 ± 0.05 U	1.71 ± 0.459	0.341 ± 0.271	0.296 ± 0.200
Radium-228	N	pCi/L	NS	1.13 ± 0.63	0.88 ± 0.48 J	1.3 ± 0.545	0.37 ± 0.25 U	0.77 ± 0.55 J	1.31 ± 0.58	0.64 ± 0.49 U	0.49 ± 0.43 U	0.526 ± 0.224	0.86 ± 0.62 J	1.68 ± 0.77	-0.157 ± 0.282 U	0.11 ± 0.6 U	0.81 ± 0.49 JQDR	0.15 ± 0.54 U	0.687 ± 0.215	-0.254 ± 0.268 U	0.939 ± 0.240
Sulfate	N	mg/L	400	43	40	38	40	39	38	39	37	39	39	34	29	31	23	24	24.7	28.6	33.4 J6
CALC																					
Radium-226/228	N	pCi/L	7.002	1.35 ± 0.75 U	1 ± 0.56 U	1.5 ± 1.61	0.48 ± 0.35 U	1.12 ± 0.71 U	1.45 ± 0.66 U	0.85 ± 0.6 U	0.88 ± 0.58 U	0.735 ± 0.325	1.13 ± 0.72 U	2.08 ± 0.9	0.247 ± 0.373 J	0.45 ± 0.72 U	1.04 ± 0.58 U	0.25 ± 0.59 U	2.39 ± 0.507	0.341 ± 0.381 J	1.26 ± 0.312
FIELD PARAM																					
Turbidity, Field	N	NTU	17.96									119	139	305	26.9	152	141	169	23.1	136	97.4
GEN CHEM																					
Chloride	N	mg/L	200	9	10	10	10	10	10	11	12	9	11	12	13	10	10	11	10.6	10.2	8.97
Dissolved Solids, Total	N	mg/L	1200	438	458	436	446	464	410	398	442	382	372 H	370	378	420	440	395	370	371	393
pH, Lab	N	pH units	6.22-9.02	7.04	7.07	7	7.12	7.25	7.11	7.04	7.04	7.34	7.47	7.25	7.31	7.18 H	7.16 H	7.27 H	7.68 T8	7.53 T8	7.2 T8
METALS																					
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0011	0.0011 U	0.001	0.0012	0.0014	0.0019	0.002 U	0.002 U F1	0.002 U	0.002 U
Arsenic	T	mg/L	0.01	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.0022	0.0015	0.0017	0.0016	0.002	0.0018	0.0025	0.002 U	0.002 U	0.002 U
Barium	D	mg/L	2									0.144	0.163	0.146 B	0.15	0.191	0.236	0.255	0.17	0.172 F1	0.194
Barium	T	mg/L	2	0.207	0.256	0.219	0.24	0.217	0.223	0.226	0.215	0.235	0.19	0.179	0.167	0.225	0.199	0.261	0.17	0.173	0.197
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U F1	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									0.077	0.0993	0.0644	0.0895	0.124	0.117	0.154		0.2 U F1	0.2 U
Boron	T	mg/L	2	0.132	0.154	0.135	0.138	0.141	0.145	0.151	0.132	0.115	0.11	0.103	0.095	0.103	0.116	0.155		0.2 U	0.2 U
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									108	79.7	75.4	72.1	92.6	94.1 S	71.3	83.1	88.4 F1	94.9
Calcium	T	mg/L	103.2	97.4	105	92.6	101	102	98.6	95	97.8	93.1	85.1	82.8	79.4	99.4 J6	86.4	81.2	82.8	87.8	98.3
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U
Chromium	T	mg/L	0.1	0.0018	0.0023	0.001 U	0.0059	0.001 U	0.0021	0.001 U	0.001 U	0.0054	0.0016	0.0036	0.0027	0.0082	0.0049	0.002 U	0.002 U	0.002 U	0.0078
Cobalt	D	mg/L	0.006									0.0013	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U
Cobalt	T	mg/L	0.006	0.0017	0.0013	0.001	0.0012	0.001 U	0.001 U	0.001 U	0.001 U	0.002	0.0013	0.0016	0.0012	0.0019	0.0014	0.0021	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS																0.1 U		
Iron	T	mg/L	NS									3.14							0.44		
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0024	0.001 U	0.0012	0.0007 J	0.0028	0.0015	0.0019	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0141	0.0142	0.0132	0.0131	0.0125	0.022	0.0204	0.0134	0.0137 F1	0.0196
Lithium	T	mg/L	0.04	0.0196	0.0206	0.0207	0.0216	0.0223	0.0216	0.0192	0.0196	0.016	0.016	0.0147	0.0155	0.0157	0.0177	0.0211	0.0143	0.0147	0.0173
Manganese	D	mg/L	NS																0.0443		
Manganese	T	mg/L	NS									0.202							0.0435		
Mercury	D	mg/L	0.002										0.0002 U						0.0002 U	0.0002 U F1	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0008 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.005 U	0.005 U F1	0.005 U
Molybdenum	T	mg/L	0.1	0.0011	0.001 U	0.001 U	0.0011	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 J	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.005 U	0.005 U	0.005 U
Nickel	D	mg/L	NS									0.0023		0.0012					0.00227		
Nickel	T	mg/L	NS	0.0039	0.0043	0.0029	0.0062	0.0026	0.0027	0.0026	0.0026	0.0054		0.0077					0.00354		
Selenium	D	mg/L	0.05									0.0027	0.0068	0.0126	0.0128	0.0113	0.0126	0.0231	0.0173	0.0185 F1	0.00425
Selenium	T	mg/L	0.05	0.008	0.0141	0.0132	0.0149	0.0135	0.0141	0.0149	0.013	0.0036	0.0077	0.011	0.0148	0.0129	0.0122	0.0221	0.0169	0.0182	0.00529
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

				Post-Closure Sampling									
Sample ID				APW-08-WG-20241016	APW-08-WG-20250115	APW-08-WG-20250625	APW-08-WG-20250905	APW-08-WG-20251120					
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-08	APW-08	APW-08	APW-08	APW-08					
Date				10/16/2024	1/15/2025	6/25/2025	9/5/2025	11/20/2025					
Sample Type				N	N	N	N	N					
Parameter/Analyte													
UNSPECIFIED													
Fluoride	N	mg/L	4	0.15 U	0.228 P1	0.25	0.253	0.266					
Radium-226	N	pCi/L	NS	0.171 ± 0.182 J	0.382 ± 0.233	0.258 ± 0.193	0.273 ± 0.291 J	0.268 ± 0.303 J					
Radium-228	N	pCi/L	NS	0.874 ± 0.414	1.1 ± 0.445	0.546 ± 0.543 J	0.95 ± 0.568	1.03 ± 0.451					
Sulfate	N	mg/L	400	29.4	28.5	28.6	27.7	26.2					
CALC													
Radium-226/228	N	pCi/L	7.002	1.04 ± 0.452	1.48 ± 0.502	0.804 ± 0.576 J	1.22 ± 0.638	1.3 ± 0.543					
FIELD PARAM													
Turbidity, Field	N	NTU	17.96	47.5	8.97	6.7	12	172					
GEN CHEM													
Chloride	N	mg/L	200	8.61	8.85	8.66	8.39	7.46					
Dissolved Solids, Total	N	mg/L	1200	418	418	422	426	432					
pH, Lab	N	pH units	6.22-9.02	7.33 T8	7.53 T8	7.63 T8	7.36 T8	7.25 T8					
METALS													
Antimony	D	mg/L	0.006	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U					
Antimony	T	mg/L	0.006	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U					
Arsenic	D	mg/L	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Arsenic	T	mg/L	0.01	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Barium	D	mg/L	2	0.188	0.191	0.191	0.216	0.216					
Barium	T	mg/L	2	0.192	0.199	0.206	0.2	0.21					
Beryllium	D	mg/L	0.004	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Beryllium	T	mg/L	0.004	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Boron	D	mg/L	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U					
Boron	T	mg/L	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U					
Cadmium	D	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U					
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U					
Calcium	D	mg/L	103.2	99.9	102	104	100	111					
Calcium	T	mg/L	103.2	104	105	104	102	107					
Chromium	D	mg/L	0.1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Chromium	T	mg/L	0.1	0.00788	0.002 U	0.00204	0.002 U	0.00243					
Cobalt	D	mg/L	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Cobalt	T	mg/L	0.006	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Iron	D	mg/L	NS										
Iron	T	mg/L	NS										
Lead	D	mg/L	0.0075	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Lead	T	mg/L	0.0075	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Lithium	D	mg/L	0.04	0.0196	0.0177	0.018	0.018	0.0185					
Lithium	T	mg/L	0.04	0.0187	0.0181	0.018	0.018	0.0186					
Manganese	D	mg/L	NS										
Manganese	T	mg/L	NS										
Mercury	D	mg/L	0.002	0.0002 U F1	0.0002 U	0.0002 U	0.0002 U	0.0002 U					
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U					
Molybdenum	D	mg/L	0.1	0.005 U F1	0.005 U	0.005 U	0.005 U	0.005 U					
Molybdenum	T	mg/L	0.1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U					
Nickel	D	mg/L	NS										
Nickel	T	mg/L	NS										
Selenium	D	mg/L	0.05	0.0193	0.0203	0.0169	0.0169	0.016					
Selenium	T	mg/L	0.05	0.0187	0.0196	0.0183	0.0166	0.0153					
Thallium	D	mg/L	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					
Thallium	T	mg/L	0.002	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U					

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 6.0 is the regulatory standard
Eight episones of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 11
Groundwater Summary Table - APW-09
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment							Post-Closure Sampling																		
Sample ID				APW-9-20170927	APW-9-20170927	APW-9-20171018	APW-9-20171108	APW-9-20171127	APW-9-20172208	APW-9-20180117	APW-9-20180208	APW-09-WG-20220615	APW-09-WG-20220913	APW-09-WG-20221130	APW-09-WG-20230301	APW-09-WG-20230627	APW-09-WG-20230920	DUP-02-WG-20230920	APW-09-WG-20231129	DUP-02-WG-20231129	APW-09-WG-20240111	DUP-02-WG-20240111	APW-09-WG-20240430	DUP-02-WG-20240430	APW-09-WG-20240606	DUP-02-WG-20240606	APW-09-WG-20241017	DUP-02-WG-20241017	APW-09-WG-20250115	DUP-02-WG-20250115	APW-09-WG-20250625	DUP-02-WG-20250625	APW-09-WG-20251009	DUP-02-WG-20251009	APW-09-WG-20251120	DUP-02-WG-20251120
Sample ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-9-20170927	APW-9-20170927	APW-9-20171018	APW-9-20171108	APW-9-20171127	APW-9-20172208	APW-9-20180117	APW-9-20180208	APW-09-WG-20220615	APW-09-WG-20220913	APW-09-WG-20221130	APW-09-WG-20230301	APW-09-WG-20230627	APW-09-WG-20230920	DUP-02-WG-20230920	APW-09-WG-20231129	DUP-02-WG-20231129	APW-09-WG-20240111	DUP-02-WG-20240111	APW-09-WG-20240430	DUP-02-WG-20240430	APW-09-WG-20240606	DUP-02-WG-20240606	APW-09-WG-20241017	DUP-02-WG-20241017	APW-09-WG-20250115	DUP-02-WG-20250115	APW-09-WG-20250625	DUP-02-WG-20250625	APW-09-WG-20251009	DUP-02-WG-20251009	APW-09-WG-20251120	DUP-02-WG-20251120
Sample Date				9/27/2017	9/27/2017	10/18/2017	11/8/2017	11/27/2017	12/28/2017	1/17/2018	2/8/2018	6/15/2022	9/13/2022	11/30/2022	3/1/2023	6/27/2023	9/20/2023	9/20/2023	11/29/2023	11/29/2023	1/11/2024	1/11/2024	4/30/2024	4/30/2024	6/4/2024	6/4/2024	10/7/2024	10/7/2024	1/15/2025	1/15/2025	6/25/2025	6/25/2025	9/25/2025	9/25/2025	11/20/2025	11/20/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD	N	FD
Parameter Name/Lab-counter+years																																				
Boron	N	mg/l	4	0.19	0.22	0.21	0.2	0.2	0.5	0.23	0.19	0.23	0.15	0.2	0.19	0.19	0.2	0.15	0.2	0.21	0.197	0.198	0.205	0.205	0.215	0.198	[illegible]	0.203	0.15	0.152	0.204	0.208	0.211	0.201	0.223	0.231		
Radium 226	N	pCi/L	MC	0.721 ± 0.711	0.474 ± 0.617	0.725 ± 0.729	0.746 ± 0.765	0.724 ± 0.726	0.746 ± 0.743	0.706 ± 0.701	0.725 ± 0.727	0.787 ± 0.786	0.746 ± 0.743	0.746 ± 0.743	0.706 ± 0.701	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.746 ± 0.743	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786	0.746 ± 0.743	0.787 ± 0.786
Radium-228	N	pCi/L	MC	0.351 ± 0.89 J	0.67 ± 0.54 U	0.275 ± 0.515	0.49 ± 0.29 U	1.07 ± 0.48 U	1.06 ± 0.51	0.66 ± 0.46 U	0.23 ± 0.57 U	0.213 ± 0.244 U	0.22 ± 0.49 U	0.77 ± 0.55 J	0.032 ± 0.243 U	0.35 ± 0.65 U	0.22 ± 0.41 U	0.8 ± 0.65 J	0.722 ± 0.511	0.614 ± 0.514	0.51 ± 0.29	0.597 ± 0.499	0.552 ± 0.263	-0.422 ± 0.295 U	0.314 ± 0.252 J	1.21 ± 0.764	0.83 ± 0.276 J	0.0412 ± 0.76 U	0.299 ± 0.463 U	0.0144 ± 0.486 U	0.551 ± 0.696 J	-0.16 ± 0.463 U	0.252 ± 0.367 U		
Sulfate	N	mg/L	400	55	47	53	55	55	40	26	25	124	73	55	80	47	51	51	54	54	53.6	53.3	54.1	54.1	46.9	47.5	49.8	47.5	48.5	47.3	49.6	49.3	43	43.5	45.6	45.6
pH																																				
Field pH 2025/26	N	pCi/L	7.000	7.08 ± 0.81 U	6.7 ± 0.63 U	6.775 ± 0.725	6.63 ± 0.38 U	1.07 ± 0.58 U	1.2 ± 0.55 U	0.51 ± 0.54 U	0.36 ± 0.5 U	0.367 ± 0.515 J	0.46 ± 0.58 U	0.83 ± 0.61 U	0.72 ± 0.285 U	0.52 ± 0.76 U	1.17 ± 0.63 U	0.22 ± 0.46 U	0.8 ± 0.67 U	0.23 ± 0.69 U	1.29 ± 0.227	1.18 ± 0.356	0.866 ± 0.317	0.572 ± 0.287	1.95 ± 0.510	1.32 ± 0.350	0.2359 ± 0.3035 U	0.536 ± 0.515	1.46 ± 0.806	0.691 ± 0.389	0.179 ± 0.6051 U	0.519 ± 0.5377 J	0.0144 ± 0.491 U	0.551 ± 0.7172 J	0.237 ± 0.5231 U	0.44 ± 0.575 J
FIELD PARAM																																				
Turbidity Field	N	NTU	17.16									34.2	7.3	7.28	23.6	24.7	5.64		3.82		13.4		5.69		13.6		13.9		19.4		31.8		4.92		23.7	
GEN CHEM																																				
Chloride	N	mg/L	1000	13	13	13	13	13	13	13	768	12	12	12	12	12	12	11	12	12.1	14.2	14	11	11	10.7	11.1	12.8	14.8	13	13	12.2	9.87	9.54	11.8	11.8		
Dissolved Solids Total	N	mg/L	2000	264.8	272	274	294	266	242	276	2880	224	260	272	310	272	310	306	314	306	341	344	299	307	317	317	311	315	312	302	274	274	324	324		
pH Lab	N	pH unit	6.5-8.5	7.31	7.25	7.29	7.29	7.52	7.42	7.57	7.23	7.48	7.59	7.39	7.72	7.56 H	7.65 H	7.6 H	7.45 H	8.1 H	7.69 H	7.7 H	7.61 H	7.65 H	7.6 H	7.6 H	7.55 H	7.56 H	7.61 H	8.15 H	7.61 H	7.6 H	7.73 H	7.62 H		
METALS																																				
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0011	0.001 U	0.004 U	0.004 U	0.004 U1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	N	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027 U1	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U
Arsenic	N	mg/L	0.01	0.0033	0.0034	0.0019	0.0022	0.002	0.003	0.003	0.0022	0.0039	0.0029	0.0029	0.0029	0.0034	0.0021	0.002	0.0013	0.0015	0.0035	0.0037	0.0033 U1	0.0033 U	0.0029	0.0029	0.0029	0.0029	0.0026	0.0031	0.0026	0.0031	0.0026	0.0031	0.0026	0.0031	0.0026	0.0031
Barium	D	mg/L	2									0.129	0.111	0.109 B	0.107	0.113	0.114	0.109	0.108	0.118	0.12	0.114 J1	0.112 J1	0.112	0.109	0.111	0.114	0.113	0.106	0.101	0.101	0.106	0.106	0.13	0.124		
Barium	N	mg/L	2	0.227	0.171	0.118	0.133	0.131	0.139	0.133	0.125	0.186	0.134	0.124	0.133	0.122	0.113	0.12	0.131	0.136	0.136	0.136	0.117	0.113	0.105	0.104	0.112	0.109	0.107	0.109	0.107	0.113	0.124			
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	N	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									0.134	0.124	0.124	0.134	0.138	0.132	0.134	0.134	0.136	0.143	0.143	1.46 J1	1.46 J1	0.464	0.464	0.464	0.464	0.513	0.513	0.513	0.513	0.524	0.524	0.524	0.524	0.524	0.524
Boron	N	mg/L	2	0.817	0.569	0.648	0.762	0.506	0.369	0.317	0.255	1.61	0.209	0.343	0.225	0.472	0.206	0.205	0.191	0.221	0.565	0.493	0.829	0.833	0.471	0.466	0.361	0.31	0.614	0.608	0.522	0.52	0.344	0.337		
Cadmium	D	mg/L	0.005									0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U1	0.0013 U1	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Cadmium	N	mg/L	0.005	0.0005 U	0.0005 U	0.0005 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U1	0.0013 U1	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Calcium	D	mg/L	1000									78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	78.3	88.2	78.4	84.1 J1	84.1 J1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1	84.1
Calcium	N	mg/L	1000	83.9	85.3	76.5	87.9	83.6	81.4 J1	80.2	92	118	89.5	85.5	93.8	83.5	87.5	89.9	72.5	72.6	90.4	89.9	88.3	87.6	90.4	91.7	88.4	87.5	90	90.2	91.9	92	89	89.5	85.1	85.1		
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0062 U	0.0062 U	0.0062 U1	0.0062 U1	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Chromium	N	mg/L	0.1	0.0148	0.0051	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0011	0.0016	0.0017 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0062 U	0.0062 U	0.0062 U1	0.0062 U1	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Cobalt	D	mg/L	0.006									0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0032 U	0.0032 U	0.0032 U1	0.0032 U1	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U
Cobalt	N	mg/L	0.006	0.0031	0.0014	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0017 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0032 U	0.0032 U	0.0032 U1	0.0032 U1	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U
Iron	D	mg/L	NE																		0.135	0.135																
Iron	N	mg/L	NE									0.496									0.175	0.21																
Lead	D	mg/L	0.0075									0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0062 U	0.0062 U	0.0062 U1	0.0062 U1	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Lead	N	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0014	0.0009	0.0013	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0062 U	0.0062 U	0.0062 U1	0.0062 U1	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
Lithium	D	mg/L	0.04									0.0246	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197	0.0197
Lithium	N	mg/L	0.04	0.0176	0.0173	0.0174	0.018	0.0167	0.0175	0.0155	0.0146	0.0246	0.0163	0.0151	0.0157	0.0154	0.015	0.0158	0.0156	0.0156	0.0139	0.0143	0.0158	0.0161	0.0163	0.0155	0.016	0.0149	0.0155	0.0146	0.0157	0.016	0.0146	0.0157	0.016	0.0146	0.0157	0.016
Manganese	D	mg/L	NE																		0.0013 U	0.0013 U																
Manganese	N	mg/L	NE									0.599									0.0013 U	0.0013 U																
Mercury	D	mg/L	0.002																		0.00012 U1	0.00012 U1	0.00012 U1	0.00012 U1	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U
Mercury	N	mg/L	0.002	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U1	0.00002 U1	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U
Molybdenum	D	mg/L	0.1									0.0251	0.0182	0.0174	0.0164	0.0211	0.0167	0.0173	0.0154	0.0146	0.0186	0.0188	0.0211 J1	0.0209 J1	0.0215	0.0216	0.0174	0.0173	0.0205	0.0208	0.0201	0.0202	0.0215	0.0212	0.0207		
Molybdenum	N	mg/L	0.1	0.0223	0.0252	0.0227	0.0203	0.0247	0.0246	0.0223	0.0224	0.0475	0.0194	0.015	0.0172	0.0189	0.0162	0.0173	0.0159	0.0177	0.0163	0.0157	0.037	0.0205	0.0259	0.0233	0.0196	0.0151	0.0214	0.0213	0.0226	0.0214	0.0252	0.0238	0.0184	0.0197		
Nickel	D	mg/L	NE									0.0013 U		0.0013 U							0.0062 U																
Nickel	N	mg/L	NE	0.012	0.0052	0.0013 U	0.001	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.004		0.0013 U							0.0062 U																
Selenium	D	mg/L	0.05									0.0147		0.0147							0.0062 U																
Selenium	N	mg/L	0.05	0.0126	0.0139	0.017	0.0186	0.0139	0.0143	0.0147	0.0134	0.0219		0.0151							0.0062 U																
Thallium	D	mg/L	0.002									0.0013 U		0.0013 U							0.0062 U																
Thallium	N	mg/L	0.002	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U		0.0013 U							0.0062 U																

Key:

Shady Cell = Not Analyzed
D = Dissolved Sample Analyte
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
N = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J1 = Analyte detected below quantitation limits but the reconstituted quality control target gen percisser
J3 = The sample matrix interfered with the ability to make any accurate determination; spike value is low
R = Spike recovery outside recovery limits.
R = MPD outside acceptance recovery limits
U = Not Detected at the Reporting Limits
TB = Sample received past hour clean to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH Lab - Standard Value 6.5 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 6.5 is the regulatory standard.
Eight moments of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentrations for the Site, utilizing data from background wells APW-01R and APW-1R. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a), and the final background concentrations as found in Table 4 of the 1/31/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only value taken from Table 4.

NA = No Standard

Table 12
Groundwater Summary Table - APW-10D
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment							Post-Closure Sampling										
Sample ID				APW-10D-20170907	APW-10D-20170927	APW-10D-20171019	APW-10D-20171109	APW-10D-20171128	APW-10D-20171228	APW-10D-20180118	APW-10D-20180209	APW-10D-WG-20220615	APW-10D-WG-20220916	APW-10D-WG-20221129	APW-10D-WG-20230202	APW-10D-WG-20230626	APW-10D-WG-20230919	APW-10D-WG-20231127	APW-10D-WG-20240111	APW-10D-WG-20240430	APW-10D-WG-20240905	APW-10D-WG-20241015	APW-10D-WG-20250116	APW-10D-WG-20250625	APW-10D-WG-20250903	APW-10D-WG-20251119
Location ID	**Total or Dissolved**	**Units**	**35 IAC 845.600**	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D	APW-10D
Date				9/7/2017	9/27/2017	10/19/2017	11/9/2017	11/28/2017	12/28/2017	1/18/2018	2/9/2018	6/15/2022	9/14/2022	11/29/2022	2/2/2023	6/26/2023	9/19/2023	11/27/2023	1/11/2024	4/30/2024	9/5/2024	10/15/2024	1/16/2025	6/25/2025	9/3/2025	11/19/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																										
UNSPECIFIED																										
Fluoride	N	mg/L	4	0.1	0.12	0.12	0.1	0.11	0.11	0.1	0.11	0.12	0.1	0.12	0.12	0.11	0.11	0.14	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.19 P1	0.15 U
Radium-226	N	pCi/L	NS	0.34 ± 0.12 U	-0.11 ± 0.1 U	0.121 ± 0.337	0.79 ± 0.12 U	0.16 ± 0.13 U	0.23 ± 0.1 U	0.09 ± 0.1 U	0.6 ± 0.07 U	0.249 ± 0.207	0.22 ± 0.09 U	0.31 ± 0.11 U	0.196 ± 0.157	0.31 ± 0.12 U	0.21 ± 0.099 U	0.14 ± 0.06 U	0.04 ± 0.1 70 U	0.134 ± 0.199 J	0.163 ± 0.151	0.108 ± 0.274 U	0.114 ± 0.141 J	0.155 ± 0.161 J	0.185 ± 0.256 J	0.651 ± 0.380
Radium-228	N	pCi/L	NS	1.16 ± 0.52	1.72 ± 0.64	0.633 ± 0.366	0.98 ± 0.33 J	0.47 ± 0.55 U	0.34 ± 0.37 U	0.98 ± 0.6 J	0.59 ± 0.43 U	1.19 ± 0.311	0.56 ± 0.58 U	0.28 ± 0.43 U	0.847 ± 0.370	1.39 ± 0.76	0.61 ± 0.49 U	1.36 ± 0.77	1.49 ± 0.351	0.886 ± 0.294	-0.266 ± 0.253 U	0.282 ± 0.302 J	2.1 ± 0.605	0.987 ± 0.557	0.697 ± 0.553 J	0.909 ± 0.378
Sulfate	N	mg/L	400	38	44	43	42	42	44	44	44	41	43	42	44	44	39	37	35.3	45	37.1	32.9	44.5	33	29.1	32
CALC																										
Radium-226/228	N	pCi/L	7.002	1.5 ± 0.64 U	1.72 ± 0.74 U	0.754 ± 0.703	1.17 ± 0.45 U	0.63 ± 0.68 U	0.57 ± 0.47 U	1.06 ± 0.7 U	0.59 ± 0.5 U	1.44 ± 0.374	0.78 ± 0.67 U	0.59 ± 0.54 U	1.03 ± 0.402	1.7 ± 0.884 U	0.82 ± 0.58 U	1.5 ± 0.83 U	1.53 ± 0.390	1.02 ± 0.355	0.163 ± 0.295 U	0.39 ± 0.408 J	2.21 ± 0.621	1.14 ± 0.580	0.881 ± 0.609 J	1.56 ± 0.536
FIELD PARAM																										
Turbidity, Field	N	NTU	17.96									46.9	21.9	36.4	45.3	176	169	196	4.76	198	5.56	45.3	169	59.9	16.6	121
GEN CHEM																										
Chloride	N	mg/L	200	24	17	17	15	17	16	14	16	16	18	14	13	14	10	10	15.4	10.9	25.5	15	13.3	16.2	20.8	11.6
Dissolved Solids, Total	N	mg/L	1200	466	474	442	468	482	448	448	512	452	460 H	460	454	485	468	445	436	459	351	447	447	463	452	447
pH, Lab	N	pH unit	6.22-9.02	7.12	7.11	7.05	7.11	7.12	7.15	7.03	7.03	7.21	7.29	7.04	7.37	6.98 H	7.22 H	7.08 H	7.66 T8	7.38 T8	7.28 T8	7.31 T8	7.37 T8	7.65 T8	7.57 T8	7.4 T8
METALS																										
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0013	0.004 U	0.004 UF1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.0008 J	0.001 U	0.0012	0.0011	0.0011	0.0011	0.0018	0.002 U F1	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.00355	0.002 U
Arsenic	T	mg/L	0.01	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0017	0.0057	0.0014	0.0017	0.0019	0.0016	0.0021	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00492	0.002 U
Barium	D	mg/L	2									0.342	0.321	0.318	0.304	0.348	0.355	0.448	0.336	0.348 F1	0.217	0.334	0.34	0.32	0.287	0.352
Barium	T	mg/L	2	0.437	0.304	0.363	0.325	0.284	0.295	0.391	0.357	0.407	0.418	0.276	0.343	0.485	0.339	0.398	0.341	0.351	0.22	0.342	0.354	0.344	0.315	0.325
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 UF1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									0.0786	0.0711	0.0841	0.0579	0.0754	0.0639	0.0523	0.2 U	0.2 UF1	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Boron	T	mg/L	2	0.0999	0.101	0.0843	0.0713	0.0885	0.0922	0.0923	0.0906	0.118	0.0731	0.0522	0.073	0.0674	0.066	0.0754	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 UF1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.2									140	124	113	114	114	116	83.4	119	121 F1	109	118	126	118	127	127
Calcium	T	mg/L	103.2	118	136	120	121	125	123	148 S	124 S	135	374	115	122	611 B	118	100	125	141	96.5	129	142	135	123	127
Chromium	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 UF1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.0036	0.0078	0.0022	0.0011	0.001 U	0.001 U	0.0042	0.001 U	0.0015 U	0.0148	0.0024	0.0015 U	0.0015	0.0042	0.0021	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	D	mg/L	0.006									0.0054	0.0027	0.0022	0.003	0.0025	0.0026	0.0039	0.00228 F1	0.00219 F1	0.002 U	0.00248	0.002 U	0.00253	0.00263	0.00218
Cobalt	T	mg/L	0.006	0.0039	0.0024	0.0025	0.0032	0.0017	0.0013	0.0026	0.0026	0.0034	0.0049	0.003	0.0033	0.007	0.0031	0.0039	0.00261	0.00271	0.002 U	0.00242	0.00271	0.00295	0.0028	0.00285
Iron	D	mg/L	NS									0.758							0.1 U							
Iron	T	mg/L	NS									0.758							0.175							
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 UF1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0135	0.0135	0.0133	0.013	0.0148	0.02	0.0176	0.0135	0.014 F1	0.0174	0.0154	0.0142	0.0149	0.0136	0.0159
Lithium	T	mg/L	0.04	0.0147	0.0155	0.0146	0.0146	0.0153	0.0155	0.0142	0.014	0.018	0.0156	0.0126	0.0146	0.0158	0.0148	0.0154	0.0152	0.0142	0.0113	0.0147	0.0152	0.0144	0.0142	0.0147
Manganese	D	mg/L	NS																0.857							
Manganese	T	mg/L	NS									1.16							0.88							
Mercury	D	mg/L	0.002										0.0002 U						0.0002 U	0.0002 UF1	0.000229	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0025	0.005 U	0.005 UF1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Molybdenum	T	mg/L	0.1	0.0024	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Nickel	D	mg/L	NS									0.0054		0.0054					0.004 U							
Nickel	T	mg/L	NS	0.0095	0.0077	0.0065	0.0057	0.0035	0.0025	0.0072	0.0053	0.007		0.0063					0.00513							
Selenium	D	mg/L	0.05									0.001 U	0.0016	0.0015	0.0024	0.0013	0.0016	0.0043	0.00274	0.00238 F3	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	T	mg/L	0.05	0.001 U	0.0011	0.0012	0.0013	0.001 U	0.0014	0.0016	0.0016	0.001 U	0.0021	0.0013	0.0027	0.0016	0.0013	0.0033	0.00369	0.00244	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 UF1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J3 = The associated batch QC was outside the established quality control range per precision
JN = The sample matrix interfered with the ability to make any accurate determination; spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T4 = Sample received past/too close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9.0 is the regulatory standard
Eight rounds of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-08. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calye taken from Table 6

NS = No Standard

Table 13
Groundwater Summary Table - APW-10S
Grand Tower Energy Center (GTEC)
Closed Residuals Impoundment
1820 Power Plant Road
Grand Tower, IL 62942

				Sampled prior to closure of CCR Impoundment								Post-Closure Sampling									
Sample ID				APW-10S-20170907	APW-10S-20170927	APW-10S-20171019	APW-10S-20171109	APW-10S-20171128	APW-10S-20171228	APW-10S-20180118	APW-10S-20180209	APW-10S-WG-20220615	APW-10S-WG-20220915	APW-10S-WG-20221129	APW-10S-WG-20230202	APW-10S-WG-20230626	APW-10S-WG-20230919	APW-10S-WG-20231127	APW-10S-WG-20240111	APW-10S-WG-20240430	APW-10S-WG-20240905	APW-10S-WG-20241015	APW-10S-WG-20250116	APW-10S-WG-20250625	APW-10S-WG-20250903	APW-10S-WG-20251119
Location ID				APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S	APW-10S
Date	**Total or Dissolved**	**Units**	**35 IAC 845.600**	9/7/2017	9/27/2017	10/19/2017	11/9/2017	11/28/2017	12/28/2017	1/18/2018	2/9/2018	6/15/2022	9/15/2022	11/29/2022	2/2/2023	6/26/2023	9/19/2023	11/27/2023	1/11/2024	4/30/2024	9/5/2024	10/15/2024	1/16/2025	6/25/2025	9/3/2025	11/19/2025
Sample Type				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter/Analyte																										
UNSPECIFIED																										
Fluoride	N	mg/L	4	0.19	0.21	0.16	0.16	0.16	0.17	0.17	0.16	0.17	0.15	0.17	0.15	0.15	0.16	0.18	0.15 U	0.15 U	0.251	0.15 U	0.199	0.228	0.265	0.187
Radium-226	N	pCi/L	NS	0.4 ± 0.14 U	0.19 ± 0.11 U	0.774 ± 0.430	0.16 ± 0.11 U	0.18 ± 0.16 U	0.28 ± 0.1 U	0.29 ± 0.12 U	0.24 ± 0.13 U	0.778 ± 0.324	0.3 ± 0.1 U	0.31 ± 0.11 U	1.08 ± 0.395	0.37 ± 0.13 U	0.59 ± 0.14 U	0.32 ± 0.09 U	0.373 ± 0.206	0.347 ± 0.299 J	0.499 ± 0.257	0.236 ± 0.207 J	0.331 ± 0.211	0.446 ± 0.231	0.889 ± 0.405	0.889 ± 0.351
Radium-228	N	pCi/L	NS	0.38 ± 0.47 U	0.98 ± 0.7 J	0.856 ± 0.391	0.71 ± 0.33 J	0.66 ± 0.57 U	0.56 ± 0.43 U	2.71 ± 0.78	0.93 ± 0.52 J	0.475 ± 0.268 J	2.52 ± 0.91	1.64 ± 0.68	0.162 ± 0.371 U	-0.18 ± 0.47 U	4.24 ± 0.91	0.95 ± 0.66 J	2.1 ± 0.228	0.234 ± 0.289 U	-0.0143 ± 0.345 U	0.934 ± 0.351	1.69 ± 0.451	0.575 ± 0.588 J	1.19 ± 0.510	1.6 ± 0.479
Sulfate	N	mg/L	400	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	21 S	10 U	10 U	10 U	10 U	10 U	10 U	5 U	5 U	5 U	5 U	5.15	5 U	5 U	5 U
CALC																										
Radium-226/228	N	pCi/L	7.002	0.78 ± 0.61	1.17 ± 0.81 U	1.63 ± 0.821	0.87 ± 0.44 U	0.84 ± 0.73 U	0.79 ± 0.54 U	3 ± 0.9	1.17 ± 0.65 U	1.25 ± 0.42	2.82 ± 1.01	1.95 ± 0.79 U	1.24 ± 0.542	0.37 ± 0.6 U	4.83 ± 1.05	1.27 ± 0.75 U	2.42 ± 0.307	0.582 ± 0.416 J	0.498 ± 0.430 J	1.17 ± 0.441	2.02 ± 0.498	1.02 ± 0.632	2.06 ± 0.651	2.48 ± 0.594
FIELD PARAM																										
Turbidity, Field	N	NTU	17.961									61.5	34.3	52.6	37.3	57.2	63.6	13.1	3.78	17.1	9.12	25.4	7.11	60.1	5.22	44
GEN CHEM																										
Chloride	N	mg/L	200	10	7	6	6	6	6	6	6	12	15	18	21	14	15	20	17.2	11.4	10.3	13.2	14.4	12.4	10.4	14.6
Dissolved Solids, Total	N	mg/L	1200	708	720	678	708	734	770	680 R	762	735	770 H	790	780	725	775	900	692	744	757	758	756	770	780	714
pH, Lab	N	pH unit	6.22-9.02	6.99	6.96	6.95	6.98	6.97	6.98	7.06	6.91	7.09	7.2	6.95	7.2	7.07 H	7.37 H	7.01 H	7.58 T8	7.18 T8	6.96 T8	7.16 T8	7.28 T8	7.27 T8	7.29 T8	7.2 T8
METALS																										
Antimony	D	mg/L	0.006									0.001 U	0.001 U	0.001 U	0.0016	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U F1	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Antimony	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
Arsenic	D	mg/L	0.01									0.192	0.0612	0.0188	0.173	0.196	0.176	0.251	0.0628	0.0629 F1	0.062	0.0557	0.0637	0.0574	0.0694	0.0702
Arsenic	T	mg/L	0.01	0.186	0.189	0.18	0.209	0.183	0.193	0.23	0.198	0.185	0.187	0.182	0.193	0.194	0.174	0.276	0.196	0.198	0.19	0.19	0.191	0.194	0.192	0.19
Barium	D	mg/L	2									0.423	0.292	0.143 B	0.506	0.506	0.567	0.711	0.288	0.339 F1	0.299	0.305	0.316	0.322	0.323	0.36
Barium	T	mg/L	2	0.633	0.634	0.543	0.668	0.565	0.598	0.703	0.585	0.575	0.612	0.536	0.575	0.589	0.591	0.804	0.597	0.559	0.567	0.474	0.593	0.596	0.601	0.556
Beryllium	D	mg/L	0.004									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Beryllium	T	mg/L	0.004	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Boron	D	mg/L	2									0.683	0.565	0.569	0.592	0.582	0.553	0.555		0.571	0.554	0.567	0.554	0.591	0.574	0.586
Boron	T	mg/L	2	0.525	0.544	0.536	0.595	0.545	0.573	0.645	0.582	0.683	0.565	0.569	0.592	0.582	0.553	0.555		0.571	0.554	0.567	0.554	0.591	0.574	0.586
Cadmium	D	mg/L	0.005									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U F1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	T	mg/L	0.005	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	D	mg/L	103.21									148	156	142	145	142	151	137	152	160 F1	154	159	157	159	160	158 V
Calcium	T	mg/L	103.21	136	144	135	152	150	145	140	140	161	171 B	154	145	153 B	134	129 S	162	163	163	162	168	163	164	158 V
Chromium	D	mg/L	0.1									0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	T	mg/L	0.1	0.0091	0.0019	0.001	0.0016	0.001 U	0.0016	0.0019	0.001 U	0.0033 J	0.0013	0.0012	0.0012	0.0012	0.0012	0.0015 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0071
Cobalt	D	mg/L	0.006									0.0001 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	mg/L	0.006	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0006 J	0.0007	0.0013	0.001 U	0.001 U	0.001 U	0.0013	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	D	mg/L	NS																0.12							
Iron	T	mg/L	NS									19.6							17.2							
Lead	D	mg/L	0.0075									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lead	T	mg/L	0.0075	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0007 J	0.0043	0.0014	0.001 U	0.0016	0.0033	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Lithium	D	mg/L	0.04									0.0364	0.0286	0.0367 R	0.0268	0.0278	0.0349	0.0359	0.0302	0.0284 F1	0.0268	0.0296	0.0285	0.0288	0.0259	0.0309
Lithium	T	mg/L	0.04	0.0263	0.0278	0.0272	0.0289	0.0293	0.0308	0.0316	0.0297	0.0353	0.033	0.0307	0.0323	0.0291	0.0301	0.0401	0.0328	0.0293	0.0272	0.0297	0.031	0.0278	0.0297	0.0283
Manganese	D	mg/L	NS																0.155							
Manganese	T	mg/L	NS									0.243							0.174							
Mercury	D	mg/L	0.002									0.0002 U	0.0002 U						0.0002 U	0.0002 U F1	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	T	mg/L	0.002	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	D	mg/L	0.1									0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.005 U	0.005 U F1	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Molybdenum	T	mg/L	0.1	0.0017	0.0016	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0021	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Nickel	D	mg/L	NS									0.001 U		0.001 U					0.002 U							
Nickel	T	mg/L	NS	0.0051	0.0012	0.001 U	0.0015	0.001 U	0.001 U	0.001 U	0.001 U	0.0014	0.001 U	0.0007	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	D	mg/L	0.05									0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Selenium	T	mg/L	0.05	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	D	mg/L	0.002									0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U F1	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Thallium	T	mg/L	0.002	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U

Notes:

Empty Cell = Not Analyzed
N = Normal Environmental Sample
FD - Field Duplicate Sample
NA = Not Applicable
T = Total
D = Dissolved
mg/L = Milligrams per Liter
pCi/L = Picocuries per Liter
NTU - Nephelometric Turbidity Units
H = Holding time exceeded
J = Analyte detected below quantitation limits
J2 = The associated batch QC was outside the established quality control range per precision
JN = The sample matrix interfered with the ability to make any accurate determination: spike value is low
S = Spike recovery outside recovery limits
R = RPD outside accepted recovery limits
U = Not Detected at the Reporting Limits
T8 = Sample received past/out close to holding time expiration

Turbidity and Calcium - Standard is from the Upper Tolerance Limit (UTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018
pH, Lab - Standard Value 6.22 is from the Lower Tolerance Limit (LTL) calculated from background well APW-01R concentrations from 8 quarterly sampling events from 2017-2018 and 9 G is the regulatory standard
Eight exposure of groundwater sampling were conducted from September 2017 through February 2018 to establish background concentration for the Site, utilizing data from background wells APW-01R and APW-09. The final Groundwater Protection Standards (GPS) are the higher values provided in 35 IAC 845.600(a) and the final background concentrations as found in Table 6 of the 7/25/2019 GMZ Application with the exception of turbidity and pH. Radium 226/228 was the only calpe taken from Table 6

NS = No Standard

APPENDIX D

Low Flow Sampling Forms

1st Quarter, 2025 – Low Flow Sampling Forms

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-01R
Well Permit No:

Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.17 (ft)	**Reference Elevation** 366.82 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 34.96 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 58.25 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 500 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 48.3 - 58.3 ()
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 3.8 (gal) / 6 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
12:15	34.96	500	1	14.4	6.57	0.427	NM	6.03	45.1	89.5	NM	Clear, no odor
12:20	34.96	500	2	14.6	6.42	0.48	NM	5.09	46.8	90.7	NM	Clear, no odor
12:25	34.96	500	3	14.6	6.53	0.533	NM	3.39	45.4	57.3	NM	Clear, no odor
12:30	34.96	500	4	14.6	6.56	0.552	NM	2.96	45	13.3	NM	Clear, no odor
12:35	34.96	500	5	14.7	6.56	0.555	NM	2.89	45.1	9.97	NM	Clear, no odor
12:40	34.96	500	6	14.7	6.57	0.556	NM	2.86	45	9.89	NM	Clear, no odor
12:45	36.96	500	7	14.7	6.57	0.556	NM	2.84	45	8.95	NM	Clear, no odor

Sample ID(s): APW-01R-WG-20250115	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Emma Portell	01/31/2025 19:28

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-02 Well Permit No:	Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.19 (ft)	**Reference Elevation** 364.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.91 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 58.19 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 200 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 47.2 - 57.2 ()
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.13 (gal) / 0.6 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
10:15	37.04	200	0.1	11.1	7.35	1.01	NM	5.03	28.1	219	NM	Cloudy, no odor
10:20	39.25	200	0.2	12.6	7.28	1.02	NM	3.83	6	128	NM	Cloudy, no odor
10:25	39.25	200	0.3	11.9	7.29	0.99	NM	3.27	-0.8	141	NM	Cloudy, no odor
10:30	39.25	200	0.4	12.7	7.24	1	NM	3.14	0.1	138	NM	Cloudy, no odor
10:35	39.25	200	0.5	12.8	7.24	1.01	NM	3.09	-0.1	132	NM	Cloudy, no odor
10:40	39.25	200	0.6	12.4	7.24	1.01	NM	3.11	1.3	127	NM	Cloudy, no odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-02-WG-20250115		Emma Portell	01/31/2025 20:17
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-03
Well Permit No:

Date: 2025/01/16

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 54.45 (ft)	**Reference Elevation** 365.79 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 34.32 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 59.45 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 ()
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.1 (gal) / 9 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
08:15	34.32	400	1	13.5	8.4	0.72	NM	7.81	32.5	38.4	NM	Clear, no odor
08:20	34.32	400	2	14.1	8.19	0.72	NM	7.5	52.7	14.3	NM	Clear, no odor
08:25	34.32	400	3	14.3	8.16	0.72	NM	7.26	52.6	9.81	NM	Clear, no odor
08:30	34.32	400	4	14.5	8.15	0.73	NM	6.11	52.2	9.24	NM	Clear, no odor
08:35	34.32	400	5	14.7	8.13	0.73	NM	4.01	51.2	6.47	NM	Clear, no odor
08:40	34.32	400	6	14.8	8.1	0.73	NM	2.97	50.8	6.23	NM	Clear, no odor
08:45	34.32	400	7	14.8	8.1	0.73	NM	2.51	49.8	6.88	NM	Clear, no odor
08:50	34.32	400	8	14.7	8.09	0.73	NM	2.52	49.7	7.15	NM	Clear, no odor
08:55	34.32	400	9	14.8	8.09	0.73	NM	2.51	49.4	7.69	NM	Clear, no odor

Sample ID(s): APW-03-WG-20250116	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Emma Portell	01/31/2025 20:17

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-04
Well Permit No:

Date: 2025/01/14

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.28 (ft)	**Reference Elevation** 367.44 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 35.54 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 60.28 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 500 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 45.7 - 55.7 ()
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.04 (gal) / 9 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
15:20	35.55	500	0	11.5	7.26	0.6116	NM	8.4	30.1	273	NM	Brown, no odor
15:25	35.55	500	1	13.8	5.89	0.634	NM	5.58	27.1	175	NM	Brown, no odor
15:30	35.55	500	2	13.8	7.18	0.634	NM	5.3	26.6	50	NM	Brown, no odor
15:35	35.55	500	3	13.6	7.22	0.633	NM	4.8	25.2	33	NM	Brown, no odor
15:40	35.55	500	4	13.5	7.22	0.634	NM	4.58	24.5	25.3	NM	Brown, no odor
15:45	35.55	500	5	13.6	7.21	0.635	NM	4.23	23.5	25	NM	Clear, no odor
15:50	35.55	500	6	13.5	7.22	0.634	NM	4.11	23.2	18.7	NM	Clear, no odor
15:55	35.55	500	7	13.6	7.22	0.633	NM	2.23	21.5	15.5	NM	Clear, no odor
16:00	35.55	500	8	13.6	7.22	0.634	NM	2.24	21.2	16.1	NM	Clear, no odor
16:05	35.55	500	9	13.6	7.21	0.635	NM	2.25	21.1	15.7	NM	Clear, no odor

Sample ID(s): APW-04-WG-20250114	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Emma Portell	01/31/2025 21:18

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-05R
Well Permit No:

Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.8 (ft)	**Reference Elevation** ()
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 33.55 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 62.8 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / - ()
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.77 (gal) / 4 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
11:05	33.68	450	0	14.1	7.41	0.92	NM	2.41	21.5	461	NM	Cloudy, gray color, no odor
11:10	33.68	450	1	14.8	7.41	0.92	NM	2.2	18.5	78.4	NM	Cloudy, gray color, no odor
11:15	33.68	450	2	14.8	7.4	0.92	NM	2.03	3.9	28.4	NM	Clear, no odor
11:20	33.68	450	3	14.9	7.41	0.92	NM	1.98	1.8	27.6	NM	Clear, no odor
11:25	33.68	500	4	14.9	7.4	0.92	NM	2.08	-2	27.2	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-05R-WG-20250115,DUP-001-WG-20250115		Emma Portell	01/31/2025 21:19
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06D
Well Permit No:

Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 146.96 (ft)	**Reference Elevation** 363.69 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.26 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 151.96 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 475 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 140 - 150 (ft)
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 19.53 (gal) / 8 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
09:15	32.31	475	1	14.1	7.76	0.73	NM	6.05	52.3	14.5	NM	Clear, no odor
09:20	32.31	475	2	14.6	7.53	0.73	NM	4.4	23.1	13.9	NM	Clear, no odor
09:25	32.31	475	3	12.3	7.48	0.73	NM	4.46	6.5	13.1	NM	Clear, no odor
09:30	32.31	475	4	14.7	7.41	0.73	NM	2.47	-4.7	12.5	NM	Clear, no odor
09:35	32.31	475	5	16.1	7.43	0.74	NM	2.38	-6.4	12.2	NM	Clear, no odor
09:40	32.31	475	6	15.3	7.43	0.74	NM	2.21	-10.5	11.8	NM	Clear, no odor
09:45	32.31	475	7	15.4	7.42	0.74	NM	2.17	-13.4	11.5	NM	Clear, no odor
09:50	32.31	475	8	15.2	7.42	0.74	NM	2.15	-14.9	11	NM	Clear, no odor

Sample ID(s): APW-06D-WG-20250115	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Emma Portell	01/31/2025 21:19

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-06S Well Permit No:	Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.75 (ft)	**Reference Elevation** 363.51 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 32.35 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 63.75 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 500 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.12 (gal) / 6 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
07:35	32.53	500	1	10.7	7.4	0.94	NM	9.04	2.5	80.5	NM	Clear, no odor
07:40	32.53	500	2	14.4	7.32	0.95	NM	5.11	-45.1	14.4	NM	Clear, no odor
07:45	32.53	500	3	14.5	7.23	0.95	NM	4.3	-49.6	8.29	NM	Clear, no odor
07:50	32.53	500	4	14.6	7.22	0.94	NM	3.72	-48.6	8.97	NM	Clear, slight rotten egg-like odor
07:55	32.53	500	5	14.6	7.22	0.94	NM	3.68	-48.2	8.82	NM	Clear, slight rotten egg-like odor
08:00	32.53	500	6	14.5	7.22	0.94	NM	3.67	-47.9	8.11	NM	Clear, slight rotten egg-like odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-06S-WG-20250115		Emma Portell	01/31/2025 21:20
Analysis:			

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-07 Well Permit No:	Date: 2025/01/16

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.22 (ft)	**Reference Elevation** ()
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 29.82 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 63.22 (ft)
Project Name 20240121-GWM	**Average Purge Rate** ()	**Well Diameter / Well Screen Interval** 2 (in) /
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.45 (gal) / 0 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
Analysis:	Sample unable to be collected due to field equipment r	Emma Portell	01/31/2025 19:31

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-08
Well Permit No:

Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.11 (ft)	**Reference Elevation** 362.71 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 30.8 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 62.11 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 500 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.11 (gal) / 9 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
14:55	30.83	500	1	15.9	7.15	0.66	NM	1.7	49.3	1000	NM	Turbidity over range 1000+; gray and cloudy, no odor
15:00	30.83	500	2	15.5	7.11	0.65	NM	1.25	46.8	1000	NM	Turbidity over range 1000+; gray and cloudy, no odor
15:05	30.83	500	3	15.4	7.07	0.64	NM	1.16	45.9	253	NM	Gray and cloudy, no odor
15:10	30.83	500	4	15.2	7.06	0.64	NM	1.16	43.8	67.6	NM	Cloudy, no odor
15:15	30.83	500	5	15.1	7.06	0.64	NM	1.2	42.9	43	NM	Cloudy, no odor
15:20	30.83	500	6	15.1	7.05	0.63	NM	1.23	42	27.6	NM	Clear, no odor
15:25	30.83	500	7	15	7.06	0.63	NM	1.24	41.6	9.43	NM	Clear, no odor
15:30	30.83	500	8	15	7.06	0.63	NM	1.24	41.5	8.77	NM	Clear, no odor
15:35	30.83	500	9	15	7.06	0.63	NM	1.26	41.7	8.97	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-08-WG-20250115		Emma Portell	01/31/2025 21:20
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-09
Well Permit No:

Date: 2025/01/15

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.17 (ft)	**Reference Elevation** 366.84 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 34.84 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 63.17 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 500 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Emma Portell: Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 4.62 (gal) / 6 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
13:20	34.84	500	1	14.9	7.28	0.536	NM	2.35	47.6	133	NM	Cloudy, no odor
13:25	34.84	500	2	14.7	7.31	0.538	NM	1.45	40.8	35.3	NM	Cloudy, no odor
13:30	34.84	500	3	14.8	7.33	0.538	NM	1.27	39	22.9	NM	Clear, no odor
13:35	34.84	500	4	14.8	7.34	0.537	NM	1.24	38.5	19.8	NM	Clear, no odor
13:40	34.84	500	5	14.8	7.34	0.536	NM	1.23	38.3	20.6	NM	Clear, no odor
13:45	34.84	500	6	14.8	7.34	0.538	NM	1.23	37.9	19.4	NM	Clear, no odor

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-09-WG-20250115,DUP-002-WG-20250115		Emma Portell	01/31/2025 21:21
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-10D
Well Permit No:

Date: 2025/01/16

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 93.05 (ft)	**Reference Elevation** 359.41 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.37 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 98.05 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 250 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 86 - 96 (ft)
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 11.53 (gal) / 4.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
10:05	27.37	250	0.5	13.9	6.99	0.66	NM	3.7	49.1	36.4	NM	Clear, no odor
10:10	27.37	250	1	14.3	7.1	0.68	NM	2.75	45.3	658	NM	Cloudy, no odor
10:15	27.37	250	1.5	14.6	7.13	0.68	NM	2.47	43.6	258	NM	Cloudy, no odor
10:20	27.37	250	2	14.6	7.09	0.68	NM	2.2	44.9	194	NM	Cloudy, no odor
10:25	27.37	250	2.5	14.7	7.05	0.68	NM	2.25	43.5	186	NM	Cloudy, no odor
10:30	27.37	250	3	14.8	7.04	0.68	NM	1.9	42.9	177	NM	Cloudy, no odor
10:35	27.37	250	3.5	14.8	7.05	0.68	NM	1.93	43.6	179	NM	Cloudy, no odor
10:40	37.37	250	4	14.8	7.04	0.68	NM	1.91	42.7	184	NM	Cloudy, no odor
10:45	27.37	250	4.5	14.8	7.03	0.68	NM	1.91	42.9	169	NM	Cloudy, no odor

Sample ID(s): APW-10D-WG-20250116	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Emma Portell	01/31/2025 21:21

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-10S Well Permit No:	Date: 2025/01/16

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.71 (ft)	**Reference Elevation** 359.47 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 28.18 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 62.71 (ft)
Project Name 20240121-GWM	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** 2 (in) / 50 - 60 (ft)
Sampler Emma Portell; Marshall Arendell	**Volume of Water in Well / Total Volume Purged** 5.64 (gal) / 4 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
11:00	28.6	250	0.5	14.2	6.99	1.25	NM	1.92	14.1	1000	NM	Turbidity over range 1000+; cloudy, no odor
11:05	28.6	250	1	14.8	6.99	1.25	NM	1.99	0.3	404	NM	Cloudy, no odor
11:10	28.6	250	1.5	14.9	7	1.25	NM	1.98	-7.9	55.4	NM	Clear, no odor
11:15	28.6	450	2	15	7.01	1.25	NM	1.97	-11.7	29	NM	Clear, no odor
11:20	28.6	450	2.5	15	7.01	1.25	NM	1.95	-12.9	15.2	NM	Clear, no odor
11:25	28.6	450	3	15	7.01	1.25	NM	1.94	-13.1	8.03	NM	Clear, no odor
11:30	28.6	450	3.5	15	7	1.25	NM	1.95	-15.2	6.97	NM	Clear, no odor
11:35	28.6	450	4	15	7	1.25	NM	1.94	-15.1	7.11	NM	Clear, no odor

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-10S-WG-20250116		Emma Portell	01/31/2025 21:22
Analysis:			

2nd Quarter, 2025 - Low Flow Sampling Forms

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-1R | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 1030 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 50.90
Screen Interval: to
Initial Depth to Water (feet): 24.80
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-01R-WG-20250625 | Date/Time: 6/25/205; 1110
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1031			250	53.9	24.80	-	initial	6.93	293.7	20.5	4.88	265.5	420.0	Cloudy, no odor
1036			450	53.9	24.80	1	2.0	6.49	359.9	15.5	2.97	286.10	294.0	Cloudy, no odor
1041			400	53.9	24.80	1	3.0	6.51	389.4	16.8	2.62	277.90	173.0	Cloudy, no odor
1046			400	53.9	24.80	1	4.0	6.47	395.7	17.7	2.56	269.40	121.0	Cloudy, no odor
1051			400	53.9	24.80	1	5.0	6.48	403.7	17.9	2.51	263.90	74.8	Cloudy, no odor
1056			400	53.9	24.80	1	6.0	6.49	409.7	17.8	2.45	261.30	45.3	Cloudy, no odor
1101			400	53.9	24.80	1	7.0	6.49	412.3	17.9	2.39	259.90	48.1	Cloudy, no odor
1106			400	53.9	24.80	1	8.0	6.49	414.4	17.9	2.38	258.3	47.6	Cloudy, no odor

Comments/Well Condition: Final DTW: 24.80

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-2 | [ ] Development [X] Purging | Date: 6/26/2025 | Time Start: 0830 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 58.15
Screen Interval: to
Initial Depth to Water (feet): 22.20
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-02-WG-20250626 | Date/Time: 6/26/25; 0930
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
0835			450	53.15	22.20	-	initial	7.17	980	18.6	2.20	140.7	256.0	Slightly cloudy, rotten egg-like odor
0840			450	53.15	29.80	1	1.0	7.15	956	17.3	0.31	-5.4	75.7	Slightly cloudy, rotten egg-like odor
0845			450	53.15	33.56	1	2.0	7.08	954	17.6	0.27	-17.8	84.4	Slightly cloudy, rotten egg-like odor
0850			450	53.15	36.61	1	3.0	7.08	960	18.2	0.27	-32.7	104.0	Slightly cloudy, rotten egg-like odor
0855			450	53.15	38.94	1	4.0	7.10	965	18.5	0.25	-54.0	102.0	Slightly cloudy, no odor
0900			450	53.15	40.80	1	5.0	7.12	970	18.9	0.23	-76.6	110.0	Slightly cloudy, no odor
0905			450	53.15	40.55	1	6.0	7.13	974	19.2	0.20	-92.0	113.0	Slightly cloudy, no odor
0910			450	53.15	41.95	1	7.0	7.15	977	19.3	0.17	-107.5	120	Slightly cloudy, no odor
0915			450	53.15	43.20	1	8.0	7.15	979	19.6	0.16	-111.9	125	Slightly cloudy, no odor
0920			450	53.15	41.65	1	9.0	7.16	982	19.7	0.15	-117.0	122	Slightly cloudy, no odor

Comments/Well Condition: Final DTW: 42.46

Signature (s): Emma Portell | Date: 6/26/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-3 | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 1145 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 59.70
Screen Interval: to
Initial Depth to Water (feet): 23.95
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-03-WG-20250625 | Date/Time: 6/25/25; 1220
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1149			500	54.7	23.95	-	initial	7.87	674	18.5	2.37	249.6	22.60	Clear, no odor
1154			500	54.7	23.95	1	1.0	8.02	681	16.9	0.40	199.7	14.40	Clear, no odor
1159			500	54.7	23.95	1	2.0	8.02	687	17.3	0.29	90.7	10.00	Clear, no odor
1204			500	54.7	23.95	1	3.0	8.02	689	17.5	0.24	-56.4	7.34	Clear, no odor
1209			500	54.7	23.95	1	4.0	8.02	690	17.5	0.20	-58.9	6.93	Clear, no odor
1214			500	54.7	23.95	1	5.0	8.03	692	17.4	0.17	-60.6	6.49	Clear, no odor

Comments/Well Condition: Final DTW: 23.95

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-4 | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 0743 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 60.39
Screen Interval: to
Initial Depth to Water (feet): 25.80
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-04-WG-20250625 | Date/Time: 6/25/25; 0815
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
0745			400	55.39	25.90	-	initial	7.16	503	19.2	7.05	230.7	49.5	Clear, no odor
0750			400	55.39	25.90	1	1.0	7.17	528	18.3	3.62	236.1	50.1	Clear, no odor
0755			400	55.39	25.90	1	2.0	7.18	576	17.0	0.62	238.1	61.5	Clear, no odor
0800			400	55.39	25.90	1	3.0	7.19	577	16.9	0.46	238.1	59.5	Clear, no odor
0805			400	55.39	25.90	1	4.0	7.18	578	17.0	0.40	238.5	56.9	Clear, no odor
0810			400	55.39	25.90	1	5.0	7.18	579	17.1	0.35	237.8	54.7	Clear, no odor

Comments/Well Condition: Final DTW: 25.90

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-5R | [ ] Development [X] Purging | Date: 6/26/2025 | Time Start: 0950 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 62.80
Screen Interval: to
Initial Depth to Water (feet): 22.58
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-05R-WG-20250626 | Date/Time: 6/26/25; 1045
Analysis:
QA/QC Samples: DUP-001-WG-20250626; 0001

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
0954			350	57.8	22.62	-	initial	7.47	637	23.3	6.00	114.1	81.2	Cloudy, no odor
959			350	57.8	22.62	1	1.0	7.43	657	18.5	3.70	54.70	975.0	Very turbid, no odor
1004			350	57.8	22.62	1	2.0	7.41	660	17.8	1.56	-23.00	619.0	Very turbid, no odor
1009			350	57.8	22.62	1	3.0	7.45	663	16.4	0.21	-91.00	264.0	Very turbid, no odor
1014			350	57.8	22.62	1	4.0	7.45	662	16.1	0.16	-115.50	79.8	Very turbid, no odor
1019			350	57.8	22.62	1	5.0	7.41	665	16.0	0.13	-126.10	51.6	Clear, no odor
1024			350	57.8	22.62	1	6.0	7.41	665	15.9	0.12	-130.80	28.7	Clear, no odor
1029			350	57.8	22.62	1	7.0	7.41	669	16.1	0.1	-135.9	16.1	Clear, no odor
1034			350	57.8	22.62	1	8.0	7.41	670	16	0.1	-138.3	15.1	Clear, no odor
1039			350	57.8	22.62	1	9.0	7.41	671	16.1	0.09	-139.9	14.8	Clear, no odor

Comments/Well Condition: Final DTW: 22.62

Signature (s): Emma Portell | Date: 6/26/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-6S | [ ] Development [X] Purging | Date: 6/24/2025 | Time Start: 1455 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 64.62
Screen Interval: to
Initial Depth to Water (feet): 21.89
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-06S-WG-20250624 | Date/Time: 6/24/25; 1545
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1457			150	59.62	21.89	-	initial	6.95	763	16.2	5.80	223.4	35.2	Clear, no odor - adjusted pump settings
1502			450	59.62	21.89	1	1.0	6.99	779	16.5	0.33	82.0	672	Gray, cloudy no odor
1507			450	59.62	21.89	1	2.0	7.05	778	17.3	0.23	-64.1	340	Gray, cloudy no odor
1512			450	59.62	21.89	1	3.0	7.06	780	19.1	0.22	-89.9	266	Gray, cloudy no odor
1517			450	59.62	21.89	1	4.0	7.08	776	16.6	0.20	-106.7	80.7	Gray, cloudy no odor
1522			450	59.62	21.89	1	5.0	7.07	775	15.4	0.13	-111.8	18.8	Gray, cloudy no odor
1527			450	59.62	21.89	1	6.0	7.08	773	16.4	0.12	-116.1	14.8	Clear, rotten egg-like odor
1532			450	59.62	21.89	1	7.0	7.08	786	16.8	0.13	-120.8	22.7	Clear, rotten egg-like odor
1537			450	59.62	21.89	1	8.0	7.08	784	16.6	0.13	-122.1	23.5	Clear, rotten egg-like odor
1542			450	59.62	21.89	1	9.0	7.08	781	16.8	0.13	-123.0	22.9	Clear, rotten egg-like odor

Comments/Well Condition: Final DTW: 21.89

Signature (s): Emma Portell | Date: 6/24/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-6D | [ ] Development [X] Purging | Date: 6/24/2025 | Time Start: 1614 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 156.44
Screen Interval: to
Initial Depth to Water (feet): 21.74
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-06D-WG-20250624 Date/Time: 9/5/1904
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1615			500	151.44	21.70	-	initial	7.18	716	17.9	3.53	128.2	19.6	Clear, no odor
1620			500	151.44	21.70	1	1.0	7.20	728	18.2	2.24	57.0	71.2	Clear, rotten egg-like odor
1625			500	151.44	21.70	1	2.0	7.21	741	17.8	1.85	-19.5	69.7	Clear, rotten egg-like odor
1630			500	151.44	21.70	1	3.0	7.22	743	17.3	1.18	-47.3	46.2	Clear, rotten egg-like odor
1635			400	151.44	21.70	1	4.0	7.22	744	17.0	0.99	-64.8	33.0	Clear, rotten egg-like odor
1640			400	151.44	21.70	1	5.0	7.22	744	17.0	0.81	-75.7	18.0	Clear, rotten egg-like odor
1645			400	151.44	21.70	1	6.0	7.22	742	16.9	0.72	-81.7	12.6	Clear, rotten egg-like odor
1650			400	151.44	21.70	1	7.0	7.22	740	16.8	0.58	-86.8	8.86	Clear, rotten egg-like odor
1655			400	151.44	21.70	1	8.0	7.22	747	16.9	0.49	-90.7	7.34	Clear, rotten egg-like odor
1700			400	151.44	21.70	1	9.0	7.22	746	16.9	0.48	-92.0	4.54	Clear, rotten egg-like odor
1705			400	151.44	21.70	1	10.0	7.22	746	16.9	0.46	-93.1	4.81	Clear, rotten egg-like odor

Comments/Well Condition: Final DTW: 21.75

Signature (s): Emma Portell | Date: 6/24/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-7 | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 1415 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 63.18
Screen Interval: to
Initial Depth to Water (feet): 19.05
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-07-WG-20250625 | Date/Time: 6/25/25; 1455
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1418			250	58.18	19.05	-	initial	7.25	1024	21.4	4.93	218.7	115.0	Clear, plastic-like odor
1423			250	58.18	19.05	1	1.0	6.74	1032	17.5	0.33	18.0	86.3	Clear, plastic-like odor
1428			250	58.18	19.05	1	2.0	6.74	1038	17.6	0.23	-38.1	51.9	Clear, plastic-like odor
1433			250	58.18	19.05	1	3.0	6.74	1040	17.9	0.18	-55.1	42.4	Clear, plastic-like odor
1438			250	58.18	19.05	1	4.0	6.74	1043	18.0	0.15	-63.7	19.7	Clear, plastic-like odor
1443			250	58.18	19.05	1	5.0	6.74	1043	18.0	0.13	-68.7	8.9	Clear, plastic/hydrocarbon-like odor
1448			250	58.18	19.05	1	6.0	6.74	1045	17.9	0.11	-72.7	5.6	Clear, plastic/hydrocarbon-like odor
1453			250	58.18	19.05	1	7.0	6.74	1046	18.0	0.10	-75.3	5.56	Clear, plastic/hydrocarbon-like odor

Comments/Well Condition: Finla DTW: 19.15

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-8 | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 1300 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 62.20
Screen Interval: to
Initial Depth to Water (feet): 21.05
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-08-WG-20250625 | Date/Time: 6/25/25; 1355
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1306			350	57.20	21.05	-	initial	7.09	624	15.7	0.54	170.7	504	Silty, turbid, no odor
1311			350	57.20	21.05	1	1.0	6.98	639	17.4	0.25	147.5	839	Silty, turbid, no odor
1316			350	57.20	21.05	1	2.0	6.92	633	18.6	0.17	128.0	627	Silty, turbid, no odor
1321			350	57.20	21.05	1	3.0	6.90	635	18.3	0.17	124.7	351	Silty, turbid, no odor
1326			350	57.20	21.05	1	4.0	6.91	637	18.6	0.15	117.8	240	Silty, turbid, no odor
1331			350	57.20	21.05	1	5.0	6.92	640	18.6	0.13	114.1	85.5	Silty, turbid, no odor
1336			350	57.20	21.05	1	6.0	6.92	630	16.6	0.11	113.5	21.3	Clear, no odor
1341			350	57.20	21.05	1	7.0	6.92	632	17.0	0.10	112.6	9.42	Clear, no odor
1346			350	57.20	21.05	1	8.0	6.92	630	16.7	0.09	112.4	8.15	Clear, no odor
1351			350	57.20	21.05	1	9.0	6.92	632	16.8	0.09	112.1	6.70	Clear, no odor

Final DTW: 21.05

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-9 | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 0900 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 63.10
Screen Interval: to
Initial Depth to Water (feet): 25.20
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-09-WG-20250625 | Date/Time: 6/25/25; 0945
Analysis:
QA/QC Samples: DUP-002-WG-20250625; 0002

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
0903			350	58.1	25.20	-	initial	7.47	494.9	16.1	1.49	237.9	173.0	Cloudy, no odor
0908			350	58.1	25.21	1	2.0	7.35	502	18.1	0.98	244.1	79.1	Cloudy, no odor
0913			350	58.1	25.21	1	3.0	7.33	512	18.3	0.78	244.9	61.1	Cloudy, no odor
0918			350	58.1	25.21	1	4.0	7.33	519	18.5	0.65	244.9	52.0	Cloudy, no odor
0923			350	58.1	25.21	1	5.0	7.32	524	18.5	0.49	244.4	40.4	Cloudy, no odor
0928			350	58.1	25.21	1	6.0	7.32	528	18.5	0.43	243.8	31.0	Cloudy, no odor
0933			350	58.1	25.21	1	7.0	7.32	532	18.5	0.37	242.7	33.7	Cloudy, no odor
0938			350	58.1	25.21	1	8.0	7.32	534	18.5	0.36	241.4	31.8	Cloudy, no odor

Comments/Well Condition: Final DTW: 25.21

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-10S | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 1645 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 62.90
Screen Interval: to
Initial Depth to Water (feet): 18.27
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-10S-WG-20250625 | Date/Time: 6/25/25; 1725
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1647			300	57.90	18.27	-	initial	6.97	1213	16.9	0.54	32.6	71.3	Clear, slight rotten egg-like odor
1652			300	57.90	18.27	1	1.0	6.95	1222	17.4	0.23	-85.8	920	Silty gray, no odor
1657			500	57.90	18.27	1	2.0	6.94	1217	15.8	0.15	-120.5	476	Silty gray, no odor - adjusted pump settings
1702			500	57.90	18.27	1	3.0	6.93	1220	15.9	0.12	-129.3	286	Silty gray, no odor
1707			500	57.90	18.27	1	4.0	6.93	1221	15.8	0.10	-133.3	168	Silty gray, no odor
1712			500	57.90	18.27	1	5.0	6.93	1222	15.8	0.09	-136.4	64.1	Silty gray, no odor
1717			500	57.90	18.27	1	6.0	6.93	1222	15.7	0.08	-137.8	62.6	Silty gray, no odor
1722			500	57.90	18.27	1	7.0	6.93	1222	15.7	0.07	-138.5	60.1	Silty gray, no odor

Comments/Well Condition: Final DTW: 18.27

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-10D | [ ] Development [X] Purging | Date: 6/25/2025 | Time Start: 1534 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q2 2025 | Project Manager/Samplers: E. Portell / C. Lowell | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 2

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 98.93
Screen Interval: to
Initial Depth to Water (feet): 17.66
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-10D-WG-20250625 | Date/Time: 6/25/25; 1620
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1535			300	93.93	17.66	-	initial	7.39	579	18.7	2.36	151.3	65.4	Clear, no odor
1540			300	93.93	17.66	1	1.0	7.02	676	18.2	0.46	75.70	352	Cloudy, no odor
1545			300	93.93	17.66	1	2.0	6.99	688	18.5	0.35	58.40	181	Clear, no odor
1550			300	93.93	17.66	1	3.0	6.99	691	18.8	0.31	55.30	176	Cloudy, no odor
1555			300	93.93	17.66	1	4.0	6.99	690	16.4	0.16	55.50	132	Cloudy, no odor
1600			300	93.93	17.66	1	5.0	6.99	691	16.2	0.13	55.90	116	Cloudy, no odor
1605			300	93.93	17.66	1	6.0	6.99	691	16.1	0.12	55.90	65.8	Cloudy, no odor
1610			300	93.93	17.66	1	7.0	6.99	693	16.1	0.10	54.8	60.0	Cloudy, no odor
1615			300	93.93	17.66	1	8.0	6.99	694	16.2	0.10	53.2	59.9	Cloudy, no odor

Comments/Well Condition: Final DTW: 17.66

Signature (s): Emma Portell | Date: 6/25/2025 | Reviewer: | Date:

3rd Quarter, 2025 - Low Flow Sampling Forms

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-01R
Well Permit No:

Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.2 (ft)	**Reference Elevation** 366.82 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.61 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 58.2 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 350 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 48.3 - 58.3 ()
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 2.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
14:30	27.61	350	0	17.1	6.11	274.6	NM	5.3	498.8	328	NM	
14:35	27.61	350	0.25	17	6.05	286.6	NM	3.69	568.2	245	NM	
14:40	27.61	350	0.5	17	5.93	299.7	NM	3.2	606.6	172	NM	
14:45	27.61	350	0.75	17.1	6.24	320.7	NM	2.73	636.8	106	NM	
14:50	27.61	350	1	17	6.12	336.1	NM	2.43	653.3	65	NM	
14:55	27.61	350	1.25	17.1	6.19	345.1	NM	2.28	662.8	44	NM	
15:00	27.61	350	1.5	17	6.19	351	NM	2.24	672.4	37.1	NM	
15:05	27.61	350	1.75	17	6.21	355.2	NM	2.16	685.1	30.6	NM	
15:10	27.61	350	2	16.8	6.2	360.6	NM	2.03	697	30.8	NM	
15:15	27.61	350	2.25	16.9	6.28	363.7	NM	2.06	704.1	31.5	NM	
15:20	27.61	350	2.5	16.9	6.24	364.5	NM	2.08	706.8	30.5	NM	

Sample ID(s): APW-01R-WG-20250904	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell	09/09/2025 15:26

Low Flow Groundwater Sampling Field Data Form

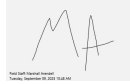
Well ID: APW-02
Well Permit No:

Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 53.05 (ft)	**Reference Elevation** 364.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 25.52 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 58.05 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 200 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 47.2 - 57.2 ()
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 0.6 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
12:55	25.52	200	0	18.8	7.02	910	NM	3	500	183	NM	
13:00	27.93	200	0.1	18.7	7.04	912	NM	1.14	474	72.1	NM	
13:05	30.01	200	0.2	18.6	7.03	919	NM	0.45	410	82.4	NM	
13:10	32.11	200	0.3	18.5	7.02	921	NM	0.44	406	79.6	NM	
13:15	33.9	200	0.4	21.3	7.02	930	NM	0.43	327	73	NM	
13:20	35.56	200	0.5	21.4	7.02	942	NM	0.42	322	76.2	NM	
13:25	37.48	200	0.6	21.5	7.02	945	NM	0.41	319	78.6	NM	

Sample ID(s): APW-02-WG-20250904	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	09/09/2025 15:48

Low Flow Groundwater Sampling Field Data Form

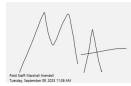
Well ID: APW-03
Well Permit No:

Date: 2025/09/03

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.25 (ft)	**Reference Elevation** 365.79 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.8 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 60.25 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 45.7 - 55.7 ()
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 0.75 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
13:15	27.8	400	0	17.4	7.61	506	NM	6.24	324	28.9	NM	
13:20	27.8	400	0.25	18.7	7.68	579	NM	4.8	319	18.8	NM	
13:25	27.8	400	0.5	19	7.76	575	NM	4.52	468	9.13	NM	
13:30	27.8	400	0.75	19	7.79	567	NM	2.9	500.7	8.17	NM	
13:35	27.8	400	1	18.8	7.82	562	NM	1.93	476.8	8.1	NM	
13:40	27.8	400	1.25	18.7	7.81	559	NM	1.66	442	7.27	NM	
13:45	27.8	400	1.5	18.3	7.81	554	NM	1.34	433	5.5	NM	Paused sampling after reading to troubleshoot equipment issues. Swapped monsoon pump.
14:15	27.8	400	1.75	18.6	7.81	600	NM	2.67	405	8.12	NM	
14:20	27.8	400	2	18.5	7.81	602	NM	2.65	409	7.63	NM	
14:25	27.8	400	2.25	18.4	7.81	605	NM	2.64	411	7.01	NM	

Sample ID(s): APW-03-WG-20250903	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	09/09/2025 16:06

Low Flow Groundwater Sampling Field Data Form

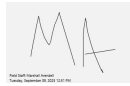
Well ID: APW-04
Well Permit No:

Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 55.61 (ft)	**Reference Elevation** 367.44 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.22 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 60.61 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 300 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 45.7 - 55.7 ()
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 1.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
07:35	27.22	300	0	15.3	6.98	467	NM	6.05	532	21.3	NM	
07:40	27.22	300	0.25	15.4	6.92	468	NM	4.13	546	25.8	NM	
07:45	27.22	300	0.5	15.6	7	486	NM	3.02	551	12.8	NM	
07:50	27.22	300	0.75	15.6	7.04	496	NM	2.02	550	15.8	NM	
07:55	27.22	300	1	15.6	7.06	500	NM	1.37	548	22.3	NM	
08:00	27.22	300	1.25	15.6	7.07	502	NM	1.33	546	21.2	NM	
08:05	27.22	300	1.5	15.7	7.07	504	NM	1.29	547	21.7	NM	

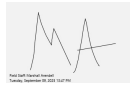
Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-04-WG-20250904		Marshall Arendell 	09/09/2025 17:51
Analysis:			

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-05R Well Permit No:	Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.83 (ft)	**Reference Elevation** ()
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 26.6 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 62.83 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** (in) / - ()
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
11:35	26.6	450	0	16.4	5.72	595	NM	6.15	436	543	NM	
11:40	26.6	450	0.5	16.2	7.36	592	NM	3.14	412	350	NM	
11:45	26.6	450	1	16.5	7.39	595	NM	1.02	315	125	NM	
11:50	26.6	450	1.5	16.4	7.36	596	NM	0.62	230	77.1	NM	
11:55	26.6	450	2	16.3	7.36	595	NM	0.52	185	59.8	NM	
12:00	26.6	450	2.5	16.4	7.33	594	NM	0.44	140	43.1	NM	
12:05	26.6	450	3	16.5	7.33	593	NM	0.4	91.6	27.7	NM	
12:10	26.6	450	3.5	16.6	7.32	601	NM	0.36	50.6	24.3	NM	
12:15	26.6	450	4	16.4	7.32	597	NM	0.37	-1.2	17.5	NM	
12:20	26.6	450	4.5	16.5	7.31	597	NM	0.34	-7.3	16.9	NM	
12:25	26.6	450	5	16.6	7.32	595	NM	0.34	-10.9	16.3	NM	

Sample ID(s): APW-05R-WG-20250904	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	09/09/2025 18:47

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06D
Well Permit No:

Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 149.08 (ft)	**Reference Elevation** 363.69 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 25.21 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 154.08 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 140 - 150 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 2.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
09:00	25.22	400	0	16.5	7.09	595	NM	5.84	451	5.72	NM	
09:05	25.22	400	0.25	16.4	7.14	593	NM	2.69	283	6.52	NM	
09:10	25.22	400	0.5	16.4	7.15	594	NM	2.04	173	5.54	NM	
09:15	25.22	400	0.75	16.5	7.15	595	NM	1.75	123	4.74	NM	
09:20	25.22	400	1	16.8	7.15	599	NM	1.48	64.7	8.27	NM	
09:25	25.22	400	1.25	17.1	7.21	602	NM	1.47	36	5.21	NM	
09:30	25.22	400	1.5	17.4	7.21	604	NM	1.5	15.1	3.62	NM	
09:35	25.22	400	1.75	17.8	7.21	651	NM	1.46	-8.8	4.96	NM	
09:40	25.22	400	2	18	7.21	651	NM	1.36	-14.4	4.35	NM	
09:45	25.22	400	2.25	18.1	7.22	652	NM	1.38	-19.2	4.92	NM	
09:50	25.22	400	2.5	18.2	7.22	653	NM	1.37	-21.7	3.78	NM	

Sample ID(s): APW-06D-WG-20250904	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell	09/09/2025 20:08

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-06S
Well Permit No:

Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.81 (ft)	**Reference Elevation** 363.51 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 25.77 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 63.81 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 400 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 50 - 60 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 2 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
10:10	25.77	400	0	16.5	7	577	NM	7.99	323	264	NM	
10:15	25.77	400	0.25	17.8	7.05	591	NM	1.64	137	254	NM	
10:20	25.77	400	0.5	18.3	7.06	595	NM	1.35	92	217	NM	
10:25	25.77	400	0.75	18.7	7.07	636	NM	1.15	36	162	NM	
10:30	25.77	400	1	19	7.08	639	NM	1.02	-27	126	NM	
10:35	25.77	400	1.25	19.3	7.09	641	NM	0.94	-54	47	NM	
10:40	25.77	400	1.5	19.6	7.09	649	NM	0.49	-79.1	39.91	NM	
10:45	25.77	400	1.75	19.7	7.09	652	NM	0.48	-81.9	39.11	NM	
10:50	25.77	400	1.75	19.8	7.09	655	NM	0.46	-82.2	38.25	NM	

Sample ID(s): APW-06S-WG-20250904	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell	09/09/2025 20:27

Low Flow Groundwater Sampling Field Data Form

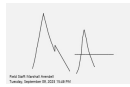
Well ID: APW-07
Well Permit No:

Date: 2025/09/04

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 59.3 (ft)	**Reference Elevation** 360.61 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 24.8 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 64.3 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 50 - 60 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 4.5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
15:45	24.8	450	0	16	6.65	997	NM	2.74	583	45.1	NM	
15:50	24.8	450	0.5	16.2	6.63	998	NM	1.63	561	51	NM	
15:55	24.8	450	1	16.7	6.62	1000	NM	1.17	535	62.2	NM	
16:00	24.8	450	1.5	15.5	6.62	1002	NM	0.65	447	50.1	NM	
16:05	24.8	450	2	15.4	6.62	1004	NM	0.47	405	25.4	NM	
16:10	24.8	450	2.5	15.3	6.62	1009	NM	0.41	386	11.7	NM	
16:15	24.8	450	3	15.2	6.64	1024	NM	0.34	360	9.9	NM	
16:20	24.8	450	3.5	15.2	6.63	1031	NM	0.33	343	7.08	NM	
16:25	24.8	450	4	15.2	6.63	1033	NM	0.32	340	7.15	NM	
16:30	24.8	450	4.5	15.2	6.63	1035	NM	0.31	337	8.77	NM	

Sample ID(s): APW-07-WG-20250904	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	09/09/2025 20:46

Low Flow Groundwater Sampling Field Data Form	Well ID: APW-08 Well Permit No:	Date: 2025/09/05

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.85 (ft)	**Reference Elevation** 362.71 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 25.09 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 62.85 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 50 - 60 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 5 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
07:40	25.09	450	0	15.2	6.98	550	NM	5.1	591	1000	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
07:45	25.09	450	0.5	15.5	6.89	548	NM	3.23	606	552	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
07:50	25.09	450	1	15.6	6.89	549	NM	2.15	619	208	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
07:55	25.09	450	1.5	15.6	6.89	551	NM	1.53	623	122	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:00	25.09	450	2	15.6	6.9	553	NM	1.07	634	82.2	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:05	25.09	450	2.5	15.6	6.9	554	NM	0.76	644	47.9	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:10	25.09	450	3	15.7	6.9	554	NM	0.49	650	32.3	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:15	25.09	450	3.5	15.6	6.9	554	NM	0.42	656	19.1	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:20	25.09	450	4	15.6	6.9	554	NM	0.34	662	12.7	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:25	25.09	450	4.5	15.6	6.9	555	NM	0.3	667	12.5	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.
08:30	25.09	450	5	15.6	6.9	556	NM	0.28	670	12	NM	turbidity was over 1000. Received "over-range" reading from HACH meter.

Sample ID(s):	Additional Comments	SAMPLER NAME AND SIGNATURE	Date Time
APW-08-WG-20250905		Marshall Arendell	09/09/2025 21:00
Analysis:			

Low Flow Groundwater Sampling Field Data Form

Well ID: APW-09
Well Permit No:

Date: 2025/09/05

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 58.4 (ft)	**Reference Elevation** 366.84 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 27.88 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 63.4 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 475 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 50 - 60 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 3 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
08:55	27.88	475	0	15.9	7.27	453	NM	5.56	665	389	NM	
09:00	27.88	475	0.5	15.5	7.24	483	NM	1.59	683	39.2	NM	
09:05	27.88	475	1	15.5	7.22	496	NM	0.78	693	7.5	NM	
09:10	27.88	475	1.5	15.6	7.2	496	NM	0.64	698	6.8	NM	
09:15	27.88	475	2	15.6	7.2	496	NM	0.47	707	4.14	NM	
09:20	27.88	475	2.5	15.6	7.19	495	NM	0.42	711	4.02	NM	
09:25	27.88	475	3	15.6	7.19	495	NM	0.41	715	4.92	NM	

Sample ID(s):	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
APW-09-WG-20250905		Marshall Arendell	09/09/2025 21:11
Analysis:			

Low Flow Groundwater Sampling Field Data Form

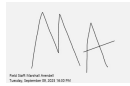
Well ID: APW-10D
Well Permit No:

Date: 2025/09/03

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 93.1 (ft)	**Reference Elevation** 359.41 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 20.8 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 98.1 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 86 - 96 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 3 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
15:15	20.8	450	0	16.6	7.01	623	NM	16.02	383	17.6	NM	
15:20	20.8	450	0.5	15.9	6.98	525	NM	2.74	346	17	NM	
15:25	20.8	450	1	15.9	6.95	497	NM	1.23	265	16.1	NM	
15:30	20.8	450	1.5	15.9	6.93	496	NM	0.49	109	17.4	NM	
15:35	20.8	450	2	16	6.96	499	NM	0.48	78	16.6	NM	
15:40	20.8	450	2.5	16.1	6.95	501	NM	0.46	76	16.5	NM	
15:45	20.8	450	3	16.1	6.94	503	NM	0.44	79	16.6	NM	

Sample ID(s): APW-10D-WG-20250903	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	09/09/2025 21:30

Low Flow Groundwater Sampling Field Data Form

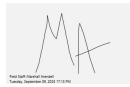
Well ID: APW-10S
Well Permit No:

Date: 2025/09/03

Site ID GTEC-GRAND-TOWER	**Purge Method / Pump Intake Depth** Low_Flow / 57.76 (ft)	**Reference Elevation** 359.47 (ft)
Site Address 1820 Power Plant Road, Grand Tower, US-IL	**Purge Equipment** NA	**Depth to Water / Free Product** 21 (ft) / None
Project Number 0761817	**Sample Equipment** NA	**Total Well Depth** 62.76 (ft)
Project Name 20250901-GWMonitor	**Average Purge Rate** 450 (mL/min)	**Well Diameter / Well Screen Interval** (in) / 50 - 60 (ft)
Sampler marshall arendell	**Volume of Water in Well / Total Volume Purged** (gal) / 3 (gal)	**Well Construction**

Well Head Vapor Measurements
PID: NA; FID: NA; CO: NA; CO2: NA; O2: NA; CH4: NA; H2S: NA

Time	DTW (ft)	Flow Rate (mL/min)	Purge Volume (gal)	Temperature (C) ±3%	pH ±0.1pH units	Specific Conductivity (uS/cm) ±3%	Total Conductivity (NA)	Dissolved Oxygen (mg/L) ±10%	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	Total Dissolved Solids(NA)	Comments
16:10	21	450	0	16.2	6.85	987	NM	8.54	-5.7	760	NM	
16:15	21	450	0.5	16.2	6.68	997	NM	1.71	-73.6	203	NM	
16:20	21	450	1	16.1	6.87	1000	NM	0.99	-98.3	84.2	NM	
16:25	21	450	1.5	16	6.87	1010	NM	0.73	-108.8	29.8	NM	
16:30	21	450	2	16.1	6.86	1014	NM	0.49	-116.6	9.21	NM	
16:35	21	450	2.5	16.1	6.86	1025	NM	0.44	-119.1	7.26	NM	
16:40	21	450	3	16	6.85	1022	NM	0.41	-120.6	5.22	NM	

Sample ID(s): APW-10S-WG-20250903	**Additional Comments**	**SAMPLER NAME AND SIGNATURE**	**Date Time**
Analysis:		Marshall Arendell 	09/09/2025 22:13

4th Quarter, 2025 - Low Flow Sampling Forms

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-1R | [ ] Development [X] Purging | Date: 11/20/2025 | Time Start: 1053 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 59.19
Screen Interval: to
Initial Depth to Water (feet): 35.88
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-01R-WG-20251120 | Date/Time: 11/20/25 / 1120
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1053			500	54.19	35.92	-	initial	6.32	427.6	14.5	13.60	51.7	230.0	Cloudy, no odor
1056			500	54.19	35.92	0.25	0.3	6.33	463.9	15.5	6.90	44.00	216.0	Cloudy, no odor
1059			500	54.19	35.92	0.25	0.5	6.38	497.9	15.7	3.10	39.00	175.0	Cloudy, no odor
1103			500	54.19	35.92	0.25	0.8	6.44	523.3	15.8	1.70	32.60	121.0	Cloudy, no odor
1106			500	54.19	35.92	0.25	1.0	6.44	527.9	15.8	1.60	32.00	48.8	Cloudy, no odor
1109			500	54.19	35.92	0.25	1.3	6.47	535.3	15.8	1.50	29.50	49.1	Clear, no odor
1112			500	54.19	35.92	0.25	1.5	6.47	542.6	15.8	1.40	28.50	48.2	Clear, no odor
1115			500	54.19	35.92	0.25	1.8	6.50	547.1	15.8	1.4	28.1	47.8	Clear, no odor

Comments/Well Condition: Final DTW: 35.92

Signature (s) mdawid | Date 11/20/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-2 | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1335 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 57.70
Screen Interval: to
Initial Depth to Water (feet): 34.10
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-02-WG-20251119 | Date/Time: 11/19/25 / 1355
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1335			200	52.7	38.90	-	initial	7.36	1010	14.3	0.90	-11.9	88.0	Clear, rotten egg-like odor
1338			200	52.7	40.65	0.1	0.1	7.28	1043	15.7	0.10	-47.7	71.9	Clear, rotten egg-like odor
1341			200	52.7	41.46	0.1	0.2	7.29	1040	15.8	0.10	-50.3	74.2	Clear, rotten egg-like odor
1344			200	52.7	41.90	0.1	0.3	7.27	1039	15.8	0.30	-52.3	73.4	Clear, rotten egg-like odor
1347			200	52.7	42.91	0.1	0.4	7.29	1035	16.3	0.10	-54.5	73.7	Clear, rotten egg-like odor
1350			200	52.7	43.30	0.1	0.5	7.28	1034	16.4	0.10	-55.4	72.4	Clear, rotten egg-like odor
1353			200	52.7	43.45	0.1	0.6	7.29	1036	16.5	0.10	-55.7	72.0	Clear, rotten egg-like odor

Comments/Well Condition: Final DTW: 43.5

Signature (s): Matt Arendell | Date: 11/20/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-3 | [ ] Development [X] Purging | Date: 11/20/2025 | Time Start: 0915 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 59.41
Screen Interval: to
Initial Depth to Water (feet): 35.00
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-03-WG-20251120 | Date/Time: 11/20/25 / 0940
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
0917			400	54.41	35.00	-	initial	8.16	687	13.8	1.00	-16.1	97.60	Clear, no odor
920			400	54.41	36.00	0.5	0.5	8.16	696	14.6	0.70	-19.9	87.20	Clear, no odor
923			400	54.41	37.00	0.5	1.0	8.12	686	15.0	0.80	-19.9	39.50	Clear, no odor
926			400	54.41	38.00	0.5	1.5	8.15	686	15.1	0.80	-22.7	23.20	Clear, no odor
929			400	54.41	39.00	0.5	2.0	8.15	689	15.2	0.60	-23.6	13.40	Clear, no odor
932			400	54.41	40.00	0.5	2.5	8.14	691	15.2	0.50	-23.6	14.00	Clear, no odor
935			400	54.41	41.00	0.5	3.0	8.12	694.000	15.2	0.50	-23.00	12.6	Clear, no odor

Comments/Well Condition: Final DTW: 35.0

Signature (s) | Date 11/20/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-4 | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1626 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 60.65
Screen Interval: to
Initial Depth to Water (feet): 36.60
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-04-WG-20251119 | Date/Time: 11/19/25; 1650
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1626			300	55.65	36.65	-	initial	7.28	611	14.6	1.10	10.9	39.7	Clear, no odor
1629			300	55.65	36.65	0.25	0.3	7.22	611	14.9	0.60	9.9	101.0	Cloudy, no odor
1632			300	55.65	36.65	0.25	0.5	7.21	631	15.4	0.50	7.6	87.1	Cloudy, no odor
1635			300	55.65	36.65	0.25	0.8	7.20	639	15.5	0.50	6.6	70.5	Clear, no odor
1638			300	55.65	36.65	0.25	1.0	7.21	661	15.5	0.40	5.3	56.0	Clear, no odor
1641			300	55.65	36.65	0.25	1.3	7.21	662	15.6	0.40	4.4	53.4	Clear, no odor
1644			300	55.65	36.65	0.25	1.5	7.21	663.000	15.6	0.40	4.20	51.3	Clear, no odor

Comments/Well Condition: Final DTW: 36.65

Signature (s) mdawid | Date 11/19/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-5R | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1238 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 62.75
Screen Interval: to
Initial Depth to Water (feet): 34.21
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-05R-WG-20251119 | Date/Time: 11/19/25 / 1310
Analysis:
QA/QC Samples: DUP-001-WG-20251119 0001

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1238			500	57.75	34.21	-	initial	7.39	936	15.0	0.20	-23.5	522.0	Cloudy, rotten egg
1241			500	57.75	34.21	0.25	0.3	7.43	919	15.3	0.10	-35.70	464.0	Cloudy, rotten egg
1244			450	57.75	34.21	0.25	0.5	7.44	929	15.9	0.10	-46.00	208.0	Cloudy, rotten egg
1247			450	57.75	34.21	0.25	0.8	7.44	939	16.2	3.70	-54.30	130.0	Cloudy, rotten egg
1250			450	57.75	34.21	0.25	1.0	7.44	949	16.3	2.70	-58.50	90.2	Cloudy, rotten egg
1253			450	57.75	34.21	0.25	1.3	7.44	954	16.3	1.70	-62.30	48.2	Clear; rotten egg
1256			450	57.75	34.21	0.25	1.5	7.44	957	16.4	1.50	-65.40	51.1	Clear, rotten egg
1259			450	57.75	34.21	0.25	1.8	7.45	961	16.4	0.5	-69.2	34.5	Clear; rotten egg
1301			450	57.75	34.21	0.25	2.0	7.45	962	16.4	0.5	-69.6	33.3	Clear, rotten egg
1304			450	57.75	34.21	0.25	2.3	7.44	962	16.4	0.5	-69.3	32.8	Clear; rotten egg

Comments/Well Condition: Final DTW: 22.62

Signature (s) mdawid | Date 11/19/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-6S | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1140 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 63.72
Screen Interval: to
Initial Depth to Water (feet): 33.42
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-06S-WG-20251119 | Date/Time: 11/19/25 / 1205
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1140			500	58.72	33.42	-	initial	7.11	959	14.5	1.10	-29.9	50.9	Cloudy, no odor
1143			500	58.72	33.42	0.25	0.3	7.15	975	14.6	0.90	-42.7	118	Cloudy, no odor
1146			500	58.72	33.42	0.25	0.5	7.20	996	14.9	0.70	-53.9	205	Cloudy, no odor
1149			500	58.72	33.42	0.25	0.8	7.22	999	1.5	0.80	-60.1	178	Cloudy, no odor
1152			500	58.72	33.42	0.25	1.0	7.23	1002	15.5	0.60	-65.5	118.0	Cloudy, no odor
1155			500	58.72	33.42	0.25	1.3	7.23	1001	16.1	0.60	-67.8	86.9	Clear, no odor
1158			500	58.72	33.42	0.25	1.5	7.23	1001	16.5	0.60	-71.4	88.0	Clear, no odor
1202			500	58.72	33.42	0.25	1.8	7.23	1002	16.6	0.60	-72.6	87	Clear, no odor

Comments/Well Condition: Final DTW: 33.45

Signature (s) mdawid | Date 11/19/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-6D | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1055 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 156.44
Screen Interval: to
Initial Depth to Water (feet): 21.74
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-06D-WG-20251119 | Date/Time: 11/19/2025
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1055			400	149.55	33.34	-	initial	7.28	770	14.8	61.00	-15.3	4.8	Clear, rotten egg-like odor
1058			400	149.55	33.34	0.25	0.3	7.28	776	14.8	43.00	-19.0	4.5	Clear, rotten egg-like odor
1101			400	149.55	33.34	0.25	0.5	7.28	766	14.9	28.00	-23.6	2.0	Clear, rotten egg-like odor
1104			400	149.55	33.34	0.25	0.8	7.29	766	15.0	22.00	-27.0	1.7	Clear, rotten egg-like odor
1107			400	149.55	33.34	0.25	1.0	7.30	765	15.1	15.00	-30.0	1.8	Clear, rotten egg-like odor
1110			400	149.55	33.34	0.25	1.3	7.31	770	15.3	1.20	-34.1	1.2	Clear, rotten egg-like odor
1113			400	149.55	33.34	0.25	1.5	7.31	769	15.3	1.30	-35.7	1.2	Clear, rotten egg-like odor
1116			400	149.55	33.34	0.25	1.8	7.31	766	15.3	1.4	-37.5	1.12	Clear, rotten egg-like odor

Comments/Well Condition: From 1055 to 1107 DO reading in %; from 1110 on in mg/L. Final DTW: 21.75

Signature (s) MDawid | Date 11/19/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-7 | [ ] Development [X] Purging | Date: 11/20/2025 | Time Start: 0820 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 63.18
Screen Interval: to
Initial Depth to Water (feet): 19.05
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-07-WG-20251120 | Date/Time: 11/20/25 / 0845
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
0820			400	58.18	30.51	-	initial	6.87	1216	14.1	11.10	13.5	57.8	Clear, no odor
823			400	58.18	30.51	0.5	0.5	6.91	1210	14.9	3.00	3.9	56.8	Clear; rotten egg
0826			400	58.18	30.51	0.5	1.0	6.93	1228	15.2	2.70	-11.4	38.9	Clear, rotten egg
829			400	58.18	30.51	0.5	1.5	6.94	1249	15.2	3.60	-13.8	18.2	Clear; rotten egg
0832			400	58.18	30.51	0.5	2.0	6.92	1238	15.6	3.00	-15.9	15.9	Clear, rotten egg
835			400	58.18	30.51	0.5	2.5	6.94	1235	15.6	2.80	-15.8	16.0	Clear; rotten egg
0838			400	58.18	30.51	0.5	3.0	6.91	1231	15.6	2.60	-15.1	15.5	Clear, rotten egg

Comments/Well Condition: Finla DTW: 30.51

Signature (s) mdawid | Date 11/20/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-8 | [ ] Development [X] Purging | Date: 11/20/2025 | Time Start: 1005 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 63.60
Screen Interval: to
Initial Depth to Water (feet): 35.45
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-08-WG-20251120 | Date/Time: 11/20/25 @1020
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1006			500	58.60	31.70	-	initial	7.14	798	14.7	0.40	-8.1	418	Cloudy, no odor
1009			500	58.60	31.70	0.5	0.5	7.13	788	15.0	0.30	-9.2	296	Cloudy, no odor
1012			500	58.60	31.70	0.5	1.0	7.12	781	15.3	0.30	-10.5	181	Cloudy, no odor
1015			500	58.60	31.70	0.5	1.5	7.12	788	15.4	0.30	-8.8	173	Cloudy, no odor
1018			500	58.60	31.70	0.5	2.0	7.12	779	15.4	0.30	-9.9	172	Cloudy, no odor

Final DTW: 31.70

Signature (s): Matt Arendell | Date: 11/20/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-9 | [ ] Development [X] Purging | Date: 11/20/2025 | Time Start: 1146 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 63.12
Screen Interval: to
Initial Depth to Water (feet): 35.64
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-09-WG-20251120 | Date/Time: 11/20/25 / 1210
Analysis:
QA/QC Samples: DUP-002-WG-202511205; 0002

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1146			400	58.12	35.65	-	initial	7.34	558.9	14.1	1.40	18.1	97.6	Clear, no odor
1149			400	58.12	35.65	0.25	0.3	7.39	552	14.8	0.90	13.5	94.8	Clear, no odor
1152			400	58.12	35.65	0.25	0.5	7.30	561	15.1	0.60	11.2	53.0	Clear, no odor
1155			400	58.12	35.65	0.25	0.8	7.40	566	15.1	0.50	9.5	42.4	Clear, no odor
1158			400	58.12	35.65	0.25	1.0	7.41	558	15.2	0.50	8.4	23.2	Clear, no odor
1201			400	58.12	35.65	0.25	1.3	7.41	565	15.2	0.50	7.6	22.9	Clear, no odor
1204			400	58.12	35.65	0.25	1.5	7.41	567	15.2	0.50	6.3	23.7	Clear, no odor

Comments/Well Condition: Final DTW: 35.65

Signature (s) mdawid | Date 11/20/2025 | Reviewer | Date

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-10S | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1538 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 62.64
Screen Interval: to
Initial Depth to Water (feet): 29.42
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-10S-WG-20251119 | Date/Time: 11/19/25 / 1600
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1538			450	57.64	30.00	-	initial	7.07	1292	14.5	1.00	-1.7	936.0	Cloudy, slight rotten egg
1541			450	57.64	30.00	0.5	0.5	7.12	1296	15.0	0.40	-50.7	377	Cloudy, slight rotten egg
1544			450	57.64	30.00	0.5	1.0	7.12	1297	15.5	0.40	-66.7	105	Cloudy, slight rotten egg
1547			450	57.64	30.00	0.5	1.5	7.13	1297	15.7	0.30	-73.6	46	Clear, slight rotten egg
1550			450	57.64	30.00	0.5	2.0	7.12	1298	15.7	0.30	-77.6	46	Clear, slight rotten egg
1553			450	57.64	30.00	0.5	2.5	7.12	1298	15.8	0.30	-78.6	44.0	Clear, slight rotten egg

Comments/Well Condition: Final DTW: 30.0

Signature (s): mdawid | Date: 11/19/2025 | Reviewer: | Date:

Well Development/Purging Data Sheet

Well/Piezometer Number: APW-10D | [ ] Development [X] Purging | Date: 11/19/2025 | Time Start: 1509 | Page 1 of 1

Project Name: GTEC Post Closure Monitoring Q4 2025 | Project Manager/Samplers: M. Arendell & M. Dawid | Project No.: 0761817

Client Company: Grand Tower Energy Center | Project/Task No.: 4

Site Name: GTEC Landfill | Site Address: 1820 Power Plant Rd Grand Tower, Illinois 62942

Development Criteria

- [ ] 3 Casing Volumes of Water Removal
- [X] Stabilization of Indicator Parameters
- [ ] Other

Water Volume Calculation

(2"-.1632 4"-.6524 6"-1.5)

Total Depth of Well (feet): 98.00
Screen Interval: to
Initial Depth to Water (feet): 27.96
Height (h) of Water Column in Well (feet):
Diameter (inches): Well 2" Gravel Pack

Item	Water Vol in Well	Purge Mult.	Purge/Dev Volume (Gal)
Well Casing			
Gravel Pack			
Drilling Fluids			
Total			

Water Quality Instrument

Calibration

- [X] YSI — Pro Plus
- [X] Solinst — Water Level Meter
- [X] Other: — HACH Turbidity Meter

Method of Purge/Development

Pump
- [X] Submersible (s)
- [ ] Peristaltic (p)
- [ ] Whale Pump (w)
- [ ] Other

Bailer
- [ ] Bottom Valve
- [ ] Double Check Valve
- [ ] Teflon
- [ ] Disposable

Water Management

- [X] Surface Discharge
- [ ] Containerize

Sample Information:

ID: APW-10D-WG-20251119 | Date/Time: 11/19/25 / 1530
Analysis:
QA/QC Samples: NA

Stabilization Data

Time	Purge Rate		Removal Rate (mL/min)	Intake Depth (feet)	Water Depth (feet)	Water Volume Removed (gallons)		pH	Sp. Cond (µS/cm)	Temp (°C)	DO (mg/L)	ORP (mV)	Turbidity (mV)	Comments
	Vol (ml)	Time(sec)	v/t*60			Increment	Cumulative							
1509			450	93	28.05	-	initial	7.17	695	14.5	1.40	15.2	236.0	Clear, no odor
1512			450	93	28.05	0.5	0.5	7.07	693	15.0	0.50	14.20	215	Clear, no odor
1515			450	93	28.05	0.5	1.0	7.06	694	15.2	0.50	12.70	183	Clear, no odor
1518			450	93	28.05	0.5	1.5	7.06	695	15.3	0.40	11.30	125	Clear, no odor
1521			450	93	28.05	0.5	2.0	7.06	698	15.5	0.40	10.20	124	Clear, no odor
1524			450	93	28.05	0.5	2.5	7.06	698	15.3	0.40	9.60	121	Clear, no odor

Comments/Well Condition: Final DTW: 28.05

Signature (s) mdawid | Date 11/19/2025 | Reviewer | Date

APPENDIX E

Laboratory Analytical Reports

ANALYTICAL REPORT

January 27, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1818476
Samples Received:	01/18/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 4Q24 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-03-WG-20250116 L1818476-01 GW

Collected by	Collected date/time	Received date/time
	01/16/25 09:00	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436202	1	01/21/25 08:23	01/21/25 08:24	MMF	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 04:27	01/19/25 04:27	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	10	01/19/25 05:21	01/19/25 05:21	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435466	1	01/22/25 11:12	01/22/25 17:35	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435699	1	01/21/25 15:37	01/22/25 13:42	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 12:53	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 12:48	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 19:54	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 21:53	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 13:43	JPD	Mt. Juliet, TN

APW-08-WG-20250115 L1818476-02 GW

Collected by	Collected date/time	Received date/time
	01/15/25 15:40	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436202	1	01/21/25 08:23	01/21/25 08:24	MMF	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 05:48	01/19/25 05:48	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435466	1	01/22/25 11:12	01/22/25 17:38	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435699	1	01/21/25 15:37	01/22/25 13:44	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 12:55	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 12:51	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 19:58	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 21:39	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 13:46	JPD	Mt. Juliet, TN

APW-10S-WG-20250116 L1818476-03 GW

Collected by	Collected date/time	Received date/time
	01/16/25 11:40	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 06:29	01/19/25 06:29	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435740	1	01/19/25 12:57	01/19/25 12:57	BJM	Mt. Juliet, TN
Mercury by Method 7470A	WG2435466	1	01/22/25 11:12	01/22/25 17:40	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435699	1	01/21/25 15:37	01/22/25 13:46	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 12:56	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 12:54	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:01	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	5	01/21/25 21:51	01/22/25 20:39	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 13:49	JPD	Mt. Juliet, TN

APW-10D-WG-20250116 L1818476-04 GW

Collected by	Collected date/time	Received date/time
	01/16/25 10:50	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 06:42	01/19/25 06:42	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435740	1	01/19/25 12:57	01/19/25 12:57	BJM	Mt. Juliet, TN
Mercury by Method 7470A	WG2435466	1	01/22/25 11:12	01/22/25 17:43	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435699	1	01/21/25 15:37	01/22/25 13:49	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 12:58	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 12:56	DJS	Mt. Juliet, TN

APW-10D-WG-20250116 L1818476-04 GW

Collected by	Collected date/time	Received date/time
	01/16/25 10:50	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:04	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 13:53	JPD	Mt. Juliet, TN

APW-06S-WG-20250115 L1818476-05 GW

Collected by	Collected date/time	Received date/time
	01/15/25 08:05	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 06:56	01/19/25 06:56	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	5	01/19/25 07:09	01/19/25 07:09	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435740	1	01/19/25 12:57	01/19/25 12:57	BJM	Mt. Juliet, TN
Mercury by Method 7470A	WG2435699	1	01/21/25 15:37	01/22/25 13:53	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 18:49	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 12:59	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 12:59	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:08	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 13:56	JPD	Mt. Juliet, TN

APW-06D-WG-20250115 L1818476-06 GW

Collected by	Collected date/time	Received date/time
	01/15/25 09:55	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 07:23	01/19/25 07:23	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	10	01/19/25 08:03	01/19/25 08:03	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2435699	1	01/21/25 15:37	01/22/25 13:56	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:00	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 13:01	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:02	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:11	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 13:59	JPD	Mt. Juliet, TN

APW-05R-WG-20250115 L1818476-07 GW

Collected by	Collected date/time	Received date/time
	01/15/25 11:30	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 08:17	01/19/25 08:17	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	10	01/19/25 08:30	01/19/25 08:30	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:23	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:02	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 13:06	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:05	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:22	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 14:03	JPD	Mt. Juliet, TN

APW-09-WG-20250115 L1818476-08 GW

Collected by	Collected date/time	Received date/time
	01/15/25 13:50	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 08:44	01/19/25 08:44	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:25	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:05	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 13:08	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:07	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:25	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 21:42	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 14:12	JPD	Mt. Juliet, TN

APW-02-WG-20250115 L1818476-09 GW

Collected by	Collected date/time	Received date/time
	01/15/25 10:45	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 08:57	01/19/25 08:57	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	10	01/19/25 09:10	01/19/25 09:10	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:28	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:12	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 13:09	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:10	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:29	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 14:15	JPD	Mt. Juliet, TN

APW-01R-WG-20250115 L1818476-10 GW

Collected by	Collected date/time	Received date/time
	01/15/25 12:50	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 09:24	01/19/25 09:24	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:30	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:14	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 13:11	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:18	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 20:32	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2436367	1	01/21/25 21:51	01/22/25 21:45	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 14:19	JPD	Mt. Juliet, TN

APW-04-WG-20250114 L1818476-11 GW

Collected by	Collected date/time	Received date/time
	01/14/25 16:10	01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 09:37	01/19/25 09:37	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:32	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:17	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2436138	1	01/21/25 23:53	01/22/25 13:13	JTM	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:21	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437013	1	01/21/25 23:45	01/22/25 14:22	JPD	Mt. Juliet, TN

APW-04-WG-20250114 L1818476-11 GW

Collected by | Collected date/time 01/14/25 16:10 | Received date/time 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG2437484	1	01/22/25 10:39	01/22/25 21:00	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437484	1	01/22/25 10:39	01/22/25 23:20	UNP	Mt. Juliet, TN

EB-01-WG-20250114 L1818476-12 GW

Collected by | Collected date/time 01/14/25 11:00 | Received date/time 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 09:51	01/19/25 09:51	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:35	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:24	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437484	1	01/22/25 10:39	01/22/25 21:14	UNP	Mt. Juliet, TN

DUP-01-WG-20250115 L1818476-13 GW

Collected by | Collected date/time 01/15/25 00:01 | Received date/time 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 10:04	01/19/25 10:04	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	10	01/19/25 10:45	01/19/25 10:45	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435740	1	01/19/25 12:57	01/19/25 12:57	BJM	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:37	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:20	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437015	1	01/21/25 22:13	01/22/25 12:22	DJS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:26	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437484	1	01/22/25 10:39	01/22/25 21:17	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2439338	1	01/24/25 17:30	01/24/25 20:49	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2439338	1	01/24/25 17:30	01/26/25 11:52	SJM	Mt. Juliet, TN

DUP-02-WG-20250115 L1818476-14 GW

Collected by | Collected date/time 01/15/25 00:02 | Received date/time 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2436213	1	01/20/25 09:16	01/21/25 11:47	ARD	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435015	1	01/21/25 03:29	01/21/25 03:29	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2435686	1	01/19/25 10:58	01/19/25 10:58	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2435741	1	01/18/25 19:00	01/18/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2436630	1	01/24/25 10:35	01/24/25 19:39	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2437894	1	01/25/25 13:24	01/26/25 19:22	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437015	1	01/21/25 22:13	01/22/25 12:25	DJS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2437020	1	01/21/25 21:45	01/22/25 13:29	DJS	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437484	1	01/22/25 10:39	01/22/25 21:20	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2437484	1	01/22/25 10:39	01/22/25 23:24	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2439338	1	01/24/25 17:30	01/24/25 20:53	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2439338	1	01/24/25 17:30	01/26/25 11:55	SJM	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Sample Delivery Group (SDG) Narrative

Analysis was filtered in the laboratory.

Lab Sample ID	Project Sample ID	Method
L1818476-01	APW-03-WG-20250116	6020B, 6010D, 7470A
L1818476-02	APW-08-WG-20250115	6020B, 7470A, 6010D
L1818476-03	APW-10S-WG-20250116	6010D, 6020B, 7470A
L1818476-04	APW-10D-WG-20250116	6020B, 6010D, 7470A
L1818476-05	APW-06S-WG-20250115	6020B, 7470A, 6010D
L1818476-06	APW-06D-WG-20250115	6020B, 7470A, 6010D
L1818476-07	APW-05R-WG-20250115	6020B, 6010D, 7470A
L1818476-08	APW-09-WG-20250115	6020B, 6010D, 7470A
L1818476-09	APW-02-WG-20250115	6020B, 6010D, 7470A
L1818476-10	APW-01R-WG-20250115	6010D, 6020B, 7470A
L1818476-11	APW-04-WG-20250114	6020B, 7470A, 6010D
L1818476-13	DUP-01-WG-20250115	6020B, 7470A, 6010D
L1818476-14	DUP-02-WG-20250115	6010D, 6020B, 7470A
R4169286-3		6010D
R4169406-3		6010D
R4170492-3		7470A

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	577		10.0	1	01/21/2025 08:24	WG2436202

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	10.4		1.00	1	01/19/2025 04:27	WG2435686
Fluoride	0.254		0.150	1	01/19/2025 04:27	WG2435686
Sulfate	299		50.0	10	01/19/2025 05:21	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.08	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-01 WG2435741: 8.08 at 18.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/22/2025 13:42	WG2435699
Mercury,Dissolved	ND		0.000200	1	01/22/2025 17:35	WG2435466

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	4.83		0.200	1	01/22/2025 12:48	WG2437020
Boron,Dissolved	4.74		0.200	1	01/22/2025 12:53	WG2436138
Calcium	124		1.00	1	01/22/2025 12:48	WG2437020
Calcium,Dissolved	116		1.00	1	01/22/2025 12:53	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 21:53	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 13:43	WG2437013
Arsenic	ND		0.00200	1	01/22/2025 19:54	WG2436367
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013
Barium	0.110		0.00200	1	01/22/2025 19:54	WG2436367
Barium,Dissolved	0.102		0.00200	1	01/22/2025 13:43	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 19:54	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 19:54	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 13:43	WG2437013
Chromium	ND		0.00200	1	01/22/2025 19:54	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 19:54	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013
Lead	ND		0.00200	1	01/22/2025 19:54	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013
Lithium	0.0307		0.00200	1	01/22/2025 19:54	WG2436367
Lithium,Dissolved	0.0297		0.00200	1	01/22/2025 13:43	WG2437013
Molybdenum	0.0673		0.00500	1	01/22/2025 19:54	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0656		0.00500	1	01/22/2025 13:43	WG2437013
Selenium	ND		0.00200	1	01/22/2025 19:54	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013
Thallium	ND		0.00200	1	01/22/2025 19:54	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 13:43	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	418		10.0	1	01/21/2025 08:24	WG2436202

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.85		1.00	1	01/19/2025 05:48	WG2435686
Fluoride	0.238	P1	0.150	1	01/19/2025 05:48	WG2435686
Sulfate	28.5		5.00	1	01/19/2025 05:48	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.53	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-02 WG2435741: 7.53 at 18.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/22/2025 13:44	WG2435699
Mercury,Dissolved	ND		0.000200	1	01/22/2025 17:38	WG2435466

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	01/22/2025 12:51	WG2437020
Boron,Dissolved	ND		0.200	1	01/22/2025 12:55	WG2436138
Calcium	105		1.00	1	01/22/2025 12:51	WG2437020
Calcium,Dissolved	102		1.00	1	01/22/2025 12:55	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 19:58	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 13:46	WG2437013
Arsenic	ND		0.00200	1	01/22/2025 19:58	WG2436367
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 13:46	WG2437013
Barium	0.199		0.00200	1	01/22/2025 19:58	WG2436367
Barium,Dissolved	0.191		0.00200	1	01/22/2025 13:46	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 19:58	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 13:46	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 19:58	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 13:46	WG2437013
Chromium	ND		0.00200	1	01/22/2025 19:58	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 13:46	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 19:58	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 13:46	WG2437013
Lead	ND		0.00200	1	01/22/2025 19:58	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 13:46	WG2437013
Lithium	0.0181		0.00200	1	01/22/2025 19:58	WG2436367
Lithium,Dissolved	0.0170		0.00200	1	01/22/2025 13:46	WG2437013
Molybdenum	ND		0.00500	1	01/22/2025 19:58	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	01/22/2025 13:46	WG2437013
Selenium	0.0196		0.00200	1	01/22/2025 21:39	WG2436367
Selenium,Dissolved	0.0203		0.00200	1	01/22/2025 13:46	WG2437013
Thallium	ND		0.00200	1	01/22/2025 19:58	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 13:46	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	758		20.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	14.4		1.00	1	01/19/2025 06:29	WG2435686
Fluoride	0.199		0.150	1	01/19/2025 06:29	WG2435686
Sulfate	5.15		5.00	1	01/19/2025 06:29	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.28	T8	1	01/19/2025 12:57	WG2435740

Sample Narrative:
L1818476-03 WG2435740: 7.28 at 19.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/22/2025 13:46	WG2435699
Mercury,Dissolved	ND		0.000200	1	01/22/2025 17:40	WG2435466

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.554		0.200	1	01/22/2025 12:54	WG2437020
Boron,Dissolved	0.563		0.200	1	01/22/2025 12:56	WG2436138
Calcium	168		1.00	1	01/22/2025 12:54	WG2437020
Calcium,Dissolved	159		1.00	1	01/22/2025 12:56	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:01	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 13:49	WG2437013
Arsenic	0.191		0.00200	1	01/22/2025 20:01	WG2436367
Arsenic,Dissolved	0.0637		0.00200	1	01/22/2025 13:49	WG2437013
Barium	0.593		0.0100	5	01/22/2025 20:39	WG2436367
Barium,Dissolved	0.316		0.00200	1	01/22/2025 13:49	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:01	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 13:49	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:01	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 13:49	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:01	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 13:49	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:01	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 13:49	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:01	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 13:49	WG2437013
Lithium	0.0310		0.00200	1	01/22/2025 20:01	WG2436367
Lithium,Dissolved	0.0285		0.00200	1	01/22/2025 13:49	WG2437013
Molybdenum	ND		0.00500	1	01/22/2025 20:01	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	01/22/2025 13:49	WG2437013
Selenium	ND		0.00200	1	01/22/2025 20:01	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 13:49	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:01	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 13:49	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	447		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	13.3		1.00	1	01/19/2025 06:42	WG2435686
Fluoride	ND		0.150	1	01/19/2025 06:42	WG2435686
Sulfate	44.5		5.00	1	01/19/2025 06:42	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.37	T8	1	01/19/2025 12:57	WG2435740

Sample Narrative:
L1818476-04 WG2435740: 7.37 at 19.3C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/22/2025 13:49	WG2435699
Mercury,Dissolved	ND		0.000200	1	01/22/2025 17:43	WG2435466

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	01/22/2025 12:56	WG2437020
Boron,Dissolved	ND		0.200	1	01/22/2025 12:58	WG2436138
Calcium	142		1.00	1	01/22/2025 12:56	WG2437020
Calcium,Dissolved	126		1.00	1	01/22/2025 12:58	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:04	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 13:53	WG2437013
Arsenic	ND		0.00200	1	01/22/2025 20:04	WG2436367
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 13:53	WG2437013
Barium	0.354		0.00200	1	01/22/2025 20:04	WG2436367
Barium,Dissolved	0.340		0.00200	1	01/22/2025 13:53	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:04	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 13:53	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:04	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 13:53	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:04	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 13:53	WG2437013
Cobalt	0.00271		0.00200	1	01/22/2025 20:04	WG2436367
Cobalt,Dissolved	0.00244		0.00200	1	01/22/2025 13:53	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:04	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 13:53	WG2437013
Lithium	0.0152		0.00200	1	01/22/2025 20:04	WG2436367
Lithium,Dissolved	0.0142		0.00200	1	01/22/2025 13:53	WG2437013
Molybdenum	ND		0.00500	1	01/22/2025 20:04	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	01/22/2025 13:53	WG2437013
Selenium	ND		0.00200	1	01/22/2025 20:04	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 13:53	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:04	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 13:53	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	673		13.3	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	21.0		1.00	1	01/19/2025 06:56	WG2435686
Fluoride	0.239		0.150	1	01/19/2025 06:56	WG2435686
Sulfate	246		25.0	5	01/19/2025 07:09	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.39	T8	1	01/19/2025 12:57	WG2435740

Sample Narrative:

L1818476-05 WG2435740: 7.39 at 19.3C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/22/2025 13:53	WG2435699
Mercury,Dissolved	ND		0.000200	1	01/26/2025 18:49	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	5.34		0.200	1	01/22/2025 12:59	WG2437020
Boron,Dissolved	5.34		0.200	1	01/22/2025 12:59	WG2436138
Calcium	139		1.00	1	01/22/2025 12:59	WG2437020
Calcium,Dissolved	134		1.00	1	01/22/2025 12:59	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:08	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 13:56	WG2437013
Arsenic	ND		0.00200	1	01/22/2025 20:08	WG2436367
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013
Barium	0.262		0.00200	1	01/22/2025 20:08	WG2436367
Barium,Dissolved	0.187		0.00200	1	01/22/2025 13:56	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:08	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:08	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 13:56	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:08	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:08	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:08	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013
Lithium	0.0409		0.00200	1	01/22/2025 20:08	WG2436367
Lithium,Dissolved	0.0386		0.00200	1	01/22/2025 13:56	WG2437013
Molybdenum	0.195		0.00500	1	01/22/2025 20:08	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.190		0.00500	1	01/22/2025 13:56	WG2437013
Selenium	ND		0.00200	1	01/22/2025 20:08	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:08	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 13:56	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	549		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.5		1.00	1	01/19/2025 07:23	WG2435686
Fluoride	0.170		0.150	1	01/19/2025 07:23	WG2435686
Sulfate	266		50.0	10	01/19/2025 08:03	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.64	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:
L1818476-06 WG2435741: 7.64 at 18.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/22/2025 13:56	WG2435699
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:00	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	3.46		0.200	1	01/22/2025 13:02	WG2437020
Boron,Dissolved	3.33		0.200	1	01/22/2025 13:01	WG2436138
Calcium	120		1.00	1	01/22/2025 13:02	WG2437020
Calcium,Dissolved	114		1.00	1	01/22/2025 13:01	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:11	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 13:59	WG2437013
Arsenic	0.00988		0.00200	1	01/22/2025 20:11	WG2436367
Arsenic,Dissolved	0.00414		0.00200	1	01/22/2025 13:59	WG2437013
Barium	0.124		0.00200	1	01/22/2025 20:11	WG2436367
Barium,Dissolved	0.111		0.00200	1	01/22/2025 13:59	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:11	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 13:59	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:11	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 13:59	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:11	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 13:59	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:11	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 13:59	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:11	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 13:59	WG2437013
Lithium	0.0167		0.00200	1	01/22/2025 20:11	WG2436367
Lithium,Dissolved	0.0156		0.00200	1	01/22/2025 13:59	WG2437013
Molybdenum	0.0553		0.00500	1	01/22/2025 20:11	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0524		0.00500	1	01/22/2025 13:59	WG2437013
Selenium	ND		0.00200	1	01/22/2025 20:11	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 13:59	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:11	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 13:59	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	700		13.3	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	16.1		1.00	1	01/19/2025 08:17	WG2435686
Fluoride	0.289		0.150	1	01/19/2025 08:17	WG2435686
Sulfate	373		50.0	10	01/19/2025 08:30	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.77	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-07 WG2435741: 7.77 at 18.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:23	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:02	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	8.37		0.200	1	01/22/2025 13:05	WG2437020
Boron,Dissolved	8.20		0.200	1	01/22/2025 13:06	WG2436138
Calcium	141		1.00	1	01/22/2025 13:05	WG2437020
Calcium,Dissolved	132		1.00	1	01/22/2025 13:06	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:22	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 14:03	WG2437013
Arsenic	0.00203		0.00200	1	01/22/2025 20:22	WG2436367
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013
Barium	0.194		0.00200	1	01/22/2025 20:22	WG2436367
Barium,Dissolved	0.144		0.00200	1	01/22/2025 14:03	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:22	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:22	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 14:03	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:22	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:22	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:22	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013
Lithium	0.0373		0.00200	1	01/22/2025 20:22	WG2436367
Lithium,Dissolved	0.0342		0.00200	1	01/22/2025 14:03	WG2437013
Molybdenum	0.185		0.00500	1	01/22/2025 20:22	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.182		0.00500	1	01/22/2025 14:03	WG2437013
Selenium	ND		0.00200	1	01/22/2025 20:22	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:22	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 14:03	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	370		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.8		1.00	1	01/19/2025 08:44	WG2435686
Fluoride	0.150		0.150	1	01/19/2025 08:44	WG2435686
Sulfate	46.8		5.00	1	01/19/2025 08:44	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.81	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:
L1818476-08 WG2435741: 7.81 at 18.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:25	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:05	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.301		0.200	1	01/22/2025 13:07	WG2437020
Boron,Dissolved	0.311		0.200	1	01/22/2025 13:08	WG2436138
Calcium	90.0		1.00	1	01/22/2025 13:07	WG2437020
Calcium,Dissolved	88.2		1.00	1	01/22/2025 13:08	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:25	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 14:12	WG2437013
Arsenic	0.00226		0.00200	1	01/22/2025 20:25	WG2436367
Arsenic,Dissolved	0.00202		0.00200	1	01/22/2025 14:12	WG2437013
Barium	0.125		0.00200	1	01/22/2025 20:25	WG2436367
Barium,Dissolved	0.113		0.00200	1	01/22/2025 14:12	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:25	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 14:12	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:25	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 14:12	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:25	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 14:12	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:25	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 14:12	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:25	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 14:12	WG2437013
Lithium	0.0155		0.00200	1	01/22/2025 20:25	WG2436367
Lithium,Dissolved	0.0144		0.00200	1	01/22/2025 14:12	WG2437013
Molybdenum	0.0214		0.00500	1	01/22/2025 20:25	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0213		0.00500	1	01/22/2025 14:12	WG2437013
Selenium	0.0204		0.00200	1	01/22/2025 21:42	WG2436367
Selenium,Dissolved	0.0208		0.00200	1	01/22/2025 14:12	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:25	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 14:12	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	861		13.3	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.58		1.00	1	01/19/2025 08:57	WG2435686
Fluoride	0.224		0.150	1	01/19/2025 08:57	WG2435686
Sulfate	509		50.0	10	01/19/2025 09:10	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.67	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-09 WG2435741: 7.67 at 19.2C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:28	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:12	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	9.07		0.200	1	01/22/2025 13:10	WG2437020
Boron,Dissolved	9.11		0.200	1	01/22/2025 13:09	WG2436138
Calcium	165		1.00	1	01/22/2025 13:10	WG2437020
Calcium,Dissolved	150		1.00	1	01/22/2025 13:09	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:29	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 14:15	WG2437013
Arsenic	0.00904		0.00200	1	01/22/2025 20:29	WG2436367
Arsenic,Dissolved	0.00299		0.00200	1	01/22/2025 14:15	WG2437013
Barium	0.147		0.00200	1	01/22/2025 20:29	WG2436367
Barium,Dissolved	0.125		0.00200	1	01/22/2025 14:15	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:29	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 14:15	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:29	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 14:15	WG2437013
Chromium	0.00228		0.00200	1	01/22/2025 20:29	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 14:15	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:29	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 14:15	WG2437013
Lead	0.00229		0.00200	1	01/22/2025 20:29	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 14:15	WG2437013
Lithium	0.0437		0.00200	1	01/22/2025 20:29	WG2436367
Lithium,Dissolved	0.0424		0.00200	1	01/22/2025 14:15	WG2437013
Molybdenum	0.188		0.00500	1	01/22/2025 20:29	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.193		0.00500	1	01/22/2025 14:15	WG2437013
Selenium	ND		0.00200	1	01/22/2025 20:29	WG2436367
Selenium,Dissolved	ND		0.00200	1	01/22/2025 14:15	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:29	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 14:15	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	395		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.52		1.00	1	01/19/2025 09:24	WG2435686
Fluoride	ND		0.150	1	01/19/2025 09:24	WG2435686
Sulfate	81.4		5.00	1	01/19/2025 09:24	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.25	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-10 WG2435741: 7.25 at 18.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:30	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:14	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.244		0.200	1	01/22/2025 13:18	WG2437020
Boron,Dissolved	0.261		0.200	1	01/22/2025 13:11	WG2436138
Calcium	95.4		1.00	1	01/22/2025 13:18	WG2437020
Calcium,Dissolved	89.8		1.00	1	01/22/2025 13:11	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 20:32	WG2436367
Antimony,Dissolved	ND		0.00400	1	01/22/2025 14:19	WG2437013
Arsenic	ND		0.00200	1	01/22/2025 20:32	WG2436367
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 14:19	WG2437013
Barium	0.168		0.00200	1	01/22/2025 20:32	WG2436367
Barium,Dissolved	0.163		0.00200	1	01/22/2025 14:19	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 20:32	WG2436367
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 14:19	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 20:32	WG2436367
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 14:19	WG2437013
Chromium	ND		0.00200	1	01/22/2025 20:32	WG2436367
Chromium,Dissolved	ND		0.00200	1	01/22/2025 14:19	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 20:32	WG2436367
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 14:19	WG2437013
Lead	ND		0.00200	1	01/22/2025 20:32	WG2436367
Lead,Dissolved	ND		0.00200	1	01/22/2025 14:19	WG2437013
Lithium	0.0154		0.00200	1	01/22/2025 20:32	WG2436367
Lithium,Dissolved	0.0145		0.00200	1	01/22/2025 14:19	WG2437013
Molybdenum	ND		0.00500	1	01/22/2025 20:32	WG2436367

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	01/22/2025 14:19	WG2437013
Selenium	0.00337		0.00200	1	01/22/2025 21:45	WG2436367
Selenium,Dissolved	0.00420		0.00200	1	01/22/2025 14:19	WG2437013
Thallium	ND		0.00200	1	01/22/2025 20:32	WG2436367
Thallium,Dissolved	ND		0.00200	1	01/22/2025 14:19	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	440		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	10.4		1.00	1	01/19/2025 09:37	WG2435686
Fluoride	ND		0.150	1	01/19/2025 09:37	WG2435686
Sulfate	70.8		5.00	1	01/19/2025 09:37	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.77	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-11 WG2435741: 7.77 at 18.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:32	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:17	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.733		0.200	1	01/22/2025 13:21	WG2437020
Boron,Dissolved	0.710		0.200	1	01/22/2025 13:13	WG2436138
Calcium	110		1.00	1	01/22/2025 13:21	WG2437020
Calcium,Dissolved	105		1.00	1	01/22/2025 13:13	WG2436138

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 21:00	WG2437484
Antimony,Dissolved	ND		0.00400	1	01/22/2025 14:22	WG2437013
Arsenic	ND		0.00200	1	01/22/2025 21:00	WG2437484
Arsenic,Dissolved	ND		0.00200	1	01/22/2025 14:22	WG2437013
Barium	0.139		0.00200	1	01/22/2025 21:00	WG2437484
Barium,Dissolved	0.132		0.00200	1	01/22/2025 14:22	WG2437013
Beryllium	ND		0.00200	1	01/22/2025 21:00	WG2437484
Beryllium,Dissolved	ND		0.00200	1	01/22/2025 14:22	WG2437013
Cadmium	ND		0.00100	1	01/22/2025 21:00	WG2437484
Cadmium,Dissolved	ND		0.00100	1	01/22/2025 14:22	WG2437013
Chromium	ND		0.00200	1	01/22/2025 21:00	WG2437484
Chromium,Dissolved	ND		0.00200	1	01/22/2025 14:22	WG2437013
Cobalt	ND		0.00200	1	01/22/2025 21:00	WG2437484
Cobalt,Dissolved	ND		0.00200	1	01/22/2025 14:22	WG2437013
Lead	ND		0.00200	1	01/22/2025 21:00	WG2437484
Lead,Dissolved	ND		0.00200	1	01/22/2025 14:22	WG2437013
Lithium	0.0293		0.00200	1	01/22/2025 21:00	WG2437484
Lithium,Dissolved	0.0275		0.00200	1	01/22/2025 14:22	WG2437013
Molybdenum	0.0443		0.00500	1	01/22/2025 21:00	WG2437484

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0440		0.00500	1	01/22/2025 14:22	WG2437013
Selenium	0.0117		0.00200	1	01/22/2025 23:20	WG2437484
Selenium,Dissolved	0.0111		0.00200	1	01/22/2025 14:22	WG2437013
Thallium	ND		0.00200	1	01/22/2025 21:00	WG2437484
Thallium,Dissolved	ND		0.00200	1	01/22/2025 14:22	WG2437013

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	ND		1.00	1	01/19/2025 09:51	WG2435686
Fluoride	ND		0.150	1	01/19/2025 09:51	WG2435686
Sulfate	7.83		5.00	1	01/19/2025 09:51	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	5.45	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-12 WG2435741: 5.45 at 18.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:35	WG2436630

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	01/22/2025 13:24	WG2437020
Calcium	ND		1.00	1	01/22/2025 13:24	WG2437020

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 21:14	WG2437484
Arsenic	ND		0.00200	1	01/22/2025 21:14	WG2437484
Barium	ND		0.00200	1	01/22/2025 21:14	WG2437484
Beryllium	ND		0.00200	1	01/22/2025 21:14	WG2437484
Cadmium	ND		0.00100	1	01/22/2025 21:14	WG2437484
Chromium	ND		0.00200	1	01/22/2025 21:14	WG2437484
Cobalt	ND		0.00200	1	01/22/2025 21:14	WG2437484
Lead	ND		0.00200	1	01/22/2025 21:14	WG2437484
Lithium	ND		0.00200	1	01/22/2025 21:14	WG2437484
Molybdenum	ND		0.00500	1	01/22/2025 21:14	WG2437484
Selenium	ND		0.00200	1	01/22/2025 21:14	WG2437484
Thallium	ND		0.00200	1	01/22/2025 21:14	WG2437484

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	688		13.3	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	16.2		1.00	1	01/19/2025 10:04	WG2435686
Fluoride	0.295		0.150	1	01/19/2025 10:04	WG2435686
Sulfate	374		50.0	10	01/19/2025 10:45	WG2435686

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.82	T8	1	01/19/2025 12:57	WG2435740

Sample Narrative:

L1818476-13 WG2435740: 7.82 at 19.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:37	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:20	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	8.28		0.200	1	01/22/2025 13:26	WG2437020
Boron,Dissolved	8.17		0.200	1	01/22/2025 12:22	WG2437015
Calcium	141		1.00	1	01/22/2025 13:26	WG2437020
Calcium,Dissolved	134		1.00	1	01/22/2025 12:22	WG2437015

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 21:17	WG2437484
Antimony,Dissolved	ND		0.00400	1	01/24/2025 20:49	WG2439338
Arsenic	0.00206		0.00200	1	01/22/2025 21:17	WG2437484
Arsenic,Dissolved	ND		0.00200	1	01/24/2025 20:49	WG2439338
Barium	0.198		0.00200	1	01/22/2025 21:17	WG2437484
Barium,Dissolved	0.137		0.00200	1	01/24/2025 20:49	WG2439338
Beryllium	ND		0.00200	1	01/22/2025 21:17	WG2437484
Beryllium,Dissolved	ND		0.00200	1	01/24/2025 20:49	WG2439338
Cadmium	ND		0.00100	1	01/22/2025 21:17	WG2437484
Cadmium,Dissolved	ND		0.00100	1	01/24/2025 20:49	WG2439338
Chromium	ND		0.00200	1	01/22/2025 21:17	WG2437484
Chromium,Dissolved	ND		0.00200	1	01/26/2025 11:52	WG2439338
Cobalt	ND		0.00200	1	01/22/2025 21:17	WG2437484
Cobalt,Dissolved	ND		0.00200	1	01/24/2025 20:49	WG2439338
Lead	ND		0.00200	1	01/22/2025 21:17	WG2437484
Lead,Dissolved	ND		0.00200	1	01/24/2025 20:49	WG2439338
Lithium	0.0361		0.00200	1	01/22/2025 21:17	WG2437484
Lithium,Dissolved	0.0326		0.00200	1	01/24/2025 20:49	WG2439338
Molybdenum	0.185		0.00500	1	01/22/2025 21:17	WG2437484

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.172		0.00500	1	01/24/2025 20:49	WG2439338
Selenium	ND		0.00200	1	01/22/2025 21:17	WG2437484
Selenium,Dissolved	ND		0.00200	1	01/26/2025 11:52	WG2439338
Thallium	ND		0.00200	1	01/22/2025 21:17	WG2437484
Thallium,Dissolved	ND		0.00200	1	01/24/2025 20:49	WG2439338

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	362		10.0	1	01/21/2025 11:47	WG2436213

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	14.8		1.00	1	01/19/2025 10:58	WG2435686
Fluoride	0.162		0.150	1	01/19/2025 10:58	WG2435686
Sulfate	41.7		5.00	1	01/21/2025 03:29	WG2435015

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.15	T8	1	01/18/2025 19:00	WG2435741

Sample Narrative:

L1818476-14 WG2435741: 8.15 at 18.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	01/24/2025 19:39	WG2436630
Mercury,Dissolved	ND		0.000200	1	01/26/2025 19:22	WG2437894

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.310		0.200	1	01/22/2025 13:29	WG2437020
Boron,Dissolved	0.318		0.200	1	01/22/2025 12:25	WG2437015
Calcium	90.2		1.00	1	01/22/2025 13:29	WG2437020
Calcium,Dissolved	86.1		1.00	1	01/22/2025 12:25	WG2437015

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	01/22/2025 21:20	WG2437484
Antimony,Dissolved	ND		0.00400	1	01/24/2025 20:53	WG2439338
Arsenic	0.00211		0.00200	1	01/22/2025 21:20	WG2437484
Arsenic,Dissolved	ND		0.00200	1	01/24/2025 20:53	WG2439338
Barium	0.124		0.00200	1	01/22/2025 21:20	WG2437484
Barium,Dissolved	0.106		0.00200	1	01/24/2025 20:53	WG2439338
Beryllium	ND		0.00200	1	01/22/2025 21:20	WG2437484
Beryllium,Dissolved	ND		0.00200	1	01/24/2025 20:53	WG2439338
Cadmium	ND		0.00100	1	01/22/2025 21:20	WG2437484
Cadmium,Dissolved	ND		0.00100	1	01/24/2025 20:53	WG2439338
Chromium	ND		0.00200	1	01/22/2025 21:20	WG2437484
Chromium,Dissolved	ND		0.00200	1	01/26/2025 11:55	WG2439338
Cobalt	ND		0.00200	1	01/22/2025 21:20	WG2437484
Cobalt,Dissolved	ND		0.00200	1	01/24/2025 20:53	WG2439338
Lead	ND		0.00200	1	01/22/2025 21:20	WG2437484
Lead,Dissolved	ND		0.00200	1	01/24/2025 20:53	WG2439338
Lithium	0.0146		0.00200	1	01/22/2025 21:20	WG2437484
Lithium,Dissolved	0.0128		0.00200	1	01/24/2025 20:53	WG2439338
Molybdenum	0.0213		0.00500	1	01/22/2025 21:20	WG2437484

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0205		0.00500	1	01/24/2025 20:53	WG2439338
Selenium	0.0216		0.00200	1	01/22/2025 23:24	WG2437484
Selenium,Dissolved	0.0203		0.00200	1	01/26/2025 11:55	WG2439338
Thallium	ND		0.00200	1	01/22/2025 21:20	WG2437484
Thallium,Dissolved	ND		0.00200	1	01/24/2025 20:53	WG2439338

Method Blank (MB)

(MB) R4169800-1 01/21/25 08:24

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1818118-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1818118-01 01/21/25 08:24 • (DUP) R4169800-3 01/21/25 08:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	20300	20100	1	1.19		10

L1818548-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1818548-04 01/21/25 08:24 • (DUP) R4169800-4 01/21/25 08:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	3040	3050	1	0.164		10

Laboratory Control Sample (LCS)

(LCS) R4169800-2 01/21/25 08:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8840	100	85.0-115	

Method Blank (MB)

(MB) R4170024-1 01/21/25 11:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1817537-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1817537-01 01/21/25 11:47 • (DUP) R4170024-3 01/21/25 11:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	151	150	1	0.664		10

L1818586-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1818586-01 01/21/25 11:47 • (DUP) R4170024-4 01/21/25 11:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	2270	2220	1	2.01		10

Laboratory Control Sample (LCS)

(LCS) R4170024-2 01/21/25 11:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8810	100	85.0-115	

Method Blank (MB)

(MB) R4168996-1 01/20/25 21:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sulfate	U		0.637	5.00

L1817892-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1817892-07 01/20/25 23:40 • (DUP) R4168996-3 01/20/25 23:53

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	9.16	8.95	1	2.41		15

L1817892-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1817892-09 01/21/25 00:44 • (DUP) R4168996-6 01/21/25 00:56

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	ND	ND	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R4168996-2 01/20/25 21:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40.0	40.1	100	80.0-120	

L1817892-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1817892-07 01/20/25 23:40 • (MS) R4168996-4 01/21/25 00:05 • (MSD) R4168996-5 01/21/25 00:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	40.0	9.16	47.5	47.8	95.8	96.5	1	80.0-120			0.594	15

L1817892-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1817892-09 01/21/25 00:44 • (MS) R4168996-7 01/21/25 01:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	40.0	ND	38.8	96.9	1	80.0-120	

Method Blank (MB)

(MB) R4168240-1 01/19/25 00:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.547	1.00
Fluoride	U		0.0761	0.150
Sulfate	U		0.637	5.00

L1818476-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1818476-01 01/19/25 04:27 • (DUP) R4168240-3 01/19/25 04:41

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	10.4	10.4	1	0.262		15
Fluoride	0.254	0.290	1	13.0		15

L1818476-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1818476-01 01/19/25 05:21 • (DUP) R4168240-6 01/19/25 05:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	299	301	10	0.594		15

L1818476-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1818476-02 01/19/25 05:48 • (DUP) R4168240-7 01/19/25 06:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8.85	8.88	1	0.250		15
Fluoride	0.238	0.279	1	16.1	P1	15
Sulfate	28.5	29.0	1	1.45		15

Laboratory Control Sample (LCS)

(LCS) R4168240-2 01/19/25 01:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.8	99.6	80.0-120	
Fluoride	8.00	7.97	99.6	80.0-120	
Sulfate	40.0	40.6	101	80.0-120	

L1818476-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818476-01 01/19/25 04:27 • (MS) R4168240-4 01/19/25 04:54 • (MSD) R4168240-5 01/19/25 05:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	10.4	48.7	49.0	95.8	96.7	1	80.0-120			0.679	15
Fluoride	8.00	0.254	8.32	8.34	101	101	1	80.0-120			0.270	15
Sulfate	40.0	297	255	257	0.000	0.000	1	80.0-120	E V	E V	0.762	15

L1818476-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1818476-02 01/19/25 05:48 • (MS) R4168240-8 01/19/25 06:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	8.85	47.6	96.8	1	80.0-120	
Fluoride	8.00	0.238	8.30	101	1	80.0-120	
Sulfate	40.0	28.5	67.8	98.2	1	80.0-120	

L1818025-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1818025-02 01/19/25 12:57 • (DUP) R4168214-2 01/19/25 12:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.08	8.07	1	0.124		1

Sample Narrative:

OS: 8.08 at 19.2C

DUP: 8.07 at 19.3C

L1818476-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1818476-13 01/19/25 12:57 • (DUP) R4168214-3 01/19/25 12:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.82	7.81	1	0.128		1

Sample Narrative:

OS: 7.82 at 19.7C

DUP: 7.81 at 19.3C

Laboratory Control Sample (LCS)

(LCS) R4168214-1 01/19/25 12:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 20.3C

L1818261-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1818261-01 01/18/25 19:00 • (DUP) R4168167-2 01/18/25 19:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.18	8.22	1	0.488		1

Sample Narrative:

OS: 8.18 at 19.4C

DUP: 8.22 at 18.7C

L1818491-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1818491-06 01/18/25 19:00 • (DUP) R4168167-3 01/18/25 19:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.37	8.38	1	0.119		1

Sample Narrative:

OS: 8.37 at 19C

DUP: 8.38 at 18.9C

Laboratory Control Sample (LCS)

(LCS) R4168167-1 01/18/25 19:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 20.3C

Method Blank (MB)

(MB) R4169475-1 01/22/25 15:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4169475-6 01/22/25 17:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00298	99.3	80.0-120	

L1818118-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818118-05 01/22/25 15:40 • (MS) R4169475-4 01/22/25 15:45 • (MSD) R4169475-5 01/22/25 15:47

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00277	0.00269	92.4	89.7	1	75.0-125			2.90	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4169376-1 01/22/25 12:56

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4169376-2 01/22/25 12:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00314	105	80.0-120	

L1818384-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818384-01 01/22/25 13:09 • (MS) R4169376-4 01/22/25 13:13 • (MSD) R4169376-5 01/22/25 13:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00306	0.00302	102	101	1	75.0-125			1.32	20

Method Blank (MB)

(MB) R4170239-1 01/24/25 19:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4170239-6 01/24/25 20:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00275	91.7	80.0-120	

L1819082-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1819082-02 01/24/25 19:06 • (MS) R4170239-4 01/24/25 19:11 • (MSD) R4170239-5 01/24/25 19:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00266	0.00280	88.6	93.5	1	75.0-125			5.37	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4170492-1 01/26/25 18:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4170492-2 01/26/25 18:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00304	101	80.0-120	

L1818476-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818476-05 01/26/25 18:49 • (MS) R4170492-4 01/26/25 18:54 • (MSD) R4170492-5 01/26/25 18:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00318	0.00326	106	109	1	75.0-125			2.43	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4169406-1 01/22/25 12:27

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron,Dissolved	U		0.0233	0.200
Calcium,Dissolved	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4169406-2 01/22/25 12:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron,Dissolved	1.00	0.938	93.8	80.0-120	
Calcium,Dissolved	10.0	9.97	99.7	80.0-120	

L1818298-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818298-01 01/22/25 12:30 • (MS) R4169406-4 01/22/25 12:33 • (MSD) R4169406-5 01/22/25 12:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	ND	0.974	0.965	97.4	96.5	1	75.0-125			0.854	20
Calcium,Dissolved	10.0	54.9	66.0	64.9	111	100	1	75.0-125			1.68	20

Method Blank (MB)

(MB) R4169286-1 01/22/25 11:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron,Dissolved	U		0.0233	0.200
Calcium,Dissolved	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4169286-6 01/22/25 12:20

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron,Dissolved	1.00	0.949	94.9	80.0-120	
Calcium,Dissolved	10.0	9.80	98.0	80.0-120	

L1818919-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818919-09 01/22/25 11:52 • (MS) R4169286-4 01/22/25 11:57 • (MSD) R4169286-5 01/22/25 11:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	ND	1.06	1.08	94.9	96.9	1	75.0-125			1.84	20
Calcium,Dissolved	10.0	108	117	117	89.7	95.8	1	75.0-125			0.527	20

Method Blank (MB)

(MB) R4169350-1 01/22/25 12:13

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0233	0.200
Calcium	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4169350-2 01/22/25 12:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.942	94.2	80.0-120	
Calcium	10.0	9.87	98.7	80.0-120	

L1818261-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818261-01 01/22/25 12:18 • (MS) R4169350-4 01/22/25 12:24 • (MSD) R4169350-5 01/22/25 12:26

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	ND	0.943	0.925	94.3	92.5	1	75.0-125			1.92	20
Calcium	10.0	47.3	56.1	55.8	88.0	84.4	1	75.0-125			0.643	20

Method Blank (MB)

(MB) R4169488-1 01/22/25 18:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.000310	0.00400
Arsenic	U		0.000120	0.00200
Barium	U		0.000500	0.00200
Beryllium	U		0.000200	0.00200
Cadmium	U		0.000120	0.00100
Chromium	U		0.000900	0.00200
Cobalt	U		0.000100	0.00200
Lead	U		0.000500	0.00200
Lithium	U		0.000600	0.00200
Molybdenum	U		0.000500	0.00500
Selenium	U		0.000250	0.00200
Thallium	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4169488-2 01/22/25 18:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0505	101	80.0-120	
Arsenic	0.0500	0.0488	97.7	80.0-120	
Barium	0.0500	0.0459	91.9	80.0-120	
Beryllium	0.0500	0.0482	96.5	80.0-120	
Cadmium	0.0500	0.0517	103	80.0-120	
Chromium	0.0500	0.0505	101	80.0-120	
Cobalt	0.0500	0.0508	102	80.0-120	
Lead	0.0500	0.0489	97.8	80.0-120	
Lithium	0.0500	0.0489	97.8	80.0-120	
Molybdenum	0.0500	0.0482	96.4	80.0-120	
Selenium	0.0500	0.0496	99.2	80.0-120	
Thallium	0.0500	0.0494	98.8	80.0-120	

L1818194-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818194-24 01/22/25 18:54 • (MS) R4169488-4 01/22/25 19:01 • (MSD) R4169488-5 01/22/25 19:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0496	0.0493	99.3	98.6	1	75.0-125			0.679	20
Arsenic	0.0500	ND	0.0476	0.0474	95.3	94.8	1	75.0-125			0.562	20
Barium	0.0500	ND	0.0488	0.0473	97.6	94.7	1	75.0-125			3.02	20

L1818194-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818194-24 01/22/25 18:54 • (MS) R4169488-4 01/22/25 19:01 • (MSD) R4169488-5 01/22/25 19:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium	0.0500	ND	0.0490	0.0479	98.0	95.8	1	75.0-125			2.24	20
Cadmium	0.0500	ND	0.0492	0.0501	98.3	100	1	75.0-125			1.86	20
Chromium	0.0500	ND	0.0494	0.0495	98.8	99.1	1	75.0-125			0.224	20
Cobalt	0.0500	ND	0.0495	0.0499	99.1	99.7	1	75.0-125			0.658	20
Lead	0.0500	ND	0.0476	0.0478	95.2	95.7	1	75.0-125			0.507	20
Lithium	0.0500		0.0492	0.0488	98.3	97.6	1	75.0-125			0.732	20
Molybdenum	0.0500	ND	0.0479	0.0480	95.9	96.0	1	75.0-125			0.103	20
Selenium	0.0500	ND	0.0481	0.0498	96.2	99.7	1	75.0-125			3.58	20
Thallium	0.0500	ND	0.0480	0.0479	95.9	95.8	1	75.0-125			0.171	20

Method Blank (MB)

(MB) R4169333-1 01/22/25 12:48

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000310	0.00400
Arsenic,Dissolved	U		0.000120	0.00200
Barium,Dissolved	U		0.000500	0.00200
Beryllium,Dissolved	U		0.000200	0.00200
Cadmium,Dissolved	U		0.000120	0.00100
Chromium,Dissolved	U		0.000900	0.00200
Cobalt,Dissolved	U		0.000100	0.00200
Lead,Dissolved	U		0.000500	0.00200
Lithium,Dissolved	U		0.000600	0.00200
Molybdenum,Dissolved	U		0.000500	0.00500
Selenium,Dissolved	U		0.000250	0.00200
Thallium,Dissolved	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4169333-2 01/22/25 12:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	0.0500	0.0539	108	80.0-120	
Arsenic,Dissolved	0.0500	0.0504	101	80.0-120	
Barium,Dissolved	0.0500	0.0474	94.8	80.0-120	
Beryllium,Dissolved	0.0500	0.0498	99.6	80.0-120	
Cadmium,Dissolved	0.0500	0.0517	103	80.0-120	
Chromium,Dissolved	0.0500	0.0513	103	80.0-120	
Cobalt,Dissolved	0.0500	0.0519	104	80.0-120	
Lead,Dissolved	0.0500	0.0489	97.9	80.0-120	
Lithium,Dissolved	0.0500	0.0499	99.8	80.0-120	
Molybdenum,Dissolved	0.0500	0.0497	99.5	80.0-120	
Selenium,Dissolved	0.0500	0.0488	97.5	80.0-120	
Thallium,Dissolved	0.0500	0.0480	96.0	80.0-120	

L1818282-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818282-21 01/22/25 12:56 • (MS) R4169333-4 01/22/25 13:02 • (MSD) R4169333-5 01/22/25 13:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0575	0.0569	114	112	1	75.0-125			1.07	20
Arsenic,Dissolved	0.0500	ND	0.0509	0.0497	101	98.5	1	75.0-125			2.42	20
Barium,Dissolved	0.0500	0.640	0.680	0.678	79.7	75.1	1	75.0-125			0.337	20

L1818282-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818282-21 01/22/25 12:56 • (MS) R4169333-4 01/22/25 13:02 • (MSD) R4169333-5 01/22/25 13:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium,Dissolved	0.0500	ND	0.0453	0.0443	90.7	88.5	1	75.0-125			2.44	20
Cadmium,Dissolved	0.0500	ND	0.0521	0.0510	104	102	1	75.0-125			2.10	20
Chromium,Dissolved	0.0500	ND	0.0506	0.0491	99.0	96.1	1	75.0-125			2.92	20
Cobalt,Dissolved	0.0500	0.00259	0.0513	0.0498	97.4	94.4	1	75.0-125			2.90	20
Lead,Dissolved	0.0500	ND	0.0478	0.0469	95.7	93.9	1	75.0-125			1.90	20
Lithium,Dissolved	0.0500		0.0525	0.0513	88.5	86.0	1	75.0-125			2.43	20
Molybdenum,Dissolved	0.0500	ND	0.0551	0.0537	107	104	1	75.0-125			2.66	20
Selenium,Dissolved	0.0500	ND	0.0533	0.0507	107	101	1	75.0-125			4.99	20
Thallium,Dissolved	0.0500	ND	0.0469	0.0463	93.7	92.6	1	75.0-125			1.20	20

Method Blank (MB)

(MB) R4169535-1 01/22/25 20:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.000310	0.00400
Arsenic	U		0.000120	0.00200
Barium	U		0.000500	0.00200
Beryllium	U		0.000200	0.00200
Cadmium	U		0.000120	0.00100
Chromium	U		0.000900	0.00200
Cobalt	U		0.000100	0.00200
Lead	U		0.000500	0.00200
Lithium	U		0.000600	0.00200
Molybdenum	U		0.000500	0.00500
Selenium	U		0.000250	0.00200
Thallium	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4169535-2 01/22/25 20:57

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0503	101	80.0-120	
Arsenic	0.0500	0.0503	101	80.0-120	
Barium	0.0500	0.0504	101	80.0-120	
Beryllium	0.0500	0.0518	104	80.0-120	
Cadmium	0.0500	0.0535	107	80.0-120	
Chromium	0.0500	0.0533	107	80.0-120	
Cobalt	0.0500	0.0535	107	80.0-120	
Lead	0.0500	0.0515	103	80.0-120	
Lithium	0.0500	0.0533	107	80.0-120	
Molybdenum	0.0500	0.0487	97.4	80.0-120	
Selenium	0.0500	0.0506	101	80.0-120	
Thallium	0.0500	0.0525	105	80.0-120	

L1818476-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818476-11 01/22/25 21:00 • (MS) R4169535-4 01/22/25 21:07 • (MSD) R4169535-5 01/22/25 21:10

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0527	0.0527	105	105	1	75.0-125			0.0870	20
Arsenic	0.0500	ND	0.0525	0.0519	102	101	1	75.0-125			1.15	20
Barium	0.0500	0.139	0.193	0.191	109	105	1	75.0-125			1.04	20

L1818476-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818476-11 01/22/25 21:00 • (MS) R4169535-4 01/22/25 21:07 • (MSD) R4169535-5 01/22/25 21:10

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium	0.0500	ND	0.0507	0.0511	101	102	1	75.0-125			0.781	20
Cadmium	0.0500	ND	0.0533	0.0522	107	104	1	75.0-125			2.14	20
Chromium	0.0500	ND	0.0533	0.0530	107	106	1	75.0-125			0.498	20
Cobalt	0.0500	ND	0.0523	0.0517	104	103	1	75.0-125			1.23	20
Lead	0.0500	ND	0.0512	0.0506	102	101	1	75.0-125			1.17	20
Lithium	0.0500	0.0293	0.0805	0.0822	102	106	1	75.0-125			2.02	20
Molybdenum	0.0500	0.0443	0.0968	0.0968	105	105	1	75.0-125			0.0535	20
Selenium	0.0500	0.0111	0.0622	0.0624	102	103	1	75.0-125			0.339	20
Thallium	0.0500	ND	0.0522	0.0510	104	102	1	75.0-125			2.31	20

Method Blank (MB)

(MB) R4170247-1 01/24/25 20:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	0.000825	J	0.000310	0.00400
Arsenic,Dissolved	0.000247	J	0.000120	0.00200
Barium,Dissolved	U		0.000500	0.00200
Beryllium,Dissolved	U		0.000200	0.00200
Cadmium,Dissolved	U		0.000120	0.00100
Cobalt,Dissolved	U		0.000100	0.00200
Lead,Dissolved	U		0.000500	0.00200
Lithium,Dissolved	U		0.000600	0.00200
Molybdenum,Dissolved	U		0.000500	0.00500
Thallium,Dissolved	U		0.000130	0.00200

Method Blank (MB)

(MB) R4170421-1 01/26/25 11:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chromium,Dissolved	U		0.000900	0.00200
Selenium,Dissolved	U		0.000250	0.00200

Laboratory Control Sample (LCS)

(LCS) R4170247-2 01/24/25 20:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	0.0500	0.0474	94.8	80.0-120	
Arsenic,Dissolved	0.0500	0.0465	93.0	80.0-120	
Barium,Dissolved	0.0500	0.0431	86.2	80.0-120	
Beryllium,Dissolved	0.0500	0.0470	94.0	80.0-120	
Cadmium,Dissolved	0.0500	0.0476	95.1	80.0-120	
Cobalt,Dissolved	0.0500	0.0479	95.7	80.0-120	
Lead,Dissolved	0.0500	0.0459	91.7	80.0-120	
Lithium,Dissolved	0.0500	0.0431	86.2	80.0-120	
Molybdenum,Dissolved	0.0500	0.0473	94.7	80.0-120	
Thallium,Dissolved	0.0500	0.0446	89.2	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R4170421-2 01/26/25 11:36

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Dissolved	0.0500	0.0496	99.2	80.0-120	
Selenium,Dissolved	0.0500	0.0462	92.4	80.0-120	

L1819840-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1819840-01 01/24/25 20:36 • (MS) R4170247-4 01/24/25 20:43 • (MSD) R4170247-5 01/24/25 20:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0498	0.0491	95.1	93.9	1	75.0-125			1.29	20
Arsenic,Dissolved	0.0500	0.0929	0.137	0.139	87.3	93.1	1	75.0-125			2.11	20
Barium,Dissolved	0.0500	0.0311	0.0722	0.0714	82.3	80.5	1	75.0-125			1.23	20
Beryllium,Dissolved	0.0500	ND	0.0471	0.0452	94.2	90.4	1	75.0-125			4.15	20
Cadmium,Dissolved	0.0500	ND	0.0450	0.0458	89.9	91.5	1	75.0-125			1.75	20
Cobalt,Dissolved	0.0500	0.0238	0.0693	0.0685	91.1	89.4	1	75.0-125			1.20	20
Lead,Dissolved	0.0500	0.00323	0.0484	0.0475	90.4	88.5	1	75.0-125			1.93	20
Lithium,Dissolved	0.0500	0.00351	0.0475	0.0463	87.9	85.6	1	75.0-125			2.43	20
Molybdenum,Dissolved	0.0500	0.0153	0.0632	0.0629	95.9	95.3	1	75.0-125			0.473	20
Thallium,Dissolved	0.0500	ND	0.0455	0.0456	88.9	89.2	1	75.0-125			0.301	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Report to: **Randy Homburg**

Email To: **Randy.Homburg@erm.com;Tim.Wilson@erm.co**

Project Description: **Grand Tower Energy Center Groundwater 4Q24**

City/State Collected: Grand Tower, IL

Please Circle: PT MT (CT) ET

Phone: **314-682-3980**

Client Project # **0599247**

Lab Project # **ERMSCMO-0599247**

Collected by (print): Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day Standard

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres	Pres Chk	Remarks	Sample # (lab only)
APW-03-WG-2024(MS)5011G	Grab	GW		1/16/25	0900	5	X	X	X	X	X			01
APW-08-WG-2024(5011S		GW		1/15/25	1540	5	X	X	X	X	X			02
~~APW-07-WG-2024(5011~~		~~GW~~		1/16/25		5	X	X	X	X	X		No samples collected	
APW-10S-WG-2024(5011G		GW		"	1140	5	X	X	X	X	X			03
APW-10D-WG-2024(5011G		GW		"	1055	5	X	X	X	X	X			04
APW-06S-WG-2024(5011S		GW		1/15/25	0805	5	X	X	X	X	X			05
APW-06D-WG-2024(5011S		GW			0955	5	X	X	X	X	X			06
APW-05R-WG-2024(5011S		GW			1130	5	X	X	X	X	X			07
APW-09-WG-2024(5011S		GW			1350	5	X	X	X	X	X			08
APW-02-WG-2024(5011S		GW			1045	5	X	X	X	X	X			09

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/17/25	12:30	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/17/25	13:00	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Dewang

Trip Blank Received: Yes / No — HCL / MeoH TBR

Temp: °C Bottles Received: 69

Date: 1.18.25 Time: 0900

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

If p... te/Time

PH – 10BDH2631
TRC – 3327A333

Hold:

Condition: NCF / OK

Chain of Custody Page 1 of 2

Pace PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # 458164770

A115

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1122249**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEx Ground**

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 4Q24

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Phone: **314-682-3980**

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day Standard

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres	Remarks	Sample # (lab only)
APW-01R-WG-2024[MD]50115	Grab	GW		1/15/25	1250	5	X	X	X	X	X		10
APW-04-WG-2024[MD]50114		GW		1/14/25	1610	5	X	X	X	X	X		-11
EB-01-WG-2024[MD]50114		GW		1/14/25	1100	4	X	X	X	X	X	No dissolved collected	-12
DUP-01-WG-2024[MD]50115		GW		1/15/25	0001	5	X	X	X	X	X		-13
DUP-02-WG-2024[MD]50115		GW		1/15/25	0002	5	X	X	X	X	X		-14

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1851010

Table #

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1122249**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Marshall Arendell	1/17/25	12:30	ESCMO
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	1/17/25	13:00	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Dwayne G

Trip Blank Received: Yes / No — HCL / MeoH TBR

Temp: °C Bottles Received: 69

Date: 1.18.25 Time: 0900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

L#_____

Fed Ex tracking #	Gun ID	Temperature
425709337279	EDAY	1.3 to .4 = 1.7
425709337327	EDAY	2.1 to .4 = 2.5
425709337280	EDAY	1.4 to .4 = 1.8

Demanly
Name

1.18.25
Date

Ex 8164 R

APPENDIX E FOURTH QUARTER 2024 RADIOLOGICAL LABORATORY ANALYTICAL REPORT

ANALYTICAL REPORT

February 14, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1818469
Samples Received:	01/18/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 4Q24 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-03-WG-20250116 L1818469-01 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/16/25 09:00 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2436773	1	01/21/25 12:37	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2436773	1	01/21/25 12:37	01/23/25 18:57	ZRG	Mt. Juliet, TN

APW-08-WG-20250115 L1818469-02 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/16/25 15:40 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2436773	1	01/21/25 12:37	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2436773	1	01/21/25 12:37	01/23/25 18:57	ZRG	Mt. Juliet, TN

APW-10S-WG-20250116 L1818469-03 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/16/25 11:40 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2436773	1	01/21/25 12:37	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2436773	1	01/21/25 12:37	01/23/25 18:57	ZRG	Mt. Juliet, TN

APW-10D-WG-20250116 L1818469-04 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/16/25 10:50 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2436773	1	01/21/25 12:37	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2436773	1	01/21/25 12:37	01/23/25 18:57	ZRG	Mt. Juliet, TN

APW-06S-WG-20250115 L1818469-05 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/15/25 08:05 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2436773	1	01/21/25 12:37	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2436773	1	01/21/25 12:37	01/23/25 18:57	ZRG	Mt. Juliet, TN

APW-06D-WG-20250115 L1818469-06 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/15/25 09:55 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2436773	1	01/21/25 12:37	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2436773	1	01/21/25 12:37	01/23/25 18:57	ZRG	Mt. Juliet, TN

APW-05R-WG-20250115 L1818469-07 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/15/25 11:30 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	01/28/25 11:53	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

APW-09-WG-20250115 L1818469-08 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/15/25 13:50 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2436311	1	01/20/25 16:16	01/27/25 18:18	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	01/28/25 11:53	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

APW-02-WG-20250115 L1818469-09 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/15/25 10:45 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2440415	1	01/27/25 12:39	01/30/25 18:46	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	01/30/25 18:46	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

APW-01R-WG-20250115 L1818469-10 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/15/25 12:50 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2441146	1	01/30/25 10:21	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

APW-04-WG-20250114 L1818469-11 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/14/25 16:10 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2441146	1	01/30/25 10:21	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

EB-01-WG-20250114 L1818469-12 Non-Potable Water

Collected by: Marshall A | Collected date/time: 01/14/25 11:00 | Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2441146	1	01/30/25 10:21	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

SAMPLE SUMMARY

DUP-01-WG-20250115 L1818469-13 Non-Potable Water

Collected by: Marshall A
Collected date/time: 01/15/25 00:01
Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2441146	1	01/30/25 10:21	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

DUP-02-WG-20250115 L1818469-14 Non-Potable Water

Collected by: Marshall A
Collected date/time: 01/15/25 00:02
Received date/time: 01/18/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2441146	1	01/30/25 10:21	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2439063	1	01/24/25 09:17	02/05/25 17:17	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2439063	1	01/24/25 09:17	01/28/25 11:53	ZRG	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Project Narrative

-12 container label ID EB-01-WG-202501 differs from COC

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.698		0.382	0.674	0.670	0.356	01/27/2025 18:18	WG2436311
(T) Barium	*85.1*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*58.1*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.794		0.400	0.688	01/27/2025 18:18	WG2436773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.0960	J	0.120	0.221	0.158	0.131	01/23/2025 18:57	WG2436773
(T) Barium-133	*98.4*					*30.0-143*	*01/23/2025 18:57*	WG2436773

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.10		0.445	0.719	0.767	0.401	01/27/2025 18:18	WG2436311
(T) Barium	*114*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*59.3*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.48		0.502	0.791	01/27/2025 18:18	WG2436773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.382		0.233	0.461	0.194	0.147	01/23/2025 18:57	WG2436773
(T) Barium-133	*110*					*30.0-143*	*01/23/2025 18:57*	WG2436773

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.69		0.451	0.803	0.758	0.401	01/27/2025 18:18	WG2436311
(T) Barium	*96.4*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*68.4*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.02		0.498	0.774	01/27/2025 18:18	WG2436773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.331		0.211	0.402	0.156	0.128	01/23/2025 18:57	WG2436773
(T) Barium-133	*106*					*30.0-143*	*01/23/2025 18:57*	WG2436773

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	2.10		0.605	0.995	1.03	0.539	01/27/2025 18:18	WG2436311
(T) Barium	*91.7*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*60.2*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.21		0.621	1.05	01/27/2025 18:18	WG2436773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.114	J	0.141	0.242	0.194	0.147	01/23/2025 18:57	WG2436773
(T) Barium-133	*108*					*30.0-143*	*01/23/2025 18:57*	WG2436773

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	2.23		0.613	0.907	0.706	0.372	01/27/2025 18:18	WG2436311
(T) Barium	*88.4*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*56.5*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.49		0.641	0.723	01/27/2025 18:18	WG2436773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.262		0.188	0.357	0.155	0.128	01/23/2025 18:57	WG2436773
(T) Barium-133	*108*					*30.0-143*	*01/23/2025 18:57*	WG2436773

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	2.46		0.606	0.856	0.696	0.364	01/27/2025 18:18	WG2436311
(T) Barium	*86.5*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*73.6*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.68		0.631	0.713	01/27/2025 18:18	WG2436773

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.227		0.176	0.340	0.154	0.127	01/23/2025 18:57	WG2436773
(T) Barium-133	*100*					*30.0-143*	*01/23/2025 18:57*	WG2436773

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.40		0.828	1.21	0.992	0.521	01/27/2025 18:18	WG2436311
(T) Barium	*88.8*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*62.8*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.10		0.917	1.07	01/28/2025 11:53	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.710		0.394	0.781	0.403	0.261	01/28/2025 11:53	WG2439063
(T) Barium-133	*108*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.21		0.764	1.13	0.915	0.478	01/27/2025 18:18	WG2436311
(T) Barium	*109*					*30.0-143*	*01/27/2025 18:18*	WG2436311
(T) Yttrium	*64.4*					*30.0-136*	*01/27/2025 18:18*	WG2436311

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.46		0.806	0.975	01/28/2025 11:53	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.246	J	0.256	0.405	0.338	0.227	01/28/2025 11:53	WG2439063
(T) Barium-133	*111*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.89		0.774	1.33	1.44	0.755	01/30/2025 18:46	WG2440415
(T) Barium	*75.5*					*30.0-143*	*01/30/2025 18:46*	WG2440415
(T) Yttrium	*91.9*					*30.0-136*	*01/30/2025 18:46*	WG2440415

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.19		0.814	1.47	01/30/2025 18:46	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.301		0.253	0.388	0.284	0.207	01/28/2025 11:53	WG2439063
(T) Barium-133	*109*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.924		0.295	0.533	0.493	0.260	02/05/2025 17:17	WG2441146
(T) Barium	*112*					*30.0-143*	*02/05/2025 17:17*	WG2441146
(T) Yttrium	*72.9*					*30.0-136*	*02/05/2025 17:17*	WG2441146

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.946		0.307	0.529	02/05/2025 17:17	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.0217	U	0.0838	0.135	0.191	0.150	01/28/2025 11:53	WG2439063
(T) Barium-133	*94.0*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.111	U	0.567	0.936	0.996	0.520	02/05/2025 17:17	WG2441146
(T) Barium	*105*					*30.0-143*	*02/05/2025 17:17*	WG2441146
(T) Yttrium	*62.5*					*30.0-136*	*02/05/2025 17:17*	WG2441146

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.174	U	0.580	1.02	02/05/2025 17:17	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.0629	U	0.123	0.204	0.208	0.151	01/28/2025 11:53	WG2439063
(T) Barium-133	*104*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.689		0.386	0.645	0.662	0.347	02/05/2025 17:17	WG2441146
(T) Barium	*90.1*					*30.0-143*	*02/05/2025 17:17*	WG2441146
(T) Yttrium	*67.5*					*30.0-136*	*02/05/2025 17:17*	WG2441146

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.839		0.417	0.686	02/05/2025 17:17	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.149	J	0.158	0.291	0.181	0.150	01/28/2025 11:53	WG2439063
(T) Barium-133	*85.8*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.48		0.434	0.706	0.723	0.378	02/05/2025 17:17	WG2441146
(T) Barium	*91.1*					*30.0-143*	*02/05/2025 17:17*	WG2441146
(T) Yttrium	*62.4*					*30.0-136*	*02/05/2025 17:17*	WG2441146

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.83		0.490	0.750	02/05/2025 17:17	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.356		0.228	0.447	0.198	0.150	01/28/2025 11:53	WG2439063
(T) Barium-133	*98.0*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.630	J	0.376	0.624	0.645	0.337	02/05/2025 17:17	WG2441146
(T) Barium	*107*					*30.0-143*	*02/05/2025 17:17*	WG2441146
(T) Yttrium	*68.4*					*30.0-136*	*02/05/2025 17:17*	WG2441146

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.691		0.389	0.664	02/05/2025 17:17	WG2439063

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.0607	J	0.0981	0.169	0.156	0.128	01/28/2025 11:53	WG2439063
(T) Barium-133	*109*					*30.0-143*	*01/28/2025 11:53*	WG2439063

Method Blank (MB)

(MB) R4171569-1 01/27/25 18:18

Analyte	MB Result	MB Qualifier	MB 2 sigma CE	MB MDA	MB Lc
	pCi/l		+ / -	pCi/l	pCi/l
Radium-228	0.174	U	0.229	0.410	0.216
(T) Barium	*115*		*115*		
(T) Yttrium	*60.2*		*60.2*		

L1818469-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1818469-07 01/27/25 18:18 • (DUP) R4171569-5 01/27/25 18:18

Analyte	Original Result	Original 2 sigma CE	Original MDA	Original Lc	DUP Result	DUP 2 sigma CE	DUP MDA	DUP Lc	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	pCi/l	+ / -	pCi/l	pCi/l	%			%	
Radium-228	1.40	0.828	0.992	0.521	0.319	0.639	1.14	0.593	126	1.03	U	20	3
(T) Barium	*88.8*				*83.7*	*83.7*							
(T) Yttrium	*62.8*				*66.6*	*66.6*							

Laboratory Control Sample (LCS)

(LCS) R4171569-2 01/27/25 18:18

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-228	5.00	5.53	111	80.0-120	
(T) Barium			*122*		
(T) Yttrium			*74.2*		

L1818231-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818231-06 01/27/25 18:18 • (MS) R4171569-3 01/27/25 18:18 • (MSD) R4171569-4 01/27/25 18:18

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	16.7	2.05	20.5	22.0	111	120	1	70.0-130			6.96		20
(T) Barium		*93.4*			*98.6*	*104*							
(T) Yttrium		*66.5*			*71.1*	*64.0*							

Method Blank (MB)

(MB) R4172937-1 01/30/25 18:46

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.373		0.188	0.354	0.185
(T) Barium	*83.8*		*83.8*		
(T) Yttrium	*101*		*101*		

L1820183-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1820183-07 01/31/25 16:37 • (DUP) R4172937-5 01/30/25 18:46

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.767	0.381	0.674	0.357	2.13	0.845	1.57	0.823	94.1	1.47		20	3
(T) Barium	*85.9*				*79.9*	*79.9*							
(T) Yttrium	*82.4*				*81.0*	*81.0*							

Laboratory Control Sample (LCS)

(LCS) R4172937-2 01/30/25 18:46

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.80	116	80.0-120	
(T) Barium			*84.9*		
(T) Yttrium			*91.5*		

L1819831-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1819831-03 01/31/25 16:37 • (MS) R4172937-3 01/30/25 18:46 • (MSD) R4172937-4 01/30/25 18:46

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	0.666	19.9	20.9	115	121	1	70.0-130			4.51		20
(T) Barium		*93.7*			*83.3*	*86.6*							
(T) Yttrium		*89.6*			*92.8*	*93.2*							

QUALITY CONTROL SUMMARY

L1818469-10,11,12,13,14

Method Blank (MB)

(MB) R4176524-1 02/04/25 17:04

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.0392	U	0.179	0.348	0.182
(T) Barium	*95.1*		*95.1*		
(T) Yttrium	*85.3*		*85.3*		

L1820688-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1820688-10 02/05/25 22:14 • (DUP) R4176524-5 02/04/25 17:04

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.374	0.533	1.03	0.537	-0.193	0.575	1.12	0.586	200	0.723	U	20	3
(T) Barium	*98.1*				*106*	*106*							
(T) Yttrium	*61.2*				*93.1*	*93.1*							

Laboratory Control Sample (LCS)

(LCS) R4176524-2 02/04/25 17:04

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.76	115	80.0-120	
(T) Barium			*112*		
(T) Yttrium			*86.5*		

L1818469-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818469-11 02/05/25 17:17 • (MS) R4176524-3 02/04/25 17:04 • (MSD) R4176524-4 02/04/25 17:04

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.111	11.4	10.8	113	107	1	70.0-130			5.41		20
(T) Barium		*105*			*107*	*92.5*							
(T) Yttrium		*62.5*			*83.4*	*77.8*							

Method Blank (MB)

(MB) R4170041-5 01/23/25 22:51

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0136	J	0.0163	0.0239	0.0171
(T) Barium-133	*103*		*103*		

L1818231-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1818231-03 01/23/25 22:51 • (DUP) R4170041-4 01/23/25 18:56

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.0660	0.129	0.218	0.159	0.000	0.166	0.343	0.235	200	0.314	U	20	3
(T) Barium-133	*95.3*				*97.9*	*97.9*							

Laboratory Control Sample (LCS)

(LCS) R4170041-1 01/23/25 18:56

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	5.70	114	80.0-120	
(T) Barium-133			*74.4*		

L1818231-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1818231-07 01/23/25 18:56 • (MS) R4170041-2 01/23/25 18:56 • (MSD) R4170041-3 01/23/25 18:56

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.0629	18.1	18.0	90.2	89.7	1	75.0-125			0.554		20
(T) Barium-133		*112*			*99.0*	*101*							

Method Blank (MB)

(MB) R4171352-1 01/28/25 11:53

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	0.0112	U	0.0346	0.0594	0.0365
(T) Barium-133	*87.3*		*87.3*		

L1817489-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1817489-06 01/28/25 11:53 • (DUP) R4171352-5 01/28/25 11:53

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	21.3	1.83	0.318	0.220	16.8	1.60	0.245	0.182	23.5	1.84		20	3
(T) Barium-133	*109*				*104*	*104*							

Laboratory Control Sample (LCS)

(LCS) R4171352-2 01/28/25 11:53

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	4.34	86.8	80.0-120	
(T) Barium-133			*97.5*		

L1819451-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1819451-04 01/28/25 11:53 • (MS) R4171352-3 01/28/25 11:53 • (MSD) R4171352-4 01/28/25 11:53

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.330	18.5	17.6	90.8	86.1	1	75.0-125			5.16		20
(T) Barium-133		*101*			*97.8*	*102*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Report to: **Randy Homburg**

Email To: **Randy.Homburg@erm.com;Tim.Wilson@erm.co**

Project Description: **Grand Tower Energy Center Groundwater 4Q24**

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Phone: **314-682-3980**

Client Project # **0599247**

Lab Project # **ERMSCMO-0599247**

Collected by (print): Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day Standard

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1818469
F184

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1122251**
PM: **206 - Jeff Carr**
PB:
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pres Chk	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3	Remarks	Sample # (lab only)
APW-03-WG-2024[5]0116	Grab	NPW		1/16/25	0900	3		X	X		-01
APW-08-WG-2024[5]0115		NPW		1/15/25	1540	3		X	X		02
~~APW-07-WG-2024[5]0116~~		~~NPW~~		~~1/16/25~~		3		X	X	No samples collected	
APW-10S-WG-2024[5]0116		NPW		"	1140	3		X	X		03
APW-10D-WG-2024[5]0116		NPW		"	1050	3		X	X		04
APW-06S-WG-2024[5]0116		NPW		1/15/25	0805	3		X	X		05
APW-06D-WG-2024[5]0115		NPW		"	0955	3		X	X		06
APW-05R-WG-2024[5]0115		NPW		"	1130	3		X	X		07
APW-09-WG-2024[5]0115		NPW		"	1350	3		X	X		08
APW-02-WG-2024[5]0115		NPW		"	1045	3		X	X		09

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Marshall Arendell	1/17/25	12:30	Esmo	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 42
	1/17/25	13:00		PH – 10BDH0941 TRC – 3227A333 : Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time: Hold: Condition: NCF / OK
			CRobeiza	01.18.25 0900

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
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Rolling Meadows, IL 60008-4242

Report to: **Randy Homburg**

Email To: **Randy.Homburg@erm.com;Tim.Wilson@erm.co**

Project Description: **Grand Tower Energy Center Groundwater 4Q24**

City/State Collected: Grand Tower, IL

Please Circle: PT MT (CT) ET

Phone: **314-682-3980**

Client Project # **0599247**

Lab Project # **ERMSCMO-0599247**

Collected by (print): Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature): Marshall Arendell

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day Standard

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3	Remarks	Sample # (lab only)
APW-01R-WG-2024 50115	Grab	NPW		1/15/25	1250	3	X	X		-10
APW-04-WG-2024 50114		NPW		1/14/25	1610	3	X	X		11
EB-01-WG-2024 50114		NPW		1/14/25	1100	3	X	X		12
DUP-01-WG-2024 50115		NPW		1/15/25	0001	3	X	X		13
DUP-02-WG-2024 50115		NPW		1/15/25	0002	3	X	X		14

Analysis / Container / Preservative — Pres Chk

Chain of Custody Page 2 of 2

Pace — PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1518469

Table #

Acctnum: **ERMSCMO**

Template: **T243472**

Prelogin: **P1122251**

PM: **206 - Jeff Carr**

PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Relinquished by : (Signature) Marshall Arendell	Date: 1/17/25	Time: 12:30	Received by: (Signature) ESCO	Trip Blank Received: Yes / No (HCL / MeoH TBR)
Relinquished by : (Signature)	Date: 1/17/25	Time: 13:00	Received by: (Signature)	Temp: °C Bottles Received: 42 — If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) CRobe WD	Date: 01.18.25 Time: 0900 — Hold: — Condition: NCF / OK

L# L1818469

Fed Ex tracking #	Gun ID	Temperature
4257 0933 7305	EDA9	2.8+0.4 = 3.2
4257 0933 7290	"	4.6+0.4 = 5.0
4257 0933 7316	"	2.4+0.4 = 2.8

Name

Date

ANALYTICAL REPORT

August 01, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1873853
Samples Received:	06/27/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 2Q25 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

John Hawkins
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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SAMPLE SUMMARY

APW-03-WG-20250625 L1873853-01

Collected by: Emma Portell | Collected date/time: 06/25/25 12:20 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566039	1	07/25/25 00:18	07/28/25 11:01	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-08-WG-20250625 L1873853-02

Collected by: Emma Portell | Collected date/time: 06/25/25 13:55 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566039	1	07/25/25 00:18	07/28/25 11:01	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-07-WG-20250625 L1873853-03

Collected by: Emma Portell | Collected date/time: 06/25/25 14:55 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566039	1	07/25/25 00:18	07/28/25 11:01	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-10S-WG-20250625 L1873853-04

Collected by: Emma Portell | Collected date/time: 06/25/25 17:25 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566039	1	07/25/25 00:18	07/28/25 11:01	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-10D-WG-20250625 L1873853-05

Collected by: Emma Portell | Collected date/time: 06/25/25 16:20 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566039	1	07/25/25 00:18	07/28/25 11:01	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-06S-WG-20250624 L1873853-06

Collected by: Emma Portell | Collected date/time: 06/24/25 15:43 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-06D-WG-20250624 L1873853-07

Collected by: Emma Portell | Collected date/time: 06/24/25 17:10 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-05R-WG-20250626 L1873853-08

Collected by: Emma Portell | Collected date/time: 06/26/25 10:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-09-WG-20250625 L1873853-09

Collected by: Emma Portell | Collected date/time: 06/25/25 09:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-02-WG-20250626 L1873853-10

Collected by: Emma Portell | Collected date/time: 06/26/25 09:30 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-01R-WG-20250625 L1873853-11

Collected by: Emma Portell | Collected date/time: 06/25/25 11:10 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

APW-04-WG-20250625 L1873853-12

Collected by: Emma Portell | Collected date/time: 06/25/25 08:15 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

EB-01-WG-20250624 L1873853-13

Collected by: Emma Portell | Collected date/time: 06/24/25 13:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

DUP-01-WG-20250626 L1873853-14

Collected by: Emma Portell | Collected date/time: 06/26/25 00:01 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

DUP-02-WG-20250625 L1873853-15

Collected by: Emma Portell | Collected date/time: 06/25/25 00:02 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2566473	1	07/26/25 00:30	07/29/25 18:11	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2567708	1	07/28/25 12:39	07/30/25 19:36	ZRG	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.702	J	0.515	0.554	0.840	0.265	07/28/2025 11:01	WG2566039
(T) Barium	*100*					*30.0-143*	*07/28/2025 11:01*	WG2566039
(T) Yttrium	*98.1*					*30.0-136*	*07/28/2025 11:01*	WG2566039

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.15		0.603	0.909	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.451		0.313	0.484	0.348	0.118	07/30/2025 19:36	WG2567708
(T) Barium-133	*94.4*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.546	J	0.543	0.577	0.907	0.288	07/28/2025 11:01	WG2566039
(T) Barium	*120*					*30.0-143*	*07/28/2025 11:01*	WG2566039
(T) Yttrium	*99.1*					*30.0-136*	*07/28/2025 11:01*	WG2566039

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.804	J	0.576	0.928	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.258		0.193	0.318	0.196	0.0508	07/30/2025 19:36	WG2567708
(T) Barium-133	*107*					*30.0-143*	*07/30/2025 19:36*	WG2567708

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.800	J	0.610	0.652	1.00	0.316	07/28/2025 11:01	WG2566039
(T) Barium	*123*					*30.0-143*	*07/28/2025 11:01*	WG2566039
(T) Yttrium	*89.7*					*30.0-136*	*07/28/2025 11:01*	WG2566039

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.927	J	0.634	1.03	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.127	J	0.171	0.261	0.248	0.0644	07/30/2025 19:36	WG2567708
(T) Barium-133	*93.9*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.575	J	0.588	0.623	0.983	0.311	07/28/2025 11:01	WG2566039
(T) Barium	*108*					*30.0-143*	*07/28/2025 11:01*	WG2566039
(T) Yttrium	*94.0*					*30.0-136*	*07/28/2025 11:01*	WG2566039

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.02		0.632	0.997	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.446		0.231	0.400	0.168	0.0405	07/30/2025 19:36	WG2567708
(T) Barium-133	*101*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.987		0.557	0.603	0.886	0.280	07/28/2025 11:01	WG2566039
(T) Barium	*115*					*30.0-143*	*07/28/2025 11:01*	WG2566039
(T) Yttrium	*96.5*					*30.0-136*	*07/28/2025 11:01*	WG2566039

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.14		0.580	0.909	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.155	J	0.161	0.278	0.205	0.0562	07/30/2025 19:36	WG2567708
(T) Barium-133	*103*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.01	J	0.805	0.856	1.33	0.431	07/29/2025 18:11	WG2566473
(T) Barium	*99.1*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*91.7*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.30	J	0.842	1.36	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.291	J	0.247	0.383	0.295	0.0930	07/30/2025 19:36	WG2567708
(T) Barium-133	*97.9*					*30.0-143*	*07/30/2025 19:36*	WG2567708

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.586	J	0.483	0.520	0.799	0.259	07/29/2025 18:11	WG2566473
(T) Barium	*101*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*98.1*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.960		0.555	0.854	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.374		0.274	0.429	0.302	0.0955	07/30/2025 19:36	WG2567708
(T) Barium-133	*100*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.879	J	0.789	0.833	1.31	0.423	07/29/2025 18:11	WG2566473
(T) Barium	*90.1*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*89.7*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.879	J	0.813	1.37	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	-0.0160	U	0.198	0.231	0.385	0.133	07/30/2025 19:36	WG2567708
(T) Barium-133	*109*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.0472	U	0.567	0.578	0.995	0.320	07/29/2025 18:11	WG2566473
(T) Barium	*116*	C1				*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*97.9*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.179	U	0.600	1.04	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.132	J	0.195	0.291	0.293	0.0887	07/30/2025 19:36	WG2567708
(T) Barium-133	*108*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.13	J	0.873	0.923	1.43	0.457	07/29/2025 18:11	WG2566473
(T) Barium	*105*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*101*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.62		0.918	1.45	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.497		0.284	0.457	0.261	0.0789	07/30/2025 19:36	WG2567708
(T) Barium-133	*110*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.654	J	0.609	0.647	1.01	0.323	07/29/2025 18:11	WG2566473
(T) Barium	*80.5*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*102*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.867	J	0.646	1.05	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.213	J	0.216	0.330	0.276	0.0814	07/30/2025 19:36	WG2567708
(T) Barium-133	*110*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.08		0.553	0.602	0.866	0.276	07/29/2025 18:11	WG2566473
(T) Barium	*109*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*90.9*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.09		0.574	0.914	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.0133	U	0.154	0.183	0.292	0.0966	07/30/2025 19:36	WG2567708
(T) Barium-133	*107*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.211	U	0.366	0.387	0.627	0.200	07/29/2025 18:11	WG2566473
(T) Barium	*105*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*91.1*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.211	U	0.380	0.687	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	-0.0833	U	0.101	0.172	0.282	0.0934	07/30/2025 19:36	WG2567708
(T) Barium-133	*99.9*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.663		0.367	0.404	0.581	0.186	07/29/2025 18:11	WG2566473
(T) Barium	*102*					*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*100*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.850		0.434	0.666	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.188	J	0.232	0.341	0.326	0.105	07/30/2025 19:36	WG2567708
(T) Barium-133	*109*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.299	U	0.463	0.487	0.790	0.252	07/29/2025 18:11	WG2566473
(T) Barium	*116*	C1				*30.0-143*	*07/29/2025 18:11*	WG2566473
(T) Yttrium	*97.1*					*30.0-136*	*07/29/2025 18:11*	WG2566473

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.519	J	0.537	0.878	07/30/2025 19:36	WG2567708

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.220	J	0.272	0.404	0.382	0.128	07/30/2025 19:36	WG2567708
(T) Barium-133	*110*					*30.0-143*	*07/30/2025 19:36*	WG2567708

Method Blank (MB)

(MB) R4251192-1 07/28/25 11:01

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.110	U	0.306	0.528	0.169
(T) Barium	*109*		*109*		
(T) Yttrium	*98.0*		*98.0*		

L1873775-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1873775-01 07/28/25 11:01 • (DUP) R4251192-5 07/28/25 11:01

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.0627	0.573	1.00	0.320	-0.0209	0.456	0.812	0.257	200	0.114	U	20	3
(T) Barium	*110*				*104*	*104*							
(T) Yttrium	*95.4*				*95.5*	*95.5*							

Laboratory Control Sample (LCS)

(LCS) R4251192-2 07/28/25 11:01

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.08	102	80.0-120	
(T) Barium			*105*		
(T) Yttrium			*94.7*		

L1880631-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1880631-20 07/28/25 11:01 • (MS) R4251192-3 07/28/25 11:01 • (MSD) R4251192-4 07/28/25 11:01

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	33.3	0.600	29.5	16.8	86.7	96.7	1	70.0-130		J3	55.0		20
(T) Barium		*91.2*			*79.2*	*92.2*							
(T) Yttrium		*95.7*			*93.9*	*91.8*							

QUALITY CONTROL SUMMARY

L1873853-06,07,08,09,10,11,12,13,14,15

Method Blank (MB)

(MB) R4251251-1 07/29/25 18:11

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.291	J	0.314	0.315	0.169
(T) Barium	*108*		*108*		
(T) Yttrium	*85.5*		*85.5*		

L1873388-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1873388-01 07/29/25 18:11 • (DUP) R4251251-5 07/29/25 18:11

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.381	0.652	0.657	0.360	0.869	0.737	0.723	0.396	78.0	0.496		20	3
(T) Barium	*111*				*112*	*112*					C1		
(T) Yttrium	*89.7*				*89.5*	*89.5*							

Laboratory Control Sample (LCS)

(LCS) R4251251-2 07/29/25 18:11

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.75	95.0	80.0-120	
(T) Barium			*96.2*		
(T) Yttrium			*87.8*		

L1880629-26 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1880629-26 07/29/25 19:15 • (MS) R4251251-3 07/29/25 18:11 • (MSD) R4251251-4 07/29/25 18:11

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	16.7	1.70	16.6	17.9	89.0	97.0	1	70.0-130			7.72		20
(T) Barium		*65.4*			*97.6*	*102*							
(T) Yttrium		*105*			*93.3*	*88.4*							

Method Blank (MB)

(MB) R4251824-1 07/30/25 19:36

Analyte	MB Result	MB Qualifier	MB 2 sigma CE	MB MDA	MB Lc
	pCi/l		+ / -	pCi/l	pCi/l
Radium-226	0.0216	U	0.0464	0.0770	0.0238
(T) Barium-133	*90.8*		*90.8*		

L1873775-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1873775-01 07/30/25 19:36 • (DUP) R4251824-5 07/30/25 19:36

Analyte	Original Result	Original 2 sigma CE	Original MDA	Original Lc	DUP Result	DUP 2 sigma CE	DUP MDA	DUP Lc	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	pCi/l	+ / -	pCi/l	pCi/l	%			%	
Radium-226	-0.0118	0.0894	0.214	0.0630	0.186	0.210	0.285	0.0931	200	0.867	J	20	3
(T) Barium-133	*108*				*106*	*106*							

Laboratory Control Sample (LCS)

(LCS) R4251824-2 07/30/25 19:36

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.00	4.84	96.8	80.0-120	
(T) Barium-133			*85.6*		

L1873853-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873853-15 07/30/25 19:36 • (MS) R4251824-3 07/30/25 19:36 • (MSD) R4251824-4 07/30/25 19:36

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.0	0.220	21.6	21.8	107	108	1	75.0-125			0.876		20
(T) Barium-133		*110*			*106*	*110*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
TPU	Total Propagated Uncertainty reported at 2 sigma (counting error plus all measurable variables).
Lc	Decision Level or Critical Level. DOE required Detection limit at a 68% confidence level.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
U (Radiochemistry)	Result + Error < MDA.
J (Radiochemistry)	Result < MDA; Result + Error > MDA.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C1	Tracer recovery limits have been exceeded; values are outside upper control limits.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 2Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT (CT) ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Emma Portell

Site/Facility ID #

P.O. #

Collected by (signature):
Emma Portell

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3							Remarks	Sample # (lab only)
APW-03-WG-2025 0625	Grab	NPW	54.70	6/25/25	1220	3	X	X								01
APW-08-WG-2025 0625		NPW	57.20	6/25/25	1355	3	X	X								02
APW-07-WG-2025 0625		NPW	58.18	6/25/25	1455	3	X	X								03
APW-10S-WG-2025 0625		NPW	57.90	6/25/25	1620	3	X	X								04
APW-10D-WG-2025 0625		NPW	93.93	6/25/25	1725	3	X	X								05
APW-06S-WG-2025 0624		NPW	59.65	6/24/25	1543	3	X	X								06
APW-06D-WG-2025 0624		NPW	151.44	6/24/25	1710	3	X	X								07
APW-05R-WG-2025 0626		NPW	57.80	6/26/25	1045	3	X	X								08
APW-09-WG-2025 0625		NPW	58.10	6/25/25	0945	3	X	X								09
APW-02-WG-2025 0626		NPW	53.15	6/26/25	0930	3	X	X								10

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1673653
F186

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1145310**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Emma Portell	6/26/25	1430			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 45	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) CAROLINE	Date: 06.27.25 Time: 0900	Hold: Condition: NCF / OK

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 2Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT (CT) ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Emma Portell

Site/Facility ID #

P.O. #

Collected by (signature):
Emma Portell

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed
STD TAT

Analysis / Container / Preservative

Pres Chk

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3								
APW-01R-WG-2025 0625	Grab	NPW	53.90	6/25/25	1110	3	X	X								11
APW-04-WG-2025 0625		NPW	55.39	6/25/25	0915	3	X	X								12
EB-01-WG-2025 0624		NPW	NA	6/24/25	1345	3	X	X								13
DUP-01-WG-2025 0626		NPW		6/26/25	0001	3	X	X								14
DUP-02-WG-2025 0625		NPW		6/25/25	0002	3	X	X								15

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1873853

Table #

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1145310**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

Remarks | Sample # (lab only)

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Emma Portell	6/26/25	1430	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 45

Date: Time:

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Multiple Parcel Form

L# 46738853

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
4257 0933 7555	TLA9	0.5	0.4	0.9	Yes / No / Not Present
4257 0933 7526	TLA9	0.8	0.4	1.2	Yes / No / Not Present
4257 0933 7603	TLA9	4.9	0.4	5.3	Yes / No / Not Present
4257 0933 7577	TLA9	2.5	0.4	2.9	Yes / No / Not Present
4257 0933 7599	TLA9	1.6	0.4	2.0	Yes / No / Not Present
4257 0933 7588	TLA9	3.1	0.4	3.5	Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

CRoberts
Name

06.27.25
Date

APPENDIX E FOURTH QUARTER 2024 RADIOLOGICAL LABORATORY ANALYTICAL REPORT

ANALYTICAL REPORT

August 01, 2025

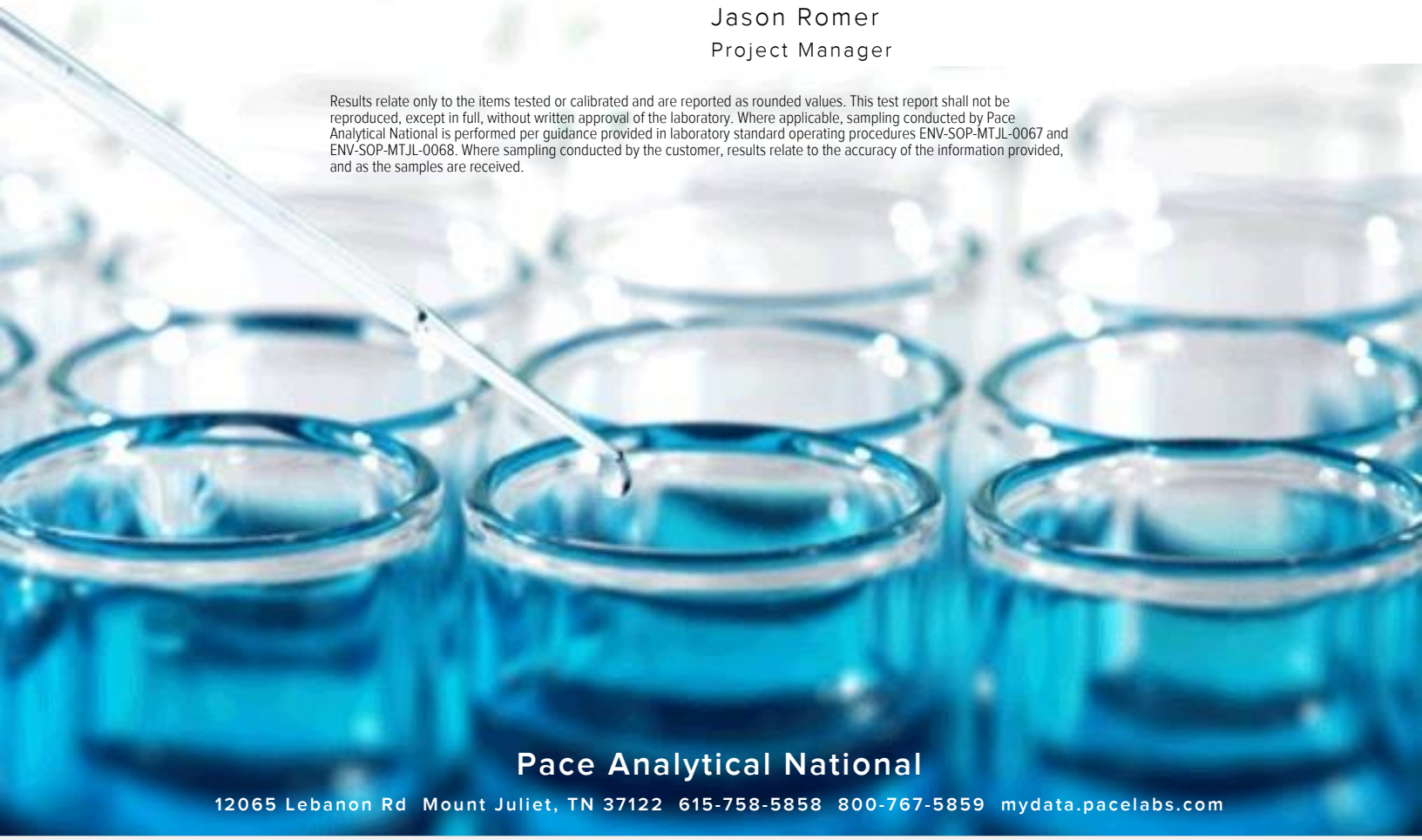
ERM - St. Louis, MO

Sample Delivery Group:	L1873864
Samples Received:	06/27/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 2Q25 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

Jason Romer
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-09-WG-20250625 L1873864-09 24

APW-02-WG-20250626 L1873864-10 26

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APW-03-WG-20250625 L1873864-01

Collected by: Emma Portell | Collected date/time: 06/25/25 12:20 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/05/25 23:04	07/05/25 23:04	DLH	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	10	07/05/25 23:17	07/05/25 23:17	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:31	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2549037	1	07/01/25 13:40	07/02/25 01:32	LAS	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:15	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 11:50	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:24	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:04	JDB	Mt. Juliet, TN

APW-08-WG-20250625 L1873864-02

Collected by: Emma Portell | Collected date/time: 06/25/25 13:55 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/05/25 23:30	07/05/25 23:30	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:33	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:36	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:25	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 11:51	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:27	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:08	JDB	Mt. Juliet, TN

APW-07-WG-20250625 L1873864-03

Collected by: Emma Portell | Collected date/time: 06/25/25 14:55 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/05/25 23:43	07/05/25 23:43	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:36	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:43	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:28	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 11:53	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:30	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:11	JDB	Mt. Juliet, TN

APW-10S-WG-20250625 L1873864-04

Collected by: Emma Portell | Collected date/time: 06/25/25 17:25 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 00:34	07/06/25 00:34	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:39	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:46	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:31	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 11:55	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:33	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:14	JDB	Mt. Juliet, TN

APW-10D-WG-20250625 L1873864-05

Collected by: Emma Portell | Collected date/time: 06/25/25 16:20 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 01:00	07/06/25 01:00	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:46	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:48	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:34	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:00	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:42	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:17	JDB	Mt. Juliet, TN

APW-06S-WG-20250624 L1873864-06

Collected by: Emma Portell | Collected date/time: 06/24/25 15:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 01:13	07/06/25 01:13	DLH	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	5	07/06/25 01:26	07/06/25 01:26	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:49	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:51	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:42	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:02	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:46	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:20	JDB	Mt. Juliet, TN

APW-06D-WG-20250624 L1873864-07

Collected by: Emma Portell | Collected date/time: 06/24/25 17:10 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 01:38	07/06/25 01:38	DLH	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	5	07/06/25 01:51	07/06/25 01:51	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:51	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:53	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:44	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:03	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:49	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:23	JDB	Mt. Juliet, TN

APW-05R-WG-20250626 L1873864-08

Collected by: Emma Portell | Collected date/time: 06/26/25 10:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 02:04	07/06/25 02:04	DLH	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	5	07/06/25 02:17	07/06/25 02:17	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552994	1	07/05/25 17:40	07/05/25 17:40	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:54	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:56	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:47	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:05	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:52	JPD	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

APW-05R-WG-20250626 L1873864-08

Collected by: Emma Portell | Collected date/time: 06/26/25 10:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:26	JDB	Mt. Juliet, TN

APW-09-WG-20250625 L1873864-09

Collected by: Emma Portell | Collected date/time: 06/25/25 09:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 02:56	07/06/25 02:56	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:56	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 03:58	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:50	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:07	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:55	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:29	JDB	Mt. Juliet, TN

APW-02-WG-20250626 L1873864-10

Collected by: Emma Portell | Collected date/time: 06/25/25 09:30 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2550382	1	07/01/25 14:18	07/02/25 11:12	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 03:21	07/06/25 03:21	DLH	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	10	07/06/25 03:34	07/06/25 03:34	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 11:59	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 04:00	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:53	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:08	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 12:58	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 15:32	JDB	Mt. Juliet, TN

APW-01R-WG-20250625 L1873864-11

Collected by: Emma Portell | Collected date/time: 06/25/25 11:10 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2550382	1	07/01/25 14:18	07/02/25 11:12	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 03:47	07/06/25 03:47	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 12:01	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 04:03	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:55	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:10	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 13:01	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 16:02	JDB	Mt. Juliet, TN

APW-04-WG-20250625 L1873864-12

Collected by: Emma Portell | Collected date/time: 06/25/25 08:15 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2550382	1	07/01/25 14:18	07/02/25 11:12	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 04:00	07/06/25 04:00	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN

APW-04-WG-20250625 L1873864-12

Collected by: Emma Portell | Collected date/time: 06/25/25 08:15 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 12:05	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 04:05	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 20:58	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:12	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 13:04	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 16:05	JDB	Mt. Juliet, TN

EB-01-WG-20250624 L1873864-13

Collected by: Emma Portell | Collected date/time: 06/24/25 13:45 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549522	1	07/01/25 07:27	07/01/25 10:29	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 04:26	07/06/25 04:26	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552999	1	07/05/25 19:20	07/05/25 19:20	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 12:11	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 04:13	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 21:01	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:13	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 13:07	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 16:08	JDB	Mt. Juliet, TN

DUP-01-WG-20250626 L1873864-14

Collected by: Emma Portell | Collected date/time: 06/26/25 00:01 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2550382	1	07/01/25 14:18	07/02/25 11:12	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	1	07/06/25 04:38	07/06/25 04:38	DLH	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548117	5	07/06/25 04:51	07/06/25 04:51	DLH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 12:26	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 04:16	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 21:04	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 12:15	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 13:10	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 16:11	JDB	Mt. Juliet, TN

DUP-02-WG-20250625 L1873864-15

Collected by: Emma Portell | Collected date/time: 06/25/25 00:02 | Received date/time: 06/27/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2549523	1	06/30/25 16:08	06/30/25 16:53	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2548798	1	07/08/25 14:39	07/08/25 14:39	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2552995	1	07/05/25 19:00	07/05/25 19:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2548580	1	06/30/25 16:03	07/02/25 12:28	NDL	Mt. Juliet, TN
Mercury by Method 7470A	WG2548583	1	06/29/25 17:34	07/01/25 04:18	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551106	1	07/08/25 10:58	07/08/25 21:06	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2551209	1	07/07/25 08:53	07/08/25 14:44	NMM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551122	1	07/08/25 11:03	07/26/25 13:33	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2551282	1	07/07/25 08:50	07/31/25 16:15	JDB	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jason Romer
Project Manager

Sample Delivery Group (SDG) Narrative

Analysis was filtered in the laboratory.

Lab Sample ID	Project Sample ID	Method
L1873864-01	APW-03-WG-20250625	6020B, 6010D
L1873864-02	APW-08-WG-20250625	6020B, 6010D, 7470A
L1873864-03	APW-07-WG-20250625	6020B, 6010D, 7470A
L1873864-04	APW-10S-WG-20250625	6010D, 6020B, 7470A
L1873864-05	APW-10D-WG-20250625	6020B, 7470A, 6010D
L1873864-06	APW-06S-WG-20250624	6010D, 6020B, 7470A
L1873864-07	APW-06D-WG-20250624	6010D, 6020B, 7470A
L1873864-08	APW-05R-WG-20250626	7470A, 6020B, 6010D
L1873864-09	APW-09-WG-20250625	6020B, 7470A, 6010D
L1873864-10	APW-02-WG-20250626	6020B, 7470A, 6010D
L1873864-11	APW-01R-WG-20250625	6010D, 6020B, 7470A
L1873864-12	APW-04-WG-20250625	7470A, 6010D, 6020B
L1873864-13	EB-01-WG-20250624	6020B, 6010D, 7470A
L1873864-14	DUP-01-WG-20250626	6010D, 6020B, 7470A
L1873864-15	DUP-02-WG-20250625	6020B, 7470A, 6010D
R4242258-3		6010D

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	536		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	6.54		1.00	1	07/05/2025 23:04	WG2548117
Fluoride	0.263		0.150	1	07/05/2025 23:04	WG2548117
Sulfate	261		50.0	10	07/05/2025 23:17	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.11	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:
L1873864-01 WG2552995: 8.11 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:31	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/02/2025 01:32	WG2549037

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	4.52		0.200	1	07/08/2025 11:50	WG2551209
Boron,Dissolved	4.49		0.200	1	07/08/2025 20:15	WG2551106
Calcium	116		1.00	1	07/08/2025 11:50	WG2551209
Calcium,Dissolved	115	V	1.00	1	07/08/2025 20:15	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:04	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:24	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 15:04	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122
Barium	0.107		0.00200	1	07/31/2025 15:04	WG2551282
Barium,Dissolved	0.0973		0.00200	1	07/26/2025 12:24	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:04	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:04	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:24	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:04	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:04	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:04	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122
Lithium	0.0290		0.00200	1	07/31/2025 15:04	WG2551282
Lithium,Dissolved	0.0314		0.00200	1	07/26/2025 12:24	WG2551122
Molybdenum	0.0600		0.00500	1	07/31/2025 15:04	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0580		0.00500	1	07/26/2025 12:24	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:04	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:04	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:24	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	422		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.66		1.00	1	07/05/2025 23:30	WG2548117
Fluoride	0.250		0.150	1	07/05/2025 23:30	WG2548117
Sulfate	28.6		5.00	1	07/05/2025 23:30	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.63	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-02 WG2552995: 7.63 at 22.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:33	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:36	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	07/08/2025 11:51	WG2551209
Boron,Dissolved	ND		0.200	1	07/08/2025 20:25	WG2551106
Calcium	104		1.00	1	07/08/2025 11:51	WG2551209
Calcium,Dissolved	104		1.00	1	07/08/2025 20:25	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:08	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:27	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 15:08	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 12:27	WG2551122
Barium	0.206		0.00200	1	07/31/2025 15:08	WG2551282
Barium,Dissolved	0.191		0.00200	1	07/26/2025 12:27	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:08	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:27	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:08	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:27	WG2551122
Chromium	0.00204		0.00200	1	07/31/2025 15:08	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:27	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:08	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:27	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:08	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:27	WG2551122
Lithium	0.0180		0.00200	1	07/31/2025 15:08	WG2551282
Lithium,Dissolved	0.0180		0.00200	1	07/26/2025 12:27	WG2551122
Molybdenum	ND		0.00500	1	07/31/2025 15:08	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	07/26/2025 12:27	WG2551122
Selenium	0.0183		0.00200	1	07/31/2025 15:08	WG2551282
Selenium,Dissolved	0.0169		0.00200	1	07/26/2025 12:27	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:08	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:27	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	683		13.3	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.38		1.00	1	07/05/2025 23:43	WG2548117
Fluoride	0.168		0.150	1	07/05/2025 23:43	WG2548117
Sulfate	39.4		5.00	1	07/05/2025 23:43	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.22	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-03 WG2552995: 7.22 at 22.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:36	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:43	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.204		0.200	1	07/08/2025 11:53	WG2551209
Boron,Dissolved	0.217		0.200	1	07/08/2025 20:28	WG2551106
Calcium	199		1.00	1	07/08/2025 11:53	WG2551209
Calcium,Dissolved	195		1.00	1	07/08/2025 20:28	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:11	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:30	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 15:11	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122
Barium	0.310		0.00200	1	07/31/2025 15:11	WG2551282
Barium,Dissolved	0.255		0.00200	1	07/26/2025 12:30	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:11	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:11	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:30	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:11	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:11	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:11	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122
Lithium	0.0141		0.00200	1	07/31/2025 15:11	WG2551282
Lithium,Dissolved	0.0138		0.00200	1	07/26/2025 12:30	WG2551122
Molybdenum	ND		0.00500	1	07/31/2025 15:11	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	07/26/2025 12:30	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:11	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:11	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:30	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	770		20.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.4		1.00	1	07/06/2025 00:34	WG2548117
Fluoride	0.228		0.150	1	07/06/2025 00:34	WG2548117
Sulfate	ND		5.00	1	07/06/2025 00:34	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.27	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-04 WG2552995: 7.27 at 22.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:39	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:46	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.591		0.200	1	07/08/2025 11:55	WG2551209
Boron,Dissolved	0.592		0.200	1	07/08/2025 20:31	WG2551106
Calcium	163		1.00	1	07/08/2025 11:55	WG2551209
Calcium,Dissolved	159		1.00	1	07/08/2025 20:31	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:14	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:33	WG2551122
Arsenic	0.194		0.00200	1	07/31/2025 15:14	WG2551282
Arsenic,Dissolved	0.0574		0.00200	1	07/26/2025 12:33	WG2551122
Barium	0.596		0.00200	1	07/31/2025 15:14	WG2551282
Barium,Dissolved	0.322		0.00200	1	07/26/2025 12:33	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:14	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:33	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:14	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:33	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:14	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:33	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:14	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:33	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:14	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:33	WG2551122
Lithium	0.0278		0.00200	1	07/31/2025 15:14	WG2551282
Lithium,Dissolved	0.0288		0.00200	1	07/26/2025 12:33	WG2551122
Molybdenum	ND		0.00500	1	07/31/2025 15:14	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	07/26/2025 12:33	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:14	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:33	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:14	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:33	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	463		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	16.2		1.00	1	07/06/2025 01:00	WG2548117
Fluoride	ND		0.150	1	07/06/2025 01:00	WG2548117
Sulfate	33.0		5.00	1	07/06/2025 01:00	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.65	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-05 WG2552995: 7.65 at 23C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:46	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:48	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	07/08/2025 12:00	WG2551209
Boron,Dissolved	ND		0.200	1	07/08/2025 20:34	WG2551106
Calcium	135		1.00	1	07/08/2025 12:00	WG2551209
Calcium,Dissolved	129		1.00	1	07/08/2025 20:34	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:17	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:42	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 15:17	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 12:42	WG2551122
Barium	0.344		0.00200	1	07/31/2025 15:17	WG2551282
Barium,Dissolved	0.320		0.00200	1	07/26/2025 12:42	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:17	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:42	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:17	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:42	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:17	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:42	WG2551122
Cobalt	0.00295		0.00200	1	07/31/2025 15:17	WG2551282
Cobalt,Dissolved	0.00253		0.00200	1	07/26/2025 12:42	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:17	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:42	WG2551122
Lithium	0.0144		0.00200	1	07/31/2025 15:17	WG2551282
Lithium,Dissolved	0.0149		0.00200	1	07/26/2025 12:42	WG2551122
Molybdenum	ND		0.00500	1	07/31/2025 15:17	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	07/26/2025 12:42	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:17	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:42	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:17	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:42	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	538		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	27.2		1.00	1	07/06/2025 01:13	WG2548117
Fluoride	0.291		0.150	1	07/06/2025 01:13	WG2548117
Sulfate	116		25.0	5	07/06/2025 01:26	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.58	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-06 WG2552995: 7.58 at 23.3C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:49	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:51	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	3.66		0.200	1	07/08/2025 12:02	WG2551209
Boron,Dissolved	3.10		0.200	1	07/08/2025 20:42	WG2551106
Calcium	109		1.00	1	07/08/2025 12:02	WG2551209
Calcium,Dissolved	84.1		1.00	1	07/08/2025 20:42	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:20	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:46	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 15:20	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122
Barium	0.230		0.00200	1	07/31/2025 15:20	WG2551282
Barium,Dissolved	0.120		0.00200	1	07/26/2025 12:46	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:20	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:20	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:46	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:20	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:20	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:20	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122
Lithium	0.0295		0.00200	1	07/31/2025 15:20	WG2551282
Lithium,Dissolved	0.0261		0.00200	1	07/26/2025 12:46	WG2551122
Molybdenum	0.185		0.00500	1	07/31/2025 15:20	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.147		0.00500	1	07/26/2025 12:46	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:20	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:20	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:46	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	584		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	17.5		1.00	1	07/06/2025 01:38	WG2548117
Fluoride	0.216		0.150	1	07/06/2025 01:38	WG2548117
Sulfate	211		25.0	5	07/06/2025 01:51	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.72	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:
L1873864-07 WG2552995: 7.72 at 23.3C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:51	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:53	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	3.89		0.200	1	07/08/2025 12:03	WG2551209
Boron,Dissolved	3.92		0.200	1	07/08/2025 20:44	WG2551106
Calcium	119		1.00	1	07/08/2025 12:03	WG2551209
Calcium,Dissolved	118		1.00	1	07/08/2025 20:44	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:23	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:49	WG2551122
Arsenic	0.0109		0.00200	1	07/31/2025 15:23	WG2551282
Arsenic,Dissolved	0.00520		0.00200	1	07/26/2025 12:49	WG2551122
Barium	0.123		0.00200	1	07/31/2025 15:23	WG2551282
Barium,Dissolved	0.107		0.00200	1	07/26/2025 12:49	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:23	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:49	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:23	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:49	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:23	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:49	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:23	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:49	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:23	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:49	WG2551122
Lithium	0.0148		0.00200	1	07/31/2025 15:23	WG2551282
Lithium,Dissolved	0.0152		0.00200	1	07/26/2025 12:49	WG2551122
Molybdenum	0.0609		0.00500	1	07/31/2025 15:23	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0558		0.00500	1	07/26/2025 12:49	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:23	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:49	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:23	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:49	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	504		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	24.1		1.00	1	07/06/2025 02:04	WG2548117
Fluoride	0.369		0.150	1	07/06/2025 02:04	WG2548117
Sulfate	135		25.0	5	07/06/2025 02:17	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.00	T8	1	07/05/2025 17:40	WG2552994

Sample Narrative:

L1873864-08 WG2552994: 8 at 22.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:54	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:56	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	5.49		0.200	1	07/08/2025 12:05	WG2551209
Boron,Dissolved	5.58		0.200	1	07/08/2025 20:47	WG2551106
Calcium	104		1.00	1	07/08/2025 12:05	WG2551209
Calcium,Dissolved	104		1.00	1	07/08/2025 20:47	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:26	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:52	WG2551122
Arsenic	0.00223		0.00200	1	07/31/2025 15:26	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122
Barium	0.147		0.00200	1	07/31/2025 15:26	WG2551282
Barium,Dissolved	0.102		0.00200	1	07/26/2025 12:52	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:26	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:26	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:52	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:26	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:26	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:26	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122
Lithium	0.0248		0.00200	1	07/31/2025 15:26	WG2551282
Lithium,Dissolved	0.0257		0.00200	1	07/26/2025 12:52	WG2551122
Molybdenum	0.147		0.00500	1	07/31/2025 15:26	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.139		0.00500	1	07/26/2025 12:52	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:26	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:26	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:52	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	378		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.1		1.00	1	07/06/2025 02:56	WG2548117
Fluoride	0.204		0.150	1	07/06/2025 02:56	WG2548117
Sulfate	48.6		5.00	1	07/06/2025 02:56	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.91	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-09 WG2552995: 7.91 at 23.1C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:56	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 03:58	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.614		0.200	1	07/08/2025 12:07	WG2551209
Boron,Dissolved	0.642		0.200	1	07/08/2025 20:50	WG2551106
Calcium	91.9		1.00	1	07/08/2025 12:07	WG2551209
Calcium,Dissolved	91.0		1.00	1	07/08/2025 20:50	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:29	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:55	WG2551122
Arsenic	0.00266		0.00200	1	07/31/2025 15:29	WG2551282
Arsenic,Dissolved	0.00233		0.00200	1	07/26/2025 12:55	WG2551122
Barium	0.132		0.00200	1	07/31/2025 15:29	WG2551282
Barium,Dissolved	0.101		0.00200	1	07/26/2025 12:55	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:29	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:55	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 15:29	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:55	WG2551122
Chromium	ND		0.00200	1	07/31/2025 15:29	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:55	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 15:29	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:55	WG2551122
Lead	ND		0.00200	1	07/31/2025 15:29	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:55	WG2551122
Lithium	0.0157		0.00200	1	07/31/2025 15:29	WG2551282
Lithium,Dissolved	0.0164		0.00200	1	07/26/2025 12:55	WG2551122
Molybdenum	0.0336		0.00500	1	07/31/2025 15:29	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0298		0.00500	1	07/26/2025 12:55	WG2551122
Selenium	0.0226		0.00200	1	07/31/2025 15:29	WG2551282
Selenium,Dissolved	0.0227		0.00200	1	07/26/2025 12:55	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:29	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:55	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	801		13.3	1	07/02/2025 11:12	WG2550382

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.99		1.00	1	07/06/2025 03:21	WG2548117
Fluoride	0.264		0.150	1	07/06/2025 03:21	WG2548117
Sulfate	432		50.0	10	07/06/2025 03:34	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.41	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-10 WG2552995: 7.41 at 22.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 11:59	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 04:00	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	10.3		0.200	1	07/08/2025 12:08	WG2551209
Boron,Dissolved	10.4		0.200	1	07/08/2025 20:53	WG2551106
Calcium	185		1.00	1	07/08/2025 12:08	WG2551209
Calcium,Dissolved	151		1.00	1	07/08/2025 20:53	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 15:32	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 12:58	WG2551122
Arsenic	0.0284		0.00200	1	07/31/2025 15:32	WG2551282
Arsenic,Dissolved	0.00214		0.00200	1	07/26/2025 12:58	WG2551122
Barium	0.484		0.00200	1	07/31/2025 15:32	WG2551282
Barium,Dissolved	0.127		0.00200	1	07/26/2025 12:58	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 15:32	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 12:58	WG2551122
Cadmium	0.00104		0.00100	1	07/31/2025 15:32	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 12:58	WG2551122
Chromium	0.0361		0.00200	1	07/31/2025 15:32	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 12:58	WG2551122
Cobalt	0.0117		0.00200	1	07/31/2025 15:32	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 12:58	WG2551122
Lead	0.0323		0.00200	1	07/31/2025 15:32	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 12:58	WG2551122
Lithium	0.0513		0.00200	1	07/31/2025 15:32	WG2551282
Lithium,Dissolved	0.0402		0.00200	1	07/26/2025 12:58	WG2551122
Molybdenum	0.210		0.00500	1	07/31/2025 15:32	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.207		0.00500	1	07/26/2025 12:58	WG2551122
Selenium	ND		0.00200	1	07/31/2025 15:32	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 12:58	WG2551122
Thallium	ND		0.00200	1	07/31/2025 15:32	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 12:58	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	307		10.0	1	07/02/2025 11:12	WG2550382

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	1.10		1.00	1	07/06/2025 03:47	WG2548117
Fluoride	0.159		0.150	1	07/06/2025 03:47	WG2548117
Sulfate	25.1		5.00	1	07/06/2025 03:47	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.18	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:
L1873864-11 WG2552995: 7.18 at 22.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 12:01	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 04:03	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	07/08/2025 12:10	WG2551209
Boron,Dissolved	ND		0.200	1	07/08/2025 20:55	WG2551106
Calcium	69.4		1.00	1	07/08/2025 12:10	WG2551209
Calcium,Dissolved	68.8		1.00	1	07/08/2025 20:55	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 16:02	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 13:01	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 16:02	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 13:01	WG2551122
Barium	0.148		0.00200	1	07/31/2025 16:02	WG2551282
Barium,Dissolved	0.135		0.00200	1	07/26/2025 13:01	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 16:02	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 13:01	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 16:02	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 13:01	WG2551122
Chromium	0.00299		0.00200	1	07/31/2025 16:02	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 13:01	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 16:02	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 13:01	WG2551122
Lead	ND		0.00200	1	07/31/2025 16:02	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 13:01	WG2551122
Lithium	0.0124		0.00200	1	07/31/2025 16:02	WG2551282
Lithium,Dissolved	0.0121		0.00200	1	07/26/2025 13:01	WG2551122
Molybdenum	ND		0.00500	1	07/31/2025 16:02	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	07/26/2025 13:01	WG2551122
Selenium	0.00316		0.00200	1	07/31/2025 16:02	WG2551282
Selenium,Dissolved	0.00289		0.00200	1	07/26/2025 13:01	WG2551122
Thallium	ND		0.00200	1	07/31/2025 16:02	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 13:01	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	445		10.0	1	07/02/2025 11:12	WG2550382

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	11.1		1.00	1	07/06/2025 04:00	WG2548117
Fluoride	0.167		0.150	1	07/06/2025 04:00	WG2548117
Sulfate	68.4		5.00	1	07/06/2025 04:00	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.83	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-12 WG2552995: 7.83 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 12:05	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 04:05	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	1.14		0.200	1	07/08/2025 12:12	WG2551209
Boron,Dissolved	1.16		0.200	1	07/08/2025 20:58	WG2551106
Calcium	99.8		1.00	1	07/08/2025 12:12	WG2551209
Calcium,Dissolved	102		1.00	1	07/08/2025 20:58	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 16:05	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 13:04	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 16:05	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 13:04	WG2551122
Barium	0.133		0.00200	1	07/31/2025 16:05	WG2551282
Barium,Dissolved	0.127		0.00200	1	07/26/2025 13:04	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 16:05	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 13:04	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 16:05	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 13:04	WG2551122
Chromium	ND		0.00200	1	07/31/2025 16:05	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 13:04	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 16:05	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 13:04	WG2551122
Lead	ND		0.00200	1	07/31/2025 16:05	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 13:04	WG2551122
Lithium	0.0269		0.00200	1	07/31/2025 16:05	WG2551282
Lithium,Dissolved	0.0263		0.00200	1	07/26/2025 13:04	WG2551122
Molybdenum	0.0535		0.00500	1	07/31/2025 16:05	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0499		0.00500	1	07/26/2025 13:04	WG2551122
Selenium	0.0165		0.00200	1	07/31/2025 16:05	WG2551282
Selenium,Dissolved	0.0152		0.00200	1	07/26/2025 13:04	WG2551122
Thallium	ND		0.00200	1	07/31/2025 16:05	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 13:04	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	07/01/2025 10:29	WG2549522

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	ND		1.00	1	07/06/2025 04:26	WG2548117
Fluoride	ND		0.150	1	07/06/2025 04:26	WG2548117
Sulfate	ND		5.00	1	07/06/2025 04:26	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	5.61	T8	1	07/05/2025 19:20	WG2552999

Sample Narrative:

L1873864-13 WG2552999: 5.61 at 22.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 12:11	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 04:13	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	07/08/2025 12:13	WG2551209
Boron,Dissolved	ND		0.200	1	07/08/2025 21:01	WG2551106
Calcium	ND		1.00	1	07/08/2025 12:13	WG2551209
Calcium,Dissolved	ND		1.00	1	07/08/2025 21:01	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 16:08	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 13:07	WG2551122
Arsenic	ND		0.00200	1	07/31/2025 16:08	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Barium	ND		0.00200	1	07/31/2025 16:08	WG2551282
Barium,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 16:08	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 16:08	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 13:07	WG2551122
Chromium	ND		0.00200	1	07/31/2025 16:08	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 16:08	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Lead	ND		0.00200	1	07/31/2025 16:08	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Lithium	ND		0.00200	1	07/31/2025 16:08	WG2551282
Lithium,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Molybdenum	ND		0.00500	1	07/31/2025 16:08	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	07/26/2025 13:07	WG2551122
Selenium	ND		0.00200	1	07/31/2025 16:08	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122
Thallium	ND		0.00200	1	07/31/2025 16:08	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 13:07	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	509		10.0	1	07/02/2025 11:12	WG2550382

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	23.6		1.00	1	07/06/2025 04:38	WG2548117
Fluoride	0.355		0.150	1	07/06/2025 04:38	WG2548117
Sulfate	133		25.0	5	07/06/2025 04:51	WG2548117

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.82	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-14 WG2552995: 7.82 at 22.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 12:26	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 04:16	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	5.53		0.200	1	07/08/2025 12:15	WG2551209
Boron,Dissolved	5.47		0.200	1	07/08/2025 21:04	WG2551106
Calcium	103		1.00	1	07/08/2025 12:15	WG2551209
Calcium,Dissolved	102		1.00	1	07/08/2025 21:04	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 16:11	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 13:10	WG2551122
Arsenic	0.00227		0.00200	1	07/31/2025 16:11	WG2551282
Arsenic,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122
Barium	0.146		0.00200	1	07/31/2025 16:11	WG2551282
Barium,Dissolved	0.103		0.00200	1	07/26/2025 13:10	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 16:11	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 16:11	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 13:10	WG2551122
Chromium	ND		0.00200	1	07/31/2025 16:11	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 16:11	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122
Lead	ND		0.00200	1	07/31/2025 16:11	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122
Lithium	0.0258		0.00200	1	07/31/2025 16:11	WG2551282
Lithium,Dissolved	0.0263		0.00200	1	07/26/2025 13:10	WG2551122
Molybdenum	0.146		0.00500	1	07/31/2025 16:11	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.140		0.00500	1	07/26/2025 13:10	WG2551122
Selenium	ND		0.00200	1	07/31/2025 16:11	WG2551282
Selenium,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122
Thallium	ND		0.00200	1	07/31/2025 16:11	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 13:10	WG2551122

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	393		10.0	1	06/30/2025 16:53	WG2549523

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.2		1.00	1	07/08/2025 14:39	WG2548798
Fluoride	0.208		0.150	1	07/08/2025 14:39	WG2548798
Sulfate	49.4		5.00	1	07/08/2025 14:39	WG2548798

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.90	T8	1	07/05/2025 19:00	WG2552995

Sample Narrative:

L1873864-15 WG2552995: 7.9 at 22.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2025 12:28	WG2548580
Mercury,Dissolved	ND		0.000200	1	07/01/2025 04:18	WG2548583

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.608		0.200	1	07/08/2025 14:44	WG2551209
Boron,Dissolved	0.624		0.200	1	07/08/2025 21:06	WG2551106
Calcium	92.0		1.00	1	07/08/2025 14:44	WG2551209
Calcium,Dissolved	89.4		1.00	1	07/08/2025 21:06	WG2551106

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	07/31/2025 16:15	WG2551282
Antimony,Dissolved	ND		0.00400	1	07/26/2025 13:33	WG2551122
Arsenic	0.00240		0.00200	1	07/31/2025 16:15	WG2551282
Arsenic,Dissolved	0.00221		0.00200	1	07/26/2025 13:33	WG2551122
Barium	0.117		0.00200	1	07/31/2025 16:15	WG2551282
Barium,Dissolved	0.101		0.00200	1	07/26/2025 13:33	WG2551122
Beryllium	ND		0.00200	1	07/31/2025 16:15	WG2551282
Beryllium,Dissolved	ND		0.00200	1	07/26/2025 13:33	WG2551122
Cadmium	ND		0.00100	1	07/31/2025 16:15	WG2551282
Cadmium,Dissolved	ND		0.00100	1	07/26/2025 13:33	WG2551122
Chromium	ND		0.00200	1	07/31/2025 16:15	WG2551282
Chromium,Dissolved	ND		0.00200	1	07/26/2025 13:33	WG2551122
Cobalt	ND		0.00200	1	07/31/2025 16:15	WG2551282
Cobalt,Dissolved	ND		0.00200	1	07/26/2025 13:33	WG2551122
Lead	ND		0.00200	1	07/31/2025 16:15	WG2551282
Lead,Dissolved	ND		0.00200	1	07/26/2025 13:33	WG2551122
Lithium	0.0160		0.00200	1	07/31/2025 16:15	WG2551282
Lithium,Dissolved	0.0163		0.00200	1	07/26/2025 13:33	WG2551122
Molybdenum	0.0314		0.00500	1	07/31/2025 16:15	WG2551282

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0301		0.00500	1	07/26/2025 13:33	WG2551122
Selenium	0.0225		0.00200	1	07/31/2025 16:15	WG2551282
Selenium,Dissolved	0.0223		0.00200	1	07/26/2025 13:33	WG2551122
Thallium	ND		0.00200	1	07/31/2025 16:15	WG2551282
Thallium,Dissolved	ND		0.00200	1	07/26/2025 13:33	WG2551122

Method Blank (MB)

(MB) R4240088-1 07/01/25 10:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1873425-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1873425-12 07/01/25 10:29 • (DUP) R4240088-3 07/01/25 10:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1820	1870	1	2.84		10

L1873893-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1873893-06 07/01/25 10:29 • (DUP) R4240088-4 07/01/25 10:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	ND	ND	1	200	P1	10

Laboratory Control Sample (LCS)

(LCS) R4240088-2 07/01/25 10:29

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8780	99.8	90.0-110	

Method Blank (MB)

(MB) R4239488-1 06/30/25 16:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1873864-15 Original Sample (OS) • Duplicate (DUP)

(OS) L1873864-15 06/30/25 16:53 • (DUP) R4239488-3 06/30/25 16:53

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	393	395	1	0.508		10

L1874350-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1874350-19 06/30/25 16:53 • (DUP) R4239488-4 06/30/25 16:53

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	747	752	1	0.711		10

Laboratory Control Sample (LCS)

(LCS) R4239488-2 06/30/25 16:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8910	101	90.0-110	

Method Blank (MB)

(MB) R4240565-1 07/02/25 11:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1873171-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1873171-05 07/02/25 11:12 • (DUP) R4240565-3 07/03/25 15:14

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1770	1800	1	1.96		10

L1874345-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1874345-10 07/02/25 11:12 • (DUP) R4240565-4 07/03/25 15:14

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	3720	3750	1	0.938		10

Laboratory Control Sample (LCS)

(LCS) R4240565-2 07/02/25 11:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8740	99.3	90.0-110	

Method Blank (MB)

(MB) R4241404-1 07/05/25 19:51

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.547	1.00
Fluoride	U		0.0761	0.150
Sulfate	U		0.637	5.00

L1873559-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1873559-03 07/05/25 20:55 • (DUP) R4241404-3 07/05/25 21:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	12.8	12.8	1	0.174		15
Fluoride	ND	ND	1	0.000		15
Sulfate	ND	ND	1	0.879		15

L1873559-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1873559-04 07/05/25 21:47 • (DUP) R4241404-6 07/05/25 22:00

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	26.2	26.7	1	1.64		15
Fluoride	ND	ND	1	10.5		15
Sulfate	ND	ND	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R4241404-2 07/05/25 20:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.0	97.5	80.0-120	
Fluoride	8.00	7.96	99.5	80.0-120	
Sulfate	40.0	40.1	100	80.0-120	

L1873559-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873559-03 07/05/25 20:55 • (MS) R4241404-4 07/05/25 21:21 • (MSD) R4241404-5 07/05/25 21:34

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	12.8	50.8	50.6	95.1	94.5	1	80.0-120			0.495	15
Fluoride	8.00	ND	8.13	8.06	102	101	1	80.0-120			0.790	15
Sulfate	40.0	ND	42.3	42.1	99.9	99.4	1	80.0-120			0.482	15

L1873559-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1873559-04 07/05/25 21:47 • (MS) R4241404-7 07/05/25 22:12

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	26.2	59.6	83.5	1	80.0-120	
Fluoride	8.00	ND	7.73	95.5	1	80.0-120	
Sulfate	40.0	ND	37.5	93.7	1	80.0-120	

Method Blank (MB)

(MB) R4242530-1 07/08/25 13:24

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.547	1.00
Fluoride	U		0.0761	0.150
Sulfate	U		0.637	5.00

L1873950-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1873950-02 07/08/25 15:04 • (DUP) R4242530-3 07/08/25 15:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	25.2	24.9	1	0.957		15
Fluoride	0.700	0.668	1	4.71		15
Sulfate	6.12	6.18	1	1.04		15

L1874000-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1874000-01 07/08/25 20:31 • (DUP) R4242530-6 07/08/25 20:43

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	12.1	11.7	1	3.97		15
Fluoride	0.361	0.357	1	0.892		15
Sulfate	8.44	8.06	1	4.53		15

Laboratory Control Sample (LCS)

(LCS) R4242530-2 07/08/25 13:36

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	38.8	96.9	80.0-120	
Fluoride	8.00	7.86	98.2	80.0-120	
Sulfate	40.0	39.8	99.4	80.0-120	

L1873950-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873950-02 07/08/25 15:04 • (MS) R4242530-4 07/08/25 15:29 • (MSD) R4242530-5 07/08/25 15:42

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	25.2	58.7	57.2	83.8	80.1	1	80.0-120			2.56	15
Fluoride	8.00	0.700	8.44	8.16	96.8	93.3	1	80.0-120			3.34	15
Sulfate	40.0	6.12	44.6	43.2	96.1	92.8	1	80.0-120			3.03	15

L1874000-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1874000-01 07/08/25 20:31 • (MS) R4242530-7 07/08/25 20:56

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	12.1	46.3	85.5	1	80.0-120	
Fluoride	8.00	0.361	7.80	93.0	1	80.0-120	
Sulfate	40.0	8.44	44.3	89.7	1	80.0-120	

L1872900-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1872900-09 07/05/25 17:40 • (DUP) R4240934-2 07/05/25 17:40

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	7.37	7.39	1	0.271		1

Sample Narrative:

OS: 7.37 at 23.4C

DUP: 7.39 at 23.4C

L1873717-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1873717-01 07/05/25 17:40 • (DUP) R4240934-3 07/05/25 17:40

Analyte	Original Result su	DUP Result su	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
pH	7.32	7.35	1	0.409		1

Sample Narrative:

OS: 7.32 at 22.9C

DUP: 7.35 at 22.8C

Laboratory Control Sample (LCS)

(LCS) R4240934-1 07/05/25 17:40

Analyte	Spike Amount su	LCS Result su	LCS Rec. %	Rec. Limits %	LCS Qualifier
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 23.4C

L1873794-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1873794-01 07/05/25 19:00 • (DUP) R4240938-2 07/05/25 19:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.33	8.34	1	0.120		1

Sample Narrative:

OS: 8.33 at 22.4C

DUP: 8.34 at 22.4C

L1874000-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1874000-01 07/05/25 19:00 • (DUP) R4240938-3 07/05/25 19:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.76	7.75	1	0.129		1

Sample Narrative:

OS: 7.76 at 22.7C

DUP: 7.75 at 22.7C

Laboratory Control Sample (LCS)

(LCS) R4240938-1 07/05/25 19:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.98	99.8	99.0-101	

Sample Narrative:

LCS: 9.98 at 22.8C

L1873660-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1873660-01 07/05/25 19:20 • (DUP) R4240943-2 07/05/25 19:20

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.98	7.98	1	0.000		1

Sample Narrative:

OS: 7.98 at 23C

DUP: 7.98 at 23C

L1874178-26 Original Sample (OS) • Duplicate (DUP)

(OS) L1874178-26 07/05/25 19:20 • (DUP) R4240943-3 07/05/25 19:20

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.91	6.87	1	0.581		1

Sample Narrative:

OS: 6.91 at 22.1C

DUP: 6.87 at 21.9C

Laboratory Control Sample (LCS)

(LCS) R4240943-1 07/05/25 19:20

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.98	99.8	99.0-101	

Sample Narrative:

LCS: 9.98 at 22.7C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4239464-1 07/02/25 11:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4239464-2 07/02/25 11:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00300	100	80.0-120	

L1873426-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873426-06 07/02/25 11:21 • (MS) R4239464-4 07/02/25 11:26 • (MSD) R4239464-5 07/02/25 11:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00224	0.00226	70.9	71.6	1	75.0-125	J6	J6	0.875	20

Method Blank (MB)

(MB) R4238590-1 07/01/25 03:20

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4238590-2 07/01/25 03:22

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00262	87.3	80.0-120	

L1873893-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873893-03 07/01/25 03:25 • (MS) R4238590-4 07/01/25 03:30 • (MSD) R4238590-5 07/01/25 03:33

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00251	0.00252	83.6	84.2	1	75.0-125			0.682	20

QUALITY CONTROL SUMMARY

L1873864-01

Method Blank (MB)

(MB) R4239244-1 07/02/25 01:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4239244-2 07/02/25 01:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00300	99.9	80.0-120	

L1873426-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873426-04 07/02/25 01:16 • (MS) R4239244-4 07/02/25 01:21 • (MSD) R4239244-5 07/02/25 01:24

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00298	0.00285	99.3	95.0	1	75.0-125			4.40	20

Method Blank (MB)

(MB) R4242258-1 07/08/25 20:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Boron,Dissolved	U		0.0233	0.200
Calcium,Dissolved	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4242258-2 07/08/25 20:12

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Boron,Dissolved	1.00	1.02	102	80.0-120	
Calcium,Dissolved	10.0	10.4	104	80.0-120	

L1873864-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873864-01 07/08/25 20:15 • (MS) R4242258-4 07/08/25 20:20 • (MSD) R4242258-5 07/08/25 20:23

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Boron,Dissolved	1.00	4.49	5.29	5.29	79.3	79.2	1	75.0-125			0.0189	20
Calcium,Dissolved	10.0	115	120	120	57.0	56.1	1	75.0-125	V	V	0.0790	20

Method Blank (MB)

(MB) R4242031-1 07/08/25 11:39

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0233	0.200
Calcium	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4242031-2 07/08/25 11:41

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	1.01	101	80.0-120	
Calcium	10.0	10.4	104	80.0-120	

L1874003-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1874003-02 07/08/25 11:43 • (MS) R4242031-4 07/08/25 11:46 • (MSD) R4242031-5 07/08/25 11:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	ND	1.02	1.02	102	102	1	75.0-125			0.351	20
Calcium	10.0	ND	10.5	10.5	105	105	1	75.0-125			0.0946	20

Method Blank (MB)

(MB) R4249949-1 07/26/25 12:05

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000310	0.00400
Arsenic,Dissolved	U		0.000120	0.00200
Barium,Dissolved	U		0.000500	0.00200
Beryllium,Dissolved	U		0.000200	0.00200
Cadmium,Dissolved	U		0.000120	0.00100
Chromium,Dissolved	U		0.000900	0.00200
Cobalt,Dissolved	U		0.000100	0.00200
Lead,Dissolved	U		0.000500	0.00200
Lithium,Dissolved	U		0.000600	0.00200
Molybdenum,Dissolved	U		0.000500	0.00500
Selenium,Dissolved	U		0.000250	0.00200
Thallium,Dissolved	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4249949-2 07/26/25 12:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	0.0500	0.0513	103	80.0-120	
Arsenic,Dissolved	0.0500	0.0515	103	80.0-120	
Barium,Dissolved	0.0500	0.0509	102	80.0-120	
Beryllium,Dissolved	0.0500	0.0492	98.5	80.0-120	
Cadmium,Dissolved	0.0500	0.0554	111	80.0-120	
Chromium,Dissolved	0.0500	0.0527	105	80.0-120	
Cobalt,Dissolved	0.0500	0.0528	106	80.0-120	
Lead,Dissolved	0.0500	0.0549	110	80.0-120	
Lithium,Dissolved	0.0500	0.0514	103	80.0-120	
Molybdenum,Dissolved	0.0500	0.0514	103	80.0-120	
Selenium,Dissolved	0.0500	0.0496	99.2	80.0-120	
Thallium,Dissolved	0.0500	0.0539	108	80.0-120	

L1874569-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1874569-01 07/26/25 12:11 • (MS) R4249949-4 07/26/25 12:18 • (MSD) R4249949-5 07/26/25 12:21

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0519	0.0520	104	104	1	75.0-125			0.106	20
Arsenic,Dissolved	0.0500	0.00298	0.0528	0.0530	99.6	100	1	75.0-125			0.343	20
Barium,Dissolved	0.0500	0.0681	0.119	0.118	101	100	1	75.0-125			0.384	20

L1874569-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1874569-01 07/26/25 12:11 • (MS) R4249949-4 07/26/25 12:18 • (MSD) R4249949-5 07/26/25 12:21

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium,Dissolved	0.0500	ND	0.0470	0.0470	94.1	94.1	1	75.0-125			0.00317	20
Cadmium,Dissolved	0.0500	ND	0.0536	0.0544	107	109	1	75.0-125			1.40	20
Chromium,Dissolved	0.0500	ND	0.0508	0.0511	102	102	1	75.0-125			0.523	20
Cobalt,Dissolved	0.0500	ND	0.0504	0.0513	101	103	1	75.0-125			1.83	20
Lead,Dissolved	0.0500	ND	0.0516	0.0530	103	106	1	75.0-125			2.54	20
Lithium,Dissolved	0.0500	0.0103	0.0579	0.0578	95.2	95.0	1	75.0-125			0.155	20
Molybdenum,Dissolved	0.0500	0.00805	0.0591	0.0603	102	104	1	75.0-125			2.00	20
Selenium,Dissolved	0.0500	ND	0.0489	0.0512	97.9	102	1	75.0-125			4.59	20
Thallium,Dissolved	0.0500	ND	0.0508	0.0528	102	106	1	75.0-125			3.86	20

Method Blank (MB)

(MB) R4252210-1 07/31/25 14:02

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.000310	0.00400
Arsenic	U		0.000120	0.00200
Barium	0.00132	J	0.000500	0.00200
Beryllium	U		0.000200	0.00200
Cadmium	U		0.000120	0.00100
Chromium	U		0.000900	0.00200
Cobalt	U		0.000100	0.00200
Lead	0.00145	J	0.000500	0.00200
Lithium	U		0.000600	0.00200
Molybdenum	U		0.000500	0.00500
Selenium	U		0.000250	0.00200
Thallium	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4252210-2 07/31/25 14:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0486	97.1	80.0-120	
Arsenic	0.0500	0.0500	100	80.0-120	
Barium	0.0500	0.0491	98.2	80.0-120	
Beryllium	0.0500	0.0455	91.0	80.0-120	
Cadmium	0.0500	0.0566	113	80.0-120	
Chromium	0.0500	0.0525	105	80.0-120	
Cobalt	0.0500	0.0523	105	80.0-120	
Lead	0.0500	0.0524	105	80.0-120	
Lithium	0.0500	0.0463	92.6	80.0-120	
Molybdenum	0.0500	0.0505	101	80.0-120	
Selenium	0.0500	0.0514	103	80.0-120	
Thallium	0.0500	0.0533	107	80.0-120	

L1873826-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873826-21 07/31/25 14:08 • (MS) R4252210-4 07/31/25 14:14 • (MSD) R4252210-5 07/31/25 14:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0531	0.0504	106	101	1	75.0-125			5.34	20
Arsenic	0.0500	ND	0.0548	0.0538	107	105	1	75.0-125			1.94	20
Barium	0.0500	0.0166	0.0669	0.0650	101	96.7	1	75.0-125			2.99	20

L1873826-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1873826-21 07/31/25 14:08 • (MS) R4252210-4 07/31/25 14:14 • (MSD) R4252210-5 07/31/25 14:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium	0.0500	ND	0.0391	0.0397	78.3	79.3	1	75.0-125			1.37	20
Cadmium	0.0500	ND	0.0572	0.0571	114	114	1	75.0-125			0.201	20
Chromium	0.0500	ND	0.0548	0.0530	107	104	1	75.0-125			3.23	20
Cobalt	0.0500	0.0379	0.0923	0.0909	109	106	1	75.0-125			1.52	20
Lead	0.0500	0.00220	0.0498	0.0514	95.3	98.4	1	75.0-125			3.05	20
Lithium	0.0500		0.407	0.405	0.000	0.000	1	75.0-125	V	V	0.636	20
Molybdenum	0.0500	ND	0.0553	0.0522	111	104	1	75.0-125			5.65	20
Selenium	0.0500	ND	0.0550	0.0545	110	109	1	75.0-125			0.901	20
Thallium	0.0500	ND	0.0498	0.0501	99.7	100	1	75.0-125			0.496	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
U (Radiochemistry)	Result + Error < MDA.
J (Radiochemistry)	Result < MDA; Result + Error > MDA.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 2Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Emma Portell

Site/Facility ID #

P.O. #

Collected by (signature):
Emma Portell

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed
STD TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres						
APW-03-WG-2025 0625	Grab	GW	54.70	6/25/25	1220	5	X	X	X	X	X						01
APW-08-WG-2025 0625		GW	57.20	6/25/25	1355	5	X	X	X	X	X						02
APW-07-WG-2025 0625		GW	58.18	6/25/25	1455	5	X	X	X	X	X						03
APW-10S-WG-2025 0625		GW	57.90	6/25/25	1620	5	X	X	X	X	X						04
APW-10D-WG-2025 0625		GW	93.93	6/23/25	1725	5	X	X	X	X	X						05
APW-06S-WG-2025 0624		GW	59.65	6/24/25	1545	5	X	X	X	X	X						06
APW-06D-WG-2025 0624		GW	151.44	6/24/25	1710	5	X	X	X	X	X						07
APW-05R-WG-2025 0626		GW	57.80	6/26/25	1045	5	X	X	X	X	X						08
APW-09-WG-2025 0625		GW	58.10	6/25/25	0945	5	X	X	X	X	X						09
APW-02-WG-2025 0626		GW	53.15	6/26/25	0930	5	X	X	X	X	X						10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Emma Portell	6/26/25	1430	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 24

Date: Time:

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1673800

F187

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1145307**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

Remarks | Sample # (lab only)

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 2Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT (CT) ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Emma Portell

Site/Facility ID #

P.O. #

Collected by (signature):
Emma Portell

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed
STD TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres					Remarks	Sample # (lab only)
					cr 06.27.25												
APW-01R-WG-2025 0625	Grab	GW	53.90	6/25/25	1110	5	X	X	X	X	X						11
APW-04-WG-2025 0625		GW	55.39	6/25/25	0815	5	X	X	X	X	X						12
EB-01-WG-2025 0624		GW	NA	6/24/25	1345	5	X	X	X	X	X						13
DUP-01-WG-2025 0626		GW		6/26/25	0001	5	X	X	X	X	X						14
DUP-02-WG-2025 0625		GW		6/25/25	0002	5	X	X	X	X	X						15

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1673864

Table #

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1145307**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Emma Portell	6/26/25	1430	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 14

Date: 06.27.25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

DC#_Title: ENV-FRM-MTJL-0575 v01_Login_Multiple Parcel Form
Effective Date: 2/20/2025

L18738864

Multiple Parcel Form

L#_____

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
4257 0933 7555	TLA9	0.5	0.4	0.9	Yes / No / Not Present
4257 0933 7526	TLA9	0.8	0.4	1.2	Yes / No / Not Present
4257 0933 7603	TLA9	4.9	0.4	5.3	Yes / No / Not Present
4257 0933 7577	TLA9	2.5	0.4	2.9	Yes / No / Not Present
4257 0933 7599	TLA9	1.6	0.4	2.0	Yes / No / Not Present
4257 0933 7588	TLA9	3.1	0.4	3.5	Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

CRoberts
Name

06.27.25
Date

ANALYTICAL REPORT

September 25, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1895667
Samples Received:	09/06/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 3Q25 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-03-WG-20250903 L1895667-01

Collected by: Marshall Arendell | Collected date/time: 09/03/25 14:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2595642	1	09/06/25 22:27	09/08/25 14:01	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595823	5	09/09/25 05:50	09/09/25 05:50	AJC	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596032	1	09/12/25 16:12	09/13/25 18:24	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2596881	1	09/11/25 09:35	09/11/25 17:47	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:13	09/11/25 20:40	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 18:54	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/22/25 22:47	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:13	TMT	Mt. Juliet, TN

APW-08-WG-20250905 L1895667-02

Collected by: Marshall Arendell | Collected date/time: 09/05/25 08:35 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596320	1	09/08/25 11:43	09/09/25 11:54	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595823	1	09/09/25 06:40	09/09/25 06:40	AJC	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596032	1	09/12/25 16:12	09/13/25 18:26	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2596881	1	09/11/25 09:35	09/11/25 17:49	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:13	09/11/25 20:42	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:01	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/22/25 23:00	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:16	TMT	Mt. Juliet, TN

APW-07-WG-20250904 L1895667-03

Collected by: Marshall Arendell | Collected date/time: 09/04/25 16:35 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596320	1	09/08/25 11:43	09/09/25 11:54	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595823	1	09/09/25 07:06	09/09/25 07:06	AJC	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596032	1	09/12/25 16:12	09/13/25 18:29	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2596881	1	09/11/25 09:35	09/11/25 17:52	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:13	09/11/25 20:44	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:03	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/22/25 23:03	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:20	TMT	Mt. Juliet, TN

APW-10S-WG-20250903 L1895667-04

Collected by: Marshall Arendell | Collected date/time: 09/03/25 16:45 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2595642	1	09/06/25 22:27	09/08/25 14:01	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595823	1	09/09/25 07:31	09/09/25 07:31	AJC	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596032	1	09/12/25 16:12	09/13/25 18:31	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2596881	1	09/11/25 09:35	09/11/25 17:54	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:13	09/11/25 20:45	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:05	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/22/25 23:06	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:23	TMT	Mt. Juliet, TN

APW-10D-WG-20250903 L1895667-05

Collected by: Marshall Arendell | Collected date/time: 09/03/25 15:55 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2595642	1	09/06/25 22:27	09/08/25 14:01	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/08/25 23:37	09/08/25 23:37	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596032	1	09/12/25 16:12	09/13/25 18:33	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2596881	1	09/11/25 09:35	09/11/25 17:57	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:13	09/11/25 20:47	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:07	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/22/25 23:09	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:26	TMT	Mt. Juliet, TN

APW-06S-WG-20250904 L1895667-06

Collected by: Marshall Arendell | Collected date/time: 09/04/25 10:55 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596320	1	09/08/25 11:43	09/09/25 11:54	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 00:29	09/09/25 00:29	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	5	09/09/25 00:47	09/09/25 00:47	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:29	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 14:53	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 20:49	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:12	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:10	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:29	TMT	Mt. Juliet, TN

APW-06D-WG-20250904 L1895667-07

Collected by: Marshall Arendell | Collected date/time: 09/04/25 09:55 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596320	1	09/08/25 11:43	09/09/25 11:54	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 01:04	09/09/25 01:04	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	5	09/09/25 01:21	09/09/25 01:21	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598465	1	09/11/25 23:00	09/11/25 23:00	KRB	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:31	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 14:55	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 20:51	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:14	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:13	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:32	TMT	Mt. Juliet, TN

APW-05R-WG-20250904 L1895667-08

Collected by: Marshall Arendell | Collected date/time: 09/04/25 12:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596320	1	09/08/25 11:43	09/09/25 11:54	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 01:39	09/09/25 01:39	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	5	09/09/25 01:56	09/09/25 01:56	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:33	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 14:58	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 20:52	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:15	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:16	UNP	Mt. Juliet, TN

APW-05R-WG-20250904 L1895667-08

Collected by: Marshall Arendell | Collected date/time: 09/04/25 12:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:36	TMT	Mt. Juliet, TN

APW-09-WG-20250605 L1895667-09

Collected by: Marshall Arendell | Collected date/time: 09/05/25 09:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596320	1	09/08/25 11:43	09/09/25 11:54	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 02:13	09/09/25 02:13	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:36	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 15:00	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 20:54	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:17	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:19	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:39	TMT	Mt. Juliet, TN

APW-02-WG-20250904 L1895667-10

Collected by: Marshall Arendell | Collected date/time: 09/04/25 13:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2599520	1	09/12/25 13:25	09/12/25 16:01	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 02:31	09/09/25 02:31	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	5	09/09/25 02:48	09/09/25 02:48	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:38	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 15:03	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 20:56	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:19	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:22	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	10	09/10/25 11:15	09/24/25 16:42	TMT	Mt. Juliet, TN

APW-01R-WG-20250904 L1895667-11

Collected by: Marshall Arendell | Collected date/time: 09/04/25 15:25 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2596935	1	09/09/25 11:49	09/09/25 18:50	KCB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 03:40	09/09/25 03:40	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:41	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 15:05	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 21:01	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:21	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:26	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:52	TMT	Mt. Juliet, TN

APW-04-WG-20250904 L1895667-12

Collected by: Marshall Arendell | Collected date/time: 09/04/25 08:10 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2599520	1	09/12/25 13:25	09/12/25 16:01	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 03:58	09/09/25 03:58	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN

APW-04-WG-20250904 L1895667-12

Collected by: Marshall Arendell | Collected date/time: 09/04/25 08:10 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:43	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 15:13	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 21:03	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:22	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:29	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:55	TMT	Mt. Juliet, TN

EB-01-WG-20250903 L1895667-13

Collected by: Marshall Arendell | Collected date/time: 09/03/25 10:00 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2595642	1	09/06/25 22:27	09/08/25 14:01	BDC	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 04:15	09/09/25 04:15	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:46	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:24	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 16:58	TMT	Mt. Juliet, TN

DUP-01-WG-20250904 L1895667-14

Collected by: Marshall Arendell | Collected date/time: 09/04/25 00:01 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2599520	1	09/12/25 13:25	09/12/25 16:01	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 04:32	09/09/25 04:32	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	5	09/09/25 19:36	09/09/25 19:36	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 15:48	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 15:15	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 21:04	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:26	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:32	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 17:02	TMT	Mt. Juliet, TN

DUP-02-WG-20250905 L1895667-15

Collected by: Marshall Arendell | Collected date/time: 09/05/25 00:02 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2599520	1	09/12/25 13:25	09/12/25 16:01	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2595826	1	09/09/25 04:50	09/09/25 04:50	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2598478	1	09/12/25 14:40	09/12/25 14:40	RJP	Mt. Juliet, TN
Mercury by Method 7470A	WG2596878	1	09/11/25 09:40	09/11/25 14:56	SDG	Mt. Juliet, TN
Mercury by Method 7470A	WG2597351	1	09/11/25 15:51	09/12/25 15:18	SDG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597476	1	09/11/25 11:12	09/11/25 21:06	BAG	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2597498	1	09/10/25 11:03	09/10/25 19:28	MAP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597487	1	09/10/25 14:09	09/23/25 14:35	UNP	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2597639	1	09/10/25 11:15	09/24/25 17:05	TMT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Sample Delivery Group (SDG) Narrative

Analysis was filtered in the laboratory.

Lab Sample ID	Project Sample ID	Method
L1895667-01	APW-03-WG-20250903	6020B, 6010D, 7470A
L1895667-02	APW-08-WG-20250905	6020B, 6010D, 7470A
L1895667-03	APW-07-WG-20250904	6010D, 6020B, 7470A
L1895667-04	APW-10S-WG-20250903	6020B, 6010D, 7470A
L1895667-05	APW-10D-WG-20250903	6010D, 6020B, 7470A
L1895667-06	APW-06S-WG-20250904	7470A, 6020B, 6010D
L1895667-07	APW-06D-WG-20250904	6020B, 6010D, 7470A
L1895667-08	APW-05R-WG-20250904	6010D, 6020B, 7470A
L1895667-09	APW-09-WG-20250605	6020B, 6010D, 7470A
L1895667-10	APW-02-WG-20250904	6020B, 6010D, 7470A
L1895667-11	APW-01R-WG-20250904	6020B, 6010D, 7470A
L1895667-12	APW-04-WG-20250904	6010D, 7470A, 6020B
L1895667-14	DUP-01-WG-20250904	7470A, 6010D, 6020B
L1895667-15	DUP-02-WG-20250905	6010D, 7470A, 6020B
R4272290-3		6010D
R4277020-3		6020B

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	540		10.0	1	09/08/2025 14:01	WG2595642

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	6.03		5.00	5	09/09/2025 05:50	WG2595823
Fluoride	ND		0.750	5	09/09/2025 05:50	WG2595823
Sulfate	251		25.0	5	09/09/2025 05:50	WG2595823

Sample Narrative:

L1895667-01 WG2595823: Dilution due to matrix impact on instrumentation at lower dilution

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	8.03	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:

L1895667-01 WG2598465: 8.03 at 20.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/13/2025 18:24	WG2596032
Mercury,Dissolved	ND		0.000200	1	09/11/2025 17:47	WG2596881

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	4.36		0.200	1	09/10/2025 18:54	WG2597498
Boron,Dissolved	4.19		0.200	1	09/11/2025 20:40	WG2597476
Calcium	111		1.00	1	09/10/2025 18:54	WG2597498
Calcium,Dissolved	107		1.00	1	09/11/2025 20:40	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:13	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/22/2025 22:47	WG2597487
Arsenic	ND		0.00200	1	09/24/2025 16:13	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487
Barium	0.116		0.00200	1	09/24/2025 16:13	WG2597639
Barium,Dissolved	0.0998		0.00200	1	09/22/2025 22:47	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:13	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:13	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/22/2025 22:47	WG2597487
Chromium	0.00203		0.00200	1	09/24/2025 16:13	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:13	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:13	WG2597639
Lead,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Lithium	0.0300		0.00200	1	09/24/2025 16:13	WG2597639
Lithium,Dissolved	0.0294		0.00200	1	09/22/2025 22:47	WG2597487
Molybdenum	0.0628		0.00500	1	09/24/2025 16:13	WG2597639
Molybdenum,Dissolved	0.0596		0.00500	1	09/22/2025 22:47	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:13	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:13	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/22/2025 22:47	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	426		10.0	1	09/09/2025 11:54	WG2596320

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.39		1.00	1	09/09/2025 06:40	WG2595823
Fluoride	0.253		0.150	1	09/09/2025 06:40	WG2595823
Sulfate	27.7		5.00	1	09/09/2025 06:40	WG2595823

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.36	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:
L1895667-02 WG2598465: 7.36 at 20.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/13/2025 18:26	WG2596032
Mercury,Dissolved	ND		0.000200	1	09/11/2025 17:49	WG2596881

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	09/10/2025 19:01	WG2597498
Boron,Dissolved	ND		0.200	1	09/11/2025 20:42	WG2597476
Calcium	102		1.00	1	09/10/2025 19:01	WG2597498
Calcium,Dissolved	100		1.00	1	09/11/2025 20:42	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:16	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/22/2025 23:00	WG2597487
Arsenic	ND		0.00200	1	09/24/2025 16:16	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/22/2025 23:00	WG2597487
Barium	0.200		0.00200	1	09/24/2025 16:16	WG2597639
Barium,Dissolved	0.185		0.00200	1	09/22/2025 23:00	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:16	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/22/2025 23:00	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:16	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/22/2025 23:00	WG2597487
Chromium	ND		0.00200	1	09/24/2025 16:16	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/22/2025 23:00	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:16	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/22/2025 23:00	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:16	WG2597639
Lead,Dissolved	ND		0.00200	1	09/22/2025 23:00	WG2597487
Lithium	0.0180		0.00200	1	09/24/2025 16:16	WG2597639
Lithium,Dissolved	0.0170		0.00200	1	09/22/2025 23:00	WG2597487
Molybdenum	ND		0.00500	1	09/24/2025 16:16	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	09/22/2025 23:00	WG2597487
Selenium	0.0166		0.00200	1	09/24/2025 16:16	WG2597639
Selenium,Dissolved	0.0169		0.00200	1	09/22/2025 23:00	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:16	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/22/2025 23:00	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	729		13.3	1	09/09/2025 11:54	WG2596320

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.97		1.00	1	09/09/2025 07:06	WG2595823
Fluoride	0.174		0.150	1	09/09/2025 07:06	WG2595823
Sulfate	37.4		5.00	1	09/09/2025 07:06	WG2595823

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.08	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:
L1895667-03 WG2598465: 7.08 at 20.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/13/2025 18:29	WG2596032
Mercury,Dissolved	ND		0.000200	1	09/11/2025 17:52	WG2596881

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.215		0.200	1	09/10/2025 19:03	WG2597498
Boron,Dissolved	0.204		0.200	1	09/11/2025 20:44	WG2597476
Calcium	212		1.00	1	09/10/2025 19:03	WG2597498
Calcium,Dissolved	201		1.00	1	09/11/2025 20:44	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:20	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/22/2025 23:03	WG2597487
Arsenic	ND		0.00200	1	09/24/2025 16:20	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487
Barium	0.337		0.00200	1	09/24/2025 16:20	WG2597639
Barium,Dissolved	0.256		0.00200	1	09/22/2025 23:03	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:20	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:20	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/22/2025 23:03	WG2597487
Chromium	ND		0.00200	1	09/24/2025 16:20	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:20	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:20	WG2597639
Lead,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487
Lithium	0.0154		0.00200	1	09/24/2025 16:20	WG2597639
Lithium,Dissolved	0.0139		0.00200	1	09/22/2025 23:03	WG2597487
Molybdenum	ND		0.00500	1	09/24/2025 16:20	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	09/22/2025 23:03	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:20	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:20	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/22/2025 23:03	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	780		20.0	1	09/08/2025 14:01	WG2595642

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	10.4		1.00	1	09/09/2025 07:31	WG2595823
Fluoride	0.265		0.150	1	09/09/2025 07:31	WG2595823
Sulfate	ND		5.00	1	09/09/2025 07:31	WG2595823

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.29	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:
L1895667-04 WG2598465: 7.29 at 20.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/13/2025 18:31	WG2596032
Mercury,Dissolved	ND		0.000200	1	09/11/2025 17:54	WG2596881

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.574		0.200	1	09/10/2025 19:05	WG2597498
Boron,Dissolved	0.553		0.200	1	09/11/2025 20:45	WG2597476
Calcium	164		1.00	1	09/10/2025 19:05	WG2597498
Calcium,Dissolved	157		1.00	1	09/11/2025 20:45	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:23	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/22/2025 23:06	WG2597487
Arsenic	0.192		0.00200	1	09/24/2025 16:23	WG2597639
Arsenic,Dissolved	0.0694		0.00200	1	09/22/2025 23:06	WG2597487
Barium	0.601		0.00200	1	09/24/2025 16:23	WG2597639
Barium,Dissolved	0.323		0.00200	1	09/22/2025 23:06	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:23	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/22/2025 23:06	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:23	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/22/2025 23:06	WG2597487
Chromium	ND		0.00200	1	09/24/2025 16:23	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/22/2025 23:06	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:23	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/22/2025 23:06	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:23	WG2597639
Lead,Dissolved	ND		0.00200	1	09/22/2025 23:06	WG2597487
Lithium	0.0297		0.00200	1	09/24/2025 16:23	WG2597639
Lithium,Dissolved	0.0259		0.00200	1	09/22/2025 23:06	WG2597487
Molybdenum	ND		0.00500	1	09/24/2025 16:23	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	09/22/2025 23:06	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:23	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/22/2025 23:06	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:23	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/22/2025 23:06	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	452		10.0	1	09/08/2025 14:01	WG2595642

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.8		1.00	1	09/08/2025 23:37	WG2595826
Fluoride	0.150	P1	0.150	1	09/08/2025 23:37	WG2595826
Sulfate	29.1		5.00	1	09/08/2025 23:37	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.57	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:

L1895667-05 WG2598465: 7.57 at 20.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/13/2025 18:33	WG2596032
Mercury,Dissolved	ND		0.000200	1	09/11/2025 17:57	WG2596881

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	09/10/2025 19:07	WG2597498
Boron,Dissolved	ND		0.200	1	09/11/2025 20:47	WG2597476
Calcium	123		1.00	1	09/10/2025 19:07	WG2597498
Calcium,Dissolved	118		1.00	1	09/11/2025 20:47	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:26	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/22/2025 23:09	WG2597487
Arsenic	0.00492		0.00200	1	09/24/2025 16:26	WG2597639
Arsenic,Dissolved	0.00355		0.00200	1	09/22/2025 23:09	WG2597487
Barium	0.315		0.00200	1	09/24/2025 16:26	WG2597639
Barium,Dissolved	0.287		0.00200	1	09/22/2025 23:09	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:26	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/22/2025 23:09	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:26	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/22/2025 23:09	WG2597487
Chromium	ND		0.00200	1	09/24/2025 16:26	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/22/2025 23:09	WG2597487
Cobalt	0.00280		0.00200	1	09/24/2025 16:26	WG2597639
Cobalt,Dissolved	0.00263		0.00200	1	09/22/2025 23:09	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:26	WG2597639
Lead,Dissolved	ND		0.00200	1	09/22/2025 23:09	WG2597487
Lithium	0.0142		0.00200	1	09/24/2025 16:26	WG2597639
Lithium,Dissolved	0.0126		0.00200	1	09/22/2025 23:09	WG2597487
Molybdenum	ND		0.00500	1	09/24/2025 16:26	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	09/22/2025 23:09	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:26	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/22/2025 23:09	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:26	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/22/2025 23:09	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	481		10.0	1	09/09/2025 11:54	WG2596320

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	36.1		1.00	1	09/09/2025 00:29	WG2595826
Fluoride	0.223		0.150	1	09/09/2025 00:29	WG2595826
Sulfate	92.6		25.0	5	09/09/2025 00:47	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.65	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:

L1895667-06 WG2598465: 7.65 at 20.9C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:29	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 14:53	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	3.78		0.200	1	09/10/2025 19:12	WG2597498
Boron,Dissolved	3.56		0.200	1	09/11/2025 20:49	WG2597476
Calcium	101		1.00	1	09/10/2025 19:12	WG2597498
Calcium,Dissolved	96.0		1.00	1	09/11/2025 20:49	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:29	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:10	WG2597487
Arsenic	ND		0.00200	1	09/24/2025 16:29	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487
Barium	0.197		0.00200	1	09/24/2025 16:29	WG2597639
Barium,Dissolved	0.138		0.00200	1	09/23/2025 14:10	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:29	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:29	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:10	WG2597487
Chromium	0.0326		0.00200	1	09/24/2025 16:29	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:29	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:29	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487
Lithium	0.0311		0.00200	1	09/24/2025 16:29	WG2597639
Lithium,Dissolved	0.0278		0.00200	1	09/23/2025 14:10	WG2597487
Molybdenum	0.203		0.00500	1	09/24/2025 16:29	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.199		0.00500	1	09/23/2025 14:10	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:29	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:29	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:10	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	712		13.3	1	09/09/2025 11:54	WG2596320

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	17.3		1.00	1	09/09/2025 01:04	WG2595826
Fluoride	0.202		0.150	1	09/09/2025 01:04	WG2595826
Sulfate	201		25.0	5	09/09/2025 01:21	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.55	T8	1	09/11/2025 23:00	WG2598465

Sample Narrative:
L1895667-07 WG2598465: 7.55 at 20.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:31	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 14:55	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	3.63		0.200	1	09/10/2025 19:14	WG2597498
Boron,Dissolved	3.60		0.200	1	09/11/2025 20:51	WG2597476
Calcium	121		1.00	1	09/10/2025 19:14	WG2597498
Calcium,Dissolved	118		1.00	1	09/11/2025 20:51	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:32	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:13	WG2597487
Arsenic	0.0107		0.00200	1	09/24/2025 16:32	WG2597639
Arsenic,Dissolved	0.00467		0.00200	1	09/23/2025 14:13	WG2597487
Barium	0.123		0.00200	1	09/24/2025 16:32	WG2597639
Barium,Dissolved	0.115		0.00200	1	09/23/2025 14:13	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:32	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:13	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:32	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:13	WG2597487
Chromium	0.0945		0.00200	1	09/24/2025 16:32	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:13	WG2597487
Cobalt	0.00223		0.00200	1	09/24/2025 16:32	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:13	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:32	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:13	WG2597487
Lithium	0.0167		0.00200	1	09/24/2025 16:32	WG2597639
Lithium,Dissolved	0.0151		0.00200	1	09/23/2025 14:13	WG2597487
Molybdenum	0.0658		0.00500	1	09/24/2025 16:32	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0598		0.00500	1	09/23/2025 14:13	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:32	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/23/2025 14:13	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:32	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:13	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	485		10.0	1	09/09/2025 11:54	WG2596320

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.2		1.00	1	09/09/2025 01:39	WG2595826
Fluoride	0.257		0.150	1	09/09/2025 01:39	WG2595826
Sulfate	97.9		25.0	5	09/09/2025 01:56	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.56	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:

L1895667-08 WG2598478: 7.56 at 23C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:33	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 14:58	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	4.18		0.200	1	09/10/2025 19:15	WG2597498
Boron,Dissolved	4.02		0.200	1	09/11/2025 20:52	WG2597476
Calcium	102		1.00	1	09/10/2025 19:15	WG2597498
Calcium,Dissolved	98.1		1.00	1	09/11/2025 20:52	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:36	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:16	WG2597487
Arsenic	0.00216		0.00200	1	09/24/2025 16:36	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487
Barium	0.139		0.00200	1	09/24/2025 16:36	WG2597639
Barium,Dissolved	0.105		0.00200	1	09/23/2025 14:16	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:36	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:36	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:16	WG2597487
Chromium	ND		0.00200	1	09/24/2025 16:36	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:36	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:36	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487
Lithium	0.0262		0.00200	1	09/24/2025 16:36	WG2597639
Lithium,Dissolved	0.0237		0.00200	1	09/23/2025 14:16	WG2597487
Molybdenum	0.130		0.00500	1	09/24/2025 16:36	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.134		0.00500	1	09/23/2025 14:16	WG2597487
Selenium	ND		0.00200	1	09/24/2025 16:36	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:36	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:16	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	374		10.0	1	09/09/2025 11:54	WG2596320

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.87		1.00	1	09/09/2025 02:13	WG2595826
Fluoride	0.211		0.150	1	09/09/2025 02:13	WG2595826
Sulfate	44.0		5.00	1	09/09/2025 02:13	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.73	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:
L1895667-09 WG2598478: 7.73 at 22.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:36	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 15:00	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.523		0.200	1	09/10/2025 19:17	WG2597498
Boron,Dissolved	0.504		0.200	1	09/11/2025 20:54	WG2597476
Calcium	89.0		1.00	1	09/10/2025 19:17	WG2597498
Calcium,Dissolved	86.6		1.00	1	09/11/2025 20:54	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:39	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:19	WG2597487
Arsenic	0.00225		0.00200	1	09/24/2025 16:39	WG2597639
Arsenic,Dissolved	0.00213		0.00200	1	09/23/2025 14:19	WG2597487
Barium	0.108		0.00200	1	09/24/2025 16:39	WG2597639
Barium,Dissolved	0.106		0.00200	1	09/23/2025 14:19	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:39	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:19	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:39	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:19	WG2597487
Chromium	0.00268		0.00200	1	09/24/2025 16:39	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:19	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:39	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:19	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:39	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:19	WG2597487
Lithium	0.0166		0.00200	1	09/24/2025 16:39	WG2597639
Lithium,Dissolved	0.0147		0.00200	1	09/23/2025 14:19	WG2597487
Molybdenum	0.0252		0.00500	1	09/24/2025 16:39	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0252		0.00500	1	09/23/2025 14:19	WG2597487
Selenium	0.0164		0.00200	1	09/24/2025 16:39	WG2597639
Selenium,Dissolved	0.0170		0.00200	1	09/23/2025 14:19	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:39	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:19	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	799		13.3	1	09/12/2025 16:01	WG2599520

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.16		1.00	1	09/09/2025 02:31	WG2595826
Fluoride	0.218		0.150	1	09/09/2025 02:31	WG2595826
Sulfate	402		25.0	5	09/09/2025 02:48	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.26	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:

L1895667-10 WG2598478: 7.26 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:38	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 15:03	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	9.90		0.200	1	09/10/2025 19:19	WG2597498
Boron,Dissolved	9.56		0.200	1	09/11/2025 20:56	WG2597476
Calcium	151		1.00	1	09/10/2025 19:19	WG2597498
Calcium,Dissolved	145		1.00	1	09/11/2025 20:56	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.0400	10	09/24/2025 16:42	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:22	WG2597487
Arsenic	ND		0.0200	10	09/24/2025 16:42	WG2597639
Arsenic,Dissolved	0.00382		0.00200	1	09/23/2025 14:22	WG2597487
Barium	0.162		0.0200	10	09/24/2025 16:42	WG2597639
Barium,Dissolved	0.127		0.00200	1	09/23/2025 14:22	WG2597487
Beryllium	ND		0.0200	10	09/24/2025 16:42	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:22	WG2597487
Cadmium	ND		0.0100	10	09/24/2025 16:42	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:22	WG2597487
Chromium	ND		0.0200	10	09/24/2025 16:42	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:22	WG2597487
Cobalt	ND		0.0200	10	09/24/2025 16:42	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:22	WG2597487
Lead	ND		0.0200	10	09/24/2025 16:42	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:22	WG2597487
Lithium	0.0438		0.0200	10	09/24/2025 16:42	WG2597639
Lithium,Dissolved	0.0375		0.00200	1	09/23/2025 14:22	WG2597487
Molybdenum	0.197		0.0500	10	09/24/2025 16:42	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.201		0.00500	1	09/23/2025 14:22	WG2597487
Selenium	ND		0.0200	10	09/24/2025 16:42	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/23/2025 14:22	WG2597487
Thallium	ND		0.0200	10	09/24/2025 16:42	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:22	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	324		10.0	1	09/09/2025 18:50	WG2596935

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	1.10		1.00	1	09/09/2025 03:40	WG2595826
Fluoride	0.155		0.150	1	09/09/2025 03:40	WG2595826
Sulfate	23.3		5.00	1	09/09/2025 03:40	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.79	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:
L1895667-11 WG2598478: 6.79 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:41	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 15:05	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	09/10/2025 19:21	WG2597498
Boron,Dissolved	ND		0.200	1	09/11/2025 21:01	WG2597476
Calcium	72.2		1.00	1	09/10/2025 19:21	WG2597498
Calcium,Dissolved	71.2		1.00	1	09/11/2025 21:01	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:52	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:26	WG2597487
Arsenic	ND		0.00200	1	09/24/2025 16:52	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/23/2025 14:26	WG2597487
Barium	0.148		0.00200	1	09/24/2025 16:52	WG2597639
Barium,Dissolved	0.135		0.00200	1	09/23/2025 14:26	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:52	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:26	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:52	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:26	WG2597487
Chromium	0.00270		0.00200	1	09/24/2025 16:52	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:26	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:52	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:26	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:52	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:26	WG2597487
Lithium	0.0136		0.00200	1	09/24/2025 16:52	WG2597639
Lithium,Dissolved	0.0114		0.00200	1	09/23/2025 14:26	WG2597487
Molybdenum	ND		0.00500	1	09/24/2025 16:52	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	09/23/2025 14:26	WG2597487
Selenium	0.00293		0.00200	1	09/24/2025 16:52	WG2597639
Selenium,Dissolved	0.00309		0.00200	1	09/23/2025 14:26	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:52	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:26	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	436		10.0	1	09/12/2025 16:01	WG2599520

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.92		1.00	1	09/09/2025 03:58	WG2595826
Fluoride	0.163		0.150	1	09/09/2025 03:58	WG2595826
Sulfate	69.1		5.00	1	09/09/2025 03:58	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.55	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:
L1895667-12 WG2598478: 7.55 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:43	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 15:13	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	1.21		0.200	1	09/10/2025 19:22	WG2597498
Boron,Dissolved	1.16		0.200	1	09/11/2025 21:03	WG2597476
Calcium	102		1.00	1	09/10/2025 19:22	WG2597498
Calcium,Dissolved	97.7		1.00	1	09/11/2025 21:03	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:55	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:29	WG2597487
Arsenic	ND		0.00200	1	09/24/2025 16:55	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/23/2025 14:29	WG2597487
Barium	0.131		0.00200	1	09/24/2025 16:55	WG2597639
Barium,Dissolved	0.128		0.00200	1	09/23/2025 14:29	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 16:55	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:29	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 16:55	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:29	WG2597487
Chromium	0.00293		0.00200	1	09/24/2025 16:55	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:29	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 16:55	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:29	WG2597487
Lead	ND		0.00200	1	09/24/2025 16:55	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:29	WG2597487
Lithium	0.0297		0.00200	1	09/24/2025 16:55	WG2597639
Lithium,Dissolved	0.0253		0.00200	1	09/23/2025 14:29	WG2597487
Molybdenum	0.0538		0.00500	1	09/24/2025 16:55	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0549		0.00500	1	09/23/2025 14:29	WG2597487
Selenium	0.0179		0.00200	1	09/24/2025 16:55	WG2597639
Selenium,Dissolved	0.0173		0.00200	1	09/23/2025 14:29	WG2597487
Thallium	ND		0.00200	1	09/24/2025 16:55	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:29	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	09/08/2025 14:01	WG2595642

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	ND		1.00	1	09/09/2025 04:15	WG2595826
Fluoride	ND		0.150	1	09/09/2025 04:15	WG2595826
Sulfate	ND		5.00	1	09/09/2025 04:15	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	5.58	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:

L1895667-13 WG2598478: 5.58 at 22.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:46	WG2596878

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	09/10/2025 19:24	WG2597498
Calcium	ND		1.00	1	09/10/2025 19:24	WG2597498

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 16:58	WG2597639
Arsenic	ND		0.00200	1	09/24/2025 16:58	WG2597639
Barium	ND		0.00200	1	09/24/2025 16:58	WG2597639
Beryllium	ND		0.00200	1	09/24/2025 16:58	WG2597639
Cadmium	ND		0.00100	1	09/24/2025 16:58	WG2597639
Chromium	ND		0.00200	1	09/24/2025 16:58	WG2597639
Cobalt	ND		0.00200	1	09/24/2025 16:58	WG2597639
Lead	ND		0.00200	1	09/24/2025 16:58	WG2597639
Lithium	ND		0.00200	1	09/24/2025 16:58	WG2597639
Molybdenum	ND		0.00500	1	09/24/2025 16:58	WG2597639
Selenium	ND		0.00200	1	09/24/2025 16:58	WG2597639
Thallium	ND		0.00200	1	09/24/2025 16:58	WG2597639

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	479		10.0	1	09/12/2025 16:01	WG2599520

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	24.1		1.00	1	09/09/2025 04:32	WG2595826
Fluoride	0.301		0.150	1	09/09/2025 04:32	WG2595826
Sulfate	116		25.0	5	09/09/2025 19:36	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.53	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:

L1895667-14 WG2598478: 7.53 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 15:48	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 15:15	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	4.20		0.200	1	09/10/2025 19:26	WG2597498
Boron,Dissolved	4.00		0.200	1	09/11/2025 21:04	WG2597476
Calcium	102		1.00	1	09/10/2025 19:26	WG2597498
Calcium,Dissolved	97.4		1.00	1	09/11/2025 21:04	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 17:02	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:32	WG2597487
Arsenic	0.00218		0.00200	1	09/24/2025 17:02	WG2597639
Arsenic,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487
Barium	0.141		0.00200	1	09/24/2025 17:02	WG2597639
Barium,Dissolved	0.101		0.00200	1	09/23/2025 14:32	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 17:02	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 17:02	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:32	WG2597487
Chromium	0.00298		0.00200	1	09/24/2025 17:02	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 17:02	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487
Lead	ND		0.00200	1	09/24/2025 17:02	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487
Lithium	0.0269		0.00200	1	09/24/2025 17:02	WG2597639
Lithium,Dissolved	0.0229		0.00200	1	09/23/2025 14:32	WG2597487
Molybdenum	0.132		0.00500	1	09/24/2025 17:02	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.132		0.00500	1	09/23/2025 14:32	WG2597487
Selenium	ND		0.00200	1	09/24/2025 17:02	WG2597639
Selenium,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487
Thallium	ND		0.00200	1	09/24/2025 17:02	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:32	WG2597487

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	375		10.0	1	09/12/2025 16:01	WG2599520

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.54		1.00	1	09/09/2025 04:50	WG2595826
Fluoride	0.201		0.150	1	09/09/2025 04:50	WG2595826
Sulfate	43.3		5.00	1	09/09/2025 04:50	WG2595826

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.67	T8	1	09/12/2025 14:40	WG2598478

Sample Narrative:

L1895667-15 WG2598478: 7.67 at 22.7C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	09/11/2025 14:56	WG2596878
Mercury,Dissolved	ND		0.000200	1	09/12/2025 15:18	WG2597351

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.530		0.200	1	09/10/2025 19:28	WG2597498
Boron,Dissolved	0.505		0.200	1	09/11/2025 21:06	WG2597476
Calcium	88.5		1.00	1	09/10/2025 19:28	WG2597498
Calcium,Dissolved	86.3		1.00	1	09/11/2025 21:06	WG2597476

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	09/24/2025 17:05	WG2597639
Antimony,Dissolved	ND		0.00400	1	09/23/2025 14:35	WG2597487
Arsenic	0.00203		0.00200	1	09/24/2025 17:05	WG2597639
Arsenic,Dissolved	0.00209		0.00200	1	09/23/2025 14:35	WG2597487
Barium	0.107		0.00200	1	09/24/2025 17:05	WG2597639
Barium,Dissolved	0.106		0.00200	1	09/23/2025 14:35	WG2597487
Beryllium	ND		0.00200	1	09/24/2025 17:05	WG2597639
Beryllium,Dissolved	ND		0.00200	1	09/23/2025 14:35	WG2597487
Cadmium	ND		0.00100	1	09/24/2025 17:05	WG2597639
Cadmium,Dissolved	ND		0.00100	1	09/23/2025 14:35	WG2597487
Chromium	ND		0.00200	1	09/24/2025 17:05	WG2597639
Chromium,Dissolved	ND		0.00200	1	09/23/2025 14:35	WG2597487
Cobalt	ND		0.00200	1	09/24/2025 17:05	WG2597639
Cobalt,Dissolved	ND		0.00200	1	09/23/2025 14:35	WG2597487
Lead	ND		0.00200	1	09/24/2025 17:05	WG2597639
Lead,Dissolved	ND		0.00200	1	09/23/2025 14:35	WG2597487
Lithium	0.0159		0.00200	1	09/24/2025 17:05	WG2597639
Lithium,Dissolved	0.0141		0.00200	1	09/23/2025 14:35	WG2597487
Molybdenum	0.0238		0.00500	1	09/24/2025 17:05	WG2597639

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0250		0.00500	1	09/23/2025 14:35	WG2597487
Selenium	0.0160		0.00200	1	09/24/2025 17:05	WG2597639
Selenium,Dissolved	0.0173		0.00200	1	09/23/2025 14:35	WG2597487
Thallium	ND		0.00200	1	09/24/2025 17:05	WG2597639
Thallium,Dissolved	ND		0.00200	1	09/23/2025 14:35	WG2597487

Method Blank (MB)

(MB) R4271613-1 09/08/25 14:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1895170-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1895170-01 09/08/25 14:01 • (DUP) R4271613-3 09/08/25 14:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	121	121	1	0.000		10

L1895667-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1895667-13 09/08/25 14:01 • (DUP) R4271613-4 09/08/25 14:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	ND	ND	1	0.000		10

Laboratory Control Sample (LCS)

(LCS) R4271613-2 09/08/25 14:01

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8500	96.6	90.0-110	

Method Blank (MB)

(MB) R4272469-1 09/09/25 11:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1895647-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1895647-08 09/09/25 11:54 • (DUP) R4272469-3 09/09/25 11:54

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1090	1060	1	2.60		10

L1895695-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1895695-08 09/09/25 11:54 • (DUP) R4272469-4 09/09/25 11:54

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	59.0	58.0	1	1.71		10

Laboratory Control Sample (LCS)

(LCS) R4272469-2 09/09/25 11:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8570	97.4	90.0-110	

Method Blank (MB)

(MB) R4271943-1 09/09/25 18:50

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1895667-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1895667-11 09/09/25 18:50 • (DUP) R4271943-3 09/09/25 18:50

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	324	324	1	0.000		10

L1895882-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1895882-19 09/09/25 18:50 • (DUP) R4271943-4 09/09/25 18:50

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	863	848	1	1.72		10

Laboratory Control Sample (LCS)

(LCS) R4271943-2 09/09/25 18:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8330	94.7	90.0-110	

Method Blank (MB)

(MB) R4273884-1 09/12/25 16:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1895658-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1895658-03 09/12/25 16:01 • (DUP) R4273884-3 09/12/25 16:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	396	401	1	1.25		10

L1895668-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1895668-06 09/12/25 16:01 • (DUP) R4273884-4 09/12/25 16:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	33100	32600	1	1.52		10

Laboratory Control Sample (LCS)

(LCS) R4273884-2 09/12/25 16:01

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8740	99.3	90.0-110	

Method Blank (MB)

(MB) R4270602-1 09/08/25 21:02

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.547	1.00
Fluoride	U		0.0761	0.150
Sulfate	U		0.637	5.00

L1895467-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1895467-02 09/08/25 21:27 • (DUP) R4270602-3 09/08/25 21:52

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	7.03	7.26	1	3.16		15
Fluoride	0.218	0.204	1	6.92		15
Sulfate	52.1	54.0	1	3.46		15

L1895467-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1895467-03 09/08/25 22:43 • (DUP) R4270602-7 09/08/25 23:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4.55	4.43	1	2.66		15
Fluoride	ND	ND	1	3.82		15
Sulfate	40.9	40.3	1	1.33		15

Laboratory Control Sample (LCS)

(LCS) R4270602-2 09/08/25 21:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	38.7	96.7	80.0-120	
Fluoride	8.00	7.90	98.7	80.0-120	
Sulfate	40.0	40.0	100	80.0-120	

L1895467-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895467-02 09/08/25 21:27 • (MS) R4270602-5 09/08/25 22:18 • (MSD) R4270602-6 09/08/25 22:30

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	7.03	44.4	42.8	93.3	89.4	1	80.0-120			3.60	15
Fluoride	8.00	0.218	8.19	7.92	99.7	96.3	1	80.0-120			3.38	15
Sulfate	40.0	52.1	82.5	79.2	75.9	67.7	1	80.0-120	J6	J6	4.09	15

L1895467-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1895467-03 09/08/25 22:43 • (MS) R4270602-9 09/08/25 23:33

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	4.55	41.4	92.1	1	80.0-120	
Fluoride	8.00	ND	7.94	97.5	1	80.0-120	
Sulfate	40.0	40.9	71.5	76.5	1	80.0-120	J6

Method Blank (MB)

(MB) R4270657-1 09/08/25 22:44

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.547	1.00
Fluoride	U		0.0761	0.150
Sulfate	U		0.637	5.00

L1895667-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1895667-05 09/08/25 23:37 • (DUP) R4270657-3 09/08/25 23:55

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	20.8	19.5	1	6.09		15
Fluoride	0.150	ND	1	16.5	P1	15
Sulfate	29.1	27.0	1	7.46		15

L1895688-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1895688-02 09/09/25 05:24 • (DUP) R4270657-5 09/09/25 05:42

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	21.4	16.5	1	25.9	J3	15
Fluoride	0.467	0.379	1	20.9	P1	15
Sulfate	14.8	11.9	1	22.0	P1	15

Laboratory Control Sample (LCS)

(LCS) R4270657-2 09/08/25 23:20

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	33.5	83.7	80.0-120	
Fluoride	8.00	6.97	87.2	80.0-120	
Sulfate	40.0	33.5	83.8	80.0-120	

L1895667-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1895667-05 09/08/25 23:37 • (MS) R4270657-4 09/09/25 00:12

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	20.8	60.7	99.9	1	80.0-120	
Fluoride	8.00	0.150	9.42	116	1	80.0-120	
Sulfate	40.0	29.1	68.8	99.3	1	80.0-120	

L1895688-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895688-02 09/09/25 05:24 • (MS) R4270657-6 09/09/25 05:59 • (MSD) R4270657-7 09/09/25 06:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	21.4	58.2	58.8	91.9	93.4	1	80.0-120			1.03	15
Fluoride	8.00	0.467	9.51	9.95	113	119	1	80.0-120			4.53	15
Sulfate	40.0	14.8	52.0	55.7	93.1	102	1	80.0-120			6.83	15

L1895051-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1895051-02 09/11/25 23:00 • (DUP) R4272273-2 09/11/25 23:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	SU	su		%		%
pH	8.42	8.42	1	0.000		1

Sample Narrative:

OS: 8.42 at 21.2C

DUP: 8.42 at 21.1C

L1895667-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1895667-07 09/11/25 23:00 • (DUP) R4272273-3 09/11/25 23:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.55	7.56	1	0.132		1

Sample Narrative:

OS: 7.55 at 20.5C

DUP: 7.56 at 20.3C

Laboratory Control Sample (LCS)

(LCS) R4272273-1 09/11/25 23:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 20.3C

L1895667-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1895667-08 09/12/25 14:40 • (DUP) R4272664-2 09/12/25 14:40

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.56	7.53	1	0.398		1

Sample Narrative:

OS: 7.56 at 23C

DUP: 7.53 at 23C

L1896799-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1896799-01 09/12/25 14:40 • (DUP) R4272664-3 09/12/25 14:40

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.86	6.81	1	0.732		1

Sample Narrative:

OS: 6.86 at 23.4C

DUP: 6.81 at 23.1C

Laboratory Control Sample (LCS)

(LCS) R4272664-1 09/12/25 14:40

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 22.4C

Method Blank (MB)

(MB) R4272957-1 09/13/25 17:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4272957-2 09/13/25 17:26

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00284	94.6	80.0-120	

L1895618-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895618-01 09/13/25 17:28 • (MS) R4272957-4 09/13/25 17:33 • (MSD) R4272957-5 09/13/25 17:36

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00249	0.00280	83.1	93.4	1	75.0-125			11.6	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

QUALITY CONTROL SUMMARY

L1895667-06,07,08,09,10,11,12,13,14,15

Method Blank (MB)

(MB) R4272341-1 09/11/25 14:51

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4272341-2 09/11/25 14:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00275	91.7	80.0-120	

L1895667-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895667-15 09/11/25 14:56 • (MS) R4272341-4 09/11/25 15:01 • (MSD) R4272341-5 09/11/25 15:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00286	0.00275	95.4	91.8	1	75.0-125			3.88	20

QUALITY CONTROL SUMMARY

L1895667-01,02,03,04,05

Method Blank (MB)

(MB) R4272340-1 09/11/25 16:16

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4272340-2 09/11/25 16:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00267	88.9	80.0-120	

L1894910-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1894910-03 09/11/25 16:21 • (MS) R4272340-4 09/11/25 16:43 • (MSD) R4272340-5 09/11/25 16:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00177	0.00309	59.0	103	1	75.0-125	J6	J3	54.3	20

Method Blank (MB)

(MB) R4272616-1 09/12/25 14:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4272616-2 09/12/25 14:25

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00297	98.8	80.0-120	

L1895456-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895456-02 09/12/25 14:28 • (MS) R4272616-4 09/12/25 14:33 • (MSD) R4272616-5 09/12/25 14:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00300	0.00300	100	99.9	1	75.0-125			0.258	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4272290-1 09/11/25 20:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron,Dissolved	U		0.0233	0.200
Calcium,Dissolved	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4272290-2 09/11/25 20:21

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron,Dissolved	1.00	0.954	95.4	80.0-120	
Calcium,Dissolved	10.0	9.92	99.2	80.0-120	

L1895360-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895360-03 09/11/25 20:23 • (MS) R4272290-4 09/11/25 20:26 • (MSD) R4272290-5 09/11/25 20:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	ND	1.00	0.986	97.8	96.3	1	75.0-125			1.48	20
Calcium,Dissolved	10.0	17.0	26.8	26.5	97.5	95.1	1	75.0-125			0.904	20

QUALITY CONTROL SUMMARY

L1895667-01,02,03,04,05,06,07,08,09,10,11,12,13,14,15

Method Blank (MB)

(MB) R4271862-1 09/10/25 18:51

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0233	0.200
Calcium	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4271862-2 09/10/25 18:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.975	97.5	80.0-120	
Calcium	10.0	10.2	102	80.0-120	

L1895667-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895667-01 09/10/25 18:54 • (MS) R4271862-4 09/10/25 18:58 • (MSD) R4271862-5 09/10/25 19:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	4.36	5.28	5.30	92.0	94.1	1	75.0-125			0.404	20
Calcium	10.0	111	120	120	86.7	90.7	1	75.0-125			0.330	20

QUALITY CONTROL SUMMARY

L1895667-01,02,03,04,05,06,07,08,09,10,11,12,14,15

Method Blank (MB)

(MB) R4277020-1 09/22/25 22:41

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000310	0.00400
Arsenic,Dissolved	U		0.000120	0.00200
Barium,Dissolved	U		0.000500	0.00200
Beryllium,Dissolved	U		0.000200	0.00200
Cadmium,Dissolved	U		0.000120	0.00100
Chromium,Dissolved	U		0.000900	0.00200
Cobalt,Dissolved	U		0.000100	0.00200
Lead,Dissolved	U		0.000500	0.00200
Lithium,Dissolved	U		0.000600	0.00200
Molybdenum,Dissolved	U		0.000500	0.00500
Selenium,Dissolved	U		0.000250	0.00200
Thallium,Dissolved	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4277020-2 09/22/25 22:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	0.0500	0.0461	92.3	80.0-120	
Arsenic,Dissolved	0.0500	0.0471	94.2	80.0-120	
Barium,Dissolved	0.0500	0.0467	93.5	80.0-120	
Beryllium,Dissolved	0.0500	0.0477	95.5	80.0-120	
Cadmium,Dissolved	0.0500	0.0505	101	80.0-120	
Chromium,Dissolved	0.0500	0.0493	98.6	80.0-120	
Cobalt,Dissolved	0.0500	0.0493	98.6	80.0-120	
Lead,Dissolved	0.0500	0.0455	91.1	80.0-120	
Lithium,Dissolved	0.0500	0.0478	95.5	80.0-120	
Molybdenum,Dissolved	0.0500	0.0463	92.6	80.0-120	
Selenium,Dissolved	0.0500	0.0469	93.9	80.0-120	
Thallium,Dissolved	0.0500	0.0462	92.4	80.0-120	

L1895667-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895667-01 09/22/25 22:47 • (MS) R4277020-4 09/22/25 22:54 • (MSD) R4277020-5 09/22/25 22:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0495	0.0477	99.0	95.5	1	75.0-125			3.62	20
Arsenic,Dissolved	0.0500	ND	0.0519	0.0522	101	102	1	75.0-125			0.662	20
Barium,Dissolved	0.0500	0.0998	0.146	0.144	92.4	88.0	1	75.0-125			1.52	20

L1895667-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895667-01 09/22/25 22:47 • (MS) R4277020-4 09/22/25 22:54 • (MSD) R4277020-5 09/22/25 22:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium,Dissolved	0.0500	ND	0.0510	0.0493	102	98.6	1	75.0-125			3.42	20
Cadmium,Dissolved	0.0500	ND	0.0491	0.0463	98.1	92.7	1	75.0-125			5.69	20
Chromium,Dissolved	0.0500	ND	0.0488	0.0473	97.7	94.6	1	75.0-125			3.20	20
Cobalt,Dissolved	0.0500	ND	0.0488	0.0473	97.6	94.6	1	75.0-125			3.15	20
Lead,Dissolved	0.0500	ND	0.0461	0.0452	92.2	90.5	1	75.0-125			1.93	20
Lithium,Dissolved	0.0500	0.0294	0.0777	0.0738	96.6	88.8	1	75.0-125			5.15	20
Molybdenum,Dissolved	0.0500	0.0596	0.110	0.106	99.8	92.4	1	75.0-125			3.42	20
Selenium,Dissolved	0.0500	ND	0.0515	0.0493	103	98.6	1	75.0-125			4.35	20
Thallium,Dissolved	0.0500	ND	0.0462	0.0455	92.3	90.9	1	75.0-125			1.58	20

Method Blank (MB)

(MB) R4277935-1 09/24/25 15:18

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	0.000918	J	0.000310	0.00400
Arsenic	U		0.000120	0.00200
Barium	0.000814	J	0.000500	0.00200
Beryllium	U		0.000200	0.00200
Cadmium	U		0.000120	0.00100
Chromium	U		0.000900	0.00200
Cobalt	U		0.000100	0.00200
Lead	0.000844	J	0.000500	0.00200
Lithium	U		0.000600	0.00200
Molybdenum	U		0.000500	0.00500
Selenium	U		0.000250	0.00200
Thallium	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4277935-2 09/24/25 15:21

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0552	110	80.0-120	
Arsenic	0.0500	0.0496	99.2	80.0-120	
Barium	0.0500	0.0480	95.9	80.0-120	
Beryllium	0.0500	0.0491	98.2	80.0-120	
Cadmium	0.0500	0.0528	106	80.0-120	
Chromium	0.0500	0.0520	104	80.0-120	
Cobalt	0.0500	0.0511	102	80.0-120	
Lead	0.0500	0.0502	100	80.0-120	
Lithium	0.0500	0.0496	99.2	80.0-120	
Molybdenum	0.0500	0.0515	103	80.0-120	
Selenium	0.0500	0.0519	104	80.0-120	
Thallium	0.0500	0.0511	102	80.0-120	

L1895549-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895549-20 09/24/25 15:25 • (MS) R4277935-4 09/24/25 15:31 • (MSD) R4277935-5 09/24/25 15:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0529	0.0540	104	106	1	75.0-125			2.06	20
Arsenic	0.0500	ND	0.0484	0.0490	96.7	97.9	1	75.0-125			1.20	20
Barium	0.0500	ND	0.0499	0.0493	99.8	98.6	1	75.0-125			1.21	20

L1895549-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895549-20 09/24/25 15:25 • (MS) R4277935-4 09/24/25 15:31 • (MSD) R4277935-5 09/24/25 15:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium	0.0500	ND	0.0493	0.0495	98.7	98.9	1	75.0-125			0.240	20
Cadmium	0.0500	ND	0.0535	0.0530	107	106	1	75.0-125			0.871	20
Chromium	0.0500	ND	0.0520	0.0522	104	104	1	75.0-125			0.435	20
Cobalt	0.0500	ND	0.0515	0.0519	103	104	1	75.0-125			0.656	20
Lead	0.0500	ND	0.0493	0.0507	98.6	101	1	75.0-125			2.83	20
Lithium	0.0500	ND	0.0498	0.0492	99.7	98.4	1	75.0-125			1.32	20
Molybdenum	0.0500	ND	0.0505	0.0502	101	100	1	75.0-125			0.695	20
Selenium	0.0500	ND	0.0512	0.0519	102	104	1	75.0-125			1.30	20
Thallium	0.0500	ND	0.0501	0.0511	100	102	1	75.0-125			1.97	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
U (Radiochemistry)	Result + Error < MDA.
J (Radiochemistry)	Result < MDA; Result + Error > MDA.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 3Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres					Remarks	Sample # (lab only)
APW-03-WG-2025 0903		GW		9/3/2025	1430	5	X	X	X	X	X						01
APW-08-WG-2025 0905		GW		9/5/2025	0835	5	X	X	X	X	X						02
APW-07-WG-2025 0904		GW		9/4/2025	1635	5	X	X	X	X	X						03
APW-10S-WG-2025 0903		GW		9/3/2025	1645	5	X	X	X	X	X						04
APW-10D-WG-2025 0903		GW		9/3/2025	1555	5	X	X	X	X	X						05
APW-06S-WG-2025 0904		GW		9/4/2025	1055	5	X	X	X	X	X						06
APW-06D-WG-2025 0904		GW		9/4/2025	0955	5	X	X	X	X	X						07
APW-05R-WG-2025 0904		GW		9/4/2025	1230	5	X	X	X	X	X						08
APW-09-WG-2025 0905		GW		9/5/2025	0930	5	X	X	X	X	X						09
APW-02-WG-2025 0904		GW		9/4/2025	1330	5	X	X	X	X	X						10

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1695267

F015

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1171954**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEx Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	9/5/2025	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 74

If preservation required by Login: Date/Time

Date: 090625 Time: 0900

Hold:

Condition: NCF / OK

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 3Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Amendell

Site/Facility ID #

P.O. #

Collected by (signature):
Marshall Amendell

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres				Remarks	Sample # (lab only)
APW-01R-WG-2025 0904	Grab	GW		9/4/2025	1525	5	X	X	X	X	X					11
APW-04-WG-2025 0904	"	GW		9/4/2025	0810	5	X	X	X	X	X					12
EB-01-WG-2025 0903	"	GW		9/3/2025	1000	4 (5)	X	X	X	X	X				No diss. collected for EB-01	13
DUP-01-WG-2025 0904	"	GW		9/4/2025	0001	5	X	X	X	X	X					14
DUP-02-WG-2025 0905	"	GW		9/5/2025	0002	5	X	X	X	X	X					15

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1495007

Table #

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1171954**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Marshall Amendell	9/5/2025	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			CRoberts

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 14

Date: 090625 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Multiple Parcel Form L# L1895067

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
4580 6312 5225	THA9	2.3	-0.1	2.2	Yes / No / Not Present
4580 6312 5236		0.4	-0.1	0.3	Yes / No / Not Present
9102 9167 4331		4.7	-0.1	4.6	Yes / No / Not Present
9416 7188 8478		3.4	-0.1	3.3	Yes / No / Not Present
4718 2716 7417		0.2	-0.1	0.1	Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

CRogers
Name

09-06-25
Date

APPENDIX E FOURTH QUARTER 2024 RADIOLOGICAL LABORATORY ANALYTICAL REPORT

ANALYTICAL REPORT

October 06, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1895679
Samples Received:	09/06/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 2Q25 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-03-WG-20250903 L1895679-01

Collected by: Marshall Arendell | Collected date/time: 09/03/25 14:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2604016	1	09/22/25 10:09	09/26/25 11:51	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-08-WG-20250905 L1895679-02

Collected by: Marshall Arendell | Collected date/time: 09/05/25 08:35 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2604016	1	09/22/25 10:09	09/26/25 11:51	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-07-WG-20250904 L1895679-03

Collected by: Marshall Arendell | Collected date/time: 09/04/25 16:35 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2605695	1	09/23/25 06:41	09/29/25 12:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-10S-WG-20250903 L1895679-04

Collected by: Marshall Arendell | Collected date/time: 09/03/25 16:45 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2605695	1	09/23/25 06:41	09/29/25 12:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-10D-WG-20250903 L1895679-05

Collected by: Marshall Arendell | Collected date/time: 09/03/25 15:55 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-06S-WG-20250904 L1895679-06

Collected by: Marshall Arendell | Collected date/time: 09/04/25 10:55 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-06D-WG-20250904 L1895679-07

Collected by: Marshall Arendell | Collected date/time: 09/04/25 09:55 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-05R-WG-20250904 L1895679-08

Collected by: Marshall Arendell | Collected date/time: 09/04/25 12:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-09-WG-20250905 L1895679-09

Collected by: Marshall Arendell | Collected date/time: 09/05/25 09:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-02-WG-20250904 L1895679-10

Collected by: Marshall Arendell | Collected date/time: 09/04/25 13:30 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2608656	1	09/29/25 08:57	09/30/25 21:48	RGT	Mt. Juliet, TN

APW-01R-WG-20250904 L1895679-11

Collected by: Marshall Arendell | Collected date/time: 09/04/25 15:25 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2610081	1	09/30/25 09:02	10/03/25 16:09	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2610081	1	09/30/25 09:02	10/03/25 16:09	ZRG	Mt. Juliet, TN

APW-04-WG-20250904 L1895679-12

Collected by: Marshall Arendell | Collected date/time: 09/04/25 08:10 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN

EB-01-WG-20250903 L1895679-13

Collected by: Marshall Arendell | Collected date/time: 09/03/25 10:00 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN

DUP-01-WG-20250904 L1895679-14

Collected by: Marshall Arendell | Collected date/time: 09/04/25 00:01 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN

DUP-02-WG-20250905 L1895679-15

Collected by: Marshall Arendell | Collected date/time: 09/05/25 00:02 | Received date/time: 09/06/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2603155	1	09/18/25 07:05	09/22/25 11:19	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2610081	1	09/30/25 09:02	10/01/25 17:27	ZRG	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.597		0.557	0.593	0.551	0.297	09/26/2025 11:51	WG2604016
(T) Barium	*95.0*					*30.0-110*	*09/26/2025 11:51*	WG2604016
(T) Yttrium	*97.5*					*30.0-110*	*09/26/2025 11:51*	WG2604016

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.899		0.661	0.739	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.302	J	0.356	0.469	0.492	0.168	09/30/2025 21:48	WG2608656
(T) Barium-133	*74.6*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.950		0.568	0.613	0.543	0.293	09/26/2025 11:51	WG2604016
(T) Barium	*123*	C1				*30.0-110*	*09/26/2025 11:51*	WG2604016
(T) Yttrium	*96.4*					*30.0-110*	*09/26/2025 11:51*	WG2604016

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.22		0.638	0.664	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.273	J	0.291	0.397	0.382	0.116	09/30/2025 21:48	WG2608656
(T) Barium-133	*82.0*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.32		0.518	0.568	0.787	0.251	09/29/2025 12:30	WG2605695
(T) Barium	*122*	C1				*30.0-110*	*09/29/2025 12:30*	WG2605695
(T) Yttrium	*104*					*30.0-110*	*09/29/2025 12:30*	WG2605695

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.91		0.654	0.893	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.597		0.399	0.553	0.423	0.136	09/30/2025 21:48	WG2608656
(T) Barium-133	*77.8*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.19		0.510	0.558	0.782	0.249	09/29/2025 12:30	WG2605695
(T) Barium	*105*					*30.0-110*	*09/29/2025 12:30*	WG2605695
(T) Yttrium	*97.9*					*30.0-110*	*09/29/2025 12:30*	WG2605695

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.06		0.651	0.855	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.869		0.405	0.571	0.345	0.113	09/30/2025 21:48	WG2608656
(T) Barium-133	*97.8*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.697	J	0.553	0.592	0.906	0.282	09/22/2025 11:19	WG2603155
(T) Barium	*125*	C1				*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*92.1*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.881	J	0.609	0.980	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.185	J	0.256	0.348	0.374	0.118	09/30/2025 21:48	WG2608656
(T) Barium-133	*87.8*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.800	J	0.516	0.557	0.832	0.259	09/22/2025 11:19	WG2603155
(T) Barium	*116*	C1				*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*100*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.14		0.589	0.898	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.339		0.283	0.394	0.338	0.110	09/30/2025 21:48	WG2608656
(T) Barium-133	*106*					*30.0-110*	*09/30/2025 21:48*	WG2608656

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.998		0.534	0.580	0.843	0.263	09/22/2025 11:19	WG2603155
(T) Barium	*114*	C1				*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*101*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.55		0.622	0.895	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.548		0.319	0.453	0.302	0.0935	09/30/2025 21:48	WG2608656
(T) Barium-133	*99.5*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.463	J	0.500	0.532	0.838	0.261	09/22/2025 11:19	WG2603155
(T) Barium	*112*	C1				*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*101*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.687	J	0.559	0.903	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.224	J	0.250	0.333	0.337	0.104	09/30/2025 21:48	WG2608656
(T) Barium-133	*104*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.0164	U	0.480	0.486	0.854	0.265	09/22/2025 11:19	WG2603155
(T) Barium	*109*					*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*93.8*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.0164	U	0.491	0.890	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	-0.00720	U	0.105	0.121	0.250	0.0713	09/30/2025 21:48	WG2608656
(T) Barium-133	*94.4*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.560	J	0.696	0.731	1.17	0.371	09/22/2025 11:19	WG2603155
(T) Barium	*102*					*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*95.6*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.619	J	0.714	1.20	09/30/2025 21:48	WG2608656

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0586	U	0.159	0.205	0.272	0.0873	09/30/2025 21:48	WG2608656
(T) Barium-133	*96.6*					*30.0-110*	*09/30/2025 21:48*	WG2608656

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.852	J	0.646	0.687	1.06	0.336	09/22/2025 11:19	WG2603155
(T) Barium	*111*	C1				*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*95.7*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.859	J	0.660	1.10	10/03/2025 16:09	WG2610081

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.00715	U	0.137	0.151	0.280	0.0866	10/03/2025 16:09	WG2610081
(T) Barium-133	*99.9*					*30.0-110*	*10/03/2025 16:09*	WG2610081

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.634	J	0.668	0.705	1.12	0.353	09/22/2025 11:19	WG2603155
(T) Barium	*103*					*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*106*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.14	J	0.726	1.15	10/01/2025 17:27	WG2610081

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.501		0.285	0.398	0.270	0.0853	10/01/2025 17:27	WG2610081
(T) Barium-133	*95.9*					*30.0-110*	*10/01/2025 17:27*	WG2610081

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	-0.0186	U	0.698	0.704	1.22	0.386	09/22/2025 11:19	WG2603155
(T) Barium	*110*					*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*100*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.000	U	0.717	1.28	10/01/2025 17:27	WG2610081

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	-0.0553	U	0.162	0.203	0.385	0.124	10/01/2025 17:27	WG2610081
(T) Barium-133	*84.8*					*30.0-110*	*10/01/2025 17:27*	WG2610081

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.66		0.734	0.796	1.15	0.363	09/22/2025 11:19	WG2603155
(T) Barium	*107*					*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*92.7*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.00		0.787	1.20	10/01/2025 17:27	WG2610081

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.341		0.283	0.406	0.326	0.0959	10/01/2025 17:27	WG2610081
(T) Barium-133	*94.3*					*30.0-110*	*10/01/2025 17:27*	WG2610081

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.551	J	0.694	0.729	1.17	0.369	09/22/2025 11:19	WG2603155
(T) Barium	*135*	C1				*30.0-110*	*09/22/2025 11:19*	WG2603155
(T) Yttrium	*92.1*					*30.0-110*	*09/22/2025 11:19*	WG2603155

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.551	J	0.717	1.25	10/01/2025 17:27	WG2610081

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	-0.0852	U	0.181	0.233	0.427	0.143	10/01/2025 17:27	WG2610081
(T) Barium-133	*88.8*					*30.0-110*	*10/01/2025 17:27*	WG2610081

Method Blank (MB)

(MB) R4278089-1 09/22/25 11:19

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.315	J	0.286	0.474	0.148
(T) Barium	*114*	C1	*114*		
(T) Yttrium	*95.9*		*95.9*		

L1895679-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1895679-11 09/22/25 11:19 • (DUP) R4278089-5 09/22/25 11:19

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.852	0.646	1.06	0.336	1.13	0.556	0.873	0.273	27.6	0.321		20	3
(T) Barium	*111*				*108*	*108*							
(T) Yttrium	*95.7*				*99.7*	*99.7*							

Laboratory Control Sample (LCS)

(LCS) R4278089-2 09/22/25 11:19

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.04	101	80.0-120	
(T) Barium			*116*		C1
(T) Yttrium			*95.6*		

L1895349-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895349-05 09/22/25 11:19 • (MS) R4278089-3 09/22/25 11:19 • (MSD) R4278089-4 09/22/25 11:19

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.453	11.0	9.96	105	95.0	1	70.0-130			9.49		20
(T) Barium		*103*			*105*	*102*							
(T) Yttrium		*98.1*			*94.5*	*98.3*							

QUALITY CONTROL SUMMARY

L1895679-01,02

Method Blank (MB)

(MB) R4279245-1 09/26/25 11:51

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.182	J	0.300	0.307	0.165
(T) Barium	*93.4*		*93.4*		
(T) Yttrium	*92.5*		*92.5*		

L1899840-29 Original Sample (OS) • Duplicate (DUP)

(OS) L1899840-29 09/26/25 11:51 • (DUP) R4279245-5 09/26/25 11:51

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.0485	0.576	0.601	0.325	0.446	0.506	0.508	0.272	161	0.519	J	20	3
(T) Barium	*123*				*110*	*110*							
(T) Yttrium	*96.8*				*99.6*	*99.6*							

Laboratory Control Sample (LCS)

(LCS) R4279245-2 09/26/25 11:51

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.59	91.8	80.0-120	
(T) Barium			*129*		C1
(T) Yttrium			*99.3*		

L1895349-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895349-05 09/26/25 11:51 • (MS) R4279245-3 09/26/25 11:51 • (MSD) R4279245-4 09/26/25 11:51

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.177	8.96	8.50	87.8	83.2	1	70.0-130			5.25		20
(T) Barium		*102*			*92.3*	*119*				C1			
(T) Yttrium		*93.1*			*95.0*	*93.0*							

Method Blank (MB)

(MB) R4281268-1 09/29/25 12:30

Analyte	MB Result	MB Qualifier	MB 2 sigma CE	MB MDA	MB Lc
	pCi/l		+ / -	pCi/l	pCi/l
Radium-228	0.185	U	0.291	0.493	
(T) Barium	*107*		*107*		
(T) Yttrium	*87.9*		*87.9*		

L1900439-25 Original Sample (OS) • Duplicate (DUP)

(OS) L1900439-25 09/29/25 12:30 • (DUP) R4281268-5 09/29/25 12:30

Analyte	Original Result	Original 2 sigma CE	Original MDA	Original Lc	DUP Result	DUP 2 sigma CE	DUP MDA	DUP Lc	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	pCi/l	+ / -	pCi/l	pCi/l	%			%	
Radium-228	1.67	0.654	1.01	0.325	1.02	0.626	1.01		48.1	0.716		20	3
(T) Barium	*121*				*128*	*128*					C1		
(T) Yttrium	*96.6*				*100*	*100*							

Laboratory Control Sample (LCS)

(LCS) R4281268-2 09/29/25 12:30

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-228	5.00	5.62	112	80.0-120	
(T) Barium			*104*		
(T) Yttrium			*86.4*		

L1900439-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1900439-21 09/29/25 12:30 • (MS) R4281268-3 09/29/25 12:30 • (MSD) R4281268-4 09/29/25 12:30

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	1.40	9.68	9.24	82.8	78.4	1	70.0-130			4.66		20
(T) Barium		*96.2*			*108*	*117*				C1			
(T) Yttrium		*89.8*			*101*	*99.1*							

Method Blank (MB)

(MB) R4281732-1 09/30/25 21:48

Analyte	MB Result	MB Qualifier	MB 2 sigma CE	MB MDA	MB Lc
	pCi/l		+ / -	pCi/l	pCi/l
Radium-226	-0.0117	U	0.0268	0.0584	
(T) Barium-133	*79.7*		*79.7*		

L1895679-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1895679-10 09/30/25 21:48 • (DUP) R4281732-5 09/30/25 21:48

Analyte	Original Result	Original 2 sigma CE	Original MDA	Original Lc	DUP Result	DUP 2 sigma CE	DUP MDA	DUP Lc	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	pCi/l	+ / -	pCi/l	pCi/l	%			%	
Radium-226	0.0586	0.159	0.272	0.0873	0.137	0.189	0.276		80.1	0.317	J	20	3
(T) Barium-133	*96.6*				*101*	*101*							

Laboratory Control Sample (LCS)

(LCS) R4281732-2 09/30/25 21:48

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.00	5.31	106	80.0-120	
(T) Barium-133			*79.6*		

L1895679-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895679-01 09/30/25 21:48 • (MS) R4281732-3 09/30/25 21:48 • (MSD) R4281732-4 09/30/25 21:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.0	0.302	20.3	19.7	100	97.1	1	75.0-125			3.05		20
(T) Barium-133		*74.6*			*98.8*	*98.2*							

Method Blank (MB)

(MB) R4283205-1 10/01/25 17:27

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	-0.00213	U	0.0428	0.0890	0.0286
(T) Barium-133	*87.6*		*87.6*		

L1895679-15 Original Sample (OS) • Duplicate (DUP)

(OS) L1895679-15 10/01/25 17:27 • (DUP) R4283205-5 10/01/25 17:27

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	-0.0852	0.181	0.427	0.143	0.0273	0.164	0.331	0.0973	200	0.460	U	20	3
(T) Barium-133	*88.8*				*83.6*	*83.6*							

Laboratory Control Sample (LCS)

(LCS) R4283205-2 10/01/25 17:27

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	5.21	104	80.0-120	
(T) Barium-133			*80.6*		

L1895679-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1895679-11 10/03/25 16:09 • (MS) R4283205-3 10/01/25 17:27 • (MSD) R4283205-4 10/01/25 17:27

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.00715	21.1	19.1	105	95.6	1	75.0-125			9.60		20
(T) Barium-133		*99.9*			*103*	*97.8*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
TPU	Total Propagated Uncertainty reported at 2 sigma (counting error plus all measurable variables).
Lc	Decision Level or Critical Level. DOE required Detection limit at a 68% confidence level.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
U (Radiochemistry)	Result + Error < MDA.
J (Radiochemistry)	Result < MDA; Result + Error > MDA.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C1	Tracer recovery limits have been exceeded; values are outside upper control limits.
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 2Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1604579

F016

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1175082**
PM: **206 - Jeff Carr**
PB:
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3	Pres Chk	Remarks	Sample # (lab only)
APW-03-WG-2025 0903	Grab	NPW		9/3/2025	1430	3	X	X			01
APW-08-WG-2025 0905		NPW		9/5/2025	0835	3	X	X			02
APW-07-WG-2025 0904		NPW		9/4/2025	1635	3	X	X			03
APW-10S-WG-2025 0903		NPW		9/3/2025	1645	3	X	X			04
APW-10D-WG-2025 0903		NPW		9/3/2025	1555	3	X	X			05
APW-06S-WG-2025 0904		NPW		9/4/2025	1055	3	X	X			06
APW-06D-WG-2025 0904		NPW		9/4/2025	0955	3	X	X			07
APW-05R-WG-2025 0904		NPW		9/4/2025	1230	3	X	X			08
APW-09-WG-2025 0905		NPW		9/5/2025	0930	3	X	X			09
APW-02-WG-2025 0904		NPW		9/4/2025	1330	3	X	X			10

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP ✓Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	9/5/25	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			CRobello

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 45

Date: 09.06.25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Conditions: NCF / OK

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 2Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3							Remarks	Sample # (lab only)
APW-01R-WG-2025 0904	Grab	NPW		9/4/2025	1525	3	X	X								11
APW-04-WG-2025 0904		NPW		9/4/2025	0810	3	X	X								12
EB-01-WG-2025 0903		NPW		9/3/2025	1000	3	X	X								13
DUP-01-WG-2025 0904		NPW		9/4/2025	0001	3	X	X								14
DUP-02-WG-2025 0905		NPW		9/5/2025	0002	3	X	X								15

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1806624

Table #

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1175082**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	9/5/2025	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			CRobert

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 45

If preservation required by Login: Date/Time

Date: 09.06.25 Time: 0900

Hold:

Condition: NCF OK

Multiple Parcel Form

L# L1895679

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
4580 6312 5225	THA9	2.3	-0.1	2.2	Yes / No / Not Present
4580 6312 5236		0.4	-0.1	0.3	Yes / No / Not Present
7102 9107 4331		4.7	-0.1	4.6	Yes / No / Not Present
4416 7188 8478		3.4	-0.1	3.3	Yes / No / Not Present
4718 2716 7417		0.2	-0.1	0.1	Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

CRiveros
Name

09-06-25
Date

ANALYTICAL REPORT

December 15, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1921496
Samples Received:	11/22/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 4Q25 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-03-WG-20251120 L1921496-01

Collected by: Marshall A | Collected date/time: 11/20/25 09:40 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 14:59	11/27/25 14:59	GEB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	10	11/27/25 15:12	11/27/25 15:12	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647379	1	11/26/25 04:02	11/26/25 04:02	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2645321	1	11/28/25 12:00	11/29/25 18:50	MDE	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:27	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:22	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:25	11/29/25 14:27	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 15:10	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:28	JPD	Mt. Juliet, TN

APW-08-WG-20251120 L1921496-02

Collected by: Marshall A | Collected date/time: 11/20/25 10:20 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 16:28	11/27/25 16:28	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647379	1	11/26/25 04:02	11/26/25 04:02	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2645321	1	11/28/25 12:00	11/29/25 18:53	MDE	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:30	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:24	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:25	11/29/25 14:30	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 15:49	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:31	JPD	Mt. Juliet, TN

APW-07-WG-20251120 L1921496-03

Collected by: Marshall A | Collected date/time: 11/20/25 08:45 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 16:40	11/27/25 16:40	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647420	1	11/25/25 23:34	11/25/25 23:34	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2645321	1	11/28/25 12:00	11/29/25 18:55	MDE	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:33	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:27	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:25	11/29/25 14:32	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 15:52	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:34	JPD	Mt. Juliet, TN

APW-10S-WG-20251119 L1921496-04

Collected by: Marshall A | Collected date/time: 11/19/25 16:00 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 17:06	11/27/25 17:06	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647420	1	11/25/25 23:34	11/25/25 23:34	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 13:54	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:35	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:30	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:18	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 15:55	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:45	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	5	12/01/25 21:57	12/13/25 19:28	TMT	Mt. Juliet, TN

APW-10D-WG-20251119 L1921496-05

Collected by: Marshall A | Collected date/time: 11/19/25 15:30 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 17:18	11/27/25 17:18	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647408	1	11/26/25 01:33	11/26/25 01:33	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 13:57	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:43	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:38	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:34	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 15:58	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:48	JPD	Mt. Juliet, TN

APW-06S-WG-20251119 L1921496-06

Collected by: Marshall A | Collected date/time: 11/19/25 12:05 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 17:31	11/27/25 17:31	GEB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	10	11/27/25 17:43	11/27/25 17:43	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647420	1	11/25/25 23:34	11/25/25 23:34	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:11	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:45	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:40	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:41	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:02	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:51	JPD	Mt. Juliet, TN

APW-06D-WG-20251119 L1921496-07

Collected by: Marshall A | Collected date/time: 11/19/25 11:40 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 17:56	11/27/25 17:56	GEB	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	10	11/27/25 18:09	11/27/25 18:09	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647379	1	11/26/25 04:02	11/26/25 04:02	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:13	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:48	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:43	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:43	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:05	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:54	JPD	Mt. Juliet, TN

APW-05R-WG-20251119 L1921496-08

Collected by: Marshall A | Collected date/time: 11/19/25 13:10 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	5	11/27/25 18:21	11/27/25 18:21	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647408	1	11/26/25 01:33	11/26/25 01:33	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:16	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:51	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:46	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:46	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:08	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 18:57	JPD	Mt. Juliet, TN

APW-09-WG-20251120 L1921496-09

Collected by: Marshall A | Collected date/time: 11/20/25 12:10 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 19:12	11/27/25 19:12	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647408	1	11/26/25 01:33	11/26/25 01:33	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:19	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:53	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:48	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:48	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:11	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:00	JPD	Mt. Juliet, TN

APW-02-WG-20251119 L1921496-10

Collected by: Marshall A | Collected date/time: 11/19/25 13:55 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	5	11/27/25 19:25	11/27/25 19:25	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647408	1	11/26/25 01:33	11/26/25 01:33	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:22	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:56	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:51	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:50	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:14	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:03	JPD	Mt. Juliet, TN

APW-01R-WG-20251120 L1921496-11

Collected by: Marshall A | Collected date/time: 11/20/25 11:20 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 19:50	11/27/25 19:50	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647379	1	11/26/25 04:02	11/26/25 04:02	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:25	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 11:58	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:53	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:53	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:18	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:06	JPD	Mt. Juliet, TN

APW-04-WG-20251119 L1921496-12

Collected by: Marshall A | Collected date/time: 11/19/25 16:50 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 20:02	11/27/25 20:02	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647420	1	11/25/25 23:34	11/25/25 23:34	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:33	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 12:01	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:56	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:55	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:32	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:09	JPD	Mt. Juliet, TN

EB-01-WG-20251119 L1921496-13

Collected by: Marshall A
Collected date/time: 11/19/25 10:40
Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2646997	1	11/25/25 08:47	11/25/25 11:09	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 20:15	11/27/25 20:15	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647420	1	11/25/25 23:34	11/25/25 23:34	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:36	AKB	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 14:57	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:12	JPD	Mt. Juliet, TN

DUP-01-WG-20251119 L1921496-14

Collected by: Marshall A
Collected date/time: 11/19/25 00:01
Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2647002	1	11/25/25 07:03	11/25/25 14:17	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	5	11/27/25 20:28	11/27/25 20:28	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647408	1	11/26/25 01:33	11/26/25 01:33	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:39	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 12:03	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 00:59	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 15:00	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:35	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:22	TMT	Mt. Juliet, TN

DUP-02-WG-20251120 L1921496-15

Collected by: Marshall A
Collected date/time: 11/20/25 00:02
Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2647002	1	11/25/25 07:03	11/25/25 14:17	AMG	Mt. Juliet, TN
Wet Chemistry by Method 300.0	WG2645785	1	11/27/25 20:53	11/27/25 20:53	GEB	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG2647408	1	11/26/25 01:33	11/26/25 01:33	AVB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646383	1	11/28/25 17:35	11/30/25 14:42	AKB	Mt. Juliet, TN
Mercury by Method 7470A	WG2646389	1	11/28/25 15:04	12/01/25 12:06	NDL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646529	1	11/26/25 18:52	11/27/25 01:01	MAP	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG2646564	1	11/28/25 09:21	11/29/25 15:02	JTM	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646542	1	11/26/25 20:55	12/14/25 16:39	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG2646586	1	12/01/25 21:57	12/13/25 19:25	TMT	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Sample Delivery Group (SDG) Narrative

Analysis was filtered in the laboratory.

Lab Sample ID	Project Sample ID	Method
L1921496-01	APW-03-WG-20251120	6020B, 7470A, 6010D
L1921496-02	APW-08-WG-20251120	6020B, 6010D, 7470A
L1921496-03	APW-07-WG-20251120	6020B, 6010D, 7470A
L1921496-04	APW-10S-WG-20251119	6020B, 6010D, 7470A
L1921496-05	APW-10D-WG-20251119	6020B, 6010D, 7470A
L1921496-06	APW-06S-WG-20251119	7470A, 6020B, 6010D
L1921496-07	APW-06D-WG-20251119	6020B, 6010D, 7470A
L1921496-08	APW-05R-WG-20251119	6020B, 6010D, 7470A
L1921496-09	APW-09-WG-20251120	6010D, 6020B, 7470A
L1921496-10	APW-02-WG-20251119	6020B, 6010D, 7470A
L1921496-11	APW-01R-WG-20251120	6010D, 6020B, 7470A
L1921496-12	APW-04-WG-20251119	6010D, 7470A, 6020B
L1921496-14	DUP-01-WG-20251119	6010D, 6020B, 7470A
L1921496-15	DUP-02-WG-20251120	6020B, 6010D, 7470A
R4307085-3		6010D
R4313983-3		6020B

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	541		10.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.41		1.00	1	11/27/2025 14:59	WG2645785
Fluoride	0.289		0.150	1	11/27/2025 14:59	WG2645785
Sulfate	242		50.0	10	11/27/2025 15:12	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.75	T8	1	11/26/2025 04:02	WG2647379

Sample Narrative:

L1921496-01 WG2647379: 7.75 at 18.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/29/2025 18:50	WG2645321
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:27	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	4.02		0.200	1	11/29/2025 14:27	WG2646564
Boron,Dissolved	4.00		0.200	1	11/27/2025 00:22	WG2646529
Calcium	116		1.00	1	11/29/2025 14:27	WG2646564
Calcium,Dissolved	122		1.00	1	11/27/2025 00:22	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:28	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 15:10	WG2646542
Arsenic	ND		0.00200	1	12/13/2025 18:28	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542
Barium	0.115		0.00200	1	12/13/2025 18:28	WG2646586
Barium,Dissolved	0.118		0.00200	1	12/14/2025 15:10	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:28	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:28	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 15:10	WG2646542
Chromium	ND		0.00200	1	12/13/2025 18:28	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:28	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:28	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542
Lithium	0.0276		0.00200	1	12/13/2025 18:28	WG2646586
Lithium,Dissolved	0.0304		0.00200	1	12/14/2025 15:10	WG2646542
Molybdenum	0.0567		0.00500	1	12/13/2025 18:28	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0584		0.00500	1	12/14/2025 15:10	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:28	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:28	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 15:10	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	432		20.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	7.46		1.00	1	11/27/2025 16:28	WG2645785
Fluoride	0.266		0.150	1	11/27/2025 16:28	WG2645785
Sulfate	26.2		5.00	1	11/27/2025 16:28	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.25	T8	1	11/26/2025 04:02	WG2647379

Sample Narrative:

L1921496-02 WG2647379: 7.25 at 18.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/29/2025 18:53	WG2645321
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:30	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	11/29/2025 14:30	WG2646564
Boron,Dissolved	ND		0.200	1	11/27/2025 00:24	WG2646529
Calcium	107		1.00	1	11/29/2025 14:30	WG2646564
Calcium,Dissolved	111		1.00	1	11/27/2025 00:24	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:31	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 15:49	WG2646542
Arsenic	ND		0.00200	1	12/13/2025 18:31	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 15:49	WG2646542
Barium	0.210		0.00200	1	12/13/2025 18:31	WG2646586
Barium,Dissolved	0.216		0.00200	1	12/14/2025 15:49	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:31	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 15:49	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:31	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 15:49	WG2646542
Chromium	0.00243		0.00200	1	12/13/2025 18:31	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 15:49	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:31	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 15:49	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:31	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 15:49	WG2646542
Lithium	0.0186		0.00200	1	12/13/2025 18:31	WG2646586
Lithium,Dissolved	0.0185		0.00200	1	12/14/2025 15:49	WG2646542
Molybdenum	ND		0.00500	1	12/13/2025 18:31	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	12/14/2025 15:49	WG2646542
Selenium	0.0153		0.00200	1	12/13/2025 18:31	WG2646586
Selenium,Dissolved	0.0160		0.00200	1	12/14/2025 15:49	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:31	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 15:49	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	706		20.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.77		1.00	1	11/27/2025 16:40	WG2645785
Fluoride	0.197		0.150	1	11/27/2025 16:40	WG2645785
Sulfate	48.7		5.00	1	11/27/2025 16:40	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.01	T8	1	11/25/2025 23:34	WG2647420

Sample Narrative:

L1921496-03 WG2647420: 7.01 at 18.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/29/2025 18:55	WG2645321
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:33	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.212		0.200	1	11/29/2025 14:32	WG2646564
Boron,Dissolved	0.211		0.200	1	11/27/2025 00:27	WG2646529
Calcium	213		1.00	1	11/29/2025 14:32	WG2646564
Calcium,Dissolved	217		1.00	1	11/27/2025 00:27	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:34	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 15:52	WG2646542
Arsenic	ND		0.00200	1	12/13/2025 18:34	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542
Barium	0.335		0.00200	1	12/13/2025 18:34	WG2646586
Barium,Dissolved	0.267		0.00200	1	12/14/2025 15:52	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:34	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:34	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 15:52	WG2646542
Chromium	ND		0.00200	1	12/13/2025 18:34	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:34	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:34	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542
Lithium	0.0151		0.00200	1	12/13/2025 18:34	WG2646586
Lithium,Dissolved	0.0152		0.00200	1	12/14/2025 15:52	WG2646542
Molybdenum	ND		0.00500	1	12/13/2025 18:34	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	12/14/2025 15:52	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:34	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:34	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 15:52	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	714		20.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	14.6		1.00	1	11/27/2025 17:06	WG2645785
Fluoride	0.187		0.150	1	11/27/2025 17:06	WG2645785
Sulfate	ND		5.00	1	11/27/2025 17:06	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.20	T8	1	11/25/2025 23:34	WG2647420

Sample Narrative:
L1921496-04 WG2647420: 7.2 at 18.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 13:54	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:35	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.586		0.200	1	11/29/2025 14:18	WG2646564
Boron,Dissolved	0.579		0.200	1	11/27/2025 00:30	WG2646529
Calcium	158	V	1.00	1	11/29/2025 14:18	WG2646564
Calcium,Dissolved	160		1.00	1	11/27/2025 00:30	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:45	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 15:55	WG2646542
Arsenic	0.190		0.00200	1	12/13/2025 18:45	WG2646586
Arsenic,Dissolved	0.0702		0.00200	1	12/14/2025 15:55	WG2646542
Barium	0.556		0.0100	5	12/13/2025 19:28	WG2646586
Barium,Dissolved	0.360		0.00200	1	12/14/2025 15:55	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:45	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 15:55	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:45	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 15:55	WG2646542
Chromium	0.00271		0.00200	1	12/13/2025 18:45	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 15:55	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:45	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 15:55	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:45	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 15:55	WG2646542
Lithium	0.0283		0.00200	1	12/13/2025 18:45	WG2646586
Lithium,Dissolved	0.0309		0.00200	1	12/14/2025 15:55	WG2646542
Molybdenum	ND		0.00500	1	12/13/2025 18:45	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	12/14/2025 15:55	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:45	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 15:55	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:45	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 15:55	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	447		10.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	11.6		1.00	1	11/27/2025 17:18	WG2645785
Fluoride	ND		0.150	1	11/27/2025 17:18	WG2645785
Sulfate	32.0		5.00	1	11/27/2025 17:18	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.40	T8	1	11/26/2025 01:33	WG2647408

Sample Narrative:
L1921496-05 WG2647408: 7.4 at 19C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 13:57	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:43	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	11/29/2025 14:34	WG2646564
Boron,Dissolved	ND		0.200	1	11/27/2025 00:38	WG2646529
Calcium	127		1.00	1	11/29/2025 14:34	WG2646564
Calcium,Dissolved	127		1.00	1	11/27/2025 00:38	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:48	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 15:58	WG2646542
Arsenic	ND		0.00200	1	12/13/2025 18:48	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 15:58	WG2646542
Barium	0.325		0.00200	1	12/13/2025 18:48	WG2646586
Barium,Dissolved	0.352		0.00200	1	12/14/2025 15:58	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:48	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 15:58	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:48	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 15:58	WG2646542
Chromium	ND		0.00200	1	12/13/2025 18:48	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 15:58	WG2646542
Cobalt	0.00285		0.00200	1	12/13/2025 18:48	WG2646586
Cobalt,Dissolved	0.00298		0.00200	1	12/14/2025 15:58	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:48	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 15:58	WG2646542
Lithium	0.0147		0.00200	1	12/13/2025 18:48	WG2646586
Lithium,Dissolved	0.0155		0.00200	1	12/14/2025 15:58	WG2646542
Molybdenum	ND		0.00500	1	12/13/2025 18:48	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	12/14/2025 15:58	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:48	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 15:58	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:48	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 15:58	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	692		13.3	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.1		1.00	1	11/27/2025 17:31	WG2645785
Fluoride	0.299		0.150	1	11/27/2025 17:31	WG2645785
Sulfate	228		50.0	10	11/27/2025 17:43	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.28	T8	1	11/25/2025 23:34	WG2647420

Sample Narrative:
L1921496-06 WG2647420: 7.28 at 18.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:11	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:45	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	6.00		0.200	1	11/29/2025 14:41	WG2646564
Boron,Dissolved	6.15		0.200	1	11/27/2025 00:40	WG2646529
Calcium	137		1.00	1	11/29/2025 14:41	WG2646564
Calcium,Dissolved	143		1.00	1	11/27/2025 00:40	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:51	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:02	WG2646542
Arsenic	ND		0.00200	1	12/13/2025 18:51	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542
Barium	0.267		0.00200	1	12/13/2025 18:51	WG2646586
Barium,Dissolved	0.214		0.00200	1	12/14/2025 16:02	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:51	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:51	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:02	WG2646542
Chromium	0.00498		0.00200	1	12/13/2025 18:51	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:51	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:51	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542
Lithium	0.0391		0.00200	1	12/13/2025 18:51	WG2646586
Lithium,Dissolved	0.0432		0.00200	1	12/14/2025 16:02	WG2646542
Molybdenum	0.171		0.00500	1	12/13/2025 18:51	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.190		0.00500	1	12/14/2025 16:02	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:51	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:51	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:02	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	680		20.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	35.3		1.00	1	11/27/2025 17:56	WG2645785
Fluoride	0.249		0.150	1	11/27/2025 17:56	WG2645785
Sulfate	136		50.0	10	11/27/2025 18:09	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.50	T8	1	11/26/2025 04:02	WG2647379

Sample Narrative:
L1921496-07 WG2647379: 7.5 at 19C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:13	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:48	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	2.57		0.200	1	11/29/2025 14:43	WG2646564
Boron,Dissolved	2.67		0.200	1	11/27/2025 00:43	WG2646529
Calcium	110		1.00	1	11/29/2025 14:43	WG2646564
Calcium,Dissolved	115		1.00	1	11/27/2025 00:43	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:54	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:05	WG2646542
Arsenic	0.0108		0.00200	1	12/13/2025 18:54	WG2646586
Arsenic,Dissolved	0.00527		0.00200	1	12/14/2025 16:05	WG2646542
Barium	0.109		0.00200	1	12/13/2025 18:54	WG2646586
Barium,Dissolved	0.114		0.00200	1	12/14/2025 16:05	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:54	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:05	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:54	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:05	WG2646542
Chromium	ND		0.00200	1	12/13/2025 18:54	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:05	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:54	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:05	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:54	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:05	WG2646542
Lithium	0.0148		0.00200	1	12/13/2025 18:54	WG2646586
Lithium,Dissolved	0.0153		0.00200	1	12/14/2025 16:05	WG2646542
Molybdenum	0.0461		0.00500	1	12/13/2025 18:54	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0522		0.00500	1	12/14/2025 16:05	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:54	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 16:05	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:54	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:05	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	700		20.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	15.0		5.00	5	11/27/2025 18:21	WG2645785
Fluoride	ND		0.750	5	11/27/2025 18:21	WG2645785
Sulfate	330		25.0	5	11/27/2025 18:21	WG2645785

Sample Narrative:

L1921496-08 WG2645785: Dilution due to matrix impact on instrumentation at lower dilution

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.66	T8	1	11/26/2025 01:33	WG2647408

Sample Narrative:

L1921496-08 WG2647408: 7.66 at 19.1C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:16	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:51	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	8.50		0.200	1	11/29/2025 14:46	WG2646564
Boron,Dissolved	8.72		0.200	1	11/27/2025 00:46	WG2646529
Calcium	132		1.00	1	11/29/2025 14:46	WG2646564
Calcium,Dissolved	136		1.00	1	11/27/2025 00:46	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 18:57	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:08	WG2646542
Arsenic	0.00218		0.00200	1	12/13/2025 18:57	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542
Barium	0.181		0.00200	1	12/13/2025 18:57	WG2646586
Barium,Dissolved	0.156		0.00200	1	12/14/2025 16:08	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 18:57	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 18:57	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:08	WG2646542
Chromium	ND		0.00200	1	12/13/2025 18:57	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 18:57	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542
Lead	ND		0.00200	1	12/13/2025 18:57	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Lithium	0.0350		0.00200	1	12/13/2025 18:57	WG2646586
Lithium,Dissolved	0.0358		0.00200	1	12/14/2025 16:08	WG2646542
Molybdenum	0.185		0.00500	1	12/13/2025 18:57	WG2646586
Molybdenum,Dissolved	0.208		0.00500	1	12/14/2025 16:08	WG2646542
Selenium	ND		0.00200	1	12/13/2025 18:57	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542
Thallium	ND		0.00200	1	12/13/2025 18:57	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:08	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	363		10.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	11.8		1.00	1	11/27/2025 19:12	WG2645785
Fluoride	0.223		0.150	1	11/27/2025 19:12	WG2645785
Sulfate	35.4		5.00	1	11/27/2025 19:12	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.65	T8	1	11/26/2025 01:33	WG2647408

Sample Narrative:
L1921496-09 WG2647408: 7.65 at 18.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:19	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:53	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.244		0.200	1	11/29/2025 14:48	WG2646564
Boron,Dissolved	0.235		0.200	1	11/27/2025 00:48	WG2646529
Calcium	85.8		1.00	1	11/29/2025 14:48	WG2646564
Calcium,Dissolved	89.2		1.00	1	11/27/2025 00:48	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:00	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:11	WG2646542
Arsenic	0.00221		0.00200	1	12/13/2025 19:00	WG2646586
Arsenic,Dissolved	0.00223		0.00200	1	12/14/2025 16:11	WG2646542
Barium	0.123		0.00200	1	12/13/2025 19:00	WG2646586
Barium,Dissolved	0.130		0.00200	1	12/14/2025 16:11	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 19:00	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:11	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 19:00	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:11	WG2646542
Chromium	ND		0.00200	1	12/13/2025 19:00	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:11	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 19:00	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:11	WG2646542
Lead	ND		0.00200	1	12/13/2025 19:00	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:11	WG2646542
Lithium	0.0134		0.00200	1	12/13/2025 19:00	WG2646586
Lithium,Dissolved	0.0139		0.00200	1	12/14/2025 16:11	WG2646542
Molybdenum	0.0184		0.00500	1	12/13/2025 19:00	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0212		0.00500	1	12/14/2025 16:11	WG2646542
Selenium	0.0160		0.00200	1	12/13/2025 19:00	WG2646586
Selenium,Dissolved	0.0167		0.00200	1	12/14/2025 16:11	WG2646542
Thallium	ND		0.00200	1	12/13/2025 19:00	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:11	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	775		13.3	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.80		5.00	5	11/27/2025 19:25	WG2645785
Fluoride	ND		0.750	5	11/27/2025 19:25	WG2645785
Sulfate	397		25.0	5	11/27/2025 19:25	WG2645785

Sample Narrative:

L1921496-10 WG2645785: Dilution due to matrix impact on instrumentation at lower dilution

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.38	T8	1	11/26/2025 01:33	WG2647408

Sample Narrative:

L1921496-10 WG2647408: 7.38 at 18.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:22	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:56	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	9.05		0.200	1	11/29/2025 14:50	WG2646564
Boron,Dissolved	9.17		0.200	1	11/27/2025 00:51	WG2646529
Calcium	150		1.00	1	11/29/2025 14:50	WG2646564
Calcium,Dissolved	149		1.00	1	11/27/2025 00:51	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:03	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:14	WG2646542
Arsenic	0.0175		0.00200	1	12/13/2025 19:03	WG2646586
Arsenic,Dissolved	0.00450		0.00200	1	12/14/2025 16:14	WG2646542
Barium	0.157		0.00200	1	12/13/2025 19:03	WG2646586
Barium,Dissolved	0.138		0.00200	1	12/14/2025 16:14	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 19:03	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:14	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 19:03	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:14	WG2646542
Chromium	0.0835		0.00200	1	12/13/2025 19:03	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:14	WG2646542
Cobalt	0.00360		0.00200	1	12/13/2025 19:03	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:14	WG2646542
Lead	0.00688		0.00200	1	12/13/2025 19:03	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:14	WG2646542

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Lithium	0.0405		0.00200	1	12/13/2025 19:03	WG2646586
Lithium,Dissolved	0.0417		0.00200	1	12/14/2025 16:14	WG2646542
Molybdenum	0.159		0.00500	1	12/13/2025 19:03	WG2646586
Molybdenum,Dissolved	0.178		0.00500	1	12/14/2025 16:14	WG2646542
Selenium	ND		0.00200	1	12/13/2025 19:03	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 16:14	WG2646542
Thallium	ND		0.00200	1	12/13/2025 19:03	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:14	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	383		10.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	6.53		1.00	1	11/27/2025 19:50	WG2645785
Fluoride	0.194		0.150	1	11/27/2025 19:50	WG2645785
Sulfate	60.8		5.00	1	11/27/2025 19:50	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.92	T8	1	11/26/2025 04:02	WG2647379

Sample Narrative:

L1921496-11 WG2647379: 6.92 at 19.4C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:25	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 11:58	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.231		0.200	1	11/29/2025 14:53	WG2646564
Boron,Dissolved	0.224		0.200	1	11/27/2025 00:53	WG2646529
Calcium	84.6		1.00	1	11/29/2025 14:53	WG2646564
Calcium,Dissolved	87.6		1.00	1	11/27/2025 00:53	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:06	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:18	WG2646542
Arsenic	ND		0.00200	1	12/13/2025 19:06	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 16:18	WG2646542
Barium	0.170		0.00200	1	12/13/2025 19:06	WG2646586
Barium,Dissolved	0.175		0.00200	1	12/14/2025 16:18	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 19:06	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:18	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 19:06	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:18	WG2646542
Chromium	0.00242		0.00200	1	12/13/2025 19:06	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:18	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 19:06	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:18	WG2646542
Lead	ND		0.00200	1	12/13/2025 19:06	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:18	WG2646542
Lithium	0.0146		0.00200	1	12/13/2025 19:06	WG2646586
Lithium,Dissolved	0.0141		0.00200	1	12/14/2025 16:18	WG2646542
Molybdenum	ND		0.00500	1	12/13/2025 19:06	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	ND		0.00500	1	12/14/2025 16:18	WG2646542
Selenium	0.00406		0.00200	1	12/13/2025 19:06	WG2646586
Selenium,Dissolved	0.00403		0.00200	1	12/14/2025 16:18	WG2646542
Thallium	ND		0.00200	1	12/13/2025 19:06	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:18	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	438		10.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	10.0		1.00	1	11/27/2025 20:02	WG2645785
Fluoride	0.178		0.150	1	11/27/2025 20:02	WG2645785
Sulfate	67.3		5.00	1	11/27/2025 20:02	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.43	T8	1	11/25/2025 23:34	WG2647420

Sample Narrative:

L1921496-12 WG2647420: 7.43 at 18.5C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:33	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 12:01	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.654		0.200	1	11/29/2025 14:55	WG2646564
Boron,Dissolved	0.654		0.200	1	11/27/2025 00:56	WG2646529
Calcium	106		1.00	1	11/29/2025 14:55	WG2646564
Calcium,Dissolved	109		1.00	1	11/27/2025 00:56	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:09	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:32	WG2646542
Arsenic	0.00200		0.00200	1	12/13/2025 19:09	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 16:32	WG2646542
Barium	0.150		0.00200	1	12/13/2025 19:09	WG2646586
Barium,Dissolved	0.143		0.00200	1	12/14/2025 16:32	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 19:09	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:32	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 19:09	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:32	WG2646542
Chromium	0.00328		0.00200	1	12/13/2025 19:09	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:32	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 19:09	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:32	WG2646542
Lead	ND		0.00200	1	12/13/2025 19:09	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:32	WG2646542
Lithium	0.0277		0.00200	1	12/13/2025 19:09	WG2646586
Lithium,Dissolved	0.0276		0.00200	1	12/14/2025 16:32	WG2646542
Molybdenum	0.0301		0.00500	1	12/13/2025 19:09	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0347		0.00500	1	12/14/2025 16:32	WG2646542
Selenium	0.0109		0.00200	1	12/13/2025 19:09	WG2646586
Selenium,Dissolved	0.0108		0.00200	1	12/14/2025 16:32	WG2646542
Thallium	ND		0.00200	1	12/13/2025 19:09	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:32	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	ND		10.0	1	11/25/2025 11:09	WG2646997

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	ND		1.00	1	11/27/2025 20:15	WG2645785
Fluoride	ND		0.150	1	11/27/2025 20:15	WG2645785
Sulfate	ND		5.00	1	11/27/2025 20:15	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.68	T8	1	11/25/2025 23:34	WG2647420

Sample Narrative:

L1921496-13 WG2647420: 6.68 at 18.9C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:36	WG2646383

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	11/29/2025 14:57	WG2646564
Calcium	ND		1.00	1	11/29/2025 14:57	WG2646564

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:12	WG2646586
Arsenic	ND		0.00200	1	12/13/2025 19:12	WG2646586
Barium	ND		0.00200	1	12/13/2025 19:12	WG2646586
Beryllium	ND		0.00200	1	12/13/2025 19:12	WG2646586
Cadmium	ND		0.00100	1	12/13/2025 19:12	WG2646586
Chromium	ND		0.00200	1	12/13/2025 19:12	WG2646586
Cobalt	ND		0.00200	1	12/13/2025 19:12	WG2646586
Lead	ND		0.00200	1	12/13/2025 19:12	WG2646586
Lithium	ND		0.00200	1	12/13/2025 19:12	WG2646586
Molybdenum	ND		0.00500	1	12/13/2025 19:12	WG2646586
Selenium	ND		0.00200	1	12/13/2025 19:12	WG2646586
Thallium	ND		0.00200	1	12/13/2025 19:12	WG2646586

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	703		13.3	1	11/25/2025 14:17	WG2647002

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	15.5		5.00	5	11/27/2025 20:28	WG2645785
Fluoride	ND		0.750	5	11/27/2025 20:28	WG2645785
Sulfate	329		25.0	5	11/27/2025 20:28	WG2645785

Sample Narrative:

L1921496-14 WG2645785: Dilution due to matrix impact on instrumentation at lower dilution

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.62	T8	1	11/26/2025 01:33	WG2647408

Sample Narrative:

L1921496-14 WG2647408: 7.62 at 18.6C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:39	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 12:03	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	8.54		0.200	1	11/29/2025 15:00	WG2646564
Boron,Dissolved	8.74		0.200	1	11/27/2025 00:59	WG2646529
Calcium	131		1.00	1	11/29/2025 15:00	WG2646564
Calcium,Dissolved	136		1.00	1	11/27/2025 00:59	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:22	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:35	WG2646542
Arsenic	0.00250		0.00200	1	12/13/2025 19:22	WG2646586
Arsenic,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542
Barium	0.185		0.00200	1	12/13/2025 19:22	WG2646586
Barium,Dissolved	0.149		0.00200	1	12/14/2025 16:35	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 19:22	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 19:22	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:35	WG2646542
Chromium	0.00260		0.00200	1	12/13/2025 19:22	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 19:22	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542
Lead	ND		0.00200	1	12/13/2025 19:22	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Lithium	0.0345		0.00200	1	12/13/2025 19:22	WG2646586
Lithium,Dissolved	0.0352		0.00200	1	12/14/2025 16:35	WG2646542
Molybdenum	0.189		0.00500	1	12/13/2025 19:22	WG2646586
Molybdenum,Dissolved	0.200		0.00500	1	12/14/2025 16:35	WG2646542
Selenium	ND		0.00200	1	12/13/2025 19:22	WG2646586
Selenium,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542
Thallium	ND		0.00200	1	12/13/2025 19:22	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:35	WG2646542

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	350		10.0	1	11/25/2025 14:17	WG2647002

Wet Chemistry by Method 300.0

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	11.8		1.00	1	11/27/2025 20:53	WG2645785
Fluoride	0.231		0.150	1	11/27/2025 20:53	WG2645785
Sulfate	35.4		5.00	1	11/27/2025 20:53	WG2645785

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.82	T8	1	11/26/2025 01:33	WG2647408

Sample Narrative:

L1921496-15 WG2647408: 7.82 at 18.8C

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	11/30/2025 14:42	WG2646383
Mercury,Dissolved	ND		0.000200	1	12/01/2025 12:06	WG2646389

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.237		0.200	1	11/29/2025 15:02	WG2646564
Boron,Dissolved	0.247		0.200	1	11/27/2025 01:01	WG2646529
Calcium	85.1		1.00	1	11/29/2025 15:02	WG2646564
Calcium,Dissolved	88.2		1.00	1	11/27/2025 01:01	WG2646529

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	12/13/2025 19:25	WG2646586
Antimony,Dissolved	ND		0.00400	1	12/14/2025 16:39	WG2646542
Arsenic	0.00236		0.00200	1	12/13/2025 19:25	WG2646586
Arsenic,Dissolved	0.00219		0.00200	1	12/14/2025 16:39	WG2646542
Barium	0.124		0.00200	1	12/13/2025 19:25	WG2646586
Barium,Dissolved	0.124		0.00200	1	12/14/2025 16:39	WG2646542
Beryllium	ND		0.00200	1	12/13/2025 19:25	WG2646586
Beryllium,Dissolved	ND		0.00200	1	12/14/2025 16:39	WG2646542
Cadmium	ND		0.00100	1	12/13/2025 19:25	WG2646586
Cadmium,Dissolved	ND		0.00100	1	12/14/2025 16:39	WG2646542
Chromium	ND		0.00200	1	12/13/2025 19:25	WG2646586
Chromium,Dissolved	ND		0.00200	1	12/14/2025 16:39	WG2646542
Cobalt	ND		0.00200	1	12/13/2025 19:25	WG2646586
Cobalt,Dissolved	ND		0.00200	1	12/14/2025 16:39	WG2646542
Lead	ND		0.00200	1	12/13/2025 19:25	WG2646586
Lead,Dissolved	ND		0.00200	1	12/14/2025 16:39	WG2646542
Lithium	0.0139		0.00200	1	12/13/2025 19:25	WG2646586
Lithium,Dissolved	0.0138		0.00200	1	12/14/2025 16:39	WG2646542
Molybdenum	0.0187		0.00500	1	12/13/2025 19:25	WG2646586

Metals (ICPMS) by Method 6020B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Molybdenum,Dissolved	0.0207		0.00500	1	12/14/2025 16:39	WG2646542
Selenium	0.0159		0.00200	1	12/13/2025 19:25	WG2646586
Selenium,Dissolved	0.0168		0.00200	1	12/14/2025 16:39	WG2646542
Thallium	ND		0.00200	1	12/13/2025 19:25	WG2646586
Thallium,Dissolved	ND		0.00200	1	12/14/2025 16:39	WG2646542

Method Blank (MB)

(MB) R4307746-1 11/25/25 11:09

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1920887-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1920887-02 11/25/25 11:09 • (DUP) R4307746-3 11/25/25 11:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	285	288	1	1.05		10

L1921496-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1921496-13 11/25/25 11:09 • (DUP) R4307746-4 11/25/25 11:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	ND	ND	1	0.000		10

Laboratory Control Sample (LCS)

(LCS) R4307746-2 11/25/25 11:09

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8570	97.4	90.0-110	

Method Blank (MB)

(MB) R4307748-1 11/25/25 14:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		10.0	10.0

L1921504-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1921504-01 11/25/25 14:17 • (DUP) R4307748-3 11/25/25 14:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	2160	2210	1	2.52		10

L1921551-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1921551-06 11/25/25 14:17 • (DUP) R4307748-4 11/25/25 14:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	255	257	1	0.781		10

Laboratory Control Sample (LCS)

(LCS) R4307748-2 11/25/25 14:17

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8500	96.6	90.0-110	

Method Blank (MB)

(MB) R4307308-1 11/27/25 12:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.547	1.00
Fluoride	U		0.0761	0.150
Sulfate	U		0.637	5.00

L1921371-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1921371-06 11/27/25 13:47 • (DUP) R4307308-3 11/27/25 14:10

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Fluoride	0.183	0.197	1	6.90		15

L1921371-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1921371-06 11/27/25 13:58 • (DUP) R4307308-4 11/27/25 14:21

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	381	379	10	0.643		15

L1921496-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1921496-01 11/27/25 14:59 • (DUP) R4307308-7 11/27/25 15:24

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8.41	7.97	1	5.38		15
Fluoride	0.289	0.280	1	3.38		15

L1921496-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1921496-01 11/27/25 15:12 • (DUP) R4307308-8 11/27/25 15:37

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	242	242	10	0.159		15

L1921371-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1921371-06 11/28/25 23:16 • (DUP) R4307557-1 11/28/25 23:26

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	6720	6680	100	0.485		15

Laboratory Control Sample (LCS)

(LCS) R4307308-2 11/27/25 12:27

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.0	100	80.0-120	
Fluoride	8.00	8.36	105	80.0-120	
Sulfate	40.0	40.7	102	80.0-120	

L1921371-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921371-06 11/27/25 13:47 • (MS) R4307308-5 11/27/25 14:34 • (MSD) R4307308-6 11/27/25 14:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	6780	5470	5480	0.000	0.000	1	80.0-120	E V	E V	0.134	15
Fluoride	8.00	0.183	4.46	4.54	53.4	54.4	1	80.0-120	J6	J6	1.77	15
Sulfate	40.0	384	347	349	0.000	0.000	1	80.0-120	E V	E V	0.309	15

L1921496-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1921496-01 11/27/25 14:59 • (MS) R4307308-9 11/27/25 15:50

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	40.0	8.41	46.5	95.1	1	80.0-120	
Fluoride	8.00	0.289	8.59	104	1	80.0-120	
Sulfate	40.0	255	244	0.000	1	80.0-120	E V

L1921294-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1921294-01 11/26/25 04:02 • (DUP) R4306483-2 11/26/25 04:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.73	6.74	1	0.148		1

Sample Narrative:

OS: 6.73 at 19.8C

DUP: 6.74 at 19.9C

L1921781-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1921781-02 11/26/25 04:02 • (DUP) R4306483-3 11/26/25 04:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.79	6.83	1	0.587		1

Sample Narrative:

OS: 6.79 at 18.8C

DUP: 6.83 at 18.9C

Laboratory Control Sample (LCS)

(LCS) R4306483-1 11/26/25 04:02

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.97	99.7	99.0-101	

Sample Narrative:

LCS: 9.97 at 18.8C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1920440-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1920440-03 11/26/25 01:33 • (DUP) R4306484-2 11/26/25 01:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.87	7.90	1	0.380		1

Sample Narrative:

OS: 7.87 at 18.8C

DUP: 7.9 at 19.2C

L1921789-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1921789-01 11/26/25 01:33 • (DUP) R4306484-3 11/26/25 01:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.23	7.24	1	0.138		1

Sample Narrative:

OS: 7.23 at 18.6C

DUP: 7.24 at 19C

Laboratory Control Sample (LCS)

(LCS) R4306484-1 11/26/25 01:33

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.98	99.8	99.0-101	

Sample Narrative:

LCS: 9.98 at 18.5C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

L1919938-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1919938-01 11/25/25 23:34 • (DUP) R4306487-2 11/25/25 23:34

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.54	9.53	1	0.105		1

Sample Narrative:

OS: 9.54 at 18.7C

DUP: 9.53 at 19C

L1922013-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1922013-01 11/25/25 23:34 • (DUP) R4306487-3 11/25/25 23:34

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.34	7.33	1	0.136		1

Sample Narrative:

OS: 7.34 at 18.7C

DUP: 7.33 at 18.8C

Laboratory Control Sample (LCS)

(LCS) R4306487-1 11/25/25 23:34

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 19.4C

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R4307653-1 11/29/25 17:41

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4307653-2 11/29/25 17:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00293	97.8	80.0-120	

L1920880-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1920880-01 11/29/25 17:47 • (MS) R4307653-4 11/29/25 17:52 • (MSD) R4307653-5 11/29/25 18:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00280	0.00285	93.4	95.0	1	75.0-125			1.64	20

Method Blank (MB)

(MB) R4307841-1 11/30/25 13:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4307841-2 11/30/25 13:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00302	101	80.0-120	

L1921593-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921593-01 11/30/25 13:37 • (MS) R4307841-4 11/30/25 13:43 • (MSD) R4307841-5 11/30/25 13:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.0300	ND	0.0288	0.0292	95.9	97.2	10	75.0-125			1.30	20

QUALITY CONTROL SUMMARY

L1921496-01,02,03,04,05,06,07,08,09,10,11,12,14,15

Method Blank (MB)

(MB) R4308141-1 12/01/25 11:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000700	0.000200

Laboratory Control Sample (LCS)

(LCS) R4308141-2 12/01/25 11:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00310	103	80.0-120	

L1921498-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921498-06 12/01/25 11:17 • (MS) R4308141-4 12/01/25 11:22 • (MSD) R4308141-5 12/01/25 11:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00286	0.00292	91.9	94.0	1	75.0-125			2.18	20

Method Blank (MB)

(MB) R4307085-1 11/27/25 00:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron,Dissolved	U		0.0233	0.200
Calcium,Dissolved	U		0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4307085-2 11/27/25 00:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron,Dissolved	1.00	0.942	94.2	80.0-120	
Calcium,Dissolved	10.0	10.1	101	80.0-120	

L1921725-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921725-01 11/27/25 00:11 • (MS) R4307085-4 11/27/25 00:16 • (MSD) R4307085-5 11/27/25 00:19

Analyte	Spike Amount mg/l	Original Result	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00		1.30	1.31	97.6	97.8	1	75.0-125			0.142	20
Calcium,Dissolved	10.0		50.6	51.0	87.9	91.3	1	75.0-125			0.664	20

Method Blank (MB)

(MB) R4307638-1 11/29/25 14:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0233	0.200
Calcium	0.221	J	0.153	1.00

Laboratory Control Sample (LCS)

(LCS) R4307638-2 11/29/25 14:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	0.986	98.6	80.0-120	
Calcium	10.0	10.1	101	80.0-120	

L1921496-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921496-04 11/29/25 14:18 • (MS) R4307638-4 11/29/25 14:23 • (MSD) R4307638-5 11/29/25 14:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	0.586	1.54	1.54	95.2	95.6	1	75.0-125			0.291	20
Calcium	10.0	158	164	164	58.6	56.7	1	75.0-125	V	V	0.116	20

Method Blank (MB)

(MB) R4313983-1 12/14/25 15:03

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000310	0.00400
Arsenic,Dissolved	U		0.000120	0.00200
Barium,Dissolved	U		0.000500	0.00200
Beryllium,Dissolved	U		0.000200	0.00200
Cadmium,Dissolved	U		0.000120	0.00100
Chromium,Dissolved	U		0.000900	0.00200
Cobalt,Dissolved	U		0.000100	0.00200
Lead,Dissolved	U		0.000500	0.00200
Lithium,Dissolved	U		0.000600	0.00200
Molybdenum,Dissolved	U		0.000500	0.00500
Selenium,Dissolved	U		0.000250	0.00200
Thallium,Dissolved	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4313983-2 12/14/25 15:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony,Dissolved	0.0500	0.0496	99.2	80.0-120	
Arsenic,Dissolved	0.0500	0.0509	102	80.0-120	
Barium,Dissolved	0.0500	0.0487	97.3	80.0-120	
Beryllium,Dissolved	0.0500	0.0499	99.9	80.0-120	
Cadmium,Dissolved	0.0500	0.0515	103	80.0-120	
Chromium,Dissolved	0.0500	0.0518	104	80.0-120	
Cobalt,Dissolved	0.0500	0.0524	105	80.0-120	
Lead,Dissolved	0.0500	0.0500	99.9	80.0-120	
Lithium,Dissolved	0.0500	0.0513	103	80.0-120	
Molybdenum,Dissolved	0.0500	0.0497	99.5	80.0-120	
Selenium,Dissolved	0.0500	0.0488	97.6	80.0-120	
Thallium,Dissolved	0.0500	0.0507	101	80.0-120	

L1921496-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921496-01 12/14/25 15:10 • (MS) R4313983-4 12/14/25 15:16 • (MSD) R4313983-5 12/14/25 15:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0511	0.0502	102	100	1	75.0-125			1.92	20
Arsenic,Dissolved	0.0500	ND	0.0521	0.0515	101	100	1	75.0-125			1.08	20
Barium,Dissolved	0.0500	0.118	0.168	0.162	100	88.0	1	75.0-125			3.70	20

L1921496-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921496-01 12/14/25 15:10 • (MS) R4313983-4 12/14/25 15:16 • (MSD) R4313983-5 12/14/25 15:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium,Dissolved	0.0500	ND	0.0484	0.0477	96.9	95.5	1	75.0-125			1.46	20
Cadmium,Dissolved	0.0500	ND	0.0514	0.0511	103	102	1	75.0-125			0.662	20
Chromium,Dissolved	0.0500	ND	0.0504	0.0511	101	102	1	75.0-125			1.54	20
Cobalt,Dissolved	0.0500	ND	0.0515	0.0511	103	102	1	75.0-125			0.845	20
Lead,Dissolved	0.0500	ND	0.0495	0.0485	98.9	96.9	1	75.0-125			2.07	20
Lithium,Dissolved	0.0500	0.0304	0.0784	0.0767	96.0	92.5	1	75.0-125			2.24	20
Molybdenum,Dissolved	0.0500	0.0584	0.108	0.107	99.7	97.7	1	75.0-125			0.931	20
Selenium,Dissolved	0.0500	ND	0.0486	0.0489	94.9	95.5	1	75.0-125			0.646	20
Thallium,Dissolved	0.0500	ND	0.0487	0.0489	97.4	97.7	1	75.0-125			0.373	20

Method Blank (MB)

(MB) R4313830-1 12/13/25 18:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.000310	0.00400
Arsenic	U		0.000120	0.00200
Barium	U		0.000500	0.00200
Beryllium	U		0.000200	0.00200
Cadmium	U		0.000120	0.00100
Chromium	U		0.000900	0.00200
Cobalt	U		0.000100	0.00200
Lead	U		0.000500	0.00200
Lithium	U		0.000600	0.00200
Molybdenum	U		0.000500	0.00500
Selenium	U		0.000250	0.00200
Thallium	U		0.000130	0.00200

Laboratory Control Sample (LCS)

(LCS) R4313830-2 12/13/25 18:09

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0453	90.5	80.0-120	
Arsenic	0.0500	0.0472	94.4	80.0-120	
Barium	0.0500	0.0481	96.2	80.0-120	
Beryllium	0.0500	0.0461	92.2	80.0-120	
Cadmium	0.0500	0.0489	97.9	80.0-120	
Chromium	0.0500	0.0479	95.8	80.0-120	
Cobalt	0.0500	0.0481	96.3	80.0-120	
Lead	0.0500	0.0471	94.2	80.0-120	
Lithium	0.0500	0.0452	90.4	80.0-120	
Molybdenum	0.0500	0.0459	91.8	80.0-120	
Selenium	0.0500	0.0488	97.7	80.0-120	
Thallium	0.0500	0.0470	93.9	80.0-120	

L1921602-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921602-02 12/13/25 18:12 • (MS) R4313830-4 12/13/25 18:19 • (MSD) R4313830-5 12/13/25 18:22

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0480	0.0475	96.0	95.0	1	75.0-125			1.02	20
Arsenic	0.0500	0.00327	0.0514	0.0511	96.3	95.6	1	75.0-125			0.642	20
Barium	0.0500	0.890	0.917	0.918	55.2	57.4	1	75.0-125	V	V	0.122	20

L1921602-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921602-02 12/13/25 18:12 • (MS) R4313830-4 12/13/25 18:19 • (MSD) R4313830-5 12/13/25 18:22

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Beryllium	0.0500	ND	0.0448	0.0450	89.6	90.1	1	75.0-125			0.539	20
Cadmium	0.0500	ND	0.0496	0.0490	99.2	97.9	1	75.0-125			1.31	20
Chromium	0.0500	ND	0.0478	0.0479	95.5	95.8	1	75.0-125			0.291	20
Cobalt	0.0500	0.00733	0.0553	0.0554	95.9	96.1	1	75.0-125			0.250	20
Lead	0.0500	ND	0.0486	0.0465	96.0	91.8	1	75.0-125			4.43	20
Lithium	0.0500	0.0771	0.118	0.119	81.6	84.2	1	75.0-125			1.08	20
Molybdenum	0.0500	ND	0.0520	0.0515	97.8	96.8	1	75.0-125			1.00	20
Selenium	0.0500	ND	0.0492	0.0486	97.1	95.9	1	75.0-125			1.24	20
Thallium	0.0500	ND	0.0477	0.0461	95.3	92.2	1	75.0-125			3.27	20

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
U (Radiochemistry)	Result + Error < MDA.
J (Radiochemistry)	Result < MDA; Result + Error > MDA.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 4Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT (CT) ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres					Remarks	Sample # (lab only)
APW-03-WG-2025	Grab	GW		11/20/2025	0940	5	X	X	X	X	X						01
APW-08-WG-2025		GW		11/20/2025	1020	5	X	X	X	X	X						02
APW-07-WG-2025		GW		11/20/2025	0845	5	X	X	X	X	X						03
APW-10S-WG-2025 1119		GW		11/19/2025	1600	5	X	X	X	X	X						04
APW-10D-WG-2025 1119		GW			1530	5	X	X	X	X	X						05
APW-06S-WG-2025 1119		GW			1205	5	X	X	X	X	X						06
APW-06D-WG-2025 1119		GW			1140	5	X	X	X	X	X						07
APW-05R-WG-2025 1119		GW			1310	5	X	X	X	X	X						08
APW-09-WG-2025		GW		11/20/2025	1210	5	X	X	X	X	X						09
APW-02-WG-2025 1119		GW		11/19/2025	1355	5	X	X	X	X	X						10

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

L1621046

SDG #

F103

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1185095**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	11/21/25	1222		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received: 74
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11.22.25 Time: 0900
				Hold: Condition: NCF / OK

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 4Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day X STD TAT

Quote #

Date Results Needed

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions 125mlHDPE-NoPres	Dissolved Metals 250mlHDPE-NoPres	TDS 1L-HDPE NoPres	Total Metals 250mlHDPE-HNO3	pH 125mlHDPE-NoPres					Remarks	Sample # (lab only)
APW-01R-WG-2025 1120	Grab	GW		11/20/2025	1120	5	X	X	X	X	X						11
APW-04-WG-2025 1119		GW		11/19/2025	1650	5	X	X	X	X	X						12
EB-01-WG-2025 1119		GW			1040	4	X	X	X	X	X						13
DUP-01-WG-2025 1119		GW		"	0001	5	X	X	X	X	X						14
DUP-02-WG-2025 1120		GW		11/20/2025	0002	5	X	X	X	X	X						15

Chain of Custody Page 2 of 2

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MT JULIET, TN
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Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1521404

Table #

Acctnum: **ERMSCMO**
Template: **T243415**
Prelogin: **P1185095**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Did not collect dissolved metals on EB-01

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
MDavid	11/21/25	1222	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			CRodeno

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 74

Date: 11.22.25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Multiple Parcel Form L#_____

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
4006155199479	TUA91	1.2	±0	1.2	Yes / No / Not Present
4746 8274 3733	TUA91	1.7	↓	1.7	Yes / No / Not Present
4006 8155 1994 80	TUA91	0.4	↓	0.4	Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

_____ _____

Name Date

APPENDIX E FOURTH QUARTER 2025 RADIOLOGICAL LABORATORY ANALYTICAL REPORT

ANALYTICAL REPORT

December 23, 2025

ERM - St. Louis, MO

Sample Delivery Group:	L1921508
Samples Received:	11/22/2025
Project Number:	0599247
Description:	Grand Tower Energy Center Groundwater 4Q25 Sampling
Report To:	Randy Homburg
	1968 Craig Road, Suite 100
	Saint Louis, MO 63146

Entire Report Reviewed By:

John Hawkins
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 mydata.pacelabs.com

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APW-03-WG-20251120 L1921508-01

Collected by: Marshall A | Collected date/time: 11/20/25 09:40 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-08-WG-20251120 L1921508-02

Collected by: Marshall A | Collected date/time: 11/20/25 10:20 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-07-WG-20251120 L1921508-03

Collected by: Marshall A | Collected date/time: 11/20/25 08:45 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:37	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:37	ZRG	Mt. Juliet, TN

APW-10S-WG-20251119 L1921508-04

Collected by: Marshall A | Collected date/time: 11/19/25 16:00 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-10D-WG-20251119 L1921508-05

Collected by: Marshall A | Collected date/time: 11/19/25 15:30 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-06S-WG-20251119 L1921508-06

Collected by: Marshall A | Collected date/time: 11/19/25 12:05 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-06D-WG-20251119 L1921508-07

Collected by: Marshall A | Collected date/time: 11/19/25 11:40 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650335	1	12/02/25 09:42	12/05/25 23:30	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-05R-WG-20251119 L1921508-08

Collected by: Marshall A | Collected date/time: 11/19/25 13:10 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650986	1	12/09/25 06:52	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-09-WG-20251120 L1921508-09

Collected by: Marshall A | Collected date/time: 11/20/25 12:10 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650986	1	12/09/25 06:52	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-02-WG-20251119 L1921508-10

Collected by: Marshall A | Collected date/time: 11/19/25 13:55 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650986	1	12/09/25 06:52	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-01R-WG-20251120 L1921508-11

Collected by: Marshall A | Collected date/time: 11/20/25 11:20 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650986	1	12/09/25 06:52	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

APW-04-WG-20251119 L1921508-12

Collected by: Marshall A | Collected date/time: 11/19/25 16:50 | Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2650986	1	12/09/25 06:52	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/18/25 23:00	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

EB-01-WG-20251119 L1921508-13

Collected by: Marshall A
Collected date/time: 11/19/25 10:40
Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2651786	1	12/10/25 07:57	12/22/25 09:38	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/22/25 09:38	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

DUP-01-WG-20251119 L1921508-14

Collected by: Marshall A
Collected date/time: 11/19/25 00:01
Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2651786	1	12/10/25 07:57	12/22/25 09:38	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/22/25 09:38	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

DUP-02-WG-20251120 L1921508-15

Collected by: Marshall A
Collected date/time: 11/20/25 00:02
Received date/time: 11/22/25 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904/9320	WG2651786	1	12/10/25 07:57	12/22/25 09:38	DDD	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG2651021	1	12/04/25 07:32	12/22/25 09:38	DDD	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG2651021	1	12/04/25 07:32	12/09/25 10:36	ZRG	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Project Manager

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.427	J	0.529	0.558	0.893	0.322	12/05/2025 23:30	WG2650335
(T) Barium	*116*	C1				*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*84.5*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.895	J	0.636	0.978	12/09/2025 10:36	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.469		0.353	0.451	0.399	0.128	12/09/2025 10:36	WG2651021
(T) Barium-133	*72.1*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.03		0.451	0.497	0.696	0.250	12/05/2025 23:30	WG2650335
(T) Barium	*114*	C1				*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*75.8*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.30		0.543	0.808	12/09/2025 10:36	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.268	J	0.303	0.375	0.411	0.134	12/09/2025 10:36	WG2651021
(T) Barium-133	*73.2*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.31		0.435	0.486	0.647	0.233	12/05/2025 23:30	WG2650335
(T) Barium	*116*	C1				*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*82.7*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.67		0.561	0.779	12/09/2025 10:37	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.362	J	0.355	0.479	0.433	0.112	12/09/2025 10:37	WG2651021
(T) Barium-133	*52.5*					*30.0-110*	*12/09/2025 10:37*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.60		0.479	0.535	0.699	0.251	12/05/2025 23:30	WG2650335
(T) Barium	*113*	C1				*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*74.9*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.48		0.594	0.730	12/09/2025 10:36	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.889		0.351	0.484	0.211	0.0548	12/09/2025 10:36	WG2651021
(T) Barium-133	*95.5*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.909		0.378	0.418	0.579	0.208	12/05/2025 23:30	WG2650335
(T) Barium	*117*	C1				*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*83.3*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.56		0.536	0.654	12/09/2025 10:36	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.651		0.380	0.530	0.304	0.0735	12/09/2025 10:36	WG2651021
(T) Barium-133	*73.0*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.916		0.386	0.428	0.593	0.213	12/05/2025 23:30	WG2650335
(T) Barium	*94.6*					*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*90.2*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.33		0.496	0.691	12/09/2025 10:36	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.418		0.311	0.409	0.354	0.117	12/09/2025 10:36	WG2651021
(T) Barium-133	*96.2*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	1.03		0.360	0.404	0.534	0.191	12/05/2025 23:30	WG2650335
(T) Barium	*111*	C1				*30.0-110*	*12/05/2025 23:30*	WG2650335
(T) Yttrium	*91.0*					*30.0-110*	*12/05/2025 23:30*	WG2650335

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.62		0.543	0.682	12/09/2025 10:36	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.585		0.407	0.524	0.425	0.129	12/09/2025 10:36	WG2651021
(T) Barium-133	*73.8*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.287	U	0.719	0.743	1.24	0.411	12/18/2025 23:00	WG2650986
(T) Barium	*82.5*					*30.0-110*	*12/18/2025 23:00*	WG2650986
(T) Yttrium	*77.8*					*30.0-110*	*12/18/2025 23:00*	WG2650986

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.962	J	0.812	1.28	12/18/2025 23:00	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.674		0.378	0.486	0.318	0.0870	12/09/2025 10:36	WG2651021
(T) Barium-133	*87.8*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	-0.160	U	0.463	0.480	0.839	0.277	12/18/2025 23:00	WG2650986
(T) Barium	*84.3*					*30.0-110*	*12/18/2025 23:00*	WG2650986
(T) Yttrium	*74.3*					*30.0-110*	*12/18/2025 23:00*	WG2650986

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.237	U	0.522	0.894	12/18/2025 23:00	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.237	J	0.241	0.293	0.308	0.0906	12/09/2025 10:36	WG2651021
(T) Barium-133	*94.1*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.0608	U	0.602	0.613	1.06	0.350	12/18/2025 23:00	WG2650986
(T) Barium	*87.0*					*30.0-110*	*12/18/2025 23:00*	WG2650986
(T) Yttrium	*83.1*					*30.0-110*	*12/18/2025 23:00*	WG2650986

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.587	J	0.721	1.15	12/18/2025 23:00	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.526		0.397	0.503	0.448	0.144	12/09/2025 10:36	WG2651021
(T) Barium-133	*74.5*					*30.0-110*	*12/09/2025 10:36*	WG2651021

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.572	J	0.456	0.490	0.749	0.247	12/18/2025 23:00	WG2650986
(T) Barium	*83.7*					*30.0-110*	*12/18/2025 23:00*	WG2650986
(T) Yttrium	*83.9*					*30.0-110*	*12/18/2025 23:00*	WG2650986

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.794	J	0.528	0.834	12/18/2025 23:00	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.222	J	0.267	0.340	0.367	0.100	12/09/2025 10:36	WG2651021
(T) Barium-133	*75.4*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.683	J	0.431	0.468	0.693	0.228	12/18/2025 23:00	WG2650986
(T) Barium	*83.7*					*30.0-110*	*12/18/2025 23:00*	WG2650986
(T) Yttrium	*93.2*					*30.0-110*	*12/18/2025 23:00*	WG2650986

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.966		0.487	0.737	12/18/2025 23:00	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.282		0.227	0.300	0.252	0.0717	12/09/2025 10:36	WG2651021
(T) Barium-133	*93.2*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	2.00		0.639	0.703	0.968	0.309	12/22/2025 09:38	WG2651786
(T) Barium	*87.1*					*30.0-110*	*12/22/2025 09:38*	WG2651786
(T) Yttrium	*89.9*					*30.0-110*	*12/22/2025 09:38*	WG2651786

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	2.06		0.667	1.03	12/22/2025 09:38	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.0633	U	0.190	0.235	0.342	0.103	12/09/2025 10:36	WG2651021
(T) Barium-133	*81.7*					*30.0-110*	*12/09/2025 10:36*	WG2651021

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.165	J5 U	0.659	0.677	1.14	0.365	12/22/2025 09:38	WG2651786
(T) Barium	*89.4*					*30.0-110*	*12/22/2025 09:38*	WG2651786
(T) Yttrium	*101*					*30.0-110*	*12/22/2025 09:38*	WG2651786

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.360	U	0.727	1.23	12/22/2025 09:38	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	2 sigma CE + / -	TPU + / -	MDA pCi/l	Lc pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.195	J	0.308	0.380	0.466	0.152	12/09/2025 10:36	WG2651021
(T) Barium-133	*80.2*					*30.0-110*	*12/09/2025 10:36*	WG2651021

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-228	0.352	U	0.507	0.534	0.863	0.272	12/22/2025 09:38	WG2651786
(T) Barium	*77.8*					*30.0-110*	*12/22/2025 09:38*	WG2651786
(T) Yttrium	*87.0*					*30.0-110*	*12/22/2025 09:38*	WG2651786

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.640	J	0.579	0.929	12/22/2025 09:38	WG2651021

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	2 sigma CE	TPU	MDA	Lc	Analysis Date	Batch
	pCi/l		+ / -	+ / -	pCi/l	pCi/l	date / time	
RADIUM-226	0.288	J	0.279	0.353	0.345	0.0984	12/09/2025 10:36	WG2651021
(T) Barium-133	*83.6*					*30.0-110*	*12/09/2025 10:36*	WG2651021

QUALITY CONTROL SUMMARY

L1921508-01,02,03,04,05,06,07

Method Blank (MB)

(MB) R4311428-1 12/05/25 18:10

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.408	J	0.338	0.556	0.168
(T) Barium	*107*		*107*		
(T) Yttrium	*78.9*		*78.9*		

L1921508-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1921508-01 12/05/25 23:30 • (DUP) R4311428-5 12/05/25 18:10

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.427	0.529	0.893	0.322	1.20	0.606	0.952	0.288	95.0	0.959		20	3
(T) Barium	*116*				*94.6*	*94.6*							
(T) Yttrium	*84.5*				*93.8*	*93.8*							

Laboratory Control Sample (LCS)

(LCS) R4311428-2 12/05/25 18:10

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.45	109	80.0-120	
(T) Barium			*95.0*		
(T) Yttrium			*82.2*		

L1921107-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921107-01 12/05/25 18:10 • (MS) R4311428-3 12/05/25 18:10 • (MSD) R4311428-4 12/05/25 18:10

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	7.85	17.6	17.1	97.0	92.0	1	70.0-130			2.89		20
(T) Barium		*91.7*			*103*	*98.1*							
(T) Yttrium		*92.1*			*81.3*	*85.7*							

QUALITY CONTROL SUMMARY

L1921508-08,09,10,11,12

Method Blank (MB)

(MB) R4317625-1 12/18/25 23:00

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	0.0146	U	0.351	0.615	0.205
(T) Barium	*91.9*		*91.9*		
(T) Yttrium	*83.3*		*83.3*		

L1920564-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1920564-07 12/18/25 23:00 • (DUP) R4317625-5 12/18/25 23:00

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.17	0.713	1.15	0.379	1.83	0.777	1.19	0.395	43.8	0.624		20	3
(T) Barium	*76.9*				*85.6*	*85.6*							
(T) Yttrium	*88.9*				*75.9*	*75.9*							

Laboratory Control Sample (LCS)

(LCS) R4317625-2 12/18/25 23:00

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.67	93.4	80.0-120	
(T) Barium			*101*		
(T) Yttrium			*83.6*		

L1920564-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1920564-05 12/18/25 23:00 • (MS) R4317625-3 12/18/25 23:00 • (MSD) R4317625-4 12/18/25 23:00

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.127	11.5	12.3	114	122	1	70.0-130			6.72		20
(T) Barium		*91.4*			*95.8*	*90.4*							
(T) Yttrium		*78.8*			*80.1*	*79.9*							

Method Blank (MB)

(MB) R4317649-1 12/22/25 09:38

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-228	-0.165	U	0.470	0.836	0.268
(T) Barium	*78.4*		*78.4*		
(T) Yttrium	*80.8*		*80.8*		

L1921891-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1921891-02 12/22/25 09:38 • (DUP) R4317649-5 12/22/25 09:38

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	1.06	0.708	1.15	0.339	-0.0275	0.733	1.28	0.411	200	1.06	U	20	3
(T) Barium	*92.8*				*91.0*	*91.0*							
(T) Yttrium	*93.9*				*86.3*	*86.3*							

Laboratory Control Sample (LCS)

(LCS) R4317649-2 12/22/25 09:38

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.59	91.9	80.0-120	
(T) Barium			*85.4*		
(T) Yttrium			*89.2*		

L1921508-14 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921508-14 12/22/25 09:38 • (MS) R4317649-3 12/22/25 09:38 • (MSD) R4317649-4 12/22/25 09:38

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	0.165	12.7	11.6	125	114	1	70.0-130			15.6		20
(T) Barium		*89.4*			*92.9*	*87.1*							
(T) Yttrium		*101*			*90.2*	*91.8*							

Method Blank (MB)

(MB) R4312085-1 12/09/25 10:36

Analyte	MB Result pCi/l	MB Qualifier	MB 2 sigma CE + / -	MB MDA pCi/l	MB Lc pCi/l
Radium-226	-0.0246	U	0.0481	0.113	0.0384
(T) Barium-133	*75.5*		*75.5*		

L1921508-15 Original Sample (OS) • Duplicate (DUP)

(OS) L1921508-15 12/09/25 10:36 • (DUP) R4312085-5 12/09/25 10:36

Analyte	Original Result pCi/l	Original 2 sigma CE + / -	Original MDA pCi/l	Original Lc pCi/l	DUP Result pCi/l	DUP 2 sigma CE + / -	DUP MDA pCi/l	DUP Lc pCi/l	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.288	0.279	0.345	0.0984	0.0331	0.112	0.219	0.0598	159	0.848	U	20	3
(T) Barium-133	*83.6*				*91.0*	*91.0*							

Laboratory Control Sample (LCS)

(LCS) R4312085-2 12/09/25 10:36

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.00	5.38	108	80.0-120	
(T) Barium-133			*70.9*		

L1921508-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1921508-01 12/09/25 10:36 • (MS) R4312085-3 12/09/25 10:36 • (MSD) R4312085-4 12/09/25 10:36

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.0	0.469	24.5	25.1	120	123	1	75.0-125			2.46		20
(T) Barium-133		*72.1*			*56.2*	*59.9*							

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
TPU	Total Propagated Uncertainty reported at 2 sigma (counting error plus all measurable variables).
Lc	Decision Level or Critical Level. DOE required Detection limit at a 68% confidence level.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
U (Radiochemistry)	Result + Error < MDA.
J (Radiochemistry)	Result < MDA; Result + Error > MDA.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
C1	Tracer recovery limits have been exceeded; values are outside upper control limits.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 4Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately
Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1021508

F104

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1185094**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add HNO3	Remarks	Sample # (lab only)
APW-03-WG-2025 1120	Grab	NPW		11/20/2025	0940	3	X	X		01
APW-08-WG-2025 1120		NPW		11/20/2025	1020	3	X	X		02
APW-07-WG-2025 1120		NPW		11/20/2025	0845	3	X	X		03
APW-10S-WG-2025 1119		NPW		11/19/2025	1600	3	X	X		04
APW-10D-WG-2025 1119		NPW			1530	3	X	X		05
APW-06S-WG-2025 1119		NPW			1205	3	X	X		06
APW-06D-WG-2025 1119		NPW			1140	3	X	X		07
APW-05R-WG-2025 1119		NPW			1310	3	X	X		08
APW-09-WG-2025 1120		NPW		11/20/2025	1210	3	X	X		09
APW-02-WG-2025 1119		NPW		11/19/2025	~~1355~~ ~~1357~~ MD	3	X	X		10

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
[signature]	11/24/25	1222	[signature]
Relinquished by : ~~(Signature)~~ [signature]	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) CROberts

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 45

Date: 11-22-25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Company Name/Address:
ERM - St. Louis, MO

1968 Craig Road, Suite 100
Saint Louis, MO 63146

Billing Information:
Accounts Payable Dept.
1701 Golf Road, Suite 1-1000
Rolling Meadows, IL 60008-4242

Pres Chk

Report to:
Randy Homburg 314-682-3980

Email To:
Randy.Homburg@erm.com;Tim.Wilson@erm.co

Project Description:
Grand Tower Energy Center Groundwater 4Q25

City/State Collected: Grand Tower, IL

Please Circle: PT MT CT ET

Regulatory Program(DOD,RCRA,DW,etc):

Client Project #
0599247

Lab Project #
ERMSCMO-0599247

Collected by (print):
Marshall Arendell

Site/Facility ID #

P.O. #

Collected by (signature):
Immediately
Packed on Ice N ____ Y X

Rush? (Lab MUST Be Notified)
____ Same Day ____ Five Day
____ Next Day ____ 5 Day (Rad Only)
____ Two Day ____ 10 Day (Rad Only)
____ Three Day X STD TAT

Quote #

Date Results Needed

No. of Cntrs

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	RA-226 1L-HDPE-Add HNO3	RA-228 1L-HDPE-Add-HNO3	Remarks	Sample # (lab only)
APW-01R-WG-2025 1120	Grab	NPW		11/20/2025	1120	3	X	X		11
APW-04-WG-2025 1119		NPW		11/19/2025	1650	3	X	X		12
EB-01-WG-2025 1119		NPW			1040	3	X	X		13
DUP-01-WG-2025 1119		NPW			0001	3	X	X		14
DUP-02-WG-2025 1120		NPW		11/20/2025	0002	3	X	X		15

Chain of Custody Page 2 of 2

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1921508

Table #

Acctnum: **ERMSCMO**
Template: **T243472**
Prelogin: **P1185094**
PM: **206 - Jeff Carr**
PB:

Shipped Via: **FedEX Ground**

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
MTDavis	11/21/25	1222	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			CRobert

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: °C Bottles Received: 45

Date: 11.22.25 Time: 0900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

L1421505

Multiple Parcel Form L#_____

Parcel Tracking Number	Infrared Thermometer ID	Temperature Reading (°C)	Correction Factor (°C)	Corrected Temperature (°C)	Custody Seal Intact
4718 2716 7334	TVA9	0.2	±0	0.2	Yes / No / Not Present
411 B 2716 7255	1	3.0	1	3.0	Yes / No / Not Present
4796 8279 3722	1	2.1	1	2.1	Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present
					Yes / No / Not Present

CRodero — Name

11.22.25 — Date

APPENDIX F

Statistical Evaluation

Table F1 - Descriptive Statistics										
Analyte	**Well Type**	**Well ID**	**Samples**	**Detects**	**% Detects**	**Minimum**	**Maximum**	**Median**	**Mean**	**Standard Deviation**
Antimony (mg/L)	Downgradient	APW-02	23	2	8	0.0006	0.04	0.001	0.0036	0.008
		APW-03	23	0	0	0.001	0.004	0.001	0.002	0.0015
		APW-05	18	1	5	0.001	0.004	0.001	0.0015	0.0011
		APW-05R	5	0	0	0.004	0.004	0.004	0.004	0
		APW-06D	22	0	0	0.001	0.004	0.001	0.0021	0.0015
		APW-06S	23	0	0	0.001	0.004	0.001	0.002	0.0015
		APW-07	22	0	0	0.001	0.004	0.001	0.002	0.0014
		APW-08	23	0	0	0.001	0.004	0.001	0.002	0.0015
		APW-10D	23	0	0	0.001	0.004	0.001	0.002	0.0015
		APW-10S	23	0	0	0.001	0.004	0.001	0.002	0.0015
	Upgradient	APW-01R	23	0	0	0.001	0.004	0.001	0.002	0.0015
		APW-04	23	0	0	0.001	0.004	0.001	0.002	0.0015
		APW-09	23	1	4	0.001	0.004	0.001	0.002	0.0015
		POOLED	69	1	1	0.001	0.004	0.001	0.002	0.0014
Arsenic (mg/L)	Downgradient	APW-02	23	22	95	0.009	0.0284	0.0175	0.0181	0.0055
		APW-03	23	16	69	0.0017	0.0059	0.002	0.0025	0.001
		APW-05	18	18	100	0.0015	0.0048	0.0023	0.0025	0.0009
		APW-05R	5	5	100	0.002	0.0024	0.0022	0.0022	0.0001
		APW-06D	22	22	100	0.0068	0.0135	0.0104	0.0101	0.0015
		APW-06S	23	14	60	0.0009	0.002	0.0016	0.0016	0.0004
		APW-07	22	9	40	0.001	0.0023	0.0015	0.0016	0.0005
		APW-08	23	9	39	0.001	0.0025	0.0018	0.0016	0.0005
		APW-10D	23	9	39	0.001	0.0057	0.0017	0.0019	0.0012
		APW-10S	23	23	100	0.174	0.276	0.191	0.1956	0.0206
	Upgradient	APW-01R	23	13	56	0.001	0.0033	0.0019	0.0017	0.0006
		APW-04	23	17	73	0.0014	0.0029	0.002	0.0019	0.0004
		APW-09	23	23	100	0.0018	0.0031	0.0022	0.0023	0.0003
		POOLED	69	53	76	0.001	0.0033	0.002	0.002	0.0005
Barium (mg/L)	Downgradient	APW-02	23	23	100	0.145	0.739	0.254	0.3094	0.1733
		APW-03	23	23	100	0.0806	0.19	0.119	0.1274	0.0291
		APW-05	18	18	100	0.102	0.233	0.19	0.1843	0.0357
		APW-05R	5	5	100	0.139	0.194	0.158	0.1638	0.0231
		APW-06D	22	22	100	0.109	0.173	0.142	0.1398	0.019
		APW-06S	23	23	100	0.19	0.305	0.224	0.226	0.026
		APW-07	22	22	100	0.303	0.522	0.3705	0.3721	0.0528
		APW-08	23	23	100	0.167	0.261	0.207	0.209	0.0253
		APW-10D	23	23	100	0.22	0.485	0.343	0.3484	0.0574
		APW-10S	23	23	100	0.474	0.804	0.591	0.5971	0.0636
	Upgradient	APW-01R	23	23	100	0.148	0.259	0.176	0.1795	0.0234
		APW-04	23	23	100	0.12	0.165	0.139	0.139	0.0104
		APW-09	23	23	100	0.108	0.227	0.125	0.1334	0.0268
		POOLED	69	69	100	0.108	0.259	0.141	0.1506	0.0295
Beryllium (mg/L)	Downgradient	APW-02	23	1	4	0.001	0.02	0.001	0.0022	0.0039
		APW-03	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-05	18	0	0	0.001	0.002	0.001	0.0012	0.0004
		APW-05R	5	0	0	0.002	0.002	0.002	0.002	0
		APW-06D	22	0	0	0.001	0.002	0.001	0.0014	0.0005
		APW-06S	23	0	0	0.001	0.002	0.001	0.0013	0.0005

Table F1 - Descriptive Statistics										
Analyte	**Well Type**	**Well ID**	**Samples**	**Detects**	**% Detects**	**Minimum**	**Maximum**	**Median**	**Mean**	**Standard Deviation**
		APW-07	22	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-08	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-10D	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-10S	23	0	0	0.001	0.002	0.001	0.0013	0.0005
	Upgradient	APW-01R	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-04	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-09	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		POOLED	69	0	0	0.001	0.002	0.001	0.0013	0.0005
Boron (mg/L)	Downgradient	APW-02	22	22	100	7.75	10.3	8.955	8.8527	0.7155
		APW-03	22	22	100	1.84	4.94	4.32	4.1845	0.7685
		APW-05	17	17	100	2.18	10.3	8.89	8.3882	1.873
		APW-05R	5	5	100	4.18	8.5	6.19	6.546	1.8698
		APW-06D	21	21	100	2.57	5.51	3.81	3.8181	0.6283
		APW-06S	22	22	100	3.66	9.19	5.815	5.78	1.2739
		APW-07	21	20	95	0.168	0.526	0.237	0.2618	0.0778
		APW-08	22	15	68	0.095	0.2	0.143	0.1511	0.0378
		APW-10D	22	15	68	0.0522	0.2	0.0922	0.1202	0.0574
		APW-10S	22	22	100	0.525	0.683	0.57	0.5746	0.0349
	Upgradient	APW-01R	22	19	86	0.176	0.357	0.2295	0.238	0.0449
		APW-04	22	22	100	0.559	2.37	1.16	1.2926	0.6257
		APW-09	22	22	100	0.191	1.61	0.472	0.5053	0.3224
		POOLED	66	63	95	0.176	2.37	0.472	0.6786	0.6035
Cadmium (mg/L)	Downgradient	APW-02	23	2	8	0.0006	0.01	0.001	0.0014	0.0019
		APW-03	23	1	4	0.0002	0.001	0.001	0.001	0.0002
		APW-05	18	0	0	0.001	0.001	0.001	0.001	0
		APW-05R	5	0	0	0.001	0.001	0.001	0.001	0
		APW-06D	22	0	0	0.001	0.001	0.001	0.001	0
		APW-06S	23	0	0	0.001	0.001	0.001	0.001	0
		APW-07	22	0	0	0.001	0.001	0.001	0.001	0
		APW-08	23	1	4	0.0002	0.001	0.001	0.001	0.0002
		APW-10D	23	1	4	0.001	0.0011	0.001	0.001	0
		APW-10S	23	0	0	0.001	0.001	0.001	0.001	0
	Upgradient	APW-01R	23	0	0	0.001	0.001	0.001	0.001	0
		APW-04	23	0	0	0.001	0.001	0.001	0.001	0
		APW-09	23	0	0	0.001	0.001	0.001	0.001	0
		POOLED	69	0	0	0.001	0.001	0.001	0.001	0
Calcium (mg/L)	Downgradient	APW-02	23	23	100	132	198	156	156.8696	18.1942
		APW-03	23	23	100	74.9	153	116	113.0609	19.624
		APW-05	18	18	100	74	142	123.5	120.6167	16.5841
		APW-05R	5	5	100	102	141	111	118	17.5071
		APW-06D	22	22	100	96.7	128	110	111.5455	8.944
		APW-06S	23	23	100	87.5	139	101	106.6087	14.6082
		APW-07	22	22	100	161	238	197.5	197.9091	17.345
		APW-08	23	23	100	79.4	107	97.8	95.0391	8.6042
		APW-10D	23	23	100	98.5	611	125	157.8478	111.9618
		APW-10S	23	23	100	129	171	153	151.8261	12.2424
	Upgradient	APW-01R	23	23	100	59.2	98	88.2	84.8261	10.3051
		APW-04	23	23	100	87.9	124	102	102.7565	8.1902
		APW-09	23	23	100	69.5	110	85.8	85.687	7.5855

Table F1 - Descriptive Statistics										
Analyte	**Well Type**	**Well ID**	**Samples**	**Detects**	**% Detects**	**Minimum**	**Maximum**	**Median**	**Mean**	**Standard Deviation**
		POOLED	69	69	100	59.2	124	90	91.0899	11.9941
Chloride (mg/L)	Downgradient	APW-02	23	22	95	5.38	13	9	9.6191	2.0538
		APW-03	23	23	100	6.03	23	16	15.7183	5.5145
		APW-05	18	18	100	14	28.1	16	16.7667	3.1779
		APW-05R	5	5	100	15	24.1	18.9	18.86	3.5976
		APW-06D	22	22	100	14	35.3	17	17.9545	4.4648
		APW-06S	23	23	100	19.4	36.1	24	24.6391	3.9175
		APW-07	22	22	100	8.97	16	11.75	12.2445	2.4342
		APW-08	23	23	100	7.46	13	10	10.0322	1.3234
		APW-10D	23	23	100	10	25.5	15.4	15.6391	3.8692
		APW-10S	23	23	100	6	21	12	11.8217	4.7398
	Upgradient	APW-01R	23	17	73	1.1	11	6.15	5.9404	2.761
		APW-04	23	23	100	9	12	11	10.6657	0.8361
		APW-09	23	23	100	9.87	768	12.8	45.1596	157.5767
		POOLED	69	63	91	1.1	768	11	20.5886	91.3573
Chromium (mg/L)	Downgradient	APW-02	23	20	86	0.002	0.127	0.0191	0.0308	0.035
		APW-03	23	11	47	0.001	0.0241	0.002	0.0042	0.0051
		APW-05	18	7	38	0.001	0.0137	0.0018	0.0029	0.0032
		APW-05R	5	0	0	0.002	0.002	0.002	0.002	0
		APW-06D	22	9	40	0.001	0.0945	0.002	0.0098	0.0242
		APW-06S	23	11	47	0.001	0.0326	0.002	0.0043	0.007
		APW-07	22	9	40	0.001	0.0329	0.002	0.0037	0.0067
		APW-08	23	14	60	0.001	0.0082	0.002	0.0029	0.002
		APW-10D	23	10	43	0.001	0.0148	0.002	0.0029	0.003
		APW-10S	23	14	60	0.001	0.015	0.002	0.0031	0.0033
	Upgradient	APW-01R	23	18	78	0.001	0.0085	0.0023	0.0027	0.0016
		APW-04	23	14	60	0.001	0.0251	0.0023	0.0036	0.0049
		APW-09	23	9	39	0.001	0.0148	0.0016	0.0023	0.0028
		POOLED	69	41	59	0.001	0.0251	0.002	0.0028	0.0034
Cobalt (mg/L)	Downgradient	APW-02	23	16	69	0.001	0.02	0.0027	0.0045	0.0046
		APW-03	23	5	21	0.0005	0.0021	0.0014	0.0014	0.0005
		APW-05	18	1	5	0.001	0.002	0.001	0.0012	0.0004
		APW-05R	5	0	0	0.002	0.002	0.002	0.002	0
		APW-06D	22	8	36	0.001	0.0054	0.0016	0.0018	0.0011
		APW-06S	23	1	4	0.0002	0.002	0.001	0.0013	0.0005
		APW-07	22	2	9	0.001	0.002	0.001	0.0013	0.0005
		APW-08	23	11	47	0.001	0.0021	0.0017	0.0016	0.0004
		APW-10D	23	22	95	0.0013	0.007	0.0028	0.003	0.0011
		APW-10S	23	5	21	0.0006	0.0021	0.0013	0.0015	0.0005
	Upgradient	APW-01R	23	8	34	0.001	0.0041	0.0017	0.0018	0.0008
		APW-04	23	4	17	0.0006	0.0025	0.001	0.0014	0.0005
		APW-09	23	3	13	0.001	0.0031	0.001	0.0015	0.0006
		POOLED	69	15	21	0.0006	0.0041	0.0013	0.0015	0.0007
Dissolved Solids, Total (mg/L)	Downgradient	APW-02	23	23	100	775	934	858	859.6522	47.0248
		APW-03	23	23	100	450	724	541	550.2609	66.6253
		APW-05	18	18	100	354	842	745	720.6667	118.1858
		APW-05R	5	5	100	485	700	560	589.8	104.3082
		APW-06D	22	22	100	482	735	566.5	586.8182	61.8713

Table F1 - Descriptive Statistics										
Analyte	**Well Type**	**Well ID**	**Samples**	**Detects**	**% Detects**	**Minimum**	**Maximum**	**Median**	**Mean**	**Standard Deviation**
		APW-06S	23	23	100	481	692	599	598.1739	56.0938
		APW-07	22	22	100	624	824	738.5	738.9545	49.5787
		APW-08	23	23	100	370	466	418	412.4348	29.933
		APW-10D	23	23	100	351	512	454	455.0435	28.2706
		APW-10S	23	23	100	678	900	750	746.1739	45.9126
	Upgradient	APW-01R	23	23	100	300	474	384	381.6087	43.2558
		APW-04	22	22	100	404	528	439	449.5909	32.4825
		APW-09	23	23	100	278	3380	372	498.3913	628.7361
		POOLED	68	68	100	278	3380	390.5	443.1029	364.8416
Fluoride (mg/L)	Downgradient	APW-02	23	21	91	0.197	1.5	0.24	0.3167	0.2795
		APW-03	23	21	91	0.15	0.75	0.27	0.2867	0.1111
		APW-05	18	17	94	0.15	0.38	0.33	0.3253	0.0489
		APW-05R	5	4	80	0.199	0.75	0.289	0.3728	0.2196
		APW-06D	22	20	90	0.15	0.249	0.211	0.2097	0.0255
		APW-06S	23	21	91	0.15	0.41	0.26	0.2666	0.0538
		APW-07	22	20	90	0.15	0.35	0.185	0.1909	0.039
		APW-08	23	22	95	0.15	0.336	0.28	0.2695	0.0352
		APW-10D	23	14	60	0.1	0.15	0.12	0.1243	0.0213
		APW-10S	23	20	86	0.15	0.265	0.17	0.1778	0.0328
	Upgradient	APW-01R	23	21	91	0.12	0.326	0.16	0.1712	0.0397
		APW-04	23	21	91	0.15	0.201	0.17	0.1712	0.0145
		APW-09	23	22	95	0.15	0.339	0.2	0.2052	0.035
		POOLED	69	64	92	0.12	0.339	0.18	0.1825	0.0351
Iron (mg/L)	Downgradient	APW-02	2	2	100	7.63	11.7	9.665	9.665	2.8779
		APW-03	2	2	100	0.367	1.66	1.0135	1.0135	0.9143
		APW-05	2	2	100	2.77	5.89	4.33	4.33	2.2062
		APW-06D	1	1	100	3.65	3.65	3.65	3.65	
		APW-06S	2	2	100	9.18	9.35	9.265	9.265	0.1202
		APW-07	2	2	100	17.3	18.9	18.1	18.1	1.1314
		APW-08	2	2	100	0.44	3.14	1.79	1.79	1.9092
		APW-10D	2	2	100	0.175	0.758	0.4665	0.4665	0.4122
		APW-10S	2	2	100	17.2	19.6	18.4	18.4	1.6971
	Upgradient	APW-01R	2	2	100	0.405	1.42	0.9125	0.9125	0.7177
		APW-04	2	2	100	0.563	0.709	0.636	0.636	0.1032
		APW-09	2	2	100	0.179	0.496	0.3375	0.3375	0.2242
		POOLED	6	6	100	0.179	1.42	0.5295	0.6287	0.4259
Lead (mg/L)	Downgradient	APW-02	23	21	91	0.002	0.0323	0.0057	0.009	0.0084
		APW-03	23	6	26	0.001	0.0044	0.002	0.0018	0.001
		APW-05	18	3	16	0.001	0.0026	0.001	0.0013	0.0005
		APW-05R	5	1	20	0.002	0.0024	0.002	0.0021	0.0002
		APW-06D	22	2	9	0.001	0.002	0.001	0.0014	0.0005
		APW-06S	23	1	4	0.001	0.0028	0.001	0.0014	0.0006
		APW-07	22	1	4	0.001	0.0074	0.001	0.0016	0.0014
		APW-08	23	5	21	0.001	0.0028	0.0015	0.0016	0.0006
		APW-10D	23	2	8	0.001	0.002	0.001	0.0014	0.0005
		APW-10S	23	5	21	0.0007	0.0043	0.0014	0.0016	0.0008
	Upgradient	APW-01R	23	5	21	0.001	0.0062	0.0014	0.0017	0.0011
		APW-04	23	1	4	0.001	0.002	0.001	0.0014	0.0005
		APW-09	23	1	4	0.001	0.0039	0.001	0.0015	0.0007

Table F1 - Descriptive Statistics										
Analyte	Well Type	Well ID	Samples	Detects	% Detects	Minimum	Maximum	Median	Mean	Standard Deviation
		POOLED	69	7	10	0.001	0.0062	0.001	0.0015	0.0008
Lithium (mg/L)	Downgradient	APW-02	23	23	100	0.0386	0.0647	0.0459	0.048	0.0068
		APW-03	23	23	100	0.0239	0.0361	0.0307	0.03	0.0035
		APW-05	18	18	100	0.0179	0.0523	0.0398	0.039	0.0066
		APW-05R	5	5	100	0.0248	0.0373	0.0314	0.0309	0.0054
		APW-06D	22	22	100	0.0148	0.0199	0.0168	0.017	0.0012
		APW-06S	23	23	100	0.0295	0.0564	0.0408	0.0398	0.0055
		APW-07	22	22	100	0.0141	0.0231	0.017	0.0169	0.0021
		APW-08	23	23	100	0.0142	0.0223	0.0181	0.0182	0.0024
		APW-10D	23	23	100	0.0113	0.018	0.0147	0.0147	0.0012
		APW-10S	23	23	100	0.0263	0.0401	0.0297	0.0303	0.003
	Upgradient	APW-01R	23	23	100	0.0124	0.0189	0.0155	0.0158	0.0017
		APW-04	23	23	100	0.0269	0.0424	0.0314	0.0338	0.0057
		APW-09	23	23	100	0.0131	0.0246	0.0157	0.016	0.0024
		POOLED	69	69	100	0.0124	0.0424	0.0173	0.0219	0.0092
Manganese (mg/L)	Downgradient	APW-02	2	2	100	0.669	0.752	0.7105	0.7105	0.0587
		APW-03	2	2	100	0.321	0.435	0.378	0.378	0.0806
		APW-05	2	2	100	0.554	0.9	0.727	0.727	0.2447
		APW-06D	1	1	100	0.622	0.622	0.622	0.622	
		APW-06S	2	2	100	0.512	0.53	0.521	0.521	0.0127
		APW-07	2	2	100	1.11	1.19	1.15	1.15	0.0566
		APW-08	2	2	100	0.0435	0.202	0.1228	0.1228	0.1121
		APW-10D	2	2	100	0.88	1.16	1.02	1.02	0.198
		APW-10S	2	2	100	0.174	0.243	0.2085	0.2085	0.0488
	Upgradient	APW-01R	2	2	100	0.0791	0.139	0.109	0.109	0.0424
		APW-04	2	2	100	0.192	0.21	0.201	0.201	0.0127
		APW-09	2	2	100	0.124	0.599	0.3615	0.3615	0.3359
		POOLED	6	6	100	0.0791	0.599	0.1655	0.2238	0.1898
Mercury (mg/L)	Downgradient	APW-02	23	1	4	0.0002	0.0004	0.0002	0.0002	0
		APW-03	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-05	18	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-05R	5	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-06D	22	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-06S	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-07	22	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-08	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-10D	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-10S	23	0	0	0.0002	0.0002	0.0002	0.0002	0
	Upgradient	APW-01R	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-04	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		APW-09	23	0	0	0.0002	0.0002	0.0002	0.0002	0
		POOLED	69	0	0	0.0002	0.0002	0.0002	0.0002	0
Molybdenum (mg/L)	Downgradient	APW-02	23	23	100	0.0951	0.332	0.165	0.175	0.05
		APW-03	23	23	100	0.0262	0.0849	0.0621	0.0622	0.0147
		APW-05	18	18	100	0.109	0.249	0.2145	0.2078	0.0338
		APW-05R	5	5	100	0.13	0.185	0.164	0.1622	0.024
		APW-06D	22	22	100	0.0461	0.072	0.0604	0.0601	0.0076
		APW-06S	23	23	100	0.171	0.324	0.243	0.243	0.0454
		APW-07	22	15	68	0.0023	0.005	0.0036	0.0039	0.0009

Table F1 - Descriptive Statistics										
Analyte	**Well Type**	**Well ID**	**Samples**	**Detects**	**% Detects**	**Minimum**	**Maximum**	**Median**	**Mean**	**Standard Deviation**
Nickel (mg/L)	Upgradient	APW-08	23	3	13	0.001	0.005	0.0015	0.0026	0.0018
		APW-10D	23	1	4	0.001	0.005	0.0015	0.0026	0.0018
		APW-10S	23	3	13	0.001	0.005	0.0015	0.0026	0.0018
		APW-01R	23	0	0	0.001	0.005	0.0015	0.0025	0.0018
		APW-04	23	23	100	0.0299	0.0891	0.0517	0.0554	0.0185
		APW-09	23	23	100	0.015	0.0455	0.0223	0.0238	0.0071
		POOLED	69	46	66	0.001	0.0891	0.0223	0.0272	0.0246
	Downgradient	APW-02	11	11	100	0.0024	0.0725	0.0263	0.0287	0.0225
		APW-03	11	8	72	0.001	0.01	0.0025	0.0033	0.0027
		APW-05	11	7	63	0.001	0.0074	0.002	0.0025	0.0019
		APW-06D	10	10	100	0.0017	0.0093	0.0026	0.0037	0.0027
		APW-06S	11	9	81	0.001	0.009	0.0021	0.0026	0.0022
		APW-07	11	5	45	0.001	0.015	0.0013	0.0029	0.0041
		APW-08	11	11	100	0.0026	0.0077	0.0035	0.004	0.0017
		APW-10D	11	11	100	0.0025	0.0095	0.0063	0.006	0.0019
		APW-10S	11	6	54	0.001	0.0051	0.0014	0.0018	0.0013
	Upgradient	APW-01R	11	11	100	0.0038	0.012	0.0054	0.0061	0.0025
		APW-04	11	11	100	0.002	0.0065	0.0034	0.0038	0.0015
		APW-09	11	6	54	0.001	0.012	0.0012	0.0027	0.0033
		POOLED	33	28	84	0.001	0.012	0.0039	0.0042	0.0028
Radium-226 (pCi/L)	Downgradient	APW-02	22	11	50	-0.132	1.47	0.328	0.4274	0.418
		APW-03	23	10	43	0.04	3.18	0.293	0.4145	0.6253
		APW-05	17	5	29	0.0135	0.649	0.209	0.2599	0.1632
		APW-05R	5	4	80	-0.016	0.71	0.261	0.3706	0.3123
		APW-06D	22	10	45	0.03	1.22	0.372	0.4013	0.2442
		APW-06S	23	9	39	0.0283	1.25	0.22	0.2776	0.2584
		APW-07	22	10	45	-0.01	0.775	0.216	0.2769	0.2045
		APW-08	23	11	47	0.1	1.71	0.258	0.3145	0.3169
		APW-10D	23	9	39	-0.11	0.651	0.163	0.182	0.1438
		APW-10S	23	11	47	0.16	1.08	0.331	0.4409	0.2609
	Upgradient	APW-01R	23	8	34	-0.07	0.738	0.213	0.1981	0.1746
		APW-04	23	8	34	-0.272	0.501	0.146	0.1713	0.1762
		APW-09	23	9	39	-0.229	0.267	0.13	0.1043	0.1201
		POOLED	69	25	36	-0.272	0.738	0.146	0.1579	0.1617
Radium-226/228 (pCi/L)	Downgradient	APW-02	22	14	63	0.03	4.09	1.21	1.2927	0.9912
		APW-03	23	12	52	0.37	3.18	0.901	1.1548	0.6807
		APW-05	17	7	41	0.473	6.34	0.99	1.4556	1.4881
		APW-05R	5	5	100	0.687	2.1	0.879	1.0716	0.5855
		APW-06D	22	11	50	0.44	2.8	1.45	1.4414	0.6119
		APW-06S	23	12	52	0.11	2.93	1.04	1.1361	0.6505
		APW-07	22	10	45	0.39	2.7	1.175	1.2532	0.5745
		APW-08	23	12	52	0.247	2.39	1.04	1.0607	0.5369
		APW-10D	23	10	43	0.163	2.21	1.03	1.076	0.503
		APW-10S	23	15	65	0.37	4.83	1.24	1.5752	1.0287
	Upgradient	APW-01R	23	11	47	0.167	2.54	0.7	0.8406	0.5599
		APW-04	23	11	47	0.02	2.65	0.852	0.9144	0.5473
		APW-09	23	6	26	0.0164	1.46	0.63	0.6594	0.437
		POOLED	69	28	40	0.0164	2.65	0.794	0.8048	0.5213
Radium-228 (pCi/L)	Downgradient	APW-02	22	14	63	-0.42	3.71	0.735	0.8404	0.8661

Table F1 - Descriptive Statistics										
Analyte	Well Type	Well ID	Samples	Detects	% Detects	Minimum	Maximum	Median	Mean	Standard Deviation
		APW-03	23	15	65	-0.0217	2.05	0.66	0.7395	0.5274
		APW-05	17	13	76	0.31	5.85	0.82	1.1953	1.4082
		APW-05R	5	4	80	0.287	1.4	0.468	0.6994	0.4479
		APW-06D	22	19	86	0.24	2.62	0.929	1.0461	0.6116
		APW-06S	23	17	73	-0.03	2.73	0.8	0.852	0.611
		APW-07	22	17	77	-0.42	1.93	0.8965	0.9573	0.5448
		APW-08	23	16	69	-0.254	1.68	0.81	0.7287	0.4704
		APW-10D	23	16	69	-0.266	2.1	0.886	0.878	0.527
		APW-10S	23	16	69	-0.18	4.24	0.93	1.1262	1.0188
	Upgradient	APW-01R	23	14	60	-0.199	2.29	0.57	0.6291	0.5109
		APW-04	23	18	78	-0.45	2.15	0.64	0.7097	0.5016
		APW-09	23	10	43	-0.422	1.21	0.49	0.5077	0.4883
		POOLED	69	42	60	-0.45	2.29	0.629	0.6155	0.5
Selenium (mg/L)	Downgradient	APW-02	23	1	4	0.001	0.02	0.001	0.0022	0.0039
		APW-03	23	2	8	0.001	0.002	0.001	0.0014	0.0005
		APW-05	18	0	0	0.001	0.002	0.001	0.0012	0.0004
		APW-05R	5	0	0	0.002	0.002	0.002	0.002	0
		APW-06D	22	0	0	0.001	0.002	0.001	0.0014	0.0005
		APW-06S	23	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-07	22	0	0	0.001	0.002	0.001	0.0013	0.0005
		APW-08	23	23	100	0.0036	0.0221	0.0141	0.0139	0.0045
		APW-10D	23	14	60	0.001	0.0033	0.0016	0.0018	0.0006
		APW-10S	23	0	0	0.001	0.002	0.001	0.0013	0.0005
	Upgradient	APW-01R	23	23	100	0.0028	0.0054	0.0037	0.0038	0.0006
		APW-04	23	23	100	0.0085	0.0218	0.014	0.0138	0.0035
		APW-09	23	23	100	0.0126	0.0334	0.017	0.0179	0.0046
		POOLED	69	69	100	0.0028	0.0334	0.0133	0.0119	0.0068
Sulfate (mg/L)	Downgradient	APW-02	23	23	100	376	510	459	448.5217	39.9578
		APW-03	23	23	100	80.1	393	226	229.0043	70.0202
		APW-05	18	18	100	70.5	460	371.5	348.4722	88.2017
		APW-05R	5	5	100	97.9	373	192	225.58	120.6967
		APW-06D	22	22	100	136	272	216.5	219.9091	34.3496
		APW-06S	23	23	100	92.6	247	208	194.0261	46.321
		APW-07	22	22	100	34.7	78	53	54.4364	12.0015
		APW-08	23	23	100	23	43	33.4	33.0478	6.1247
		APW-10D	23	23	100	26	44.5	41	38.5391	5.6292
		APW-10S	23	3	13	5	21	10	8.7457	3.5887
	Upgradient	APW-01R	23	23	100	23.3	88	65	59.987	18.995
		APW-04	23	23	100	50.9	126	70.8	82.313	22.7707
		APW-09	23	23	100	25	104	44	46.3304	16.3895
		POOLED	69	69	100	23.3	126	62	62.8768	24.3842
Thallium (mg/L)	Downgradient	APW-02	23	0	0	0.001	0.02	0.002	0.0024	0.0039
		APW-03	23	0	0	0.001	0.002	0.002	0.0017	0.0005
		APW-05	18	0	0	0.001	0.002	0.002	0.0016	0.0005
		APW-05R	5	0	0	0.002	0.002	0.002	0.002	0
		APW-06D	22	0	0	0.001	0.002	0.002	0.0016	0.0005
		APW-06S	23	0	0	0.001	0.002	0.002	0.0017	0.0005
		APW-07	22	0	0	0.001	0.002	0.002	0.0016	0.0005
		APW-08	23	0	0	0.001	0.002	0.002	0.0017	0.0005

Table F1 - Descriptive Statistics										
Analyte	**Well Type**	**Well ID**	**Samples**	**Detects**	**% Detects**	**Minimum**	**Maximum**	**Median**	**Mean**	**Standard Deviation**
		APW-10D	23	0	0	0.001	0.002	0.002	0.0017	0.0005
		APW-10S	23	0	0	0.001	0.002	0.002	0.0017	0.0005
	Upgradient	APW-01R	23	1	4	0.001	0.002	0.002	0.0017	0.0005
		APW-04	23	0	0	0.001	0.002	0.002	0.0017	0.0005
		APW-09	23	1	4	0.001	0.002	0.002	0.0017	0.0005
		POOLED	69	2	2	0.001	0.002	0.002	0.0017	0.0005
Turbidity, Field (NTU)	Downgradient	APW-02	15	15	100	19.2	663	104	136.8533	151.5774
		APW-03	15	15	100	1.94	103	7.34	20.982	29.0645
		APW-05	10	10	100	4.65	76.1	36.3	33.727	25.6247
		APW-05R	5	5	100	14.8	32.8	23.4	22.9	7.5153
		APW-06D	14	14	100	1.12	181	18.35	33.8729	47.9716
		APW-06S	15	15	100	1.26	87	8.11	16.756	22.1893
		APW-07	14	14	100	3.34	79.2	12.65	22.7871	24.274
		APW-08	15	15	100	6.7	305	119	103.7047	83.7013
		APW-10D	15	15	100	4.76	198	46.9	87.4413	74.4958
		APW-10S	15	15	100	3.78	63.6	34.3	32.4287	22.7765
	Upgradient	APW-01R	15	15	100	8.95	133	33.9	51.1167	35.5723
		APW-04	15	15	100	15.7	91.7	29.8	38.5067	24.9716
		APW-09	15	15	100	3.82	34.2	13.8	15.5433	10.1226
		POOLED	45	45	100	3.82	133	25.6	35.0556	29.2478
pH, Lab	Downgradient	APW-02	23	23	100	6.9	7.67	7.14	7.1713	0.1855
		APW-03	23	23	100	7.21	8.11	7.77	7.6848	0.2748
		APW-05	18	18	100	7.18	7.6	7.31	7.3444	0.1183
		APW-05R	5	5	100	7.53	8	7.66	7.704	0.1903
		APW-06D	22	22	100	7.19	7.73	7.33	7.3755	0.1752
		APW-06S	23	23	100	7.02	7.67	7.2	7.2396	0.1884
		APW-07	22	22	100	6.78	7.31	6.935	6.9614	0.145
		APW-08	23	23	100	7	7.68	7.25	7.2678	0.1951
		APW-10D	23	23	100	6.98	7.66	7.21	7.2491	0.209
		APW-10S	23	23	100	6.91	7.58	7.06	7.1022	0.1608
	Upgradient	APW-01R	23	23	100	6.43	7.25	6.85	6.8274	0.2478
		APW-04	23	23	100	7.2	8.17	7.41	7.4591	0.2251
		APW-09	23	23	100	7.31	8.03	7.51	7.5461	0.1981
		POOLED	69	69	100	6.43	8.17	7.33	7.2775	0.3912

Table F2 - Potential Statistical Outliers					
Well ID	**Analyte**	**Sample Date**	**Result**	**Units**	**Well Type**
APW-01R	Arsenic	2023-11-29	3.3	µg/L	Upgradient
APW-01R	Barium	2023-11-29	259	µg/L	Upgradient
APW-01R	Boron	2017-12-28	329	µg/L	Upgradient
APW-01R	Boron	2018-01-17	357	µg/L	Upgradient
APW-01R	Boron	2018-02-07	311	µg/L	Upgradient
APW-01R	Chloride	2018-01-17	11000	µg/L	Upgradient
APW-01R	Chloride	2025-06-25	1100	µg/L	Upgradient
APW-01R	Chromium	2023-09-20	8.5	µg/L	Upgradient
APW-01R	Cobalt	2023-09-20	4.1	µg/L	Upgradient
APW-01R	Fluoride	2024-05-01	326	µg/L	Upgradient
APW-02	Chromium	2018-01-19	127	µg/L	Downgradient
APW-02	Chromium	2018-02-07	112	µg/L	Downgradient
APW-02	Cobalt	2025-06-26	11.7	µg/L	Downgradient
APW-02	Cobalt	2025-09-04	20	µg/L	Downgradient
APW-02	Fluoride	2024-10-15	1500	µg/L	Downgradient
APW-02	Fluoride	2025-11-19	750	µg/L	Downgradient
APW-02	Mercury	2022-09-14	0.43	µg/L	Downgradient
APW-02	Molybdenum	2024-05-01	332	µg/L	Downgradient
APW-03	Arsenic	2022-09-15	4.6	µg/L	Downgradient
APW-03	Arsenic	2022-11-30	5.9	µg/L	Downgradient
APW-03	Arsenic	2023-06-26	4	µg/L	Downgradient
APW-03	Boron	2022-09-15	1840	µg/L	Downgradient
APW-03	Boron	2023-11-27	2220	µg/L	Downgradient
APW-03	Chromium	2022-11-30	11.8	µg/L	Downgradient
APW-03	Chromium	2023-06-26	24.1	µg/L	Downgradient
APW-03	Fluoride	2024-04-30	370	µg/L	Downgradient
APW-03	Fluoride	2024-10-16	150	µg/L	Downgradient
APW-03	Fluoride	2025-09-03	750	µg/L	Downgradient
APW-03	Molybdenum	2024-01-11	26.2	µg/L	Downgradient
APW-04	Arsenic	2022-09-15	2.9	µg/L	Upgradient
APW-04	Arsenic	2023-11-30	2.8	µg/L	Upgradient
APW-04	Barium	2022-09-15	165	µg/L	Upgradient
APW-04	Calcium	2023-11-30	124000	µg/L	Upgradient
APW-04	Chromium	2022-09-15	25.1	µg/L	Upgradient
APW-04	Chromium	2024-10-17	7.62	µg/L	Upgradient
APW-05	Antimony	2022-09-14	1.1	µg/L	Downgradient
APW-05	Arsenic	2022-06-16	4.8	µg/L	Downgradient
APW-05	Chromium	2017-09-06	13.7	µg/L	Downgradient
APW-05	Chromium	2017-12-27	8.4	µg/L	Downgradient
APW-05	Cobalt	2022-06-16	1.3	µg/L	Downgradient
APW-05	Sulfate	2022-06-16	224000	µg/L	Downgradient
APW-05R	Chloride	2024-09-05	28100	µg/L	Downgradient
APW-05R	Chromium	2023-06-27	1.5	µg/L	Downgradient
APW-05R	Chromium	2023-09-20	3.1	µg/L	Downgradient
APW-05R	Fluoride	2025-11-19	750	µg/L	Downgradient
APW-06D	Arsenic	2017-09-06	6.8	µg/L	Downgradient
APW-06D	Arsenic	2017-10-19	7.4	µg/L	Downgradient
APW-06D	Arsenic	2023-11-28	13.5	µg/L	Downgradient
APW-06D	Boron	2022-09-13	5510	µg/L	Downgradient
APW-06D	Boron	2023-06-27	4990	µg/L	Downgradient
APW-06D	Boron	2025-11-19	2570	µg/L	Downgradient
APW-06D	Chloride	2023-11-28	22000	µg/L	Downgradient
APW-06D	Chloride	2025-11-19	35300	µg/L	Downgradient
APW-06D	Chromium	2023-09-20	72.7	µg/L	Downgradient
APW-06D	Chromium	2025-09-04	94.5	µg/L	Downgradient
APW-06D	Cobalt	2023-06-27	5.4	µg/L	Downgradient
APW-06D	Fluoride	2024-05-01	150	µg/L	Downgradient
APW-06D	Lithium	2023-11-28	19.9	µg/L	Downgradient
APW-06D	Nickel	2022-11-28	9.3	µg/L	Downgradient
APW-06D	Nickel	2024-01-10	8.25	µg/L	Downgradient
APW-06S	Barium	2023-11-28	305	µg/L	Downgradient
APW-06S	Chloride	2025-09-04	36100	µg/L	Downgradient
APW-06S	Chromium	2017-09-28	17.3	µg/L	Downgradient
APW-06S	Chromium	2017-12-27	4.8	µg/L	Downgradient
APW-06S	Chromium	2023-09-20	6.7	µg/L	Downgradient

Table F2 - Potential Statistical Outliers					
Well ID	**Analyte**	**Sample Date**	**Result**	**Units**	**Well Type**
APW-06S	Chromium	2025-09-04	32.6	µg/L	Downgradient
APW-06S	Chromium	2025-11-19	4.98	µg/L	Downgradient
APW-06S	Fluoride	2017-09-06	410	µg/L	Downgradient
APW-06S	Lithium	2023-11-28	56.4	µg/L	Downgradient
APW-06S	Lithium	2025-06-24	29.5	µg/L	Downgradient
APW-06S	Nickel	2017-09-28	9	µg/L	Downgradient
APW-07	Barium	2017-09-07	465	µg/L	Downgradient
APW-07	Barium	2023-11-28	522	µg/L	Downgradient
APW-07	Boron	2024-09-04	526	µg/L	Downgradient
APW-07	Chromium	2017-12-27	32.9	µg/L	Downgradient
APW-07	Chromium	2023-09-19	5.7	µg/L	Downgradient
APW-07	Fluoride	2017-09-07	350	µg/L	Downgradient
APW-07	Lithium	2023-11-28	23.1	µg/L	Downgradient
APW-07	Nickel	2017-12-27	15	µg/L	Downgradient
APW-08	Chromium	2023-06-26	8.2	µg/L	Downgradient
APW-08	Chromium	2024-10-16	7.38	µg/L	Downgradient
APW-08	Fluoride	2024-10-16	150	µg/L	Downgradient
APW-09	Arsenic	2017-09-05	3.1	µg/L	Upgradient
APW-09	Barium	2017-09-05	227	µg/L	Upgradient
APW-09	Barium	2017-09-27	171	µg/L	Upgradient
APW-09	Barium	2022-06-15	186	µg/L	Upgradient
APW-09	Boron	2022-06-15	1610	µg/L	Upgradient
APW-09	Calcium	2022-06-15	110000	µg/L	Upgradient
APW-09	Chloride	2018-02-08	768000	µg/L	Upgradient
APW-09	Chloride	2025-09-05	9870	µg/L	Upgradient
APW-09	Chromium	2017-09-05	14.8	µg/L	Upgradient
APW-09	Chromium	2024-10-17	3.38	µg/L	Upgradient
APW-09	Fluoride	2024-04-30	339	µg/L	Upgradient
APW-09	Lithium	2022-06-15	24.6	µg/L	Upgradient
APW-09	Molybdenum	2022-06-15	45.5	µg/L	Upgradient
APW-09	Nickel	2017-09-05	12	µg/L	Upgradient
APW-09	Sulfate	2022-06-15	104000	µg/L	Upgradient
APW-10D	Arsenic	2022-09-16	5.7	µg/L	Downgradient
APW-10D	Arsenic	2025-09-03	4.92	µg/L	Downgradient
APW-10D	Calcium	2022-09-16	374000	µg/L	Downgradient
APW-10D	Calcium	2023-06-26	611000	µg/L	Downgradient
APW-10D	Chloride	2017-09-07	24000	µg/L	Downgradient
APW-10D	Chloride	2024-09-05	25500	µg/L	Downgradient
APW-10D	Chromium	2017-09-27	7.8	µg/L	Downgradient
APW-10D	Chromium	2018-01-18	4.2	µg/L	Downgradient
APW-10D	Chromium	2022-09-16	14.8	µg/L	Downgradient
APW-10D	Cobalt	2017-11-28	1.7	µg/L	Downgradient
APW-10D	Cobalt	2022-09-16	4.9	µg/L	Downgradient
APW-10D	Cobalt	2023-06-26	7	µg/L	Downgradient
APW-10D	Lithium	2022-06-15	18	µg/L	Downgradient
APW-10D	Lithium	2024-09-05	11.3	µg/L	Downgradient
APW-10S	Arsenic	2018-01-18	230	µg/L	Downgradient
APW-10S	Arsenic	2023-11-27	276	µg/L	Downgradient
APW-10S	Barium	2018-01-18	703	µg/L	Downgradient
APW-10S	Barium	2023-11-27	804	µg/L	Downgradient
APW-10S	Barium	2024-10-15	474	µg/L	Downgradient
APW-10S	Boron	2018-01-18	645	µg/L	Downgradient
APW-10S	Boron	2022-06-15	683	µg/L	Downgradient
APW-10S	Chromium	2017-09-07	9.1	µg/L	Downgradient
APW-10S	Chromium	2022-09-15	15	µg/L	Downgradient
APW-10S	Chromium	2023-09-19	8.7	µg/L	Downgradient
APW-10S	Fluoride	2024-09-05	251	µg/L	Downgradient
APW-10S	Fluoride	2025-09-03	265	µg/L	Downgradient
APW-10S	Lithium	2023-11-27	40.1	µg/L	Downgradient
APW-10S	Nickel	2017-09-07	5.1	µg/L	Downgradient
APW-10S	Sulfate	2022-09-15	21000	µg/L	Downgradient

Table F3 - Summary of Background Concentrations			
Analyte	**Selected Distribution**	**UTL**	**Unit**
Antimony*		1	ug/L
Arsenic	Normal	3.11	ug/L
Barium	NDD	241.9	ug/L
Beryllium*		2	ug/L
Boron	Gamma	1.354	mg/l
Cadmium*		1	ug/L
Calcium	Normal	118.3	mg/l
Chloride	NDD	12.84	mg/l
Chromium	NDD	25.1	ug/L
Cobalt	Normal	2.685	ug/L
Dissolved Solids	Normal	514.7	mg/l
Fluoride	Normal	226.1	mg/l
Iron	Normal	2.208	mg/L
Lead	Normal	3.086	ug/L
Lithium	NDD	32.42	ug/L
Manganese	Normal	0.928	mg/l
Mercury*		0.2	ug/l
Molybdenum	Normal	55.02	ug/l
Nickel	Normal	10.42	mg/l
pH	Normal	6.22	
Selenium	NDD	2.54	mg/l
Sulfate	Normal	22.95	mg/l
Thallium	NDD	93.25	mg/l
Turbidity	Gamma	2	NTU
Radium 226-228	NDD	8.113	pCi/L

Notes:
mg/L - milligram per liter
pCi/l - picocuries per liter
NTU - nephelometric turbidity unit
* UTL = RL where all background results were non-detect at the reporting limit

Table F4 - Summary of Downgradient Confidence Limit					
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**
Antimony (mg/L)	Downgradient	APW-02	Non-parametric	0.001	0.003
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		
Arsenic (mg/L)	Downgradient	APW-02	Lognormal	0.016	0.021
		APW-03	Non-parametric	0.002	0.003
		APW-05	Gamma	0.002	0.003
		APW-05R	Non-parametric	0.002	0.003
		APW-06D	Normal	0.010	0.011
		APW-06S	Non-parametric	0.001	0.002
		APW-07	Non-parametric	0.001	0.002
		APW-08	Non-parametric	0.001	0.002
		APW-10D	Non-parametric	0.001	0.002
		APW-10S	Non-parametric	0.188	0.203
Barium (mg/L)	Downgradient	APW-02	Normal	0.247	0.371
		APW-03	Lognormal	0.117	0.139
		APW-05	Lognormal	0.170	0.211
		APW-05R	Lognormal	0.142	0.190
		APW-06D	Lognormal	0.133	0.147
		APW-06S	Lognormal	0.217	0.235
		APW-07	Lognormal	0.353	0.392
		APW-08	Lognormal	0.200	0.219
		APW-10D	Lognormal	0.328	0.371
		APW-10S	Non-parametric	0.574	0.368
Beryllium (mg/L)	Downgradient	APW-02	Insufficient Data		
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		
Boron (mg/L)	Downgradient	APW-02	Lognormal	8.590	9.115
		APW-03	Non-parametric	3.903	4.454
		APW-05	Lognormal	7.595	9.386
		APW-05R	Lognormal	4.763	10.020
		APW-06D	Lognormal	3.582	4.069
		APW-06S	Lognormal	5.313	6.313
		APW-07	Lognormal	0.233	0.290
		APW-08	Non-parametric	0.137	0.167
		APW-10D	Non-parametric	0.099	0.140
		APW-10S	Gamma	0.562	0.587
Cadmium (mg/L)	Downgradient	APW-02	Non-parametric	0.001	0.002
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		

Table F4 - Summary of Downgradient Confidence Limit					
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**
Calcium (mg/L)	Downgradient	APW-02	Lognormal	150.355	163.600
		APW-03	Lognormal	106.035	121.200
		APW-05	Gamma	113.817	129.700
		APW-05R	Lognormal	101.309	128.500
		APW-06D	Gamma	108.264	114.900
		APW-06S	Non-parametric	101.378	111.600
		APW-07	Gamma	191.546	204.500
		APW-08	Normal	91.958	98.120
		APW-10D	Non-parametric	117.760	196.200
		APW-10S	Gamma	147.443	156.400
Chloride (mg/L)	Downgradient	APW-02	Lognormal	8.884	10.500
		APW-03	Lognormal	13.744	18.850
		APW-05	Normal	15.464	156.400
		APW-05R	Lognormal	15.430	20.830
		APW-06D	Non-parametric	16.317	19.520
		APW-06S	Lognormal	23.236	26.070
		APW-07	Non-parametric	11.351	13.100
		APW-08	Lognormal	9.558	10.540
		APW-10D	Lognormal	14.254	17.140
		APW-10S	Lognormal	10.125	14.230
Chromium (mg/L)	Downgradient	APW-02	Lognormal	0.018	0.080
		APW-03	Non-parametric	0.002	0.006
		APW-05	Non-parametric	0.002	0.005
		APW-05R	Insufficient Data		
		APW-06D	Non-parametric	0.001	0.018
		APW-06S	Non-parametric	0.002	0.007
		APW-07	Non-parametric	0.001	0.006
		APW-08	Lognormal	0.002	0.004
		APW-10D	Non-parametric	0.002	0.004
		APW-10S	Non-parametric	0.002	0.004
Cobalt (mg/L)	Downgradient	APW-02	Lognormal	0.003	0.006
		APW-03	Non-parametric	0.001	0.002
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Non-parametric	0.001	0.002
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Non-parametric	0.001	0.002
		APW-10D	Lognormal	0.003	0.003
		APW-10S	Non-parametric	0.001	0.002
Dissolved Solids, Total (mg/L)	Downgradient	APW-02	Gamma	842.815	876.900
		APW-03	Lognormal	526.406	575.000
		APW-05	Gamma	672.207	804.900
		APW-05R	Normal	490.354	695.300
		APW-06D	Non-parametric	564.120	608.500
		APW-06S	Gamma	578.090	619.200
		APW-07	Normal	720.766	757.100
		APW-08	Gamma	401.717	423.400
		APW-10D	Non-parametric	444.921	464.700
		APW-10S	Gamma	729.735	762.600
Fluoride (mg/L)	Downgradient	APW-02	Normal	0.217	0.246
		APW-03	Lognormal	0.247	0.288
		APW-05	Normal	0.305	0.345
		APW-05R	Lognormal	0.163	0.360
		APW-06D	Non-parametric	0.200	0.221
		APW-06S	Normal	0.247	0.286
		APW-07	Non-parametric	0.177	0.205
		APW-08	Gamma	0.257	0.284
		APW-10D	Non-parametric	0.117	0.132

Table F4 - Summary of Downgradient Confidence Limit					
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**
		APW-10S	Non-parametric	0.166	0.189
Iron (mg/L)	Downgradient	APW-02	Insufficient Data		
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		
Lead (mg/L)	Downgradient	APW-02	Lognormal	0.006	0.014
		APW-03	Non-parametric	0.001	0.002
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Non-parametric	0.001	0.002
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Non-parametric	0.001	0.002
		APW-10D	Non-parametric	0.001	0.002
		APW-10S	Non-parametric	0.001	0.002
Lithium (mg/L)	Downgradient	APW-02	Lognormal	0.046	0.051
		APW-03	Lognormal	0.029	0.031
		APW-05	Normal	0.036	0.041
		APW-05R	Lognormal	0.026	0.042
		APW-06D	Lognormal	0.017	0.017
		APW-06S	Lognormal	0.038	0.042
		APW-07	Lognormal	0.016	0.018
		APW-08	Lognormal	0.017	0.019
		APW-10D	Non-parametric	0.014	0.015
		APW-10S	Normal	0.029	0.031
Manganese (mg/L)	Downgradient	APW-02	Insufficient Data		
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		
Mercury (mg/L)	Downgradient	APW-02	Insufficient Data		
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		
Molybdenum (mg/L)	Downgradient	APW-02	Lognormal	0.157	0.194
		APW-03	Normal	0.057	0.067
		APW-05	Lognormal	0.194	0.228
		APW-05R	Lognormal	0.139	0.212
		APW-06D	Lognormal	0.057	0.063
		APW-06S	Lognormal	0.227	0.261
		APW-07	Non-parametric	0.004	0.004
		APW-08	Non-parametric	0.002	0.003
		APW-10D	Insufficient Data		
		APW-10S	Non-parametric	0.002	0.003
Nickel (mg/L)	Downgradient	APW-02	Normal	0.016	0.041

Table F4 - Summary of Downgradient Confidence Limit					
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**
		APW-03	Lognormal	0.002	0.006
		APW-05	Lognormal	0.001	0.005
		APW-06D	Non-parametric	0.002	0.005
		APW-06S	Lognormal	0.001	0.004
		APW-07	Non-parametric	0.001	0.005
		APW-08	Lognormal	0.003	0.005
		APW-10D	Lognormal	0.005	0.008
		APW-10S	Lognormal	0.001	0.003
Radium-226/228 (pCi/L)	Downgradient	APW-02	Normal	0.929	1.656
		APW-03	Lognormal	0.911	1.437
		APW-05	Normal	0.825	1.275
		APW-05R	Lognormal	0.513	3.273
		APW-06D	Normal	1.217	1.666
		APW-06S	Normal	0.903	1.369
		APW-07	Normal	1.042	1.464
		APW-08	Normal	0.868	1.253
		APW-10D	Normal	0.896	1.256
		APW-10S	Gamma	1.207	2.016
Selenium (mg/L)	Downgradient	APW-02	Insufficient Data		
		APW-03	Lognormal	0.001	0.002
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Normal	0.012	0.017
		APW-10D	Lognormal	0.002	0.002
		APW-10S	Insufficient Data		
Sulfate (mg/L)	Downgradient	APW-02	Normal	434.215	462.800
		APW-03	Normal	203.934	254.100
		APW-05	Lognormal	312.307	419.900
		APW-05R	Non-parametric	110.509	318.300
		APW-06D	Normal	207.307	232.500
		APW-06S	Normal	177.441	210.600
		APW-07	Lognormal	50.033	59.540
		APW-08	Lognormal	30.855	35.540
		APW-10D	Non-parametric	36.524	40.470
		APW-10S	Non-parametric	7.461	9.976
Thallium (mg/L)	Downgradient	APW-02	Insufficient Data		
		APW-03	Insufficient Data		
		APW-05	Insufficient Data		
		APW-05R	Insufficient Data		
		APW-06D	Insufficient Data		
		APW-06S	Insufficient Data		
		APW-07	Insufficient Data		
		APW-08	Insufficient Data		
		APW-10D	Insufficient Data		
		APW-10S	Insufficient Data		
Turbidity, Field (NTU)	Downgradient	APW-02	Gamma	67.921	213.300
		APW-03	Lognormal	7.764	59.050
		APW-05	Normal	18.873	44.710
		APW-05R	Lognormal	15.735	58.690
		APW-06D	Gamma	11.168	71.470
		APW-06S	Gamma	6.665	30.570
		APW-07	Lognormal	11.298	52.910
		APW-08	Gamma	65.640	170.800
		APW-10D	Normal	53.563	121.300
		APW-10S	Normal	22.071	42.790
pH, Lab	Downgradient	APW-02	Normal	7.105	7.238
		APW-03	Normal	7.586	7.783

Table F4 - Summary of Downgradient Confidence Limit					
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**
		APW-05	Normal	7.296	7.353
		APW-05R	Normal	7.523	7.666
		APW-06D	Normal	7.311	7.440
		APW-06S	Normal	7.172	7.307
		APW-07	Normal	6.908	7.015
		APW-08	Normal	7.198	7.338
		APW-10D	Normal	7.174	7.324
		APW-10S	Non-parametric	7.045	7.157

Table F5 - COCs Exceedances										
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**	**Background Concentration**	**GWPS**	**LCL > background**	**LCL> GWPS**	**Exceedances**
Antimony (mg/L)	Downgradient	APW-02	Non-parametric	0.001	0.003	0.001	0.006	No	No	No
		APW-03	Insufficient Data			0.001	0.006	No		
		APW-05	Insufficient Data			0.001	0.006	No		
		APW-05R	Insufficient Data			0.001	0.006	No		
		APW-06D	Insufficient Data			0.001	0.006	No		
		APW-06S	Insufficient Data			0.001	0.006	No		
		APW-07	Insufficient Data			0.001	0.006	No		
		APW-08	Insufficient Data			0.001	0.006	No		
		APW-10D	Insufficient Data			0.001	0.006	No		
		APW-10S	Insufficient Data			0.001	0.006	No		
Arsenic (mg/L)	Downgradient	APW-02	Lognormal	0.016	0.021	0.00311	0.01	Yes	Yes	Yes
		APW-03	Non-parametric	0.002	0.003	0.00311	0.01	No	No	No
		APW-05	Gamma	0.002	0.003	0.00311	0.01	No	No	No
		APW-05R	Non-parametric	0.002	0.003	0.00311	0.01	No	No	No
		APW-06D	Normal	0.010	0.011	0.00311	0.01	Yes	No	Yes
		APW-06S	Non-parametric	0.001	0.002	0.00311	0.01	No	No	No
		APW-07	Non-parametric	0.001	0.002	0.00311	0.01	No	No	No
		APW-08	Non-parametric	0.001	0.002	0.00311	0.01	No	No	No
		APW-10D	Non-parametric	0.001	0.002	0.00311	0.01	No	No	No
		APW-10S	Non-parametric	0.188	0.203	0.00311	0.01	Yes	Yes	Yes
Barium (mg/L)	Downgradient	APW-02	Normal	0.247	0.371	0.2419	2	Yes	No	Yes
		APW-03	Lognormal	0.117	0.139	0.2419	2	No	No	No
		APW-05	Lognormal	0.170	0.211	0.2419	2	No	No	No
		APW-05R	Lognormal	0.142	0.190	0.2419	2	No	No	No
		APW-06D	Lognormal	0.133	0.147	0.2419	2	No	No	No
		APW-06S	Lognormal	0.217	0.235	0.2419	2	No	No	No
		APW-07	Lognormal	0.353	0.392	0.2419	2	Yes	No	Yes
		APW-08	Lognormal	0.200	0.219	0.2419	2	No	No	No
		APW-10D	Lognormal	0.328	0.371	0.2419	2	Yes	No	Yes
		APW-10S	Non-parametric	0.574	0.368	0.2419	2	Yes	No	Yes
Beryllium (mg/L)	Downgradient	APW-02	Insufficient Data							
		APW-03	Insufficient Data							
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Insufficient Data							
		APW-10D	Insufficient Data							
		APW-10S	Insufficient Data							
Boron (mg/L)	Downgradient	APW-02	Lognormal	8.590	9.115	1.354	2	Yes	Yes	Yes
		APW-03	Non-parametric	3.903	4.454	1.354	2	Yes	Yes	Yes
		APW-05	Lognormal	7.595	9.386	1.354	2	Yes	Yes	Yes
		APW-05R	Lognormal	4.763	10.020	1.354	2	Yes	Yes	Yes
		APW-06D	Lognormal	3.582	4.069	1.354	2	Yes	Yes	Yes

Table F5 - COCs Exceedances										
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**	**Background Concentration**	**GWPS**	**LCL > background**	**LCL> GWPS**	**Exceedances**
		APW-06S	Lognormal	5.313	6.313	1.354	2	Yes	Yes	Yes
		APW-07	Lognormal	0.233	0.290	1.354	2	No	No	No
		APW-08	Non-parametric	0.137	0.167	1.354	2	No	No	No
		APW-10D	Non-parametric	0.099	0.140	1.354	2	No	No	No
		APW-10S	Gamma	0.562	0.587	1.354	2	No	No	No
Cadmium (mg/L)	Downgradient	APW-02	Non-parametric	0.001	0.002	0.001	2.0	No	No	No
		APW-03	Insufficient Data							
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Insufficient Data							
		APW-10D	Insufficient Data							
		APW-10S	Insufficient Data							
Calcium (mg/L)	Downgradient	APW-02	Lognormal	150.355	163.600	118.3	103.200	Yes	Yes	Yes
		APW-03	Lognormal	106.035	121.200	118.3	103.200	No	Yes	Yes
		APW-05	Gamma	113.817	129.700	118.3	103.200	No	Yes	Yes
		APW-05R	Lognormal	101.309	128.500	118.3	103.200	No	No	No
		APW-06D	Gamma	108.264	114.900	118.3	103.200	No	Yes	Yes
		APW-06S	Non-parametric	101.378	111.600	118.3	103.200	No	No	No
		APW-07	Gamma	191.546	204.500	118.3	103.200	Yes	Yes	Yes
		APW-08	Normal	91.958	98.120	118.3	103.200	No	No	No
		APW-10D	Non-parametric	117.760	196.200	118.3	103.200	No	Yes	Yes
		APW-10S	Gamma	147.443	156.400	118.3	103.200	Yes	Yes	Yes
Chloride (mg/L)	Downgradient	APW-02	Lognormal	8.884	10.500	12.84	200	No	No	No
		APW-03	Lognormal	13.744	18.850	12.84	200	Yes	No	Yes
		APW-05	Normal	15.464	156.400	12.84	200	Yes	No	Yes
		APW-05R	Lognormal	15.430	20.830	12.84	200	Yes	No	Yes
		APW-06D	Non-parametric	16.317	19.520	12.84	200	Yes	No	Yes
		APW-06S	Lognormal	23.236	26.070	12.84	200	Yes	No	Yes
		APW-07	Non-parametric	11.351	13.100	12.84	200	No	No	No
		APW-08	Lognormal	9.558	10.540	12.84	200	No	No	No
		APW-10D	Lognormal	14.254	17.140	12.84	200	Yes	No	Yes
		APW-10S	Lognormal	10.125	14.230	12.84	200	No	No	No
Chromium (mg/L)	Downgradient	APW-02	Lognormal	0.018	0.080	0.0251	0.1	No	No	No
		APW-03	Non-parametric	0.002	0.006	0.0251	0.1	No	No	No
		APW-05	Non-parametric	0.002	0.005	0.0251	0.1	No	No	No
		APW-05R	Insufficient Data			0.0251				
		APW-06D	Non-parametric	0.001	0.018	0.0251	0.1	No	No	No
		APW-06S	Non-parametric	0.002	0.007	0.0251	0.1	No	No	No
		APW-07	Non-parametric	0.001	0.006	0.0251	0.1	No	No	No
		APW-08	Lognormal	0.002	0.004	0.0251	0.1	No	No	No
		APW-10D	Non-parametric	0.002	0.004	0.0251	0.1	No	No	No

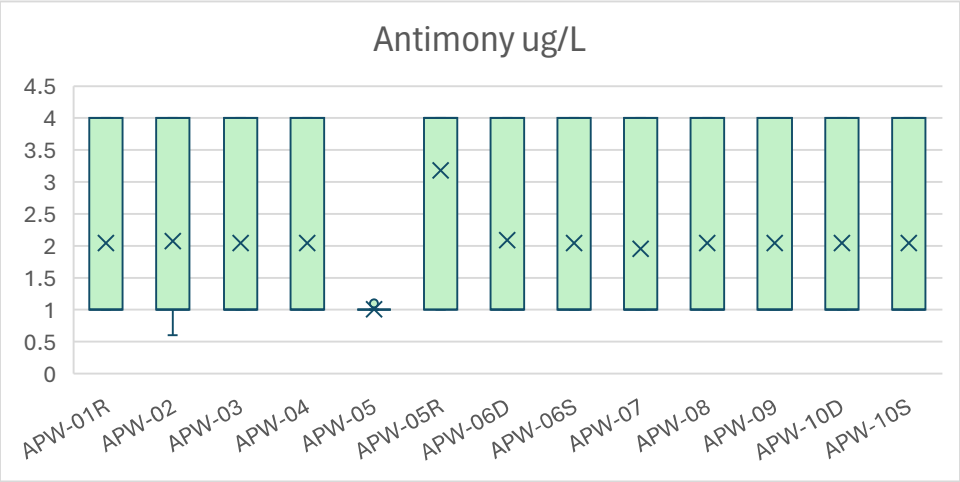
Table F5 - COCs Exceedances										
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**	**Background Concentration**	**GWPS**	**LCL > background**	**LCL> GWPS**	**Exceedances**
		APW-10S	Non-parametric	0.002	0.004	0.0251	0.1	No	No	No
Cobalt (mg/L)	Downgradient	APW-02	Lognormal	0.003	0.006	0.002685	1	Yes	No	Yes
		APW-03	Non-parametric	0.001	0.002	0.002685	1	No	No	No
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Non-parametric	0.001	0.002	0.002685	1	No	No	No
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Non-parametric	0.001	0.002	0.002685	1	No	No	No
		APW-10D	Lognormal	0.003	0.003	0.002685	1	No	No	No
		APW-10S	Non-parametric	0.001	0.002	0.002685	1	No	No	No
Dissolved Solids, Total (mg/L)	Downgradient	APW-02	Gamma	842.815	876.900	514.7	1,200	Yes	No	Yes
		APW-03	Lognormal	526.406	575.000	514.7	1,200	Yes	No	Yes
		APW-05	Gamma	672.207	804.900	514.7	1,200	Yes	No	Yes
		APW-05R	Normal	490.354	695.300	514.7	1,200	No	No	No
		APW-06D	Non-parametric	564.120	608.500	514.7	1,200	Yes	No	Yes
		APW-06S	Gamma	578.090	619.200	514.7	1,200	Yes	No	Yes
		APW-07	Normal	720.766	757.100	514.7	1,200	Yes	No	Yes
		APW-08	Gamma	401.717	423.400	514.7	1,200	No	No	No
		APW-10D	Non-parametric	444.921	464.700	514.7	1,200	No	No	No
		APW-10S	Gamma	729.735	762.600	514.7	1,200	Yes	No	Yes
Fluoride (mg/L)	Downgradient	APW-02	Normal	0.217	0.246	226.1	4.0	No	No	No
		APW-03	Lognormal	0.247	0.288	226.1	4.0	No	No	No
		APW-05	Normal	0.305	0.345	226.1	4.0	No	No	No
		APW-05R	Lognormal	0.163	0.360	226.1	4.0	No	No	No
		APW-06D	Non-parametric	0.200	0.221	226.1	4.0	No	No	No
		APW-06S	Normal	0.247	0.286	226.1	4.0	No	No	No
		APW-07	Non-parametric	0.177	0.205	226.1	4.0	No	No	No
		APW-08	Gamma	0.257	0.284	226.1	4.0	No	No	No
		APW-10D	Non-parametric	0.117	0.132	226.1	4.0	No	No	No
		APW-10S	Non-parametric	0.166	0.189	226.1	4.0	No	No	No
Iron (mg/L)	Downgradient	APW-02	Insufficient Data							
		APW-03	Insufficient Data							
		APW-05	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Insufficient Data							
		APW-10D	Insufficient Data							
		APW-10S	Insufficient Data							
Lead (mg/L)	Downgradient	APW-02	Lognormal	0.006	0.014	0.003086	0.0075	Yes	No	Yes
		APW-03	Non-parametric	0.001	0.002	0.003086	0.0075	No	No	No
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Non-parametric	0.001	0.002	0.003086	0.0075	No	No	No

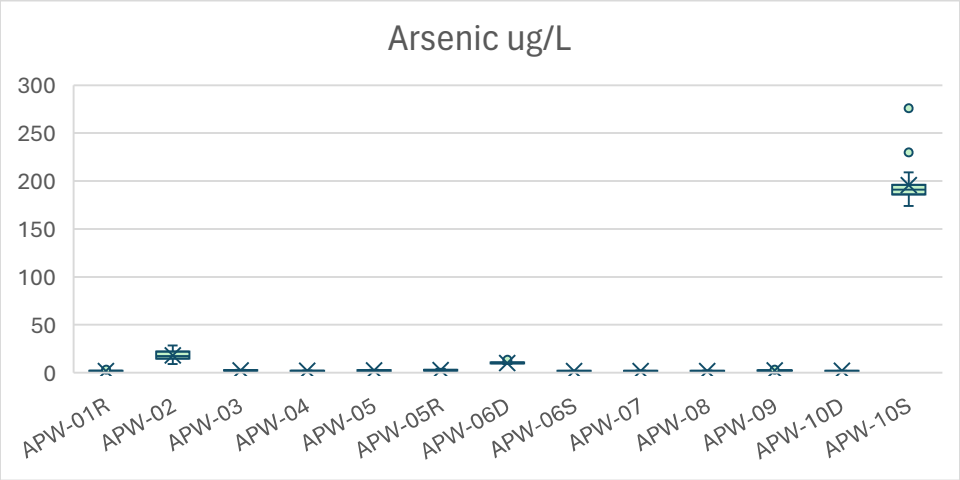
Table F5 - COCs Exceedances										
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**	**Background Concentration**	**GWPS**	**LCL > background**	**LCL> GWPS**	**Exceedances**
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Non-parametric	0.001	0.002	0.003086	0.0075	No	No	No
		APW-10D	Non-parametric	0.001	0.002	0.003086	0.0075	No	No	No
		APW-10S	Non-parametric	0.001	0.002	0.003086	0.0075	No	No	No
Lithium (mg/L)	Downgradient	APW-02	Lognormal	0.046	0.051	0.03242	0.0424	Yes	Yes	Yes
		APW-03	Lognormal	0.029	0.031	0.03242	0.04	No	No	No
		APW-05	Normal	0.036	0.041	0.03242	0.04	Yes	No	Yes
		APW-05R	Lognormal	0.026	0.042	0.03242	0.04	No	No	No
		APW-06D	Lognormal	0.017	0.017	0.03242	0.04	No	No	No
		APW-06S	Lognormal	0.038	0.042	0.03242	0.04	Yes	No	Yes
		APW-07	Lognormal	0.016	0.018	0.03242	0.04	No	No	No
		APW-08	Lognormal	0.017	0.019	0.03242	0.04	No	No	No
		APW-10D	Non-parametric	0.014	0.015	0.03242	0.04	No	No	No
		APW-10S	Normal	0.029	0.031	0.03242	0.04	No	No	No
Manganese (mg/L)	Downgradient	APW-02	Insufficient Data							
		APW-03	Insufficient Data							
		APW-05	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Insufficient Data							
		APW-10D	Insufficient Data							
		APW-10S	Insufficient Data							
Mercury (mg/L)	Downgradient	APW-02	Insufficient Data							
		APW-03	Insufficient Data							
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Insufficient Data							
		APW-10D	Insufficient Data							
		APW-10S	Insufficient Data							
Molybdenum (mg/L)	Downgradient	APW-02	Lognormal	0.157	0.194	0.05502	0.1	Yes	Yes	Yes
		APW-03	Normal	0.057	0.067	0.05502	0.1	Yes	No	Yes
		APW-05	Lognormal	0.194	0.228	0.05502	0.1	Yes	Yes	Yes
		APW-05R	Lognormal	0.139	0.212	0.05502	0.1	Yes	Yes	Yes
		APW-06D	Lognormal	0.057	0.063	0.05502	0.1	Yes	No	Yes
		APW-06S	Lognormal	0.227	0.261	0.05502	0.1	Yes	Yes	Yes
		APW-07	Non-parametric	0.004	0.004	0.05502	0.1	No	No	No
		APW-08	Non-parametric	0.002	0.003	0.05502	0.1	No	No	No
		APW-10D	Insufficient Data							
		APW-10S	Non-parametric	0.002	0.003	0.05502	0.1	No	No	No
Nickel (mg/L)	Downgradient	APW-02	Normal	0.016	0.041	10.42	0.1	No	No	No

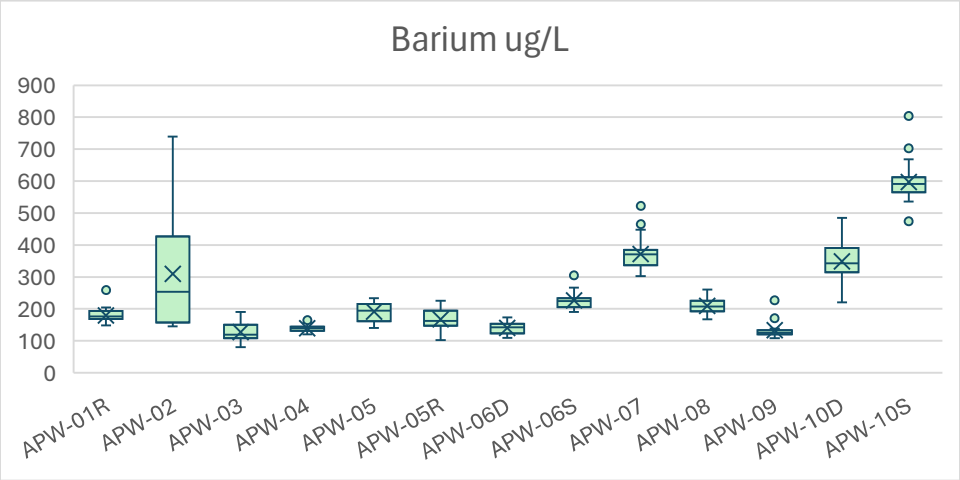
Table F5 - COCs Exceedances										
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**	**Background Concentration**	**GWPS**	**LCL > background**	**LCL> GWPS**	**Exceedances**
		APW-03	Lognormal	0.002	0.006	10.42	0.1	No	No	No
		APW-05	Lognormal	0.001	0.005	10.42	0.1	No	No	No
		APW-06D	Non-parametric	0.002	0.005	10.42	0.1	No	No	No
		APW-06S	Lognormal	0.001	0.004	10.42	0.1	No	No	No
		APW-07	Non-parametric	0.001	0.005	10.42	0.1	No	No	No
		APW-08	Lognormal	0.003	0.005	10.42	0.1	No	No	No
		APW-10D	Lognormal	0.005	0.008	10.42	0.1	No	No	No
		APW-10S	Lognormal	0.001	0.003	10.42	0.1	No	No	No
Radium-226/228 (pCi/L)	Downgradient	APW-02	Normal	0.929	1.656	8.113	7.002	No	No	No
		APW-03	Lognormal	0.911	1.437	8.113	7.002	No	No	No
		APW-05	Normal	0.825	1.275	8.113	7.002	No	No	No
		APW-05R	Lognormal	0.513	3.273	8.113	7.002	No	No	No
		APW-06D	Normal	1.217	1.666	8.113	7.002	No	No	No
		APW-06S	Normal	0.903	1.369	8.113	7.002	No	No	No
		APW-07	Normal	1.042	1.464	8.113	7.002	No	No	No
		APW-08	Normal	0.868	1.253	8.113	7.002	No	No	No
		APW-10D	Normal	0.896	1.256	8.113	7.002	No	No	No
		APW-10S	Gamma	1.207	2.016	8.113	7.002	No	No	No
Selenium (mg/L)	Downgradient	APW-02	Insufficient Data							
		APW-03	Lognormal	0.001	0.002	2.54	0.05	No	No	No
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							
		APW-08	Normal	0.012	0.017	2.54	0.05	No	No	No
		APW-10D	Lognormal	0.002	0.002	2.54	0.05	No	No	No
		APW-10S	Insufficient Data							
Sulfate (mg/L)	Downgradient	APW-02	Normal	434.215	462.800	22.95	400	Yes	Yes	Yes
		APW-03	Normal	203.934	254.100	22.95	400	Yes	No	Yes
		APW-05	Lognormal	312.307	419.900	22.95	400	Yes	No	Yes
		APW-05R	Non-parametric	110.509	318.300	22.95	400	Yes	No	Yes
		APW-06D	Normal	207.307	232.500	22.95	400	Yes	No	Yes
		APW-06S	Normal	177.441	210.600	22.95	400	Yes	No	Yes
		APW-07	Lognormal	50.033	59.540	22.95	400	Yes	No	Yes
		APW-08	Lognormal	30.855	35.540	22.95	400	Yes	No	Yes
		APW-10D	Non-parametric	36.524	40.470	22.95	400	Yes	No	Yes
		APW-10S	Non-parametric	7.461	9.976	22.95	400	No	No	No
Thallium (mg/L)	Downgradient	APW-02	Insufficient Data							
		APW-03	Insufficient Data							
		APW-05	Insufficient Data							
		APW-05R	Insufficient Data							
		APW-06D	Insufficient Data							
		APW-06S	Insufficient Data							
		APW-07	Insufficient Data							

Table F5 - COCs Exceedances										
Analyte	**Well Type**	**Well ID**	**Distribution**	**LCL**	**UCL**	**Background Concentration**	**GWPS**	**LCL > background**	**LCL> GWPS**	**Exceedances**
		APW-08	Insufficient Data							
		APW-10D	Insufficient Data							
		APW-10S	Insufficient Data							
Turbidity, Field (NTU)	Downgradient	APW-02	Gamma	67.921	213.300	2	17.96	Yes	Yes	Yes
		APW-03	Lognormal	7.764	59.050	2	17.96	Yes	No	Yes
		APW-05	Normal	18.873	44.710	2	17.96	Yes	Yes	Yes
		APW-05R	Lognormal	15.735	58.690	2	17.96	Yes	No	Yes
		APW-06D	Gamma	11.168	71.470	2	17.96	Yes	No	Yes
		APW-06S	Gamma	6.665	30.570	2	17.96	Yes	No	Yes
		APW-07	Lognormal	11.298	52.910	2	17.96	Yes	No	Yes
		APW-08	Gamma	65.640	170.800	2	17.96	Yes	Yes	Yes
		APW-10D	Normal	53.563	121.300	2	17.96	Yes	Yes	Yes
		APW-10S	Normal	22.071	42.790	2	17.96	Yes	Yes	Yes
pH, Lab	Downgradient	APW-02	Normal	7.105	7.238	8.17	6.22-9.02	No	No	No
		APW-03	Normal	7.586	7.783	8.17	6.22-9.03	No	No	No
		APW-05	Normal	7.296	7.353	8.17	6.22-9.04	No	No	No
		APW-05R	Normal	7.523	7.666	8.17	6.22-9.05	No	No	No
		APW-06D	Normal	7.311	7.440	8.17	6.22-9.06	No	No	No
		APW-06S	Normal	7.172	7.307	8.17	6.22-9.07	No	No	No
		APW-07	Normal	6.908	7.015	8.17	6.22-9.08	No	No	No
		APW-08	Normal	7.198	7.338	8.17	6.22-9.09	No	No	No
		APW-10D	Normal	7.174	7.324	8.17	6.22-9.10	No	No	No
		APW-10S	Non-parametric	7.045	7.157	8.17	6.22-9.11	No	No	No

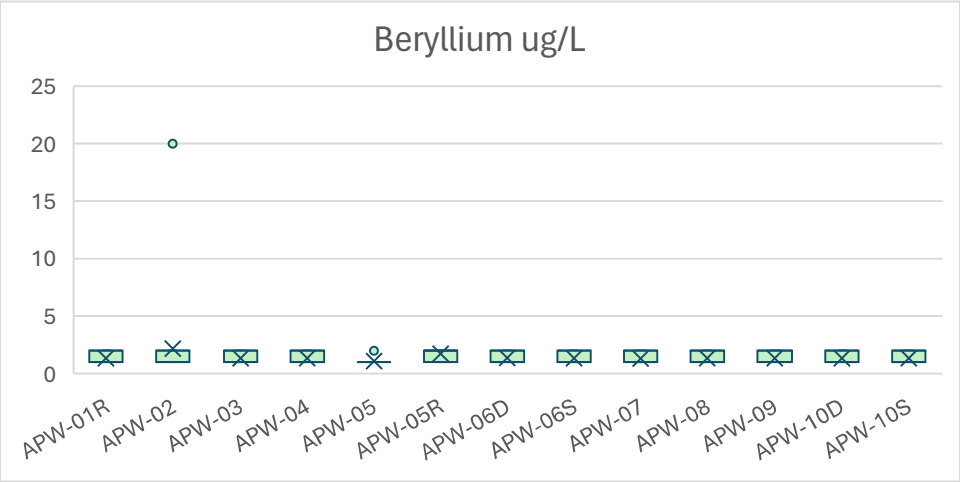
Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots

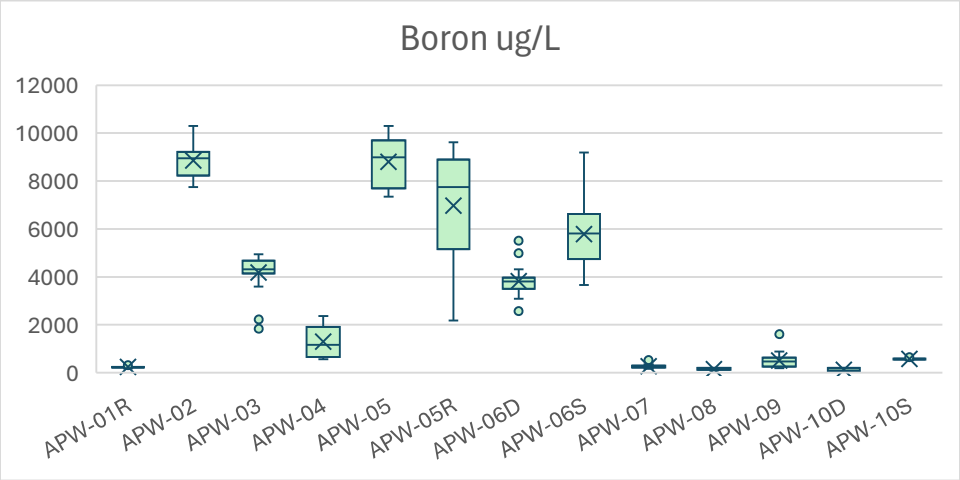


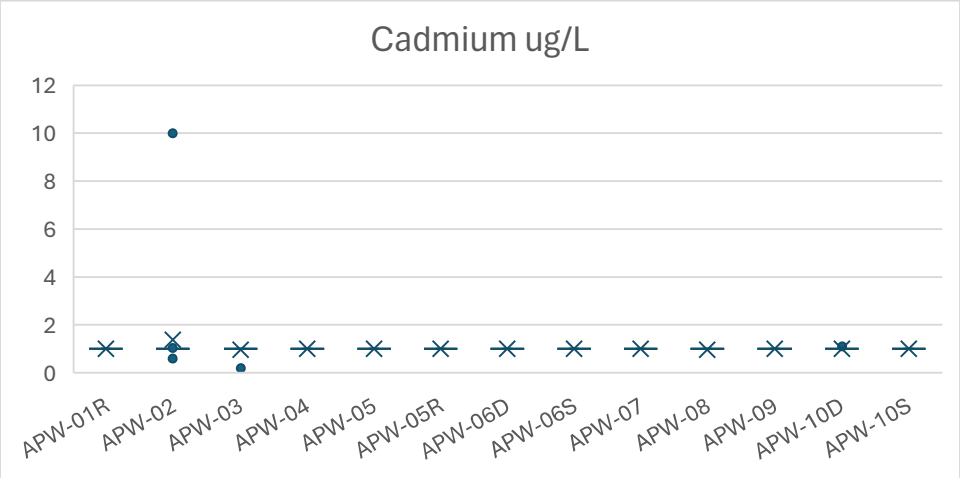




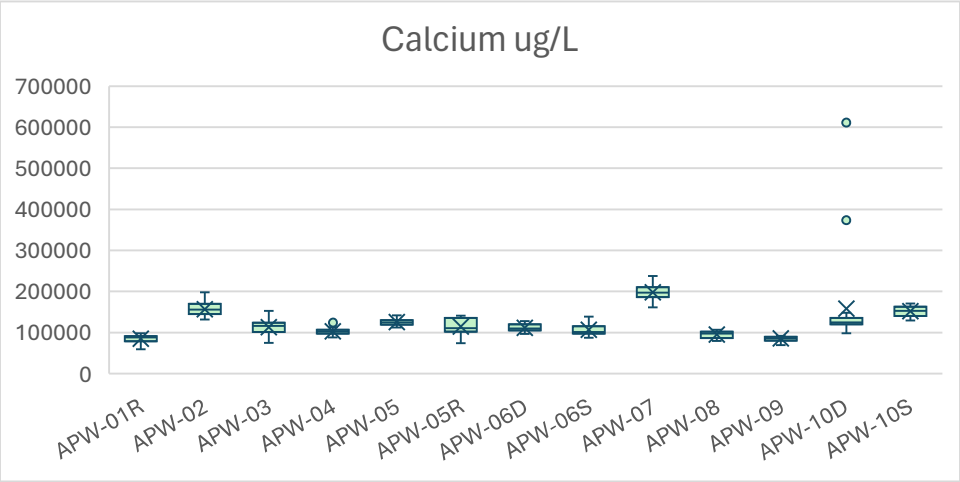
Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots

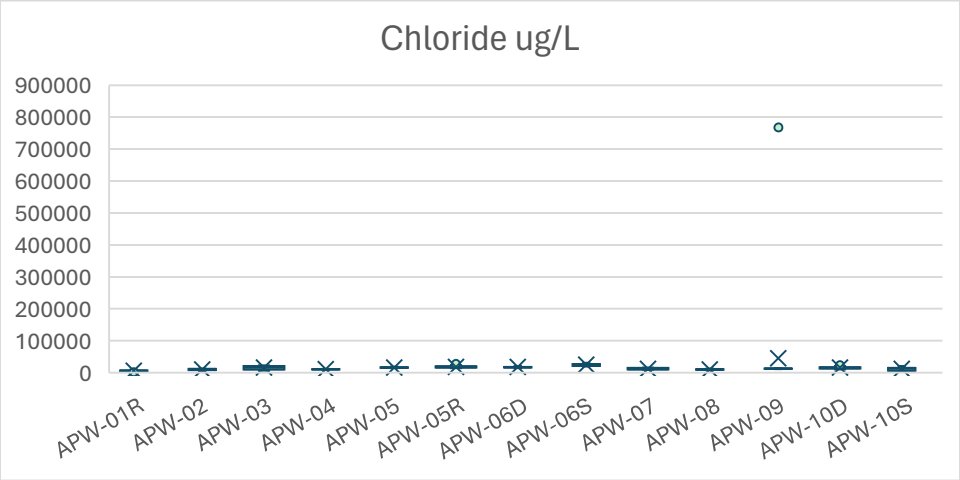


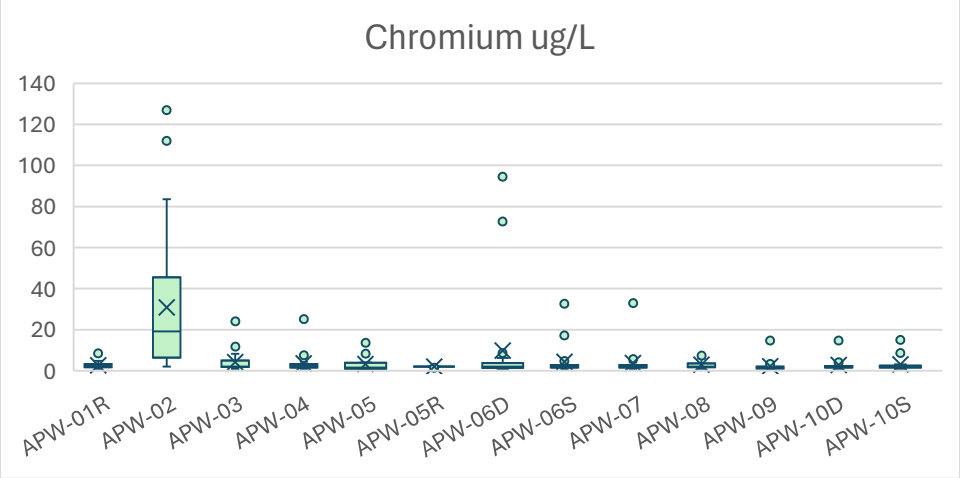




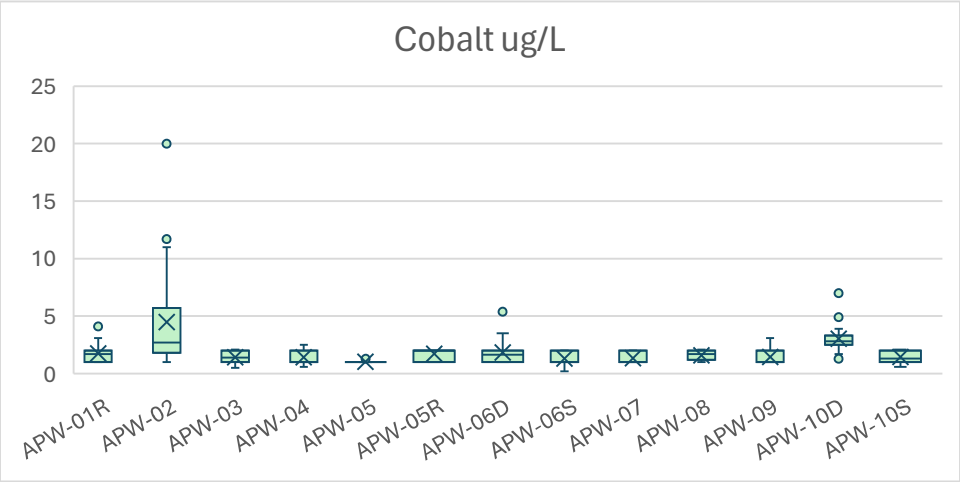
Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots

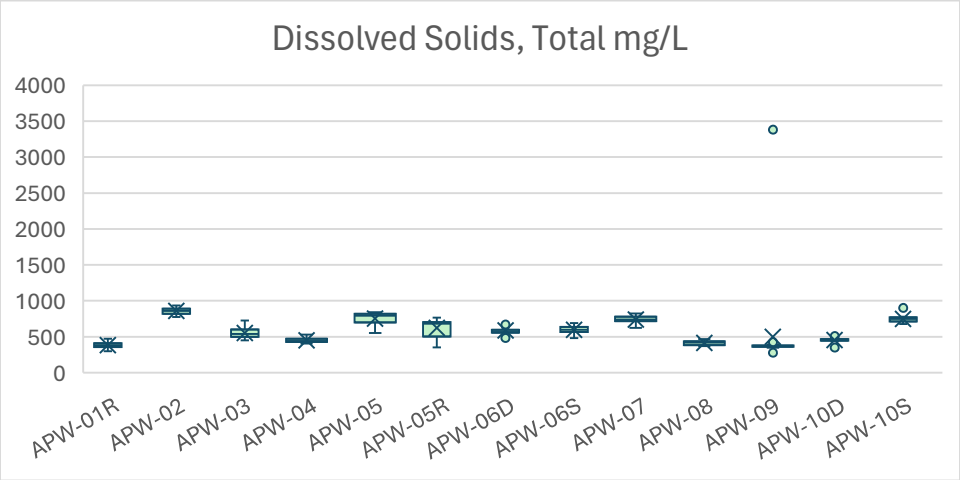


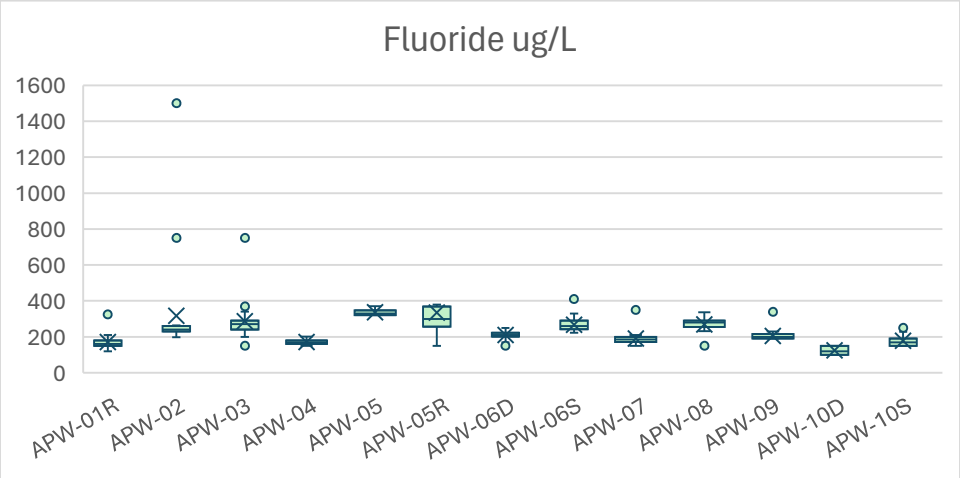




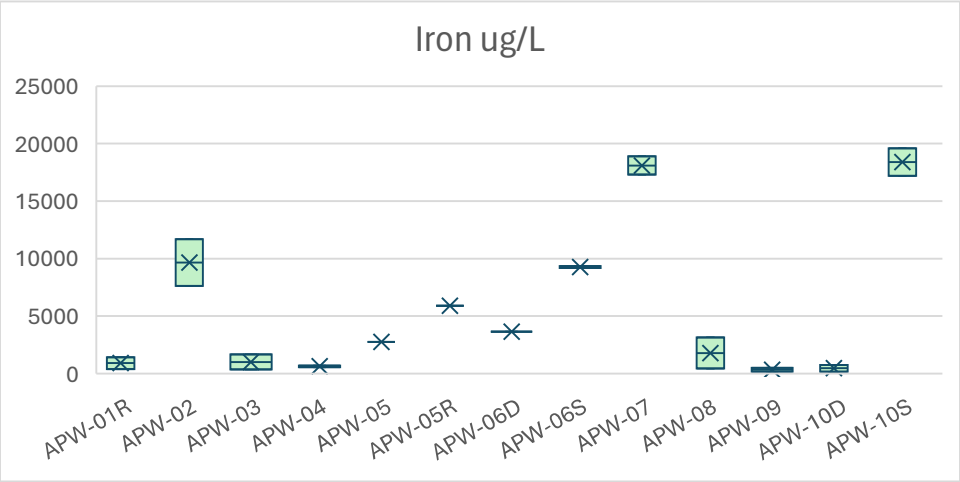
Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots

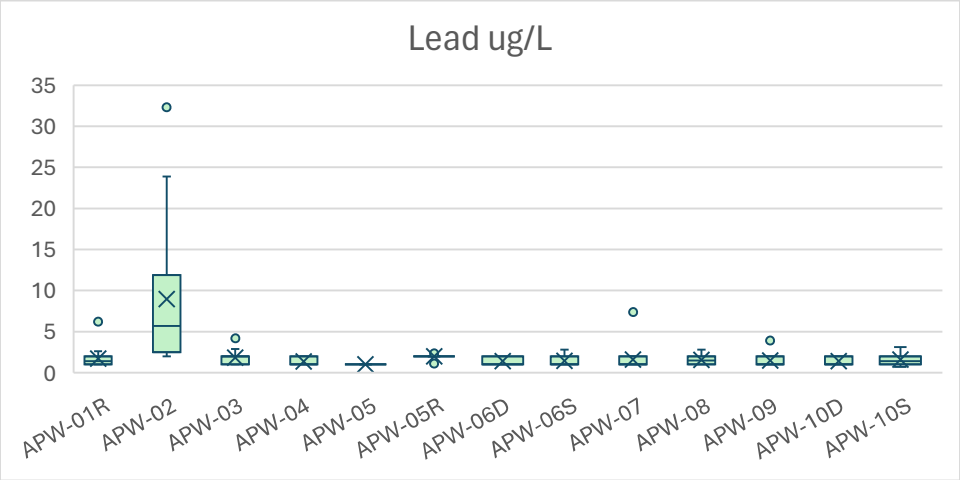


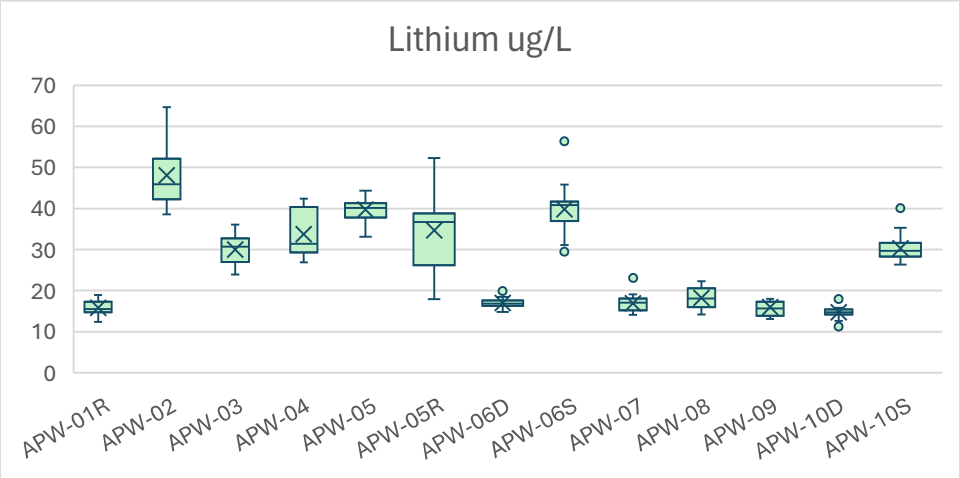




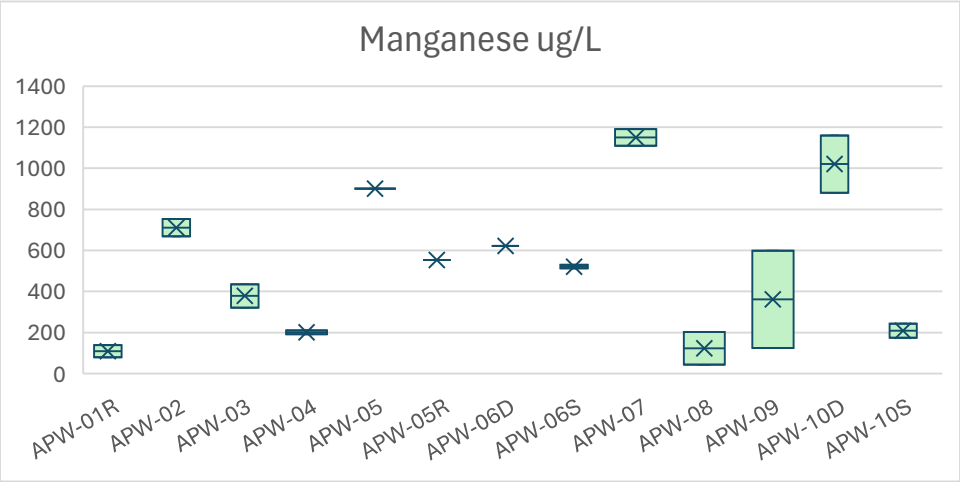
Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots

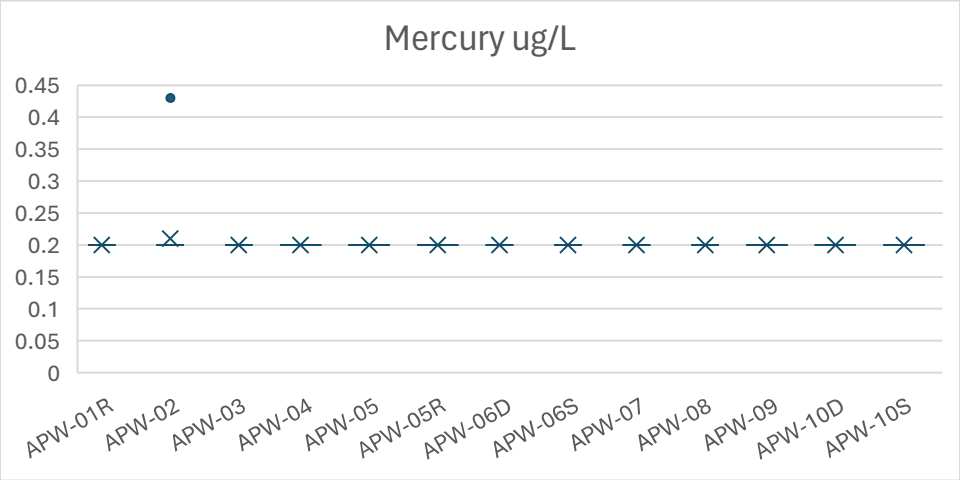


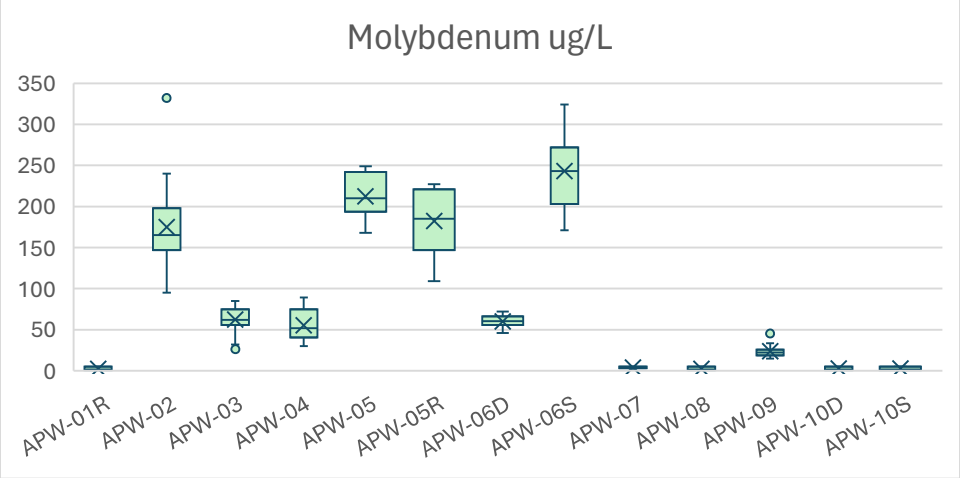




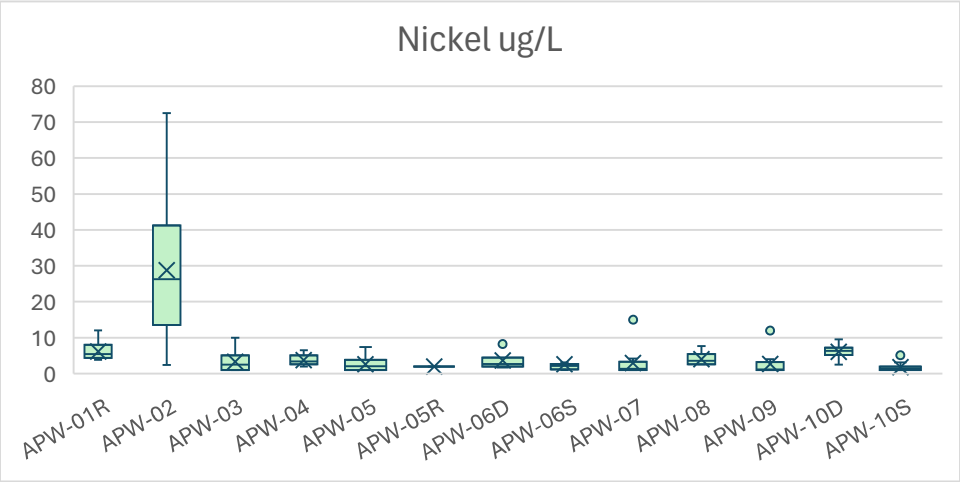
Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots

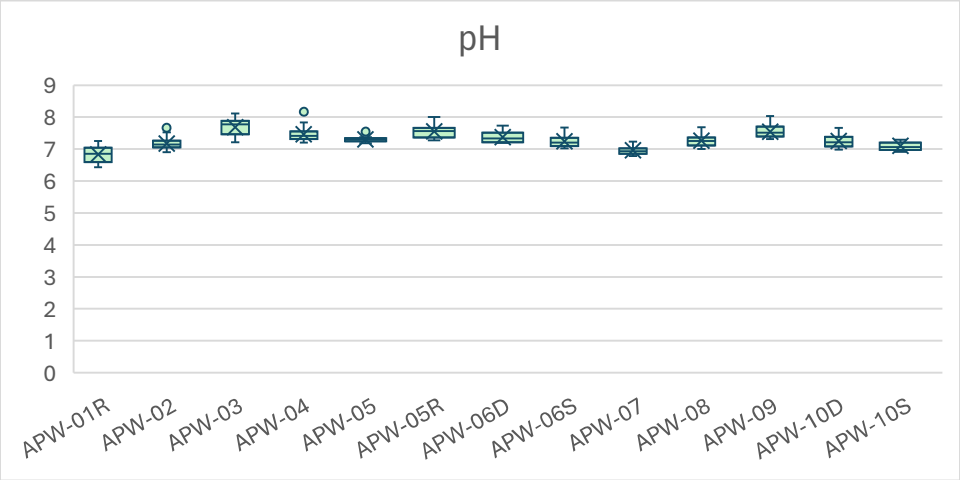


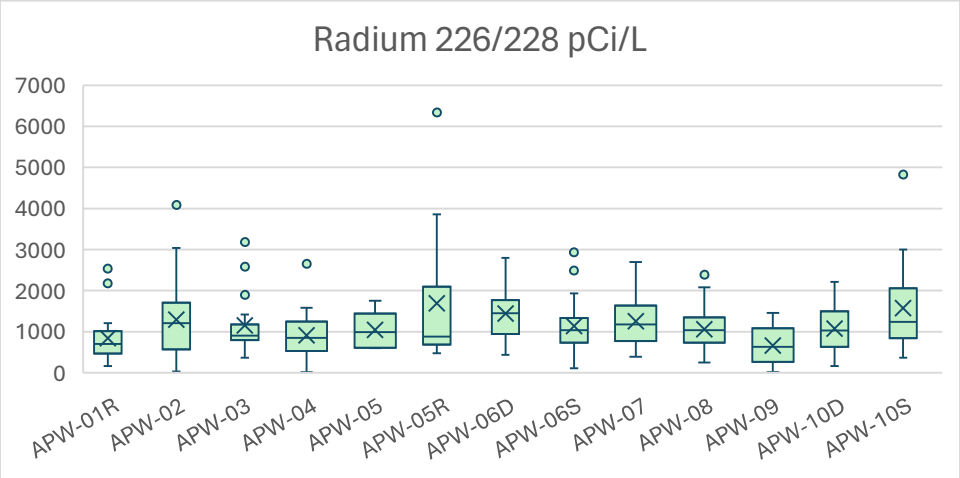




Statistical Analysis - Outlier Evaluation
Figure F1 – Tukey Box Plots







Statistical Analysis - Outlier Evaluation
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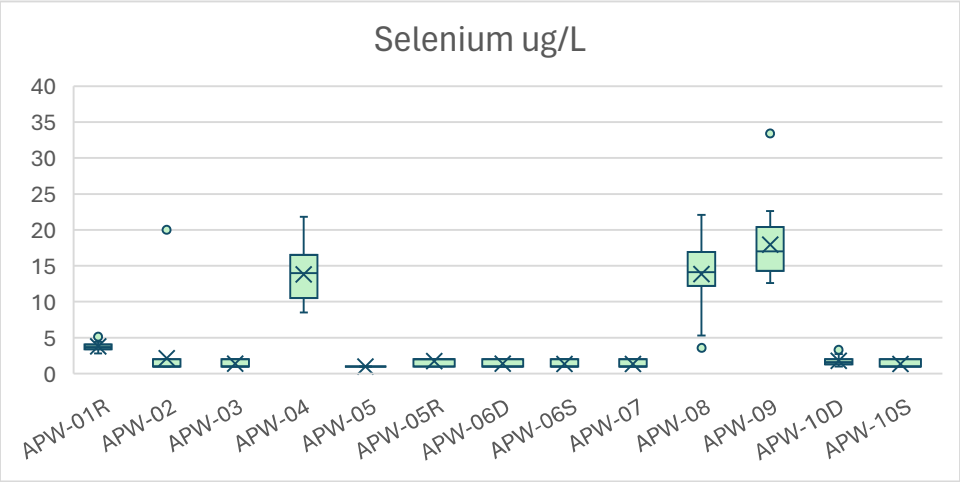

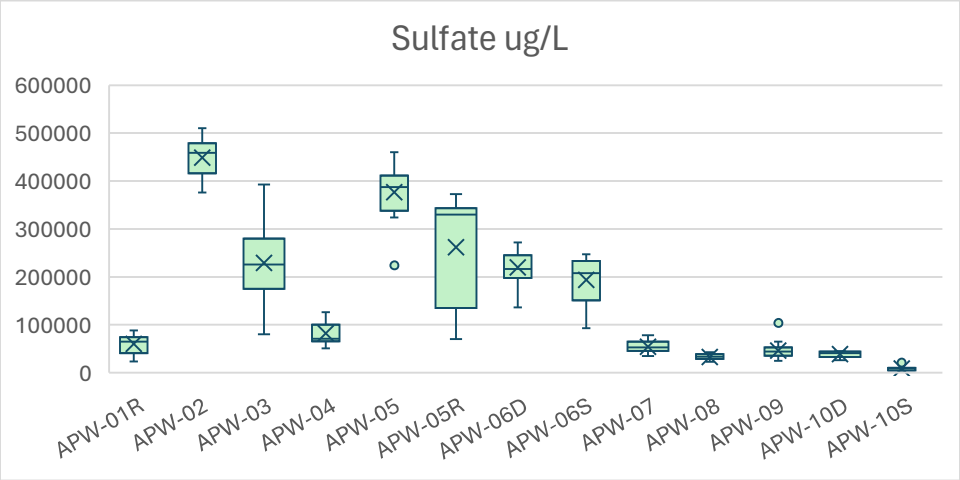

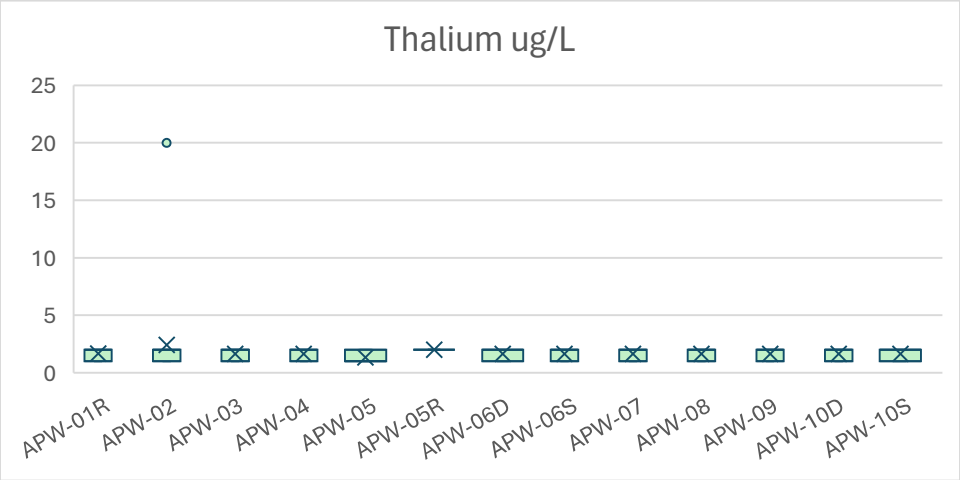

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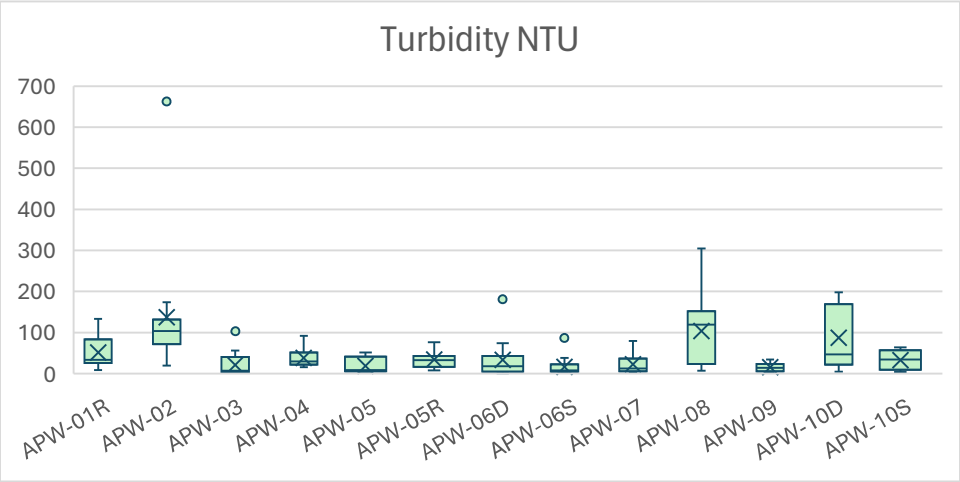
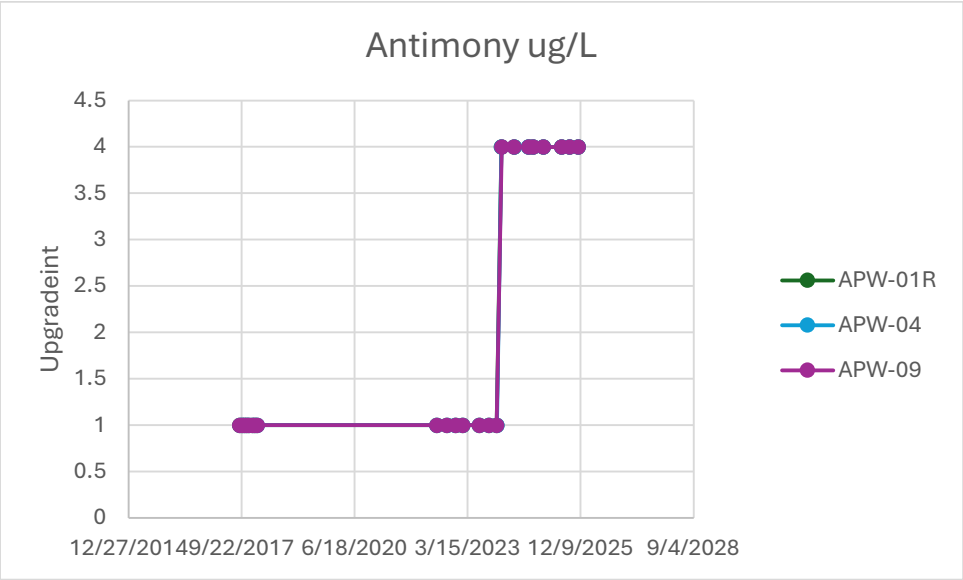
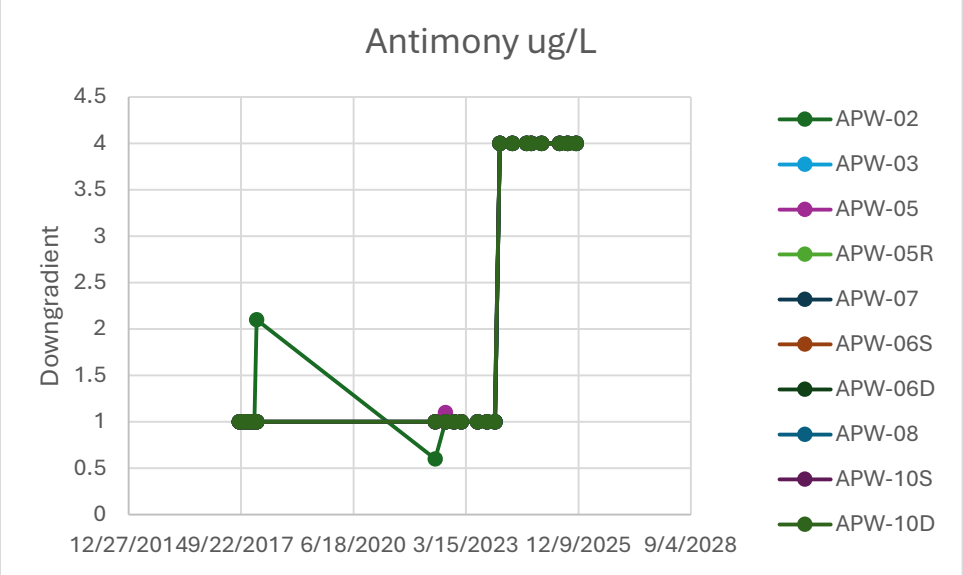


Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots





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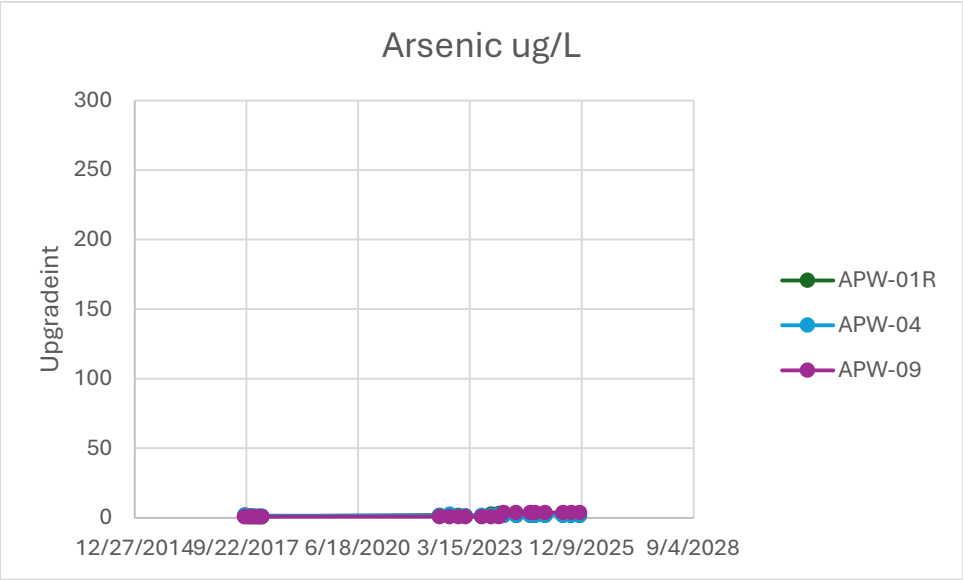

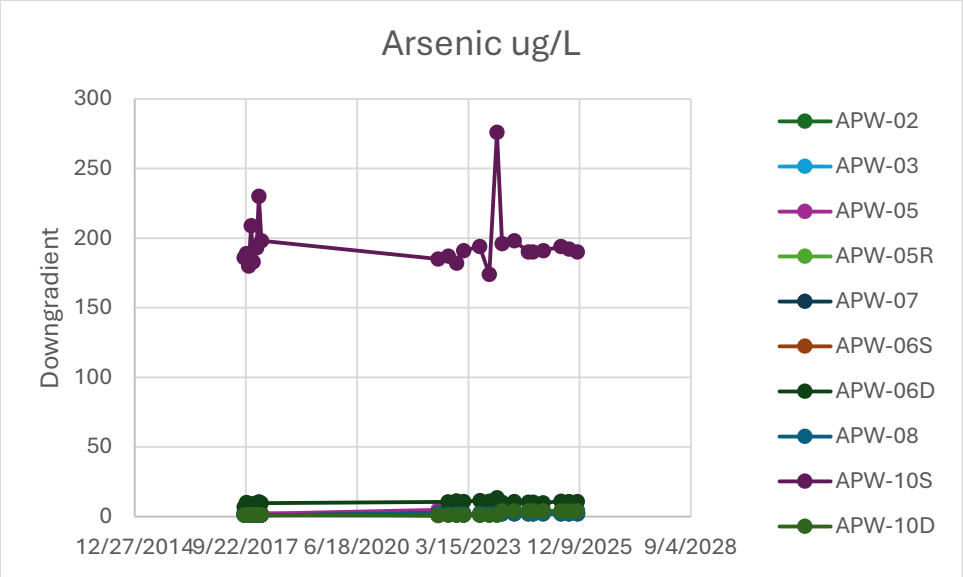

Statistical Analysis - Outlier Evaluation
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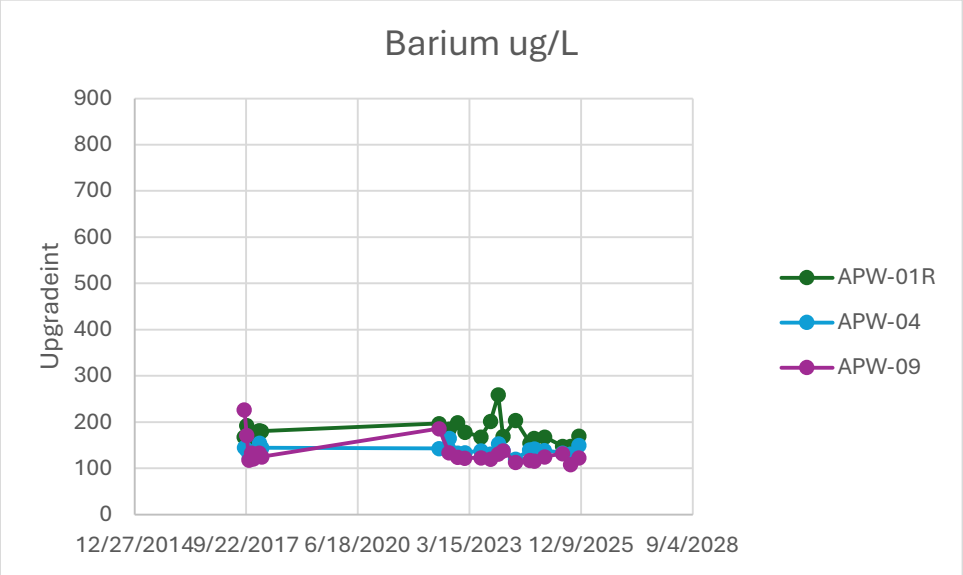

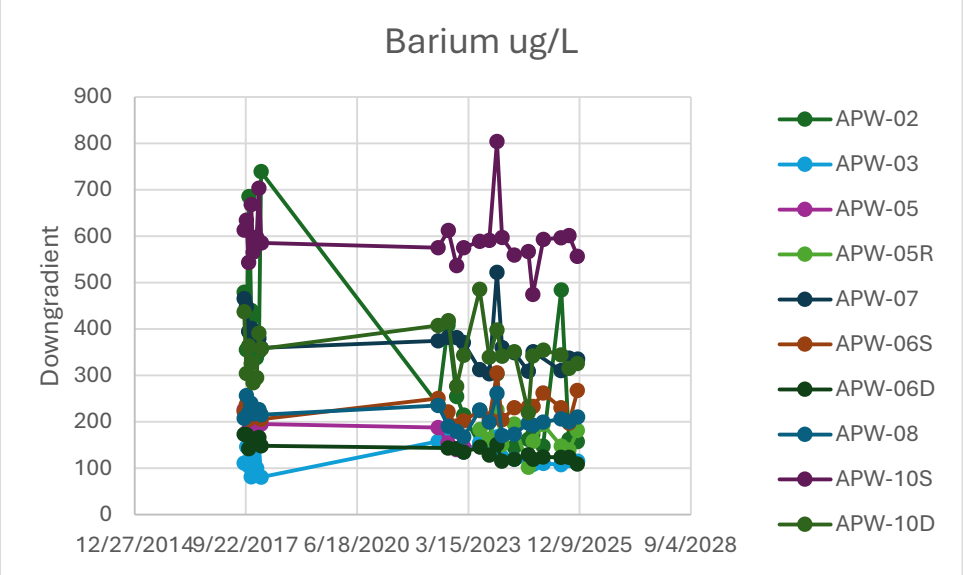

Statistical Analysis - Outlier Evaluation
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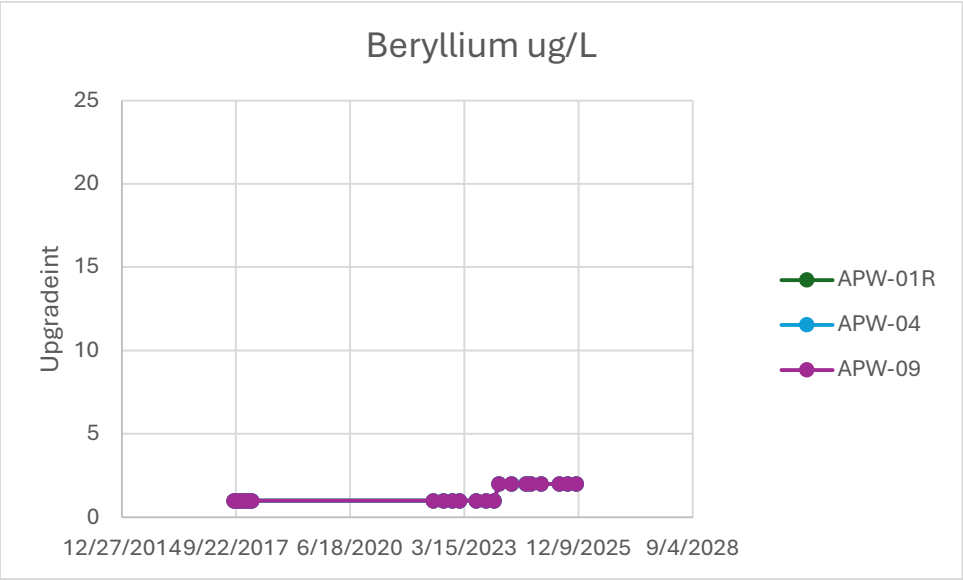

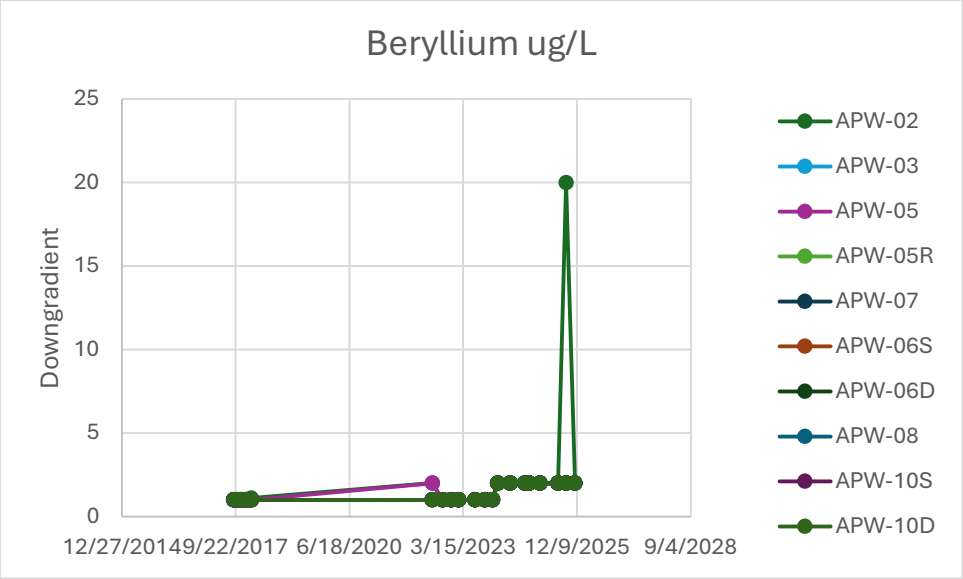

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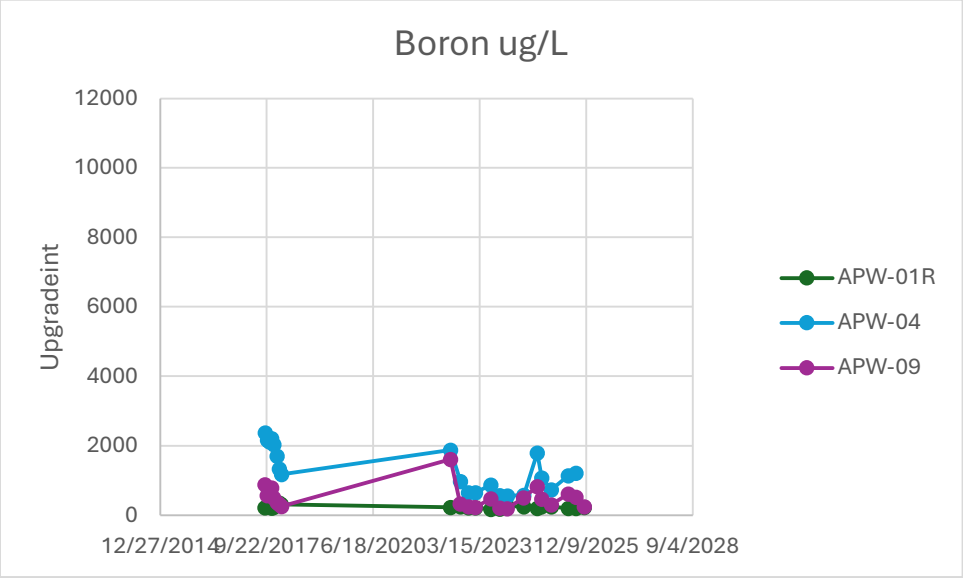

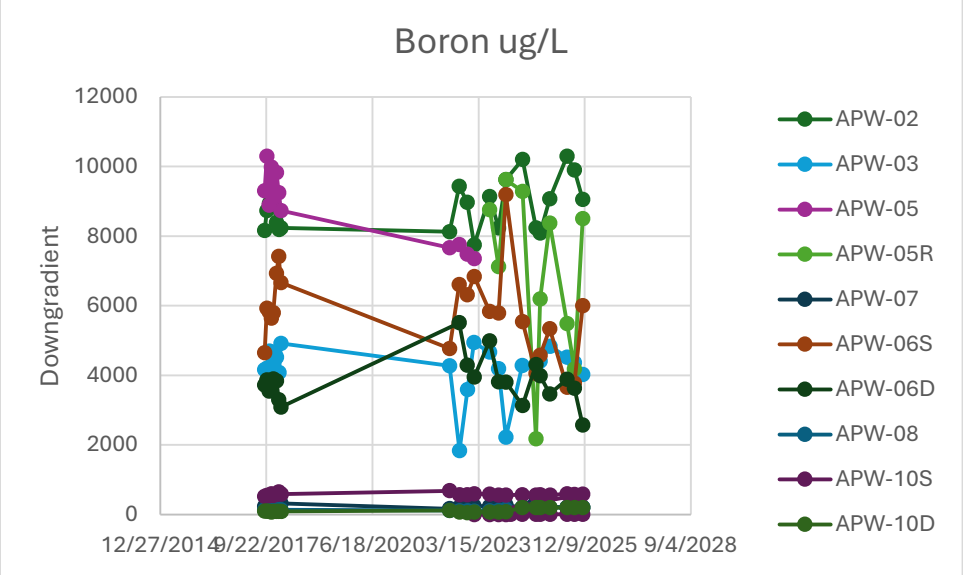

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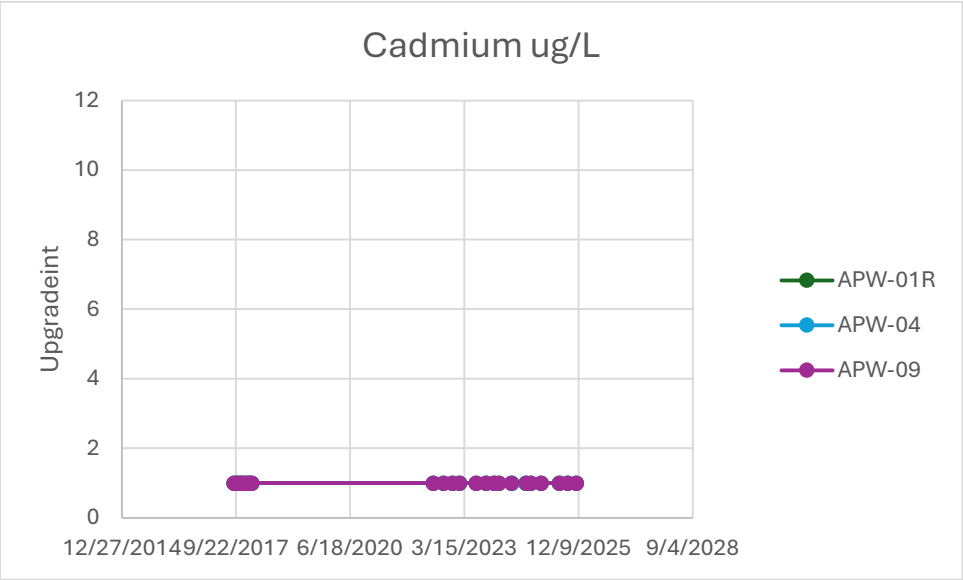

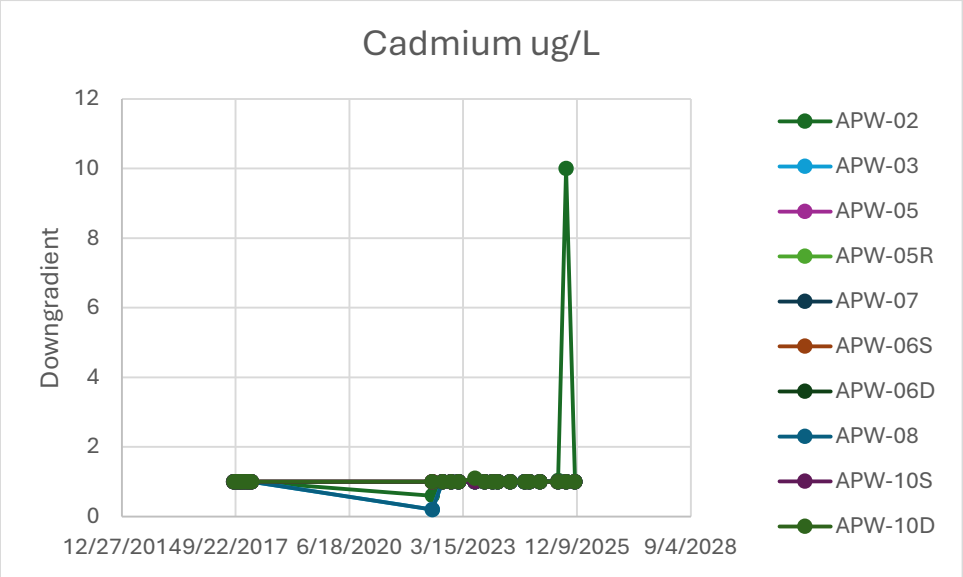

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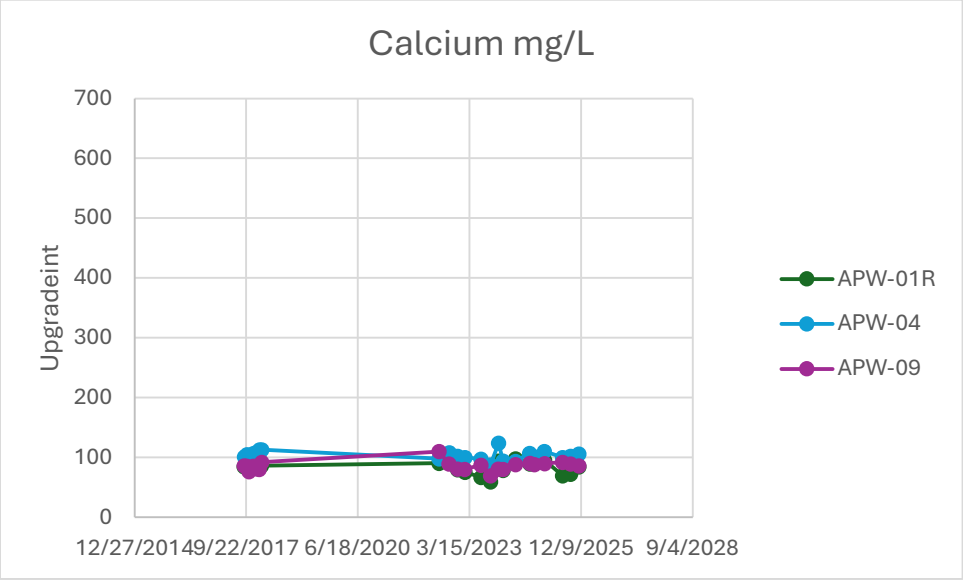

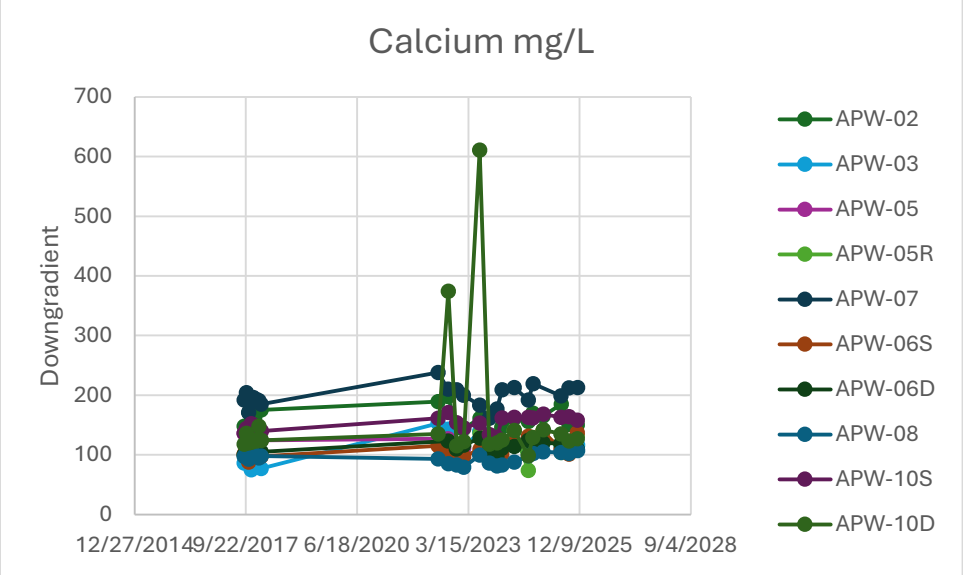

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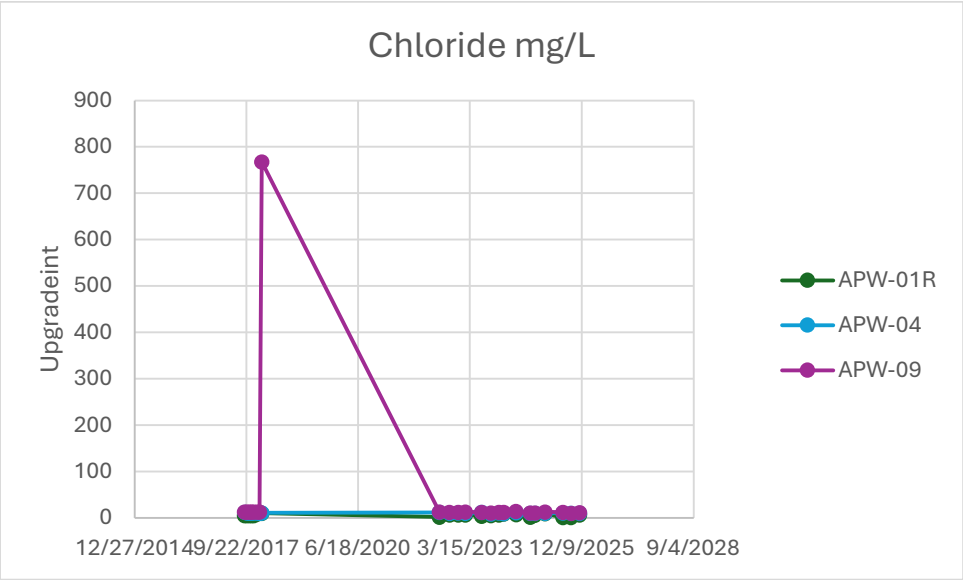

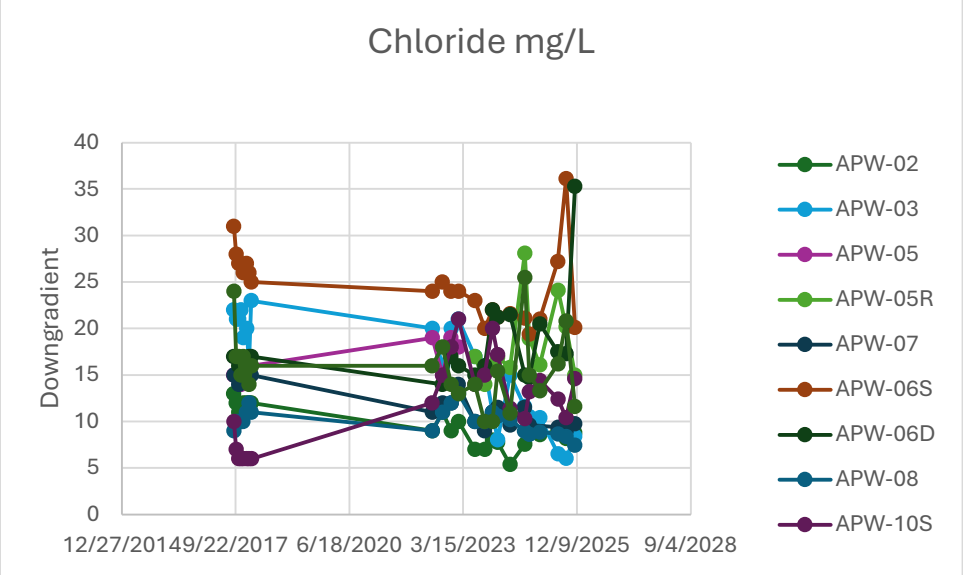

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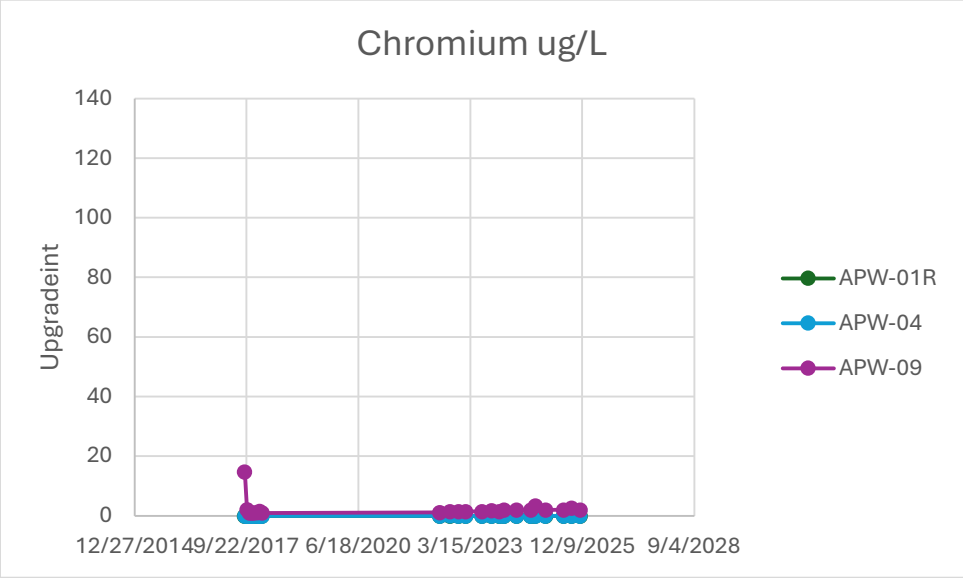

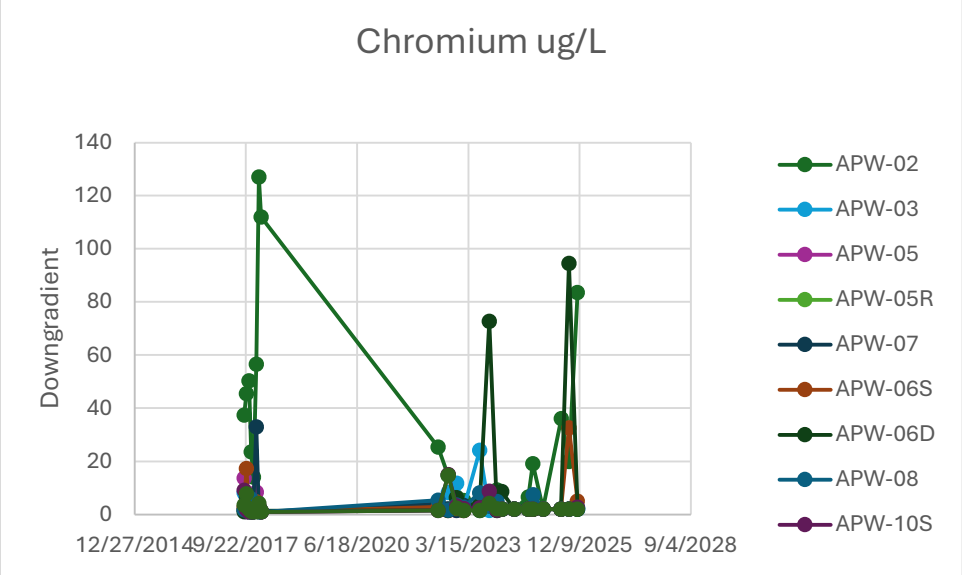

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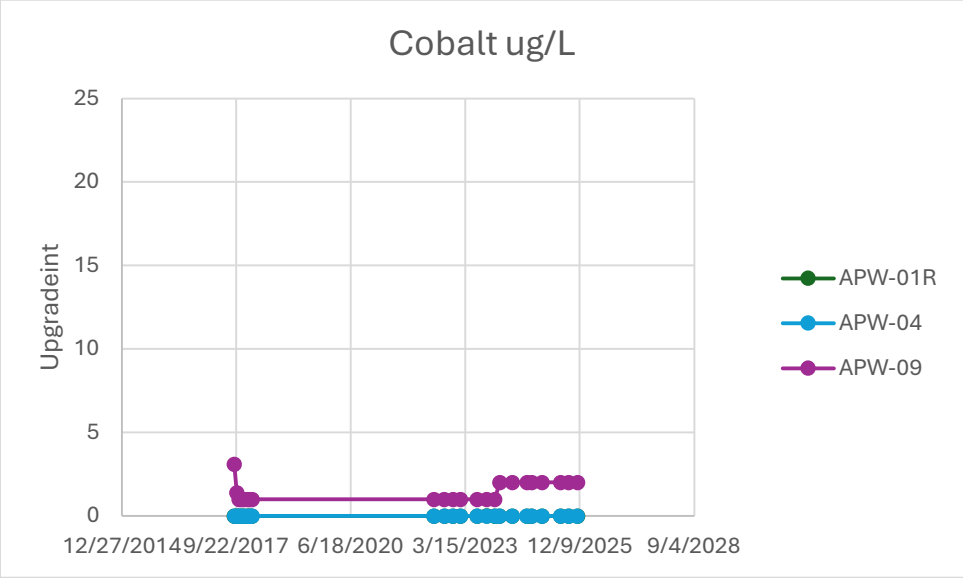

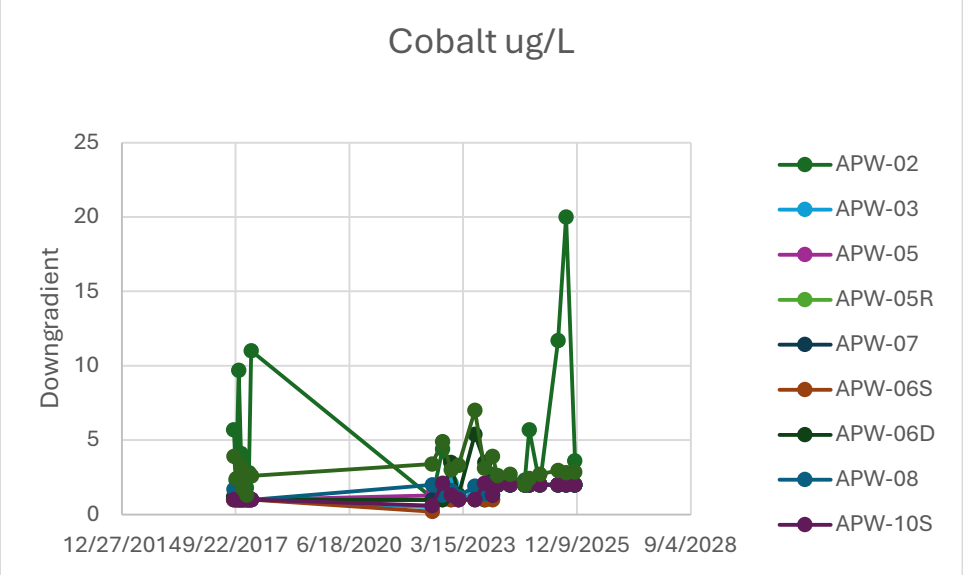

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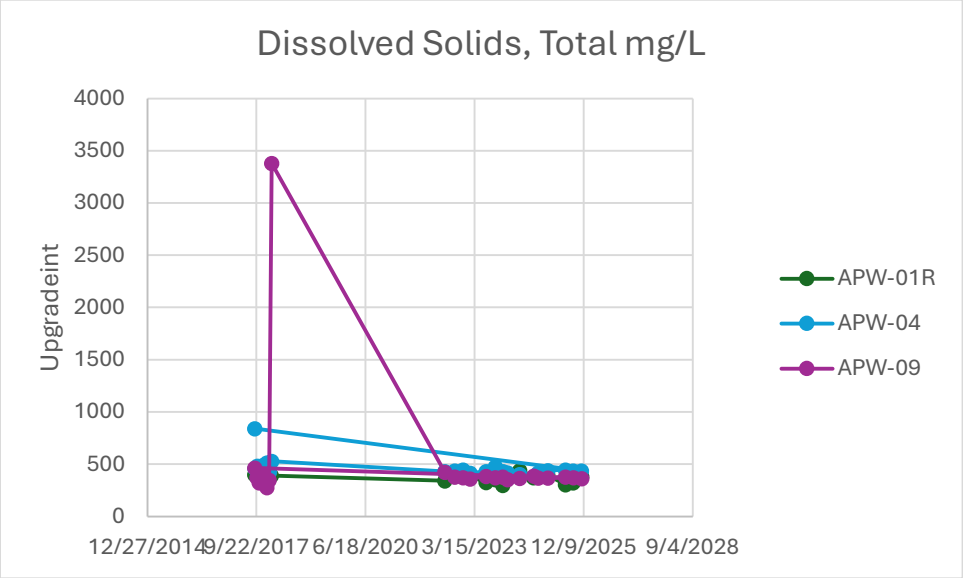

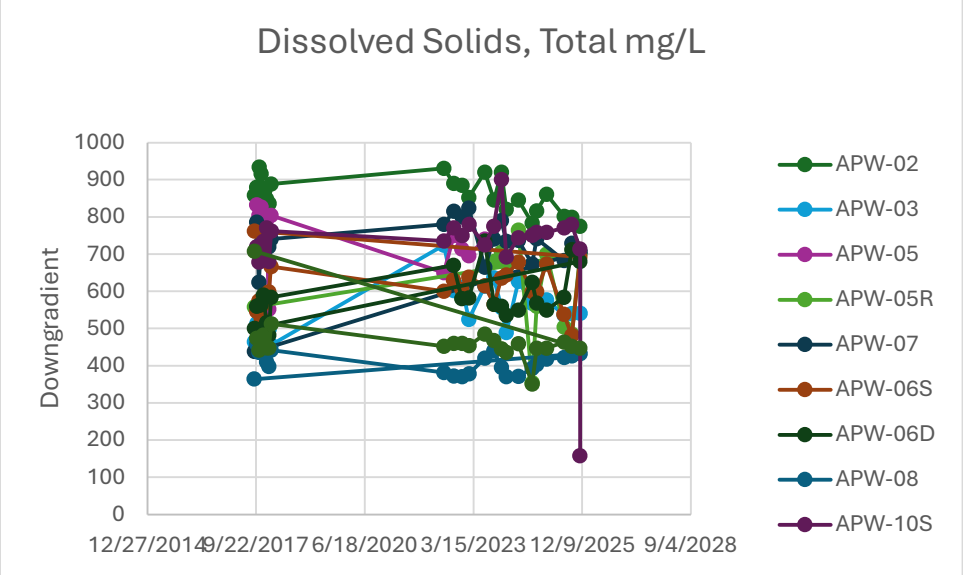

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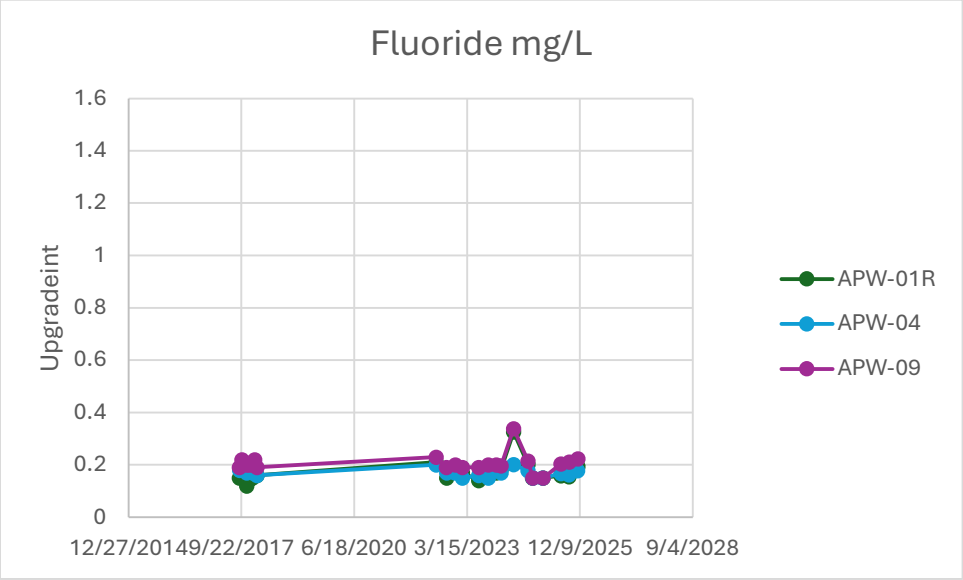

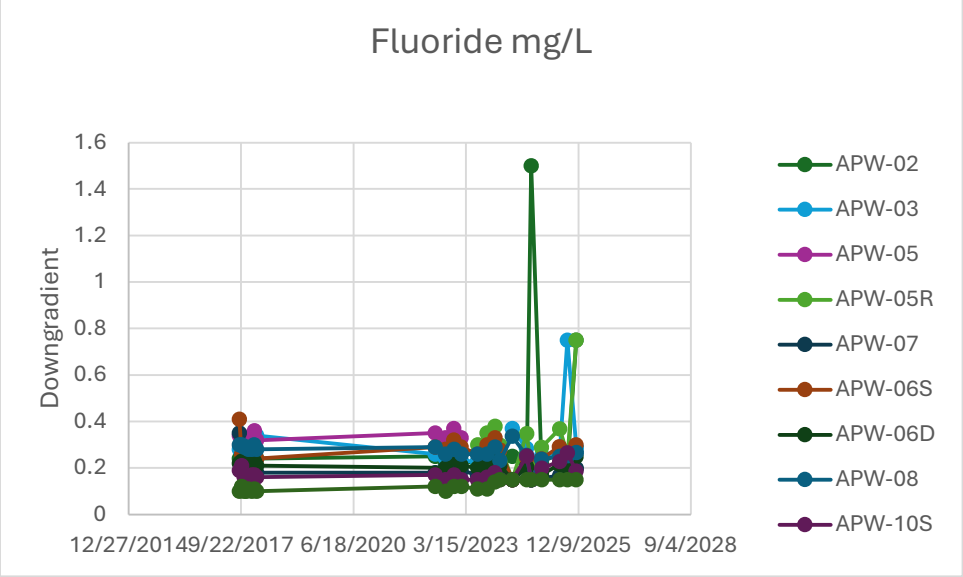

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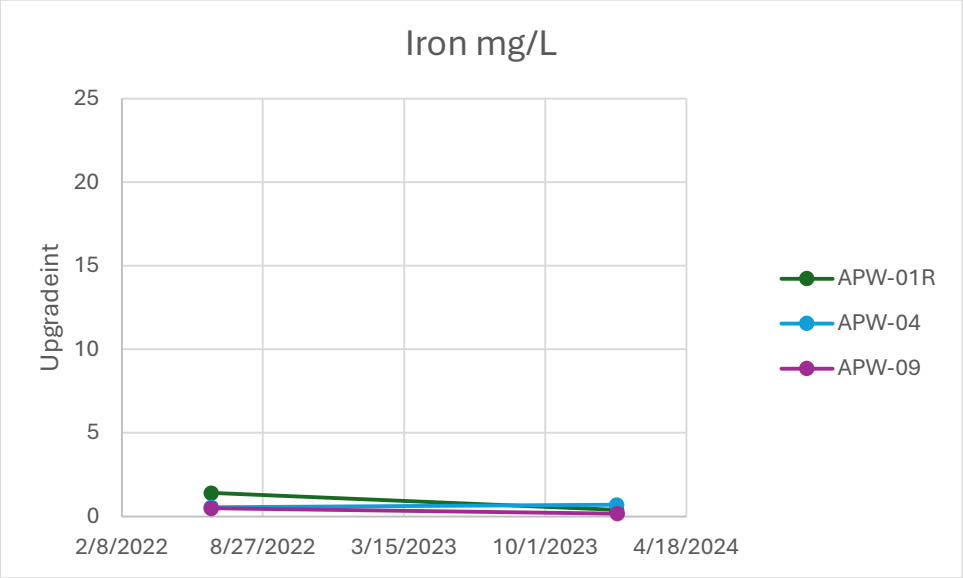

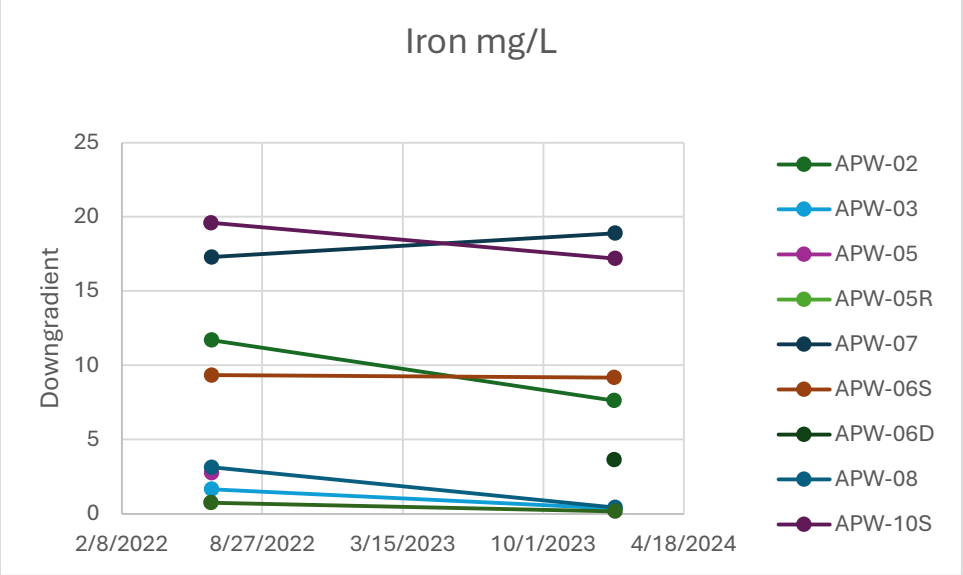

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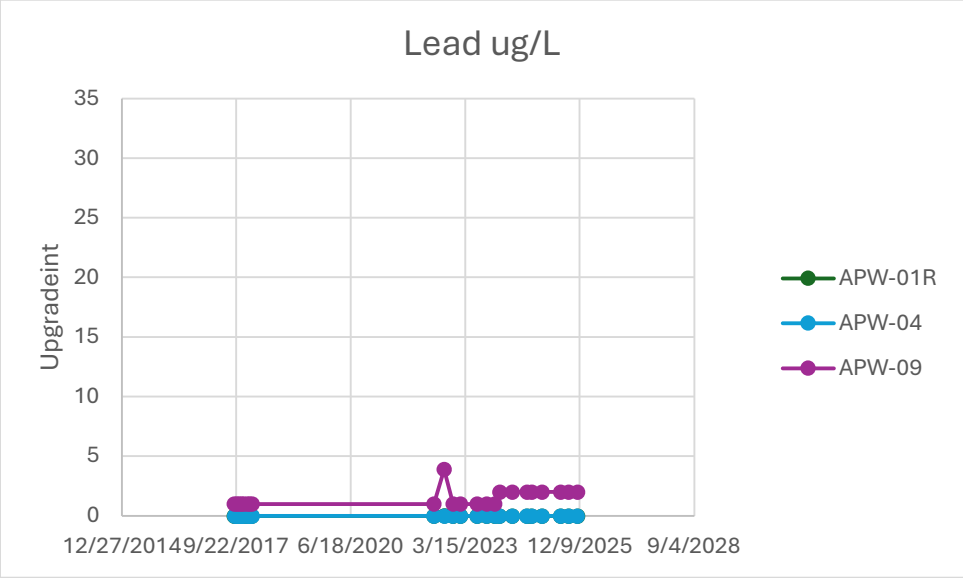

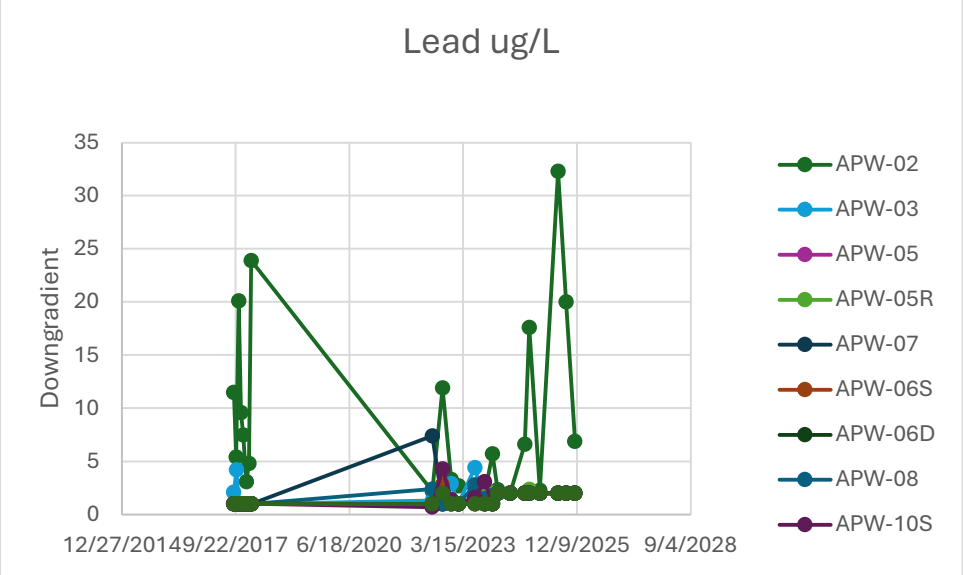

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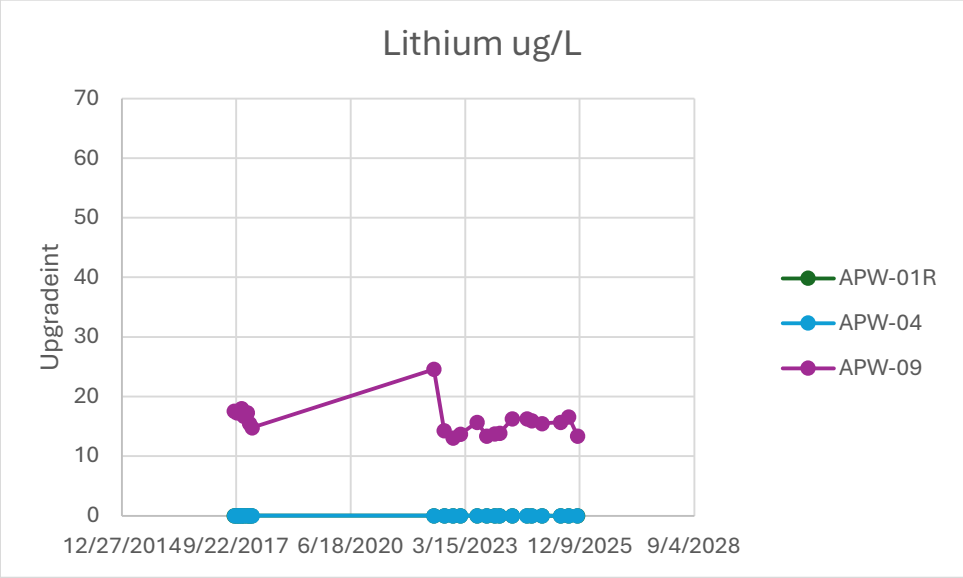

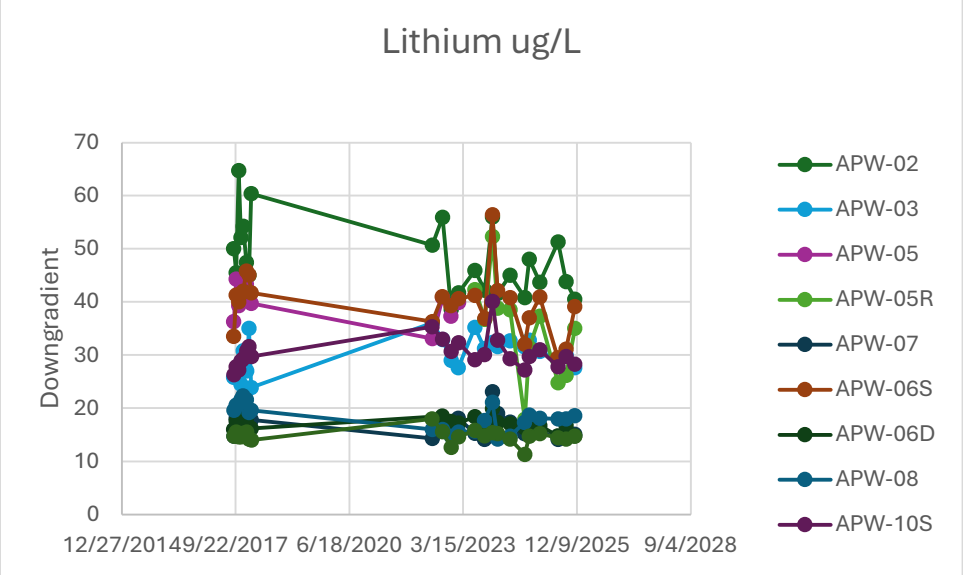

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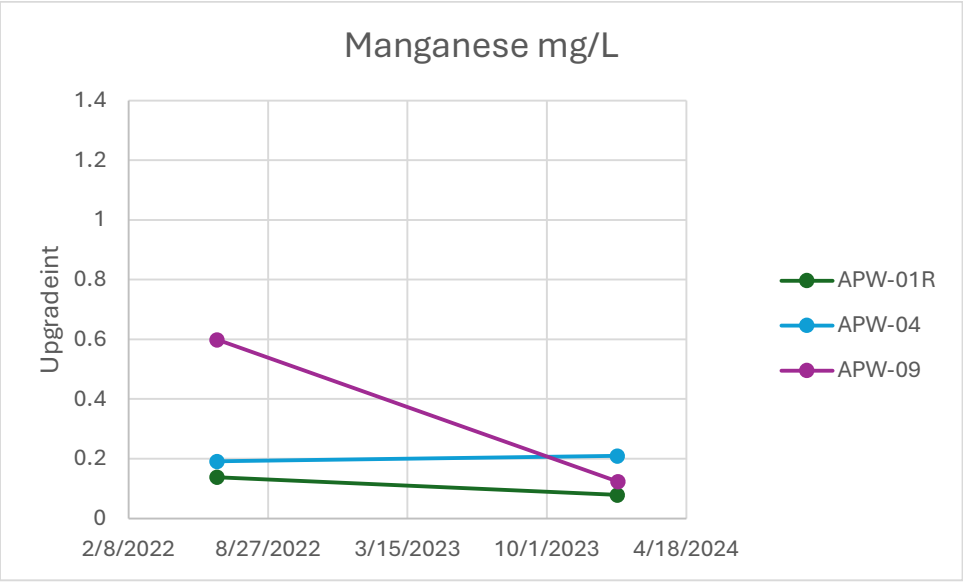

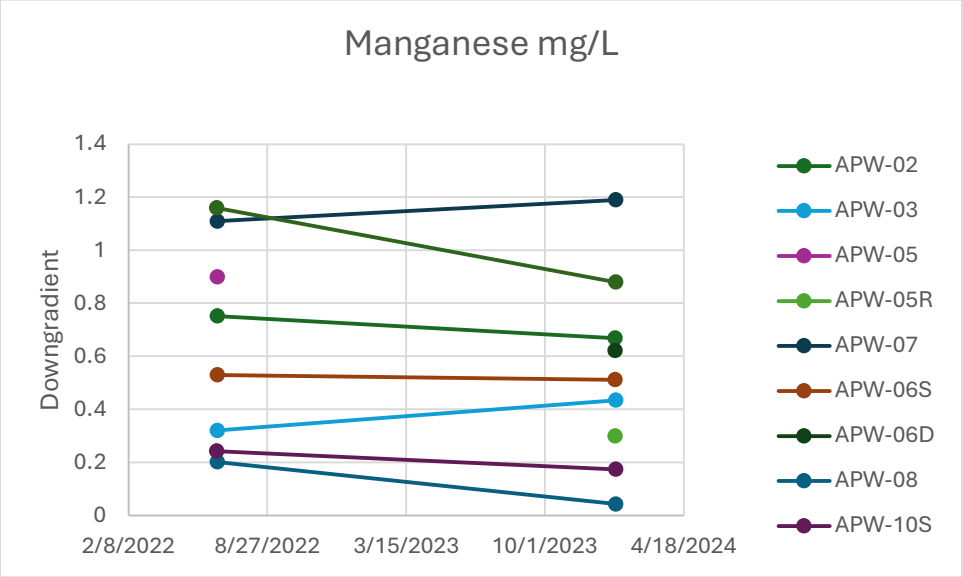

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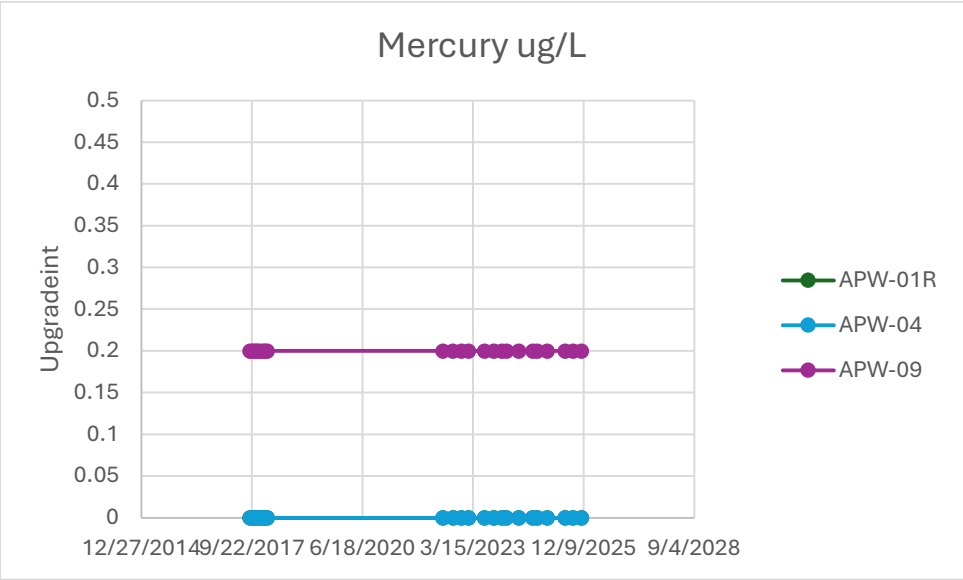

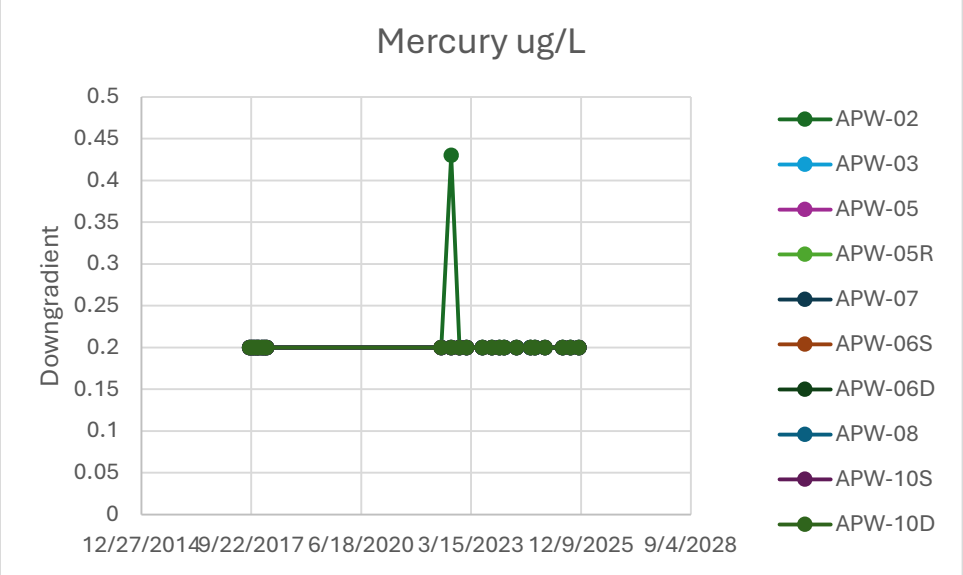

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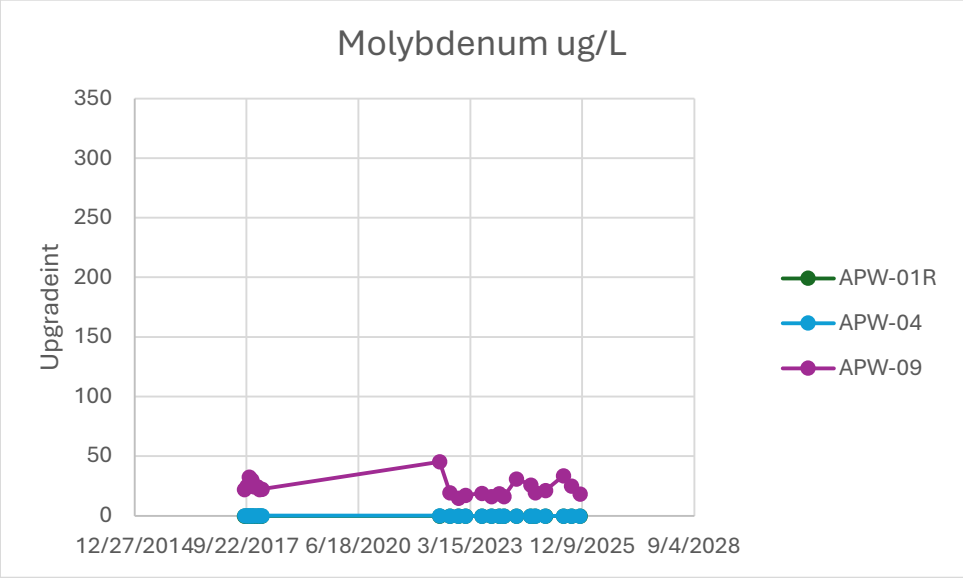
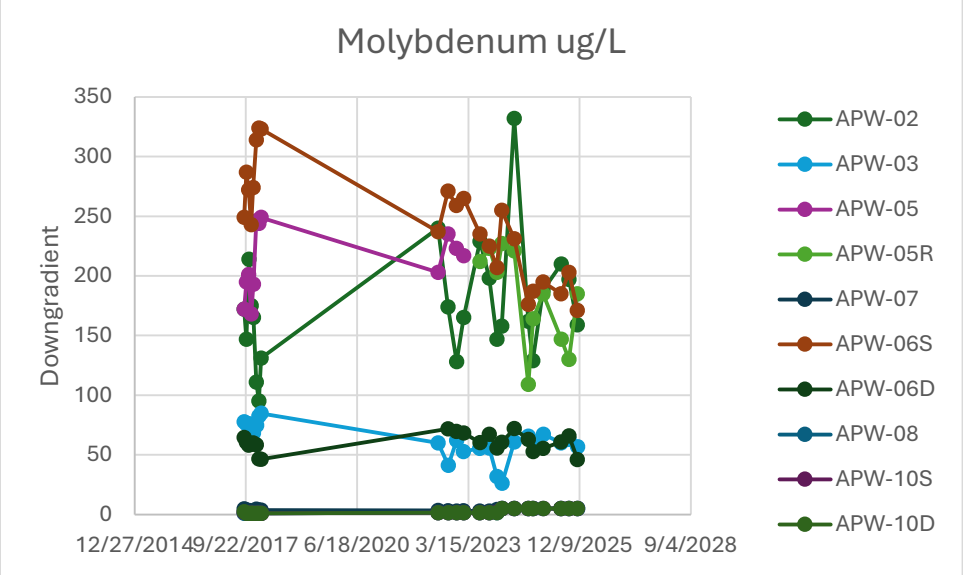
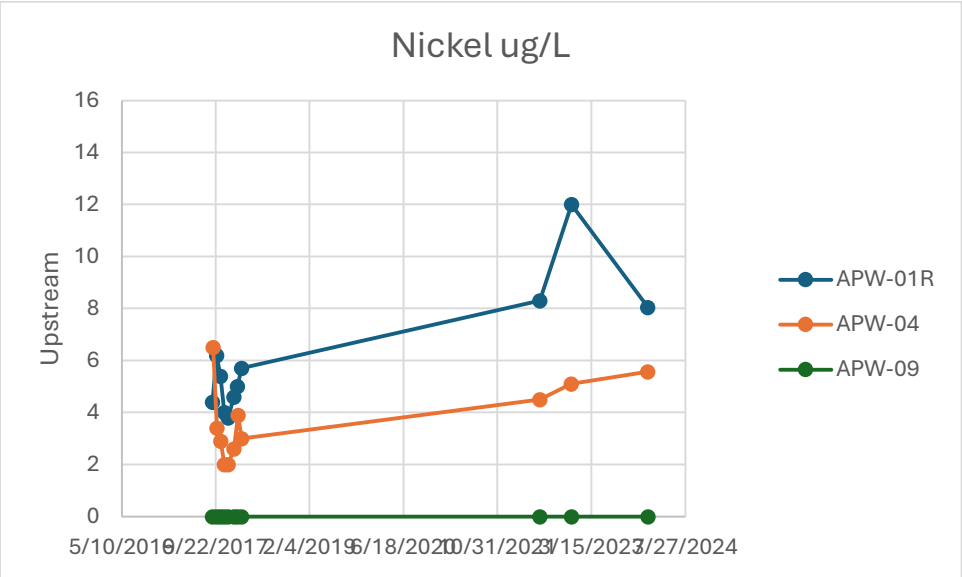
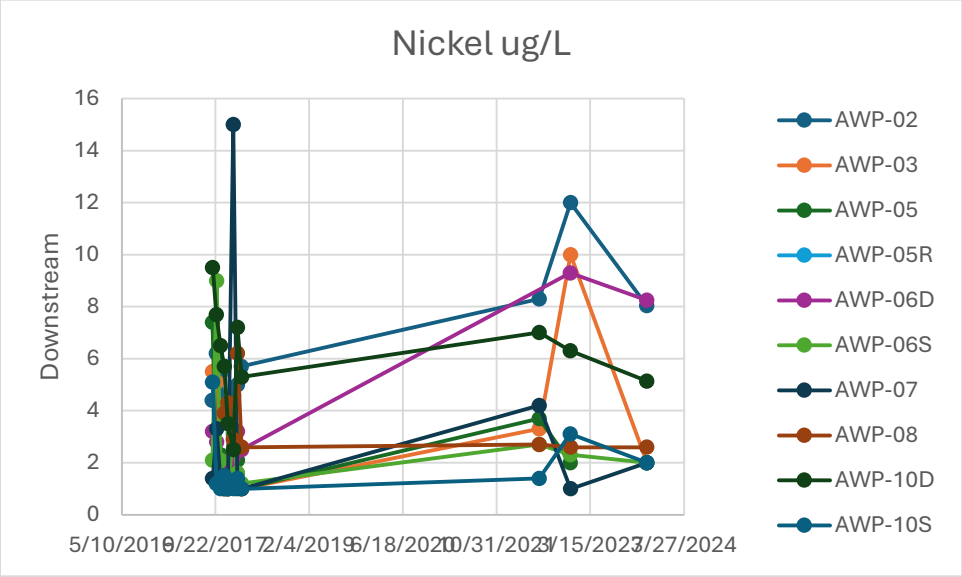


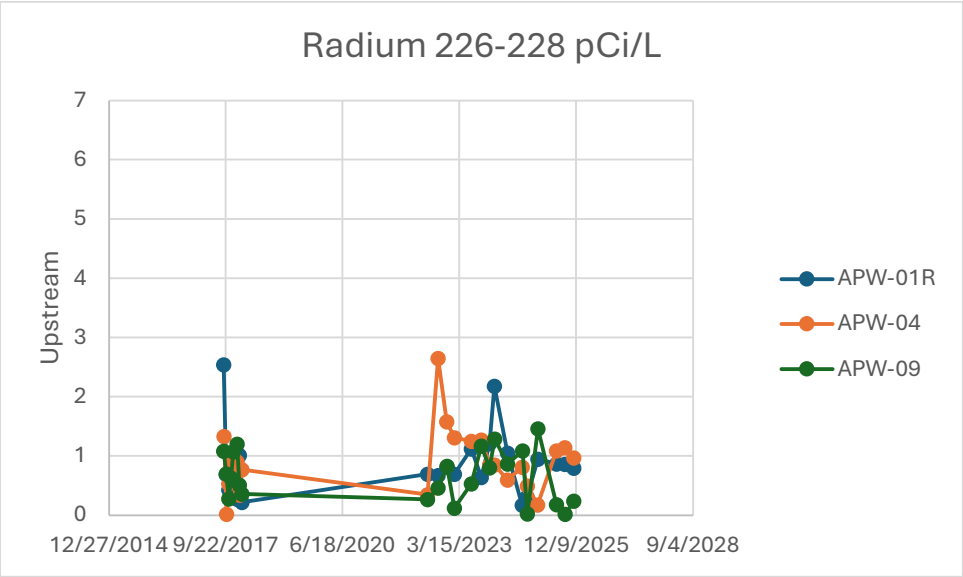


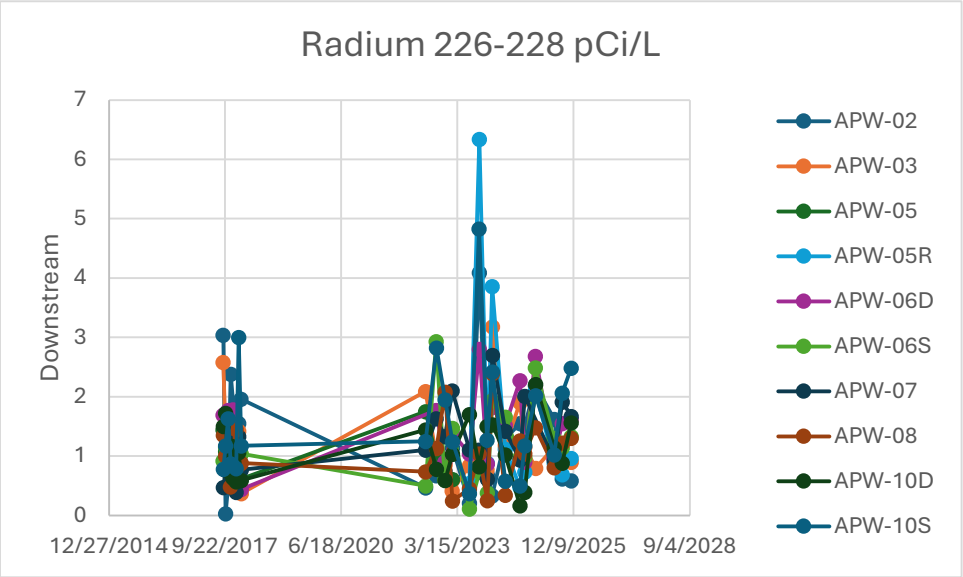
Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots



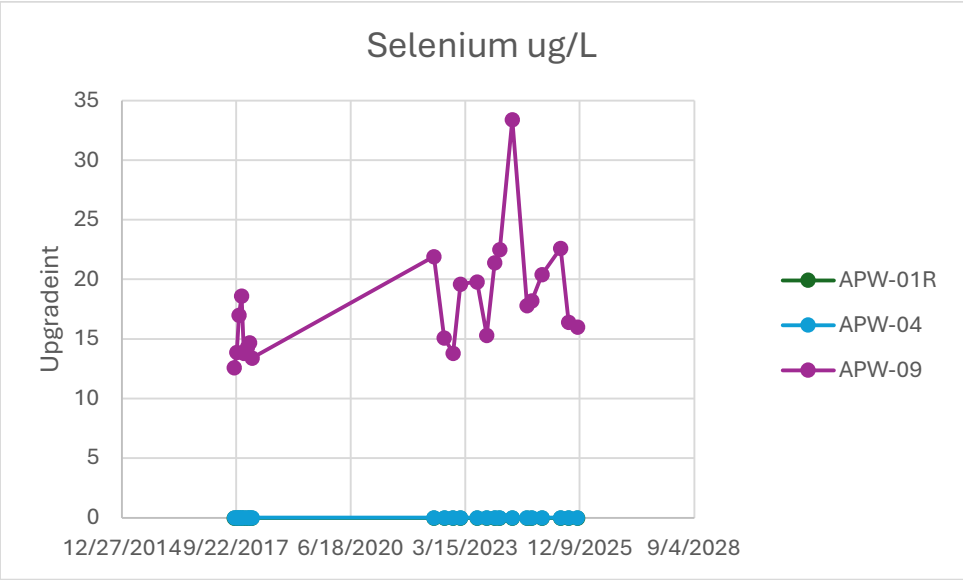


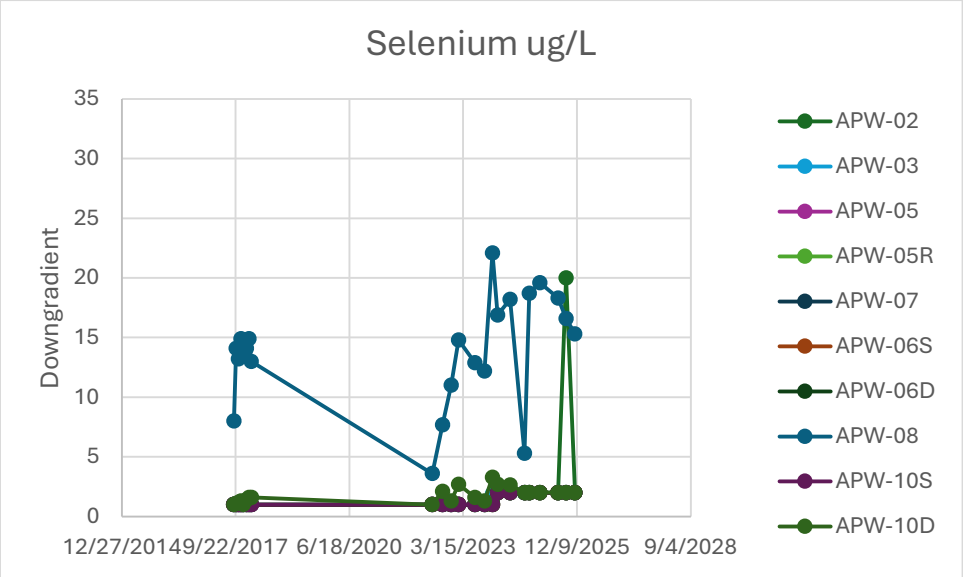
Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots



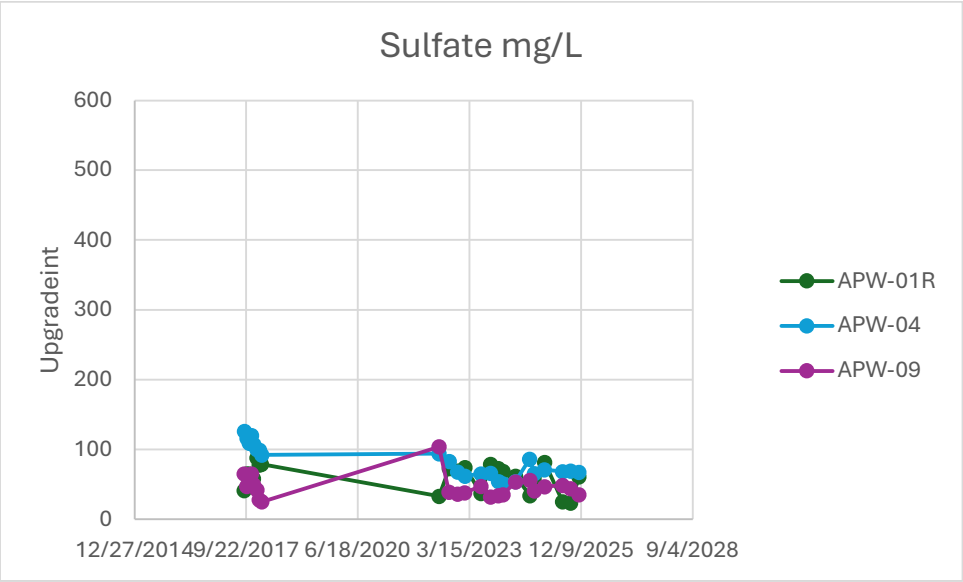


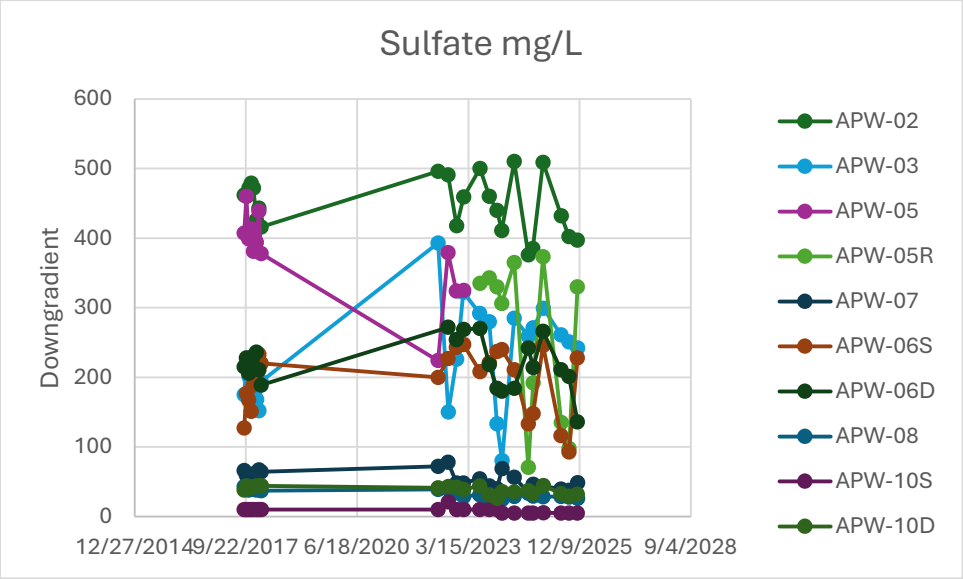
Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots



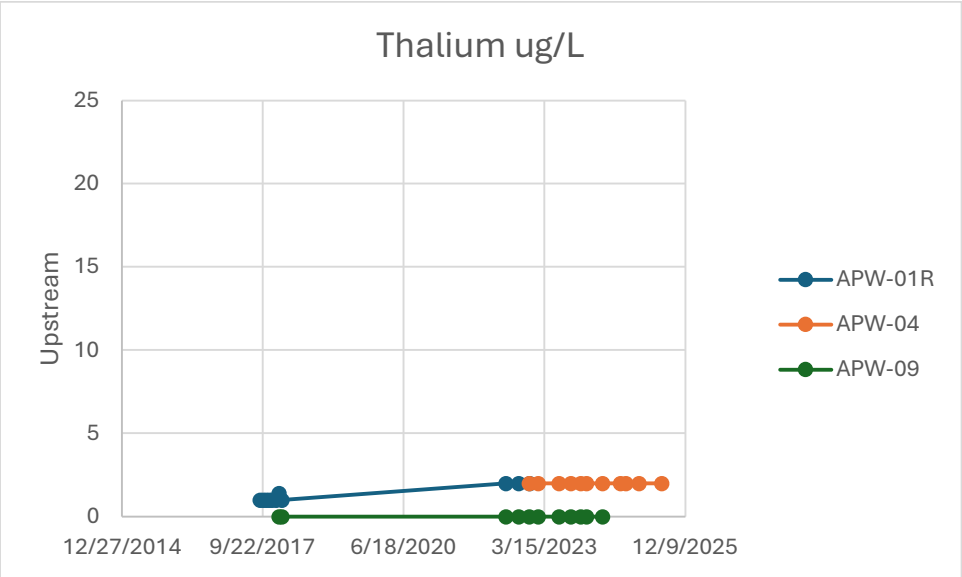


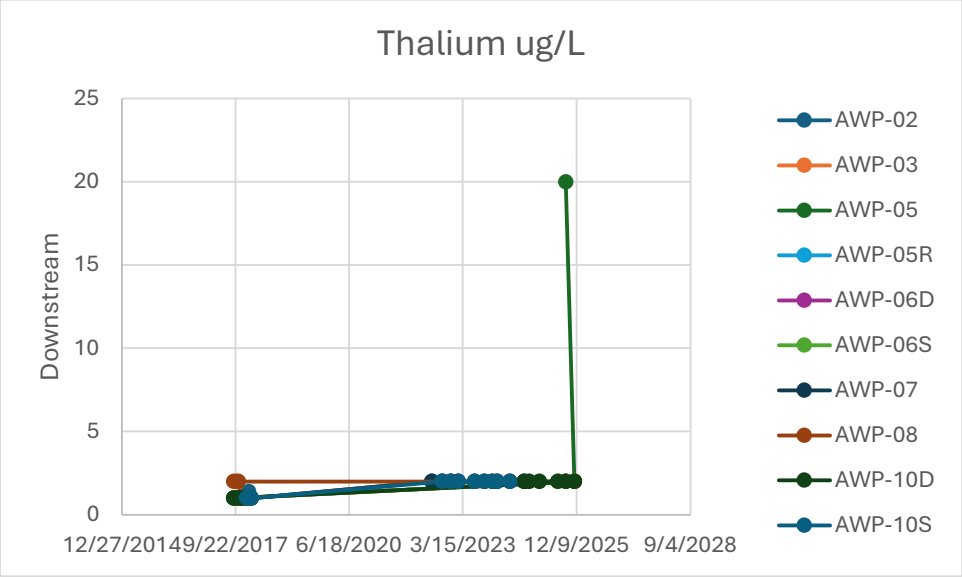
Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots



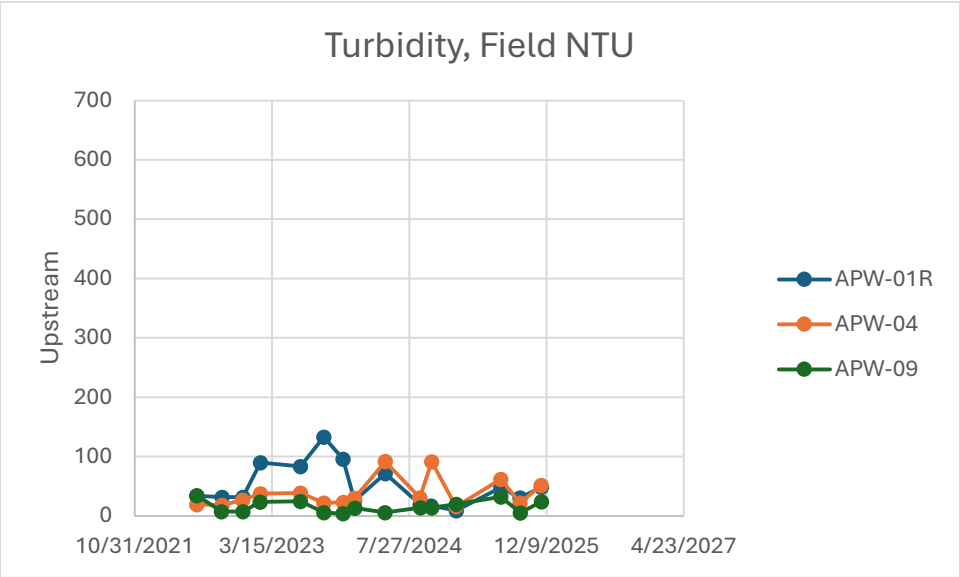


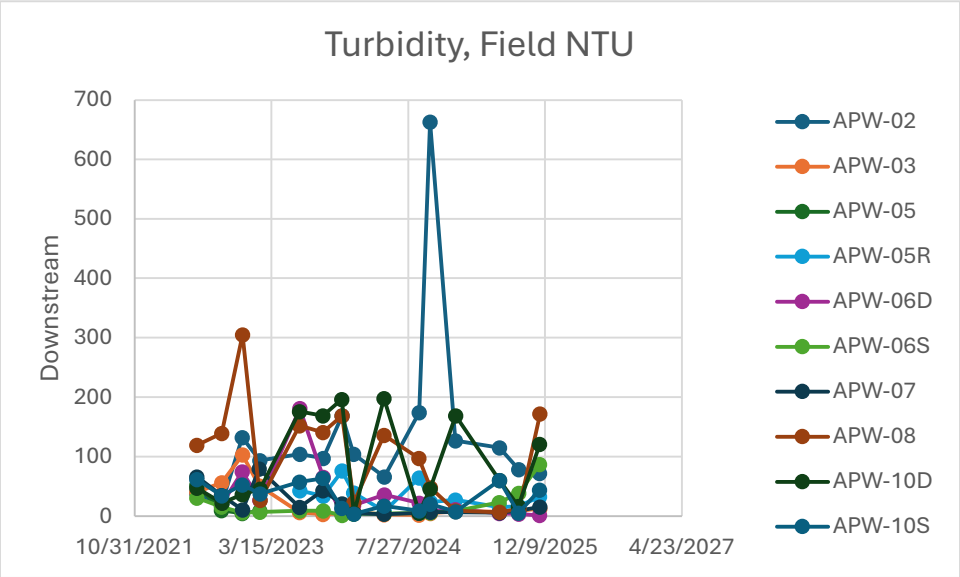
Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots



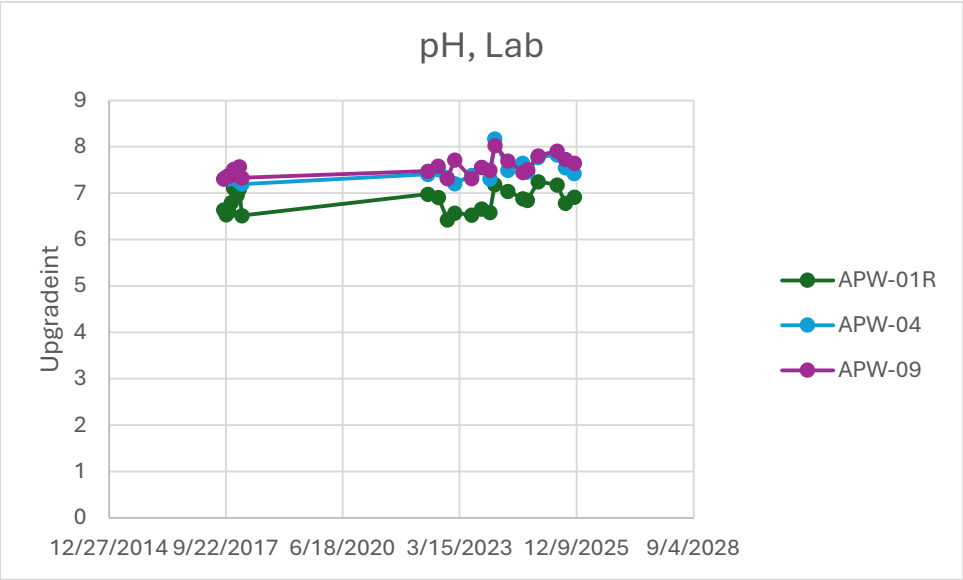


Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots





Statistical Analysis - Outlier Evaluation
Figure F2 – Time-Series Plots



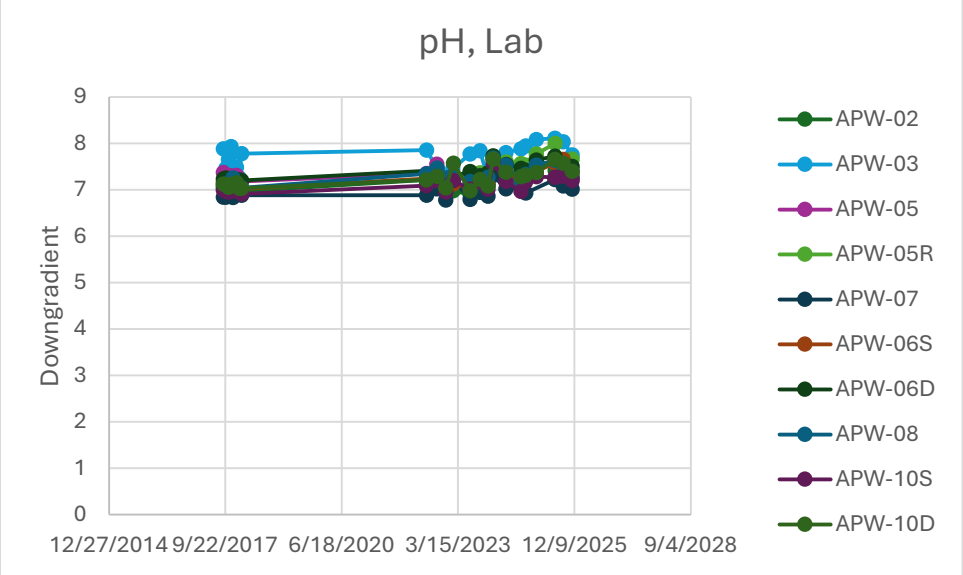


Figure F3 - Mann-Kendall Trend Analysis													
Analyte	**Upgradient**			**Downgradient**									
	APW-01R	AWP-04	AWP-09	AWP-02	AWP-03	AWP-05	AWP-05R	AWP-06D	AWP-06S	AWP-07	AWP-08	AWP-10D	AWP-10S
Antimony													
Arsenic													
Barium													
Beryllium													
Boron													
Cadmium													
Calcium													
Chloride													
Chromium													
Cobalt													
Dissolved Solids, Total													
Fluoride													
Iron													
Lead													
Lithium													
Manganese													
Mercury													
Molybdenum													
Nickel													
pH, Lab													
Radium 226-228													
Selenium													
Sulfate													
Thallium													
Turbidity													

Notes:

Insuficient Data

	< 5 detections
	< 50% detections
	< 5 detections and < 50% detections

Trend

	Increasing
	Decreasing
	Not Significant

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:26:24 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_a.xls
Full Precision	OFF
Confidence Coefficient	0.95

Antimony DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	5
Minimum	6.0000E-4
Maximum	0.004
Mean of Raw Data	0.00204
Standard Deviation of Raw Data	0.00143
Khat	2.302
Theta hat	8.8748E-4
Kstar	2.272
Theta star	8.9937E-4
Mean of Log Transformed Data	-6.426
Standard Deviation of Log Transformed Data	0.663

Normal GOF Test Results

Correlation Coefficient R	0.784
Approximate Shapiro Wilk Test Statistic	0.591
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.411
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.803
A-D Test Statistic	40.17
A-D Critical (0.05) Value	0.765
K-S Test Statistic	0.413
K-S Critical(0.05) Value	0.0638

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.789
Approximate Shapiro Wilk Test Statistic	0.603
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.41
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	202
Number of Missing Observations	3
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.04
Mean of Raw Data	0.00223
Standard Deviation of Raw Data	0.00303
Khat	1.79
Theta hat	0.00125
Kstar	1.767
Theta star	0.00126
Mean of Log Transformed Data	-6.409
Standard Deviation of Log Transformed Data	0.698

Normal GOF Test Results

Correlation Coefficient R	0.533
Approximate Shapiro Wilk Test Statistic	0.341
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.342
Lilliefors Critical (0.05) Value	0.0628

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.644
A-D Test Statistic	33.82
A-D Critical (0.05) Value	0.768
K-S Test Statistic	0.402
K-S Critical(0.05) Value	0.0644

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.787
Approximate Shapiro Wilk Test Statistic	0.62
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.411
Lilliefors Critical (0.05) Value	0.0628

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:31:32 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_c.xls
Full Precision	OFF
Confidence Coefficient	0.95

Arsenig DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	94
Minimum	9.0000E-4
Maximum	0.276
Mean of Raw Data	0.0263
Standard Deviation of Raw Data	0.0609
Khat	0.384
Theta hat	0.0687
Kstar	0.381
Theta star	0.0691
Mean of Log Transformed Data	-5.363
Standard Deviation of Log Transformed Data	1.601

Normal GOF Test Results

Correlation Coefficient R	0.665
Approximate Shapiro Wilk Test Statistic	0.443
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.395
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.889
A-D Test Statistic	29.95
A-D Critical (0.05) Value	0.849
K-S Test Statistic	0.295
K-S Critical(0.05) Value	0.0678

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.893
Approximate Shapiro Wilk Test Statistic	0.776
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.244
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	58
Number of Missing Observations	124
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00197
Standard Deviation of Raw Data	0.00246
Khat	2.904
Theta hat	6.7675E-4
Kstar	2.766
Theta star	7.1070E-4
Mean of Log Transformed Data	-6.414
Standard Deviation of Log Transformed Data	0.47

Normal GOF Test Results

Correlation Coefficient R	0.453
Approximate Shapiro Wilk Test Statistic	0.25
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.477
Lilliefors Critical (0.05) Value	0.116

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.558
A-D Test Statistic	9.03
A-D Critical (0.05) Value	0.758
K-S Test Statistic	0.393
K-S Critical(0.05) Value	0.118

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.754
Approximate Shapiro Wilk Test Statistic	0.602
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.319
Lilliefors Critical (0.05) Value	0.116

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:41:14 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_e.xls
Full Precision	OFF
Confidence Coefficient	0.95

Barium DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	161
Minimum	0.0806
Maximum	0.804
Mean of Raw Data	0.279
Standard Deviation of Raw Data	0.156
Khat	3.719
Theta hat	0.075
Kstar	3.668
Theta star	0.0761
Mean of Log Transformed Data	-1.417
Standard Deviation of Log Transformed Data	0.524

Normal GOF Test Results

Correlation Coefficient R	0.937
Approximate Shapiro Wilk Test Statistic	0.863
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.187
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.984
A-D Test Statistic	3.486
A-D Critical (0.05) Value	0.758
K-S Test Statistic	0.132
K-S Critical(0.05) Value	0.0634

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.987
Approximate Shapiro Wilk Test Statistic	0.951
Approximate Shapiro Wilk P Value	1.6357E-6
Lilliefors Test Statistic	0.0979
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:42:19 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_g.xls
Full Precision	OFF
Confidence Coefficient	0.95

Beryllium DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	4
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00144
Standard Deviation of Raw Data	0.00139
Khat	4.741
Theta hat	3.0468E-4
Kstar	4.675
Theta star	3.0899E-4
Mean of Log Transformed Data	-6.649
Standard Deviation of Log Transformed Data	0.383

Normal GOF Test Results

Correlation Coefficient R	0.446
Approximate Shapiro Wilk Test Statistic	0.255
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.374
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.525
A-D Test Statistic	4.878E+28
A-D Critical (0.05) Value	0.756
K-S Test Statistic	0.364
K-S Critical(0.05) Value	0.0632

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.761
Approximate Shapiro Wilk Test Statistic	0.603
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.389
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	204
Number of Missing Observations	1
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00145
Standard Deviation of Raw Data	0.00139
Khat	4.725
Theta hat	3.0603E-4
Kstar	4.659
Theta star	3.1038E-4
Mean of Log Transformed Data	-6.648
Standard Deviation of Log Transformed Data	0.383

Normal GOF Test Results

Correlation Coefficient R	0.446
Approximate Shapiro Wilk Test Statistic	0.255
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.374
Lilliefors Critical (0.05) Value	0.0625

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.525
A-D Test Statistic	4.902E+28
A-D Critical (0.05) Value	0.756
K-S Test Statistic	0.367
K-S Critical(0.05) Value	0.0634

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.76
Approximate Shapiro Wilk Test Statistic	0.602
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.393
Lilliefors Critical (0.05) Value	0.0625

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:43:46 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_i.xls
Full Precision	OFF
Confidence Coefficient	0.95

Boron DG

ResultValue

Raw Statistics

Number of Valid Observations	196
Number of Distinct Observations	171
Minimum	0.0522
Maximum	10.3
Mean of Raw Data	3.539
Standard Deviation of Raw Data	3.398
Khat	0.631
Theta hat	5.606
Kstar	0.625
Theta star	5.662
Mean of Log Transformed Data	0.292
Standard Deviation of Log Transformed Data	1.715

Normal GOF Test Results

Correlation Coefficient R	0.926
Approximate Shapiro Wilk Test Statistic	0.826
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.244
Lilliefors Critical (0.05) Value	0.0637

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.872
A-D Test Statistic	9.861
A-D Critical (0.05) Value	0.808
K-S Test Statistic	0.181
K-S Critical(0.05) Value	0.0678

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.928
Approximate Shapiro Wilk Test Statistic	0.832
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.23
Lilliefors Critical (0.05) Value	0.0637

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	196
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	15
Number of Missing Observations	155
Number of Distinct Observations	1
Minimum	0.2
Maximum	0.2

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable ReportingLimit was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:45:24 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_k.xls
Full Precision	OFF
Confidence Coefficient	0.95

Cadmium DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	6
Minimum	2.0000E-4
Maximum	0.01
Mean of Raw Data	0.00103
Standard Deviation of Raw Data	6.3479E-4
Khat	12.5
Theta hat	8.2804E-5
Kstar	12.32
Theta star	8.4012E-5
Mean of Log Transformed Data	-6.914
Standard Deviation of Log Transformed Data	0.23

Normal GOF Test Results

Correlation Coefficient R	0.233
Approximate Shapiro Wilk Test Statistic	0.0955
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.507
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.276
A-D Test Statistic	4.878E+28
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.496
K-S Critical(0.05) Value	0.063

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.345
Approximate Shapiro Wilk Test Statistic	0.181
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.496
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	200
Number of Missing Observations	5
Number of Distinct Observations	2
Minimum	0.001
Maximum	0.01
Mean of Raw Data	0.00105
Standard Deviation of Raw Data	6.3640E-4
Khat	15.55
Theta hat	6.7213E-5
Kstar	15.32
Theta star	6.8222E-5
Mean of Log Transformed Data	-6.896
Standard Deviation of Log Transformed Data	0.163

Normal GOF Test Results

Correlation Coefficient R	0.196
Approximate Shapiro Wilk Test Statistic	0.071
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.523
Lilliefors Critical (0.05) Value	0.0631

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.242
A-D Test Statistic	5.000E+28
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.53
K-S Critical(0.05) Value	0.0635

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.196
Approximate Shapiro Wilk Test Statistic	0.071
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.523
Lilliefors Critical (0.05) Value	0.0631

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:46:20 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_m.xls
Full Precision	OFF
Confidence Coefficient	0.95

Calcium DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	113
Minimum	74
Maximum	611
Mean of Raw Data	134.3
Standard Deviation of Raw Data	50.25
Khat	11.39
Theta hat	11.79
Kstar	11.23
Theta star	11.96
Mean of Log Transformed Data	4.856
Standard Deviation of Log Transformed Data	0.279

Normal GOF Test Results

Correlation Coefficient R	0.808
Approximate Shapiro Wilk Test Statistic	0.701
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.143
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.857
A-D Test Statistic	3.189
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.0925
K-S Critical(0.05) Value	0.063

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.964
Approximate Shapiro Wilk Test Statistic	0.943
Approximate Shapiro Wilk P Value	1.1273E-8
Lilliefors Test Statistic	0.0758
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Qualifier

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	191
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Qualifier was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:47:41 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_o.xls
Full Precision	OFF
Confidence Coefficient	0.95

Chloride DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	83
Minimum	5.38
Maximum	36.1
Mean of Raw Data	14.99
Standard Deviation of Raw Data	5.791
Khat	6.933
Theta hat	2.162
Kstar	6.835
Theta star	2.193
Mean of Log Transformed Data	2.633
Standard Deviation of Log Transformed Data	0.39

Normal GOF Test Results

Correlation Coefficient R	0.977
Approximate Shapiro Wilk Test Statistic	0.942
Approximate Shapiro Wilk P Value	4.5502E-9
Lilliefors Test Statistic	0.0988
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.996
A-D Test Statistic	0.752
A-D Critical (0.05) Value	0.754
K-S Test Statistic	0.0685
K-S Critical(0.05) Value	0.0631

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.995
Approximate Shapiro Wilk Test Statistic	0.972
Approximate Shapiro Wilk P Value	0.0311
Lilliefors Test Statistic	0.0931
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	1
Number of Missing Observations	15
Number of Distinct Observations	1
Minimum	10
Maximum	10

Warning: This data set only has 1 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable ReportingLimit was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:49:59 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_q.xls
Full Precision	OFF
Confidence Coefficient	0.95

Chromium DG

ResultValue

Raw Statistics

Number of Valid Observations	204
Number of Distinct Observations	80
Minimum	0.001
Maximum	0.127
Mean of Raw Data	0.00719
Standard Deviation of Raw Data	0.0169
Khat	0.688
Theta hat	0.0105
Kstar	0.681
Theta star	0.0106
Mean of Log Transformed Data	-5.816
Standard Deviation of Log Transformed Data	1.05

Normal GOF Test Results

Correlation Coefficient R	0.608
Approximate Shapiro Wilk Test Statistic	0.393
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.357
Lilliefors Critical (0.05) Value	0.0625

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.88
A-D Test Statistic	26.4
A-D Critical (0.05) Value	0.802
K-S Test Statistic	0.29
K-S Critical(0.05) Value	0.066

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.9
Approximate Shapiro Wilk Test Statistic	0.798
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.234
Lilliefors Critical (0.05) Value	0.0625

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	204
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	99
Number of Missing Observations	103
Number of Distinct Observations	4
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00183
Standard Deviation of Raw Data	0.0019
Khat	4.246
Theta hat	4.3179E-4
Kstar	4.124
Theta star	4.4456E-4
Mean of Log Transformed Data	-6.424
Standard Deviation of Log Transformed Data	0.394

Normal GOF Test Results

Correlation Coefficient R	0.438
Approximate Shapiro Wilk Test Statistic	0.243
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.455
Lilliefors Critical (0.05) Value	0.0893

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.513
A-D Test Statistic	11.73
A-D Critical (0.05) Value	0.756
K-S Test Statistic	0.356
K-S Critical(0.05) Value	0.0902

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.786
Approximate Shapiro Wilk Test Statistic	0.655
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.287
Lilliefors Critical (0.05) Value	0.0893

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:51:22 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_s.xls
Full Precision	OFF
Confidence Coefficient	0.95

Cobalt DG

ResultValue

Raw Statistics

Number of Valid Observations	204
Number of Distinct Observations	46
Minimum	2.0000E-4
Maximum	0.0117
Mean of Raw Data	0.0019
Standard Deviation of Raw Data	0.00147
Khat	3.107
Theta hat	6.1098E-4
Kstar	3.065
Theta star	6.1944E-4
Mean of Log Transformed Data	-6.436
Standard Deviation of Log Transformed Data	0.541

Normal GOF Test Results

Correlation Coefficient R	0.769
Approximate Shapiro Wilk Test Statistic	0.615
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.272
Lilliefors Critical (0.05) Value	0.0625

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.881
A-D Test Statistic	11.51
A-D Critical (0.05) Value	0.76
K-S Test Statistic	0.192
K-S Critical(0.05) Value	0.0636

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.929
Approximate Shapiro Wilk Test Statistic	0.878
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.205
Lilliefors Critical (0.05) Value	0.0625

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	204
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	133
Number of Missing Observations	71
Number of Distinct Observations	2
Minimum	0.001
Maximum	0.002
Mean of Raw Data	0.00144
Standard Deviation of Raw Data	4.9777E-4
Khat	8.546
Theta hat	1.6805E-4
Kstar	8.358
Theta star	1.7183E-4
Mean of Log Transformed Data	-6.605
Standard Deviation of Log Transformed Data	0.345

Normal GOF Test Results

Correlation Coefficient R	0.798
Approximate Shapiro Wilk Test Statistic	0.608
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.373
Lilliefors Critical (0.05) Value	0.0772

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.799
A-D Test Statistic	24.41
A-D Critical (0.05) Value	0.753
K-S Test Statistic	0.375
K-S Critical(0.05) Value	0.0809

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.798
Approximate Shapiro Wilk Test Statistic	0.608
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.373
Lilliefors Critical (0.05) Value	0.0772

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 6:52:31 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_u.xls
Full Precision	OFF
Confidence Coefficient	0.95

Dissolved Solids DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	159
Minimum	351
Maximum	934
Mean of Raw Data	626.3
Standard Deviation of Raw Data	151
Khat	16.71
Theta hat	37.48
Kstar	16.47
Theta star	38.03
Mean of Log Transformed Data	6.41
Standard Deviation of Log Transformed Data	0.25

Normal GOF Test Results

Correlation Coefficient R	0.984
Approximate Shapiro Wilk Test Statistic	0.941
Approximate Shapiro Wilk P Value	2.3058E-9
Lilliefors Test Statistic	0.0821
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.98
A-D Test Statistic	2.345
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.0879
K-S Critical(0.05) Value	0.0629

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.982
Approximate Shapiro Wilk Test Statistic	0.938
Approximate Shapiro Wilk P Value	2.368E-10
Lilliefors Test Statistic	0.0978
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Qualifier

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	195
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Qualifier was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:08:53 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_w.xls
Full Precision	OFF
Confidence Coefficient	0.95

Fluoride DG

ResultValue

Raw Statistics

Number of Valid Observations	198
Number of Distinct Observations	65
Minimum	0.1
Maximum	0.41
Mean of Raw Data	0.23
Standard Deviation of Raw Data	0.0673
Khat	10.83
Theta hat	0.0212
Kstar	10.67
Theta star	0.0215
Mean of Log Transformed Data	-1.518
Standard Deviation of Log Transformed Data	0.317

Normal GOF Test Results

Correlation Coefficient R	0.994
Approximate Shapiro Wilk Test Statistic	0.967
Approximate Shapiro Wilk P Value	0.00765
Lilliefors Test Statistic	0.0589
Lilliefors Critical (0.05) Value	0.0634

Data appear Approximate Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.988
A-D Test Statistic	1.362
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.082
K-S Critical(0.05) Value	0.0641

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.982
Approximate Shapiro Wilk Test Statistic	0.943
Approximate Shapiro Wilk P Value	1.9774E-8
Lilliefors Test Statistic	0.0973
Lilliefors Critical (0.05) Value	0.0634

Data not Lognormal at (0.05) Significance Level

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	198
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	18
Number of Missing Observations	173
Number of Distinct Observations	2
Minimum	0.1
Maximum	0.15
Mean of Raw Data	0.144
Standard Deviation of Raw Data	0.0162
Khat	68.55
Theta hat	0.00211
Kstar	57.16
Theta star	0.00253
Mean of Log Transformed Data	-1.942
Standard Deviation of Log Transformed Data	0.131

Normal GOF Test Results

Correlation Coefficient R	0.6
Shapiro Wilk Test Statistic	0.373
Shapiro Wilk Critical (0.05) Value	0.897
Approximate Shapiro Wilk P Value	3.1421E-9
Lilliefors Test Statistic	0.523
Lilliefors Critical (0.05) Value	0.202

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.573
A-D Test Statistic	5.802
A-D Critical (0.05) Value	0.738
K-S Test Statistic	0.527
K-S Critical(0.05) Value	0.203

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.6
Shapiro Wilk Test Statistic	0.373
Shapiro Wilk Critical (0.05) Value	0.897
Approximate Shapiro Wilk P Value	3.1421E-9
Lilliefors Test Statistic	0.523
Lilliefors Critical (0.05) Value	0.202

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:11:00 AM
From File	ProUCL_Input_UpgradientDowngradient_Split_y.xls
Full Precision	OFF
Confidence Coefficient	0.95

Iron DG

ResultValue

Raw Statistics

Number of Valid Observations	17
Number of Distinct Observations	17
Minimum	0.175
Maximum	19.6
Mean of Raw Data	7.63
Standard Deviation of Raw Data	6.995
Khat	0.83
Theta hat	9.192
Kstar	0.723
Theta star	10.56
Mean of Log Transformed Data	1.321
Standard Deviation of Log Transformed Data	1.508

Normal GOF Test Results

Correlation Coefficient R	0.945
Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical (0.05) Value	0.892
Approximate Shapiro Wilk P Value	0.0287
Lilliefors Test Statistic	0.186
Lilliefors Critical (0.05) Value	0.207

Data appear Approximate Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.922
A-D Test Statistic	0.387
A-D Critical (0.05) Value	0.773
K-S Test Statistic	0.121
K-S Critical(0.05) Value	0.217

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.957
Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical (0.05) Value	0.892
Approximate Shapiro Wilk P Value	0.0852
Lilliefors Test Statistic	0.152
Lilliefors Critical (0.05) Value	0.207

Data appear Lognormal at (0.05) Significance Level

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	17
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:15:15 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Lead DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	42
Minimum	7.0000E-4
Maximum	0.0323
Mean of Raw Data	0.00237
Standard Deviation of Raw Data	0.00369
Khat	1.539
Theta hat	0.00154
Kstar	1.519
Theta star	0.00156
Mean of Log Transformed Data	-6.403
Standard Deviation of Log Transformed Data	0.669

Normal GOF Test Results

Correlation Coefficient R	0.599
Approximate Shapiro Wilk Test Statistic	0.39
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.374
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.794
A-D Test Statistic	25.54
A-D Critical (0.05) Value	0.771
K-S Test Statistic	0.307
K-S Critical(0.05) Value	0.0642

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.854
Approximate Shapiro Wilk Test Statistic	0.73
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.243
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	158
Number of Missing Observations	47
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00152
Standard Deviation of Raw Data	0.00156
Khat	4.234
Theta hat	3.5872E-4
Kstar	4.158
Theta star	3.6530E-4
Mean of Log Transformed Data	-6.612
Standard Deviation of Log Transformed Data	0.403

Normal GOF Test Results

Correlation Coefficient R	0.447
Approximate Shapiro Wilk Test Statistic	0.255
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.372
Lilliefors Critical (0.05) Value	0.0709

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.53
A-D Test Statistic	6.329E+28
A-D Critical (0.05) Value	0.756
K-S Test Statistic	0.333
K-S Critical(0.05) Value	0.0747

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.77
Approximate Shapiro Wilk Test Statistic	0.618
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.363
Lilliefors Critical (0.05) Value	0.0709

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:17:07 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Lithium DG

WellType

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable WellType was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	145
Minimum	0.0113
Maximum	0.0647
Mean of Raw Data	0.0281
Standard Deviation of Raw Data	0.0121
Khat	5.585
Theta hat	0.00504
Kstar	5.507
Theta star	0.00511
Mean of Log Transformed Data	-3.663
Standard Deviation of Log Transformed Data	0.432

Normal GOF Test Results

Correlation Coefficient R	0.957
Approximate Shapiro Wilk Test Statistic	0.898
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.165
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.978
A-D Test Statistic	5.569
A-D Critical (0.05) Value	0.756
K-S Test Statistic	0.156
K-S Critical(0.05) Value	0.0632

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.965

Approximate Shapiro Wilk Test Statistic	0.908
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.148
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:19:40 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Manganese DG

ResultValue

Raw Statistics

Number of Valid Observations	17
Number of Distinct Observations	17
Minimum	0.0435
Maximum	1.19
Mean of Raw Data	0.606
Standard Deviation of Raw Data	0.355
Khat	2.172
Theta hat	0.279
Kstar	1.828
Theta star	0.331
Mean of Log Transformed Data	-0.749
Standard Deviation of Log Transformed Data	0.854

Normal GOF Test Results

Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical (0.05) Value	0.892
Approximate Shapiro Wilk P Value	0.649
Lilliefors Test Statistic	0.0988
Lilliefors Critical (0.05) Value	0.207

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.956
A-D Test Statistic	0.322
A-D Critical (0.05) Value	0.749
K-S Test Statistic	0.143
K-S Critical(0.05) Value	0.211

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.933
Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical (0.05) Value	0.892
Approximate Shapiro Wilk P Value	0.0265
Lilliefors Test Statistic	0.184
Lilliefors Critical (0.05) Value	0.207

Data appear Approximate_Lognormal at (0.05) Significance Level

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	17
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:21:29 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Mercury DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	2
Minimum	2.0000E-4
Maximum	4.3000E-4
Mean of Raw Data	2.0112E-4
Standard Deviation of Raw Data	1.6064E-5
Khat	269
Theta hat	7.4775E-7
Kstar	265
Theta star	7.5884E-7
Mean of Log Transformed Data	-8.513
Standard Deviation of Log Transformed Data	0.0535

Normal GOF Test Results

Correlation Coefficient R	0.194
Approximate Shapiro Wilk Test Statistic	0.0701
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.523
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.208
A-D Test Statistic	4.878E+28
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.524
K-S Critical(0.05) Value	0.0629

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.194
Approximate Shapiro Wilk Test Statistic	0.0701
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.523
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	204
Number of Missing Observations	1
Number of Distinct Observations	1
Minimum	2.0000E-4
Maximum	2.0000E-4

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable ReportingLimit was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:22:34 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Molybdenum DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	118
Minimum	0.001
Maximum	0.332
Mean of Raw Data	0.0838
Standard Deviation of Raw Data	0.0947
Khat	0.47
Theta hat	0.178
Kstar	0.466
Theta star	0.18
Mean of Log Transformed Data	-3.844
Standard Deviation of Log Transformed Data	2.071

Normal GOF Test Results

Correlation Coefficient R	0.905
Approximate Shapiro Wilk Test Statistic	0.796
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.241
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.894
A-D Test Statistic	9.648
A-D Critical (0.05) Value	0.828
K-S Test Statistic	0.235
K-S Critical(0.05) Value	0.067

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.928
Approximate Shapiro Wilk Test Statistic	0.828
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.203
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	69
Number of Missing Observations	136
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.005
Mean of Raw Data	0.00293
Standard Deviation of Raw Data	0.00189
Khat	2.219
Theta hat	0.00132
Kstar	2.132
Theta star	0.00138
Mean of Log Transformed Data	-6.073
Standard Deviation of Log Transformed Data	0.721

Normal GOF Test Results

Correlation Coefficient R	0.835
Approximate Shapiro Wilk Test Statistic	0.666
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.327
Lilliefors Critical (0.05) Value	0.107

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.795
A-D Test Statistic	8.989
A-D Critical (0.05) Value	0.762
K-S Test Statistic	0.311
K-S Critical(0.05) Value	0.108

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.862
Approximate Shapiro Wilk Test Statistic	0.711
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.308
Lilliefors Critical (0.05) Value	0.107

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:23:38 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Nickel DG

ResultValue

Raw Statistics

Number of Valid Observations	98
Number of Distinct Observations	57
Minimum	0.001
Maximum	0.0725
Mean of Raw Data	0.0062
Standard Deviation of Raw Data	0.0111
Khat	0.899
Theta hat	0.0069
Kstar	0.879
Theta star	0.00706
Mean of Log Transformed Data	-5.733
Standard Deviation of Log Transformed Data	0.993

Normal GOF Test Results

Correlation Coefficient R	0.674
Approximate Shapiro Wilk Test Statistic	0.481
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.32
Lilliefors Critical (0.05) Value	0.0897

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.898
A-D Test Statistic	6.187
A-D Critical (0.05) Value	0.788
K-S Test Statistic	0.181
K-S Critical(0.05) Value	0.0934

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.957
Approximate Shapiro Wilk Test Statistic	0.901
Approximate Shapiro Wilk P Value	1.6145E-8
Lilliefors Test Statistic	0.118
Lilliefors Critical (0.05) Value	0.0897

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	98
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	20
Number of Missing Observations	78
Number of Distinct Observations	2
Minimum	0.001
Maximum	0.002
Mean of Raw Data	0.00125
Standard Deviation of Raw Data	4.4426E-4
Khat	10.19
Theta hat	1.2264E-4
Kstar	8.697
Theta star	1.4373E-4
Mean of Log Transformed Data	-6.734
Standard Deviation of Log Transformed Data	0.308

Normal GOF Test Results

Correlation Coefficient R	0.746
Shapiro Wilk Test Statistic	0.544
Shapiro Wilk Critical (0.05) Value	0.905
Approximate Shapiro Wilk P Value	7.6205E-8
Lilliefors Test Statistic	0.463
Lilliefors Critical (0.05) Value	0.192

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.79
A-D Test Statistic	4.807
A-D Critical (0.05) Value	0.742
K-S Test Statistic	0.469
K-S Critical(0.05) Value	0.194

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.746
Shapiro Wilk Test Statistic	0.544
Shapiro Wilk Critical (0.05) Value	0.905
Approximate Shapiro Wilk P Value	7.6205E-8
Lilliefors Test Statistic	0.463
Lilliefors Critical (0.05) Value	0.192

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 9:32:45 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

pH DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	92
Minimum	6.78
Maximum	8.11
Mean of Raw Data	7.276
Standard Deviation of Raw Data	0.274
Khat	723.1
Theta hat	0.0101
Kstar	712.6
Theta star	0.0102
Mean of Log Transformed Data	1.984
Standard Deviation of Log Transformed Data	0.0371

Normal GOF Test Results

Correlation Coefficient R	0.978
Approximate Shapiro Wilk Test Statistic	0.941
Approximate Shapiro Wilk P Value	2.2590E-9
Lilliefors Test Statistic	0.104
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.981
A-D Test Statistic	2.322
A-D Critical (0.05) Value	0.751
K-S Test Statistic	0.0988
K-S Critical(0.05) Value	0.0629

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.983
Approximate Shapiro Wilk Test Statistic	0.948
Approximate Shapiro Wilk P Value	2.7981E-7
Lilliefors Test Statistic	0.0963
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Qualifier

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	202
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable Qualifier was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:31:27 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Radium 226-228 DG

ResultValue

Raw Statistics

Number of Valid Observations	203
Number of Distinct Observations	150
Minimum	0.03
Maximum	6.34
Mean of Raw Data	1.261
Standard Deviation of Raw Data	0.812
Khat	2.858
Theta hat	0.441
Kstar	2.819
Theta star	0.447
Mean of Log Transformed Data	0.0465
Standard Deviation of Log Transformed Data	0.65

Normal GOF Test Results

Correlation Coefficient R	0.909
Approximate Shapiro Wilk Test Statistic	0.844
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.136
Lilliefors Critical (0.05) Value	0.0626

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	0.933
A-D Critical (0.05) Value	0.761
K-S Test Statistic	0.0611
K-S Critical(0.05) Value	0.0638

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.97
Approximate Shapiro Wilk Test Statistic	0.961
Approximate Shapiro Wilk P Value	3.5269E-4
Lilliefors Test Statistic	0.0824
Lilliefors Critical (0.05) Value	0.0626

Data not Lognormal at (0.05) Significance Level

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	203
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	95
Number of Missing Observations	108
Number of Distinct Observations	71
Minimum	0.03
Maximum	1.96
Mean of Raw Data	0.949
Standard Deviation of Raw Data	0.421
Khat	3.775
Theta hat	0.251
Kstar	3.662
Theta star	0.259
Mean of Log Transformed Data	-0.191
Standard Deviation of Log Transformed Data	0.625

Normal GOF Test Results

Correlation Coefficient R	0.995
Approximate Shapiro Wilk Test Statistic	0.974
Approximate Shapiro Wilk P Value	0.282
Lilliefors Test Statistic	0.0682
Lilliefors Critical (0.05) Value	0.0911

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.982
A-D Test Statistic	1.049
A-D Critical (0.05) Value	0.757
K-S Test Statistic	0.0997
K-S Critical(0.05) Value	0.0922

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.909
Approximate Shapiro Wilk Test Statistic	0.847
Approximate Shapiro Wilk P Value	2.753E-14
Lilliefors Test Statistic	0.141
Lilliefors Critical (0.05) Value	0.0911

Data not Lognormal at (0.05) Significance Level

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:32:39 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Selenium DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	36
Minimum	0.001
Maximum	0.0221
Mean of Raw Data	0.00289
Standard Deviation of Raw Data	0.00441
Khat	1.108
Theta hat	0.00261
Kstar	1.095
Theta star	0.00264
Mean of Log Transformed Data	-6.36
Standard Deviation of Log Transformed Data	0.821

Normal GOF Test Results

Correlation Coefficient R	0.68
Approximate Shapiro Wilk Test Statistic	0.465
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.439
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.873
A-D Test Statistic	34.78
A-D Critical (0.05) Value	0.781
K-S Test Statistic	0.374
K-S Critical(0.05) Value	0.0648

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.817
Approximate Shapiro Wilk Test Statistic	0.654
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.288
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	165
Number of Missing Observations	40
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00148
Standard Deviation of Raw Data	0.00153
Khat	4.291
Theta hat	3.4459E-4
Kstar	4.217
Theta star	3.5064E-4
Mean of Log Transformed Data	-6.638
Standard Deviation of Log Transformed Data	0.396

Normal GOF Test Results

Correlation Coefficient R	0.442
Approximate Shapiro Wilk Test Statistic	0.25
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.377
Lilliefors Critical (0.05) Value	0.0694

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.527
A-D Test Statistic	6.061E+28
A-D Critical (0.05) Value	0.756
K-S Test Statistic	0.354
K-S Critical(0.05) Value	0.0729

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.76
Approximate Shapiro Wilk Test Statistic	0.604
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.383
Lilliefors Critical (0.05) Value	0.0694

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:33:39 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Sulfate DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	152
Minimum	5
Maximum	510
Mean of Raw Data	172.3
Standard Deviation of Raw Data	151
Khat	0.969
Theta hat	177.8
Kstar	0.958
Theta star	179.8
Mean of Log Transformed Data	4.552
Standard Deviation of Log Transformed Data	1.28

Normal GOF Test Results

Correlation Coefficient R	0.941
Approximate Shapiro Wilk Test Statistic	0.856
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.191
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.933
A-D Test Statistic	4.683
A-D Critical (0.05) Value	0.785
K-S Test Statistic	0.127
K-S Critical(0.05) Value	0.065

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.958
Approximate Shapiro Wilk Test Statistic	0.89
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.162
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	20
Number of Missing Observations	185
Number of Distinct Observations	2
Minimum	5
Maximum	10
Mean of Raw Data	8.25
Standard Deviation of Raw Data	2.447
Khat	10.12
Theta hat	0.815
Kstar	8.634
Theta star	0.956
Mean of Log Transformed Data	2.06
Standard Deviation of Log Transformed Data	0.339

Normal GOF Test Results

Correlation Coefficient R	0.793
Shapiro Wilk Test Statistic	0.608
Shapiro Wilk Critical (0.05) Value	0.905
Approximate Shapiro Wilk P Value	5.9981E-7
Lilliefors Test Statistic	0.413
Lilliefors Critical (0.05) Value	0.192

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.748
A-D Test Statistic	4.03
A-D Critical (0.05) Value	0.742
K-S Test Statistic	0.419
K-S Critical(0.05) Value	0.194

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.793
Shapiro Wilk Test Statistic	0.608
Shapiro Wilk Critical (0.05) Value	0.905
Approximate Shapiro Wilk P Value	5.9981E-7
Lilliefors Test Statistic	0.413
Lilliefors Critical (0.05) Value	0.192

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:34:38 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Thalium DG

ResultValue

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00174
Standard Deviation of Raw Data	0.00137
Khat	5.657
Theta hat	3.0700E-4
Kstar	5.577
Theta star	3.1138E-4
Mean of Log Transformed Data	-6.447
Standard Deviation of Log Transformed Data	0.376

Normal GOF Test Results

Correlation Coefficient R	0.451
Approximate Shapiro Wilk Test Statistic	0.26
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.419
Lilliefors Critical (0.05) Value	0.0623

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.497
A-D Test Statistic	4.878E+28
A-D Critical (0.05) Value	0.755
K-S Test Statistic	0.334
K-S Critical(0.05) Value	0.0632

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.771
Approximate Shapiro Wilk Test Statistic	0.619
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.38
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	205
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

ReportingLimit

Raw Statistics

Number of Valid Observations	205
Number of Distinct Observations	3
Minimum	0.001
Maximum	0.02
Mean of Raw Data	0.00174
Standard Deviation of Raw Data	0.00137
Khat	5.657
Theta hat	3.0700E-4
Kstar	5.577
Theta star	3.1138E-4
Mean of Log Transformed Data	-6.447
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Correlation Coefficient R	0.497
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Lognormal GOF Test Results

Correlation Coefficient R	0.771
Approximate Shapiro Wilk Test Statistic	0.619
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.38
Lilliefors Critical (0.05) Value	0.0623

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 2/24/2026 7:35:50 AM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	0.95

Turbidity DG

ResultValue

Raw Statistics

Number of Valid Observations	133
Number of Distinct Observations	125
Minimum	1.12
Maximum	663
Mean of Raw Data	54.27
Standard Deviation of Raw Data	77.67
Khat	0.76
Theta hat	71.37
Kstar	0.748
Theta star	72.53
Mean of Log Transformed Data	3.208
Standard Deviation of Log Transformed Data	1.338

Normal GOF Test Results

Correlation Coefficient R	0.779
Approximate Shapiro Wilk Test Statistic	0.646
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.247
Lilliefors Critical (0.05) Value	0.0772

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.946
A-D Test Statistic	1.79
A-D Critical (0.05) Value	0.795
K-S Test Statistic	0.107
K-S Critical(0.05) Value	0.0841

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.99
Approximate Shapiro Wilk Test Statistic	0.964
Approximate Shapiro Wilk P Value	0.0169
Lilliefors Test Statistic	0.0936
Lilliefors Critical (0.05) Value	0.0772

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Significance

CensorFlag

Raw Statistics

Number of Valid Observations	0
Number of Missing Observations	133
Number of Distinct Observations	0
Minimum	N/A
Maximum	N/A

Warning: This data set only has 0 observations!
Data set is too small to compute reliable and meaningful statistics and estimates!
The data set for variable CensorFlag was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!
If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Mann-Kendall Trend Test Analysis		
User Selected Options	Antimony	
Date/Time of Computation	ProUCL 5.2 2/26/2026 10:48:04 AM	
From File	MK Trend Analysis Combined by Analyte.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Sample Date-apw-01r

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	23
Number Values Reported (n)	23
Minimum	42983
Maximum	45981
Mean	44550
Geometric Mean	44536
Median	44959
Standard Deviation	1159
Coefficient of Variation	0.026

Mann-Kendall Test

M-K Test Value (S)	253
Critical Value (0.05)	1.645
Standard Deviation of S	37.86
Standardized Value of S	6.655
Approximate p-value	1.412E-11

Statistically significant evidence of an increasing trend at the specified level of significance.

Sample Date-apw-02

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	23
Number Values Reported (n)	23
Minimum	42984
Maximum	45980
Mean	44550
Geometric Mean	44536
Median	44958
Standard Deviation	1158
Coefficient of Variation	0.026

Mann-Kendall Test

M-K Test Value (S)	253
Critical Value (0.05)	1.645
Standard Deviation of S	37.86
Standardized Value of S	6.655
Approximate p-value	1.412E-11

Statistically significant evidence of an increasing trend at the specified level of significance.

Sample Date-apw-03

	General Statistics	
Number or Reported Events Not Used		0
Number of Generated Events		23
Number Values Reported (n)		23
Minimum		42984
Maximum		45981
Mean		44550
Geometric Mean		44536
Median		44956
Standard Deviation		1158
Coefficient of Variation		0.026
	Mann-Kendall Test	
M-K Test Value (S)		253
Critical Value (0.05)		1.645
Standard Deviation of S		37.86
Standardized Value of S		6.655
Approximate p-value		1.412E-11
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
	Sample Date-apw-04	
	General Statistics	
Number or Reported Events Not Used		0
Number of Generated Events		23
Number Values Reported (n)		23
Minimum		42986
Maximum		45980
Mean		44551
Geometric Mean		44536
Median		44959
Standard Deviation		1158
Coefficient of Variation		0.026
	Mann-Kendall Test	
M-K Test Value (S)		253
Critical Value (0.05)		1.645
Standard Deviation of S		37.86
Standardized Value of S		6.655
Approximate p-value		1.412E-11
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
	Sample Date-apw-05	
	General Statistics	
Number or Reported Events Not Used		0
Number of Generated Events		12
Number Values Reported (n)		12
Minimum		42984
Maximum		44958
Mean		43657
Geometric Mean		43649

			Median	43107	
			Standard Deviation	883.2	
			Coefficient of Variation	0.0202	
		Mann-Kendall Test			
			M-K Test Value (S)	66	
			Tabulated p-value	0	
			Standard Deviation of S	14.58	
			Standardized Value of S	4.457	
			Approximate p-value	4.1516E-6	
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
		Sample Date-apw-05r			
		General Statistics			
			Number or Reported Events Not Used	0	
			Number of Generated Events	11	
			Number Values Reported (n)	11	
			Minimum	45104	
			Maximum	45980	
			Mean	45525	
			Geometric Mean	45524	
			Median	45540	
			Standard Deviation	299.2	
			Coefficient of Variation	0.00657	
		Mann-Kendall Test			
			M-K Test Value (S)	55	
			Tabulated p-value	0	
			Standard Deviation of S	12.85	
			Standardized Value of S	4.204	
			Approximate p-value	1.3118E-5	
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
		Sample Date-apw-06d			
		General Statistics			
			Number or Reported Events Not Used	0	
			Number of Generated Events	22	
			Number Values Reported (n)	22	
			Minimum	42984	
			Maximum	45980	
			Mean	44542	
			Geometric Mean	44527	
			Median	45031	
			Standard Deviation	1185	
			Coefficient of Variation	0.0266	
		Mann-Kendall Test			
			M-K Test Value (S)	231	
			Tabulated p-value	0	
			Standard Deviation of S	35.46	
			Standardized Value of S	6.486	

Approximate p-value	4.421E-11	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Sample Date-apw-06s		
General Statistics		
Number or Reported Events Not Used	0	
Number of Generated Events	23	
Number Values Reported (n)	23	
Minimum	42984	
Maximum	45980	
Mean	44550	
Geometric Mean	44536	
Median	44958	
Standard Deviation	1158	
Coefficient of Variation	0.026	
Mann-Kendall Test		
M-K Test Value (S)	253	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.86	
Standardized Value of S	6.655	
Approximate p-value	1.412E-11	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Sample Date-apw-07		
General Statistics		
Number or Reported Events Not Used	0	
Number of Generated Events	22	
Number Values Reported (n)	22	
Minimum	42985	
Maximum	45981	
Mean	44499	
Geometric Mean	44485	
Median	44926	
Standard Deviation	1159	
Coefficient of Variation	0.026	
Mann-Kendall Test		
M-K Test Value (S)	231	
Tabulated p-value	0	
Standard Deviation of S	35.46	
Standardized Value of S	6.486	
Approximate p-value	4.421E-11	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Sample Date-apw-08		
General Statistics		
Number or Reported Events Not Used	0	
Number of Generated Events	23	

Number Values Reported (n)	23	
Minimum	42985	
Maximum	45981	
Mean	44550	
Geometric Mean	44536	
Median	44959	
Standard Deviation	1158	
Coefficient of Variation	0.026	

Mann-Kendall Test

M-K Test Value (S)	253
Critical Value (0.05)	1.645
Standard Deviation of S	37.86
Standardized Value of S	6.655
Approximate p-value	1.412E-11

Statistically significant evidence of an increasing trend at the specified level of significance.

Sample Date-apw-09

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	23
Number Values Reported (n)	23
Minimum	42983
Maximum	45981
Mean	44550
Geometric Mean	44536
Median	44958
Standard Deviation	1159
Coefficient of Variation	0.026

Mann-Kendall Test

M-K Test Value (S)	253
Critical Value (0.05)	1.645
Standard Deviation of S	37.86
Standardized Value of S	6.655
Approximate p-value	1.412E-11

Statistically significant evidence of an increasing trend at the specified level of significance.

Sample Date-apw-10d

General Statistics

Number or Reported Events Not Used	0
Number of Generated Events	23
Number Values Reported (n)	23
Minimum	42985
Maximum	45980
Mean	44550
Geometric Mean	44536
Median	44959
Standard Deviation	1158
Coefficient of Variation	0.026

	A	B	C	D	E	F	G	H	I	J	K	L
276	**Mann-Kendall Test**											
277				M-K Test Value (S)	253							
278				Critical Value (0.05)	1.645							
279				Standard Deviation of S	37.86							
280				Standardized Value of S	6.655							
281				Approximate p-value	1.412E-11							
282												
283	**Statistically significant evidence of an increasing**											
284	**trend at the specified level of significance.**											
285	**Sample Date-apw-10s**											
286												
287	**General Statistics**											
288				Number or Reported Events Not Used	0							
289				Number of Generated Events	23							
290				Number Values Reported (n)	23							
291				Minimum	42985							
292				Maximum	45980							
293				Mean	44550							
294				Geometric Mean	44536							
295				Median	44959							
296				Standard Deviation	1158							
297				Coefficient of Variation	0.026							
298												
299	**Mann-Kendall Test**											
300				M-K Test Value (S)	253							
301				Critical Value (0.05)	1.645							
302				Standard Deviation of S	37.86							
303				Standardized Value of S	6.655							
304				Approximate p-value	1.412E-11							
305												
306	**Statistically significant evidence of an increasing**											
307	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options	Arsenic	
Date/Time of Computation	ProUCL 5.2 2/26/2026 11:36:39 AM	
From File	MK Trend Analysis Combined by Analyte_a.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.0033
Mean	0.00173
Geometric Mean	0.00164
Median	0.0019
Standard Deviation	5.9970E-4
Coefficient of Variation	0.346

Mann-Kendall Test

M-K Test Value (S)	125
Critical Value (0.05)	1.645
Standard Deviation of S	36.86
Standardized Value of S	3.364
Approximate p-value	3.8458E-4

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.00904
Maximum	0.0284
Mean	0.0181
Geometric Mean	0.0172
Median	0.0175
Standard Deviation	0.00549
Coefficient of Variation	0.304

Mann-Kendall Test

M-K Test Value (S)	2
Critical Value (0.05)	1.645
Standard Deviation of S	37.85
Standardized Value of S	0.0264
Approximate p-value	0.489

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.0017
Maximum	0.0059
Mean	0.00252
Geometric Mean	0.00239
Median	0.002
Standard Deviation	0.00102
Coefficient of Variation	0.404

Mann-Kendall Test

M-K Test Value (S)	-42
Critical Value (0.05)	-1.645
Standard Deviation of S	36.62
Standardized Value of S	-1.12
Approximate p-value	0.131

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.0014	
Maximum	0.0029	
Mean	0.00193	
Geometric Mean	0.0019	
Median	0.002	
Standard Deviation	3.8750E-4	
Coefficient of Variation	0.201	
Mann-Kendall Test		
M-K Test Value (S)	79	
Critical Value (0.05)	1.645	
Standard Deviation of S	36.85	
Standardized Value of S	2.117	
Approximate p-value	0.0171	

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-05

General Statistics	
Number of Events Reported (m)	12
Number of Missing Events	0
Number or Reported Events Used	12
Number Values Reported (n)	12
Minimum	0.0015
Maximum	0.0048
Mean	0.00235
Geometric Mean	0.00223
Median	0.00215
Standard Deviation	9.0403E-4
Coefficient of Variation	0.385
Mann-Kendall Test	
M-K Test Value (S)	14
Tabulated p-value	0.19
Standard Deviation of S	14.51
Standardized Value of S	0.896
Approximate p-value	0.185

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

Result Value-apw-05r

General Statistics	
Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.00203
Maximum	0.0042
Mean	0.00259
Geometric Mean	0.00253
Median	0.00228
Standard Deviation	6.4134E-4
Coefficient of Variation	0.248
Mann-Kendall Test	
M-K Test Value (S)	-27
Tabulated p-value	0.02
Standard Deviation of S	12.85
Standardized Value of S	-2.024
Approximate p-value	0.0215

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

Result Value-apw-06d

General Statistics	
Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.0068
Maximum	0.0135
Mean	0.0101
Geometric Mean	0.01
Median	0.0104

Standard Deviation	0.00146				
Coefficient of Variation	0.144				
Mann-Kendall Test					
M-K Test Value (S)	99				
Tabulated p-value	0.002				
Standard Deviation of S	35.41				
Standardized Value of S	2.768				
Approximate p-value	0.00282				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-06s					
General Statistics					
Number of Events Reported (m)	23				
Number of Missing Events	0				
Number or Reported Events Used	23				
Number Values Reported (n)	23				
Minimum	9.0000E-4				
Maximum	0.002				
Mean	0.00156				
Geometric Mean	0.0015				
Median	0.0016				
Standard Deviation	4.2515E-4				
Coefficient of Variation	0.273				
Mann-Kendall Test					
M-K Test Value (S)	71				
Critical Value (0.05)	1.645				
Standard Deviation of S	36.5				
Standardized Value of S	1.918				
Approximate p-value	0.0276				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-07					
General Statistics					
Number of Events Reported (m)	22				
Number of Missing Events	0				
Number or Reported Events Used	22				
Number Values Reported (n)	22				
Minimum	0.001				
Maximum	0.0023				
Mean	0.00156				
Geometric Mean	0.00149				
Median	0.0015				
Standard Deviation	4.7162E-4				
Coefficient of Variation	0.302				
Mann-Kendall Test					
M-K Test Value (S)	116				
Tabulated p-value	0				
Standard Deviation of S	34.37				
Standardized Value of S	3.346				
Approximate p-value	4.1010E-4				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-08					
General Statistics					
Number of Events Reported (m)	23				
Number of Missing Events	0				
Number or Reported Events Used	23				
Number Values Reported (n)	23				
Minimum	0.001				
Maximum	0.0025				
Mean	0.00163				
Geometric Mean	0.00155				
Median	0.0018				
Standard Deviation	4.9655E-4				
Coefficient of Variation	0.305				
Mann-Kendall Test					
M-K Test Value (S)	138				
Critical Value (0.05)	1.645				
Standard Deviation of S	36.02				
Standardized Value of S	3.804				
Approximate p-value	7.1304E-5				

Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.0018	
Maximum	0.0031	
Mean	0.00229	
Geometric Mean	0.00228	
Median	0.00225	
Standard Deviation	2.7513E-4	
Coefficient of Variation	0.12	
Mann-Kendall Test		
M-K Test Value (S)	20	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.73	
Standardized Value of S	0.504	
Approximate p-value	0.307	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0057	
Mean	0.00187	
Geometric Mean	0.00164	
Median	0.0017	
Standard Deviation	0.00118	
Coefficient of Variation	0.63	
Mann-Kendall Test		
M-K Test Value (S)	153	
Critical Value (0.05)	1.645	
Standard Deviation of S	36.37	
Standardized Value of S	4.179	
Approximate p-value	1.4645E-5	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.174	
Maximum	0.276	
Mean	0.196	
Geometric Mean	0.195	
Median	0.191	
Standard Deviation	0.0206	
Coefficient of Variation	0.106	
Mann-Kendall Test		
M-K Test Value (S)	31	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.78	
Standardized Value of S	0.794	
Approximate p-value	0.214	
Insufficient evidence to identify a significant trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Beryllium	
Date/Time of Computation	ProUCL 5.2 2/26/2026 11:49:32 AM	
From File	MK Trend Analysis Combined by Analyte_b.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.148
Maximum	0.259
Mean	0.179
Geometric Mean	0.178
Median	0.176
Standard Deviation	0.0234
Coefficient of Variation	0.13

Mann-Kendall Test

M-K Test Value (S)	-35
Critical Value (0.05)	-1.645
Standard Deviation of S	37.78
Standardized Value of S	-0.9
Approximate p-value	0.184

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.145
Maximum	0.739
Mean	0.309
Geometric Mean	0.269
Median	0.254
Standard Deviation	0.173
Coefficient of Variation	0.56

Mann-Kendall Test

M-K Test Value (S)	-126
Critical Value (0.05)	-1.645
Standard Deviation of S	37.85
Standardized Value of S	-3.302
Approximate p-value	4.7921E-4

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.0806
Maximum	0.19
Mean	0.127
Geometric Mean	0.124
Median	0.119
Standard Deviation	0.0291
Coefficient of Variation	0.228

Mann-Kendall Test

M-K Test Value (S)	-18
Critical Value (0.05)	-1.645
Standard Deviation of S	37.85
Standardized Value of S	-0.449
Approximate p-value	0.327

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.12	
Maximum	0.165	
Mean	0.139	
Geometric Mean	0.139	
Median	0.139	
Standard Deviation	0.0104	
Coefficient of Variation	0.0749	
Mann-Kendall Test		
M-K Test Value (S)	-2	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.79	
Standardized Value of S	-0.0265	
Approximate p-value	0.489	

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

Result Value-apw-05

General Statistics		
Number of Events Reported (m)	12	
Number of Missing Events	0	
Number or Reported Events Used	12	
Number Values Reported (n)	12	
Minimum	0.14	
Maximum	0.233	
Mean	0.192	
Geometric Mean	0.189	
Median	0.194	
Standard Deviation	0.0314	
Coefficient of Variation	0.164	
Mann-Kendall Test		
M-K Test Value (S)	-43	
Tabulated p-value	0.002	
Standard Deviation of S	14.55	
Standardized Value of S	-2.887	
Approximate p-value	0.00195	

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.102	
Maximum	0.225	
Mean	0.167	
Geometric Mean	0.164	
Median	0.162	
Standard Deviation	0.0333	
Coefficient of Variation	0.2	
Mann-Kendall Test		
M-K Test Value (S)	-15	
Tabulated p-value	0.141	
Standard Deviation of S	12.85	
Standardized Value of S	-1.09	
Approximate p-value	0.138	

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

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.109	
Maximum	0.173	
Mean	0.14	
Geometric Mean	0.139	
Median	0.142	

Standard Deviation	0.019	
Coefficient of Variation	0.136	
Mann-Kendall Test		
M-K Test Value (S)	-154	
Tabulated p-value	0	
Standard Deviation of S	35.42	
Standardized Value of S	-4.319	
Approximate p-value	7.8214E-6	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.19	
Maximum	0.305	
Mean	0.226	
Geometric Mean	0.225	
Median	0.224	
Standard Deviation	0.026	
Coefficient of Variation	0.115	
Mann-Kendall Test		
M-K Test Value (S)	40	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.82	
Standardized Value of S	1.031	
Approximate p-value	0.151	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.303	
Maximum	0.522	
Mean	0.372	
Geometric Mean	0.369	
Median	0.371	
Standard Deviation	0.0528	
Coefficient of Variation	0.142	
Mann-Kendall Test		
M-K Test Value (S)	-126	
Tabulated p-value	0	
Standard Deviation of S	35.45	
Standardized Value of S	-3.526	
Approximate p-value	2.1083E-4	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.167	
Maximum	0.261	
Mean	0.209	
Geometric Mean	0.208	
Median	0.207	
Standard Deviation	0.0253	
Coefficient of Variation	0.121	
Mann-Kendall Test		
M-K Test Value (S)	-64	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.85	
Standardized Value of S	-1.664	
Approximate p-value	0.048	

	A	B	C	D	E	F	G	H	I	J	K	L
247	**Statistically significant evidence of a decreasing**											
248	**trend at the specified level of significance.**											
249				**Result Value-apw-09**								
250												
251				**General Statistics**								
252				Number of Events Reported (m)	23							
253				Number of Missing Events	0							
254				Number or Reported Events Used	23							
255				Number Values Reported (n)	23							
256				Minimum	0.108							
257				Maximum	0.227							
258				Mean	0.133							
259				Geometric Mean	0.131							
260				Median	0.125							
261				Standard Deviation	0.0268							
262				Coefficient of Variation	0.201							
263												
264				**Mann-Kendall Test**								
265				M-K Test Value (S)	-86							
266				Critical Value (0.05)	-1.645							
267				Standard Deviation of S	37.82							
268				Standardized Value of S	-2.247							
269				Approximate p-value	0.0123							
270												
271	**Statistically significant evidence of a decreasing**											
272	**trend at the specified level of significance.**											
273				**Result Value-apw-10d**								
274												
275				**General Statistics**								
276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	0.22							
281				Maximum	0.485							
282				Mean	0.348							
283				Geometric Mean	0.344							
284				Median	0.343							
285				Standard Deviation	0.0574							
286				Coefficient of Variation	0.165							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	-26							
290				Critical Value (0.05)	-1.645							
291				Standard Deviation of S	37.85							
292				Standardized Value of S	-0.66							
293				Approximate p-value	0.254							
294												
295	**Insufficient evidence to identify a significant**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	0.474							
305				Maximum	0.804							
306				Mean	0.597							
307				Geometric Mean	0.594							
308				Median	0.591							
309				Standard Deviation	0.0636							
310				Coefficient of Variation	0.107							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	-38							
314				Critical Value (0.05)	-1.645							
315				Standard Deviation of S	37.85							
316				Standardized Value of S	-0.978							
317				Approximate p-value	0.164							
318												
319	**Insufficient evidence to identify a significant**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options	Boron	
Date/Time of Computation	ProUCL 5.2 2/26/2026 11:52:27 AM	
From File	MK Trend Analysis Combined by Analyte_d.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.176
Maximum	0.357
Mean	0.238
Geometric Mean	0.234
Median	0.23
Standard Deviation	0.0449
Coefficient of Variation	0.188

Mann-Kendall Test

M-K Test Value (S)	-41
Tabulated p-value	0.131
Standard Deviation of S	35.4
Standardized Value of S	-1.13
Approximate p-value	0.129

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	7.75
Maximum	10.3
Mean	8.853
Geometric Mean	8.826
Median	8.955
Standard Deviation	0.716
Coefficient of Variation	0.0808

Mann-Kendall Test

M-K Test Value (S)	58
Tabulated p-value	0.051
Standard Deviation of S	35.41
Standardized Value of S	1.61
Approximate p-value	0.0537

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	1.84
Maximum	4.94
Mean	4.185
Geometric Mean	4.089
Median	4.32
Standard Deviation	0.769
Coefficient of Variation	0.184

Mann-Kendall Test

M-K Test Value (S)	-7
Tabulated p-value	0.434
Standard Deviation of S	35.44
Standardized Value of S	-0.169
Approximate p-value	0.433

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.559	
Maximum	2.37	
Mean	1.293	
Geometric Mean	1.148	
Median	1.16	
Standard Deviation	0.626	
Coefficient of Variation	0.484	
Mann-Kendall Test		
M-K Test Value (S)	-119	
Tabulated p-value	0	
Standard Deviation of S	35.46	
Standardized Value of S	-3.327	
Approximate p-value	4.3837E-4	

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

Result Value-apw-05

General Statistics		
Number of Events Reported (m)	12	
Number of Missing Events	0	
Number or Reported Events Used	12	
Number Values Reported (n)	12	
Minimum	7.35	
Maximum	10.3	
Mean	8.803	
Geometric Mean	8.748	
Median	8.995	
Standard Deviation	1.021	
Coefficient of Variation	0.116	
Mann-Kendall Test		
M-K Test Value (S)	-46	
Tabulated p-value	0	
Standard Deviation of S	14.58	
Standardized Value of S	-3.086	
Approximate p-value	0.00102	

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)	10	
Number of Missing Events	0	
Number or Reported Events Used	10	
Number Values Reported (n)	10	
Minimum	2.18	
Maximum	9.62	
Mean	6.969	
Geometric Mean	6.44	
Median	7.745	
Standard Deviation	2.436	
Coefficient of Variation	0.35	
Mann-Kendall Test		
M-K Test Value (S)	-13	
Tabulated p-value	0.146	
Standard Deviation of S	11.18	
Standardized Value of S	-1.073	
Approximate p-value	0.142	

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

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)	21	
Number of Missing Events	0	
Number or Reported Events Used	21	
Number Values Reported (n)	21	
Minimum	2.57	
Maximum	5.51	
Mean	3.818	
Geometric Mean	3.771	
Median	3.81	

Standard Deviation	0.628	
Coefficient of Variation	0.165	
Mann-Kendall Test		
M-K Test Value (S)	-12	
Tabulated p-value	0.371	
Standard Deviation of S	33.12	
Standardized Value of S	-0.332	
Approximate p-value	0.37	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	3.66	
Maximum	9.19	
Mean	5.78	
Geometric Mean	5.647	
Median	5.815	
Standard Deviation	1.274	
Coefficient of Variation	0.22	
Mann-Kendall Test		
M-K Test Value (S)	-57	
Tabulated p-value	0.058	
Standard Deviation of S	35.46	
Standardized Value of S	-1.579	
Approximate p-value	0.0572	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	21	
Number of Missing Events	0	
Number or Reported Events Used	21	
Number Values Reported (n)	21	
Minimum	0.168	
Maximum	0.526	
Mean	0.262	
Geometric Mean	0.253	
Median	0.237	
Standard Deviation	0.0778	
Coefficient of Variation	0.297	
Mann-Kendall Test		
M-K Test Value (S)	-66	
Tabulated p-value	0.024	
Standard Deviation of S	33.12	
Standardized Value of S	-1.963	
Approximate p-value	0.0248	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.095	
Maximum	0.2	
Mean	0.151	
Geometric Mean	0.147	
Median	0.143	
Standard Deviation	0.0378	
Coefficient of Variation	0.25	
Mann-Kendall Test		
M-K Test Value (S)	74	
Tabulated p-value	0.018	
Standard Deviation of S	34.8	
Standardized Value of S	2.097	
Approximate p-value	0.018	

Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.191	
Maximum	1.61	
Mean	0.505	
Geometric Mean	0.433	
Median	0.472	
Standard Deviation	0.322	
Coefficient of Variation	0.638	
Mann-Kendall Test		
M-K Test Value (S)	-59	
Tabulated p-value	0.051	
Standard Deviation of S	35.46	
Standardized Value of S	-1.635	
Approximate p-value	0.051	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.0522	
Maximum	0.2	
Mean	0.12	
Geometric Mean	0.108	
Median	0.0923	
Standard Deviation	0.0574	
Coefficient of Variation	0.478	
Mann-Kendall Test		
M-K Test Value (S)	64	
Tabulated p-value	0.035	
Standard Deviation of S	34.83	
Standardized Value of S	1.809	
Approximate p-value	0.0353	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.525	
Maximum	0.683	
Mean	0.575	
Geometric Mean	0.574	
Median	0.57	
Standard Deviation	0.0349	
Coefficient of Variation	0.0608	
Mann-Kendall Test		
M-K Test Value (S)	39	
Tabulated p-value	0.144	
Standard Deviation of S	35.44	
Standardized Value of S	1.072	
Approximate p-value	0.142	
Insufficient evidence to identify a significant trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Chromium	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:00:50 PM	
From File	MK Trend Analysis Combined by Analyte_h.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.0085
Mean	0.0027
Geometric Mean	0.00239
Median	0.0023
Standard Deviation	0.00158
Coefficient of Variation	0.586

Mann-Kendall Test

M-K Test Value (S)	42
Critical Value (0.05)	1.645
Standard Deviation of S	37.79
Standardized Value of S	1.085
Approximate p-value	0.139

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.002
Maximum	0.127
Mean	0.0308
Geometric Mean	0.0158
Median	0.0191
Standard Deviation	0.035
Coefficient of Variation	1.135

Mann-Kendall Test

M-K Test Value (S)	-66
Critical Value (0.05)	-1.645
Standard Deviation of S	37.85
Standardized Value of S	-1.717
Approximate p-value	0.043

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.0241
Mean	0.00418
Geometric Mean	0.00278
Median	0.002
Standard Deviation	0.00514
Coefficient of Variation	1.232

Mann-Kendall Test

M-K Test Value (S)	-20
Critical Value (0.05)	-1.645
Standard Deviation of S	37.21
Standardized Value of S	-0.511
Approximate p-value	0.305

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0251	
Mean	0.00356	
Geometric Mean	0.00251	
Median	0.0023	
Standard Deviation	0.00491	
Coefficient of Variation	1.382	
Mann-Kendall Test		
M-K Test Value (S)	35	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.69	
Standardized Value of S	0.902	
Approximate p-value	0.183	

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

Result Value-apw-05

General Statistics		
Number of Events Reported (m)	12	
Number of Missing Events	0	
Number or Reported Events Used	12	
Number Values Reported (n)	12	
Minimum	0.001	
Maximum	0.0137	
Mean	0.0033	
Geometric Mean	0.00212	
Median	0.0015	
Standard Deviation	0.00391	
Coefficient of Variation	1.186	
Mann-Kendall Test		
M-K Test Value (S)	-9	
Tabulated p-value	0.319	
Standard Deviation of S	14.15	
Standardized Value of S	-0.565	
Approximate p-value	0.286	

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.0015	
Maximum	0.0031	
Mean	0.00205	
Geometric Mean	0.00203	
Median	0.002	
Standard Deviation	3.7779E-4	
Coefficient of Variation	0.184	
Mann-Kendall Test		
M-K Test Value (S)	1	
Tabulated p-value	0.5	
Standard Deviation of S	8.544	
Standardized Value of S	0	
Approximate p-value	0.5	

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

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.001	
Maximum	0.0945	
Mean	0.00981	
Geometric Mean	0.00274	
Median	0.002	

Standard Deviation	0.0242	
Coefficient of Variation	2.468	
Mann-Kendall Test		
M-K Test Value (S)	111	
Tabulated p-value	0.001	
Standard Deviation of S	34.89	
Standardized Value of S	3.153	
Approximate p-value	8.0754E-4	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0326	
Mean	0.00433	
Geometric Mean	0.00254	
Median	0.002	
Standard Deviation	0.00704	
Coefficient of Variation	1.628	
Mann-Kendall Test		
M-K Test Value (S)	41	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.38	
Standardized Value of S	1.07	
Approximate p-value	0.142	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.001	
Maximum	0.0329	
Mean	0.00374	
Geometric Mean	0.00232	
Median	0.002	
Standard Deviation	0.00666	
Coefficient of Variation	1.783	
Mann-Kendall Test		
M-K Test Value (S)	1	
Tabulated p-value	0.5	
Standard Deviation of S	34.69	
Standardized Value of S	0	
Approximate p-value	0.5	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0082	
Mean	0.00293	
Geometric Mean	0.00241	
Median	0.00204	
Standard Deviation	0.00204	
Coefficient of Variation	0.695	
Mann-Kendall Test		
M-K Test Value (S)	37	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.53	
Standardized Value of S	0.959	
Approximate p-value	0.169	

Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0148	
Mean	0.00226	
Geometric Mean	0.00177	
Median	0.0016	
Standard Deviation	0.00279	
Coefficient of Variation	1.234	
Mann-Kendall Test		
M-K Test Value (S)	111	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.13	
Standardized Value of S	2.962	
Approximate p-value	0.00153	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0148	
Mean	0.00287	
Geometric Mean	0.0022	
Median	0.002	
Standard Deviation	0.00299	
Coefficient of Variation	1.045	
Mann-Kendall Test		
M-K Test Value (S)	-6	
Critical Value (0.05)	-1.645	
Standard Deviation of S	36.88	
Standardized Value of S	-0.136	
Approximate p-value	0.446	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.015	
Mean	0.00307	
Geometric Mean	0.00228	
Median	0.002	
Standard Deviation	0.00333	
Coefficient of Variation	1.085	
Mann-Kendall Test		
M-K Test Value (S)	55	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.16	
Standardized Value of S	1.453	
Approximate p-value	0.0731	
Insufficient evidence to identify a significant trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Dissolved Solidas	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:03:59 PM	
From File	MK Trend Analysis Combined by Analyte_i.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.0041
Mean	0.00175
Geometric Mean	0.0016
Median	0.0017
Standard Deviation	7.9100E-4
Coefficient of Variation	0.452

Mann-Kendall Test

M-K Test Value (S)	127
Critical Value (0.05)	1.645
Standard Deviation of S	36.37
Standardized Value of S	3.464
Approximate p-value	2.6600E-4

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.02
Mean	0.00449
Geometric Mean	0.00309
Median	0.0027
Standard Deviation	0.0046
Coefficient of Variation	1.024

Mann-Kendall Test

M-K Test Value (S)	0
Critical Value (0.05)	N/A
Standard Deviation of S	37.75
Standardized Value of S	N/A
Approximate p-value	N/A

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	5.0000E-4
Maximum	0.0021
Mean	0.00143
Geometric Mean	0.00134
Median	0.0014
Standard Deviation	5.1207E-4
Coefficient of Variation	0.358

Mann-Kendall Test

M-K Test Value (S)	107
Critical Value (0.05)	1.645
Standard Deviation of S	35.25
Standardized Value of S	3.007
Approximate p-value	0.00132

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-04

General Statistics		
Number of Events Reported (m)		23
Number of Missing Events		0
Number or Reported Events Used		23
Number Values Reported (n)		23
Minimum		6.0000E-4
Maximum		0.0025
Mean		0.00142
Geometric Mean		0.00132
Median		0.001
Standard Deviation		5.4494E-4
Coefficient of Variation		0.384
Mann-Kendall Test		
M-K Test Value (S)		104
Critical Value (0.05)		1.645
Standard Deviation of S		34.69
Standardized Value of S		2.969
Approximate p-value		0.00149

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-05

General Statistics		
Number of Events Reported (m)		12
Number of Missing Events		0
Number or Reported Events Used		12
Number Values Reported (n)		12
Minimum		0.001
Maximum		0.0013
Mean		0.00103
Geometric Mean		0.00102
Median		0.001
Standard Deviation		8.6603E-5
Coefficient of Variation		0.0845
Mann-Kendall Test		
M-K Test Value (S)		5
Tabulated p-value		0.42
Standard Deviation of S		6.904
Standardized Value of S		0.579
Approximate p-value		0.281

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)		11
Number of Missing Events		0
Number or Reported Events Used		11
Number Values Reported (n)		11
Minimum		0.001
Maximum		0.002
Mean		0.00173
Geometric Mean		0.00166
Median		0.002
Standard Deviation		4.6710E-4
Coefficient of Variation		0.27
Mann-Kendall Test		
M-K Test Value (S)		24
Tabulated p-value		0.03
Standard Deviation of S		9.798
Standardized Value of S		2.347
Approximate p-value		0.00945

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)		22
Number of Missing Events		0
Number or Reported Events Used		22
Number Values Reported (n)		22
Minimum		0.001
Maximum		0.0054
Mean		0.00184
Geometric Mean		0.00162
Median		0.00165

Standard Deviation	0.00109	
Coefficient of Variation	0.596	
Mann-Kendall Test		
M-K Test Value (S)	104	
Tabulated p-value	0.001	
Standard Deviation of S	33.85	
Standardized Value of S	3.043	
Approximate p-value	0.00117	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	2.0000E-4	
Maximum	0.002	
Mean	0.00131	
Geometric Mean	0.00119	
Median	0.001	
Standard Deviation	5.3877E-4	
Coefficient of Variation	0.41	
Mann-Kendall Test		
M-K Test Value (S)	118	
Critical Value (0.05)	1.645	
Standard Deviation of S	32.17	
Standardized Value of S	3.637	
Approximate p-value	1.3773E-4	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.001	
Maximum	0.002	
Mean	0.00133	
Geometric Mean	0.00126	
Median	0.001	
Standard Deviation	4.7146E-4	
Coefficient of Variation	0.354	
Mann-Kendall Test		
M-K Test Value (S)	119	
Tabulated p-value	0	
Standard Deviation of S	29.66	
Standardized Value of S	3.979	
Approximate p-value	3.4671E-5	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.0021	
Mean	0.0016	
Geometric Mean	0.00153	
Median	0.0017	
Standard Deviation	4.3325E-4	
Coefficient of Variation	0.272	
Mann-Kendall Test		
M-K Test Value (S)	127	
Critical Value (0.05)	1.645	
Standard Deviation of S	36.37	
Standardized Value of S	3.464	
Approximate p-value	2.6600E-4	

	A	B	C	D	E	F	G	H	I	J	K	L
247	**Statistically significant evidence of an increasing**											
248	**trend at the specified level of significance.**											
249				**Result Value-apw-09**								
250												
251				**General Statistics**								
252				Number of Events Reported (m)	23							
253				Number of Missing Events	0							
254				Number or Reported Events Used	23							
255				Number Values Reported (n)	23							
256				Minimum	0.001							
257				Maximum	0.0031							
258				Mean	0.00146							
259				Geometric Mean	0.00136							
260				Median	0.001							
261				Standard Deviation	5.9454E-4							
262				Coefficient of Variation	0.408							
263												
264				**Mann-Kendall Test**								
265				M-K Test Value (S)	77							
266				Critical Value (0.05)	1.645							
267				Standard Deviation of S	33.16							
268				Standardized Value of S	2.292							
269				Approximate p-value	0.011							
270												
271	**Statistically significant evidence of an increasing**											
272	**trend at the specified level of significance.**											
273				**Result Value-apw-10d**								
274												
275				**General Statistics**								
276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	0.0013							
281				Maximum	0.007							
282				Mean	0.00304							
283				Geometric Mean	0.00287							
284				Median	0.0028							
285				Standard Deviation	0.00114							
286				Coefficient of Variation	0.376							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	16							
290				Critical Value (0.05)	1.645							
291				Standard Deviation of S	37.82							
292				Standardized Value of S	0.397							
293				Approximate p-value	0.346							
294												
295	**Insufficient evidence to identify a significant**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	6.0000E-4							
305				Maximum	0.0021							
306				Mean	0.00145							
307				Geometric Mean	0.00136							
308				Median	0.0013							
309				Standard Deviation	5.2472E-4							
310				Coefficient of Variation	0.361							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	116							
314				Critical Value (0.05)	1.645							
315				Standard Deviation of S	35.23							
316				Standardized Value of S	3.264							
317				Approximate p-value	5.4921E-4							
318												
319	**Statistically significant evidence of an increasing**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options	Lithium	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:16:25 PM	
From File	MK Trend Analysis Combined by Analyte_m.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.0062
Mean	0.00172
Geometric Mean	0.00152
Median	0.0014
Standard Deviation	0.00111
Coefficient of Variation	0.645

Mann-Kendall Test

M-K Test Value (S)	120
Critical Value (0.05)	1.645
Standard Deviation of S	34.88
Standardized Value of S	3.412
Approximate p-value	3.2289E-4

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.002
Maximum	0.0323
Mean	0.00897
Geometric Mean	0.00611
Median	0.0057
Standard Deviation	0.00835
Coefficient of Variation	0.931

Mann-Kendall Test

M-K Test Value (S)	-24
Critical Value (0.05)	-1.645
Standard Deviation of S	37.85
Standardized Value of S	-0.608
Approximate p-value	0.272

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.0044
Mean	0.00183
Geometric Mean	0.00164
Median	0.002
Standard Deviation	9.6229E-4
Coefficient of Variation	0.524

Mann-Kendall Test

M-K Test Value (S)	43
Critical Value (0.05)	1.645
Standard Deviation of S	35.73
Standardized Value of S	1.176
Approximate p-value	0.12

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.002	
Mean	0.00137	
Geometric Mean	0.0013	
Median	0.001	
Standard Deviation	4.8356E-4	
Coefficient of Variation	0.352	
Mann-Kendall Test		
M-K Test Value (S)	124	
Critical Value (0.05)	1.645	
Standard Deviation of S	32.17	
Standardized Value of S	3.824	
Approximate p-value	6.5682E-5	

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-05

General Statistics	
Number of Events Reported (m)	12
Number of Missing Events	0
Number or Reported Events Used	12
Number Values Reported (n)	12
Minimum	0.001
Maximum	0.001
Mean	0.001
Geometric Mean	0.001
Median	0.001
Standard Deviation	2.265E-19
Coefficient of Variation	N/A
Mann-Kendall Test	
M-K Test Value (S)	0
Tabulated p-value	0.527
Standard Deviation of S	0
Standardized Value of S	N/A
Approximate p-value	N/A

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

Result Value-apw-05r

General Statistics	
Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.0011
Maximum	0.0026
Mean	0.00201
Geometric Mean	0.00197
Median	0.002
Standard Deviation	3.6145E-4
Coefficient of Variation	0.18
Mann-Kendall Test	
M-K Test Value (S)	1
Tabulated p-value	0.5
Standard Deviation of S	9.983
Standardized Value of S	0
Approximate p-value	0.5

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

Result Value-apw-06d

General Statistics	
Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.001
Maximum	0.002
Mean	0.0014
Geometric Mean	0.00133
Median	0.001

Standard Deviation	4.8206E-4				
Coefficient of Variation	0.344				
Mann-Kendall Test					
M-K Test Value (S)	127				
Tabulated p-value	0				
Standard Deviation of S	31.3				
Standardized Value of S	4.026				
Approximate p-value	2.8414E-5				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-06s					
General Statistics					
Number of Events Reported (m)	23				
Number of Missing Events	0				
Number or Reported Events Used	23				
Number Values Reported (n)	23				
Minimum	0.001				
Maximum	0.0028				
Mean	0.00143				
Geometric Mean	0.00133				
Median	0.001				
Standard Deviation	5.6666E-4				
Coefficient of Variation	0.397				
Mann-Kendall Test					
M-K Test Value (S)	108				
Critical Value (0.05)	1.645				
Standard Deviation of S	32.17				
Standardized Value of S	3.326				
Approximate p-value	4.3977E-4				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-07					
General Statistics					
Number of Events Reported (m)	22				
Number of Missing Events	0				
Number or Reported Events Used	22				
Number Values Reported (n)	22				
Minimum	0.001				
Maximum	0.0074				
Mean	0.00161				
Geometric Mean	0.00137				
Median	0.001				
Standard Deviation	0.00138				
Coefficient of Variation	0.856				
Mann-Kendall Test					
M-K Test Value (S)	93				
Tabulated p-value	0.004				
Standard Deviation of S	29.66				
Standardized Value of S	3.102				
Approximate p-value	9.6139E-4				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-08					
General Statistics					
Number of Events Reported (m)	23				
Number of Missing Events	0				
Number or Reported Events Used	23				
Number Values Reported (n)	23				
Minimum	0.001				
Maximum	0.0028				
Mean	0.00155				
Geometric Mean	0.00146				
Median	0.0015				
Standard Deviation	5.6879E-4				
Coefficient of Variation	0.366				
Mann-Kendall Test					
M-K Test Value (S)	132				
Critical Value (0.05)	1.645				
Standard Deviation of S	35.26				
Standardized Value of S	3.715				
Approximate p-value	1.0154E-4				

	A	B	C	D	E	F	G	H	I	J	K	L
247	**Statistically significant evidence of an increasing**											
248	**trend at the specified level of significance.**											
249				**Result Value-apw-09**								
250												
251				**General Statistics**								
252				Number of Events Reported (m)	23							
253				Number of Missing Events	0							
254				Number or Reported Events Used	23							
255				Number Values Reported (n)	23							
256				Minimum	0.001							
257				Maximum	0.0039							
258				Mean	0.00147							
259				Geometric Mean	0.00135							
260				Median	0.001							
261				Standard Deviation	7.1492E-4							
262				Coefficient of Variation	0.485							
263												
264				**Mann-Kendall Test**								
265				M-K Test Value (S)	108							
266				Critical Value (0.05)	1.645							
267				Standard Deviation of S	32.17							
268				Standardized Value of S	3.326							
269				Approximate p-value	4.3977E-4							
270												
271	**Statistically significant evidence of an increasing**											
272	**trend at the specified level of significance.**											
273				**Result Value-apw-10d**								
274												
275				**General Statistics**								
276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	0.001							
281				Maximum	0.002							
282				Mean	0.00139							
283				Geometric Mean	0.00131							
284				Median	0.001							
285				Standard Deviation	4.9901E-4							
286				Coefficient of Variation	0.359							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	116							
290				Critical Value (0.05)	1.645							
291				Standard Deviation of S	31.75							
292				Standardized Value of S	3.622							
293				Approximate p-value	1.4608E-4							
294												
295	**Statistically significant evidence of an increasing**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	7.0000E-4							
305				Maximum	0.0043							
306				Mean	0.00161							
307				Geometric Mean	0.00145							
308				Median	0.0014							
309				Standard Deviation	8.3301E-4							
310				Coefficient of Variation	0.516							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	114							
314				Critical Value (0.05)	1.645							
315				Standard Deviation of S	35.26							
316				Standardized Value of S	3.205							
317				Approximate p-value	6.7606E-4							
318												
319	**Statistically significant evidence of an increasing**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options	Molybdenum	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:24:23 PM	
From File	MK Trend Analysis Combined by Analyte_q.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.005
Mean	0.00254
Geometric Mean	0.00198
Median	0.0015
Standard Deviation	0.00185
Coefficient of Variation	0.726

Mann-Kendall Test

M-K Test Value (S)	176
Critical Value (0.05)	1.645
Standard Deviation of S	35.48
Standardized Value of S	4.933
Approximate p-value	4.0555E-7

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.0951
Maximum	0.332
Mean	0.175
Geometric Mean	0.169
Median	0.165
Standard Deviation	0.05
Coefficient of Variation	0.286

Mann-Kendall Test

M-K Test Value (S)	25
Critical Value (0.05)	1.645
Standard Deviation of S	37.84
Standardized Value of S	0.634
Approximate p-value	0.263

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.0262
Maximum	0.0849
Mean	0.0622
Geometric Mean	0.0601
Median	0.0621
Standard Deviation	0.0147
Coefficient of Variation	0.236

Mann-Kendall Test

M-K Test Value (S)	-90
Critical Value (0.05)	-1.645
Standard Deviation of S	37.85
Standardized Value of S	-2.351
Approximate p-value	0.00935

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)		23
Number of Missing Events		0
Number or Reported Events Used		23
Number Values Reported (n)		23
Minimum		0.0299
Maximum		0.0891
Mean		0.0554
Geometric Mean		0.0525
Median		0.0517
Standard Deviation		0.0185
Coefficient of Variation		0.334
Mann-Kendall Test		
M-K Test Value (S)		-136
Critical Value (0.05)		-1.645
Standard Deviation of S		37.85
Standardized Value of S		-3.567
Approximate p-value		1.8078E-4

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

Result Value-apw-05

General Statistics	
Number of Events Reported (m)	12
Number of Missing Events	0
Number or Reported Events Used	12
Number Values Reported (n)	12
Minimum	0.168
Maximum	0.249
Mean	0.212
Geometric Mean	0.21
Median	0.21
Standard Deviation	0.028
Coefficient of Variation	0.132
Mann-Kendall Test	
M-K Test Value (S)	24
Tabulated p-value	0.058
Standard Deviation of S	14.58
Standardized Value of S	1.577
Approximate p-value	0.0574

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

Result Value-apw-05r

General Statistics	
Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.109
Maximum	0.227
Mean	0.182
Geometric Mean	0.178
Median	0.185
Standard Deviation	0.0402
Coefficient of Variation	0.22
Mann-Kendall Test	
M-K Test Value (S)	-24
Tabulated p-value	0.03
Standard Deviation of S	12.81
Standardized Value of S	-1.796
Approximate p-value	0.0362

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

Result Value-apw-06d

General Statistics	
Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.0461
Maximum	0.072
Mean	0.0601
Geometric Mean	0.0596
Median	0.0604

Standard Deviation	0.00764	
Coefficient of Variation	0.127	
Mann-Kendall Test		
M-K Test Value (S)	-11	
Tabulated p-value	0.39	
Standard Deviation of S	35.46	
Standardized Value of S	-0.282	
Approximate p-value	0.389	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.171	
Maximum	0.324	
Mean	0.243	
Geometric Mean	0.239	
Median	0.243	
Standard Deviation	0.0454	
Coefficient of Variation	0.187	
Mann-Kendall Test		
M-K Test Value (S)	-157	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.86	
Standardized Value of S	-4.12	
Approximate p-value	1.8941E-5	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.0023	
Maximum	0.005	
Mean	0.0039	
Geometric Mean	0.0038	
Median	0.00365	
Standard Deviation	9.2761E-4	
Coefficient of Variation	0.238	
Mann-Kendall Test		
M-K Test Value (S)	75	
Tabulated p-value	0.018	
Standard Deviation of S	34.79	
Standardized Value of S	2.127	
Approximate p-value	0.0167	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.005	
Mean	0.00255	
Geometric Mean	0.002	
Median	0.0015	
Standard Deviation	0.00184	
Coefficient of Variation	0.72	
Mann-Kendall Test		
M-K Test Value (S)	168	
Critical Value (0.05)	1.645	
Standard Deviation of S	35.98	
Standardized Value of S	4.641	
Approximate p-value	1.7313E-6	

Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.015	
Maximum	0.0455	
Mean	0.0238	
Geometric Mean	0.0229	
Median	0.0223	
Standard Deviation	0.00711	
Coefficient of Variation	0.299	
Mann-Kendall Test		
M-K Test Value (S)	-41	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.84	
Standardized Value of S	-1.057	
Approximate p-value	0.145	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.005	
Mean	0.0026	
Geometric Mean	0.00206	
Median	0.0015	
Standard Deviation	0.00182	
Coefficient of Variation	0.697	
Mann-Kendall Test		
M-K Test Value (S)	155	
Critical Value (0.05)	1.645	
Standard Deviation of S	35.77	
Standardized Value of S	4.305	
Approximate p-value	8.3496E-6	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.005	
Mean	0.00263	
Geometric Mean	0.0021	
Median	0.0015	
Standard Deviation	0.00179	
Coefficient of Variation	0.683	
Mann-Kendall Test		
M-K Test Value (S)	145	
Critical Value (0.05)	1.645	
Standard Deviation of S	36.22	
Standardized Value of S	3.976	
Approximate p-value	3.5036E-5	
Statistically significant evidence of an increasing trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Radium 226-228	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:32:52 PM	
From File	MK Trend Analysis Combined by Analyte_t.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.167
Maximum	2.54
Mean	0.841
Geometric Mean	0.693
Median	0.7
Standard Deviation	0.56
Coefficient of Variation	0.666

Mann-Kendall Test

M-K Test Value (S)	25
Critical Value (0.05)	1.645
Standard Deviation of S	37.86
Standardized Value of S	0.634
Approximate p-value	0.263

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.03
Maximum	4.09
Mean	1.293
Geometric Mean	0.894
Median	1.21
Standard Deviation	0.991
Coefficient of Variation	0.767

Mann-Kendall Test

M-K Test Value (S)	2
Tabulated p-value	0.478
Standard Deviation of S	35.45
Standardized Value of S	0.0282
Approximate p-value	0.489

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.37
Maximum	3.18
Mean	1.155
Geometric Mean	1.009
Median	0.901
Standard Deviation	0.681
Coefficient of Variation	0.589

Mann-Kendall Test

M-K Test Value (S)	-1
Critical Value (0.05)	-1.645
Standard Deviation of S	37.84
Standardized Value of S	0
Approximate p-value	0.5

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.02	
Maximum	2.65	
Mean	0.914	
Geometric Mean	0.701	
Median	0.852	
Standard Deviation	0.547	
Coefficient of Variation	0.599	
Mann-Kendall Test		
M-K Test Value (S)	3	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.86	
Standardized Value of S	0.0528	
Approximate p-value	0.479	

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

Result Value-apw-05

General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.6	
Maximum	1.75	
Mean	1.048	
Geometric Mean	0.977	
Median	0.99	
Standard Deviation	0.415	
Coefficient of Variation	0.396	
Mann-Kendall Test		
M-K Test Value (S)	-19	
Tabulated p-value	0.082	
Standard Deviation of S	12.85	
Standardized Value of S	-1.401	
Approximate p-value	0.0806	

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.473	
Maximum	6.34	
Mean	1.688	
Geometric Mean	1.167	
Median	0.88	
Standard Deviation	1.828	
Coefficient of Variation	1.082	
Mann-Kendall Test		
M-K Test Value (S)	-7	
Tabulated p-value	0.324	
Standard Deviation of S	12.85	
Standardized Value of S	-0.467	
Approximate p-value	0.32	

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

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.44	
Maximum	2.8	
Mean	1.441	
Geometric Mean	1.318	
Median	1.45	

		Standard Deviation	0.612		
		Coefficient of Variation	0.425		
	Mann-Kendall Test				
		M-K Test Value (S)	25		
		Tabulated p-value	0.252		
		Standard Deviation of S	35.44		
		Standardized Value of S	0.677		
		Approximate p-value	0.249		
Insufficient evidence to identify a significant					
trend at the specified level of significance.					
Result Value-apw-06s					
	General Statistics				
		Number of Events Reported (m)	23		
		Number of Missing Events	0		
		Number or Reported Events Used	23		
		Number Values Reported (n)	23		
		Minimum	0.11		
		Maximum	2.93		
		Mean	1.136		
		Geometric Mean	0.951		
		Median	1.04		
		Standard Deviation	0.65		
		Coefficient of Variation	0.573		
	Mann-Kendall Test				
		M-K Test Value (S)	43		
		Critical Value (0.05)	1.645		
		Standard Deviation of S	37.86		
		Standardized Value of S	1.109		
		Approximate p-value	0.134		
Insufficient evidence to identify a significant					
trend at the specified level of significance.					
Result Value-apw-07					
	General Statistics				
		Number of Events Reported (m)	22		
		Number of Missing Events	0		
		Number or Reported Events Used	22		
		Number Values Reported (n)	22		
		Minimum	0.39		
		Maximum	2.7		
		Mean	1.253		
		Geometric Mean	1.127		
		Median	1.175		
		Standard Deviation	0.574		
		Coefficient of Variation	0.458		
	Mann-Kendall Test				
		M-K Test Value (S)	76		
		Tabulated p-value	0.015		
		Standard Deviation of S	35.42		
		Standardized Value of S	2.117		
		Approximate p-value	0.0171		
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-08					
	General Statistics				
		Number of Events Reported (m)	23		
		Number of Missing Events	0		
		Number or Reported Events Used	23		
		Number Values Reported (n)	23		
		Minimum	0.247		
		Maximum	2.39		
		Mean	1.061		
		Geometric Mean	0.912		
		Median	1.04		
		Standard Deviation	0.537		
		Coefficient of Variation	0.506		
	Mann-Kendall Test				
		M-K Test Value (S)	2		
		Critical Value (0.05)	1.645		
		Standard Deviation of S	37.85		
		Standardized Value of S	0.0264		
		Approximate p-value	0.489		

	A	B	C	D	E	F	G	H	I	J	K	L
247	**Insufficient evidence to identify a significant**											
248	**trend at the specified level of significance.**											
249				**Result Value-apw-09**								
250												
251				**General Statistics**								
252				Number of Events Reported (m)	23							
253				Number of Missing Events	0							
254				Number or Reported Events Used	23							
255				Number Values Reported (n)	23							
256				Minimum	0.0164							
257				Maximum	1.46							
258				Mean	0.659							
259				Geometric Mean	0.439							
260				Median	0.63							
261				Standard Deviation	0.437							
262				Coefficient of Variation	0.663							
263												
264				**Mann-Kendall Test**								
265				M-K Test Value (S)	-27							
266				Critical Value (0.05)	-1.645							
267				Standard Deviation of S	37.86							
268				Standardized Value of S	-0.687							
269				Approximate p-value	0.246							
270												
271	**Insufficient evidence to identify a significant**											
272	**trend at the specified level of significance.**											
273				**Result Value-apw-10d**								
274												
275				**General Statistics**								
276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	0.163							
281				Maximum	2.21							
282				Mean	1.076							
283				Geometric Mean	0.942							
284				Median	1.03							
285				Standard Deviation	0.503							
286				Coefficient of Variation	0.468							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	11							
290				Critical Value (0.05)	1.645							
291				Standard Deviation of S	37.84							
292				Standardized Value of S	0.264							
293				Approximate p-value	0.396							
294												
295	**Insufficient evidence to identify a significant**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	0.37							
305				Maximum	4.83							
306				Mean	1.575							
307				Geometric Mean	1.311							
308				Median	1.24							
309				Standard Deviation	1.029							
310				Coefficient of Variation	0.653							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	40							
314				Critical Value (0.05)	1.645							
315				Standard Deviation of S	37.82							
316				Standardized Value of S	1.031							
317				Approximate p-value	0.151							
318												
319	**Insufficient evidence to identify a significant**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options	Selenium	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:35:20 PM	
From File	MK Trend Analysis Combined by Analyte_u.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.0028
Maximum	0.0054
Mean	0.0038
Geometric Mean	0.00375
Median	0.0037
Standard Deviation	6.2394E-4
Coefficient of Variation	0.164

Mann-Kendall Test

M-K Test Value (S)	-60
Critical Value (0.05)	-1.645
Standard Deviation of S	37.75
Standardized Value of S	-1.563
Approximate p-value	0.0591

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.001
Maximum	0.02
Mean	0.00215
Geometric Mean	0.00143
Median	0.001
Standard Deviation	0.00392
Coefficient of Variation	1.82

Mann-Kendall Test

M-K Test Value (S)	139
Critical Value (0.05)	1.645
Standard Deviation of S	32.49
Standardized Value of S	4.247
Approximate p-value	1.0817E-5

Statistically significant evidence of an increasing

	A	B	C	D	E	F	G	H	I	J	K	L
56	trend at the specified level of significance.											
57				Result Value-apw-03								
58												
59				General Statistics								
60				Number of Events Reported (m)	23							
61				Number of Missing Events	0							
62				Number or Reported Events Used	23							
63				Number Values Reported (n)	23							
64				Minimum	0.001							
65				Maximum	0.002							
66				Mean	0.00139							
67				Geometric Mean	0.00131							
68				Median	0.001							
69				Standard Deviation	4.9074E-4							
70				Coefficient of Variation	0.353							
71												
72				Mann-Kendall Test								
73				M-K Test Value (S)	133							
74				Critical Value (0.05)	1.645							
75				Standard Deviation of S	33.16							
76				Standardized Value of S	3.981							
77				Approximate p-value	3.4378E-5							
78												
79	Statistically significant evidence of an increasing											
80	trend at the specified level of significance.											
81				Result Value-apw-04								
82												
83				General Statistics								
84				Number of Events Reported (m)	23							
85				Number of Missing Events	0							
86				Number or Reported Events Used	23							
87				Number Values Reported (n)	23							
88				Minimum	0.0085							
89				Maximum	0.0218							
90				Mean	0.0138							
91				Geometric Mean	0.0134							
92				Median	0.014							
93				Standard Deviation	0.00351							
94				Coefficient of Variation	0.254							
95												
96				Mann-Kendall Test								
97				M-K Test Value (S)	17							
98				Critical Value (0.05)	1.645							
99				Standard Deviation of S	37.84							
100				Standardized Value of S	0.423							
101				Approximate p-value	0.336							
102												
103	Insufficient evidence to identify a significant											
104	trend at the specified level of significance.											
105				Result Value-apw-05								
106												
107				General Statistics								
108				Number of Events Reported (m)	12							
109				Number of Missing Events	0							
110				Number or Reported Events Used	12							

Number Values Reported (n)	12	
Minimum	0.001	
Maximum	0.001	
Mean	0.001	
Geometric Mean	0.001	
Median	0.001	
Standard Deviation	2.265E-19	
Coefficient of Variation	N/A	

Mann-Kendall Test

M-K Test Value (S)	0
Tabulated p-value	0.527
Standard Deviation of S	0
Standardized Value of S	N/A
Approximate p-value	N/A

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

Result Value-apw-05r

General Statistics

Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.001
Maximum	0.002
Mean	0.00173
Geometric Mean	0.00166
Median	0.002
Standard Deviation	4.6710E-4
Coefficient of Variation	0.27

Mann-Kendall Test

M-K Test Value (S)	24
Tabulated p-value	0.03
Standard Deviation of S	9.798
Standardized Value of S	2.347
Approximate p-value	0.00945

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-06d

General Statistics

Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.001
Maximum	0.002
Mean	0.00136
Geometric Mean	0.00129
Median	0.001
Standard Deviation	4.9237E-4

Coefficient of Variation	0.361	
Mann-Kendall Test		
M-K Test Value (S)	112	
Tabulated p-value	0.001	
Standard Deviation of S	29.3	
Standardized Value of S	3.788	
Approximate p-value	7.5931E-5	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.001	
Maximum	0.002	
Mean	0.00135	
Geometric Mean	0.00127	
Median	0.001	
Standard Deviation	4.8698E-4	
Coefficient of Variation	0.361	
Mann-Kendall Test		
M-K Test Value (S)	120	
Critical Value (0.05)	1.645	
Standard Deviation of S	30.98	
Standardized Value of S	3.841	
Approximate p-value	6.1340E-5	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	0.001	
Maximum	0.002	
Mean	0.00132	
Geometric Mean	0.00125	
Median	0.001	
Standard Deviation	4.7673E-4	
Coefficient of Variation	0.362	
Mann-Kendall Test		
M-K Test Value (S)	105	
Tabulated p-value	0.001	
Standard Deviation of S	28.37	
Standardized Value of S	3.666	

Approximate p-value	1.2342E-4	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.0036	
Maximum	0.0221	
Mean	0.0139	
Geometric Mean	0.0129	
Median	0.0141	
Standard Deviation	0.00452	
Coefficient of Variation	0.326	
Mann-Kendall Test		
M-K Test Value (S)	75	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.84	
Standardized Value of S	1.956	
Approximate p-value	0.0252	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.0126	
Maximum	0.0334	
Mean	0.0179	
Geometric Mean	0.0175	
Median	0.017	
Standard Deviation	0.00461	
Coefficient of Variation	0.257	
Mann-Kendall Test		
M-K Test Value (S)	102	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.85	
Standardized Value of S	2.668	
Approximate p-value	0.00381	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		

276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	0.001							
281				Maximum	0.0033							
282				Mean	0.00178							
283				Geometric Mean	0.00167							
284				Median	0.0016							
285				Standard Deviation	6.2790E-4							
286				Coefficient of Variation	0.354							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	117							
290				Critical Value (0.05)	1.645							
291				Standard Deviation of S	37.34							
292				Standardized Value of S	3.107							
293				Approximate p-value	9.4651E-4							
294												
295	**Statistically significant evidence of an increasing**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	0.001							
305				Maximum	0.002							
306				Mean	0.00135							
307				Geometric Mean	0.00127							
308				Median	0.001							
309				Standard Deviation	4.8698E-4							
310				Coefficient of Variation	0.361							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	120							
314				Critical Value (0.05)	1.645							
315				Standard Deviation of S	30.98							
316				Standardized Value of S	3.841							
317				Approximate p-value	6.1340E-5							
318												
319	**Statistically significant evidence of an increasing**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis		
User Selected Options	Sulfate	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:37:10 PM	
From File	MK Trend Analysis Combined by Analyte_v.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	23.3
Maximum	88
Mean	59.99
Geometric Mean	56.38
Median	65
Standard Deviation	19
Coefficient of Variation	0.317

Mann-Kendall Test

M-K Test Value (S)	-36
Critical Value (0.05)	-1.645
Standard Deviation of S	37.82
Standardized Value of S	-0.925
Approximate p-value	0.177

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	376
Maximum	510
Mean	448.5
Geometric Mean	446.8
Median	459
Standard Deviation	39.96
Coefficient of Variation	0.0891

Mann-Kendall Test

M-K Test Value (S)	-63
Critical Value (0.05)	-1.645
Standard Deviation of S	37.84
Standardized Value of S	-1.639
Approximate p-value	0.0506

Insufficient evidence to identify a significant

	A	B	C	D	E	F	G	H	I	J	K	L
56	trend at the specified level of significance.											
57				Result Value-apw-03								
58												
59				General Statistics								
60				Number of Events Reported (m)	23							
61				Number of Missing Events	0							
62				Number or Reported Events Used	23							
63				Number Values Reported (n)	23							
64				Minimum	80.1							
65				Maximum	393							
66				Mean	229							
67				Geometric Mean	217.5							
68				Median	226							
69				Standard Deviation	70.02							
70				Coefficient of Variation	0.306							
71												
72				Mann-Kendall Test								
73				M-K Test Value (S)	43							
74				Critical Value (0.05)	1.645							
75				Standard Deviation of S	37.86							
76				Standardized Value of S	1.109							
77				Approximate p-value	0.134							
78												
79	Insufficient evidence to identify a significant											
80	trend at the specified level of significance.											
81				Result Value-apw-04								
82												
83				General Statistics								
84				Number of Events Reported (m)	23							
85				Number of Missing Events	0							
86				Number or Reported Events Used	23							
87				Number Values Reported (n)	23							
88				Minimum	50.9							
89				Maximum	126							
90				Mean	82.31							
91				Geometric Mean	79.4							
92				Median	70.8							
93				Standard Deviation	22.77							
94				Coefficient of Variation	0.277							
95												
96				Mann-Kendall Test								
97				M-K Test Value (S)	-149							
98				Critical Value (0.05)	-1.645							
99				Standard Deviation of S	37.86							
100				Standardized Value of S	-3.909							
101				Approximate p-value	4.6388E-5							
102												
103	Statistically significant evidence of a decreasing											
104	trend at the specified level of significance.											
105				Result Value-apw-05								
106												
107				General Statistics								
108				Number of Events Reported (m)	12							
109				Number of Missing Events	0							
110				Number or Reported Events Used	12							

Number Values Reported (n)	12	
Minimum	224	
Maximum	460	
Mean	376.9	
Geometric Mean	371.3	
Median	387.5	
Standard Deviation	62.26	
Coefficient of Variation	0.165	
Mann-Kendall Test		
M-K Test Value (S)	-38	
Tabulated p-value	0.004	
Standard Deviation of S	14.58	
Standardized Value of S	-2.537	
Approximate p-value	0.00559	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-05r		
General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	70.5	
Maximum	373	
Mean	261.6	
Geometric Mean	229.6	
Median	330	
Standard Deviation	114.3	
Coefficient of Variation	0.437	
Mann-Kendall Test		
M-K Test Value (S)	-14	
Tabulated p-value	0.141	
Standard Deviation of S	12.81	
Standardized Value of S	-1.015	
Approximate p-value	0.155	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-06d		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	136	
Maximum	272	
Mean	219.9	
Geometric Mean	217.2	
Median	216.5	
Standard Deviation	34.35	

Coefficient of Variation	0.156	
Mann-Kendall Test		
M-K Test Value (S)	-39	
Tabulated p-value	0.144	
Standard Deviation of S	35.44	
Standardized Value of S	-1.072	
Approximate p-value	0.142	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	92.6	
Maximum	247	
Mean	194	
Geometric Mean	187.8	
Median	208	
Standard Deviation	46.32	
Coefficient of Variation	0.239	
Mann-Kendall Test		
M-K Test Value (S)	35	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.86	
Standardized Value of S	0.898	
Approximate p-value	0.185	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	34.7	
Maximum	78	
Mean	54.44	
Geometric Mean	53.16	
Median	53	
Standard Deviation	12	
Coefficient of Variation	0.22	
Mann-Kendall Test		
M-K Test Value (S)	-86	
Tabulated p-value	0.007	
Standard Deviation of S	35.45	
Standardized Value of S	-2.398	

Approximate p-value	0.00825	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	23	
Maximum	43	
Mean	33.05	
Geometric Mean	32.49	
Median	33.4	
Standard Deviation	6.125	
Coefficient of Variation	0.185	
Mann-Kendall Test		
M-K Test Value (S)	-162	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.71	
Standardized Value of S	-4.269	
Approximate p-value	9.7960E-6	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	25	
Maximum	104	
Mean	46.33	
Geometric Mean	44.13	
Median	44	
Standard Deviation	16.39	
Coefficient of Variation	0.354	
Mann-Kendall Test		
M-K Test Value (S)	-37	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.84	
Standardized Value of S	-0.951	
Approximate p-value	0.171	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		

	A	B	C	D	E	F	G	H	I	J	K	L
276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	26							
281				Maximum	44.5							
282				Mean	38.54							
283				Geometric Mean	38.11							
284				Median	41							
285				Standard Deviation	5.629							
286				Coefficient of Variation	0.146							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	-103							
290				Critical Value (0.05)	-1.645							
291				Standard Deviation of S	37.58							
292				Standardized Value of S	-2.714							
293				Approximate p-value	0.00332							
294												
295	**Statistically significant evidence of a decreasing**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	5							
305				Maximum	21							
306				Mean	8.746							
307				Geometric Mean	8.126							
308				Median	10							
309				Standard Deviation	3.589							
310				Coefficient of Variation	0.41							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	-115							
314				Critical Value (0.05)	-1.645							
315				Standard Deviation of S	32.49							
316				Standardized Value of S	-3.509							
317				Approximate p-value	2.2518E-4							
318												
319	**Statistically significant evidence of a decreasing**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis

User Selected Options	Calcium
Date/Time of Computation	ProUCL 5.2 2/26/2026 11:55:32 AM
From File	MK Trend Analysis Combined by Analyte_f.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	59.2
Maximum	98
Mean	84.83
Geometric Mean	84.17
Median	88.2
Standard Deviation	10.31
Coefficient of Variation	0.121

Mann-Kendall Test

M-K Test Value (S)	-36
Critical Value (0.05)	-1.645
Standard Deviation of S	37.85
Standardized Value of S	-0.925
Approximate p-value	0.178

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	132
Maximum	198
Mean	156.9
Geometric Mean	155.9
Median	156
Standard Deviation	18.19
Coefficient of Variation	0.116

Mann-Kendall Test

M-K Test Value (S)	18
Critical Value (0.05)	1.645
Standard Deviation of S	37.82
Standardized Value of S	0.449
Approximate p-value	0.327

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	74.9
Maximum	153
Mean	113.1
Geometric Mean	111.3
Median	116
Standard Deviation	19.62
Coefficient of Variation	0.174

Mann-Kendall Test

M-K Test Value (S)	79
Critical Value (0.05)	1.645
Standard Deviation of S	37.78
Standardized Value of S	2.065
Approximate p-value	0.0195

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-04

General Statistics		
Number of Events Reported (m)		23
Number of Missing Events		0
Number or Reported Events Used		23
Number Values Reported (n)		23
Minimum		87.9
Maximum		124
Mean		102.8
Geometric Mean		102.4
Median		102
Standard Deviation		8.19
Coefficient of Variation		0.0797
Mann-Kendall Test		
M-K Test Value (S)		2
Critical Value (0.05)		1.645
Standard Deviation of S		37.76
Standardized Value of S		0.0265
Approximate p-value		0.489

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

Result Value-apw-05

General Statistics		
Number of Events Reported (m)		12
Number of Missing Events		0
Number or Reported Events Used		12
Number Values Reported (n)		12
Minimum		112
Maximum		142
Mean		125.3
Geometric Mean		125.1
Median		124.5
Standard Deviation		8.217
Coefficient of Variation		0.0656
Mann-Kendall Test		
M-K Test Value (S)		-27
Tabulated p-value		0.043
Standard Deviation of S		14.55
Standardized Value of S		-1.787
Approximate p-value		0.037

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)		11
Number of Missing Events		0
Number or Reported Events Used		11
Number Values Reported (n)		11
Minimum		74
Maximum		141
Mean		114.3
Geometric Mean		112.4
Median		111
Standard Deviation		21.18
Coefficient of Variation		0.185
Mann-Kendall Test		
M-K Test Value (S)		-2
Tabulated p-value		0.44
Standard Deviation of S		12.81
Standardized Value of S		-0.0781
Approximate p-value		0.469

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

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)		22
Number of Missing Events		0
Number or Reported Events Used		22
Number Values Reported (n)		22
Minimum		96.7
Maximum		128
Mean		111.5
Geometric Mean		111.2
Median		110

Standard Deviation	8.944	
Coefficient of Variation	0.0802	
Mann-Kendall Test		
M-K Test Value (S)	97	
Tabulated p-value	0.003	
Standard Deviation of S	35.31	
Standardized Value of S	2.719	
Approximate p-value	0.00328	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	87.5	
Maximum	139	
Mean	106.6	
Geometric Mean	105.7	
Median	101	
Standard Deviation	14.61	
Coefficient of Variation	0.137	
Mann-Kendall Test		
M-K Test Value (S)	105	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.8	
Standardized Value of S	2.751	
Approximate p-value	0.00297	
Statistically significant evidence of an increasing		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	161	
Maximum	238	
Mean	197.9	
Geometric Mean	197.2	
Median	197.5	
Standard Deviation	17.34	
Coefficient of Variation	0.0876	
Mann-Kendall Test		
M-K Test Value (S)	56	
Tabulated p-value	0.058	
Standard Deviation of S	35.42	
Standardized Value of S	1.553	
Approximate p-value	0.0602	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	79.4	
Maximum	107	
Mean	95.04	
Geometric Mean	94.65	
Median	97.8	
Standard Deviation	8.604	
Coefficient of Variation	0.0905	
Mann-Kendall Test		
M-K Test Value (S)	24	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.79	
Standardized Value of S	0.609	
Approximate p-value	0.271	

	A	B	C	D	E	F	G	H	I	J	K	L
247	**Insufficient evidence to identify a significant**											
248	**trend at the specified level of significance.**											
249				**Result Value-apw-09**								
250												
251				**General Statistics**								
252				Number of Events Reported (m)	23							
253				Number of Missing Events	0							
254				Number or Reported Events Used	23							
255				Number Values Reported (n)	23							
256				Minimum	69.5							
257				Maximum	110							
258				Mean	85.69							
259				Geometric Mean	85.38							
260				Median	85.8							
261				Standard Deviation	7.586							
262				Coefficient of Variation	0.0885							
263												
264				**Mann-Kendall Test**								
265				M-K Test Value (S)	50							
266				Critical Value (0.05)	1.645							
267				Standard Deviation of S	37.85							
268				Standardized Value of S	1.295							
269				Approximate p-value	0.0977							
270												
271	**Insufficient evidence to identify a significant**											
272	**trend at the specified level of significance.**											
273				**Result Value-apw-10d**								
274												
275				**General Statistics**								
276				Number of Events Reported (m)	23							
277				Number of Missing Events	0							
278				Number or Reported Events Used	23							
279				Number Values Reported (n)	23							
280				Minimum	98.5							
281				Maximum	611							
282				Mean	157.8							
283				Geometric Mean	141							
284				Median	125							
285				Standard Deviation	112							
286				Coefficient of Variation	0.709							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	30							
290				Critical Value (0.05)	1.645							
291				Standard Deviation of S	37.8							
292				Standardized Value of S	0.767							
293				Approximate p-value	0.221							
294												
295	**Insufficient evidence to identify a significant**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	23							
301				Number of Missing Events	0							
302				Number or Reported Events Used	23							
303				Number Values Reported (n)	23							
304				Minimum	129							
305				Maximum	171							
306				Mean	151.8							
307				Geometric Mean	151.3							
308				Median	153							
309				Standard Deviation	12.24							
310				Coefficient of Variation	0.0806							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	107							
314				Critical Value (0.05)	1.645							
315				Standard Deviation of S	37.78							
316				Standardized Value of S	2.806							
317				Approximate p-value	0.00251							
318												
319	**Statistically significant evidence of an increasing**											
320	**trend at the specified level of significance.**											

Mann-Kendall Trend Test Analysis	
User Selected Options	Chloride
Date/Time of Computation	ProUCL 5.2 2/26/2026 11:57:54 AM
From File	MK Trend Analysis Combined by Analyte_g.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	1.1
Maximum	11
Mean	5.94
Geometric Mean	5.086
Median	6.15
Standard Deviation	2.761
Coefficient of Variation	0.465

Mann-Kendall Test

M-K Test Value (S)	-13
Critical Value (0.05)	-1.645
Standard Deviation of S	37.36
Standardized Value of S	-0.321
Approximate p-value	0.374

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	5.38
Maximum	13
Mean	9.619
Geometric Mean	9.397
Median	9
Standard Deviation	2.054
Coefficient of Variation	0.214

Mann-Kendall Test

M-K Test Value (S)	-131
Critical Value (0.05)	-1.645
Standard Deviation of S	37.55
Standardized Value of S	-3.462
Approximate p-value	2.6844E-4

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	6.03
Maximum	23
Mean	15.72
Geometric Mean	14.61
Median	16
Standard Deviation	5.514
Coefficient of Variation	0.351

Mann-Kendall Test

M-K Test Value (S)	-179
Critical Value (0.05)	-1.645
Standard Deviation of S	37.7
Standardized Value of S	-4.721
Approximate p-value	1.1742E-6

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)		23
Number of Missing Events		0
Number or Reported Events Used		23
Number Values Reported (n)		23
Minimum		9
Maximum		12
Mean		10.67
Geometric Mean		10.63
Median		11
Standard Deviation		0.836
Coefficient of Variation		0.0784
Mann-Kendall Test		
M-K Test Value (S)		-66
Critical Value (0.05)		-1.645
Standard Deviation of S		36.82
Standardized Value of S		-1.765
Approximate p-value		0.0388

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

Result Value-apw-05

General Statistics		
Number of Events Reported (m)		12
Number of Missing Events		0
Number or Reported Events Used		12
Number Values Reported (n)		12
Minimum		14
Maximum		19
Mean		16.17
Geometric Mean		16.09
Median		16
Standard Deviation		1.642
Coefficient of Variation		0.102
Mann-Kendall Test		
M-K Test Value (S)		33
Tabulated p-value		0.016
Standard Deviation of S		13.94
Standardized Value of S		2.295
Approximate p-value		0.0109

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)		11
Number of Missing Events		0
Number or Reported Events Used		11
Number Values Reported (n)		11
Minimum		14
Maximum		28.1
Mean		18.37
Geometric Mean		17.98
Median		16.9
Standard Deviation		4.278
Coefficient of Variation		0.233
Mann-Kendall Test		
M-K Test Value (S)		9
Tabulated p-value		0.271
Standard Deviation of S		12.85
Standardized Value of S		0.623
Approximate p-value		0.267

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

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)		22
Number of Missing Events		0
Number or Reported Events Used		22
Number Values Reported (n)		22
Minimum		14
Maximum		35.3
Mean		17.95
Geometric Mean		17.57
Median		17

Standard Deviation	4.465	
Coefficient of Variation	0.249	
Mann-Kendall Test		
M-K Test Value (S)	45	
Tabulated p-value	0.109	
Standard Deviation of S	34.81	
Standardized Value of S	1.264	
Approximate p-value	0.103	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	19.4	
Maximum	36.1	
Mean	24.64	
Geometric Mean	24.36	
Median	24	
Standard Deviation	3.918	
Coefficient of Variation	0.159	
Mann-Kendall Test		
M-K Test Value (S)	-145	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.74	
Standardized Value of S	-3.816	
Approximate p-value	6.7941E-5	
Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	8.97	
Maximum	16	
Mean	12.24	
Geometric Mean	12.01	
Median	11.75	
Standard Deviation	2.434	
Coefficient of Variation	0.199	
Mann-Kendall Test		
M-K Test Value (S)	-147	
Tabulated p-value	0	
Standard Deviation of S	34.99	
Standardized Value of S	-4.173	
Approximate p-value	1.5060E-5	
Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	7.46	
Maximum	13	
Mean	10.03	
Geometric Mean	9.949	
Median	10	
Standard Deviation	1.323	
Coefficient of Variation	0.132	
Mann-Kendall Test		
M-K Test Value (S)	-78	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.35	
Standardized Value of S	-2.062	
Approximate p-value	0.0196	

Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	9.87	
Maximum	768	
Mean	45.16	
Geometric Mean	14.68	
Median	12.8	
Standard Deviation	157.6	
Coefficient of Variation	3.489	
Mann-Kendall Test		
M-K Test Value (S)	-111	
Critical Value (0.05)	-1.645	
Standard Deviation of S	36.48	
Standardized Value of S	-3.015	
Approximate p-value	0.00128	
Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	10	
Maximum	25.5	
Mean	15.64	
Geometric Mean	15.21	
Median	15.4	
Standard Deviation	3.869	
Coefficient of Variation	0.247	
Mann-Kendall Test		
M-K Test Value (S)	-66	
Critical Value (0.05)	-1.645	
Standard Deviation of S	37.69	
Standardized Value of S	-1.725	
Approximate p-value	0.0423	
Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	6	
Maximum	21	
Mean	11.82	
Geometric Mean	10.87	
Median	12	
Standard Deviation	4.74	
Coefficient of Variation	0.401	
Mann-Kendall Test		
M-K Test Value (S)	79	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.47	
Standardized Value of S	2.081	
Approximate p-value	0.0187	
Statistically significant evidence of an increasing trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Fluoride	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:07:14 PM	
From File	MK Trend Analysis Combined by Analyte_k.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.12
Maximum	0.326
Mean	0.171
Geometric Mean	0.168
Median	0.16
Standard Deviation	0.0397
Coefficient of Variation	0.232

Mann-Kendall Test

M-K Test Value (S)	52
Critical Value (0.05)	1.645
Standard Deviation of S	37.49
Standardized Value of S	1.36
Approximate p-value	0.0868

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.197
Maximum	1.5
Mean	0.317
Geometric Mean	0.272
Median	0.24
Standard Deviation	0.279
Coefficient of Variation	0.883

Mann-Kendall Test

M-K Test Value (S)	-12
Critical Value (0.05)	-1.645
Standard Deviation of S	37.35
Standardized Value of S	-0.295
Approximate p-value	0.384

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	0.15
Maximum	0.75
Mean	0.287
Geometric Mean	0.273
Median	0.27
Standard Deviation	0.111
Coefficient of Variation	0.388

Mann-Kendall Test

M-K Test Value (S)	-37
Critical Value (0.05)	-1.645
Standard Deviation of S	37.72
Standardized Value of S	-0.954
Approximate p-value	0.17

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)		23
Number of Missing Events		0
Number or Reported Events Used		23
Number Values Reported (n)		23
Minimum		0.15
Maximum		0.201
Mean		0.171
Geometric Mean		0.171
Median		0.17
Standard Deviation		0.0145
Coefficient of Variation		0.0846
Mann-Kendall Test		
M-K Test Value (S)		-68
Critical Value (0.05)		-1.645
Standard Deviation of S		37.23
Standardized Value of S		-1.8
Approximate p-value		0.036

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

Result Value-apw-05

General Statistics	
Number of Events Reported (m)	12
Number of Missing Events	0
Number or Reported Events Used	12
Number Values Reported (n)	12
Minimum	0.32
Maximum	0.37
Mean	0.336
Geometric Mean	0.335
Median	0.33
Standard Deviation	0.0168
Coefficient of Variation	0.0499
Mann-Kendall Test	
M-K Test Value (S)	12
Tabulated p-value	0.23
Standard Deviation of S	14.12
Standardized Value of S	0.779
Approximate p-value	0.218

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

Result Value-apw-05r

General Statistics	
Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.15
Maximum	0.75
Mean	0.335
Geometric Mean	0.31
Median	0.3
Standard Deviation	0.155
Coefficient of Variation	0.461
Mann-Kendall Test	
M-K Test Value (S)	1
Tabulated p-value	0.5
Standard Deviation of S	12.85
Standardized Value of S	0
Approximate p-value	0.5

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

Result Value-apw-06d

General Statistics	
Number of Events Reported (m)	22
Number of Missing Events	0
Number or Reported Events Used	22
Number Values Reported (n)	22
Minimum	0.15
Maximum	0.249
Mean	0.21
Geometric Mean	0.208
Median	0.211

	A	B	C	D	E	F	G	H	I	J	K	L
165				Standard Deviation	0.0255							
166				Coefficient of Variation	0.122							
167												
168				**Mann-Kendall Test**								
169				M-K Test Value (S)	-45							
170				Tabulated p-value	0.109							
171				Standard Deviation of S	35.16							
172				Standardized Value of S	-1.251							
173				Approximate p-value	0.105							
174												
175	**Insufficient evidence to identify a significant**											
176	**trend at the specified level of significance.**											
177				**Result Value-apw-06s**								
178												
179				**General Statistics**								
180				Number of Events Reported (m)	23							
181				Number of Missing Events	0							
182				Number or Reported Events Used	23							
183				Number Values Reported (n)	23							
184				Minimum	0.15							
185				Maximum	0.41							
186				Mean	0.267							
187				Geometric Mean	0.261							
188				Median	0.26							
189				Standard Deviation	0.0538							
190				Coefficient of Variation	0.202							
191												
192				**Mann-Kendall Test**								
193				M-K Test Value (S)	-19							
194				Critical Value (0.05)	-1.645							
195				Standard Deviation of S	37.74							
196				Standardized Value of S	-0.477							
197				Approximate p-value	0.317							
198												
199	**Insufficient evidence to identify a significant**											
200	**trend at the specified level of significance.**											
201				**Result Value-apw-07**								
202												
203				**General Statistics**								
204				Number of Events Reported (m)	22							
205				Number of Missing Events	0							
206				Number or Reported Events Used	22							
207				Number Values Reported (n)	22							
208				Minimum	0.15							
209				Maximum	0.35							
210				Mean	0.191							
211				Geometric Mean	0.188							
212				Median	0.185							
213				Standard Deviation	0.039							
214				Coefficient of Variation	0.204							
215												
216				**Mann-Kendall Test**								
217				M-K Test Value (S)	-104							
218				Tabulated p-value	0.001							
219				Standard Deviation of S	35.14							
220				Standardized Value of S	-2.931							
221				Approximate p-value	0.00169							
222												
223	**Statistically significant evidence of a decreasing**											
224	**trend at the specified level of significance.**											
225				**Result Value-apw-08**								
226												
227				**General Statistics**								
228				Number of Events Reported (m)	23							
229				Number of Missing Events	0							
230				Number or Reported Events Used	23							
231				Number Values Reported (n)	23							
232				Minimum	0.15							
233				Maximum	0.336							
234				Mean	0.27							
235				Geometric Mean	0.267							
236				Median	0.28							
237				Standard Deviation	0.0352							
238				Coefficient of Variation	0.131							
239												
240				**Mann-Kendall Test**								
241				M-K Test Value (S)	-128							
242				Critical Value (0.05)	-1.645							
243				Standard Deviation of S	37.47							
244				Standardized Value of S	-3.389							
245				Approximate p-value	3.5026E-4							
246												

Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.15	
Maximum	0.339	
Mean	0.205	
Geometric Mean	0.203	
Median	0.2	
Standard Deviation	0.035	
Coefficient of Variation	0.17	
Mann-Kendall Test		
M-K Test Value (S)	4	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.24	
Standardized Value of S	0.0806	
Approximate p-value	0.468	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.1	
Maximum	0.15	
Mean	0.124	
Geometric Mean	0.123	
Median	0.12	
Standard Deviation	0.0213	
Coefficient of Variation	0.171	
Mann-Kendall Test		
M-K Test Value (S)	156	
Critical Value (0.05)	1.645	
Standard Deviation of S	36.37	
Standardized Value of S	4.262	
Approximate p-value	1.0133E-5	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	0.15	
Maximum	0.265	
Mean	0.178	
Geometric Mean	0.175	
Median	0.17	
Standard Deviation	0.0328	
Coefficient of Variation	0.184	
Mann-Kendall Test		
M-K Test Value (S)	20	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.15	
Standardized Value of S	0.511	
Approximate p-value	0.305	
Insufficient evidence to identify a significant trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Nickel	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:27:59 PM	
From File	MK Trend Analysis Combined by Analyte_r.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.0038
Maximum	0.012
Mean	0.00613
Geometric Mean	0.00577
Median	0.0054
Standard Deviation	0.00245
Coefficient of Variation	0.4

Mann-Kendall Test

M-K Test Value (S)	25
Tabulated p-value	0.03
Standard Deviation of S	12.85
Standardized Value of S	1.868
Approximate p-value	0.0309

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-02

General Statistics

Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.00237
Maximum	0.0725
Mean	0.0287
Geometric Mean	0.0197
Median	0.0263
Standard Deviation	0.0225
Coefficient of Variation	0.782

Mann-Kendall Test

M-K Test Value (S)	-15
Tabulated p-value	0.141
Standard Deviation of S	12.85
Standardized Value of S	-1.09
Approximate p-value	0.138

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

Result Value-apw-03

General Statistics

Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.001
Maximum	0.01
Mean	0.00326
Geometric Mean	0.00249
Median	0.0025
Standard Deviation	0.00271
Coefficient of Variation	0.831

Mann-Kendall Test

M-K Test Value (S)	-2
Tabulated p-value	0.44
Standard Deviation of S	12.7
Standardized Value of S	-0.0787
Approximate p-value	0.469

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.002	
Maximum	0.0065	
Mean	0.00377	
Geometric Mean	0.00351	
Median	0.0034	
Standard Deviation	0.00149	
Coefficient of Variation	0.395	
Mann-Kendall Test		
M-K Test Value (S)	16	
Tabulated p-value	0.109	
Standard Deviation of S	12.81	
Standardized Value of S	1.171	
Approximate p-value	0.121	

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

Result Value-apw-05

General Statistics	
Number of Events Reported (m)	10
Number of Missing Events	0
Number or Reported Events Used	10
Number Values Reported (n)	10
Minimum	0.001
Maximum	0.0074
Mean	0.0026
Geometric Mean	0.00206
Median	0.00205
Standard Deviation	0.00204
Coefficient of Variation	0.785
Mann-Kendall Test	
M-K Test Value (S)	-6
Tabulated p-value	0.3
Standard Deviation of S	11.02
Standardized Value of S	-0.454
Approximate p-value	0.325

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

Result Value-apw-05r

General Statistics	
Number of Events Reported (m)	1
Number of Missing Events	0
Number or Reported Events Used	1
Number Values Reported (n)	1
Minimum	0.002
Maximum	0.002
Mean	0.002
Geometric Mean	0.002
Median	0.002
Standard Deviation	N/A
Coefficient of Variation	N/A

Not enough reported values (n) to provide Mann-Kendall Statistics!

Result Value-apw-06d

General Statistics	
Number of Events Reported (m)	10
Number of Missing Events	0
Number or Reported Events Used	10
Number Values Reported (n)	10
Minimum	0.0017
Maximum	0.0093
Mean	0.0037
Geometric Mean	0.00307
Median	0.00265
Standard Deviation	0.00274
Coefficient of Variation	0.742
Mann-Kendall Test	
M-K Test Value (S)	14
Tabulated p-value	0.108
Standard Deviation of S	11.14
Standardized Value of S	1.167

Approximate p-value	0.122	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.001	
Maximum	0.009	
Mean	0.00257	
Geometric Mean	0.0021	
Median	0.0021	
Standard Deviation	0.00223	
Coefficient of Variation	0.866	
Mann-Kendall Test		
M-K Test Value (S)	-5	
Tabulated p-value	0.381	
Standard Deviation of S	12.77	
Standardized Value of S	-0.313	
Approximate p-value	0.377	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.001	
Maximum	0.015	
Mean	0.00293	
Geometric Mean	0.00183	
Median	0.0013	
Standard Deviation	0.00415	
Coefficient of Variation	1.416	
Mann-Kendall Test		
M-K Test Value (S)	-5	
Tabulated p-value	0.381	
Standard Deviation of S	12.18	
Standardized Value of S	-0.328	
Approximate p-value	0.371	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	0.0026	
Maximum	0.0077	
Mean	0.00404	
Geometric Mean	0.00376	
Median	0.00354	
Standard Deviation	0.00172	
Coefficient of Variation	0.426	
Mann-Kendall Test		
M-K Test Value (S)	0	
Tabulated p-value	0.5	
Standard Deviation of S	12.7	
Standardized Value of S	N/A	
Approximate p-value	N/A	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	

Number Values Reported (n)	11	
Minimum	0.001	
Maximum	0.012	
Mean	0.00266	
Geometric Mean	0.00181	
Median	0.0012	
Standard Deviation	0.00326	
Coefficient of Variation	1.224	

Mann-Kendall Test

M-K Test Value (S)	3
Tabulated p-value	0.44
Standard Deviation of S	12.18
Standardized Value of S	0.164
Approximate p-value	0.435

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

Result Value-apw-10d

General Statistics

Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.0025
Maximum	0.0095
Mean	0.00603
Geometric Mean	0.0057
Median	0.0063
Standard Deviation	0.00194
Coefficient of Variation	0.322

Mann-Kendall Test

M-K Test Value (S)	-21
Tabulated p-value	0.06
Standard Deviation of S	12.85
Standardized Value of S	-1.557
Approximate p-value	0.0597

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

Result Value-apw-10s

General Statistics

Number of Events Reported (m)	11
Number of Missing Events	0
Number or Reported Events Used	11
Number Values Reported (n)	11
Minimum	0.001
Maximum	0.0051
Mean	0.00179
Geometric Mean	0.00154
Median	0.0014
Standard Deviation	0.00126
Coefficient of Variation	0.705

Mann-Kendall Test

M-K Test Value (S)	6
Tabulated p-value	0.324
Standard Deviation of S	12.46
Standardized Value of S	0.401
Approximate p-value	0.344

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

Mann-Kendall Trend Test Analysis		
User Selected Options	pH	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:30:50 PM	
From File	MK Trend Analysis Combined by Analyte_s.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	6.43
Maximum	7.25
Mean	6.827
Geometric Mean	6.823
Median	6.85
Standard Deviation	0.248
Coefficient of Variation	0.0363

Mann-Kendall Test

M-K Test Value (S)	53
Critical Value (0.05)	1.645
Standard Deviation of S	37.86
Standardized Value of S	1.373
Approximate p-value	0.0848

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	6.9
Maximum	7.67
Mean	7.171
Geometric Mean	7.169
Median	7.14
Standard Deviation	0.186
Coefficient of Variation	0.0259

Mann-Kendall Test

M-K Test Value (S)	103
Critical Value (0.05)	1.645
Standard Deviation of S	37.84
Standardized Value of S	2.696
Approximate p-value	0.00351

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-03

General Statistics

Number of Events Reported (m)	23
Number of Missing Events	0
Number or Reported Events Used	23
Number Values Reported (n)	23
Minimum	7.21
Maximum	8.11
Mean	7.685
Geometric Mean	7.68
Median	7.77
Standard Deviation	0.275
Coefficient of Variation	0.0358

Mann-Kendall Test

M-K Test Value (S)	59
Critical Value (0.05)	1.645
Standard Deviation of S	37.84
Standardized Value of S	1.533
Approximate p-value	0.0627

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

Result Value-apw-04

General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	7.2	
Maximum	8.17	
Mean	7.459	
Geometric Mean	7.456	
Median	7.41	
Standard Deviation	0.225	
Coefficient of Variation	0.0302	
Mann-Kendall Test		
M-K Test Value (S)	113	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.8	
Standardized Value of S	2.963	
Approximate p-value	0.00152	

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-05

General Statistics		
Number of Events Reported (m)	12	
Number of Missing Events	0	
Number or Reported Events Used	12	
Number Values Reported (n)	12	
Minimum	7.18	
Maximum	7.55	
Mean	7.305	
Geometric Mean	7.304	
Median	7.3	
Standard Deviation	0.0934	
Coefficient of Variation	0.0128	
Mann-Kendall Test		
M-K Test Value (S)	-3	
Tabulated p-value	0.473	
Standard Deviation of S	14.48	
Standardized Value of S	-0.138	
Approximate p-value	0.445	

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

Result Value-apw-05r

General Statistics		
Number of Events Reported (m)	11	
Number of Missing Events	0	
Number or Reported Events Used	11	
Number Values Reported (n)	11	
Minimum	7.27	
Maximum	8	
Mean	7.551	
Geometric Mean	7.548	
Median	7.56	
Standard Deviation	0.211	
Coefficient of Variation	0.028	
Mann-Kendall Test		
M-K Test Value (S)	36	
Tabulated p-value	0.002	
Standard Deviation of S	12.81	
Standardized Value of S	2.733	
Approximate p-value	0.00314	

Statistically significant evidence of an increasing trend at the specified level of significance.

Result Value-apw-06d

General Statistics		
Number of Events Reported (m)	22	
Number of Missing Events	0	
Number or Reported Events Used	22	
Number Values Reported (n)	22	
Minimum	7.19	
Maximum	7.73	
Mean	7.375	
Geometric Mean	7.373	
Median	7.33	

Standard Deviation	0.175				
Coefficient of Variation	0.0238				
Mann-Kendall Test					
M-K Test Value (S)	135				
Tabulated p-value	0				
Standard Deviation of S	35.41				
Standardized Value of S	3.785				
Approximate p-value	7.6995E-5				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-06s					
General Statistics					
Number of Events Reported (m)	23				
Number of Missing Events	0				
Number or Reported Events Used	23				
Number Values Reported (n)	23				
Minimum	7.02				
Maximum	7.67				
Mean	7.24				
Geometric Mean	7.237				
Median	7.2				
Standard Deviation	0.188				
Coefficient of Variation	0.026				
Mann-Kendall Test					
M-K Test Value (S)	105				
Critical Value (0.05)	1.645				
Standard Deviation of S	37.84				
Standardized Value of S	2.749				
Approximate p-value	0.00299				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-07					
General Statistics					
Number of Events Reported (m)	22				
Number of Missing Events	0				
Number or Reported Events Used	22				
Number Values Reported (n)	22				
Minimum	6.78				
Maximum	7.31				
Mean	6.961				
Geometric Mean	6.96				
Median	6.935				
Standard Deviation	0.145				
Coefficient of Variation	0.0208				
Mann-Kendall Test					
M-K Test Value (S)	97				
Tabulated p-value	0.003				
Standard Deviation of S	35.41				
Standardized Value of S	2.711				
Approximate p-value	0.00335				
Statistically significant evidence of an increasing					
trend at the specified level of significance.					
Result Value-apw-08					
General Statistics					
Number of Events Reported (m)	23				
Number of Missing Events	0				
Number or Reported Events Used	23				
Number Values Reported (n)	23				
Minimum	7				
Maximum	7.68				
Mean	7.268				
Geometric Mean	7.265				
Median	7.25				
Standard Deviation	0.195				
Coefficient of Variation	0.0268				
Mann-Kendall Test					
M-K Test Value (S)	126				
Critical Value (0.05)	1.645				
Standard Deviation of S	37.75				
Standardized Value of S	3.311				
Approximate p-value	4.6491E-4				

Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	7.31	
Maximum	8.03	
Mean	7.546	
Geometric Mean	7.544	
Median	7.51	
Standard Deviation	0.198	
Coefficient of Variation	0.0262	
Mann-Kendall Test		
M-K Test Value (S)	121	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.84	
Standardized Value of S	3.171	
Approximate p-value	7.5835E-4	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	6.98	
Maximum	7.66	
Mean	7.249	
Geometric Mean	7.246	
Median	7.21	
Standard Deviation	0.209	
Coefficient of Variation	0.0288	
Mann-Kendall Test		
M-K Test Value (S)	117	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.81	
Standardized Value of S	3.068	
Approximate p-value	0.00108	
Statistically significant evidence of an increasing trend at the specified level of significance.		
Result Value-apw-10s		
General Statistics		
Number of Events Reported (m)	23	
Number of Missing Events	0	
Number or Reported Events Used	23	
Number Values Reported (n)	23	
Minimum	6.91	
Maximum	7.58	
Mean	7.102	
Geometric Mean	7.1	
Median	7.06	
Standard Deviation	0.161	
Coefficient of Variation	0.0226	
Mann-Kendall Test		
M-K Test Value (S)	122	
Critical Value (0.05)	1.645	
Standard Deviation of S	37.76	
Standardized Value of S	3.204	
Approximate p-value	6.7709E-4	
Statistically significant evidence of an increasing trend at the specified level of significance.		

Mann-Kendall Trend Test Analysis		
User Selected Options	Turbidity	
Date/Time of Computation	ProUCL 5.2 2/26/2026 12:39:35 PM	
From File	MK Trend Analysis Combined by Analyte_x.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
Level of Significance	0.05	

Result Value-apw-01r

General Statistics

Number of Events Reported (m)	15
Number of Missing Events	0
Number or Reported Events Used	15
Number Values Reported (n)	15
Minimum	8.95
Maximum	133
Mean	51.12
Geometric Mean	40.27
Median	33.9
Standard Deviation	35.57
Coefficient of Variation	0.696

Mann-Kendall Test

M-K Test Value (S)	-24
Tabulated p-value	0.12
Standard Deviation of S	20.18
Standardized Value of S	-1.14
Approximate p-value	0.127

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

Result Value-apw-02

General Statistics

Number of Events Reported (m)	15
Number of Missing Events	0
Number or Reported Events Used	15
Number Values Reported (n)	15
Minimum	19.2
Maximum	663
Mean	136.9
Geometric Mean	100.1
Median	104
Standard Deviation	151.6
Coefficient of Variation	1.108

Mann-Kendall Test

M-K Test Value (S)	17
Tabulated p-value	0.218
Standard Deviation of S	20.21
Standardized Value of S	0.792
Approximate p-value	0.214

Insufficient evidence to identify a significant

trend at the specified level of significance.		
Result Value-apw-03		
General Statistics		
Number of Events Reported (m)	15	
Number of Missing Events	0	
Number or Reported Events Used	15	
Number Values Reported (n)	15	
Minimum	1.94	
Maximum	103	
Mean	20.98	
Geometric Mean	9.77	
Median	7.34	
Standard Deviation	29.06	
Coefficient of Variation	1.385	
Mann-Kendall Test		
M-K Test Value (S)	-15	
Tabulated p-value	0.248	
Standard Deviation of S	20.21	
Standardized Value of S	-0.693	
Approximate p-value	0.244	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-04		
General Statistics		
Number of Events Reported (m)	15	
Number of Missing Events	0	
Number or Reported Events Used	15	
Number Values Reported (n)	15	
Minimum	15.7	
Maximum	91.7	
Mean	38.51	
Geometric Mean	32.75	
Median	29.8	
Standard Deviation	24.97	
Coefficient of Variation	0.649	
Mann-Kendall Test		
M-K Test Value (S)	29	
Tabulated p-value	0.084	
Standard Deviation of S	20.21	
Standardized Value of S	1.386	
Approximate p-value	0.0829	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-05		
General Statistics		
Number of Events Reported (m)	4	
Number of Missing Events	0	
Number or Reported Events Used	4	

111				Number Values Reported (n)	4							
112				Minimum	4.65							
113				Maximum	51.8							
114				Mean	18.46							
115				Geometric Mean	11.61							
116				Median	8.7							
117				Standard Deviation	22.31							
118				Coefficient of Variation	1.208							
119												
120				**Mann-Kendall Test**								
121				M-K Test Value (S)	-4							
122				Tabulated p-value	0.167							
123				Standard Deviation of S	2.944							
124				Standardized Value of S	-1.019							
125				Approximate p-value	0.154							
126												
127	**Insufficient evidence to identify a significant**											
128	**trend at the specified level of significance.**											
129				**Result Value-apw-05r**								
130												
131				**General Statistics**								
132				Number of Events Reported (m)	11							
133				Number of Missing Events	0							
134				Number or Reported Events Used	11							
135				Number Values Reported (n)	11							
136				Minimum	8.02							
137				Maximum	76.1							
138				Mean	34.36							
139				Geometric Mean	28.73							
140				Median	32.8							
141				Standard Deviation	20.72							
142				Coefficient of Variation	0.603							
143												
144				**Mann-Kendall Test**								
145				M-K Test Value (S)	-19							
146				Tabulated p-value	0.082							
147				Standard Deviation of S	12.85							
148				Standardized Value of S	-1.401							
149				Approximate p-value	0.0806							
150												
151	**Insufficient evidence to identify a significant**											
152	**trend at the specified level of significance.**											
153				**Result Value-apw-06d**								
154												
155				**General Statistics**								
156				Number of Events Reported (m)	14							
157				Number of Missing Events	0							
158				Number or Reported Events Used	14							
159				Number Values Reported (n)	14							
160				Minimum	1.12							
161				Maximum	181							
162				Mean	33.87							
163				Geometric Mean	15.21							
164				Median	18.35							
165				Standard Deviation	47.97							

Coefficient of Variation	1.416	
Mann-Kendall Test		
M-K Test Value (S)	-51	
Tabulated p-value	0.002	
Standard Deviation of S	18.27	
Standardized Value of S	-2.737	
Approximate p-value	0.0031	
Statistically significant evidence of a decreasing trend at the specified level of significance.		
Result Value-apw-06s		
General Statistics		
Number of Events Reported (m)	15	
Number of Missing Events	0	
Number or Reported Events Used	15	
Number Values Reported (n)	15	
Minimum	1.26	
Maximum	87	
Mean	16.76	
Geometric Mean	9.406	
Median	8.11	
Standard Deviation	22.19	
Coefficient of Variation	1.324	
Mann-Kendall Test		
M-K Test Value (S)	17	
Tabulated p-value	0.218	
Standard Deviation of S	20.21	
Standardized Value of S	0.792	
Approximate p-value	0.214	
Insufficient evidence to identify a significant trend at the specified level of significance.		
Result Value-apw-07		
General Statistics		
Number of Events Reported (m)	14	
Number of Missing Events	0	
Number or Reported Events Used	14	
Number Values Reported (n)	14	
Minimum	3.34	
Maximum	79.2	
Mean	22.79	
Geometric Mean	13.9	
Median	12.65	
Standard Deviation	24.27	
Coefficient of Variation	1.065	
Mann-Kendall Test		
M-K Test Value (S)	-31	
Tabulated p-value	0.05	
Standard Deviation of S	18.27	
Standardized Value of S	-1.642	

Approximate p-value	0.0503	
Statistically significant evidence of a decreasing		
trend at the specified level of significance.		
Result Value-apw-08		
General Statistics		
Number of Events Reported (m)	15	
Number of Missing Events	0	
Number or Reported Events Used	15	
Number Values Reported (n)	15	
Minimum	6.7	
Maximum	305	
Mean	103.7	
Geometric Mean	62.59	
Median	119	
Standard Deviation	83.7	
Coefficient of Variation	0.807	
Mann-Kendall Test		
M-K Test Value (S)	-33	
Tabulated p-value	0.057	
Standard Deviation of S	20.21	
Standardized Value of S	-1.584	
Approximate p-value	0.0566	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-09		
General Statistics		
Number of Events Reported (m)	15	
Number of Missing Events	0	
Number or Reported Events Used	15	
Number Values Reported (n)	15	
Minimum	3.82	
Maximum	34.2	
Mean	15.54	
Geometric Mean	12.36	
Median	13.8	
Standard Deviation	10.12	
Coefficient of Variation	0.651	
Mann-Kendall Test		
M-K Test Value (S)	5	
Tabulated p-value	0.423	
Standard Deviation of S	20.21	
Standardized Value of S	0.198	
Approximate p-value	0.422	
Insufficient evidence to identify a significant		
trend at the specified level of significance.		
Result Value-apw-10d		
General Statistics		

276				Number of Events Reported (m)	15							
277				Number of Missing Events	0							
278				Number or Reported Events Used	15							
279				Number Values Reported (n)	15							
280				Minimum	4.76							
281				Maximum	198							
282				Mean	87.44							
283				Geometric Mean	51.51							
284				Median	46.9							
285				Standard Deviation	74.5							
286				Coefficient of Variation	0.852							
287												
288				**Mann-Kendall Test**								
289				M-K Test Value (S)	7							
290				Tabulated p-value	0.385							
291				Standard Deviation of S	20.16							
292				Standardized Value of S	0.298							
293				Approximate p-value	0.383							
294												
295	**Insufficient evidence to identify a significant**											
296	**trend at the specified level of significance.**											
297				**Result Value-apw-10s**								
298												
299				**General Statistics**								
300				Number of Events Reported (m)	15							
301				Number of Missing Events	0							
302				Number or Reported Events Used	15							
303				Number Values Reported (n)	15							
304				Minimum	3.78							
305				Maximum	63.6							
306				Mean	32.43							
307				Geometric Mean	22.79							
308				Median	34.3							
309				Standard Deviation	22.78							
310				Coefficient of Variation	0.702							
311												
312				**Mann-Kendall Test**								
313				M-K Test Value (S)	-29							
314				Tabulated p-value	0.084							
315				Standard Deviation of S	20.21							
316				Standardized Value of S	-1.386							
317				Approximate p-value	0.0829							
318												
319	**Insufficient evidence to identify a significant**											
320	**trend at the specified level of significance.**											

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Antimony
Date/Time of Computation	ProUCL 5.2 2/27/2026 12:48:11 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	6.0000E-4	Mean	0.00207
Maximum	0.004	Median	0.001
SD	0.00146	Std. Error of Mean	3.0427E-4
Coefficient of Variation	0.704	Skewness	0.607

Normal GOF Test

Shapiro Wilk Test Statistic	0.668	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0026	95% Adjusted-CLT UCL (Chen-1995)	0.00262
		95% Modified-t UCL (Johnson-1978)	0.0026

Gamma GOF Test

A-D Test Statistic	3.573	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.38	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.184	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.261	k star (bias corrected MLE)	1.995
Theta hat (MLE)	9.1744E-4	Theta star (bias corrected MLE)	0.00104
nu hat (MLE)	104	nu star (bias corrected)	91.76
MLE Mean (bias corrected)	0.00207	MLE Sd (bias corrected)	0.00147
		Approximate Chi Square Value (0.05)	70.67
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	69.33

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.00269	95% Adjusted Gamma UCL	0.00274

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.712	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.369	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

56	**Data Not Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-7.419			Mean of logged Data	-6.416	
60						Maximum of Logged Data	-5.521			SD of logged Data	0.695	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.00287			90% Chebyshev (MVUE) UCL	0.00301	
64						95% Chebyshev (MVUE) UCL	0.00345			97.5% Chebyshev (MVUE) UCL	0.00405	
65						99% Chebyshev (MVUE) UCL	0.00523					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.00257			95% BCA Bootstrap UCL	N/A	
72						95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A	
73						95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A	
74						90% Chebyshev(Mean, Sd) UCL	0.00299			95% Chebyshev(Mean, Sd) UCL	0.0034	
75						97.5% Chebyshev(Mean, Sd) UCL	0.00397			99% Chebyshev(Mean, Sd) UCL	0.0051	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.0026					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	2	
89										Number of Missing Observations	0	
90						Minimum	0.001			Mean	0.00204	
91						Maximum	0.004			Median	0.001	
92						SD	0.00146			Std. Error of Mean	3.0463E-4	
93						Coefficient of Variation	0.715			Skewness	0.684	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
100	**Data Not Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	0.00257			95% Adjusted-CLT UCL (Chen-1995)	0.00259	
105										95% Modified-t UCL (Johnson-1978)	0.00257	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	4.643			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.753			Data Not Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.422			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.183	Data Not Gamma Distributed at 5% Significance Level						
112	**Data Not Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	2.304					k star (bias corrected MLE)	2.032	
116				Theta hat (MLE)	8.8702E-4					Theta star (bias corrected MLE)	0.00101	
117				nu hat (MLE)	106					nu star (bias corrected)	93.48	
118				MLE Mean (bias corrected)	0.00204					MLE Sd (bias corrected)	0.00143	
119										Approximate Chi Square Value (0.05)	72.19	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	70.83	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	0.00265					95% Adjusted Gamma UCL	0.0027	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.606	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.415	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
130	**Data Not Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	-6.908					Mean of logged Data	-6.426	
134				Maximum of Logged Data	-5.521					SD of logged Data	0.675	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	0.00277					90% Chebyshev (MVUE) UCL	0.00292	
138				95% Chebyshev (MVUE) UCL	0.00333					97.5% Chebyshev (MVUE) UCL	0.0039	
139				99% Chebyshev (MVUE) UCL	0.00502							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data do not follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	0.00254					95% BCA Bootstrap UCL	N/A	
146				95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A	
147				95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A	
148				90% Chebyshev(Mean, Sd) UCL	0.00296					95% Chebyshev(Mean, Sd) UCL	0.00337	
149				97.5% Chebyshev(Mean, Sd) UCL	0.00395					99% Chebyshev(Mean, Sd) UCL	0.00507	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	0.00257							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158												
159	**ResultValue (apw-05)**											
160												
161	**General Statistics**											
162				Total Number of Observations	12					Number of Distinct Observations	2	
163										Number of Missing Observations	0	
164				Minimum	0.001					Mean	0.00101	
165				Maximum	0.0011					Median	0.001	

166					SD	2.8868E-5					Std. Error of Mean	8.3333E-6
167					Coefficient of Variation	0.0286					Skewness	3.464
168												
169					**Normal GOF Test**							
170					Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk GOF Test**					
171					1% Shapiro Wilk Critical Value	0.805	Data Not Normal at 1% Significance Level					
172					Lilliefors Test Statistic	0.53	**Lilliefors GOF Test**					
173					1% Lilliefors Critical Value	0.281	Data Not Normal at 1% Significance Level					
174					**Data Not Normal at 1% Significance Level**							
175												
176					**Assuming Normal Distribution**							
177					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
178					95% Student's-t UCL	0.00102	95% Adjusted-CLT UCL (Chen-1995)	0.00103				
179							95% Modified-t UCL (Johnson-1978)	0.00102				
180												
181					**Gamma GOF Test**							
182					A-D Test Statistic	4.095	**Anderson-Darling Gamma GOF Test**					
183					5% A-D Critical Value	0.731	Data Not Gamma Distributed at 5% Significance Level					
184					K-S Test Statistic	0.537	**Kolmogorov-Smirnov Gamma GOF Test**					
185					5% K-S Critical Value	0.245	Data Not Gamma Distributed at 5% Significance Level					
186					**Data Not Gamma Distributed at 5% Significance Level**							
187												
188					**Gamma Statistics**							
189					k hat (MLE)	1404	k star (bias corrected MLE)	1053				
190					Theta hat (MLE)	7.1843E-7	Theta star (bias corrected MLE)	9.5785E-7				
191					nu hat (MLE)	33685	nu star (bias corrected)	25265				
192					MLE Mean (bias corrected)	0.00101	MLE Sd (bias corrected)	3.1078E-5				
193							Approximate Chi Square Value (0.05)	24896				
194					Adjusted Level of Significance	0.029	Adjusted Chi Square Value	24840				
195												
196					**Assuming Gamma Distribution**							
197					95% Approximate Gamma UCL	0.00102	95% Adjusted Gamma UCL	0.00103				
198												
199					**Lognormal GOF Test**							
200					Shapiro Wilk Test Statistic	0.327	**Shapiro Wilk Lognormal GOF Test**					
201					10% Shapiro Wilk Critical Value	0.883	Data Not Lognormal at 10% Significance Level					
202					Lilliefors Test Statistic	0.53	**Lilliefors Lognormal GOF Test**					
203					10% Lilliefors Critical Value	0.223	Data Not Lognormal at 10% Significance Level					
204					**Data Not Lognormal at 10% Significance Level**							
205												
206					**Lognormal Statistics**							
207					Minimum of Logged Data	-6.908	Mean of logged Data	-6.9				
208					Maximum of Logged Data	-6.812	SD of logged Data	0.0275				
209												
210					**Assuming Lognormal Distribution**							
211					95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	0.00103				
212					95% Chebyshev (MVUE) UCL	0.00104	97.5% Chebyshev (MVUE) UCL	0.00106				
213					99% Chebyshev (MVUE) UCL	0.00109						
214												
215					**Nonparametric Distribution Free UCL Statistics**							
216					**Data do not follow a Discernible Distribution**							
217												
218					**Nonparametric Distribution Free UCLs**							
219					95% CLT UCL	0.00102	95% BCA Bootstrap UCL	N/A				
220					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				

221				95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A		
222				90% Chebyshev(Mean, Sd) UCL	0.00103				95% Chebyshev(Mean, Sd) UCL	0.00104		
223				97.5% Chebyshev(Mean, Sd) UCL	0.00106				99% Chebyshev(Mean, Sd) UCL	0.00109		
224												
225				**Suggested UCL to Use**								
226				95% Student's-t UCL	0.00102							
227												
228	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
229	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
230	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
231												
232												
233	**ResultValue (apw-05r)**											
234												
235				**General Statistics**								
236				Total Number of Observations	11				Number of Distinct Observations	2		
237									Number of Missing Observations	0		
238				Minimum	0.001				Mean	0.00318		
239				Maximum	0.004				Median	0.004		
240				SD	0.0014				Std. Error of Mean	4.2251E-4		
241				Coefficient of Variation	0.44				Skewness	-1.189		
242												
243				**Normal GOF Test**								
244				Shapiro Wilk Test Statistic	0.572				**Shapiro Wilk GOF Test**			
245				1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level			
246				Lilliefors Test Statistic	0.448				**Lilliefors GOF Test**			
247				1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level			
248				**Data Not Normal at 1% Significance Level**								
249												
250				**Assuming Normal Distribution**								
251				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
252				95% Student's-t UCL	0.00395				95% Adjusted-CLT UCL (Chen-1995)	0.00371		
253									95% Modified-t UCL (Johnson-1978)	0.00392		
254												
255				**Gamma GOF Test**								
256				A-D Test Statistic	2.541				**Anderson-Darling Gamma GOF Test**			
257				5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level			
258				K-S Test Statistic	0.46				**Kolmogorov-Smirnov Gamma GOF Test**			
259				5% K-S Critical Value	0.257				Data Not Gamma Distributed at 5% Significance Level			
260				**Data Not Gamma Distributed at 5% Significance Level**								
261												
262				**Gamma Statistics**								
263				k hat (MLE)	3.508				k star (bias corrected MLE)	2.612		
264				Theta hat (MLE)	9.0695E-4				Theta star (bias corrected MLE)	0.00122		
265				nu hat (MLE)	77.18				nu star (bias corrected)	57.47		
266				MLE Mean (bias corrected)	0.00318				MLE Sd (bias corrected)	0.00197		
267									Approximate Chi Square Value (0.05)	41.04		
268				Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	38.79		
269												
270				**Assuming Gamma Distribution**								
271				95% Approximate Gamma UCL	0.00446				95% Adjusted Gamma UCL	0.00471		
272												
273				**Lognormal GOF Test**								
274				Shapiro Wilk Test Statistic	0.572				**Shapiro Wilk Lognormal GOF Test**			
275				10% Shapiro Wilk Critical Value	0.876				Data Not Lognormal at 10% Significance Level			

276				Lilliefors Test Statistic	0.448	**Lilliefors Lognormal GOF Test**						
277				10% Lilliefors Critical Value	0.231	Data Not Lognormal at 10% Significance Level						
278	**Data Not Lognormal at 10% Significance Level**											
279												
280	**Lognormal Statistics**											
281				Minimum of Logged Data	-6.908	Mean of logged Data	-5.9					
282				Maximum of Logged Data	-5.521	SD of logged Data	0.648					
283												
284	**Assuming Lognormal Distribution**											
285				95% H-UCL	0.00551	90% Chebyshev (MVUE) UCL	0.00531					
286				95% Chebyshev (MVUE) UCL	0.00621	97.5% Chebyshev (MVUE) UCL	0.00747					
287				99% Chebyshev (MVUE) UCL	0.00994							
288												
289	**Nonparametric Distribution Free UCL Statistics**											
290	**Data do not follow a Discernible Distribution**											
291												
292	**Nonparametric Distribution Free UCLs**											
293				95% CLT UCL	0.00388	95% BCA Bootstrap UCL	N/A					
294				95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A					
295				95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A					
296				90% Chebyshev(Mean, Sd) UCL	0.00445	95% Chebyshev(Mean, Sd) UCL	0.00502					
297				97.5% Chebyshev(Mean, Sd) UCL	0.00582	99% Chebyshev(Mean, Sd) UCL	0.00739					
298												
299	**Suggested UCL to Use**											
300				95% Student's-t UCL	0.00395							
301												
302	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
303	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
304	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
305												
306	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
307	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
308												
309												
310	**ResultValue (apw-06d)**											
311												
312	**General Statistics**											
313				Total Number of Observations	22	Number of Distinct Observations	2					
314						Number of Missing Observations	0					
315				Minimum	0.001	Mean	0.00209					
316				Maximum	0.004	Median	0.001					
317				SD	0.00148	Std. Error of Mean	3.1492E-4					
318				Coefficient of Variation	0.706	Skewness	0.609					
319												
320	**Normal GOF Test**											
321				Shapiro Wilk Test Statistic	0.614	**Shapiro Wilk GOF Test**						
322				1% Shapiro Wilk Critical Value	0.878	Data Not Normal at 1% Significance Level						
323				Lilliefors Test Statistic	0.406	**Lilliefors GOF Test**						
324				1% Lilliefors Critical Value	0.214	Data Not Normal at 1% Significance Level						
325	**Data Not Normal at 1% Significance Level**											
326												
327	**Assuming Normal Distribution**											
328	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
329				95% Student's-t UCL	0.00263	95% Adjusted-CLT UCL (Chen-1995)	0.00265					
330						95% Modified-t UCL (Johnson-1978)	0.00264					

331												
332						**Gamma GOF Test**						
333					A-D Test Statistic	4.342		**Anderson-Darling Gamma GOF Test**				
334					5% A-D Critical Value	0.754		Data Not Gamma Distributed at 5% Significance Level				
335					K-S Test Statistic	0.414		**Kolmogorov-Smirnov Gamma GOF Test**				
336					5% K-S Critical Value	0.188		Data Not Gamma Distributed at 5% Significance Level				
337					**Data Not Gamma Distributed at 5% Significance Level**							
338												
339					**Gamma Statistics**							
340					k hat (MLE)	2.294		k star (bias corrected MLE)	2.012			
341					Theta hat (MLE)	9.1137E-4		Theta star (bias corrected MLE)	0.00104			
342					nu hat (MLE)	100.9		nu star (bias corrected)	88.51			
343					MLE Mean (bias corrected)	0.00209		MLE Sd (bias corrected)	0.00147			
344								Approximate Chi Square Value (0.05)	67.82			
345					Adjusted Level of Significance	0.0386		Adjusted Chi Square Value	66.47			
346												
347					**Assuming Gamma Distribution**							
348					95% Approximate Gamma UCL	0.00273		95% Adjusted Gamma UCL	0.00278			
349												
350					**Lognormal GOF Test**							
351					Shapiro Wilk Test Statistic	0.614		**Shapiro Wilk Lognormal GOF Test**				
352					10% Shapiro Wilk Critical Value	0.926		Data Not Lognormal at 10% Significance Level				
353					Lilliefors Test Statistic	0.406		**Lilliefors Lognormal GOF Test**				
354					10% Lilliefors Critical Value	0.169		Data Not Lognormal at 10% Significance Level				
355					**Data Not Lognormal at 10% Significance Level**							
356												
357					**Lognormal Statistics**							
358					Minimum of Logged Data	-6.908		Mean of logged Data	-6.404			
359					Maximum of Logged Data	-5.521		SD of logged Data	0.683			
360												
361					**Assuming Lognormal Distribution**							
362					95% H-UCL	0.00289		90% Chebyshev (MVUE) UCL	0.00303			
363					95% Chebyshev (MVUE) UCL	0.00346		97.5% Chebyshev (MVUE) UCL	0.00407			
364					99% Chebyshev (MVUE) UCL	0.00525						
365												
366					**Nonparametric Distribution Free UCL Statistics**							
367					**Data do not follow a Discernible Distribution**							
368												
369					**Nonparametric Distribution Free UCLs**							
370					95% CLT UCL	0.00261		95% BCA Bootstrap UCL	N/A			
371					95% Standard Bootstrap UCL	N/A		95% Bootstrap-t UCL	N/A			
372					95% Hall's Bootstrap UCL	N/A		95% Percentile Bootstrap UCL	N/A			
373					90% Chebyshev(Mean, Sd) UCL	0.00304		95% Chebyshev(Mean, Sd) UCL	0.00346			
374					97.5% Chebyshev(Mean, Sd) UCL	0.00406		99% Chebyshev(Mean, Sd) UCL	0.00522			
375												
376					**Suggested UCL to Use**							
377					95% Student's-t UCL	0.00263						
378												
379	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
380	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
381	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
382												
383												
384	**ResultValue (apw-06s)**											
385												

386	**General Statistics**											
387					Total Number of Observations	23				Number of Distinct Observations		2
388										Number of Missing Observations		0
389					Minimum	0.001				Mean		0.00204
390					Maximum	0.004				Median		0.001
391					SD	0.00146				Std. Error of Mean		3.0463E-4
392					Coefficient of Variation	0.715				Skewness		0.684
393												
394	**Normal GOF Test**											
395					Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**			
396					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
397					Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**			
398					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
399	**Data Not Normal at 1% Significance Level**											
400												
401	**Assuming Normal Distribution**											
402				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
403					95% Student's-t UCL	0.00257			95% Adjusted-CLT UCL (Chen-1995)			0.00259
404									95% Modified-t UCL (Johnson-1978)			0.00257
405												
406	**Gamma GOF Test**											
407					A-D Test Statistic	4.643			**Anderson-Darling Gamma GOF Test**			
408					5% A-D Critical Value	0.753			Data Not Gamma Distributed at 5% Significance Level			
409					K-S Test Statistic	0.422			**Kolmogorov-Smirnov Gamma GOF Test**			
410					5% K-S Critical Value	0.183			Data Not Gamma Distributed at 5% Significance Level			
411	**Data Not Gamma Distributed at 5% Significance Level**											
412												
413	**Gamma Statistics**											
414					k hat (MLE)	2.304			k star (bias corrected MLE)			2.032
415					Theta hat (MLE)	8.8702E-4			Theta star (bias corrected MLE)			0.00101
416					nu hat (MLE)	106			nu star (bias corrected)			93.48
417					MLE Mean (bias corrected)	0.00204			MLE Sd (bias corrected)			0.00143
418									Approximate Chi Square Value (0.05)			72.19
419					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value			70.83
420												
421	**Assuming Gamma Distribution**											
422					95% Approximate Gamma UCL	0.00265			95% Adjusted Gamma UCL			0.0027
423												
424	**Lognormal GOF Test**											
425					Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk Lognormal GOF Test**			
426					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
427					Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**			
428					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
429	**Data Not Lognormal at 10% Significance Level**											
430												
431	**Lognormal Statistics**											
432					Minimum of Logged Data	-6.908			Mean of logged Data			-6.426
433					Maximum of Logged Data	-5.521			SD of logged Data			0.675
434												
435	**Assuming Lognormal Distribution**											
436					95% H-UCL	0.00277			90% Chebyshev (MVUE) UCL			0.00292
437					95% Chebyshev (MVUE) UCL	0.00333			97.5% Chebyshev (MVUE) UCL			0.0039
438					99% Chebyshev (MVUE) UCL	0.00502						
439												
440	**Nonparametric Distribution Free UCL Statistics**											

441	**Data do not follow a Discernible Distribution**											
442												
443	**Nonparametric Distribution Free UCLs**											
444					95% CLT UCL	0.00254			95% BCA Bootstrap UCL	N/A		
445					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A		
446					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A		
447					90% Chebyshev(Mean, Sd) UCL	0.00296			95% Chebyshev(Mean, Sd) UCL	0.00337		
448					97.5% Chebyshev(Mean, Sd) UCL	0.00395			99% Chebyshev(Mean, Sd) UCL	0.00507		
449												
450	**Suggested UCL to Use**											
451					95% Student's-t UCL	0.00257						
452												
453	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
454	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
455	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
456												
457												
458	**ResultValue (apw-07)**											
459												
460	**General Statistics**											
461					Total Number of Observations	22			Number of Distinct Observations	2		
462									Number of Missing Observations	0		
463					Minimum	0.001			Mean	0.00195		
464					Maximum	0.004			Median	0.001		
465					SD	0.00143			Std. Error of Mean	3.0492E-4		
466					Coefficient of Variation	0.732			Skewness	0.839		
467												
468	**Normal GOF Test**											
469					Shapiro Wilk Test Statistic	0.592			**Shapiro Wilk GOF Test**			
470					1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level			
471					Lilliefors Test Statistic	0.43			**Lilliefors GOF Test**			
472					1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level			
473	**Data Not Normal at 1% Significance Level**											
474												
475	**Assuming Normal Distribution**											
476					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
477					95% Student's-t UCL	0.00248			95% Adjusted-CLT UCL (Chen-1995)	0.00251		
478									95% Modified-t UCL (Johnson-1978)	0.00249		
479												
480	**Gamma GOF Test**											
481					A-D Test Statistic	4.657			**Anderson-Darling Gamma GOF Test**			
482					5% A-D Critical Value	0.754			Data Not Gamma Distributed at 5% Significance Level			
483					K-S Test Statistic	0.437			**Kolmogorov-Smirnov Gamma GOF Test**			
484					5% K-S Critical Value	0.187			Data Not Gamma Distributed at 5% Significance Level			
485	**Data Not Gamma Distributed at 5% Significance Level**											
486												
487	**Gamma Statistics**											
488					k hat (MLE)	2.336			k star (bias corrected MLE)	2.048		
489					Theta hat (MLE)	8.3674E-4			Theta star (bias corrected MLE)	9.5452E-4		
490					nu hat (MLE)	102.8			nu star (bias corrected)	90.1		
491					MLE Mean (bias corrected)	0.00195			MLE Sd (bias corrected)	0.00137		
492									Approximate Chi Square Value (0.05)	69.21		
493					Adjusted Level of Significance	0.0386			Adjusted Chi Square Value	67.85		
494												
495	**Assuming Gamma Distribution**											

496			95% Approximate Gamma UCL		0.00254					95% Adjusted Gamma UCL	0.0026	
497												
498					**Lognormal GOF Test**							
499			Shapiro Wilk Test Statistic		0.592			**Shapiro Wilk Lognormal GOF Test**				
500			10% Shapiro Wilk Critical Value		0.926			Data Not Lognormal at 10% Significance Level				
501			Lilliefors Test Statistic		0.43			**Lilliefors Lognormal GOF Test**				
502			10% Lilliefors Critical Value		0.169			Data Not Lognormal at 10% Significance Level				
503					**Data Not Lognormal at 10% Significance Level**							
504												
505					**Lognormal Statistics**							
506			Minimum of Logged Data		-6.908					Mean of logged Data	-6.467	
507			Maximum of Logged Data		-5.521					SD of logged Data	0.661	
508												
509					**Assuming Lognormal Distribution**							
510			95% H-UCL		0.00264					90% Chebyshev (MVUE) UCL	0.00277	
511			95% Chebyshev (MVUE) UCL		0.00316					97.5% Chebyshev (MVUE) UCL	0.0037	
512			99% Chebyshev (MVUE) UCL		0.00476							
513												
514					**Nonparametric Distribution Free UCL Statistics**							
515					**Data do not follow a Discernible Distribution**							
516												
517					**Nonparametric Distribution Free UCLs**							
518			95% CLT UCL		0.00246					95% BCA Bootstrap UCL	N/A	
519			95% Standard Bootstrap UCL		N/A					95% Bootstrap-t UCL	N/A	
520			95% Hall's Bootstrap UCL		N/A					95% Percentile Bootstrap UCL	N/A	
521			90% Chebyshev(Mean, Sd) UCL		0.00287					95% Chebyshev(Mean, Sd) UCL	0.00328	
522			97.5% Chebyshev(Mean, Sd) UCL		0.00386					99% Chebyshev(Mean, Sd) UCL	0.00499	
523												
524					**Suggested UCL to Use**							
525			95% Student's-t UCL		0.00248							
526												
527					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
528					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
529					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
530												
531												
532	**ResultValue (apw-08)**											
533												
534					**General Statistics**							
535			Total Number of Observations		23					Number of Distinct Observations	2	
536										Number of Missing Observations	0	
537			Minimum		0.001					Mean	0.00204	
538			Maximum		0.004					Median	0.001	
539			SD		0.00146					Std. Error of Mean	3.0463E-4	
540			Coefficient of Variation		0.715					Skewness	0.684	
541												
542					**Normal GOF Test**							
543			Shapiro Wilk Test Statistic		0.606			**Shapiro Wilk GOF Test**				
544			1% Shapiro Wilk Critical Value		0.881			Data Not Normal at 1% Significance Level				
545			Lilliefors Test Statistic		0.415			**Lilliefors GOF Test**				
546			1% Lilliefors Critical Value		0.209			Data Not Normal at 1% Significance Level				
547					**Data Not Normal at 1% Significance Level**							
548												
549					**Assuming Normal Distribution**							
550			**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**				

551				95% Student's-t UCL	0.00257			95% Adjusted-CLT UCL (Chen-1995)			0.00259	
552								95% Modified-t UCL (Johnson-1978)			0.00257	
553												
554					**Gamma GOF Test**							
555				A-D Test Statistic	4.643			**Anderson-Darling Gamma GOF Test**				
556				5% A-D Critical Value	0.753			Data Not Gamma Distributed at 5% Significance Level				
557				K-S Test Statistic	0.422			**Kolmogorov-Smirnov Gamma GOF Test**				
558				5% K-S Critical Value	0.183			Data Not Gamma Distributed at 5% Significance Level				
559					**Data Not Gamma Distributed at 5% Significance Level**							
560												
561					**Gamma Statistics**							
562				k hat (MLE)	2.304			k star (bias corrected MLE)			2.032	
563				Theta hat (MLE)	8.8702E-4			Theta star (bias corrected MLE)			0.00101	
564				nu hat (MLE)	106			nu star (bias corrected)			93.48	
565				MLE Mean (bias corrected)	0.00204			MLE Sd (bias corrected)			0.00143	
566								Approximate Chi Square Value (0.05)			72.19	
567				Adjusted Level of Significance	0.0389			Adjusted Chi Square Value			70.83	
568												
569					**Assuming Gamma Distribution**							
570				95% Approximate Gamma UCL	0.00265			95% Adjusted Gamma UCL			0.0027	
571												
572					**Lognormal GOF Test**							
573				Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk Lognormal GOF Test**				
574				10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level				
575				Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**				
576				10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level				
577					**Data Not Lognormal at 10% Significance Level**							
578												
579					**Lognormal Statistics**							
580				Minimum of Logged Data	-6.908			Mean of logged Data			-6.426	
581				Maximum of Logged Data	-5.521			SD of logged Data			0.675	
582												
583					**Assuming Lognormal Distribution**							
584				95% H-UCL	0.00277			90% Chebyshev (MVUE) UCL			0.00292	
585				95% Chebyshev (MVUE) UCL	0.00333			97.5% Chebyshev (MVUE) UCL			0.0039	
586				99% Chebyshev (MVUE) UCL	0.00502							
587												
588					**Nonparametric Distribution Free UCL Statistics**							
589					**Data do not follow a Discernible Distribution**							
590												
591					**Nonparametric Distribution Free UCLs**							
592				95% CLT UCL	0.00254			95% BCA Bootstrap UCL			N/A	
593				95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL			N/A	
594				95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL			N/A	
595				90% Chebyshev(Mean, Sd) UCL	0.00296			95% Chebyshev(Mean, Sd) UCL			0.00337	
596				97.5% Chebyshev(Mean, Sd) UCL	0.00395			99% Chebyshev(Mean, Sd) UCL			0.00507	
597												
598					**Suggested UCL to Use**							
599				95% Student's-t UCL	0.00257							
600												
601	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
602	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
603	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
604												
605												

606	**ResultValue (apw-10d)**											
607												
608						**General Statistics**							
609						Total Number of Observations	23				Number of Distinct Observations	2	
610											Number of Missing Observations	0	
611						Minimum	0.001				Mean	0.00204	
612						Maximum	0.004				Median	0.001	
613						SD	0.00146				Std. Error of Mean	3.0463E-4	
614						Coefficient of Variation	0.715				Skewness	0.684	
615													
616						**Normal GOF Test**							
617						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**			
618						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
619						Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**			
620						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
621						**Data Not Normal at 1% Significance Level**							
622													
623						**Assuming Normal Distribution**							
624						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
625						95% Student's-t UCL	0.00257			95% Adjusted-CLT UCL (Chen-1995)	0.00259	
626										95% Modified-t UCL (Johnson-1978)	0.00257	
627													
628						**Gamma GOF Test**							
629						A-D Test Statistic	4.643			**Anderson-Darling Gamma GOF Test**			
630						5% A-D Critical Value	0.753			Data Not Gamma Distributed at 5% Significance Level			
631						K-S Test Statistic	0.422			**Kolmogorov-Smirnov Gamma GOF Test**			
632						5% K-S Critical Value	0.183			Data Not Gamma Distributed at 5% Significance Level			
633						**Data Not Gamma Distributed at 5% Significance Level**							
634													
635						**Gamma Statistics**							
636						k hat (MLE)	2.304			k star (bias corrected MLE)	2.032	
637						Theta hat (MLE)	8.8702E-4			Theta star (bias corrected MLE)	0.00101	
638						nu hat (MLE)	106			nu star (bias corrected)	93.48	
639						MLE Mean (bias corrected)	0.00204			MLE Sd (bias corrected)	0.00143	
640										Approximate Chi Square Value (0.05)	72.19	
641						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	70.83	
642													
643						**Assuming Gamma Distribution**							
644						95% Approximate Gamma UCL	0.00265			95% Adjusted Gamma UCL	0.0027	
645													
646						**Lognormal GOF Test**							
647						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk Lognormal GOF Test**			
648						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
649						Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**			
650						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
651						**Data Not Lognormal at 10% Significance Level**							
652													
653						**Lognormal Statistics**							
654						Minimum of Logged Data	-6.908			Mean of logged Data	-6.426	
655						Maximum of Logged Data	-5.521			SD of logged Data	0.675	
656													
657						**Assuming Lognormal Distribution**							
658						95% H-UCL	0.00277			90% Chebyshev (MVUE) UCL	0.00292	
659						95% Chebyshev (MVUE) UCL	0.00333			97.5% Chebyshev (MVUE) UCL	0.0039	
660						99% Chebyshev (MVUE) UCL	0.00502					

661												
662						**Nonparametric Distribution Free UCL Statistics**							
663						**Data do not follow a Discernible Distribution**							
664												
665						**Nonparametric Distribution Free UCLs**							
666						95% CLT UCL	0.00254			95% BCA Bootstrap UCL	N/A	
667						95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A	
668						95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A	
669						90% Chebyshev(Mean, Sd) UCL	0.00296			95% Chebyshev(Mean, Sd) UCL	0.00337	
670						97.5% Chebyshev(Mean, Sd) UCL	0.00395			99% Chebyshev(Mean, Sd) UCL	0.00507	
671												
672						**Suggested UCL to Use**							
673						95% Student's-t UCL	0.00257					
674												
675						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
676						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
677						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
678												
679												
680	**ResultValue (apw-10s)**											
681												
682						**General Statistics**							
683						Total Number of Observations	23			Number of Distinct Observations	2	
684										Number of Missing Observations	0	
685						Minimum	0.001			Mean	0.00204	
686						Maximum	0.004			Median	0.001	
687						SD	0.00146			Std. Error of Mean	3.0463E-4	
688						Coefficient of Variation	0.715			Skewness	0.684	
689												
690						**Normal GOF Test**							
691						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**		
692						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
693						Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**		
694						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
695						**Data Not Normal at 1% Significance Level**							
696												
697						**Assuming Normal Distribution**							
698						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
699						95% Student's-t UCL	0.00257			95% Adjusted-CLT UCL (Chen-1995)	0.00259	
700										95% Modified-t UCL (Johnson-1978)	0.00257	
701												
702						**Gamma GOF Test**							
703						A-D Test Statistic	4.643			**Anderson-Darling Gamma GOF Test**		
704						5% A-D Critical Value	0.753			Data Not Gamma Distributed at 5% Significance Level		
705						K-S Test Statistic	0.422			**Kolmogorov-Smirnov Gamma GOF Test**		
706						5% K-S Critical Value	0.183			Data Not Gamma Distributed at 5% Significance Level		
707						**Data Not Gamma Distributed at 5% Significance Level**							
708												
709						**Gamma Statistics**							
710						k hat (MLE)	2.304			k star (bias corrected MLE)	2.032	
711						Theta hat (MLE)	8.8702E-4			Theta star (bias corrected MLE)	0.00101	
712						nu hat (MLE)	106			nu star (bias corrected)	93.48	
713						MLE Mean (bias corrected)	0.00204			MLE Sd (bias corrected)	0.00143	
714										Approximate Chi Square Value (0.05)	72.19	
715						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	70.83	

	A	B	C	D	E	F	G	H	I	J	K	L
716												
717	**Assuming Gamma Distribution**											
718				95% Approximate Gamma UCL		0.00265				95% Adjusted Gamma UCL		0.0027
719												
720	**Lognormal GOF Test**											
721				Shapiro Wilk Test Statistic		0.606		**Shapiro Wilk Lognormal GOF Test**				
722				10% Shapiro Wilk Critical Value		0.928		Data Not Lognormal at 10% Significance Level				
723				Lilliefors Test Statistic		0.415		**Lilliefors Lognormal GOF Test**				
724				10% Lilliefors Critical Value		0.165		Data Not Lognormal at 10% Significance Level				
725	**Data Not Lognormal at 10% Significance Level**											
726												
727	**Lognormal Statistics**											
728				Minimum of Logged Data		-6.908				Mean of logged Data		-6.426
729				Maximum of Logged Data		-5.521				SD of logged Data		0.675
730												
731	**Assuming Lognormal Distribution**											
732				95% H-UCL		0.00277				90% Chebyshev (MVUE) UCL		0.00292
733				95% Chebyshev (MVUE) UCL		0.00333				97.5% Chebyshev (MVUE) UCL		0.0039
734				99% Chebyshev (MVUE) UCL		0.00502						
735												
736	**Nonparametric Distribution Free UCL Statistics**											
737	**Data do not follow a Discernible Distribution**											
738												
739	**Nonparametric Distribution Free UCLs**											
740				95% CLT UCL		0.00254				95% BCA Bootstrap UCL		N/A
741				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
742				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
743				90% Chebyshev(Mean, Sd) UCL		0.00296				95% Chebyshev(Mean, Sd) UCL		0.00337
744				97.5% Chebyshev(Mean, Sd) UCL		0.00395				99% Chebyshev(Mean, Sd) UCL		0.00507
745												
746	**Suggested UCL to Use**											
747				95% Student's-t UCL		0.00257						
748												
749	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
750	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
751	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
752												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Arsenic
Date/Time of Computation	ProUCL 5.2 2/27/2026 12:52:45 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.00904	Mean	0.0181
Maximum	0.0284	Median	0.0175
SD	0.00549	Std. Error of Mean	0.00114
Coefficient of Variation	0.304	Skewness	0.125

Normal GOF Test

Shapiro Wilk Test Statistic	0.969	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.0964	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.02	95% Adjusted-CLT UCL (Chen-1995)	0.02
		95% Modified-t UCL (Johnson-1978)	0.02

Gamma GOF Test

A-D Test Statistic	0.288	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.12	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.182	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	10.56	k star (bias corrected MLE)	9.216
Theta hat (MLE)	0.00171	Theta star (bias corrected MLE)	0.00196
nu hat (MLE)	486	nu star (bias corrected)	423.9
MLE Mean (bias corrected)	0.0181	MLE Sd (bias corrected)	0.00595
		Approximate Chi Square Value (0.05)	377.2
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	374

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0203	95% Adjusted Gamma UCL	0.0205

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.948	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.14	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-4.706			Mean of logged Data	-4.062	
60						Maximum of Logged Data	-3.561			SD of logged Data	0.326	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.0206			90% Chebyshev (MVUE) UCL	0.0219	
64						95% Chebyshev (MVUE) UCL	0.0236			97.5% Chebyshev (MVUE) UCL	0.0259	
65						99% Chebyshev (MVUE) UCL	0.0306					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0199			95% BCA Bootstrap UCL	0.0199	
72						95% Standard Bootstrap UCL	0.0199			95% Bootstrap-t UCL	0.0201	
73						95% Hall's Bootstrap UCL	0.02			95% Percentile Bootstrap UCL	0.0199	
74						90% Chebyshev(Mean, Sd) UCL	0.0215			95% Chebyshev(Mean, Sd) UCL	0.023	
75						97.5% Chebyshev(Mean, Sd) UCL	0.0252			99% Chebyshev(Mean, Sd) UCL	0.0294	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.02					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	14	
89										Number of Missing Observations	0	
90						Minimum	0.0017			Mean	0.00252	
91						Maximum	0.0059			Median	0.002	
92						SD	0.00102			Std. Error of Mean	2.1264E-4	
93						Coefficient of Variation	0.404			Skewness	2.259	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.691			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.244			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
100	**Data Not Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	0.00289			95% Adjusted-CLT UCL (Chen-1995)	0.00298	
105										95% Modified-t UCL (Johnson-1978)	0.00291	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	2.181			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.234			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level						
112	**Data Not Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	9.051					k star (bias corrected MLE)	7.899	
116				Theta hat (MLE)	2.7881E-4					Theta star (bias corrected MLE)	3.1946E-4	
117				nu hat (MLE)	416.3					nu star (bias corrected)	363.4	
118				MLE Mean (bias corrected)	0.00252					MLE Sd (bias corrected)	8.9785E-4	
119										Approximate Chi Square Value (0.05)	320.2	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	317.3	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	0.00286					95% Adjusted Gamma UCL	0.00289	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.795	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.232	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
130	**Data Not Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	-6.377					Mean of logged Data	-6.038	
134				Maximum of Logged Data	-5.133					SD of logged Data	0.317	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	0.00284					90% Chebyshev (MVUE) UCL	0.00301	
138				95% Chebyshev (MVUE) UCL	0.00324					97.5% Chebyshev (MVUE) UCL	0.00355	
139				99% Chebyshev (MVUE) UCL	0.00418							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data do not follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	0.00287					95% BCA Bootstrap UCL	0.00296	
146				95% Standard Bootstrap UCL	0.00285					95% Bootstrap-t UCL	0.00311	
147				95% Hall's Bootstrap UCL	0.0031					95% Percentile Bootstrap UCL	0.00288	
148				90% Chebyshev(Mean, Sd) UCL	0.00316					95% Chebyshev(Mean, Sd) UCL	0.00345	
149				97.5% Chebyshev(Mean, Sd) UCL	0.00385					99% Chebyshev(Mean, Sd) UCL	0.00464	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	0.00289							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158												
159	**ResultValue (apw-05)**											
160												
161	**General Statistics**											
162				Total Number of Observations	12					Number of Distinct Observations	10	
163										Number of Missing Observations	0	
164				Minimum	0.0015					Mean	0.00235	
165				Maximum	0.0048					Median	0.00215	

166					SD	9.0403E-4					Std. Error of Mean	2.6097E-4
167					Coefficient of Variation	0.385					Skewness	1.992
168												
169					**Normal GOF Test**							
170					Shapiro Wilk Test Statistic	0.802	**Shapiro Wilk GOF Test**					
171					1% Shapiro Wilk Critical Value	0.805	Data Not Normal at 1% Significance Level					
172					Lilliefors Test Statistic	0.224	**Lilliefors GOF Test**					
173					1% Lilliefors Critical Value	0.281	Data appear Normal at 1% Significance Level					
174					**Data appear Approximate Normal at 1% Significance Level**							
175												
176					**Assuming Normal Distribution**							
177					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
178					95% Student's-t UCL	0.00282	95% Adjusted-CLT UCL (Chen-1995)	0.00294				
179							95% Modified-t UCL (Johnson-1978)	0.00284				
180												
181					**Gamma GOF Test**							
182					A-D Test Statistic	0.474	**Anderson-Darling Gamma GOF Test**					
183					5% A-D Critical Value	0.73	Detected data appear Gamma Distributed at 5% Significance Level					
184					K-S Test Statistic	0.169	**Kolmogorov-Smirnov Gamma GOF Test**					
185					5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level					
186					**Detected data appear Gamma Distributed at 5% Significance Level**							
187												
188					**Gamma Statistics**							
189					k hat (MLE)	9.45	k star (bias corrected MLE)	7.143				
190					Theta hat (MLE)	2.4868E-4	Theta star (bias corrected MLE)	3.2900E-4				
191					nu hat (MLE)	226.8	nu star (bias corrected)	171.4				
192					MLE Mean (bias corrected)	0.00235	MLE Sd (bias corrected)	8.7929E-4				
193							Approximate Chi Square Value (0.05)	142.2				
194					Adjusted Level of Significance	0.029	Adjusted Chi Square Value	138.1				
195												
196					**Assuming Gamma Distribution**							
197					95% Approximate Gamma UCL	0.00283	95% Adjusted Gamma UCL	0.00292				
198												
199					**Lognormal GOF Test**							
200					Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**					
201					10% Shapiro Wilk Critical Value	0.883	Data appear Lognormal at 10% Significance Level					
202					Lilliefors Test Statistic	0.151	**Lilliefors Lognormal GOF Test**					
203					10% Lilliefors Critical Value	0.223	Data appear Lognormal at 10% Significance Level					
204					**Data appear Lognormal at 10% Significance Level**							
205												
206					**Lognormal Statistics**							
207					Minimum of Logged Data	-6.502	Mean of logged Data	-6.107				
208					Maximum of Logged Data	-5.339	SD of logged Data	0.326				
209												
210					**Assuming Lognormal Distribution**							
211					95% H-UCL	0.00285	90% Chebyshev (MVUE) UCL	0.00301				
212					95% Chebyshev (MVUE) UCL	0.00331	97.5% Chebyshev (MVUE) UCL	0.00373				
213					99% Chebyshev (MVUE) UCL	0.00455						
214												
215					**Nonparametric Distribution Free UCL Statistics**							
216					**Data appear to follow a Discernible Distribution**							
217												
218					**Nonparametric Distribution Free UCLs**							
219					95% CLT UCL	0.00278	95% BCA Bootstrap UCL	0.00291				
220					95% Standard Bootstrap UCL	0.00276	95% Bootstrap-t UCL	0.0032				

221				95% Hall's Bootstrap UCL	0.00492				95% Percentile Bootstrap UCL			0.00277
222				90% Chebyshev(Mean, Sd) UCL	0.00313				95% Chebyshev(Mean, Sd) UCL			0.00349
223				97.5% Chebyshev(Mean, Sd) UCL	0.00398				99% Chebyshev(Mean, Sd) UCL			0.00495
224												
225					**Suggested UCL to Use**							
226				95% Student's-t UCL	0.00282							
227												
228					When a data set follows an approximate distribution passing only one of the GOF tests,							
229					it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL							
230												
231					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
232					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
233					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
234												
235												
236	**ResultValue (apw-05r)**											
237												
238					**General Statistics**							
239				Total Number of Observations	11				Number of Distinct Observations			11
240									Number of Missing Observations			0
241				Minimum	0.00203				Mean			0.00259
242				Maximum	0.0042				Median			0.00228
243				SD	6.4134E-4				Std. Error of Mean			1.9337E-4
244				Coefficient of Variation	0.248				Skewness			1.796
245												
246					**Normal GOF Test**							
247				Shapiro Wilk Test Statistic	0.779				**Shapiro Wilk GOF Test**			
248				1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level			
249				Lilliefors Test Statistic	0.276				**Lilliefors GOF Test**			
250				1% Lilliefors Critical Value	0.291				Data appear Normal at 1% Significance Level			
251					**Data appear Approximate Normal at 1% Significance Level**							
252												
253					**Assuming Normal Distribution**							
254					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
255				95% Student's-t UCL	0.00294				95% Adjusted-CLT UCL (Chen-1995)			0.00302
256									95% Modified-t UCL (Johnson-1978)			0.00296
257												
258					**Gamma GOF Test**							
259				A-D Test Statistic	0.863				**Anderson-Darling Gamma GOF Test**			
260				5% A-D Critical Value	0.729				Data Not Gamma Distributed at 5% Significance Level			
261				K-S Test Statistic	0.274				**Kolmogorov-Smirnov Gamma GOF Test**			
262				5% K-S Critical Value	0.255				Data Not Gamma Distributed at 5% Significance Level			
263					**Data Not Gamma Distributed at 5% Significance Level**							
264												
265					**Gamma Statistics**							
266				k hat (MLE)	21.4				k star (bias corrected MLE)			15.62
267				Theta hat (MLE)	1.2103E-4				Theta star (bias corrected MLE)			1.6577E-4
268				nu hat (MLE)	470.8				nu star (bias corrected)			343.7
269				MLE Mean (bias corrected)	0.00259				MLE Sd (bias corrected)			6.5524E-4
270									Approximate Chi Square Value (0.05)			301.8
271				Adjusted Level of Significance	0.0278				Adjusted Chi Square Value			295.4
272												
273					**Assuming Gamma Distribution**							
274				95% Approximate Gamma UCL	0.00295				95% Adjusted Gamma UCL			0.00301
275												

276	**Lognormal GOF Test**											
277					Shapiro Wilk Test Statistic	0.836	**Shapiro Wilk Lognormal GOF Test**					
278					10% Shapiro Wilk Critical Value	0.876	Data Not Lognormal at 10% Significance Level					
279					Lilliefors Test Statistic	0.261	**Lilliefors Lognormal GOF Test**					
280					10% Lilliefors Critical Value	0.231	Data Not Lognormal at 10% Significance Level					
281	**Data Not Lognormal at 10% Significance Level**											
282												
283	**Lognormal Statistics**											
284					Minimum of Logged Data	-6.2			Mean of logged Data	-5.98		
285					Maximum of Logged Data	-5.473			SD of logged Data	0.219		
286												
287	**Assuming Lognormal Distribution**											
288					95% H-UCL	0.00295			90% Chebyshev (MVUE) UCL	0.0031		
289					95% Chebyshev (MVUE) UCL	0.00333			97.5% Chebyshev (MVUE) UCL	0.00365		
290					99% Chebyshev (MVUE) UCL	0.00429						
291												
292	**Nonparametric Distribution Free UCL Statistics**											
293	**Data appear to follow a Discernible Distribution**											
294												
295	**Nonparametric Distribution Free UCLs**											
296					95% CLT UCL	0.00291			95% BCA Bootstrap UCL	0.00299		
297					95% Standard Bootstrap UCL	0.0029			95% Bootstrap-t UCL	0.0032		
298					95% Hall's Bootstrap UCL	0.0032			95% Percentile Bootstrap UCL	0.00291		
299					90% Chebyshev(Mean, Sd) UCL	0.00317			95% Chebyshev(Mean, Sd) UCL	0.00343		
300					97.5% Chebyshev(Mean, Sd) UCL	0.0038			99% Chebyshev(Mean, Sd) UCL	0.00451		
301												
302	**Suggested UCL to Use**											
303					95% Student's-t UCL	0.00294						
304												
305	When a data set follows an approximate distribution passing only one of the GOF tests,											
306	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
307												
308	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
309	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
310	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
311												
312												
313	**ResultValue (apw-06d)**											
314												
315	**General Statistics**											
316					Total Number of Observations	22			Number of Distinct Observations	18		
317									Number of Missing Observations	0		
318					Minimum	0.0068			Mean	0.0101		
319					Maximum	0.0135			Median	0.0104		
320					SD	0.00146			Std. Error of Mean	3.1117E-4		
321					Coefficient of Variation	0.144			Skewness	-0.526		
322												
323	**Normal GOF Test**											
324					Shapiro Wilk Test Statistic	0.893	**Shapiro Wilk GOF Test**					
325					1% Shapiro Wilk Critical Value	0.878	Data appear Normal at 1% Significance Level					
326					Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**					
327					1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level					
328	**Data appear Normal at 1% Significance Level**											
329												
330	**Assuming Normal Distribution**											

331	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
332				95% Student's-t UCL		0.0106				95% Adjusted-CLT UCL (Chen-1995)		0.0106
333										95% Modified-t UCL (Johnson-1978)		0.0106
334												
335	**Gamma GOF Test**											
336				A-D Test Statistic		1.333	**Anderson-Darling Gamma GOF Test**					
337				5% A-D Critical Value		0.743	Data Not Gamma Distributed at 5% Significance Level					
338				K-S Test Statistic		0.198	**Kolmogorov-Smirnov Gamma GOF Test**					
339				5% K-S Critical Value		0.185	Data Not Gamma Distributed at 5% Significance Level					
340	**Data Not Gamma Distributed at 5% Significance Level**											
341												
342	**Gamma Statistics**											
343				k hat (MLE)		46.3				k star (bias corrected MLE)		40.02
344				Theta hat (MLE)		2.1841E-4				Theta star (bias corrected MLE)		2.5271E-4
345				nu hat (MLE)		2037				nu star (bias corrected)		1761
346				MLE Mean (bias corrected)		0.0101				MLE Sd (bias corrected)		0.0016
347										Approximate Chi Square Value (0.05)		1664
348				Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		1657
349												
350	**Assuming Gamma Distribution**											
351				95% Approximate Gamma UCL		0.0107				95% Adjusted Gamma UCL		0.0107
352												
353	**Lognormal GOF Test**											
354				Shapiro Wilk Test Statistic		0.859	**Shapiro Wilk Lognormal GOF Test**					
355				10% Shapiro Wilk Critical Value		0.926	Data Not Lognormal at 10% Significance Level					
356				Lilliefors Test Statistic		0.207	**Lilliefors Lognormal GOF Test**					
357				10% Lilliefors Critical Value		0.169	Data Not Lognormal at 10% Significance Level					
358	**Data Not Lognormal at 10% Significance Level**											
359												
360	**Lognormal Statistics**											
361				Minimum of Logged Data		-4.991				Mean of logged Data		-4.605
362				Maximum of Logged Data		-4.305				SD of logged Data		0.154
363												
364	**Assuming Lognormal Distribution**											
365				95% H-UCL		0.0107				90% Chebyshev (MVUE) UCL		0.0111
366				95% Chebyshev (MVUE) UCL		0.0116				97.5% Chebyshev (MVUE) UCL		0.0122
367				99% Chebyshev (MVUE) UCL		0.0134						
368												
369	**Nonparametric Distribution Free UCL Statistics**											
370	**Data appear to follow a Discernible Distribution**											
371												
372	**Nonparametric Distribution Free UCLs**											
373				95% CLT UCL		0.0106				95% BCA Bootstrap UCL		0.0106
374				95% Standard Bootstrap UCL		0.0106				95% Bootstrap-t UCL		0.0106
375				95% Hall's Bootstrap UCL		0.0106				95% Percentile Bootstrap UCL		0.0106
376				90% Chebyshev(Mean, Sd) UCL		0.011				95% Chebyshev(Mean, Sd) UCL		0.0115
377				97.5% Chebyshev(Mean, Sd) UCL		0.0121				99% Chebyshev(Mean, Sd) UCL		0.0132
378												
379	**Suggested UCL to Use**											
380				95% Student's-t UCL		0.0106						
381												
382	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
383	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
384	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
385												

386	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
387	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
388												
389												
390	ResultValue (apw-06s)											
391												
392	General Statistics											
393					Total Number of Observations	23				Number of Distinct Observations	9	
394										Number of Missing Observations	0	
395					Minimum	9.0000E-4				Mean	0.00156	
396					Maximum	0.002				Median	0.0016	
397					SD	4.2515E-4				Std. Error of Mean	8.8650E-5	
398					Coefficient of Variation	0.273				Skewness	-0.171	
399												
400	Normal GOF Test											
401					Shapiro Wilk Test Statistic	0.821				Shapiro Wilk GOF Test		
402					1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
403					Lilliefors Test Statistic	0.243				Lilliefors GOF Test		
404					1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
405	Data Not Normal at 1% Significance Level											
406												
407	Assuming Normal Distribution											
408					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
409					95% Student's-t UCL	0.00171				95% Adjusted-CLT UCL (Chen-1995)	0.0017	
410										95% Modified-t UCL (Johnson-1978)	0.00171	
411												
412	Gamma GOF Test											
413					A-D Test Statistic	1.654				Anderson-Darling Gamma GOF Test		
414					5% A-D Critical Value	0.743				Data Not Gamma Distributed at 5% Significance Level		
415					K-S Test Statistic	0.241				Kolmogorov-Smirnov Gamma GOF Test		
416					5% K-S Critical Value	0.181				Data Not Gamma Distributed at 5% Significance Level		
417	Data Not Gamma Distributed at 5% Significance Level											
418												
419	Gamma Statistics											
420					k hat (MLE)	13.09				k star (bias corrected MLE)	11.41	
421					Theta hat (MLE)	1.1892E-4				Theta star (bias corrected MLE)	1.3641E-4	
422					nu hat (MLE)	602.1				nu star (bias corrected)	524.9	
423					MLE Mean (bias corrected)	0.00156				MLE Sd (bias corrected)	4.6079E-4	
424										Approximate Chi Square Value (0.05)	472.8	
425					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	469.2	
426												
427	Assuming Gamma Distribution											
428					95% Approximate Gamma UCL	0.00173				95% Adjusted Gamma UCL	0.00174	
429												
430	Lognormal GOF Test											
431					Shapiro Wilk Test Statistic	0.833				Shapiro Wilk Lognormal GOF Test		
432					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
433					Lilliefors Test Statistic	0.232				Lilliefors Lognormal GOF Test		
434					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
435	Data Not Lognormal at 10% Significance Level											
436												
437	Lognormal Statistics											
438					Minimum of Logged Data	-7.013				Mean of logged Data	-6.504	
439					Maximum of Logged Data	-6.215				SD of logged Data	0.29	
440												

441	**Assuming Lognormal Distribution**											
442					95% H-UCL	0.00175				90% Chebyshev (MVUE) UCL	0.00185	
443					95% Chebyshev (MVUE) UCL	0.00198				97.5% Chebyshev (MVUE) UCL	0.00216	
444					99% Chebyshev (MVUE) UCL	0.00251						
445												
446	**Nonparametric Distribution Free UCL Statistics**											
447	**Data do not follow a Discernible Distribution**											
448												
449	**Nonparametric Distribution Free UCLs**											
450					95% CLT UCL	0.0017				95% BCA Bootstrap UCL	0.00169	
451					95% Standard Bootstrap UCL	0.0017				95% Bootstrap-t UCL	0.00171	
452					95% Hall's Bootstrap UCL	0.00169				95% Percentile Bootstrap UCL	0.0017	
453					90% Chebyshev(Mean, Sd) UCL	0.00182				95% Chebyshev(Mean, Sd) UCL	0.00194	
454					97.5% Chebyshev(Mean, Sd) UCL	0.00211				99% Chebyshev(Mean, Sd) UCL	0.00244	
455												
456	**Suggested UCL to Use**											
457					95% Student's-t UCL	0.00171						
458												
459	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
460	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
461	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
462												
463	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
464	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
465												
466												
467	**ResultValue (apw-07)**											
468												
469	**General Statistics**											
470					Total Number of Observations	22				Number of Distinct Observations	9	
471										Number of Missing Observations	0	
472					Minimum	0.001				Mean	0.00156	
473					Maximum	0.0023				Median	0.0015	
474					SD	4.7162E-4				Std. Error of Mean	1.0055E-4	
475					Coefficient of Variation	0.302				Skewness	0.00829	
476												
477	**Normal GOF Test**											
478					Shapiro Wilk Test Statistic	0.851				**Shapiro Wilk GOF Test**		
479					1% Shapiro Wilk Critical Value	0.878				Data Not Normal at 1% Significance Level		
480					Lilliefors Test Statistic	0.232				**Lilliefors GOF Test**		
481					1% Lilliefors Critical Value	0.214				Data Not Normal at 1% Significance Level		
482	**Data Not Normal at 1% Significance Level**											
483												
484	**Assuming Normal Distribution**											
485					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
486					95% Student's-t UCL	0.00174				95% Adjusted-CLT UCL (Chen-1995)	0.00173	
487										95% Modified-t UCL (Johnson-1978)	0.00174	
488												
489	**Gamma GOF Test**											
490					A-D Test Statistic	1.433				**Anderson-Darling Gamma GOF Test**		
491					5% A-D Critical Value	0.743				Data Not Gamma Distributed at 5% Significance Level		
492					K-S Test Statistic	0.238				**Kolmogorov-Smirnov Gamma GOF Test**		
493					5% K-S Critical Value	0.185				Data Not Gamma Distributed at 5% Significance Level		
494	**Data Not Gamma Distributed at 5% Significance Level**											
495												

496	**Gamma Statistics**											
497					k hat (MLE)	10.99				k star (bias corrected MLE)		9.522
498					Theta hat (MLE)	1.4228E-4				Theta star (bias corrected MLE)		1.6422E-4
499					nu hat (MLE)	483.6				nu star (bias corrected)		419
500					MLE Mean (bias corrected)	0.00156				MLE Sd (bias corrected)		5.0673E-4
501										Approximate Chi Square Value (0.05)		372.5
502					Adjusted Level of Significance	0.0386				Adjusted Chi Square Value		369.2
503												
504	**Assuming Gamma Distribution**											
505					95% Approximate Gamma UCL	0.00176				95% Adjusted Gamma UCL		0.00177
506												
507	**Lognormal GOF Test**											
508					Shapiro Wilk Test Statistic	0.84				**Shapiro Wilk Lognormal GOF Test**		
509					10% Shapiro Wilk Critical Value	0.926				Data Not Lognormal at 10% Significance Level		
510					Lilliefors Test Statistic	0.232				**Lilliefors Lognormal GOF Test**		
511					10% Lilliefors Critical Value	0.169				Data Not Lognormal at 10% Significance Level		
512	**Data Not Lognormal at 10% Significance Level**											
513												
514	**Lognormal Statistics**											
515					Minimum of Logged Data	-6.908				Mean of logged Data		-6.507
516					Maximum of Logged Data	-6.075				SD of logged Data		0.316
517												
518	**Assuming Lognormal Distribution**											
519					95% H-UCL	0.00178				90% Chebyshev (MVUE) UCL		0.00189
520					95% Chebyshev (MVUE) UCL	0.00203				97.5% Chebyshev (MVUE) UCL		0.00223
521					99% Chebyshev (MVUE) UCL	0.00263						
522												
523	**Nonparametric Distribution Free UCL Statistics**											
524	**Data do not follow a Discernible Distribution**											
525												
526	**Nonparametric Distribution Free UCLs**											
527					95% CLT UCL	0.00173				95% BCA Bootstrap UCL		0.00172
528					95% Standard Bootstrap UCL	0.00173				95% Bootstrap-t UCL		0.00174
529					95% Hall's Bootstrap UCL	0.00172				95% Percentile Bootstrap UCL		0.00173
530					90% Chebyshev(Mean, Sd) UCL	0.00187				95% Chebyshev(Mean, Sd) UCL		0.002
531					97.5% Chebyshev(Mean, Sd) UCL	0.00219				99% Chebyshev(Mean, Sd) UCL		0.00256
532												
533	**Suggested UCL to Use**											
534					95% Student's-t UCL	0.00174						
535												
536	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
537	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
538	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
539												
540												
541	**ResultValue (apw-08)**											
542												
543	**General Statistics**											
544					Total Number of Observations	23				Number of Distinct Observations		9
545										Number of Missing Observations		0
546					Minimum	0.001				Mean		0.00163
547					Maximum	0.0025				Median		0.0018
548					SD	4.9655E-4				Std. Error of Mean		1.0354E-4
549					Coefficient of Variation	0.305				Skewness		-0.217
550												

551	**Normal GOF Test**											
552				Shapiro Wilk Test Statistic	0.827	**Shapiro Wilk GOF Test**						
553				1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level						
554				Lilliefors Test Statistic	0.253	**Lilliefors GOF Test**						
555				1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level						
556	**Data Not Normal at 1% Significance Level**											
557												
558	**Assuming Normal Distribution**											
559	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
560				95% Student's-t UCL	0.0018	95% Adjusted-CLT UCL (Chen-1995)	0.00179					
561						95% Modified-t UCL (Johnson-1978)	0.0018					
562												
563	**Gamma GOF Test**											
564				A-D Test Statistic	2.111	**Anderson-Darling Gamma GOF Test**						
565				5% A-D Critical Value	0.744	Data Not Gamma Distributed at 5% Significance Level						
566				K-S Test Statistic	0.262	**Kolmogorov-Smirnov Gamma GOF Test**						
567				5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level						
568	**Data Not Gamma Distributed at 5% Significance Level**											
569												
570	**Gamma Statistics**											
571				k hat (MLE)	10.17	k star (bias corrected MLE)	8.869					
572				Theta hat (MLE)	1.5996E-4	Theta star (bias corrected MLE)	1.8335E-4					
573				nu hat (MLE)	467.6	nu star (bias corrected)	408					
574				MLE Mean (bias corrected)	0.00163	MLE Sd (bias corrected)	5.4603E-4					
575						Approximate Chi Square Value (0.05)	362.1					
576				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	359					
577												
578	**Assuming Gamma Distribution**											
579				95% Approximate Gamma UCL	0.00183	95% Adjusted Gamma UCL	0.00185					
580												
581	**Lognormal GOF Test**											
582				Shapiro Wilk Test Statistic	0.793	**Shapiro Wilk Lognormal GOF Test**						
583				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
584				Lilliefors Test Statistic	0.259	**Lilliefors Lognormal GOF Test**						
585				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
586	**Data Not Lognormal at 10% Significance Level**											
587												
588	**Lognormal Statistics**											
589				Minimum of Logged Data	-6.908	Mean of logged Data	-6.472					
590				Maximum of Logged Data	-5.991	SD of logged Data	0.332					
591												
592	**Assuming Lognormal Distribution**											
593				95% H-UCL	0.00186	90% Chebyshev (MVUE) UCL	0.00198					
594				95% Chebyshev (MVUE) UCL	0.00213	97.5% Chebyshev (MVUE) UCL	0.00235					
595				99% Chebyshev (MVUE) UCL	0.00278							
596												
597	**Nonparametric Distribution Free UCL Statistics**											
598	**Data do not follow a Discernible Distribution**											
599												
600	**Nonparametric Distribution Free UCLs**											
601				95% CLT UCL	0.0018	95% BCA Bootstrap UCL	0.00179					
602				95% Standard Bootstrap UCL	0.00179	95% Bootstrap-t UCL	0.0018					
603				95% Hall's Bootstrap UCL	0.00179	95% Percentile Bootstrap UCL	0.00179					
604				90% Chebyshev(Mean, Sd) UCL	0.00194	95% Chebyshev(Mean, Sd) UCL	0.00208					
605				97.5% Chebyshev(Mean, Sd) UCL	0.00227	99% Chebyshev(Mean, Sd) UCL	0.00266					

606												
607					**Suggested UCL to Use**							
608					95% Student's-t UCL	0.0018						
609												
610					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
611					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
612					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
613												
614					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
615					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
616												
617												
618	**ResultValue (apw-10d)**											
619												
620					**General Statistics**							
621					Total Number of Observations	23				Number of Distinct Observations	9	
622										Number of Missing Observations	0	
623					Minimum	0.001				Mean	0.00187	
624					Maximum	0.0057				Median	0.0017	
625					SD	0.00118				Std. Error of Mean	2.4572E-4	
626					Coefficient of Variation	0.63				Skewness	2.408	
627												
628					**Normal GOF Test**							
629					Shapiro Wilk Test Statistic	0.652				**Shapiro Wilk GOF Test**		
630					1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
631					Lilliefors Test Statistic	0.336				**Lilliefors GOF Test**		
632					1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
633					**Data Not Normal at 1% Significance Level**							
634												
635					**Assuming Normal Distribution**							
636					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
637					95% Student's-t UCL	0.00229				95% Adjusted-CLT UCL (Chen-1995)	0.00241	
638										95% Modified-t UCL (Johnson-1978)	0.00231	
639												
640					**Gamma GOF Test**							
641					A-D Test Statistic	1.788				**Anderson-Darling Gamma GOF Test**		
642					5% A-D Critical Value	0.749				Data Not Gamma Distributed at 5% Significance Level		
643					K-S Test Statistic	0.257				**Kolmogorov-Smirnov Gamma GOF Test**		
644					5% K-S Critical Value	0.182				Data Not Gamma Distributed at 5% Significance Level		
645					**Data Not Gamma Distributed at 5% Significance Level**							
646												
647					**Gamma Statistics**							
648					k hat (MLE)	4.038				k star (bias corrected MLE)	3.541	
649					Theta hat (MLE)	4.6318E-4				Theta star (bias corrected MLE)	5.2830E-4	
650					nu hat (MLE)	185.8				nu star (bias corrected)	162.9	
651					MLE Mean (bias corrected)	0.00187				MLE Sd (bias corrected)	9.9405E-4	
652										Approximate Chi Square Value (0.05)	134.4	
653					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	132.5	
654												
655					**Assuming Gamma Distribution**							
656					95% Approximate Gamma UCL	0.00227				95% Adjusted Gamma UCL	0.0023	
657												
658					**Lognormal GOF Test**							
659					Shapiro Wilk Test Statistic	0.815				**Shapiro Wilk Lognormal GOF Test**		
660					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		

661				Lilliefors Test Statistic	0.219	**Lilliefors Lognormal GOF Test**						
662				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
663	**Data Not Lognormal at 10% Significance Level**											
664												
665	**Lognormal Statistics**											
666				Minimum of Logged Data	-6.908					Mean of logged Data	-6.41	
667				Maximum of Logged Data	-5.167					SD of logged Data	0.482	
668												
669	**Assuming Lognormal Distribution**											
670				95% H-UCL	0.00226					90% Chebyshev (MVUE) UCL	0.00241	
671				95% Chebyshev (MVUE) UCL	0.00267					97.5% Chebyshev (MVUE) UCL	0.00303	
672				99% Chebyshev (MVUE) UCL	0.00374							
673												
674	**Nonparametric Distribution Free UCL Statistics**											
675	**Data do not follow a Discernible Distribution**											
676												
677	**Nonparametric Distribution Free UCLs**											
678				95% CLT UCL	0.00227					95% BCA Bootstrap UCL	0.00242	
679				95% Standard Bootstrap UCL	0.00227					95% Bootstrap-t UCL	0.00278	
680				95% Hall's Bootstrap UCL	0.00476					95% Percentile Bootstrap UCL	0.00231	
681				90% Chebyshev(Mean, Sd) UCL	0.00261					95% Chebyshev(Mean, Sd) UCL	0.00294	
682				97.5% Chebyshev(Mean, Sd) UCL	0.0034					99% Chebyshev(Mean, Sd) UCL	0.00432	
683												
684	**Suggested UCL to Use**											
685				95% Student's-t UCL	0.00229							
686												
687	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
688	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
689	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
690												
691												
692	**ResultValue (apw-10s)**											
693												
694	**General Statistics**											
695				Total Number of Observations	23					Number of Distinct Observations	18	
696										Number of Missing Observations	0	
697				Minimum	0.174					Mean	0.196	
698				Maximum	0.276					Median	0.191	
699				SD	0.0206					Std. Error of Mean	0.0043	
700				Coefficient of Variation	0.106					Skewness	3.065	
701												
702	**Normal GOF Test**											
703				Shapiro Wilk Test Statistic	0.641	**Shapiro Wilk GOF Test**						
704				1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level						
705				Lilliefors Test Statistic	0.323	**Lilliefors GOF Test**						
706				1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level						
707	**Data Not Normal at 1% Significance Level**											
708												
709	**Assuming Normal Distribution**											
710	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
711				95% Student's-t UCL	0.203					95% Adjusted-CLT UCL (Chen-1995)	0.206	
712										95% Modified-t UCL (Johnson-1978)	0.203	
713												
714	**Gamma GOF Test**											
715				A-D Test Statistic	2.51	**Anderson-Darling Gamma GOF Test**						

716				5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level						
717				K-S Test Statistic	0.305	**Kolmogorov-Smirnov Gamma GOF Test**						
718				5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level						
719	**Data Not Gamma Distributed at 5% Significance Level**											
720												
721	**Gamma Statistics**											
722				k hat (MLE)	110.6	k star (bias corrected MLE)	96.22					
723				Theta hat (MLE)	0.00177	Theta star (bias corrected MLE)	0.00203					
724				nu hat (MLE)	5089	nu star (bias corrected)	4426					
725				MLE Mean (bias corrected)	0.196	MLE Sd (bias corrected)	0.0199					
726						Approximate Chi Square Value (0.05)	4273					
727				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	4262					
728												
729	**Assuming Gamma Distribution**											
730				95% Approximate Gamma UCL	0.203	95% Adjusted Gamma UCL	0.203					
731												
732	**Lognormal GOF Test**											
733				Shapiro Wilk Test Statistic	0.7	**Shapiro Wilk Lognormal GOF Test**						
734				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
735				Lilliefors Test Statistic	0.298	**Lilliefors Lognormal GOF Test**						
736				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
737	**Data Not Lognormal at 10% Significance Level**											
738												
739	**Lognormal Statistics**											
740				Minimum of Logged Data	-1.749	Mean of logged Data	-1.636					
741				Maximum of Logged Data	-1.287	SD of logged Data	0.0935					
742												
743	**Assuming Lognormal Distribution**											
744				95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	0.207					
745				95% Chebyshev (MVUE) UCL	0.212	97.5% Chebyshev (MVUE) UCL	0.219					
746				99% Chebyshev (MVUE) UCL	0.233							
747												
748	**Nonparametric Distribution Free UCL Statistics**											
749	**Data do not follow a Discernible Distribution**											
750												
751	**Nonparametric Distribution Free UCLs**											
752				95% CLT UCL	0.203	95% BCA Bootstrap UCL	0.205					
753				95% Standard Bootstrap UCL	0.203	95% Bootstrap-t UCL	0.214					
754				95% Hall's Bootstrap UCL	0.239	95% Percentile Bootstrap UCL	0.203					
755				90% Chebyshev(Mean, Sd) UCL	0.208	95% Chebyshev(Mean, Sd) UCL	0.214					
756				97.5% Chebyshev(Mean, Sd) UCL	0.222	99% Chebyshev(Mean, Sd) UCL	0.238					
757												
758	**Suggested UCL to Use**											
759				95% Student's-t UCL	0.203							
760												
761	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
762	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
763	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
764												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Barium DG
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:11:33 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_e.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.145	Mean	0.309
Maximum	0.739	Median	0.254
SD	0.173	Std. Error of Mean	0.0361
Coefficient of Variation	0.56	Skewness	1.083

Normal GOF Test

Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.176	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.371	95% Adjusted-CLT UCL (Chen-1995)	0.378
		95% Modified-t UCL (Johnson-1978)	0.373

Gamma GOF Test

A-D Test Statistic	0.873	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.193	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.765	k star (bias corrected MLE)	3.303
Theta hat (MLE)	0.0822	Theta star (bias corrected MLE)	0.0937
nu hat (MLE)	173.2	nu star (bias corrected)	151.9
MLE Mean (bias corrected)	0.309	MLE Sd (bias corrected)	0.17
		Approximate Chi Square Value (0.05)	124.5
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	122.7

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.378	95% Adjusted Gamma UCL	0.383

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.189	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

56	**Data Not Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-1.931				Mean of logged Data	-1.312
60						Maximum of Logged Data	-0.302				SD of logged Data	0.531
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.389				90% Chebyshev (MVUE) UCL	0.415
64						95% Chebyshev (MVUE) UCL	0.463				97.5% Chebyshev (MVUE) UCL	0.531
65						99% Chebyshev (MVUE) UCL	0.663					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.369				95% BCA Bootstrap UCL	0.377
72						95% Standard Bootstrap UCL	0.369				95% Bootstrap-t UCL	0.388
73						95% Hall's Bootstrap UCL	0.383				95% Percentile Bootstrap UCL	0.37
74						90% Chebyshev(Mean, Sd) UCL	0.418				95% Chebyshev(Mean, Sd) UCL	0.467
75						97.5% Chebyshev(Mean, Sd) UCL	0.535				99% Chebyshev(Mean, Sd) UCL	0.669
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.371					
79												
80	When a data set follows an approximate distribution passing only one of the GOF tests,											
81	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
82												
83	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
84	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
85	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	23				Number of Distinct Observations	22
92											Number of Missing Observations	0
93						Minimum	0.0806				Mean	0.127
94						Maximum	0.19				Median	0.119
95						SD	0.0291				Std. Error of Mean	0.00606
96						Coefficient of Variation	0.228				Skewness	0.535
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.951				**Shapiro Wilk GOF Test**	
100						1% Shapiro Wilk Critical Value	0.881				Data appear Normal at 1% Significance Level	
101						Lilliefors Test Statistic	0.169				**Lilliefors GOF Test**	
102						1% Lilliefors Critical Value	0.209				Data appear Normal at 1% Significance Level	
103	**Data appear Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
107						95% Student's-t UCL	0.138				95% Adjusted-CLT UCL (Chen-1995)	0.138
108											95% Modified-t UCL (Johnson-1978)	0.138
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	0.363	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.143	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
115	**Detected data appear Gamma Distributed at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	20.58	k star (bias corrected MLE)	17.93					
119				Theta hat (MLE)	0.00619	Theta star (bias corrected MLE)	0.00711					
120				nu hat (MLE)	946.8	nu star (bias corrected)	824.6					
121				MLE Mean (bias corrected)	0.127	MLE Sd (bias corrected)	0.0301					
122						Approximate Chi Square Value (0.05)	759					
123				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	754.4					
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	0.138	95% Adjusted Gamma UCL	0.139					
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.967	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.128	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
133	**Data appear Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	-2.518	Mean of logged Data	-2.085					
137				Maximum of Logged Data	-1.661	SD of logged Data	0.226					
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	0.139	90% Chebyshev (MVUE) UCL	0.146					
141				95% Chebyshev (MVUE) UCL	0.154	97.5% Chebyshev (MVUE) UCL	0.165					
142				99% Chebyshev (MVUE) UCL	0.188							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data appear to follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	0.137	95% BCA Bootstrap UCL	0.138					
149				95% Standard Bootstrap UCL	0.137	95% Bootstrap-t UCL	0.138					
150				95% Hall's Bootstrap UCL	0.138	95% Percentile Bootstrap UCL	0.137					
151				90% Chebyshev(Mean, Sd) UCL	0.146	95% Chebyshev(Mean, Sd) UCL	0.154					
152				97.5% Chebyshev(Mean, Sd) UCL	0.165	99% Chebyshev(Mean, Sd) UCL	0.188					
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	0.138							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12	Number of Distinct Observations	11					

166											Number of Missing Observations	0
167					Minimum	0.14					Mean	0.192
168					Maximum	0.233					Median	0.194
169					SD	0.0314					Std. Error of Mean	0.00907
170					Coefficient of Variation	0.164					Skewness	-0.514
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.919			**Shapiro Wilk GOF Test**			
174					1% Shapiro Wilk Critical Value	0.805			Data appear Normal at 1% Significance Level			
175					Lilliefors Test Statistic	0.178			**Lilliefors GOF Test**			
176					1% Lilliefors Critical Value	0.281			Data appear Normal at 1% Significance Level			
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
181					95% Student's-t UCL	0.208			95% Adjusted-CLT UCL (Chen-1995)	0.205		
182									95% Modified-t UCL (Johnson-1978)	0.208		
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.517			**Anderson-Darling Gamma GOF Test**			
186					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
187					K-S Test Statistic	0.189			**Kolmogorov-Smirnov Gamma GOF Test**			
188					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
189						**Detected data appear Gamma Distributed at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	37.98			k star (bias corrected MLE)	28.54		
193					Theta hat (MLE)	0.00505			Theta star (bias corrected MLE)	0.00672		
194					nu hat (MLE)	911.5			nu star (bias corrected)	685		
195					MLE Mean (bias corrected)	0.192			MLE Sd (bias corrected)	0.0359		
196									Approximate Chi Square Value (0.05)	625.2		
197					Adjusted Level of Significance	0.029			Adjusted Chi Square Value	616.5		
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	0.21			95% Adjusted Gamma UCL	0.213		
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.897			**Shapiro Wilk Lognormal GOF Test**			
204					10% Shapiro Wilk Critical Value	0.883			Data appear Lognormal at 10% Significance Level			
205					Lilliefors Test Statistic	0.179			**Lilliefors Lognormal GOF Test**			
206					10% Lilliefors Critical Value	0.223			Data appear Lognormal at 10% Significance Level			
207						**Data appear Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	-1.966			Mean of logged Data	-1.665		
211					Maximum of Logged Data	-1.457			SD of logged Data	0.173		
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	0.211			90% Chebyshev (MVUE) UCL	0.221		
215					95% Chebyshev (MVUE) UCL	0.234			97.5% Chebyshev (MVUE) UCL	0.252		
216					99% Chebyshev (MVUE) UCL	0.287						
217												
218						**Nonparametric Distribution Free UCL Statistics**						
219						**Data appear to follow a Discernible Distribution**						
220												

221	**Nonparametric Distribution Free UCLs**											
222				95% CLT UCL	0.207			95% BCA Bootstrap UCL	0.204			
223				95% Standard Bootstrap UCL	0.206			95% Bootstrap-t UCL	0.206			
224				95% Hall's Bootstrap UCL	0.205			95% Percentile Bootstrap UCL	0.205			
225				90% Chebyshev(Mean, Sd) UCL	0.219			95% Chebyshev(Mean, Sd) UCL	0.231			
226				97.5% Chebyshev(Mean, Sd) UCL	0.248			99% Chebyshev(Mean, Sd) UCL	0.282			
227												
228	**Suggested UCL to Use**											
229				95% Student's-t UCL	0.208							
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
236	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
237												
238												
239	**ResultValue (apw-05r)**											
240												
241	**General Statistics**											
242				Total Number of Observations	11			Number of Distinct Observations	11			
243								Number of Missing Observations	0			
244				Minimum	0.102			Mean	0.167			
245				Maximum	0.225			Median	0.162			
246				SD	0.0333			Std. Error of Mean	0.01			
247				Coefficient of Variation	0.2			Skewness	-0.218			
248												
249	**Normal GOF Test**											
250				Shapiro Wilk Test Statistic	0.979			**Shapiro Wilk GOF Test**				
251				1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level				
252				Lilliefors Test Statistic	0.117			**Lilliefors GOF Test**				
253				1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level				
254	**Data appear Normal at 1% Significance Level**											
255												
256	**Assuming Normal Distribution**											
257	**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**				
258				95% Student's-t UCL	0.185			95% Adjusted-CLT UCL (Chen-1995)	0.183			
259								95% Modified-t UCL (Johnson-1978)	0.185			
260												
261	**Gamma GOF Test**											
262				A-D Test Statistic	0.243			**Anderson-Darling Gamma GOF Test**				
263				5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level				
264				K-S Test Statistic	0.139			**Kolmogorov-Smirnov Gamma GOF Test**				
265				5% K-S Critical Value	0.255			Detected data appear Gamma Distributed at 5% Significance Level				
266	**Detected data appear Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269				k hat (MLE)	25.67			k star (bias corrected MLE)	18.73			
270				Theta hat (MLE)	0.00651			Theta star (bias corrected MLE)	0.00892			
271				nu hat (MLE)	564.8			nu star (bias corrected)	412.1			
272				MLE Mean (bias corrected)	0.167			MLE Sd (bias corrected)	0.0386			
273								Approximate Chi Square Value (0.05)	366			
274				Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	358.9			
275												

276					**Assuming Gamma Distribution**							
277				95% Approximate Gamma UCL	0.188				95% Adjusted Gamma UCL	0.192		
278												
279					**Lognormal GOF Test**							
280				Shapiro Wilk Test Statistic	0.947			**Shapiro Wilk Lognormal GOF Test**				
281				10% Shapiro Wilk Critical Value	0.876			Data appear Lognormal at 10% Significance Level				
282				Lilliefors Test Statistic	0.135			**Lilliefors Lognormal GOF Test**				
283				10% Lilliefors Critical Value	0.231			Data appear Lognormal at 10% Significance Level				
284					**Data appear Lognormal at 10% Significance Level**							
285												
286					**Lognormal Statistics**							
287				Minimum of Logged Data	-2.283				Mean of logged Data	-1.809		
288				Maximum of Logged Data	-1.492				SD of logged Data	0.213		
289												
290					**Assuming Lognormal Distribution**							
291				95% H-UCL	0.19				90% Chebyshev (MVUE) UCL	0.199		
292				95% Chebyshev (MVUE) UCL	0.214				97.5% Chebyshev (MVUE) UCL	0.234		
293				99% Chebyshev (MVUE) UCL	0.274							
294												
295					**Nonparametric Distribution Free UCL Statistics**							
296					**Data appear to follow a Discernible Distribution**							
297												
298					**Nonparametric Distribution Free UCLs**							
299				95% CLT UCL	0.184				95% BCA Bootstrap UCL	0.182		
300				95% Standard Bootstrap UCL	0.183				95% Bootstrap-t UCL	0.184		
301				95% Hall's Bootstrap UCL	0.185				95% Percentile Bootstrap UCL	0.183		
302				90% Chebyshev(Mean, Sd) UCL	0.197				95% Chebyshev(Mean, Sd) UCL	0.211		
303				97.5% Chebyshev(Mean, Sd) UCL	0.23				99% Chebyshev(Mean, Sd) UCL	0.267		
304												
305					**Suggested UCL to Use**							
306				95% Student's-t UCL	0.185							
307												
308					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
309					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
310					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
311												
312					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
313					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
314												
315												
316	**ResultValue (apw-06d)**											
317												
318					**General Statistics**							
319				Total Number of Observations	22				Number of Distinct Observations	19		
320									Number of Missing Observations	0		
321				Minimum	0.109				Mean	0.14		
322				Maximum	0.173				Median	0.142		
323				SD	0.019				Std. Error of Mean	0.00404		
324				Coefficient of Variation	0.136				Skewness	0.223		
325												
326					**Normal GOF Test**							
327				Shapiro Wilk Test Statistic	0.958			**Shapiro Wilk GOF Test**				
328				1% Shapiro Wilk Critical Value	0.878			Data appear Normal at 1% Significance Level				
329				Lilliefors Test Statistic	0.125			**Lilliefors GOF Test**				
330				1% Lilliefors Critical Value	0.214			Data appear Normal at 1% Significance Level				

331	**Data appear Normal at 1% Significance Level**											
332												
333	**Assuming Normal Distribution**											
334	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
335	95% Student's-t UCL				0.147		95% Adjusted-CLT UCL (Chen-1995)					0.147
336							95% Modified-t UCL (Johnson-1978)					0.147
337												
338	**Gamma GOF Test**											
339	A-D Test Statistic				0.326		**Anderson-Darling Gamma GOF Test**					
340	5% A-D Critical Value				0.743		Detected data appear Gamma Distributed at 5% Significance Level					
341	K-S Test Statistic				0.12		**Kolmogorov-Smirnov Gamma GOF Test**					
342	5% K-S Critical Value				0.185		Detected data appear Gamma Distributed at 5% Significance Level					
343	**Detected data appear Gamma Distributed at 5% Significance Level**											
344												
345	**Gamma Statistics**											
346	k hat (MLE)				57.29		k star (bias corrected MLE)					49.51
347	Theta hat (MLE)				0.00244		Theta star (bias corrected MLE)					0.00282
348	nu hat (MLE)				2521		nu star (bias corrected)					2178
349	MLE Mean (bias corrected)				0.14		MLE Sd (bias corrected)					0.0199
350							Approximate Chi Square Value (0.05)					2071
351	Adjusted Level of Significance				0.0386		Adjusted Chi Square Value					2063
352												
353	**Assuming Gamma Distribution**											
354	95% Approximate Gamma UCL				0.147		95% Adjusted Gamma UCL					0.148
355												
356	**Lognormal GOF Test**											
357	Shapiro Wilk Test Statistic				0.963		**Shapiro Wilk Lognormal GOF Test**					
358	10% Shapiro Wilk Critical Value				0.926		Data appear Lognormal at 10% Significance Level					
359	Lilliefors Test Statistic				0.116		**Lilliefors Lognormal GOF Test**					
360	10% Lilliefors Critical Value				0.169		Data appear Lognormal at 10% Significance Level					
361	**Data appear Lognormal at 10% Significance Level**											
362												
363	**Lognormal Statistics**											
364	Minimum of Logged Data				-2.216		Mean of logged Data					-1.976
365	Maximum of Logged Data				-1.754		SD of logged Data					0.135
366												
367	**Assuming Lognormal Distribution**											
368	95% H-UCL				0.147		90% Chebyshev (MVUE) UCL					0.152
369	95% Chebyshev (MVUE) UCL				0.157		97.5% Chebyshev (MVUE) UCL					0.165
370	99% Chebyshev (MVUE) UCL				0.18							
371												
372	**Nonparametric Distribution Free UCL Statistics**											
373	**Data appear to follow a Discernible Distribution**											
374												
375	**Nonparametric Distribution Free UCLs**											
376	95% CLT UCL				0.146		95% BCA Bootstrap UCL					0.147
377	95% Standard Bootstrap UCL				0.146		95% Bootstrap-t UCL					0.147
378	95% Hall's Bootstrap UCL				0.147		95% Percentile Bootstrap UCL					0.146
379	90% Chebyshev(Mean, Sd) UCL				0.152		95% Chebyshev(Mean, Sd) UCL					0.157
380	97.5% Chebyshev(Mean, Sd) UCL				0.165		99% Chebyshev(Mean, Sd) UCL					0.18
381												
382	**Suggested UCL to Use**											
383	95% Student's-t UCL				0.147							
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

386	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
387	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
388												
389												
390	**ResultValue (apw-06s)**											
391												
392	**General Statistics**											
393						Total Number of Observations	23			Number of Distinct Observations	20	
394										Number of Missing Observations	0	
395						Minimum	0.19			Mean	0.226	
396						Maximum	0.305			Median	0.224	
397						SD	0.026			Std. Error of Mean	0.00542	
398						Coefficient of Variation	0.115			Skewness	1.406	
399												
400	**Normal GOF Test**											
401						Shapiro Wilk Test Statistic	0.894			**Shapiro Wilk GOF Test**		
402						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
403						Lilliefors Test Statistic	0.177			**Lilliefors GOF Test**		
404						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
405	**Data appear Normal at 1% Significance Level**											
406												
407	**Assuming Normal Distribution**											
408						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
409						95% Student's-t UCL	0.235			95% Adjusted-CLT UCL (Chen-1995)	0.237	
410										95% Modified-t UCL (Johnson-1978)	0.236	
411												
412	**Gamma GOF Test**											
413						A-D Test Statistic	0.582			**Anderson-Darling Gamma GOF Test**		
414						5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level		
415						K-S Test Statistic	0.158			**Kolmogorov-Smirnov Gamma GOF Test**		
416						5% K-S Critical Value	0.181			Detected data appear Gamma Distributed at 5% Significance Level		
417	**Detected data appear Gamma Distributed at 5% Significance Level**											
418												
419	**Gamma Statistics**											
420						k hat (MLE)	85.4			k star (bias corrected MLE)	74.29	
421						Theta hat (MLE)	0.00265			Theta star (bias corrected MLE)	0.00304	
422						nu hat (MLE)	3928			nu star (bias corrected)	3417	
423						MLE Mean (bias corrected)	0.226			MLE Sd (bias corrected)	0.0262	
424										Approximate Chi Square Value (0.05)	3283	
425						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	3273	
426												
427	**Assuming Gamma Distribution**											
428						95% Approximate Gamma UCL	0.235			95% Adjusted Gamma UCL	0.236	
429												
430	**Lognormal GOF Test**											
431						Shapiro Wilk Test Statistic	0.932			**Shapiro Wilk Lognormal GOF Test**		
432						10% Shapiro Wilk Critical Value	0.928			Data appear Lognormal at 10% Significance Level		
433						Lilliefors Test Statistic	0.152			**Lilliefors Lognormal GOF Test**		
434						10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level		
435	**Data appear Lognormal at 10% Significance Level**											
436												
437	**Lognormal Statistics**											
438						Minimum of Logged Data	-1.661			Mean of logged Data	-1.493	
439						Maximum of Logged Data	-1.187			SD of logged Data	0.109	
440												

441	**Assuming Lognormal Distribution**											
442				95% H-UCL	0.235				90% Chebyshev (MVUE) UCL	0.241		
443				95% Chebyshev (MVUE) UCL	0.248				97.5% Chebyshev (MVUE) UCL	0.258		
444				99% Chebyshev (MVUE) UCL	0.277							
445												
446	**Nonparametric Distribution Free UCL Statistics**											
447	**Data appear to follow a Discernible Distribution**											
448												
449	**Nonparametric Distribution Free UCLs**											
450				95% CLT UCL	0.235				95% BCA Bootstrap UCL	0.237		
451				95% Standard Bootstrap UCL	0.235				95% Bootstrap-t UCL	0.238		
452				95% Hall's Bootstrap UCL	0.241				95% Percentile Bootstrap UCL	0.235		
453				90% Chebyshev(Mean, Sd) UCL	0.242				95% Chebyshev(Mean, Sd) UCL	0.25		
454				97.5% Chebyshev(Mean, Sd) UCL	0.26				99% Chebyshev(Mean, Sd) UCL	0.28		
455												
456	**Suggested UCL to Use**											
457				95% Student's-t UCL	0.235							
458												
459	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
460	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
461	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
462												
463												
464	**ResultValue (apw-07)**											
465												
466	**General Statistics**											
467				Total Number of Observations	22				Number of Distinct Observations	21		
468									Number of Missing Observations	0		
469				Minimum	0.303				Mean	0.372		
470				Maximum	0.522				Median	0.371		
471				SD	0.0528				Std. Error of Mean	0.0113		
472				Coefficient of Variation	0.142				Skewness	1.238		
473												
474	**Normal GOF Test**											
475				Shapiro Wilk Test Statistic	0.894				**Shapiro Wilk GOF Test**			
476				1% Shapiro Wilk Critical Value	0.878				Data appear Normal at 1% Significance Level			
477				Lilliefors Test Statistic	0.199				**Lilliefors GOF Test**			
478				1% Lilliefors Critical Value	0.214				Data appear Normal at 1% Significance Level			
479	**Data appear Normal at 1% Significance Level**											
480												
481	**Assuming Normal Distribution**											
482				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
483				95% Student's-t UCL	0.392				95% Adjusted-CLT UCL (Chen-1995)	0.394		
484									95% Modified-t UCL (Johnson-1978)	0.392		
485												
486	**Gamma GOF Test**											
487				A-D Test Statistic	0.6				**Anderson-Darling Gamma GOF Test**			
488				5% A-D Critical Value	0.743				Detected data appear Gamma Distributed at 5% Significance Level			
489				K-S Test Statistic	0.177				**Kolmogorov-Smirnov Gamma GOF Test**			
490				5% K-S Critical Value	0.185				Detected data appear Gamma Distributed at 5% Significance Level			
491	**Detected data appear Gamma Distributed at 5% Significance Level**											
492												
493	**Gamma Statistics**											
494				k hat (MLE)	56.24				k star (bias corrected MLE)	48.6		
495				Theta hat (MLE)	0.00662				Theta star (bias corrected MLE)	0.00766		

496					nu hat (MLE)	2475					nu star (bias corrected)	2139
497					MLE Mean (bias corrected)	0.372					MLE Sd (bias corrected)	0.0534
498											Approximate Chi Square Value (0.05)	2032
499					Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	2024
500												
501					**Assuming Gamma Distribution**							
502					95% Approximate Gamma UCL	0.392					95% Adjusted Gamma UCL	0.393
503												
504					**Lognormal GOF Test**							
505					Shapiro Wilk Test Statistic	0.931					**Shapiro Wilk Lognormal GOF Test**	
506					10% Shapiro Wilk Critical Value	0.926					Data appear Lognormal at 10% Significance Level	
507					Lilliefors Test Statistic	0.17					**Lilliefors Lognormal GOF Test**	
508					10% Lilliefors Critical Value	0.169					Data Not Lognormal at 10% Significance Level	
509					**Data appear Approximate Lognormal at 10% Significance Level**							
510												
511					**Lognormal Statistics**							
512					Minimum of Logged Data	-1.194					Mean of logged Data	-0.997
513					Maximum of Logged Data	-0.65					SD of logged Data	0.134
514												
515					**Assuming Lognormal Distribution**							
516					95% H-UCL	0.392					90% Chebyshev (MVUE) UCL	0.404
517					95% Chebyshev (MVUE) UCL	0.419					97.5% Chebyshev (MVUE) UCL	0.439
518					99% Chebyshev (MVUE) UCL	0.478						
519												
520					**Nonparametric Distribution Free UCL Statistics**							
521					**Data appear to follow a Discernible Distribution**							
522												
523					**Nonparametric Distribution Free UCLs**							
524					95% CLT UCL	0.391					95% BCA Bootstrap UCL	0.394
525					95% Standard Bootstrap UCL	0.39					95% Bootstrap-t UCL	0.398
526					95% Hall's Bootstrap UCL	0.402					95% Percentile Bootstrap UCL	0.391
527					90% Chebyshev(Mean, Sd) UCL	0.406					95% Chebyshev(Mean, Sd) UCL	0.421
528					97.5% Chebyshev(Mean, Sd) UCL	0.442					99% Chebyshev(Mean, Sd) UCL	0.484
529												
530					**Suggested UCL to Use**							
531					95% Student's-t UCL	0.392						
532												
533	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
534	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
535	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
536												
537												
538	**ResultValue (apw-08)**											
539												
540					**General Statistics**							
541					Total Number of Observations	23					Number of Distinct Observations	22
542											Number of Missing Observations	0
543					Minimum	0.167					Mean	0.209
544					Maximum	0.261					Median	0.207
545					SD	0.0253					Std. Error of Mean	0.00527
546					Coefficient of Variation	0.121					Skewness	0.258
547												
548					**Normal GOF Test**							
549					Shapiro Wilk Test Statistic	0.975					**Shapiro Wilk GOF Test**	
550					1% Shapiro Wilk Critical Value	0.881					Data appear Normal at 1% Significance Level	

551				Lilliefors Test Statistic	0.0762	**Lilliefors GOF Test**						
552				1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level						
553	**Data appear Normal at 1% Significance Level**											
554												
555	**Assuming Normal Distribution**											
556	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
557				95% Student's-t UCL	0.218	95% Adjusted-CLT UCL (Chen-1995)	0.218					
558						95% Modified-t UCL (Johnson-1978)	0.218					
559												
560	**Gamma GOF Test**											
561				A-D Test Statistic	0.162	**Anderson-Darling Gamma GOF Test**						
562				5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level						
563				K-S Test Statistic	0.066	**Kolmogorov-Smirnov Gamma GOF Test**						
564				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
565	**Detected data appear Gamma Distributed at 5% Significance Level**											
566												
567	**Gamma Statistics**											
568				k hat (MLE)	71.71	k star (bias corrected MLE)	62.38					
569				Theta hat (MLE)	0.00291	Theta star (bias corrected MLE)	0.00335					
570				nu hat (MLE)	3299	nu star (bias corrected)	2870					
571				MLE Mean (bias corrected)	0.209	MLE Sd (bias corrected)	0.0265					
572						Approximate Chi Square Value (0.05)	2746					
573				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	2737					
574												
575	**Assuming Gamma Distribution**											
576				95% Approximate Gamma UCL	0.218	95% Adjusted Gamma UCL	0.219					
577												
578	**Lognormal GOF Test**											
579				Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk Lognormal GOF Test**						
580				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
581				Lilliefors Test Statistic	0.073	**Lilliefors Lognormal GOF Test**						
582				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
583	**Data appear Lognormal at 10% Significance Level**											
584												
585	**Lognormal Statistics**											
586				Minimum of Logged Data	-1.79	Mean of logged Data	-1.573					
587				Maximum of Logged Data	-1.343	SD of logged Data	0.121					
588												
589	**Assuming Lognormal Distribution**											
590				95% H-UCL	0.219	90% Chebyshev (MVUE) UCL	0.225					
591				95% Chebyshev (MVUE) UCL	0.232	97.5% Chebyshev (MVUE) UCL	0.242					
592				99% Chebyshev (MVUE) UCL	0.262							
593												
594	**Nonparametric Distribution Free UCL Statistics**											
595	**Data appear to follow a Discernible Distribution**											
596												
597	**Nonparametric Distribution Free UCLs**											
598				95% CLT UCL	0.218	95% BCA Bootstrap UCL	0.218					
599				95% Standard Bootstrap UCL	0.218	95% Bootstrap-t UCL	0.219					
600				95% Hall's Bootstrap UCL	0.219	95% Percentile Bootstrap UCL	0.218					
601				90% Chebyshev(Mean, Sd) UCL	0.225	95% Chebyshev(Mean, Sd) UCL	0.232					
602				97.5% Chebyshev(Mean, Sd) UCL	0.242	99% Chebyshev(Mean, Sd) UCL	0.261					
603												
604	**Suggested UCL to Use**											
605				95% Student's-t UCL	0.218							

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ResultValue (apw-10d)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.22	Mean	0.348
Maximum	0.485	Median	0.343
SD	0.0574	Std. Error of Mean	0.012
Coefficient of Variation	0.165	Skewness	0.239

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.369	95% Adjusted-CLT UCL (Chen-1995)	0.369
		95% Modified-t UCL (Johnson-1978)	0.369

Gamma GOF Test

A-D Test Statistic	0.301	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.118	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	37.83	k star (bias corrected MLE)	32.93
Theta hat (MLE)	0.00921	Theta star (bias corrected MLE)	0.0106
nu hat (MLE)	1740	nu star (bias corrected)	1515
MLE Mean (bias corrected)	0.348	MLE Sd (bias corrected)	0.0607
		Approximate Chi Square Value (0.05)	1425
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	1419

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.37	95% Adjusted Gamma UCL	0.372

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.97	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.119	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-1.514	Mean of logged Data	-1.068

661				Maximum of Logged Data	-0.724					SD of logged Data	0.168	
662												
663					**Assuming Lognormal Distribution**							
664				95% H-UCL	0.371					90% Chebyshev (MVUE) UCL	0.385	
665				95% Chebyshev (MVUE) UCL	0.402					97.5% Chebyshev (MVUE) UCL	0.425	
666				99% Chebyshev (MVUE) UCL	0.471							
667												
668					**Nonparametric Distribution Free UCL Statistics**							
669					**Data appear to follow a Discernible Distribution**							
670												
671					**Nonparametric Distribution Free UCLs**							
672				95% CLT UCL	0.368					95% BCA Bootstrap UCL	0.368	
673				95% Standard Bootstrap UCL	0.368					95% Bootstrap-t UCL	0.37	
674				95% Hall's Bootstrap UCL	0.371					95% Percentile Bootstrap UCL	0.367	
675				90% Chebyshev(Mean, Sd) UCL	0.384					95% Chebyshev(Mean, Sd) UCL	0.401	
676				97.5% Chebyshev(Mean, Sd) UCL	0.423					99% Chebyshev(Mean, Sd) UCL	0.468	
677												
678					**Suggested UCL to Use**							
679				95% Student's-t UCL	0.369							
680												
681					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
682					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
683					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
684												
685												
686	**ResultValue (apw-10s)**											
687												
688					**General Statistics**							
689				Total Number of Observations	23					Number of Distinct Observations	22	
690										Number of Missing Observations	0	
691				Minimum	0.474					Mean	0.597	
692				Maximum	0.804					Median	0.591	
693				SD	0.0636					Std. Error of Mean	0.0133	
694				Coefficient of Variation	0.107					Skewness	1.545	
695												
696					**Normal GOF Test**							
697				Shapiro Wilk Test Statistic	0.854					**Shapiro Wilk GOF Test**		
698				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
699				Lilliefors Test Statistic	0.228					**Lilliefors GOF Test**		
700				1% Lilliefors Critical Value	0.209					Data Not Normal at 1% Significance Level		
701					**Data Not Normal at 1% Significance Level**							
702												
703					**Assuming Normal Distribution**							
704					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
705				95% Student's-t UCL	0.62					95% Adjusted-CLT UCL (Chen-1995)	0.624	
706										95% Modified-t UCL (Johnson-1978)	0.621	
707												
708					**Gamma GOF Test**							
709				A-D Test Statistic	1.063					**Anderson-Darling Gamma GOF Test**		
710				5% A-D Critical Value	0.74					Data Not Gamma Distributed at 5% Significance Level		
711				K-S Test Statistic	0.21					**Kolmogorov-Smirnov Gamma GOF Test**		
712				5% K-S Critical Value	0.181					Data Not Gamma Distributed at 5% Significance Level		
713					**Data Not Gamma Distributed at 5% Significance Level**							
714												
715					**Gamma Statistics**							

716					k hat (MLE)	99.27				k star (bias corrected MLE)		86.35
717					Theta hat (MLE)	0.00602				Theta star (bias corrected MLE)		0.00692
718					nu hat (MLE)	4566				nu star (bias corrected)		3972
719					MLE Mean (bias corrected)	0.597				MLE Sd (bias corrected)		0.0643
720										Approximate Chi Square Value (0.05)		3827
721					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		3816
722												
723					**Assuming Gamma Distribution**							
724					95% Approximate Gamma UCL	0.62				95% Adjusted Gamma UCL		0.622
725												
726					**Lognormal GOF Test**							
727					Shapiro Wilk Test Statistic	0.895				**Shapiro Wilk Lognormal GOF Test**		
728					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
729					Lilliefors Test Statistic	0.205				**Lilliefors Lognormal GOF Test**		
730					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
731					**Data Not Lognormal at 10% Significance Level**							
732												
733					**Lognormal Statistics**							
734					Minimum of Logged Data	-0.747				Mean of logged Data		-0.521
735					Maximum of Logged Data	-0.218				SD of logged Data		0.101
736												
737					**Assuming Lognormal Distribution**							
738					95% H-UCL	0.62				90% Chebyshev (MVUE) UCL		0.635
739					95% Chebyshev (MVUE) UCL	0.652				97.5% Chebyshev (MVUE) UCL		0.676
740					99% Chebyshev (MVUE) UCL	0.722						
741												
742					**Nonparametric Distribution Free UCL Statistics**							
743					**Data do not follow a Discernible Distribution**							
744												
745					**Nonparametric Distribution Free UCLs**							
746					95% CLT UCL	0.619				95% BCA Bootstrap UCL		0.624
747					95% Standard Bootstrap UCL	0.619				95% Bootstrap-t UCL		0.63
748					95% Hall's Bootstrap UCL	0.656				95% Percentile Bootstrap UCL		0.619
749					90% Chebyshev(Mean, Sd) UCL	0.637				95% Chebyshev(Mean, Sd) UCL		0.655
750					97.5% Chebyshev(Mean, Sd) UCL	0.68				99% Chebyshev(Mean, Sd) UCL		0.729
751												
752					**Suggested UCL to Use**							
753					95% Student's-t UCL	0.62						
754												
755	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
756	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
757	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
758												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Beryllium
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:17:21 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_g.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	0.001	Mean	0.00218
Maximum	0.02	Median	0.001
SD	0.00391	Std. Error of Mean	8.1619E-4
Coefficient of Variation	1.797	Skewness	4.68

Normal GOF Test

Shapiro Wilk Test Statistic	0.298	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.475	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.00358	95% Adjusted-CLT UCL (Chen-1995)	0.00437
		95% Modified-t UCL (Johnson-1978)	0.00371

Gamma GOF Test

A-D Test Statistic	4.537	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.762	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.381	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.185	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.384	k star (bias corrected MLE)	1.232
Theta hat (MLE)	0.00157	Theta star (bias corrected MLE)	0.00177
nu hat (MLE)	63.64	nu star (bias corrected)	56.68
MLE Mean (bias corrected)	0.00218	MLE Sd (bias corrected)	0.00196
		Approximate Chi Square Value (0.05)	40.37
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	39.37

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.00306	95% Adjusted Gamma UCL	0.00314

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.567	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

56	**Data Not Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-6.908			Mean of logged Data	-6.532	
60						Maximum of Logged Data	-3.912			SD of logged Data	0.66	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.00244			90% Chebyshev (MVUE) UCL	0.00258	
64						95% Chebyshev (MVUE) UCL	0.00293			97.5% Chebyshev (MVUE) UCL	0.00343	
65						99% Chebyshev (MVUE) UCL	0.0044					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.00352			95% BCA Bootstrap UCL	N/A	
72						95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A	
73						95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A	
74						90% Chebyshev(Mean, Sd) UCL	0.00463			95% Chebyshev(Mean, Sd) UCL	0.00574	
75						97.5% Chebyshev(Mean, Sd) UCL	0.00728			99% Chebyshev(Mean, Sd) UCL	0.0103	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.00358					
79												
80	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
81	**Please verify the data were collected from random locations.**											
82	**If the data were collected using judgmental or other non-random methods,**											
83	**then contact a statistician to correctly calculate UCLs.**											
84												
85	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
86	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
88												
89												
90	**ResultValue (apw-03)**											
91												
92	**General Statistics**											
93						Total Number of Observations	23			Number of Distinct Observations	2	
94										Number of Missing Observations	0	
95						Minimum	0.001			Mean	0.00135	
96						Maximum	0.002			Median	0.001	
97						SD	4.8698E-4			Std. Error of Mean	1.0154E-4	
98						Coefficient of Variation	0.361			Skewness	0.684	
99												
100	**Normal GOF Test**											
101						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**		
102						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
103						Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**		
104						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
105	**Data Not Normal at 1% Significance Level**											
106												
107	**Assuming Normal Distribution**											
108						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
109						95% Student's-t UCL	0.00152			95% Adjusted-CLT UCL (Chen-1995)	0.00153	
110										95% Modified-t UCL (Johnson-1978)	0.00152	

111												
112	**Gamma GOF Test**											
113					A-D Test Statistic	4.647	**Anderson-Darling Gamma GOF Test**					
114					5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level					
115					K-S Test Statistic	0.42	**Kolmogorov-Smirnov Gamma GOF Test**					
116					5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level					
117	**Data Not Gamma Distributed at 5% Significance Level**											
118												
119	**Gamma Statistics**											
120					k hat (MLE)	8.874	k star (bias corrected MLE)	7.746				
121					Theta hat (MLE)	1.5188E-4	Theta star (bias corrected MLE)	1.7401E-4				
122					nu hat (MLE)	408.2	nu star (bias corrected)	356.3				
123					MLE Mean (bias corrected)	0.00135	MLE Sd (bias corrected)	4.8428E-4				
124							Approximate Chi Square Value (0.05)	313.6				
125					Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	310.7				
126												
127	**Assuming Gamma Distribution**											
128					95% Approximate Gamma UCL	0.00153	95% Adjusted Gamma UCL	0.00155				
129												
130	**Lognormal GOF Test**											
131					Shapiro Wilk Test Statistic	0.606	**Shapiro Wilk Lognormal GOF Test**					
132					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
133					Lilliefors Test Statistic	0.415	**Lilliefors Lognormal GOF Test**					
134					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
135	**Data Not Lognormal at 10% Significance Level**											
136												
137	**Lognormal Statistics**											
138					Minimum of Logged Data	-6.908	Mean of logged Data	-6.667				
139					Maximum of Logged Data	-6.215	SD of logged Data	0.338				
140												
141	**Assuming Lognormal Distribution**											
142					95% H-UCL	0.00154	90% Chebyshev (MVUE) UCL	0.00163				
143					95% Chebyshev (MVUE) UCL	0.00176	97.5% Chebyshev (MVUE) UCL	0.00195				
144					99% Chebyshev (MVUE) UCL	0.0023						
145												
146	**Nonparametric Distribution Free UCL Statistics**											
147	**Data do not follow a Discernible Distribution**											
148												
149	**Nonparametric Distribution Free UCLs**											
150					95% CLT UCL	0.00151	95% BCA Bootstrap UCL	N/A				
151					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				
152					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A				
153					90% Chebyshev(Mean, Sd) UCL	0.00165	95% Chebyshev(Mean, Sd) UCL	0.00179				
154					97.5% Chebyshev(Mean, Sd) UCL	0.00198	99% Chebyshev(Mean, Sd) UCL	0.00236				
155												
156	**Suggested UCL to Use**											
157					95% Student's-t UCL	0.00152						
158												
159	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
160	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
161	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
162												
163												
164	**ResultValue (apw-05)**											
165												

166	**General Statistics**											
167				Total Number of Observations	12				Number of Distinct Observations		2	
168									Number of Missing Observations		0	
169				Minimum	0.001				Mean		0.00108	
170				Maximum	0.002				Median		0.001	
171				SD	2.8868E-4				Std. Error of Mean		8.3333E-5	
172				Coefficient of Variation	0.266				Skewness		3.464	
173												
174	**Normal GOF Test**											
175				Shapiro Wilk Test Statistic	0.327			**Shapiro Wilk GOF Test**				
176				1% Shapiro Wilk Critical Value	0.805			Data Not Normal at 1% Significance Level				
177				Lilliefors Test Statistic	0.53			**Lilliefors GOF Test**				
178				1% Lilliefors Critical Value	0.281			Data Not Normal at 1% Significance Level				
179	**Data Not Normal at 1% Significance Level**											
180												
181	**Assuming Normal Distribution**											
182				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
183				95% Student's-t UCL	0.00123				95% Adjusted-CLT UCL (Chen-1995)		0.00131	
184									95% Modified-t UCL (Johnson-1978)		0.00125	
185												
186	**Gamma GOF Test**											
187				A-D Test Statistic	4.092			**Anderson-Darling Gamma GOF Test**				
188				5% A-D Critical Value	0.732			Data Not Gamma Distributed at 5% Significance Level				
189				K-S Test Statistic	0.536			**Kolmogorov-Smirnov Gamma GOF Test**				
190				5% K-S Critical Value	0.245			Data Not Gamma Distributed at 5% Significance Level				
191	**Data Not Gamma Distributed at 5% Significance Level**											
192												
193	**Gamma Statistics**											
194				k hat (MLE)	22.61				k star (bias corrected MLE)		17.01	
195				Theta hat (MLE)	4.7921E-5				Theta star (bias corrected MLE)		6.3686E-5	
196				nu hat (MLE)	542.6				nu star (bias corrected)		408.3	
197				MLE Mean (bias corrected)	0.00108				MLE Sd (bias corrected)		2.6267E-4	
198									Approximate Chi Square Value (0.05)		362.4	
199				Adjusted Level of Significance	0.029				Adjusted Chi Square Value		355.8	
200												
201	**Assuming Gamma Distribution**											
202				95% Approximate Gamma UCL	0.00122				95% Adjusted Gamma UCL		0.00124	
203												
204	**Lognormal GOF Test**											
205				Shapiro Wilk Test Statistic	0.327			**Shapiro Wilk Lognormal GOF Test**				
206				10% Shapiro Wilk Critical Value	0.883			Data Not Lognormal at 10% Significance Level				
207				Lilliefors Test Statistic	0.53			**Lilliefors Lognormal GOF Test**				
208				10% Lilliefors Critical Value	0.223			Data Not Lognormal at 10% Significance Level				
209	**Data Not Lognormal at 10% Significance Level**											
210												
211	**Lognormal Statistics**											
212				Minimum of Logged Data	-6.908				Mean of logged Data		-6.85	
213				Maximum of Logged Data	-6.215				SD of logged Data		0.2	
214												
215	**Assuming Lognormal Distribution**											
216				95% H-UCL	0.00121				90% Chebyshev (MVUE) UCL		0.00127	
217				95% Chebyshev (MVUE) UCL	0.00135				97.5% Chebyshev (MVUE) UCL		0.00147	
218				99% Chebyshev (MVUE) UCL	0.0017							
219												
220	**Nonparametric Distribution Free UCL Statistics**											

221	**Data do not follow a Discernible Distribution**											
222												
223	**Nonparametric Distribution Free UCLs**											
224					95% CLT UCL	0.00122			95% BCA Bootstrap UCL	N/A		
225					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A		
226					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A		
227					90% Chebyshev(Mean, Sd) UCL	0.00133			95% Chebyshev(Mean, Sd) UCL	0.00145		
228					97.5% Chebyshev(Mean, Sd) UCL	0.0016			99% Chebyshev(Mean, Sd) UCL	0.00191		
229												
230	**Suggested UCL to Use**											
231					95% Student's-t UCL	0.00123						
232												
233	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
234	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
235	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
236												
237												
238	**ResultValue (apw-05r)**											
239												
240	**General Statistics**											
241					Total Number of Observations	11			Number of Distinct Observations	2		
242									Number of Missing Observations	0		
243					Minimum	0.001			Mean	0.00173		
244					Maximum	0.002			Median	0.002		
245					SD	4.6710E-4			Std. Error of Mean	1.4084E-4		
246					Coefficient of Variation	0.27			Skewness	-1.189		
247												
248	**Normal GOF Test**											
249					Shapiro Wilk Test Statistic	0.572			**Shapiro Wilk GOF Test**			
250					1% Shapiro Wilk Critical Value	0.792			Data Not Normal at 1% Significance Level			
251					Lilliefors Test Statistic	0.448			**Lilliefors GOF Test**			
252					1% Lilliefors Critical Value	0.291			Data Not Normal at 1% Significance Level			
253	**Data Not Normal at 1% Significance Level**											
254												
255	**Assuming Normal Distribution**											
256					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
257					95% Student's-t UCL	0.00198			95% Adjusted-CLT UCL (Chen-1995)	0.0019		
258									95% Modified-t UCL (Johnson-1978)	0.00197		
259												
260	**Gamma GOF Test**											
261					A-D Test Statistic	2.529			**Anderson-Darling Gamma GOF Test**			
262					5% A-D Critical Value	0.729			Data Not Gamma Distributed at 5% Significance Level			
263					K-S Test Statistic	0.458			**Kolmogorov-Smirnov Gamma GOF Test**			
264					5% K-S Critical Value	0.255			Data Not Gamma Distributed at 5% Significance Level			
265	**Data Not Gamma Distributed at 5% Significance Level**											
266												
267	**Gamma Statistics**											
268					k hat (MLE)	11.95			k star (bias corrected MLE)	8.749		
269					Theta hat (MLE)	1.4458E-4			Theta star (bias corrected MLE)	1.9743E-4		
270					nu hat (MLE)	262.8			nu star (bias corrected)	192.5		
271					MLE Mean (bias corrected)	0.00173			MLE Sd (bias corrected)	5.8396E-4		
272									Approximate Chi Square Value (0.05)	161.4		
273					Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	156.7		
274												
275	**Assuming Gamma Distribution**											

276				95% Approximate Gamma UCL	0.00206					95% Adjusted Gamma UCL	0.00212	
277												
278					**Lognormal GOF Test**							
279				Shapiro Wilk Test Statistic	0.572			**Shapiro Wilk Lognormal GOF Test**				
280				10% Shapiro Wilk Critical Value	0.876			Data Not Lognormal at 10% Significance Level				
281				Lilliefors Test Statistic	0.448			**Lilliefors Lognormal GOF Test**				
282				10% Lilliefors Critical Value	0.231			Data Not Lognormal at 10% Significance Level				
283					**Data Not Lognormal at 10% Significance Level**							
284												
285					**Lognormal Statistics**							
286				Minimum of Logged Data	-6.908					Mean of logged Data	-6.404	
287				Maximum of Logged Data	-6.215					SD of logged Data	0.324	
288												
289					**Assuming Lognormal Distribution**							
290				95% H-UCL	0.00214					90% Chebyshev (MVUE) UCL	0.00225	
291				95% Chebyshev (MVUE) UCL	0.00248					97.5% Chebyshev (MVUE) UCL	0.0028	
292				99% Chebyshev (MVUE) UCL	0.00344							
293												
294					**Nonparametric Distribution Free UCL Statistics**							
295					**Data do not follow a Discernible Distribution**							
296												
297					**Nonparametric Distribution Free UCLs**							
298				95% CLT UCL	0.00196					95% BCA Bootstrap UCL	N/A	
299				95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A	
300				95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A	
301				90% Chebyshev(Mean, Sd) UCL	0.00215					95% Chebyshev(Mean, Sd) UCL	0.00234	
302				97.5% Chebyshev(Mean, Sd) UCL	0.00261					99% Chebyshev(Mean, Sd) UCL	0.00313	
303												
304					**Suggested UCL to Use**							
305				95% Student's-t UCL	0.00198							
306												
307					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
308					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
309					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
310												
311					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
312					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
313												
314												
315	**ResultValue (apw-06d)**											
316												
317					**General Statistics**							
318				Total Number of Observations	22					Number of Distinct Observations	2	
319										Number of Missing Observations	0	
320				Minimum	0.001					Mean	0.00136	
321				Maximum	0.002					Median	0.001	
322				SD	4.9237E-4					Std. Error of Mean	1.0497E-4	
323				Coefficient of Variation	0.361					Skewness	0.609	
324												
325					**Normal GOF Test**							
326				Shapiro Wilk Test Statistic	0.614			**Shapiro Wilk GOF Test**				
327				1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level				
328				Lilliefors Test Statistic	0.406			**Lilliefors GOF Test**				
329				1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level				
330					**Data Not Normal at 1% Significance Level**							

331												
332	**Assuming Normal Distribution**											
333	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
334			95% Student's-t UCL		0.00154			95% Adjusted-CLT UCL (Chen-1995)				0.00155
335								95% Modified-t UCL (Johnson-1978)				0.00155
336												
337	**Gamma GOF Test**											
338			A-D Test Statistic		4.348		**Anderson-Darling Gamma GOF Test**					
339			5% A-D Critical Value		0.744		Data Not Gamma Distributed at 5% Significance Level					
340			K-S Test Statistic		0.412		**Kolmogorov-Smirnov Gamma GOF Test**					
341			5% K-S Critical Value		0.185		Data Not Gamma Distributed at 5% Significance Level					
342	**Data Not Gamma Distributed at 5% Significance Level**											
343												
344	**Gamma Statistics**											
345			k hat (MLE)		8.769			k star (bias corrected MLE)				7.604
346			Theta hat (MLE)		1.5551E-4			Theta star (bias corrected MLE)				1.7934E-4
347			nu hat (MLE)		385.8			nu star (bias corrected)				334.6
348			MLE Mean (bias corrected)		0.00136			MLE Sd (bias corrected)				4.9453E-4
349								Approximate Chi Square Value (0.05)				293.2
350			Adjusted Level of Significance		0.0386			Adjusted Chi Square Value				290.3
351												
352	**Assuming Gamma Distribution**											
353			95% Approximate Gamma UCL		0.00156			95% Adjusted Gamma UCL				0.00157
354												
355	**Lognormal GOF Test**											
356			Shapiro Wilk Test Statistic		0.614		**Shapiro Wilk Lognormal GOF Test**					
357			10% Shapiro Wilk Critical Value		0.926		Data Not Lognormal at 10% Significance Level					
358			Lilliefors Test Statistic		0.406		**Lilliefors Lognormal GOF Test**					
359			10% Lilliefors Critical Value		0.169		Data Not Lognormal at 10% Significance Level					
360	**Data Not Lognormal at 10% Significance Level**											
361												
362	**Lognormal Statistics**											
363			Minimum of Logged Data		-6.908			Mean of logged Data				-6.656
364			Maximum of Logged Data		-6.215			SD of logged Data				0.341
365												
366	**Assuming Lognormal Distribution**											
367			95% H-UCL		0.00157			90% Chebyshev (MVUE) UCL				0.00166
368			95% Chebyshev (MVUE) UCL		0.0018			97.5% Chebyshev (MVUE) UCL				0.00199
369			99% Chebyshev (MVUE) UCL		0.00236							
370												
371	**Nonparametric Distribution Free UCL Statistics**											
372	**Data do not follow a Discernible Distribution**											
373												
374	**Nonparametric Distribution Free UCLs**											
375			95% CLT UCL		0.00154			95% BCA Bootstrap UCL				N/A
376			95% Standard Bootstrap UCL		N/A			95% Bootstrap-t UCL				N/A
377			95% Hall's Bootstrap UCL		N/A			95% Percentile Bootstrap UCL				N/A
378			90% Chebyshev(Mean, Sd) UCL		0.00168			95% Chebyshev(Mean, Sd) UCL				0.00182
379			97.5% Chebyshev(Mean, Sd) UCL		0.00202			99% Chebyshev(Mean, Sd) UCL				0.00241
380												
381	**Suggested UCL to Use**											
382			95% Student's-t UCL		0.00154							
383												
384	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
385	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

386	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
387												
388												
389	**ResultValue (apw-06s)**											
390												
391	**General Statistics**											
392						Total Number of Observations	23			Number of Distinct Observations	2	
393										Number of Missing Observations	0	
394						Minimum	0.001			Mean	0.00135	
395						Maximum	0.002			Median	0.001	
396						SD	4.8698E-4			Std. Error of Mean	1.0154E-4	
397						Coefficient of Variation	0.361			Skewness	0.684	
398												
399	**Normal GOF Test**											
400						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**		
401						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
402						Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**		
403						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
404	**Data Not Normal at 1% Significance Level**											
405												
406	**Assuming Normal Distribution**											
407					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
408						95% Student's-t UCL	0.00152			95% Adjusted-CLT UCL (Chen-1995)	0.00153	
409										95% Modified-t UCL (Johnson-1978)	0.00152	
410												
411	**Gamma GOF Test**											
412						A-D Test Statistic	4.647			**Anderson-Darling Gamma GOF Test**		
413						5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level		
414						K-S Test Statistic	0.42			**Kolmogorov-Smirnov Gamma GOF Test**		
415						5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level		
416	**Data Not Gamma Distributed at 5% Significance Level**											
417												
418	**Gamma Statistics**											
419						k hat (MLE)	8.874			k star (bias corrected MLE)	7.746	
420						Theta hat (MLE)	1.5188E-4			Theta star (bias corrected MLE)	1.7401E-4	
421						nu hat (MLE)	408.2			nu star (bias corrected)	356.3	
422						MLE Mean (bias corrected)	0.00135			MLE Sd (bias corrected)	4.8428E-4	
423										Approximate Chi Square Value (0.05)	313.6	
424						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	310.7	
425												
426	**Assuming Gamma Distribution**											
427						95% Approximate Gamma UCL	0.00153			95% Adjusted Gamma UCL	0.00155	
428												
429	**Lognormal GOF Test**											
430						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk Lognormal GOF Test**		
431						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
432						Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**		
433						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
434	**Data Not Lognormal at 10% Significance Level**											
435												
436	**Lognormal Statistics**											
437						Minimum of Logged Data	-6.908			Mean of logged Data	-6.667	
438						Maximum of Logged Data	-6.215			SD of logged Data	0.338	
439												
440	**Assuming Lognormal Distribution**											

441				95% H-UCL	0.00154				90% Chebyshev (MVUE) UCL			0.00163
442				95% Chebyshev (MVUE) UCL	0.00176				97.5% Chebyshev (MVUE) UCL			0.00195
443				99% Chebyshev (MVUE) UCL	0.0023							
444												
445					**Nonparametric Distribution Free UCL Statistics**							
446					**Data do not follow a Discernible Distribution**							
447												
448					**Nonparametric Distribution Free UCLs**							
449				95% CLT UCL	0.00151				95% BCA Bootstrap UCL			N/A
450				95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL			N/A
451				95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL			N/A
452				90% Chebyshev(Mean, Sd) UCL	0.00165				95% Chebyshev(Mean, Sd) UCL			0.00179
453				97.5% Chebyshev(Mean, Sd) UCL	0.00198				99% Chebyshev(Mean, Sd) UCL			0.00236
454												
455					**Suggested UCL to Use**							
456				95% Student's-t UCL	0.00152							
457												
458	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
459	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
460	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
461												
462												
463	**ResultValue (apw-07)**											
464												
465					**General Statistics**							
466				Total Number of Observations	22				Number of Distinct Observations			2
467									Number of Missing Observations			0
468				Minimum	0.001				Mean			0.00132
469				Maximum	0.002				Median			0.001
470				SD	4.7673E-4				Std. Error of Mean			1.0164E-4
471				Coefficient of Variation	0.362				Skewness			0.839
472												
473					**Normal GOF Test**							
474				Shapiro Wilk Test Statistic	0.592				**Shapiro Wilk GOF Test**			
475				1% Shapiro Wilk Critical Value	0.878				Data Not Normal at 1% Significance Level			
476				Lilliefors Test Statistic	0.43				**Lilliefors GOF Test**			
477				1% Lilliefors Critical Value	0.214				Data Not Normal at 1% Significance Level			
478					**Data Not Normal at 1% Significance Level**							
479												
480					**Assuming Normal Distribution**							
481				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
482				95% Student's-t UCL	0.00149				95% Adjusted-CLT UCL (Chen-1995)			0.0015
483									95% Modified-t UCL (Johnson-1978)			0.0015
484												
485					**Gamma GOF Test**							
486				A-D Test Statistic	4.657				**Anderson-Darling Gamma GOF Test**			
487				5% A-D Critical Value	0.744				Data Not Gamma Distributed at 5% Significance Level			
488				K-S Test Statistic	0.435				**Kolmogorov-Smirnov Gamma GOF Test**			
489				5% K-S Critical Value	0.185				Data Not Gamma Distributed at 5% Significance Level			
490					**Data Not Gamma Distributed at 5% Significance Level**							
491												
492					**Gamma Statistics**							
493				k hat (MLE)	9.139				k star (bias corrected MLE)			7.923
494				Theta hat (MLE)	1.4424E-4				Theta star (bias corrected MLE)			1.6637E-4
495				nu hat (MLE)	402.1				nu star (bias corrected)			348.6

496					MLE Mean (bias corrected)	0.00132					MLE Sd (bias corrected)	4.6830E-4
497											Approximate Chi Square Value (0.05)	306.4
498					Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	303.4
499												
500					**Assuming Gamma Distribution**							
501					95% Approximate Gamma UCL	0.0015					95% Adjusted Gamma UCL	0.00151
502												
503					**Lognormal GOF Test**							
504					Shapiro Wilk Test Statistic	0.592					**Shapiro Wilk Lognormal GOF Test**	
505					10% Shapiro Wilk Critical Value	0.926					Data Not Lognormal at 10% Significance Level	
506					Lilliefors Test Statistic	0.43					**Lilliefors Lognormal GOF Test**	
507					10% Lilliefors Critical Value	0.169					Data Not Lognormal at 10% Significance Level	
508					**Data Not Lognormal at 10% Significance Level**							
509												
510					**Lognormal Statistics**							
511					Minimum of Logged Data	-6.908					Mean of logged Data	-6.687
512					Maximum of Logged Data	-6.215					SD of logged Data	0.33
513												
514					**Assuming Lognormal Distribution**							
515					95% H-UCL	0.00151					90% Chebyshev (MVUE) UCL	0.0016
516					95% Chebyshev (MVUE) UCL	0.00172					97.5% Chebyshev (MVUE) UCL	0.0019
517					99% Chebyshev (MVUE) UCL	0.00225						
518												
519					**Nonparametric Distribution Free UCL Statistics**							
520					**Data do not follow a Discernible Distribution**							
521												
522					**Nonparametric Distribution Free UCLs**							
523					95% CLT UCL	0.00149					95% BCA Bootstrap UCL	N/A
524					95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A
525					95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A
526					90% Chebyshev(Mean, Sd) UCL	0.00162					95% Chebyshev(Mean, Sd) UCL	0.00176
527					97.5% Chebyshev(Mean, Sd) UCL	0.00195					99% Chebyshev(Mean, Sd) UCL	0.00233
528												
529					**Suggested UCL to Use**							
530					95% Student's-t UCL	0.00149						
531												
532					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
533					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
534					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
535												
536												
537	**ResultValue (apw-08)**											
538												
539					**General Statistics**							
540					Total Number of Observations	23					Number of Distinct Observations	2
541											Number of Missing Observations	0
542					Minimum	0.001					Mean	0.00135
543					Maximum	0.002					Median	0.001
544					SD	4.8698E-4					Std. Error of Mean	1.0154E-4
545					Coefficient of Variation	0.361					Skewness	0.684
546												
547					**Normal GOF Test**							
548					Shapiro Wilk Test Statistic	0.606					**Shapiro Wilk GOF Test**	
549					1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level	
550					Lilliefors Test Statistic	0.415					**Lilliefors GOF Test**	

551				1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level						
552	**Data Not Normal at 1% Significance Level**											
553												
554	**Assuming Normal Distribution**											
555	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
556				95% Student's-t UCL	0.00152	95% Adjusted-CLT UCL (Chen-1995)						0.00153
557						95% Modified-t UCL (Johnson-1978)						0.00152
558												
559	**Gamma GOF Test**											
560				A-D Test Statistic	4.647	**Anderson-Darling Gamma GOF Test**						
561				5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level						
562				K-S Test Statistic	0.42	**Kolmogorov-Smirnov Gamma GOF Test**						
563				5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level						
564	**Data Not Gamma Distributed at 5% Significance Level**											
565												
566	**Gamma Statistics**											
567				k hat (MLE)	8.874	k star (bias corrected MLE)						7.746
568				Theta hat (MLE)	1.5188E-4	Theta star (bias corrected MLE)						1.7401E-4
569				nu hat (MLE)	408.2	nu star (bias corrected)						356.3
570				MLE Mean (bias corrected)	0.00135	MLE Sd (bias corrected)						4.8428E-4
571						Approximate Chi Square Value (0.05)						313.6
572				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value						310.7
573												
574	**Assuming Gamma Distribution**											
575				95% Approximate Gamma UCL	0.00153	95% Adjusted Gamma UCL						0.00155
576												
577	**Lognormal GOF Test**											
578				Shapiro Wilk Test Statistic	0.606	**Shapiro Wilk Lognormal GOF Test**						
579				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
580				Lilliefors Test Statistic	0.415	**Lilliefors Lognormal GOF Test**						
581				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
582	**Data Not Lognormal at 10% Significance Level**											
583												
584	**Lognormal Statistics**											
585				Minimum of Logged Data	-6.908	Mean of logged Data						-6.667
586				Maximum of Logged Data	-6.215	SD of logged Data						0.338
587												
588	**Assuming Lognormal Distribution**											
589				95% H-UCL	0.00154	90% Chebyshev (MVUE) UCL						0.00163
590				95% Chebyshev (MVUE) UCL	0.00176	97.5% Chebyshev (MVUE) UCL						0.00195
591				99% Chebyshev (MVUE) UCL	0.0023							
592												
593	**Nonparametric Distribution Free UCL Statistics**											
594	**Data do not follow a Discernible Distribution**											
595												
596	**Nonparametric Distribution Free UCLs**											
597				95% CLT UCL	0.00151	95% BCA Bootstrap UCL						N/A
598				95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL						N/A
599				95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL						N/A
600				90% Chebyshev(Mean, Sd) UCL	0.00165	95% Chebyshev(Mean, Sd) UCL						0.00179
601				97.5% Chebyshev(Mean, Sd) UCL	0.00198	99% Chebyshev(Mean, Sd) UCL						0.00236
602												
603	**Suggested UCL to Use**											
604				95% Student's-t UCL	0.00152							
605												

	A	B	C	D	E	F	G	H	I	J	K	L
606	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
607	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
608	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
609												
610												
611	**ResultValue (apw-10d)**											
612												
613	**General Statistics**											
614					Total Number of Observations	23			Number of Distinct Observations	2		
615									Number of Missing Observations	0		
616					Minimum	0.001			Mean	0.00135		
617					Maximum	0.002			Median	0.001		
618					SD	4.8698E-4			Std. Error of Mean	1.0154E-4		
619					Coefficient of Variation	0.361			Skewness	0.684		
620												
621	**Normal GOF Test**											
622					Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**			
623					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
624					Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**			
625					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
626	**Data Not Normal at 1% Significance Level**											
627												
628	**Assuming Normal Distribution**											
629					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
630					95% Student's-t UCL	0.00152			95% Adjusted-CLT UCL (Chen-1995)	0.00153		
631									95% Modified-t UCL (Johnson-1978)	0.00152		
632												
633	**Gamma GOF Test**											
634					A-D Test Statistic	4.647			**Anderson-Darling Gamma GOF Test**			
635					5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level			
636					K-S Test Statistic	0.42			**Kolmogorov-Smirnov Gamma GOF Test**			
637					5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level			
638	**Data Not Gamma Distributed at 5% Significance Level**											
639												
640	**Gamma Statistics**											
641					k hat (MLE)	8.874			k star (bias corrected MLE)	7.746		
642					Theta hat (MLE)	1.5188E-4			Theta star (bias corrected MLE)	1.7401E-4		
643					nu hat (MLE)	408.2			nu star (bias corrected)	356.3		
644					MLE Mean (bias corrected)	0.00135			MLE Sd (bias corrected)	4.8428E-4		
645									Approximate Chi Square Value (0.05)	313.6		
646					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	310.7		
647												
648	**Assuming Gamma Distribution**											
649					95% Approximate Gamma UCL	0.00153			95% Adjusted Gamma UCL	0.00155		
650												
651	**Lognormal GOF Test**											
652					Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk Lognormal GOF Test**			
653					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
654					Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**			
655					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
656	**Data Not Lognormal at 10% Significance Level**											
657												
658	**Lognormal Statistics**											
659					Minimum of Logged Data	-6.908			Mean of logged Data	-6.667		
660					Maximum of Logged Data	-6.215			SD of logged Data	0.338		

661												
662						**Assuming Lognormal Distribution**							
663						95% H-UCL	0.00154			90% Chebyshev (MVUE) UCL	0.00163	
664						95% Chebyshev (MVUE) UCL	0.00176			97.5% Chebyshev (MVUE) UCL	0.00195	
665						99% Chebyshev (MVUE) UCL	0.0023					
666												
667						**Nonparametric Distribution Free UCL Statistics**							
668						**Data do not follow a Discernible Distribution**							
669												
670						**Nonparametric Distribution Free UCLs**							
671						95% CLT UCL	0.00151			95% BCA Bootstrap UCL	N/A	
672						95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A	
673						95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A	
674						90% Chebyshev(Mean, Sd) UCL	0.00165			95% Chebyshev(Mean, Sd) UCL	0.00179	
675						97.5% Chebyshev(Mean, Sd) UCL	0.00198			99% Chebyshev(Mean, Sd) UCL	0.00236	
676												
677						**Suggested UCL to Use**							
678						95% Student's-t UCL	0.00152					
679												
680						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
681						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
682						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
683												
684												
685	**ResultValue (apw-10s)**											
686												
687						**General Statistics**							
688						Total Number of Observations	23			Number of Distinct Observations	2	
689										Number of Missing Observations	0	
690						Minimum	0.001			Mean	0.00135	
691						Maximum	0.002			Median	0.001	
692						SD	4.8698E-4			Std. Error of Mean	1.0154E-4	
693						Coefficient of Variation	0.361			Skewness	0.684	
694												
695						**Normal GOF Test**							
696						Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**		
697						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
698						Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**		
699						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
700						**Data Not Normal at 1% Significance Level**							
701												
702						**Assuming Normal Distribution**							
703						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
704						95% Student's-t UCL	0.00152			95% Adjusted-CLT UCL (Chen-1995)	0.00153	
705										95% Modified-t UCL (Johnson-1978)	0.00152	
706												
707						**Gamma GOF Test**							
708						A-D Test Statistic	4.647			**Anderson-Darling Gamma GOF Test**		
709						5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level		
710						K-S Test Statistic	0.42			**Kolmogorov-Smirnov Gamma GOF Test**		
711						5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level		
712						**Data Not Gamma Distributed at 5% Significance Level**							
713												
714						**Gamma Statistics**							
715						k hat (MLE)	8.874			k star (bias corrected MLE)	7.746	

716					Theta hat (MLE)	1.5188E-4				Theta star (bias corrected MLE)		1.7401E-4
717					nu hat (MLE)	408.2				nu star (bias corrected)		356.3
718					MLE Mean (bias corrected)	0.00135				MLE Sd (bias corrected)		4.8428E-4
719										Approximate Chi Square Value (0.05)		313.6
720					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		310.7
721												
722					**Assuming Gamma Distribution**							
723					95% Approximate Gamma UCL	0.00153				95% Adjusted Gamma UCL		0.00155
724												
725					**Lognormal GOF Test**							
726					Shapiro Wilk Test Statistic	0.606				**Shapiro Wilk Lognormal GOF Test**		
727					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
728					Lilliefors Test Statistic	0.415				**Lilliefors Lognormal GOF Test**		
729					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
730					**Data Not Lognormal at 10% Significance Level**							
731												
732					**Lognormal Statistics**							
733					Minimum of Logged Data	-6.908				Mean of logged Data		-6.667
734					Maximum of Logged Data	-6.215				SD of logged Data		0.338
735												
736					**Assuming Lognormal Distribution**							
737					95% H-UCL	0.00154				90% Chebyshev (MVUE) UCL		0.00163
738					95% Chebyshev (MVUE) UCL	0.00176				97.5% Chebyshev (MVUE) UCL		0.00195
739					99% Chebyshev (MVUE) UCL	0.0023						
740												
741					**Nonparametric Distribution Free UCL Statistics**							
742					**Data do not follow a Discernible Distribution**							
743												
744					**Nonparametric Distribution Free UCLs**							
745					95% CLT UCL	0.00151				95% BCA Bootstrap UCL		N/A
746					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
747					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
748					90% Chebyshev(Mean, Sd) UCL	0.00165				95% Chebyshev(Mean, Sd) UCL		0.00179
749					97.5% Chebyshev(Mean, Sd) UCL	0.00198				99% Chebyshev(Mean, Sd) UCL		0.00236
750												
751					**Suggested UCL to Use**							
752					95% Student's-t UCL	0.00152						
753												
754	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
755	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
756	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
757												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Boron
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:17:53 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_i.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	22	Number of Distinct Observations	20
		Number of Missing Observations	0
Minimum	7.75	Mean	8.853
Maximum	10.3	Median	8.955
SD	0.716	Std. Error of Mean	0.153
Coefficient of Variation	0.0808	Skewness	0.535

Normal GOF Test

Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.878	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.168	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	9.115	95% Adjusted-CLT UCL (Chen-1995)	9.122
		95% Modified-t UCL (Johnson-1978)	9.118

Gamma GOF Test

A-D Test Statistic	0.592	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.174	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	163.7	k star (bias corrected MLE)	141.4
Theta hat (MLE)	0.0541	Theta star (bias corrected MLE)	0.0626
nu hat (MLE)	7203	nu star (bias corrected)	6222
MLE Mean (bias corrected)	8.853	MLE Sd (bias corrected)	0.744
		Approximate Chi Square Value (0.05)	6040
Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	6026

Assuming Gamma Distribution

95% Approximate Gamma UCL	9.12	95% Adjusted Gamma UCL	9.14

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.926	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.169	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.169	Data Not Lognormal at 10% Significance Level

56	**Data appear Approximate Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	2.048			Mean of logged Data	2.178	
60						Maximum of Logged Data	2.332			SD of logged Data	0.0797	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	N/A			90% Chebyshev (MVUE) UCL	9.304	
64						95% Chebyshev (MVUE) UCL	9.509			97.5% Chebyshev (MVUE) UCL	9.793	
65						99% Chebyshev (MVUE) UCL	10.35					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	9.104			95% BCA Bootstrap UCL	9.119	
72						95% Standard Bootstrap UCL	9.103			95% Bootstrap-t UCL	9.15	
73						95% Hall's Bootstrap UCL	9.148			95% Percentile Bootstrap UCL	9.11	
74						90% Chebyshev(Mean, Sd) UCL	9.31			95% Chebyshev(Mean, Sd) UCL	9.518	
75						97.5% Chebyshev(Mean, Sd) UCL	9.805			99% Chebyshev(Mean, Sd) UCL	10.37	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	9.115					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	22			Number of Distinct Observations	20	
89										Number of Missing Observations	0	
90						Minimum	1.84			Mean	4.185	
91						Maximum	4.94			Median	4.32	
92						SD	0.769			Std. Error of Mean	0.164	
93						Coefficient of Variation	0.184			Skewness	-2.205	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.726			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.279			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level		
100	**Data Not Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	4.466			95% Adjusted-CLT UCL (Chen-1995)	4.372	
105										95% Modified-t UCL (Johnson-1978)	4.454	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	2.813			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.74			Data Not Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.318			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.185	Data Not Gamma Distributed at 5% Significance Level						
112	**Data Not Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	21.84					k star (bias corrected MLE)	18.89	
116				Theta hat (MLE)	0.192					Theta star (bias corrected MLE)	0.221	
117				nu hat (MLE)	961.1					nu star (bias corrected)	831.3	
118				MLE Mean (bias corrected)	4.185					MLE Sd (bias corrected)	0.963	
119										Approximate Chi Square Value (0.05)	765.4	
120				Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	760.7	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	4.545					95% Adjusted Gamma UCL	4.573	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.624	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.926	Data Not Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.335	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.169	Data Not Lognormal at 10% Significance Level						
130	**Data Not Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	0.61					Mean of logged Data	1.408	
134				Maximum of Logged Data	1.597					SD of logged Data	0.241	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	4.629					90% Chebyshev (MVUE) UCL	4.86	
138				95% Chebyshev (MVUE) UCL	5.156					97.5% Chebyshev (MVUE) UCL	5.568	
139				99% Chebyshev (MVUE) UCL	6.378							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data do not follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	4.454					95% BCA Bootstrap UCL	4.387	
146				95% Standard Bootstrap UCL	4.444					95% Bootstrap-t UCL	4.399	
147				95% Hall's Bootstrap UCL	4.383					95% Percentile Bootstrap UCL	4.428	
148				90% Chebyshev(Mean, Sd) UCL	4.676					95% Chebyshev(Mean, Sd) UCL	4.899	
149				97.5% Chebyshev(Mean, Sd) UCL	5.208					99% Chebyshev(Mean, Sd) UCL	5.815	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	4.466							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
159	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12					Number of Distinct Observations	12	

166											Number of Missing Observations	0
167					Minimum	7.35					Mean	8.803
168					Maximum	10.3					Median	8.995
169					SD	1.021					Std. Error of Mean	0.295
170					Coefficient of Variation	0.116					Skewness	-0.172
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.923			**Shapiro Wilk GOF Test**			
174					1% Shapiro Wilk Critical Value	0.805			Data appear Normal at 1% Significance Level			
175					Lilliefors Test Statistic	0.18			**Lilliefors GOF Test**			
176					1% Lilliefors Critical Value	0.281			Data appear Normal at 1% Significance Level			
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
181					95% Student's-t UCL	9.333			95% Adjusted-CLT UCL (Chen-1995)	9.272		
182									95% Modified-t UCL (Johnson-1978)	9.33		
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.47			**Anderson-Darling Gamma GOF Test**			
186					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
187					K-S Test Statistic	0.19			**Kolmogorov-Smirnov Gamma GOF Test**			
188					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
189						**Detected data appear Gamma Distributed at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	79.57			k star (bias corrected MLE)	59.73		
193					Theta hat (MLE)	0.111			Theta star (bias corrected MLE)	0.147		
194					nu hat (MLE)	1910			nu star (bias corrected)	1434		
195					MLE Mean (bias corrected)	8.803			MLE Sd (bias corrected)	1.139		
196									Approximate Chi Square Value (0.05)	1347		
197					Adjusted Level of Significance	0.029			Adjusted Chi Square Value	1334		
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	9.372			95% Adjusted Gamma UCL	9.462		
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.913			**Shapiro Wilk Lognormal GOF Test**			
204					10% Shapiro Wilk Critical Value	0.883			Data appear Lognormal at 10% Significance Level			
205					Lilliefors Test Statistic	0.179			**Lilliefors Lognormal GOF Test**			
206					10% Lilliefors Critical Value	0.223			Data appear Lognormal at 10% Significance Level			
207						**Data appear Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	1.995			Mean of logged Data	2.169		
211					Maximum of Logged Data	2.332			SD of logged Data	0.118		
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	9.386			90% Chebyshev (MVUE) UCL	9.704		
215					95% Chebyshev (MVUE) UCL	10.11			97.5% Chebyshev (MVUE) UCL	10.68		
216					99% Chebyshev (MVUE) UCL	11.79						
217												
218						**Nonparametric Distribution Free UCL Statistics**							
219						**Data appear to follow a Discernible Distribution**							
220												

221	**Nonparametric Distribution Free UCLs**											
222					95% CLT UCL	9.288				95% BCA Bootstrap UCL	9.227	
223					95% Standard Bootstrap UCL	9.266				95% Bootstrap-t UCL	9.32	
224					95% Hall's Bootstrap UCL	9.259				95% Percentile Bootstrap UCL	9.255	
225					90% Chebyshev(Mean, Sd) UCL	9.687				95% Chebyshev(Mean, Sd) UCL	10.09	
226					97.5% Chebyshev(Mean, Sd) UCL	10.64				99% Chebyshev(Mean, Sd) UCL	11.74	
227												
228	**Suggested UCL to Use**											
229					95% Student's-t UCL	9.333						
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
236	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
237												
238												
239	**ResultValue (apw-05r)**											
240												
241	**General Statistics**											
242					Total Number of Observations	10				Number of Distinct Observations	10	
243										Number of Missing Observations	0	
244					Minimum	2.18				Mean	6.969	
245					Maximum	9.62				Median	7.745	
246					SD	2.436				Std. Error of Mean	0.77	
247					Coefficient of Variation	0.35				Skewness	-0.885	
248												
249	**Normal GOF Test**											
250					Shapiro Wilk Test Statistic	0.912				**Shapiro Wilk GOF Test**		
251					1% Shapiro Wilk Critical Value	0.781				Data appear Normal at 1% Significance Level		
252					Lilliefors Test Statistic	0.217				**Lilliefors GOF Test**		
253					1% Lilliefors Critical Value	0.304				Data appear Normal at 1% Significance Level		
254	**Data appear Normal at 1% Significance Level**											
255												
256	**Assuming Normal Distribution**											
257					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
258					95% Student's-t UCL	8.381				95% Adjusted-CLT UCL (Chen-1995)	8.006	
259										95% Modified-t UCL (Johnson-1978)	8.345	
260												
261	**Gamma GOF Test**											
262					A-D Test Statistic	0.599				**Anderson-Darling Gamma GOF Test**		
263					5% A-D Critical Value	0.728				Detected data appear Gamma Distributed at 5% Significance Level		
264					K-S Test Statistic	0.229				**Kolmogorov-Smirnov Gamma GOF Test**		
265					5% K-S Critical Value	0.267				Detected data appear Gamma Distributed at 5% Significance Level		
266	**Detected data appear Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269					k hat (MLE)	6.494				k star (bias corrected MLE)	4.612	
270					Theta hat (MLE)	1.073				Theta star (bias corrected MLE)	1.511	
271					nu hat (MLE)	129.9				nu star (bias corrected)	92.25	
272					MLE Mean (bias corrected)	6.969				MLE Sd (bias corrected)	3.245	
273										Approximate Chi Square Value (0.05)	71.1	
274					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value	67.88	
275												

276					**Assuming Gamma Distribution**							
277				95% Approximate Gamma UCL	9.042				95% Adjusted Gamma UCL	9.471		
278												
279					**Lognormal GOF Test**							
280				Shapiro Wilk Test Statistic	0.821			**Shapiro Wilk Lognormal GOF Test**				
281				10% Shapiro Wilk Critical Value	0.869			Data Not Lognormal at 10% Significance Level				
282				Lilliefors Test Statistic	0.214			**Lilliefors Lognormal GOF Test**				
283				10% Lilliefors Critical Value	0.241			Data appear Lognormal at 10% Significance Level				
284					**Data appear Approximate Lognormal at 10% Significance Level**							
285												
286					**Lognormal Statistics**							
287				Minimum of Logged Data	0.779				Mean of logged Data	1.863		
288				Maximum of Logged Data	2.264				SD of logged Data	0.463		
289												
290					**Assuming Lognormal Distribution**							
291				95% H-UCL	10.02				90% Chebyshev (MVUE) UCL	10.25		
292				95% Chebyshev (MVUE) UCL	11.68				97.5% Chebyshev (MVUE) UCL	13.67		
293				99% Chebyshev (MVUE) UCL	17.58							
294												
295					**Nonparametric Distribution Free UCL Statistics**							
296					**Data appear to follow a Discernible Distribution**							
297												
298					**Nonparametric Distribution Free UCLs**							
299				95% CLT UCL	8.236				95% BCA Bootstrap UCL	8.03		
300				95% Standard Bootstrap UCL	8.174				95% Bootstrap-t UCL	8.164		
301				95% Hall's Bootstrap UCL	8.015				95% Percentile Bootstrap UCL	8.139		
302				90% Chebyshev(Mean, Sd) UCL	9.28				95% Chebyshev(Mean, Sd) UCL	10.33		
303				97.5% Chebyshev(Mean, Sd) UCL	11.78				99% Chebyshev(Mean, Sd) UCL	14.63		
304												
305					**Suggested UCL to Use**							
306				95% Student's-t UCL	8.381							
307												
308					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
309					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
310					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
311												
312					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
313					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
314												
315												
316	**ResultValue (apw-06d)**											
317												
318					**General Statistics**							
319				Total Number of Observations	21				Number of Distinct Observations	21		
320									Number of Missing Observations	0		
321				Minimum	2.57				Mean	3.818		
322				Maximum	5.51				Median	3.81		
323				SD	0.628				Std. Error of Mean	0.137		
324				Coefficient of Variation	0.165				Skewness	0.848		
325												
326					**Normal GOF Test**							
327				Shapiro Wilk Test Statistic	0.921			**Shapiro Wilk GOF Test**				
328				1% Shapiro Wilk Critical Value	0.873			Data appear Normal at 1% Significance Level				
329				Lilliefors Test Statistic	0.202			**Lilliefors GOF Test**				
330				1% Lilliefors Critical Value	0.219			Data appear Normal at 1% Significance Level				

331	**Data appear Normal at 1% Significance Level**											
332												
333	**Assuming Normal Distribution**											
334	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
335				95% Student's-t UCL		4.055				95% Adjusted-CLT UCL (Chen-1995)		4.071
336										95% Modified-t UCL (Johnson-1978)		4.059
337												
338	**Gamma GOF Test**											
339				A-D Test Statistic		0.578	**Anderson-Darling Gamma GOF Test**					
340				5% A-D Critical Value		0.742	Detected data appear Gamma Distributed at 5% Significance Level					
341				K-S Test Statistic		0.179	**Kolmogorov-Smirnov Gamma GOF Test**					
342				5% K-S Critical Value		0.189	Detected data appear Gamma Distributed at 5% Significance Level					
343	**Detected data appear Gamma Distributed at 5% Significance Level**											
344												
345	**Gamma Statistics**											
346				k hat (MLE)		40.28				k star (bias corrected MLE)		34.56
347				Theta hat (MLE)		0.0948				Theta star (bias corrected MLE)		0.11
348				nu hat (MLE)		1692				nu star (bias corrected)		1451
349				MLE Mean (bias corrected)		3.818				MLE Sd (bias corrected)		0.649
350										Approximate Chi Square Value (0.05)		1364
351				Adjusted Level of Significance		0.0383				Adjusted Chi Square Value		1358
352												
353	**Assuming Gamma Distribution**											
354				95% Approximate Gamma UCL		4.063				95% Adjusted Gamma UCL		4.082
355												
356	**Lognormal GOF Test**											
357				Shapiro Wilk Test Statistic		0.947	**Shapiro Wilk Lognormal GOF Test**					
358				10% Shapiro Wilk Critical Value		0.923	Data appear Lognormal at 10% Significance Level					
359				Lilliefors Test Statistic		0.173	**Lilliefors Lognormal GOF Test**					
360				10% Lilliefors Critical Value		0.173	Data appear Lognormal at 10% Significance Level					
361	**Data appear Lognormal at 10% Significance Level**											
362												
363	**Lognormal Statistics**											
364				Minimum of Logged Data		0.944				Mean of logged Data		1.327
365				Maximum of Logged Data		1.707				SD of logged Data		0.161
366												
367	**Assuming Lognormal Distribution**											
368				95% H-UCL		4.069				90% Chebyshev (MVUE) UCL		4.222
369				95% Chebyshev (MVUE) UCL		4.406				97.5% Chebyshev (MVUE) UCL		4.66
370				99% Chebyshev (MVUE) UCL		5.16						
371												
372	**Nonparametric Distribution Free UCL Statistics**											
373	**Data appear to follow a Discernible Distribution**											
374												
375	**Nonparametric Distribution Free UCLs**											
376				95% CLT UCL		4.044				95% BCA Bootstrap UCL		4.069
377				95% Standard Bootstrap UCL		4.04				95% Bootstrap-t UCL		4.115
378				95% Hall's Bootstrap UCL		4.211				95% Percentile Bootstrap UCL		4.041
379				90% Chebyshev(Mean, Sd) UCL		4.229				95% Chebyshev(Mean, Sd) UCL		4.416
380				97.5% Chebyshev(Mean, Sd) UCL		4.674				99% Chebyshev(Mean, Sd) UCL		5.182
381												
382	**Suggested UCL to Use**											
383				95% Student's-t UCL		4.055						
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

386	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
387	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
388												
389												
390	**ResultValue (apw-06s)**											
391												
392	**General Statistics**											
393						Total Number of Observations	22			Number of Distinct Observations	22	
394										Number of Missing Observations	0	
395						Minimum	3.66			Mean	5.78	
396						Maximum	9.19			Median	5.815	
397						SD	1.274			Std. Error of Mean	0.272	
398						Coefficient of Variation	0.22			Skewness	0.537	
399												
400	**Normal GOF Test**											
401						Shapiro Wilk Test Statistic	0.954			**Shapiro Wilk GOF Test**		
402						1% Shapiro Wilk Critical Value	0.878			Data appear Normal at 1% Significance Level		
403						Lilliefors Test Statistic	0.113			**Lilliefors GOF Test**		
404						1% Lilliefors Critical Value	0.214			Data appear Normal at 1% Significance Level		
405	**Data appear Normal at 1% Significance Level**											
406												
407	**Assuming Normal Distribution**											
408	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
409						95% Student's-t UCL	6.247			95% Adjusted-CLT UCL (Chen-1995)	6.26	
410										95% Modified-t UCL (Johnson-1978)	6.253	
411												
412	**Gamma GOF Test**											
413						A-D Test Statistic	0.373			**Anderson-Darling Gamma GOF Test**		
414						5% A-D Critical Value	0.74			Detected data appear Gamma Distributed at 5% Significance Level		
415						K-S Test Statistic	0.132			**Kolmogorov-Smirnov Gamma GOF Test**		
416						5% K-S Critical Value	0.185			Detected data appear Gamma Distributed at 5% Significance Level		
417	**Detected data appear Gamma Distributed at 5% Significance Level**											
418												
419	**Gamma Statistics**											
420						k hat (MLE)	21.66			k star (bias corrected MLE)	18.74	
421						Theta hat (MLE)	0.267			Theta star (bias corrected MLE)	0.308	
422						nu hat (MLE)	953.2			nu star (bias corrected)	824.6	
423						MLE Mean (bias corrected)	5.78			MLE Sd (bias corrected)	1.335	
424										Approximate Chi Square Value (0.05)	758.9	
425						Adjusted Level of Significance	0.0386			Adjusted Chi Square Value	754.2	
426												
427	**Assuming Gamma Distribution**											
428						95% Approximate Gamma UCL	6.28			95% Adjusted Gamma UCL	6.319	
429												
430	**Lognormal GOF Test**											
431						Shapiro Wilk Test Statistic	0.962			**Shapiro Wilk Lognormal GOF Test**		
432						10% Shapiro Wilk Critical Value	0.926			Data appear Lognormal at 10% Significance Level		
433						Lilliefors Test Statistic	0.147			**Lilliefors Lognormal GOF Test**		
434						10% Lilliefors Critical Value	0.169			Data appear Lognormal at 10% Significance Level		
435	**Data appear Lognormal at 10% Significance Level**											
436												
437	**Lognormal Statistics**											
438						Minimum of Logged Data	1.297			Mean of logged Data	1.731	
439						Maximum of Logged Data	2.218			SD of logged Data	0.222	
440												

441	**Assuming Lognormal Distribution**											
442					95% H-UCL	6.313				90% Chebyshev (MVUE) UCL	6.61	
443					95% Chebyshev (MVUE) UCL	6.986				97.5% Chebyshev (MVUE) UCL	7.507	
444					99% Chebyshev (MVUE) UCL	8.53						
445												
446	**Nonparametric Distribution Free UCL Statistics**											
447	**Data appear to follow a Discernible Distribution**											
448												
449	**Nonparametric Distribution Free UCLs**											
450					95% CLT UCL	6.227				95% BCA Bootstrap UCL	6.244	
451					95% Standard Bootstrap UCL	6.209				95% Bootstrap-t UCL	6.267	
452					95% Hall's Bootstrap UCL	6.311				95% Percentile Bootstrap UCL	6.227	
453					90% Chebyshev(Mean, Sd) UCL	6.595				95% Chebyshev(Mean, Sd) UCL	6.964	
454					97.5% Chebyshev(Mean, Sd) UCL	7.476				99% Chebyshev(Mean, Sd) UCL	8.482	
455												
456	**Suggested UCL to Use**											
457					95% Student's-t UCL	6.247						
458												
459	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
460	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
461	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
462												
463												
464	**ResultValue (apw-07)**											
465												
466	**General Statistics**											
467					Total Number of Observations	21				Number of Distinct Observations	21	
468										Number of Missing Observations	0	
469					Minimum	0.168				Mean	0.262	
470					Maximum	0.526				Median	0.237	
471					SD	0.0778				Std. Error of Mean	0.017	
472					Coefficient of Variation	0.297				Skewness	2.004	
473												
474	**Normal GOF Test**											
475					Shapiro Wilk Test Statistic	0.821				**Shapiro Wilk GOF Test**		
476					1% Shapiro Wilk Critical Value	0.873				Data Not Normal at 1% Significance Level		
477					Lilliefors Test Statistic	0.152				**Lilliefors GOF Test**		
478					1% Lilliefors Critical Value	0.219				Data appear Normal at 1% Significance Level		
479	**Data appear Approximate Normal at 1% Significance Level**											
480												
481	**Assuming Normal Distribution**											
482					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
483					95% Student's-t UCL	0.291				95% Adjusted-CLT UCL (Chen-1995)	0.298	
484										95% Modified-t UCL (Johnson-1978)	0.292	
485												
486	**Gamma GOF Test**											
487					A-D Test Statistic	0.557				**Anderson-Darling Gamma GOF Test**		
488					5% A-D Critical Value	0.743				Detected data appear Gamma Distributed at 5% Significance Level		
489					K-S Test Statistic	0.136				**Kolmogorov-Smirnov Gamma GOF Test**		
490					5% K-S Critical Value	0.189				Detected data appear Gamma Distributed at 5% Significance Level		
491	**Detected data appear Gamma Distributed at 5% Significance Level**											
492												
493	**Gamma Statistics**											
494					k hat (MLE)	14.63				k star (bias corrected MLE)	12.57	
495					Theta hat (MLE)	0.0179				Theta star (bias corrected MLE)	0.0208	

496					nu hat (MLE)	614.4					nu star (bias corrected)	528
497					MLE Mean (bias corrected)	0.262					MLE Sd (bias corrected)	0.0738
498											Approximate Chi Square Value (0.05)	475.7
499					Adjusted Level of Significance	0.0383					Adjusted Chi Square Value	471.9
500												
501					**Assuming Gamma Distribution**							
502					95% Approximate Gamma UCL	0.291					95% Adjusted Gamma UCL	0.293
503												
504					**Lognormal GOF Test**							
505					Shapiro Wilk Test Statistic	0.933					**Shapiro Wilk Lognormal GOF Test**	
506					10% Shapiro Wilk Critical Value	0.923					Data appear Lognormal at 10% Significance Level	
507					Lilliefors Test Statistic	0.123					**Lilliefors Lognormal GOF Test**	
508					10% Lilliefors Critical Value	0.173					Data appear Lognormal at 10% Significance Level	
509					**Data appear Lognormal at 10% Significance Level**							
510												
511					**Lognormal Statistics**							
512					Minimum of Logged Data	-1.784					Mean of logged Data	-1.375
513					Maximum of Logged Data	-0.642					SD of logged Data	0.259
514												
515					**Assuming Lognormal Distribution**							
516					95% H-UCL	0.29					90% Chebyshev (MVUE) UCL	0.306
517					95% Chebyshev (MVUE) UCL	0.326					97.5% Chebyshev (MVUE) UCL	0.354
518					99% Chebyshev (MVUE) UCL	0.409						
519												
520					**Nonparametric Distribution Free UCL Statistics**							
521					**Data appear to follow a Discernible Distribution**							
522												
523					**Nonparametric Distribution Free UCLs**							
524					95% CLT UCL	0.29					95% BCA Bootstrap UCL	0.299
525					95% Standard Bootstrap UCL	0.29					95% Bootstrap-t UCL	0.304
526					95% Hall's Bootstrap UCL	0.353					95% Percentile Bootstrap UCL	0.291
527					90% Chebyshev(Mean, Sd) UCL	0.313					95% Chebyshev(Mean, Sd) UCL	0.336
528					97.5% Chebyshev(Mean, Sd) UCL	0.368					99% Chebyshev(Mean, Sd) UCL	0.431
529												
530					**Suggested UCL to Use**							
531					95% Student's-t UCL	0.291						
532												
533					When a data set follows an approximate distribution passing only one of the GOF tests,							
534					it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL							
535												
536					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
537					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
538					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
539												
540												
541	**ResultValue (apw-08)**											
542												
543					**General Statistics**							
544					Total Number of Observations	22					Number of Distinct Observations	14
545											Number of Missing Observations	0
546					Minimum	0.095					Mean	0.151
547					Maximum	0.2					Median	0.143
548					SD	0.0378					Std. Error of Mean	0.00807
549					Coefficient of Variation	0.25					Skewness	0.227
550												

551	**Normal GOF Test**											
552				Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**						
553				1% Shapiro Wilk Critical Value	0.878	Data Not Normal at 1% Significance Level						
554				Lilliefors Test Statistic	0.22	**Lilliefors GOF Test**						
555				1% Lilliefors Critical Value	0.214	Data Not Normal at 1% Significance Level						
556	**Data Not Normal at 1% Significance Level**											
557												
558	**Assuming Normal Distribution**											
559	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
560				95% Student's-t UCL	0.165				95% Adjusted-CLT UCL (Chen-1995)	0.165		
561									95% Modified-t UCL (Johnson-1978)	0.165		
562												
563	**Gamma GOF Test**											
564				A-D Test Statistic	0.934	**Anderson-Darling Gamma GOF Test**						
565				5% A-D Critical Value	0.741	Data Not Gamma Distributed at 5% Significance Level						
566				K-S Test Statistic	0.218	**Kolmogorov-Smirnov Gamma GOF Test**						
567				5% K-S Critical Value	0.185	Data Not Gamma Distributed at 5% Significance Level						
568	**Data Not Gamma Distributed at 5% Significance Level**											
569												
570	**Gamma Statistics**											
571				k hat (MLE)	16.63				k star (bias corrected MLE)	14.39		
572				Theta hat (MLE)	0.00909				Theta star (bias corrected MLE)	0.0105		
573				nu hat (MLE)	731.6				nu star (bias corrected)	633.2		
574				MLE Mean (bias corrected)	0.151				MLE Sd (bias corrected)	0.0398		
575									Approximate Chi Square Value (0.05)	575.8		
576				Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	571.7		
577												
578	**Assuming Gamma Distribution**											
579				95% Approximate Gamma UCL	0.166				95% Adjusted Gamma UCL	0.167		
580												
581	**Lognormal GOF Test**											
582				Shapiro Wilk Test Statistic	0.895	**Shapiro Wilk Lognormal GOF Test**						
583				10% Shapiro Wilk Critical Value	0.926	Data Not Lognormal at 10% Significance Level						
584				Lilliefors Test Statistic	0.208	**Lilliefors Lognormal GOF Test**						
585				10% Lilliefors Critical Value	0.169	Data Not Lognormal at 10% Significance Level						
586	**Data Not Lognormal at 10% Significance Level**											
587												
588	**Lognormal Statistics**											
589				Minimum of Logged Data	-2.354				Mean of logged Data	-1.92		
590				Maximum of Logged Data	-1.609				SD of logged Data	0.253		
591												
592	**Assuming Lognormal Distribution**											
593				95% H-UCL	0.167				90% Chebyshev (MVUE) UCL	0.176		
594				95% Chebyshev (MVUE) UCL	0.187				97.5% Chebyshev (MVUE) UCL	0.203		
595				99% Chebyshev (MVUE) UCL	0.233							
596												
597	**Nonparametric Distribution Free UCL Statistics**											
598	**Data do not follow a Discernible Distribution**											
599												
600	**Nonparametric Distribution Free UCLs**											
601				95% CLT UCL	0.164				95% BCA Bootstrap UCL	0.164		
602				95% Standard Bootstrap UCL	0.164				95% Bootstrap-t UCL	0.165		
603				95% Hall's Bootstrap UCL	0.164				95% Percentile Bootstrap UCL	0.164		
604				90% Chebyshev(Mean, Sd) UCL	0.175				95% Chebyshev(Mean, Sd) UCL	0.186		
605				97.5% Chebyshev(Mean, Sd) UCL	0.202				99% Chebyshev(Mean, Sd) UCL	0.231		

606												
607					**Suggested UCL to Use**							
608					95% Student's-t UCL	0.165						
609												
610					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
611					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
612					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
613												
614												
615	**ResultValue (apw-10d)**											
616												
617					**General Statistics**							
618					Total Number of Observations	22				Number of Distinct Observations	16	
619										Number of Missing Observations	0	
620					Minimum	0.0522				Mean	0.12	
621					Maximum	0.2				Median	0.0923	
622					SD	0.0574				Std. Error of Mean	0.0122	
623					Coefficient of Variation	0.478				Skewness	0.649	
624												
625					**Normal GOF Test**							
626					Shapiro Wilk Test Statistic	0.769				**Shapiro Wilk GOF Test**		
627					1% Shapiro Wilk Critical Value	0.878				Data Not Normal at 1% Significance Level		
628					Lilliefors Test Statistic	0.268				**Lilliefors GOF Test**		
629					1% Lilliefors Critical Value	0.214				Data Not Normal at 1% Significance Level		
630					**Data Not Normal at 1% Significance Level**							
631												
632					**Assuming Normal Distribution**							
633					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
634					95% Student's-t UCL	0.141				95% Adjusted-CLT UCL (Chen-1995)	0.142	
635										95% Modified-t UCL (Johnson-1978)	0.142	
636												
637					**Gamma GOF Test**							
638					A-D Test Statistic	1.776				**Anderson-Darling Gamma GOF Test**		
639					5% A-D Critical Value	0.746				Data Not Gamma Distributed at 5% Significance Level		
640					K-S Test Statistic	0.235				**Kolmogorov-Smirnov Gamma GOF Test**		
641					5% K-S Critical Value	0.186				Data Not Gamma Distributed at 5% Significance Level		
642					**Data Not Gamma Distributed at 5% Significance Level**							
643												
644					**Gamma Statistics**							
645					k hat (MLE)	4.965				k star (bias corrected MLE)	4.318	
646					Theta hat (MLE)	0.0242				Theta star (bias corrected MLE)	0.0278	
647					nu hat (MLE)	218.4				nu star (bias corrected)	190	
648					MLE Mean (bias corrected)	0.12				MLE Sd (bias corrected)	0.0579	
649										Approximate Chi Square Value (0.05)	159.1	
650					Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	157	
651												
652					**Assuming Gamma Distribution**							
653					95% Approximate Gamma UCL	0.144				95% Adjusted Gamma UCL	0.146	
654												
655					**Lognormal GOF Test**							
656					Shapiro Wilk Test Statistic	0.846				**Shapiro Wilk Lognormal GOF Test**		
657					10% Shapiro Wilk Critical Value	0.926				Data Not Lognormal at 10% Significance Level		
658					Lilliefors Test Statistic	0.226				**Lilliefors Lognormal GOF Test**		
659					10% Lilliefors Critical Value	0.169				Data Not Lognormal at 10% Significance Level		
660					**Data Not Lognormal at 10% Significance Level**							

661												
662						**Lognormal Statistics**							
663						Minimum of Logged Data	-2.953				Mean of logged Data	-2.222
664						Maximum of Logged Data	-1.609				SD of logged Data	0.461
665												
666						**Assuming Lognormal Distribution**							
667						95% H-UCL	0.147				90% Chebyshev (MVUE) UCL	0.156
668						95% Chebyshev (MVUE) UCL	0.173				97.5% Chebyshev (MVUE) UCL	0.196
669						99% Chebyshev (MVUE) UCL	0.241					
670												
671						**Nonparametric Distribution Free UCL Statistics**							
672						**Data do not follow a Discernible Distribution**							
673												
674						**Nonparametric Distribution Free UCLs**							
675						95% CLT UCL	0.14				95% BCA Bootstrap UCL	0.142
676						95% Standard Bootstrap UCL	0.14				95% Bootstrap-t UCL	0.144
677						95% Hall's Bootstrap UCL	0.14				95% Percentile Bootstrap UCL	0.14
678						90% Chebyshev(Mean, Sd) UCL	0.157				95% Chebyshev(Mean, Sd) UCL	0.174
679						97.5% Chebyshev(Mean, Sd) UCL	0.197				99% Chebyshev(Mean, Sd) UCL	0.242
680												
681						**Suggested UCL to Use**							
682						95% Student's-t UCL	0.141					
683												
684						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
685						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
686						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
687												
688												
689	**ResultValue (apw-10s)**											
690												
691						**General Statistics**							
692						Total Number of Observations	22				Number of Distinct Observations	20
693											Number of Missing Observations	0
694						Minimum	0.525				Mean	0.575
695						Maximum	0.683				Median	0.57
696						SD	0.0349				Std. Error of Mean	0.00744
697						Coefficient of Variation	0.0608				Skewness	1.69
698												
699						**Normal GOF Test**						
700						Shapiro Wilk Test Statistic	0.853				**Shapiro Wilk GOF Test**	
701						1% Shapiro Wilk Critical Value	0.878				Data Not Normal at 1% Significance Level	
702						Lilliefors Test Statistic	0.188				**Lilliefors GOF Test**	
703						1% Lilliefors Critical Value	0.214				Data appear Normal at 1% Significance Level	
704						**Data appear Approximate Normal at 1% Significance Level**							
705												
706						**Assuming Normal Distribution**							
707						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
708						95% Student's-t UCL	0.587				95% Adjusted-CLT UCL (Chen-1995)	0.59
709											95% Modified-t UCL (Johnson-1978)	0.588
710												
711						**Gamma GOF Test**							
712						A-D Test Statistic	0.874				**Anderson-Darling Gamma GOF Test**	
713						5% A-D Critical Value	0.741				Data Not Gamma Distributed at 5% Significance Level	
714						K-S Test Statistic	0.174				**Kolmogorov-Smirnov Gamma GOF Test**	
715						5% K-S Critical Value	0.185				Detected data appear Gamma Distributed at 5% Significance Level	

716	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
717												
718	**Gamma Statistics**											
719					k hat (MLE)	299.9			k star (bias corrected MLE)	259		
720					Theta hat (MLE)	0.00192			Theta star (bias corrected MLE)	0.00222		
721					nu hat (MLE)	13195			nu star (bias corrected)	11397		
722					MLE Mean (bias corrected)	0.575			MLE Sd (bias corrected)	0.0357		
723									Approximate Chi Square Value (0.05)	11150		
724					Adjusted Level of Significance	0.0386			Adjusted Chi Square Value	11132		
725												
726	**Assuming Gamma Distribution**											
727					95% Approximate Gamma UCL	0.587			95% Adjusted Gamma UCL	0.588		
728												
729	**Lognormal GOF Test**											
730					Shapiro Wilk Test Statistic	0.881			**Shapiro Wilk Lognormal GOF Test**			
731					10% Shapiro Wilk Critical Value	0.926			Data Not Lognormal at 10% Significance Level			
732					Lilliefors Test Statistic	0.174			**Lilliefors Lognormal GOF Test**			
733					10% Lilliefors Critical Value	0.169			Data Not Lognormal at 10% Significance Level			
734	**Data Not Lognormal at 10% Significance Level**											
735												
736	**Lognormal Statistics**											
737					Minimum of Logged Data	-0.644			Mean of logged Data	-0.556		
738					Maximum of Logged Data	-0.381			SD of logged Data	0.0583		
739												
740	**Assuming Lognormal Distribution**											
741					95% H-UCL	N/A			90% Chebyshev (MVUE) UCL	0.596		
742					95% Chebyshev (MVUE) UCL	0.606			97.5% Chebyshev (MVUE) UCL	0.619		
743					99% Chebyshev (MVUE) UCL	0.646						
744												
745	**Nonparametric Distribution Free UCL Statistics**											
746	**Data appear to follow a Discernible Distribution**											
747												
748	**Nonparametric Distribution Free UCLs**											
749					95% CLT UCL	0.587			95% BCA Bootstrap UCL	0.59		
750					95% Standard Bootstrap UCL	0.587			95% Bootstrap-t UCL	0.593		
751					95% Hall's Bootstrap UCL	0.608			95% Percentile Bootstrap UCL	0.588		
752					90% Chebyshev(Mean, Sd) UCL	0.597			95% Chebyshev(Mean, Sd) UCL	0.607		
753					97.5% Chebyshev(Mean, Sd) UCL	0.621			99% Chebyshev(Mean, Sd) UCL	0.649		
754												
755	**Suggested UCL to Use**											
756					95% Student's-t UCL	0.587						
757												
758	When a data set follows an approximate distribution passing only one of the GOF tests,											
759	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
760												
761	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
762	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
763	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
764												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Cadmium
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:18:21 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_k.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	6.0000E-4	Mean	0.00138
Maximum	0.01	Median	0.001
SD	0.00188	Std. Error of Mean	3.9241E-4
Coefficient of Variation	1.368	Skewness	4.78

Normal GOF Test

Shapiro Wilk Test Statistic	0.235	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.527	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.00205	95% Adjusted-CLT UCL (Chen-1995)	0.00244
		95% Modified-t UCL (Johnson-1978)	0.00211

Gamma GOF Test

A-D Test Statistic	7.752	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.524	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.184	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.242	k star (bias corrected MLE)	1.978
Theta hat (MLE)	6.1365E-4	Theta star (bias corrected MLE)	6.9536E-4
nu hat (MLE)	103.1	nu star (bias corrected)	91
MLE Mean (bias corrected)	0.00138	MLE Sd (bias corrected)	9.7805E-4
		Approximate Chi Square Value (0.05)	70.01
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	68.67

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.00179	95% Adjusted Gamma UCL	0.00182

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.307	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.489	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

56	**Data Not Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-7.419			Mean of logged Data	-6.828	
60						Maximum of Logged Data	-4.605			SD of logged Data	0.496	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.00151			90% Chebyshev (MVUE) UCL	0.00161	
64						95% Chebyshev (MVUE) UCL	0.00179			97.5% Chebyshev (MVUE) UCL	0.00204	
65						99% Chebyshev (MVUE) UCL	0.00252					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.00202			95% BCA Bootstrap UCL	N/A	
72						95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A	
73						95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A	
74						90% Chebyshev(Mean, Sd) UCL	0.00255			95% Chebyshev(Mean, Sd) UCL	0.00309	
75						97.5% Chebyshev(Mean, Sd) UCL	0.00383			99% Chebyshev(Mean, Sd) UCL	0.00528	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.00205					
79												
80	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
81	**Please verify the data were collected from random locations.**											
82	**If the data were collected using judgmental or other non-random methods,**											
83	**then contact a statistician to correctly calculate UCLs.**											
84												
85	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
86	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
88												
89												
90	**ResultValue (apw-03)**											
91												
92	**General Statistics**											
93						Total Number of Observations	23			Number of Distinct Observations	2	
94										Number of Missing Observations	0	
95						Minimum	2.0000E-4			Mean	9.6522E-4	
96						Maximum	0.001			Median	0.001	
97						SD	1.6681E-4			Std. Error of Mean	3.4783E-5	
98						Coefficient of Variation	0.173			Skewness	-4.796	
99												
100	**Normal GOF Test**											
101						Shapiro Wilk Test Statistic	0.216			**Shapiro Wilk GOF Test**		
102						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
103						Lilliefors Test Statistic	0.539			**Lilliefors GOF Test**		
104						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
105	**Data Not Normal at 1% Significance Level**											
106												
107	**Assuming Normal Distribution**											
108						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
109						95% Student's-t UCL	0.00102			95% Adjusted-CLT UCL (Chen-1995)	9.8526E-4	
110										95% Modified-t UCL (Johnson-1978)	0.00102	

111												
112	**Gamma GOF Test**											
113					A-D Test Statistic	8.441	**Anderson-Darling Gamma GOF Test**					
114					5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level					
115					K-S Test Statistic	0.545	**Kolmogorov-Smirnov Gamma GOF Test**					
116					5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level					
117	**Data Not Gamma Distributed at 5% Significance Level**											
118												
119	**Gamma Statistics**											
120					k hat (MLE)	14.63			k star (bias corrected MLE)	12.75		
121					Theta hat (MLE)	6.5991E-5			Theta star (bias corrected MLE)	7.5717E-5		
122					nu hat (MLE)	672.8			nu star (bias corrected)	586.4		
123					MLE Mean (bias corrected)	9.6522E-4			MLE Sd (bias corrected)	2.7034E-4		
124									Approximate Chi Square Value (0.05)	531.2		
125					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	527.4		
126												
127	**Assuming Gamma Distribution**											
128					95% Approximate Gamma UCL	0.00107			95% Adjusted Gamma UCL	0.00107		
129												
130	**Lognormal GOF Test**											
131					Shapiro Wilk Test Statistic	0.216	**Shapiro Wilk Lognormal GOF Test**					
132					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
133					Lilliefors Test Statistic	0.539	**Lilliefors Lognormal GOF Test**					
134					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
135	**Data Not Lognormal at 10% Significance Level**											
136												
137	**Lognormal Statistics**											
138					Minimum of Logged Data	-8.517			Mean of logged Data	-6.978		
139					Maximum of Logged Data	-6.908			SD of logged Data	0.336		
140												
141	**Assuming Lognormal Distribution**											
142					95% H-UCL	0.00113			90% Chebyshev (MVUE) UCL	0.00119		
143					95% Chebyshev (MVUE) UCL	0.00129			97.5% Chebyshev (MVUE) UCL	0.00142		
144					99% Chebyshev (MVUE) UCL	0.00168						
145												
146	**Nonparametric Distribution Free UCL Statistics**											
147	**Data do not follow a Discernible Distribution**											
148												
149	**Nonparametric Distribution Free UCLs**											
150					95% CLT UCL	0.00102			95% BCA Bootstrap UCL	N/A		
151					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A		
152					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A		
153					90% Chebyshev(Mean, Sd) UCL	0.00107			95% Chebyshev(Mean, Sd) UCL	0.00112		
154					97.5% Chebyshev(Mean, Sd) UCL	0.00118			99% Chebyshev(Mean, Sd) UCL	0.00131		
155												
156	**Suggested UCL to Use**											
157					95% Student's-t UCL	0.00102						
158	**Recommended UCL exceeds the maximum observation**											
159												
160	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
161	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
162	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
163												
164	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
165	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											

	A	B	C	D	E	F	G	H	I	J	K	L
166												
167												
168	**ResultValue (apw-05)**											
169												
170						**General Statistics**							
171					Total Number of Observations	12			Number of Distinct Observations	1		
172									Number of Missing Observations	0		
173					Minimum	0.001			Mean	0.001		
174					Maximum	0.001			Median	0.001		
175												
176						**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**						
177						**ProUCL (or any other software) should not be used on such a data set!**						
178						**The data set for variable ResultValue (apw-05) was not processed!**						
179												
180						**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**						
181						**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**						
182												
183												
184												
185	**ResultValue (apw-05r)**											
186												
187						**General Statistics**							
188					Total Number of Observations	11			Number of Distinct Observations	1		
189									Number of Missing Observations	0		
190					Minimum	0.001			Mean	0.001		
191					Maximum	0.001			Median	0.001		
192												
193						**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**						
194						**ProUCL (or any other software) should not be used on such a data set!**						
195						**The data set for variable ResultValue (apw-05r) was not processed!**						
196												
197						**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**						
198						**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**						
199												
200												
201												
202	**ResultValue (apw-06d)**											
203												
204						**General Statistics**							
205					Total Number of Observations	22			Number of Distinct Observations	1		
206									Number of Missing Observations	0		
207					Minimum	0.001			Mean	0.001		
208					Maximum	0.001			Median	0.001		
209												
210						**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**						
211						**ProUCL (or any other software) should not be used on such a data set!**						
212						**The data set for variable ResultValue (apw-06d) was not processed!**						
213												
214						**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**						
215						**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**						
216												
217												
218												
219	**ResultValue (apw-06s)**											
220												

	A	B	C	D	E	F	G	H	I	J	K	L
221	**General Statistics**											
222					Total Number of Observations	23				Number of Distinct Observations		1
223										Number of Missing Observations		0
224					Minimum	0.001				Mean		0.001
225					Maximum	0.001				Median		0.001
226												
227	**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**											
228	**ProUCL (or any other software) should not be used on such a data set!**											
229	**The data set for variable ResultValue (apw-06s) was not processed!**											
230												
231	**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**											
232	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
233												
234												
235												
236	**ResultValue (apw-07)**											
237												
238	**General Statistics**											
239					Total Number of Observations	22				Number of Distinct Observations		1
240										Number of Missing Observations		0
241					Minimum	0.001				Mean		0.001
242					Maximum	0.001				Median		0.001
243												
244	**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**											
245	**ProUCL (or any other software) should not be used on such a data set!**											
246	**The data set for variable ResultValue (apw-07) was not processed!**											
247												
248	**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**											
249	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
250												
251												
252												
253	**ResultValue (apw-08)**											
254												
255	**General Statistics**											
256					Total Number of Observations	23				Number of Distinct Observations		2
257										Number of Missing Observations		0
258					Minimum	2.0000E-4				Mean		9.6522E-4
259					Maximum	0.001				Median		0.001
260					SD	1.6681E-4				Std. Error of Mean		3.4783E-5
261					Coefficient of Variation	0.173				Skewness		-4.796
262												
263	**Normal GOF Test**											
264					Shapiro Wilk Test Statistic	0.216			**Shapiro Wilk GOF Test**			
265					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
266					Lilliefors Test Statistic	0.539			**Lilliefors GOF Test**			
267					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
268	**Data Not Normal at 1% Significance Level**											
269												
270	**Assuming Normal Distribution**											
271	**95% Normal UCL**								**95% UCLs (Adjusted for Skewness)**			
272					95% Student's-t UCL	0.00102				95% Adjusted-CLT UCL (Chen-1995)		9.8526E-4
273										95% Modified-t UCL (Johnson-1978)		0.00102
274												
275	**Gamma GOF Test**											

276				A-D Test Statistic	8.441	**Anderson-Darling Gamma GOF Test**						
277				5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level						
278				K-S Test Statistic	0.545	**Kolmogorov-Smirnov Gamma GOF Test**						
279				5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level						
280				**Data Not Gamma Distributed at 5% Significance Level**								
281												
282				**Gamma Statistics**								
283				k hat (MLE)	14.63					k star (bias corrected MLE)	12.75	
284				Theta hat (MLE)	6.5991E-5					Theta star (bias corrected MLE)	7.5717E-5	
285				nu hat (MLE)	672.8					nu star (bias corrected)	586.4	
286				MLE Mean (bias corrected)	9.6522E-4					MLE Sd (bias corrected)	2.7034E-4	
287										Approximate Chi Square Value (0.05)	531.2	
288				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	527.4	
289												
290				**Assuming Gamma Distribution**								
291				95% Approximate Gamma UCL	0.00107					95% Adjusted Gamma UCL	0.00107	
292												
293				**Lognormal GOF Test**								
294				Shapiro Wilk Test Statistic	0.216	**Shapiro Wilk Lognormal GOF Test**						
295				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
296				Lilliefors Test Statistic	0.539	**Lilliefors Lognormal GOF Test**						
297				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
298				**Data Not Lognormal at 10% Significance Level**								
299												
300				**Lognormal Statistics**								
301				Minimum of Logged Data	-8.517					Mean of logged Data	-6.978	
302				Maximum of Logged Data	-6.908					SD of logged Data	0.336	
303												
304				**Assuming Lognormal Distribution**								
305				95% H-UCL	0.00113					90% Chebyshev (MVUE) UCL	0.00119	
306				95% Chebyshev (MVUE) UCL	0.00129					97.5% Chebyshev (MVUE) UCL	0.00142	
307				99% Chebyshev (MVUE) UCL	0.00168							
308												
309				**Nonparametric Distribution Free UCL Statistics**								
310				**Data do not follow a Discernible Distribution**								
311												
312				**Nonparametric Distribution Free UCLs**								
313				95% CLT UCL	0.00102					95% BCA Bootstrap UCL	N/A	
314				95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A	
315				95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A	
316				90% Chebyshev(Mean, Sd) UCL	0.00107					95% Chebyshev(Mean, Sd) UCL	0.00112	
317				97.5% Chebyshev(Mean, Sd) UCL	0.00118					99% Chebyshev(Mean, Sd) UCL	0.00131	
318												
319				**Suggested UCL to Use**								
320				95% Student's-t UCL	0.00102							
321				**Recommended UCL exceeds the maximum observation**								
322												
323				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
324				Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.								
325				However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.								
326												
327				**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**								
328				**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**								
329												
330												

331	**ResultValue (apw-10d)**											
332												
333						**General Statistics**							
334						Total Number of Observations	23				Number of Distinct Observations	2	
335											Number of Missing Observations	0	
336						Minimum	0.001				Mean	0.001	
337						Maximum	0.0011				Median	0.001	
338						SD	2.0851E-5				Std. Error of Mean	4.3478E-6	
339						Coefficient of Variation	0.0208				Skewness	4.796	
340													
341						**Normal GOF Test**							
342						Shapiro Wilk Test Statistic	0.216				**Shapiro Wilk GOF Test**		
343						1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
344						Lilliefors Test Statistic	0.539				**Lilliefors GOF Test**		
345						1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
346						**Data Not Normal at 1% Significance Level**							
347													
348						**Assuming Normal Distribution**							
349						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
350						95% Student's-t UCL	0.00101				95% Adjusted-CLT UCL (Chen-1995)	0.00102	
351											95% Modified-t UCL (Johnson-1978)	0.00101	
352													
353						**Gamma GOF Test**							
354						A-D Test Statistic	8.575				**Anderson-Darling Gamma GOF Test**		
355						5% A-D Critical Value	0.74				Data Not Gamma Distributed at 5% Significance Level		
356						K-S Test Statistic	0.555				**Kolmogorov-Smirnov Gamma GOF Test**		
357						5% K-S Critical Value	0.181				Data Not Gamma Distributed at 5% Significance Level		
358						**Data Not Gamma Distributed at 5% Significance Level**							
359													
360						**Gamma Statistics**							
361						k hat (MLE)	2571				k star (bias corrected MLE)	2236	
362						Theta hat (MLE)	3.9063E-7				Theta star (bias corrected MLE)	4.4922E-7	
363						nu hat (MLE)	118271				nu star (bias corrected)	102846	
364						MLE Mean (bias corrected)	0.001				MLE Sd (bias corrected)	2.1241E-5	
365											Approximate Chi Square Value (0.05)	102101	
366						Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	102048	
367													
368						**Assuming Gamma Distribution**							
369						95% Approximate Gamma UCL	0.00101				95% Adjusted Gamma UCL	0.00101	
370													
371						**Lognormal GOF Test**							
372						Shapiro Wilk Test Statistic	0.216				**Shapiro Wilk Lognormal GOF Test**		
373						10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
374						Lilliefors Test Statistic	0.539				**Lilliefors Lognormal GOF Test**		
375						10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
376						**Data Not Lognormal at 10% Significance Level**							
377													
378						**Lognormal Statistics**							
379						Minimum of Logged Data	-6.908				Mean of logged Data	-6.904	
380						Maximum of Logged Data	-6.812				SD of logged Data	0.0199	
381													
382						**Assuming Lognormal Distribution**							
383						95% H-UCL	N/A				90% Chebyshev (MVUE) UCL	0.00102	
384						95% Chebyshev (MVUE) UCL	0.00102				97.5% Chebyshev (MVUE) UCL	0.00103	
385						99% Chebyshev (MVUE) UCL	0.00105						

	A	B	C	D	E	F	G	H	I	J	K	L
386												
387	**Nonparametric Distribution Free UCL Statistics**											
388	**Data do not follow a Discernible Distribution**											
389												
390	**Nonparametric Distribution Free UCLs**											
391					95% CLT UCL	0.00101			95% BCA Bootstrap UCL	N/A		
392					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A		
393					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A		
394					90% Chebyshev(Mean, Sd) UCL	0.00102			95% Chebyshev(Mean, Sd) UCL	0.00102		
395					97.5% Chebyshev(Mean, Sd) UCL	0.00103			99% Chebyshev(Mean, Sd) UCL	0.00105		
396												
397	**Suggested UCL to Use**											
398					95% Student's-t UCL	0.00101						
399												
400	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
401	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
402	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
403												
404												
405	**ResultValue (apw-10s)**											
406												
407	**General Statistics**											
408					Total Number of Observations	23			Number of Distinct Observations	1		
409									Number of Missing Observations	0		
410					Minimum	0.001			Mean	0.001		
411					Maximum	0.001			Median	0.001		
412												
413	**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**											
414	**ProUCL (or any other software) should not be used on such a data set!**											
415	**The data set for variable ResultValue (apw-10s) was not processed!**											
416												
417	**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**											
418	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
419												
420												

1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options	Calcium										
4	Date/Time of Computation	ProUCL 5.2 2/27/2026 1:18:48 PM										
5	From File	ProUCL_Input_UpgradientDowngradient_Split_m.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**ResultValue (apw-02)**											
12												
13	**General Statistics**											
14	Total Number of Observations	23			Number of Distinct Observations	20						
15					Number of Missing Observations	0						
16	Minimum	132			Mean	156.9						
17	Maximum	198			Median	156						
18	SD	18.19			Std. Error of Mean	3.794						
19	Coefficient of Variation	0.116			Skewness	0.625						
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic	0.95			**Shapiro Wilk GOF Test**							
23	1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level							
24	Lilliefors Test Statistic	0.106			**Lilliefors GOF Test**							
25	1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level							
26	**Data appear Normal at 1% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**							
30	95% Student's-t UCL	163.4			95% Adjusted-CLT UCL (Chen-1995)	163.6						
31					95% Modified-t UCL (Johnson-1978)	163.5						
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic	0.288			**Anderson-Darling Gamma GOF Test**							
35	5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic	0.0969			**Kolmogorov-Smirnov Gamma GOF Test**							
37	5% K-S Critical Value	0.181			Detected data appear Gamma Distributed at 5% Significance Level							
38	**Detected data appear Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)	80.17			k star (bias corrected MLE)	69.75						
42	Theta hat (MLE)	1.957			Theta star (bias corrected MLE)	2.249						
43	nu hat (MLE)	3688			nu star (bias corrected)	3208						
44	MLE Mean (bias corrected)	156.9			MLE Sd (bias corrected)	18.78						
45					Approximate Chi Square Value (0.05)	3078						
46	Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	3068						
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL	163.5			95% Adjusted Gamma UCL	164						
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic	0.963			**Shapiro Wilk Lognormal GOF Test**							
53	10% Shapiro Wilk Critical Value	0.928			Data appear Lognormal at 10% Significance Level							
54	Lilliefors Test Statistic	0.0888			**Lilliefors Lognormal GOF Test**							
55	10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level							

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	4.883			Mean of logged Data	5.049	
60						Maximum of Logged Data	5.288			SD of logged Data	0.114	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	163.6			90% Chebyshev (MVUE) UCL	168	
64						95% Chebyshev (MVUE) UCL	173.1			97.5% Chebyshev (MVUE) UCL	180.1	
65						99% Chebyshev (MVUE) UCL	193.9					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	163.1			95% BCA Bootstrap UCL	163.3	
72						95% Standard Bootstrap UCL	162.8			95% Bootstrap-t UCL	163.5	
73						95% Hall's Bootstrap UCL	163.4			95% Percentile Bootstrap UCL	163	
74						90% Chebyshev(Mean, Sd) UCL	168.3			95% Chebyshev(Mean, Sd) UCL	173.4	
75						97.5% Chebyshev(Mean, Sd) UCL	180.6			99% Chebyshev(Mean, Sd) UCL	194.6	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	163.4					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	18	
89										Number of Missing Observations	0	
90						Minimum	74.9			Mean	113.1	
91						Maximum	153			Median	116	
92						SD	19.62			Std. Error of Mean	4.092	
93						Coefficient of Variation	0.174			Skewness	-0.202	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.959			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.154			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
100	**Data appear Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	120.1			95% Adjusted-CLT UCL (Chen-1995)	119.6	
105										95% Modified-t UCL (Johnson-1978)	120.1	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	0.607			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.742			Detected data appear Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.177			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
112	**Detected data appear Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	32.74					k star (bias corrected MLE)	28.5	
116				Theta hat (MLE)	3.453					Theta star (bias corrected MLE)	3.967	
117				nu hat (MLE)	1506					nu star (bias corrected)	1311	
118				MLE Mean (bias corrected)	113.1					MLE Sd (bias corrected)	21.18	
119										Approximate Chi Square Value (0.05)	1228	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	1222	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	120.7					95% Adjusted Gamma UCL	121.3	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.189	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
130	**Data appear Approximate Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	4.316					Mean of logged Data	4.713	
134				Maximum of Logged Data	5.03					SD of logged Data	0.183	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	121.2					90% Chebyshev (MVUE) UCL	126.1	
138				95% Chebyshev (MVUE) UCL	132					97.5% Chebyshev (MVUE) UCL	140.2	
139				99% Chebyshev (MVUE) UCL	156.2							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data appear to follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	119.8					95% BCA Bootstrap UCL	119.9	
146				95% Standard Bootstrap UCL	119.6					95% Bootstrap-t UCL	119.7	
147				95% Hall's Bootstrap UCL	119.6					95% Percentile Bootstrap UCL	119.9	
148				90% Chebyshev(Mean, Sd) UCL	125.3					95% Chebyshev(Mean, Sd) UCL	130.9	
149				97.5% Chebyshev(Mean, Sd) UCL	138.6					99% Chebyshev(Mean, Sd) UCL	153.8	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	120.1							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
159	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12					Number of Distinct Observations	11	

166											Number of Missing Observations	0
167					Minimum	112					Mean	125.3
168					Maximum	142					Median	124.5
169					SD	8.217					Std. Error of Mean	2.372
170					Coefficient of Variation	0.0656					Skewness	0.538
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.975					**Shapiro Wilk GOF Test**	
174					1% Shapiro Wilk Critical Value	0.805					Data appear Normal at 1% Significance Level	
175					Lilliefors Test Statistic	0.17					**Lilliefors GOF Test**	
176					1% Lilliefors Critical Value	0.281					Data appear Normal at 1% Significance Level	
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
181					95% Student's-t UCL	129.6					95% Adjusted-CLT UCL (Chen-1995)	129.6
182											95% Modified-t UCL (Johnson-1978)	129.7
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.182					**Anderson-Darling Gamma GOF Test**	
186					5% A-D Critical Value	0.731					Detected data appear Gamma Distributed at 5% Significance Level	
187					K-S Test Statistic	0.158					**Kolmogorov-Smirnov Gamma GOF Test**	
188					5% K-S Critical Value	0.245					Detected data appear Gamma Distributed at 5% Significance Level	
189						**Detected data appear Gamma Distributed at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	257.7					k star (bias corrected MLE)	193.3
193					Theta hat (MLE)	0.486					Theta star (bias corrected MLE)	0.648
194					nu hat (MLE)	6184					nu star (bias corrected)	4639
195					MLE Mean (bias corrected)	125.3					MLE Sd (bias corrected)	9.015
196											Approximate Chi Square Value (0.05)	4482
197					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	4458
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	129.7					95% Adjusted Gamma UCL	130.4
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.983					**Shapiro Wilk Lognormal GOF Test**	
204					10% Shapiro Wilk Critical Value	0.883					Data appear Lognormal at 10% Significance Level	
205					Lilliefors Test Statistic	0.158					**Lilliefors Lognormal GOF Test**	
206					10% Lilliefors Critical Value	0.223					Data appear Lognormal at 10% Significance Level	
207						**Data appear Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	4.718					Mean of logged Data	4.829
211					Maximum of Logged Data	4.956					SD of logged Data	0.0649
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	132.4
215					95% Chebyshev (MVUE) UCL	135.6					97.5% Chebyshev (MVUE) UCL	140
216					99% Chebyshev (MVUE) UCL	148.7						
217												
218						**Nonparametric Distribution Free UCL Statistics**						
219						**Data appear to follow a Discernible Distribution**						
220												

221	**Nonparametric Distribution Free UCLs**											
222				95% CLT UCL	129.2			95% BCA Bootstrap UCL	129.5			
223				95% Standard Bootstrap UCL	129.1			95% Bootstrap-t UCL	130.2			
224				95% Hall's Bootstrap UCL	130.8			95% Percentile Bootstrap UCL	129.3			
225				90% Chebyshev(Mean, Sd) UCL	132.4			95% Chebyshev(Mean, Sd) UCL	135.7			
226				97.5% Chebyshev(Mean, Sd) UCL	140.1			99% Chebyshev(Mean, Sd) UCL	148.9			
227												
228	**Suggested UCL to Use**											
229				95% Student's-t UCL	129.6							
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235												
236	**ResultValue (apw-05r)**											
237												
238	**General Statistics**											
239				Total Number of Observations	11			Number of Distinct Observations	10			
240								Number of Missing Observations	0			
241				Minimum	74			Mean	114.3			
242				Maximum	141			Median	111			
243				SD	21.18			Std. Error of Mean	6.385			
244				Coefficient of Variation	0.185			Skewness	-0.261			
245												
246	**Normal GOF Test**											
247				Shapiro Wilk Test Statistic	0.924			**Shapiro Wilk GOF Test**				
248				1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level				
249				Lilliefors Test Statistic	0.162			**Lilliefors GOF Test**				
250				1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level				
251	**Data appear Normal at 1% Significance Level**											
252												
253	**Assuming Normal Distribution**											
254				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
255				95% Student's-t UCL	125.9			95% Adjusted-CLT UCL (Chen-1995)	124.2			
256								95% Modified-t UCL (Johnson-1978)	125.8			
257												
258	**Gamma GOF Test**											
259				A-D Test Statistic	0.401			**Anderson-Darling Gamma GOF Test**				
260				5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level				
261				K-S Test Statistic	0.172			**Kolmogorov-Smirnov Gamma GOF Test**				
262				5% K-S Critical Value	0.255			Detected data appear Gamma Distributed at 5% Significance Level				
263	**Detected data appear Gamma Distributed at 5% Significance Level**											
264												
265	**Gamma Statistics**											
266				k hat (MLE)	30.14			k star (bias corrected MLE)	21.98			
267				Theta hat (MLE)	3.792			Theta star (bias corrected MLE)	5.2			
268				nu hat (MLE)	663			nu star (bias corrected)	483.5			
269				MLE Mean (bias corrected)	114.3			MLE Sd (bias corrected)	24.38			
270								Approximate Chi Square Value (0.05)	433.5			
271				Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	425.8			
272												
273	**Assuming Gamma Distribution**											
274				95% Approximate Gamma UCL	127.5			95% Adjusted Gamma UCL	129.8			
275												

276	**Lognormal GOF Test**											
277					Shapiro Wilk Test Statistic	0.911	**Shapiro Wilk Lognormal GOF Test**					
278					10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level					
279					Lilliefors Test Statistic	0.158	**Lilliefors Lognormal GOF Test**					
280					10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level					
281	**Data appear Lognormal at 10% Significance Level**											
282												
283	**Lognormal Statistics**											
284					Minimum of Logged Data	4.304				Mean of logged Data	4.722	
285					Maximum of Logged Data	4.949				SD of logged Data	0.195	
286												
287	**Assuming Lognormal Distribution**											
288					95% H-UCL	128.5				90% Chebyshev (MVUE) UCL	134.6	
289					95% Chebyshev (MVUE) UCL	143.8				97.5% Chebyshev (MVUE) UCL	156.6	
290					99% Chebyshev (MVUE) UCL	181.6						
291												
292	**Nonparametric Distribution Free UCL Statistics**											
293	**Data appear to follow a Discernible Distribution**											
294												
295	**Nonparametric Distribution Free UCLs**											
296					95% CLT UCL	124.8				95% BCA Bootstrap UCL	124.3	
297					95% Standard Bootstrap UCL	124.4				95% Bootstrap-t UCL	125.2	
298					95% Hall's Bootstrap UCL	123.9				95% Percentile Bootstrap UCL	124.3	
299					90% Chebyshev(Mean, Sd) UCL	133.4				95% Chebyshev(Mean, Sd) UCL	142.1	
300					97.5% Chebyshev(Mean, Sd) UCL	154.2				99% Chebyshev(Mean, Sd) UCL	177.8	
301												
302	**Suggested UCL to Use**											
303					95% Student's-t UCL	125.9						
304												
305	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
306	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
307	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
308												
309	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
310	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
311												
312												
313	**ResultValue (apw-06d)**											
314												
315	**General Statistics**											
316					Total Number of Observations	22				Number of Distinct Observations	17	
317										Number of Missing Observations	0	
318					Minimum	96.7				Mean	111.5	
319					Maximum	128				Median	110	
320					SD	8.944				Std. Error of Mean	1.907	
321					Coefficient of Variation	0.0802				Skewness	0.0702	
322												
323	**Normal GOF Test**											
324					Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**					
325					1% Shapiro Wilk Critical Value	0.878	Data appear Normal at 1% Significance Level					
326					Lilliefors Test Statistic	0.116	**Lilliefors GOF Test**					
327					1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level					
328	**Data appear Normal at 1% Significance Level**											
329												
330	**Assuming Normal Distribution**											

331	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
332				95% Student's-t UCL		114.8				95% Adjusted-CLT UCL (Chen-1995)		114.7
333										95% Modified-t UCL (Johnson-1978)		114.8
334												
335	**Gamma GOF Test**											
336				A-D Test Statistic		0.328	**Anderson-Darling Gamma GOF Test**					
337				5% A-D Critical Value		0.741	Detected data appear Gamma Distributed at 5% Significance Level					
338				K-S Test Statistic		0.123	**Kolmogorov-Smirnov Gamma GOF Test**					
339				5% K-S Critical Value		0.185	Detected data appear Gamma Distributed at 5% Significance Level					
340	**Detected data appear Gamma Distributed at 5% Significance Level**											
341												
342	**Gamma Statistics**											
343				k hat (MLE)		162.7				k star (bias corrected MLE)		140.5
344				Theta hat (MLE)		0.686				Theta star (bias corrected MLE)		0.794
345				nu hat (MLE)		7157				nu star (bias corrected)		6183
346				MLE Mean (bias corrected)		111.5				MLE Sd (bias corrected)		9.41
347										Approximate Chi Square Value (0.05)		6001
348				Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		5988
349												
350	**Assuming Gamma Distribution**											
351				95% Approximate Gamma UCL		114.9				95% Adjusted Gamma UCL		115.2
352												
353	**Lognormal GOF Test**											
354				Shapiro Wilk Test Statistic		0.964	**Shapiro Wilk Lognormal GOF Test**					
355				10% Shapiro Wilk Critical Value		0.926	Data appear Lognormal at 10% Significance Level					
356				Lilliefors Test Statistic		0.119	**Lilliefors Lognormal GOF Test**					
357				10% Lilliefors Critical Value		0.169	Data appear Lognormal at 10% Significance Level					
358	**Data appear Lognormal at 10% Significance Level**											
359												
360	**Lognormal Statistics**											
361				Minimum of Logged Data		4.572				Mean of logged Data		4.711
362				Maximum of Logged Data		4.852				SD of logged Data		0.0804
363												
364	**Assuming Lognormal Distribution**											
365				95% H-UCL		N/A				90% Chebyshev (MVUE) UCL		117.3
366				95% Chebyshev (MVUE) UCL		119.9				97.5% Chebyshev (MVUE) UCL		123.5
367				99% Chebyshev (MVUE) UCL		130.6						
368												
369	**Nonparametric Distribution Free UCL Statistics**											
370	**Data appear to follow a Discernible Distribution**											
371												
372	**Nonparametric Distribution Free UCLs**											
373				95% CLT UCL		114.7				95% BCA Bootstrap UCL		114.6
374				95% Standard Bootstrap UCL		114.7				95% Bootstrap-t UCL		114.9
375				95% Hall's Bootstrap UCL		114.8				95% Percentile Bootstrap UCL		114.6
376				90% Chebyshev(Mean, Sd) UCL		117.3				95% Chebyshev(Mean, Sd) UCL		119.9
377				97.5% Chebyshev(Mean, Sd) UCL		123.5				99% Chebyshev(Mean, Sd) UCL		130.5
378												
379	**Suggested UCL to Use**											
380				95% Student's-t UCL		114.8						
381												
382	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
383	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
384	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
385												

386												
387	**ResultValue (apw-06s)**											
388												
389						**General Statistics**						
390					Total Number of Observations	23			Number of Distinct Observations	20		
391									Number of Missing Observations	0		
392					Minimum	87.5			Mean	106.6		
393					Maximum	139			Median	101		
394					SD	14.61			Std. Error of Mean	3.046		
395					Coefficient of Variation	0.137			Skewness	1.073		
396												
397						**Normal GOF Test**						
398					Shapiro Wilk Test Statistic	0.869			**Shapiro Wilk GOF Test**			
399					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
400					Lilliefors Test Statistic	0.215			**Lilliefors GOF Test**			
401					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
402						**Data Not Normal at 1% Significance Level**						
403												
404						**Assuming Normal Distribution**						
405					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
406					95% Student's-t UCL	111.8			95% Adjusted-CLT UCL (Chen-1995)	112.3		
407									95% Modified-t UCL (Johnson-1978)	112		
408												
409						**Gamma GOF Test**						
410					A-D Test Statistic	1.103			**Anderson-Darling Gamma GOF Test**			
411					5% A-D Critical Value	0.741			Data Not Gamma Distributed at 5% Significance Level			
412					K-S Test Statistic	0.21			**Kolmogorov-Smirnov Gamma GOF Test**			
413					5% K-S Critical Value	0.181			Data Not Gamma Distributed at 5% Significance Level			
414						**Data Not Gamma Distributed at 5% Significance Level**						
415												
416						**Gamma Statistics**						
417					k hat (MLE)	59.86			k star (bias corrected MLE)	52.08		
418					Theta hat (MLE)	1.781			Theta star (bias corrected MLE)	2.047		
419					nu hat (MLE)	2753			nu star (bias corrected)	2396		
420					MLE Mean (bias corrected)	106.6			MLE Sd (bias corrected)	14.77		
421									Approximate Chi Square Value (0.05)	2283		
422					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	2275		
423												
424						**Assuming Gamma Distribution**						
425					95% Approximate Gamma UCL	111.9			95% Adjusted Gamma UCL	112.3		
426												
427						**Lognormal GOF Test**						
428					Shapiro Wilk Test Statistic	0.899			**Shapiro Wilk Lognormal GOF Test**			
429					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
430					Lilliefors Test Statistic	0.202			**Lilliefors Lognormal GOF Test**			
431					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
432						**Data Not Lognormal at 10% Significance Level**						
433												
434						**Lognormal Statistics**						
435					Minimum of Logged Data	4.472			Mean of logged Data	4.661		
436					Maximum of Logged Data	4.934			SD of logged Data	0.13		
437												
438						**Assuming Lognormal Distribution**						
439					95% H-UCL	111.9			90% Chebyshev (MVUE) UCL	115.3		
440					95% Chebyshev (MVUE) UCL	119.2			97.5% Chebyshev (MVUE) UCL	124.7		

441				99% Chebyshev (MVUE) UCL	135.4							
442												
443					**Nonparametric Distribution Free UCL Statistics**							
444					**Data do not follow a Discernible Distribution**							
445												
446					**Nonparametric Distribution Free UCLs**							
447				95% CLT UCL	111.6			95% BCA Bootstrap UCL	112.1			
448				95% Standard Bootstrap UCL	111.5			95% Bootstrap-t UCL	112.8			
449				95% Hall's Bootstrap UCL	112.2			95% Percentile Bootstrap UCL	111.7			
450				90% Chebyshev(Mean, Sd) UCL	115.7			95% Chebyshev(Mean, Sd) UCL	119.9			
451				97.5% Chebyshev(Mean, Sd) UCL	125.6			99% Chebyshev(Mean, Sd) UCL	136.9			
452												
453					**Suggested UCL to Use**							
454				95% Student's-t UCL	111.8							
455												
456					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
457					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
458					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
459												
460												
461	**ResultValue (apw-07)**											
462												
463					**General Statistics**							
464				Total Number of Observations	22			Number of Distinct Observations	19			
465								Number of Missing Observations	0			
466				Minimum	161			Mean	197.9			
467				Maximum	238			Median	197.5			
468				SD	17.34			Std. Error of Mean	3.698			
469				Coefficient of Variation	0.0876			Skewness	0.0169			
470												
471					**Normal GOF Test**							
472				Shapiro Wilk Test Statistic	0.983			**Shapiro Wilk GOF Test**				
473				1% Shapiro Wilk Critical Value	0.878			Data appear Normal at 1% Significance Level				
474				Lilliefors Test Statistic	0.102			**Lilliefors GOF Test**				
475				1% Lilliefors Critical Value	0.214			Data appear Normal at 1% Significance Level				
476					**Data appear Normal at 1% Significance Level**							
477												
478					**Assuming Normal Distribution**							
479				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
480				95% Student's-t UCL	204.3			95% Adjusted-CLT UCL (Chen-1995)	204			
481								95% Modified-t UCL (Johnson-1978)	204.3			
482												
483					**Gamma GOF Test**							
484				A-D Test Statistic	0.221			**Anderson-Darling Gamma GOF Test**				
485				5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level				
486				K-S Test Statistic	0.112			**Kolmogorov-Smirnov Gamma GOF Test**				
487				5% K-S Critical Value	0.185			Detected data appear Gamma Distributed at 5% Significance Level				
488					**Detected data appear Gamma Distributed at 5% Significance Level**							
489												
490					**Gamma Statistics**							
491				k hat (MLE)	135.1			k star (bias corrected MLE)	116.7			
492				Theta hat (MLE)	1.465			Theta star (bias corrected MLE)	1.695			
493				nu hat (MLE)	5946			nu star (bias corrected)	5136			
494				MLE Mean (bias corrected)	197.9			MLE Sd (bias corrected)	18.32			
495								Approximate Chi Square Value (0.05)	4971			

496				Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	4959	
497												
498					**Assuming Gamma Distribution**							
499				95% Approximate Gamma UCL	204.5					95% Adjusted Gamma UCL	205	
500												
501					**Lognormal GOF Test**							
502				Shapiro Wilk Test Statistic	0.981			**Shapiro Wilk Lognormal GOF Test**				
503				10% Shapiro Wilk Critical Value	0.926			Data appear Lognormal at 10% Significance Level				
504				Lilliefors Test Statistic	0.109			**Lilliefors Lognormal GOF Test**				
505				10% Lilliefors Critical Value	0.169			Data appear Lognormal at 10% Significance Level				
506					**Data appear Lognormal at 10% Significance Level**							
507												
508					**Lognormal Statistics**							
509				Minimum of Logged Data	5.081					Mean of logged Data	5.284	
510				Maximum of Logged Data	5.472					SD of logged Data	0.0884	
511												
512					**Assuming Lognormal Distribution**							
513				95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	209.1	
514				95% Chebyshev (MVUE) UCL	214.2					97.5% Chebyshev (MVUE) UCL	221.2	
515				99% Chebyshev (MVUE) UCL	235.1							
516												
517					**Nonparametric Distribution Free UCL Statistics**							
518					**Data appear to follow a Discernible Distribution**							
519												
520					**Nonparametric Distribution Free UCLs**							
521				95% CLT UCL	204					95% BCA Bootstrap UCL	203.5	
522				95% Standard Bootstrap UCL	203.9					95% Bootstrap-t UCL	204.1	
523				95% Hall's Bootstrap UCL	204.2					95% Percentile Bootstrap UCL	203.8	
524				90% Chebyshev(Mean, Sd) UCL	209					95% Chebyshev(Mean, Sd) UCL	214	
525				97.5% Chebyshev(Mean, Sd) UCL	221					99% Chebyshev(Mean, Sd) UCL	234.7	
526												
527					**Suggested UCL to Use**							
528				95% Student's-t UCL	204.3							
529												
530					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
531					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
532					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
533												
534												
535	**ResultValue (apw-08)**											
536												
537					**General Statistics**							
538				Total Number of Observations	23					Number of Distinct Observations	19	
539										Number of Missing Observations	0	
540				Minimum	79.4					Mean	95.04	
541				Maximum	107					Median	97.8	
542				SD	8.604					Std. Error of Mean	1.794	
543				Coefficient of Variation	0.0905					Skewness	-0.496	
544												
545					**Normal GOF Test**							
546				Shapiro Wilk Test Statistic	0.916			**Shapiro Wilk GOF Test**				
547				1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level				
548				Lilliefors Test Statistic	0.173			**Lilliefors GOF Test**				
549				1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level				
550					**Data appear Normal at 1% Significance Level**							

551												
552	**Assuming Normal Distribution**											
553	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
554			95% Student's-t UCL		98.12		95% Adjusted-CLT UCL (Chen-1995)				97.79	
555							95% Modified-t UCL (Johnson-1978)				98.09	
556												
557	**Gamma GOF Test**											
558			A-D Test Statistic		0.838		**Anderson-Darling Gamma GOF Test**					
559			5% A-D Critical Value		0.74		Data Not Gamma Distributed at 5% Significance Level					
560			K-S Test Statistic		0.185		**Kolmogorov-Smirnov Gamma GOF Test**					
561			5% K-S Critical Value		0.181		Data Not Gamma Distributed at 5% Significance Level					
562	**Data Not Gamma Distributed at 5% Significance Level**											
563												
564	**Gamma Statistics**											
565			k hat (MLE)		123.4		k star (bias corrected MLE)				107.3	
566			Theta hat (MLE)		0.77		Theta star (bias corrected MLE)				0.886	
567			nu hat (MLE)		5676		nu star (bias corrected)				4937	
568			MLE Mean (bias corrected)		95.04		MLE Sd (bias corrected)				9.174	
569							Approximate Chi Square Value (0.05)				4774	
570			Adjusted Level of Significance		0.0389		Adjusted Chi Square Value				4763	
571												
572	**Assuming Gamma Distribution**											
573			95% Approximate Gamma UCL		98.27		95% Adjusted Gamma UCL				98.51	
574												
575	**Lognormal GOF Test**											
576			Shapiro Wilk Test Statistic		0.906		**Shapiro Wilk Lognormal GOF Test**					
577			10% Shapiro Wilk Critical Value		0.928		Data Not Lognormal at 10% Significance Level					
578			Lilliefors Test Statistic		0.186		**Lilliefors Lognormal GOF Test**					
579			10% Lilliefors Critical Value		0.165		Data Not Lognormal at 10% Significance Level					
580	**Data Not Lognormal at 10% Significance Level**											
581												
582	**Lognormal Statistics**											
583			Minimum of Logged Data		4.374		Mean of logged Data				4.55	
584			Maximum of Logged Data		4.673		SD of logged Data				0.0929	
585												
586	**Assuming Lognormal Distribution**											
587			95% H-UCL		N/A		90% Chebyshev (MVUE) UCL				100.6	
588			95% Chebyshev (MVUE) UCL		103.1		97.5% Chebyshev (MVUE) UCL				106.6	
589			99% Chebyshev (MVUE) UCL		113.4							
590												
591	**Nonparametric Distribution Free UCL Statistics**											
592	**Data appear to follow a Discernible Distribution**											
593												
594	**Nonparametric Distribution Free UCLs**											
595			95% CLT UCL		97.99		95% BCA Bootstrap UCL				97.83	
596			95% Standard Bootstrap UCL		97.97		95% Bootstrap-t UCL				97.93	
597			95% Hall's Bootstrap UCL		97.76		95% Percentile Bootstrap UCL				97.92	
598			90% Chebyshev(Mean, Sd) UCL		100.4		95% Chebyshev(Mean, Sd) UCL				102.9	
599			97.5% Chebyshev(Mean, Sd) UCL		106.2		99% Chebyshev(Mean, Sd) UCL				112.9	
600												
601	**Suggested UCL to Use**											
602			95% Student's-t UCL		98.12							
603												
604	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
605	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

606	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
607												
608	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
609	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
610												
611												
612	**ResultValue (apw-10d)**											
613												
614	**General Statistics**											
615						Total Number of Observations	23			Number of Distinct Observations	18	
616										Number of Missing Observations	0	
617						Minimum	98.5			Mean	157.8	
618						Maximum	611			Median	125	
619						SD	112			Std. Error of Mean	23.35	
620						Coefficient of Variation	0.709			Skewness	3.627	
621												
622	**Normal GOF Test**											
623						Shapiro Wilk Test Statistic	0.41			**Shapiro Wilk GOF Test**		
624						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
625						Lilliefors Test Statistic	0.448			**Lilliefors GOF Test**		
626						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
627	**Data Not Normal at 1% Significance Level**											
628												
629	**Assuming Normal Distribution**											
630					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
631						95% Student's-t UCL	197.9			95% Adjusted-CLT UCL (Chen-1995)	215.1	
632										95% Modified-t UCL (Johnson-1978)	200.9	
633												
634	**Gamma GOF Test**											
635						A-D Test Statistic	5.089			**Anderson-Darling Gamma GOF Test**		
636						5% A-D Critical Value	0.748			Data Not Gamma Distributed at 5% Significance Level		
637						K-S Test Statistic	0.405			**Kolmogorov-Smirnov Gamma GOF Test**		
638						5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level		
639	**Data Not Gamma Distributed at 5% Significance Level**											
640												
641	**Gamma Statistics**											
642						k hat (MLE)	4.589			k star (bias corrected MLE)	4.019	
643						Theta hat (MLE)	34.4			Theta star (bias corrected MLE)	39.27	
644						nu hat (MLE)	211.1			nu star (bias corrected)	184.9	
645						MLE Mean (bias corrected)	157.8			MLE Sd (bias corrected)	78.74	
646										Approximate Chi Square Value (0.05)	154.4	
647						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	152.4	
648												
649	**Assuming Gamma Distribution**											
650						95% Approximate Gamma UCL	189			95% Adjusted Gamma UCL	191.5	
651												
652	**Lognormal GOF Test**											
653						Shapiro Wilk Test Statistic	0.53			**Shapiro Wilk Lognormal GOF Test**		
654						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
655						Lilliefors Test Statistic	0.365			**Lilliefors Lognormal GOF Test**		
656						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
657	**Data Not Lognormal at 10% Significance Level**											
658												
659	**Lognormal Statistics**											
660						Minimum of Logged Data	4.59			Mean of logged Data	4.949	

661				Maximum of Logged Data	6.415					SD of logged Data	0.401	
662												
663					**Assuming Lognormal Distribution**							
664				95% H-UCL	179.7					90% Chebyshev (MVUE) UCL	191.4	
665				95% Chebyshev (MVUE) UCL	209.2					97.5% Chebyshev (MVUE) UCL	233.8	
666				99% Chebyshev (MVUE) UCL	282.3							
667												
668					**Nonparametric Distribution Free UCL Statistics**							
669					**Data do not follow a Discernible Distribution**							
670												
671					**Nonparametric Distribution Free UCLs**							
672				95% CLT UCL	196.2					95% BCA Bootstrap UCL	221	
673				95% Standard Bootstrap UCL	195.5					95% Bootstrap-t UCL	514.8	
674				95% Hall's Bootstrap UCL	459.4					95% Percentile Bootstrap UCL	200.3	
675				90% Chebyshev(Mean, Sd) UCL	227.9					95% Chebyshev(Mean, Sd) UCL	259.6	
676				97.5% Chebyshev(Mean, Sd) UCL	303.6					99% Chebyshev(Mean, Sd) UCL	390.1	
677												
678					**Suggested UCL to Use**							
679				95% Student's-t UCL	197.9							
680												
681					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
682					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
683					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
684												
685												
686	**ResultValue (apw-10s)**											
687												
688					**General Statistics**							
689				Total Number of Observations	23					Number of Distinct Observations	18	
690										Number of Missing Observations	0	
691				Minimum	129					Mean	151.8	
692				Maximum	171					Median	153	
693				SD	12.24					Std. Error of Mean	2.553	
694				Coefficient of Variation	0.0806					Skewness	-0.28	
695												
696					**Normal GOF Test**							
697				Shapiro Wilk Test Statistic	0.941					**Shapiro Wilk GOF Test**		
698				1% Shapiro Wilk Critical Value	0.881					Data appear Normal at 1% Significance Level		
699				Lilliefors Test Statistic	0.164					**Lilliefors GOF Test**		
700				1% Lilliefors Critical Value	0.209					Data appear Normal at 1% Significance Level		
701					**Data appear Normal at 1% Significance Level**							
702												
703					**Assuming Normal Distribution**							
704					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
705				95% Student's-t UCL	156.2					95% Adjusted-CLT UCL (Chen-1995)	155.9	
706										95% Modified-t UCL (Johnson-1978)	156.2	
707												
708					**Gamma GOF Test**							
709				A-D Test Statistic	0.607					**Anderson-Darling Gamma GOF Test**		
710				5% A-D Critical Value	0.74					Detected data appear Gamma Distributed at 5% Significance Level		
711				K-S Test Statistic	0.171					**Kolmogorov-Smirnov Gamma GOF Test**		
712				5% K-S Critical Value	0.181					Detected data appear Gamma Distributed at 5% Significance Level		
713					**Detected data appear Gamma Distributed at 5% Significance Level**							
714												
715					**Gamma Statistics**							

716					k hat (MLE)	157.9				k star (bias corrected MLE)		137.3
717					Theta hat (MLE)	0.962				Theta star (bias corrected MLE)		1.106
718					nu hat (MLE)	7261				nu star (bias corrected)		6315
719					MLE Mean (bias corrected)	151.8				MLE Sd (bias corrected)		12.96
720										Approximate Chi Square Value (0.05)		6132
721					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		6119
722												
723					**Assuming Gamma Distribution**							
724					95% Approximate Gamma UCL	156.4				95% Adjusted Gamma UCL		156.7
725												
726					**Lognormal GOF Test**							
727					Shapiro Wilk Test Statistic	0.937				**Shapiro Wilk Lognormal GOF Test**		
728					10% Shapiro Wilk Critical Value	0.928				Data appear Lognormal at 10% Significance Level		
729					Lilliefors Test Statistic	0.166				**Lilliefors Lognormal GOF Test**		
730					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
731					**Data appear Approximate Lognormal at 10% Significance Level**							
732												
733					**Lognormal Statistics**							
734					Minimum of Logged Data	4.86				Mean of logged Data		5.02
735					Maximum of Logged Data	5.142				SD of logged Data		0.0818
736												
737					**Assuming Lognormal Distribution**							
738					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL		159.6
739					95% Chebyshev (MVUE) UCL	163.1				97.5% Chebyshev (MVUE) UCL		168
740					99% Chebyshev (MVUE) UCL	177.6						
741												
742					**Nonparametric Distribution Free UCL Statistics**							
743					**Data appear to follow a Discernible Distribution**							
744												
745					**Nonparametric Distribution Free UCLs**							
746					95% CLT UCL	156				95% BCA Bootstrap UCL		155.5
747					95% Standard Bootstrap UCL	155.9				95% Bootstrap-t UCL		155.8
748					95% Hall's Bootstrap UCL	155.6				95% Percentile Bootstrap UCL		155.7
749					90% Chebyshev(Mean, Sd) UCL	159.5				95% Chebyshev(Mean, Sd) UCL		163
750					97.5% Chebyshev(Mean, Sd) UCL	167.8				99% Chebyshev(Mean, Sd) UCL		177.2
751												
752					**Suggested UCL to Use**							
753					95% Student's-t UCL	156.2						
754												
755					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
756					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
757					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
758												
759					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
760					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
761												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Chloride
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:19:14 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_o.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	5.38	Mean	9.619
Maximum	13	Median	9
SD	2.054	Std. Error of Mean	0.428
Coefficient of Variation	0.214	Skewness	-0.131

Normal GOF Test

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.141	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	10.35	95% Adjusted-CLT UCL (Chen-1995)	10.31
		95% Modified-t UCL (Johnson-1978)	10.35

Gamma GOF Test

A-D Test Statistic	0.479	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.152	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	21.58	k star (bias corrected MLE)	18.8
Theta hat (MLE)	0.446	Theta star (bias corrected MLE)	0.512
nu hat (MLE)	992.8	nu star (bias corrected)	864.6
MLE Mean (bias corrected)	9.619	MLE Sd (bias corrected)	2.219
		Approximate Chi Square Value (0.05)	797.4
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	792.7

Assuming Gamma Distribution

95% Approximate Gamma UCL	10.43	95% Adjusted Gamma UCL	10.49

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.941	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.149	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	1.683			Mean of logged Data	2.24	
60						Maximum of Logged Data	2.565			SD of logged Data	0.225	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	10.5			90% Chebyshev (MVUE) UCL	11	
64						95% Chebyshev (MVUE) UCL	11.62			97.5% Chebyshev (MVUE) UCL	12.48	
65						99% Chebyshev (MVUE) UCL	14.17					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	10.32			95% BCA Bootstrap UCL	10.27	
72						95% Standard Bootstrap UCL	10.31			95% Bootstrap-t UCL	10.39	
73						95% Hall's Bootstrap UCL	10.36			95% Percentile Bootstrap UCL	10.29	
74						90% Chebyshev(Mean, Sd) UCL	10.9			95% Chebyshev(Mean, Sd) UCL	11.49	
75						97.5% Chebyshev(Mean, Sd) UCL	12.29			99% Chebyshev(Mean, Sd) UCL	13.88	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	10.35					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
85	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	23			Number of Distinct Observations	16	
92										Number of Missing Observations	0	
93						Minimum	6.03			Mean	15.72	
94						Maximum	23			Median	16	
95						SD	5.514			Std. Error of Mean	1.15	
96						Coefficient of Variation	0.351			Skewness	-0.415	
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.907			**Shapiro Wilk GOF Test**		
100						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
101						Lilliefors Test Statistic	0.173			**Lilliefors GOF Test**		
102						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
103	**Data appear Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
107						95% Student's-t UCL	17.69			95% Adjusted-CLT UCL (Chen-1995)	17.5	
108										95% Modified-t UCL (Johnson-1978)	17.68	
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	1.009	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.746	Data Not Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.178	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.182	Detected data appear Gamma Distributed at 5% Significance Level						
115	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	6.973					k star (bias corrected MLE)	6.093	
119				Theta hat (MLE)	2.254					Theta star (bias corrected MLE)	2.58	
120				nu hat (MLE)	320.8					nu star (bias corrected)	280.3	
121				MLE Mean (bias corrected)	15.72					MLE Sd (bias corrected)	6.368	
122										Approximate Chi Square Value (0.05)	242.5	
123				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	239.9	
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	18.17					95% Adjusted Gamma UCL	18.36	
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.873	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.196	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
133	**Data Not Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	1.797					Mean of logged Data	2.681	
137				Maximum of Logged Data	3.135					SD of logged Data	0.416	
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	18.85					90% Chebyshev (MVUE) UCL	20.1	
141				95% Chebyshev (MVUE) UCL	22.01					97.5% Chebyshev (MVUE) UCL	24.68	
142				99% Chebyshev (MVUE) UCL	29.91							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data appear to follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	17.61					95% BCA Bootstrap UCL	17.33	
149				95% Standard Bootstrap UCL	17.52					95% Bootstrap-t UCL	17.57	
150				95% Hall's Bootstrap UCL	17.47					95% Percentile Bootstrap UCL	17.47	
151				90% Chebyshev(Mean, Sd) UCL	19.17					95% Chebyshev(Mean, Sd) UCL	20.73	
152				97.5% Chebyshev(Mean, Sd) UCL	22.9					99% Chebyshev(Mean, Sd) UCL	27.16	
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	17.69							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
162	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
163												
164												
165	**ResultValue (apw-05)**											

166												
167						**General Statistics**						
168					Total Number of Observations	12			Number of Distinct Observations	5		
169									Number of Missing Observations	0		
170					Minimum	14			Mean	16.17		
171					Maximum	19			Median	16		
172					SD	1.642			Std. Error of Mean	0.474		
173					Coefficient of Variation	0.102			Skewness	0.865		
174												
175						**Normal GOF Test**						
176					Shapiro Wilk Test Statistic	0.85			**Shapiro Wilk GOF Test**			
177					1% Shapiro Wilk Critical Value	0.805			Data appear Normal at 1% Significance Level			
178					Lilliefors Test Statistic	0.29			**Lilliefors GOF Test**			
179					1% Lilliefors Critical Value	0.281			Data Not Normal at 1% Significance Level			
180						**Data appear Approximate Normal at 1% Significance Level**						
181												
182						**Assuming Normal Distribution**						
183					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
184					95% Student's-t UCL	17.02			95% Adjusted-CLT UCL (Chen-1995)	17.07		
185									95% Modified-t UCL (Johnson-1978)	17.04		
186												
187						**Gamma GOF Test**						
188					A-D Test Statistic	0.835			**Anderson-Darling Gamma GOF Test**			
189					5% A-D Critical Value	0.731			Data Not Gamma Distributed at 5% Significance Level			
190					K-S Test Statistic	0.281			**Kolmogorov-Smirnov Gamma GOF Test**			
191					5% K-S Critical Value	0.245			Data Not Gamma Distributed at 5% Significance Level			
192						**Data Not Gamma Distributed at 5% Significance Level**						
193												
194						**Gamma Statistics**						
195					k hat (MLE)	110.1			k star (bias corrected MLE)	82.67		
196					Theta hat (MLE)	0.147			Theta star (bias corrected MLE)	0.196		
197					nu hat (MLE)	2644			nu star (bias corrected)	1984		
198					MLE Mean (bias corrected)	16.17			MLE Sd (bias corrected)	1.778		
199									Approximate Chi Square Value (0.05)	1882		
200					Adjusted Level of Significance	0.029			Adjusted Chi Square Value	1866		
201												
202						**Assuming Gamma Distribution**						
203					95% Approximate Gamma UCL	17.05			95% Adjusted Gamma UCL	17.19		
204												
205						**Lognormal GOF Test**						
206					Shapiro Wilk Test Statistic	0.868			**Shapiro Wilk Lognormal GOF Test**			
207					10% Shapiro Wilk Critical Value	0.883			Data Not Lognormal at 10% Significance Level			
208					Lilliefors Test Statistic	0.274			**Lilliefors Lognormal GOF Test**			
209					10% Lilliefors Critical Value	0.223			Data Not Lognormal at 10% Significance Level			
210						**Data Not Lognormal at 10% Significance Level**						
211												
212						**Lognormal Statistics**						
213					Minimum of Logged Data	2.639			Mean of logged Data	2.778		
214					Maximum of Logged Data	2.944			SD of logged Data	0.0986		
215												
216						**Assuming Lognormal Distribution**						
217					95% H-UCL	N/A			90% Chebyshev (MVUE) UCL	17.55		
218					95% Chebyshev (MVUE) UCL	18.17			97.5% Chebyshev (MVUE) UCL	19.04		
219					99% Chebyshev (MVUE) UCL	20.75						
220												

221	**Nonparametric Distribution Free UCL Statistics**											
222	**Data appear to follow a Discernible Distribution**											
223												
224	**Nonparametric Distribution Free UCLs**											
225				95% CLT UCL	16.95			95% BCA Bootstrap UCL	17			
226				95% Standard Bootstrap UCL	16.92			95% Bootstrap-t UCL	17.23			
227				95% Hall's Bootstrap UCL	17.08			95% Percentile Bootstrap UCL	16.92			
228				90% Chebyshev(Mean, Sd) UCL	17.59			95% Chebyshev(Mean, Sd) UCL	18.23			
229				97.5% Chebyshev(Mean, Sd) UCL	19.13			99% Chebyshev(Mean, Sd) UCL	20.88			
230												
231	**Suggested UCL to Use**											
232				95% Student's-t UCL	17.02							
233												
234	When a data set follows an approximate distribution passing only one of the GOF tests,											
235	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
236												
237	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
238	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
239	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
240												
241												
242	**ResultValue (apw-05r)**											
243												
244	**General Statistics**											
245				Total Number of Observations	11			Number of Distinct Observations	11			
246								Number of Missing Observations	0			
247				Minimum	14			Mean	18.37			
248				Maximum	28.1			Median	16.9			
249				SD	4.278			Std. Error of Mean	1.29			
250				Coefficient of Variation	0.233			Skewness	1.475			
251												
252	**Normal GOF Test**											
253				Shapiro Wilk Test Statistic	0.838			**Shapiro Wilk GOF Test**				
254				1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level				
255				Lilliefors Test Statistic	0.262			**Lilliefors GOF Test**				
256				1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level				
257	**Data appear Normal at 1% Significance Level**											
258												
259	**Assuming Normal Distribution**											
260	**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**				
261				95% Student's-t UCL	20.71			95% Adjusted-CLT UCL (Chen-1995)	21.11			
262								95% Modified-t UCL (Johnson-1978)	20.81			
263												
264	**Gamma GOF Test**											
265				A-D Test Statistic	0.65			**Anderson-Darling Gamma GOF Test**				
266				5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level				
267				K-S Test Statistic	0.254			**Kolmogorov-Smirnov Gamma GOF Test**				
268				5% K-S Critical Value	0.255			Detected data appear Gamma Distributed at 5% Significance Level				
269	**Detected data appear Gamma Distributed at 5% Significance Level**											
270												
271	**Gamma Statistics**											
272				k hat (MLE)	23.31			k star (bias corrected MLE)	17.01			
273				Theta hat (MLE)	0.788			Theta star (bias corrected MLE)	1.08			
274				nu hat (MLE)	512.8			nu star (bias corrected)	374.3			
275				MLE Mean (bias corrected)	18.37			MLE Sd (bias corrected)	4.455			

276											Approximate Chi Square Value (0.05)	330.4
277					Adjusted Level of Significance	0.0278					Adjusted Chi Square Value	323.7
278												
279						**Assuming Gamma Distribution**							
280					95% Approximate Gamma UCL	20.81					95% Adjusted Gamma UCL	21.24
281												
282						**Lognormal GOF Test**							
283					Shapiro Wilk Test Statistic	0.891			**Shapiro Wilk Lognormal GOF Test**			
284					10% Shapiro Wilk Critical Value	0.876			Data appear Lognormal at 10% Significance Level			
285					Lilliefors Test Statistic	0.241			**Lilliefors Lognormal GOF Test**			
286					10% Lilliefors Critical Value	0.231			Data Not Lognormal at 10% Significance Level			
287						**Data appear Approximate Lognormal at 10% Significance Level**						
288												
289						**Lognormal Statistics**						
290					Minimum of Logged Data	2.639					Mean of logged Data	2.889
291					Maximum of Logged Data	3.336					SD of logged Data	0.211
292												
293						**Assuming Lognormal Distribution**							
294					95% H-UCL	20.83					90% Chebyshev (MVUE) UCL	21.87
295					95% Chebyshev (MVUE) UCL	23.46					97.5% Chebyshev (MVUE) UCL	25.68
296					99% Chebyshev (MVUE) UCL	30.02						
297												
298						**Nonparametric Distribution Free UCL Statistics**							
299						**Data appear to follow a Discernible Distribution**							
300												
301						**Nonparametric Distribution Free UCLs**							
302					95% CLT UCL	20.49					95% BCA Bootstrap UCL	21.04
303					95% Standard Bootstrap UCL	20.41					95% Bootstrap-t UCL	22.91
304					95% Hall's Bootstrap UCL	30.94					95% Percentile Bootstrap UCL	20.53
305					90% Chebyshev(Mean, Sd) UCL	22.24					95% Chebyshev(Mean, Sd) UCL	23.99
306					97.5% Chebyshev(Mean, Sd) UCL	26.43					99% Chebyshev(Mean, Sd) UCL	31.21
307												
308						**Suggested UCL to Use**							
309					95% Student's-t UCL	20.71						
310												
311						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
312						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
313						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
314												
315												
316	**ResultValue (apw-06d)**											
317												
318						**General Statistics**							
319					Total Number of Observations	22					Number of Distinct Observations	12
320											Number of Missing Observations	0
321					Minimum	14					Mean	17.95
322					Maximum	35.3					Median	17
323					SD	4.465					Std. Error of Mean	0.952
324					Coefficient of Variation	0.249					Skewness	3.05
325												
326						**Normal GOF Test**							
327					Shapiro Wilk Test Statistic	0.644			**Shapiro Wilk GOF Test**			
328					1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level			
329					Lilliefors Test Statistic	0.313			**Lilliefors GOF Test**			
330					1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level			

331	**Data Not Normal at 1% Significance Level**											
332												
333	**Assuming Normal Distribution**											
334	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
335				95% Student's-t UCL		19.59				95% Adjusted-CLT UCL (Chen-1995)		20.18
336										95% Modified-t UCL (Johnson-1978)		19.7
337												
338	**Gamma GOF Test**											
339				A-D Test Statistic		1.955	**Anderson-Darling Gamma GOF Test**					
340				5% A-D Critical Value		0.741	Data Not Gamma Distributed at 5% Significance Level					
341				K-S Test Statistic		0.294	**Kolmogorov-Smirnov Gamma GOF Test**					
342				5% K-S Critical Value		0.185	Data Not Gamma Distributed at 5% Significance Level					
343	**Data Not Gamma Distributed at 5% Significance Level**											
344												
345	**Gamma Statistics**											
346				k hat (MLE)		23.2				k star (bias corrected MLE)		20.06
347				Theta hat (MLE)		0.774				Theta star (bias corrected MLE)		0.895
348				nu hat (MLE)		1021				nu star (bias corrected)		882.8
349				MLE Mean (bias corrected)		17.95				MLE Sd (bias corrected)		4.008
350										Approximate Chi Square Value (0.05)		814.8
351				Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		809.9
352												
353	**Assuming Gamma Distribution**											
354				95% Approximate Gamma UCL		19.45				95% Adjusted Gamma UCL		19.57
355												
356	**Lognormal GOF Test**											
357				Shapiro Wilk Test Statistic		0.762	**Shapiro Wilk Lognormal GOF Test**					
358				10% Shapiro Wilk Critical Value		0.926	Data Not Lognormal at 10% Significance Level					
359				Lilliefors Test Statistic		0.281	**Lilliefors Lognormal GOF Test**					
360				10% Lilliefors Critical Value		0.169	Data Not Lognormal at 10% Significance Level					
361	**Data Not Lognormal at 10% Significance Level**											
362												
363	**Lognormal Statistics**											
364				Minimum of Logged Data		2.639				Mean of logged Data		2.866
365				Maximum of Logged Data		3.564				SD of logged Data		0.199
366												
367	**Assuming Lognormal Distribution**											
368				95% H-UCL		19.35				90% Chebyshev (MVUE) UCL		20.19
369				95% Chebyshev (MVUE) UCL		21.23				97.5% Chebyshev (MVUE) UCL		22.67
370				99% Chebyshev (MVUE) UCL		25.5						
371												
372	**Nonparametric Distribution Free UCL Statistics**											
373	**Data do not follow a Discernible Distribution**											
374												
375	**Nonparametric Distribution Free UCLs**											
376				95% CLT UCL		19.52				95% BCA Bootstrap UCL		20.3
377				95% Standard Bootstrap UCL		19.5				95% Bootstrap-t UCL		21.37
378				95% Hall's Bootstrap UCL		25.88				95% Percentile Bootstrap UCL		19.59
379				90% Chebyshev(Mean, Sd) UCL		20.81				95% Chebyshev(Mean, Sd) UCL		22.1
380				97.5% Chebyshev(Mean, Sd) UCL		23.9				99% Chebyshev(Mean, Sd) UCL		27.43
381												
382	**Suggested UCL to Use**											
383				95% Student's-t UCL		19.59						
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

386	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
387	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
388												
389												
390	**ResultValue (apw-06s)**											
391												
392	**General Statistics**											
393						Total Number of Observations	23			Number of Distinct Observations	17	
394										Number of Missing Observations	0	
395						Minimum	19.4			Mean	24.64	
396						Maximum	36.1			Median	24	
397						SD	3.918			Std. Error of Mean	0.817	
398						Coefficient of Variation	0.159			Skewness	1.11	
399												
400	**Normal GOF Test**											
401						Shapiro Wilk Test Statistic	0.916			**Shapiro Wilk GOF Test**		
402						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
403						Lilliefors Test Statistic	0.126			**Lilliefors GOF Test**		
404						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
405	**Data appear Normal at 1% Significance Level**											
406												
407	**Assuming Normal Distribution**											
408	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
409						95% Student's-t UCL	26.04			95% Adjusted-CLT UCL (Chen-1995)	26.18	
410										95% Modified-t UCL (Johnson-1978)	26.07	
411												
412	**Gamma GOF Test**											
413						A-D Test Statistic	0.381			**Anderson-Darling Gamma GOF Test**		
414						5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level		
415						K-S Test Statistic	0.105			**Kolmogorov-Smirnov Gamma GOF Test**		
416						5% K-S Critical Value	0.181			Detected data appear Gamma Distributed at 5% Significance Level		
417	**Detected data appear Gamma Distributed at 5% Significance Level**											
418												
419	**Gamma Statistics**											
420						k hat (MLE)	44.46			k star (bias corrected MLE)	38.69	
421						Theta hat (MLE)	0.554			Theta star (bias corrected MLE)	0.637	
422						nu hat (MLE)	2045			nu star (bias corrected)	1780	
423						MLE Mean (bias corrected)	24.64			MLE Sd (bias corrected)	3.961	
424										Approximate Chi Square Value (0.05)	1683	
425						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	1676	
426												
427	**Assuming Gamma Distribution**											
428						95% Approximate Gamma UCL	26.06			95% Adjusted Gamma UCL	26.17	
429												
430	**Lognormal GOF Test**											
431						Shapiro Wilk Test Statistic	0.952			**Shapiro Wilk Lognormal GOF Test**		
432						10% Shapiro Wilk Critical Value	0.928			Data appear Lognormal at 10% Significance Level		
433						Lilliefors Test Statistic	0.103			**Lilliefors Lognormal GOF Test**		
434						10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level		
435	**Data appear Lognormal at 10% Significance Level**											
436												
437	**Lognormal Statistics**											
438						Minimum of Logged Data	2.965			Mean of logged Data	3.193	
439						Maximum of Logged Data	3.586			SD of logged Data	0.151	
440												

441	**Assuming Lognormal Distribution**											
442					95% H-UCL	26.07				90% Chebyshev (MVUE) UCL	26.97	
443					95% Chebyshev (MVUE) UCL	28.03				97.5% Chebyshev (MVUE) UCL	29.51	
444					99% Chebyshev (MVUE) UCL	32.4						
445												
446	**Nonparametric Distribution Free UCL Statistics**											
447	**Data appear to follow a Discernible Distribution**											
448												
449	**Nonparametric Distribution Free UCLs**											
450					95% CLT UCL	25.98				95% BCA Bootstrap UCL	26.18	
451					95% Standard Bootstrap UCL	25.98				95% Bootstrap-t UCL	26.32	
452					95% Hall's Bootstrap UCL	26.59				95% Percentile Bootstrap UCL	26.03	
453					90% Chebyshev(Mean, Sd) UCL	27.09				95% Chebyshev(Mean, Sd) UCL	28.2	
454					97.5% Chebyshev(Mean, Sd) UCL	29.74				99% Chebyshev(Mean, Sd) UCL	32.77	
455												
456	**Suggested UCL to Use**											
457					95% Student's-t UCL	26.04						
458												
459	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
460	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
461	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
462												
463												
464	**ResultValue (apw-07)**											
465												
466	**General Statistics**											
467					Total Number of Observations	22				Number of Distinct Observations	12	
468										Number of Missing Observations	0	
469					Minimum	8.97				Mean	12.24	
470					Maximum	16				Median	11.75	
471					SD	2.434				Std. Error of Mean	0.519	
472					Coefficient of Variation	0.199				Skewness	0.108	
473												
474	**Normal GOF Test**											
475					Shapiro Wilk Test Statistic	0.879				**Shapiro Wilk GOF Test**		
476					1% Shapiro Wilk Critical Value	0.878				Data appear Normal at 1% Significance Level		
477					Lilliefors Test Statistic	0.189				**Lilliefors GOF Test**		
478					1% Lilliefors Critical Value	0.214				Data appear Normal at 1% Significance Level		
479	**Data appear Normal at 1% Significance Level**											
480												
481	**Assuming Normal Distribution**											
482					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
483					95% Student's-t UCL	13.14				95% Adjusted-CLT UCL (Chen-1995)	13.11	
484										95% Modified-t UCL (Johnson-1978)	13.14	
485												
486	**Gamma GOF Test**											
487					A-D Test Statistic	1.042				**Anderson-Darling Gamma GOF Test**		
488					5% A-D Critical Value	0.741				Data Not Gamma Distributed at 5% Significance Level		
489					K-S Test Statistic	0.191				**Kolmogorov-Smirnov Gamma GOF Test**		
490					5% K-S Critical Value	0.185				Data Not Gamma Distributed at 5% Significance Level		
491	**Data Not Gamma Distributed at 5% Significance Level**											
492												
493	**Gamma Statistics**											
494					k hat (MLE)	26.29				k star (bias corrected MLE)	22.73	
495					Theta hat (MLE)	0.466				Theta star (bias corrected MLE)	0.539	

496					nu hat (MLE)	1157				nu star (bias corrected)		1000
497					MLE Mean (bias corrected)	12.24				MLE Sd (bias corrected)		2.568
498										Approximate Chi Square Value (0.05)		927.8
499					Adjusted Level of Significance	0.0386				Adjusted Chi Square Value		922.6
500												
501					**Assuming Gamma Distribution**							
502					95% Approximate Gamma UCL	13.2				95% Adjusted Gamma UCL		13.27
503												
504					**Lognormal GOF Test**							
505					Shapiro Wilk Test Statistic	0.886				**Shapiro Wilk Lognormal GOF Test**		
506					10% Shapiro Wilk Critical Value	0.926				Data Not Lognormal at 10% Significance Level		
507					Lilliefors Test Statistic	0.186				**Lilliefors Lognormal GOF Test**		
508					10% Lilliefors Critical Value	0.169				Data Not Lognormal at 10% Significance Level		
509					**Data Not Lognormal at 10% Significance Level**							
510												
511					**Lognormal Statistics**							
512					Minimum of Logged Data	2.194				Mean of logged Data		2.486
513					Maximum of Logged Data	2.773				SD of logged Data		0.201
514												
515					**Assuming Lognormal Distribution**							
516					95% H-UCL	13.25				90% Chebyshev (MVUE) UCL		13.83
517					95% Chebyshev (MVUE) UCL	14.55				97.5% Chebyshev (MVUE) UCL		15.54
518					99% Chebyshev (MVUE) UCL	17.5						
519												
520					**Nonparametric Distribution Free UCL Statistics**							
521					**Data appear to follow a Discernible Distribution**							
522												
523					**Nonparametric Distribution Free UCLs**							
524					95% CLT UCL	13.1				95% BCA Bootstrap UCL		13.15
525					95% Standard Bootstrap UCL	13.1				95% Bootstrap-t UCL		13.19
526					95% Hall's Bootstrap UCL	13.1				95% Percentile Bootstrap UCL		13.07
527					90% Chebyshev(Mean, Sd) UCL	13.8				95% Chebyshev(Mean, Sd) UCL		14.51
528					97.5% Chebyshev(Mean, Sd) UCL	15.49				99% Chebyshev(Mean, Sd) UCL		17.41
529												
530					**Suggested UCL to Use**							
531					95% Student's-t UCL	13.14						
532												
533					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
534					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
535					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
536												
537												
538	**ResultValue (apw-08)**											
539												
540					**General Statistics**							
541					Total Number of Observations	23				Number of Distinct Observations		13
542										Number of Missing Observations		0
543					Minimum	7.46				Mean		10.03
544					Maximum	13				Median		10
545					SD	1.323				Std. Error of Mean		0.276
546					Coefficient of Variation	0.132				Skewness		0.284
547												
548					**Normal GOF Test**							
549					Shapiro Wilk Test Statistic	0.967				**Shapiro Wilk GOF Test**		
550					1% Shapiro Wilk Critical Value	0.881				Data appear Normal at 1% Significance Level		

551				Lilliefors Test Statistic	0.142	**Lilliefors GOF Test**						
552				1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level						
553	**Data appear Normal at 1% Significance Level**											
554												
555	**Assuming Normal Distribution**											
556	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
557				95% Student's-t UCL	10.51	95% Adjusted-CLT UCL (Chen-1995)	10.5					
558						95% Modified-t UCL (Johnson-1978)	10.51					
559												
560	**Gamma GOF Test**											
561				A-D Test Statistic	0.403	**Anderson-Darling Gamma GOF Test**						
562				5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level						
563				K-S Test Statistic	0.159	**Kolmogorov-Smirnov Gamma GOF Test**						
564				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
565	**Detected data appear Gamma Distributed at 5% Significance Level**											
566												
567	**Gamma Statistics**											
568				k hat (MLE)	60.3	k star (bias corrected MLE)	52.46					
569				Theta hat (MLE)	0.166	Theta star (bias corrected MLE)	0.191					
570				nu hat (MLE)	2774	nu star (bias corrected)	2413					
571				MLE Mean (bias corrected)	10.03	MLE Sd (bias corrected)	1.385					
572						Approximate Chi Square Value (0.05)	2300					
573				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	2292					
574												
575	**Assuming Gamma Distribution**											
576				95% Approximate Gamma UCL	10.53	95% Adjusted Gamma UCL	10.56					
577												
578	**Lognormal GOF Test**											
579				Shapiro Wilk Test Statistic	0.971	**Shapiro Wilk Lognormal GOF Test**						
580				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
581				Lilliefors Test Statistic	0.168	**Lilliefors Lognormal GOF Test**						
582				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
583	**Data appear Approximate Lognormal at 10% Significance Level**											
584												
585	**Lognormal Statistics**											
586				Minimum of Logged Data	2.01	Mean of logged Data	2.297					
587				Maximum of Logged Data	2.565	SD of logged Data	0.132					
588												
589	**Assuming Lognormal Distribution**											
590				95% H-UCL	10.54	90% Chebyshev (MVUE) UCL	10.86					
591				95% Chebyshev (MVUE) UCL	11.24	97.5% Chebyshev (MVUE) UCL	11.76					
592				99% Chebyshev (MVUE) UCL	12.79							
593												
594	**Nonparametric Distribution Free UCL Statistics**											
595	**Data appear to follow a Discernible Distribution**											
596												
597	**Nonparametric Distribution Free UCLs**											
598				95% CLT UCL	10.49	95% BCA Bootstrap UCL	10.47					
599				95% Standard Bootstrap UCL	10.47	95% Bootstrap-t UCL	10.51					
600				95% Hall's Bootstrap UCL	10.51	95% Percentile Bootstrap UCL	10.47					
601				90% Chebyshev(Mean, Sd) UCL	10.86	95% Chebyshev(Mean, Sd) UCL	11.24					
602				97.5% Chebyshev(Mean, Sd) UCL	11.76	99% Chebyshev(Mean, Sd) UCL	12.78					
603												
604	**Suggested UCL to Use**											
605				95% Student's-t UCL	10.51							

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ResultValue (apw-10d)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	10	Mean	15.64
Maximum	25.5	Median	15.4
SD	3.869	Std. Error of Mean	0.807
Coefficient of Variation	0.247	Skewness	0.968

Normal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.189	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	17.02	95% Adjusted-CLT UCL (Chen-1995)	17.14
		95% Modified-t UCL (Johnson-1978)	17.05

Gamma GOF Test

A-D Test Statistic	0.452	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.156	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	18.27	k star (bias corrected MLE)	15.92
Theta hat (MLE)	0.856	Theta star (bias corrected MLE)	0.982
nu hat (MLE)	840.6	nu star (bias corrected)	732.2
MLE Mean (bias corrected)	15.64	MLE Sd (bias corrected)	3.92
		Approximate Chi Square Value (0.05)	670.5
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	666.2

Assuming Gamma Distribution

95% Approximate Gamma UCL	17.08	95% Adjusted Gamma UCL	17.19

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.147	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.303	Mean of logged Data	2.722

661				Maximum of Logged Data	3.239					SD of logged Data	0.238	
662												
663					**Assuming Lognormal Distribution**							
664				95% H-UCL	17.14					90% Chebyshev (MVUE) UCL	17.98	
665				95% Chebyshev (MVUE) UCL	19.05					97.5% Chebyshev (MVUE) UCL	20.53	
666				99% Chebyshev (MVUE) UCL	23.44							
667												
668					**Nonparametric Distribution Free UCL Statistics**							
669					**Data appear to follow a Discernible Distribution**							
670												
671					**Nonparametric Distribution Free UCLs**							
672				95% CLT UCL	16.97					95% BCA Bootstrap UCL	17.04	
673				95% Standard Bootstrap UCL	16.91					95% Bootstrap-t UCL	17.34	
674				95% Hall's Bootstrap UCL	17.7					95% Percentile Bootstrap UCL	16.89	
675				90% Chebyshev(Mean, Sd) UCL	18.06					95% Chebyshev(Mean, Sd) UCL	19.16	
676				97.5% Chebyshev(Mean, Sd) UCL	20.68					99% Chebyshev(Mean, Sd) UCL	23.67	
677												
678					**Suggested UCL to Use**							
679				95% Student's-t UCL	17.02							
680												
681	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
682	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
683	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
684												
685												
686	**ResultValue (apw-10s)**											
687												
688					**General Statistics**							
689				Total Number of Observations	23					Number of Distinct Observations	17	
690										Number of Missing Observations	0	
691				Minimum	6					Mean	11.82	
692				Maximum	21					Median	12	
693				SD	4.74					Std. Error of Mean	0.988	
694				Coefficient of Variation	0.401					Skewness	0.243	
695												
696					**Normal GOF Test**							
697				Shapiro Wilk Test Statistic	0.921					**Shapiro Wilk GOF Test**		
698				1% Shapiro Wilk Critical Value	0.881					Data appear Normal at 1% Significance Level		
699				Lilliefors Test Statistic	0.151					**Lilliefors GOF Test**		
700				1% Lilliefors Critical Value	0.209					Data appear Normal at 1% Significance Level		
701					**Data appear Normal at 1% Significance Level**							
702												
703					**Assuming Normal Distribution**							
704					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
705				95% Student's-t UCL	13.52					95% Adjusted-CLT UCL (Chen-1995)	13.5	
706										95% Modified-t UCL (Johnson-1978)	13.53	
707												
708					**Gamma GOF Test**							
709				A-D Test Statistic	0.801					**Anderson-Darling Gamma GOF Test**		
710				5% A-D Critical Value	0.746					Data Not Gamma Distributed at 5% Significance Level		
711				K-S Test Statistic	0.174					**Kolmogorov-Smirnov Gamma GOF Test**		
712				5% K-S Critical Value	0.182					Detected data appear Gamma Distributed at 5% Significance Level		
713					**Detected data follow Appr. Gamma Distribution at 5% Significance Level**							
714												
715					**Gamma Statistics**							

716					k hat (MLE)	6.089				k star (bias corrected MLE)		5.324
717					Theta hat (MLE)	1.942				Theta star (bias corrected MLE)		2.221
718					nu hat (MLE)	280.1				nu star (bias corrected)		244.9
719					MLE Mean (bias corrected)	11.82				MLE Sd (bias corrected)		5.124
720										Approximate Chi Square Value (0.05)		209.7
721					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		207.3
722												
723					**Assuming Gamma Distribution**							
724					95% Approximate Gamma UCL	13.81				95% Adjusted Gamma UCL		13.97
725												
726					**Lognormal GOF Test**							
727					Shapiro Wilk Test Statistic	0.888				**Shapiro Wilk Lognormal GOF Test**		
728					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
729					Lilliefors Test Statistic	0.176				**Lilliefors Lognormal GOF Test**		
730					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
731					**Data Not Lognormal at 10% Significance Level**							
732												
733					**Lognormal Statistics**							
734					Minimum of Logged Data	1.792				Mean of logged Data		2.386
735					Maximum of Logged Data	3.045				SD of logged Data		0.432
736												
737					**Assuming Lognormal Distribution**							
738					95% H-UCL	14.23				90% Chebyshev (MVUE) UCL		15.18
739					95% Chebyshev (MVUE) UCL	16.67				97.5% Chebyshev (MVUE) UCL		18.75
740					99% Chebyshev (MVUE) UCL	22.83						
741												
742					**Nonparametric Distribution Free UCL Statistics**							
743					**Data appear to follow a Discernible Distribution**							
744												
745					**Nonparametric Distribution Free UCLs**							
746					95% CLT UCL	13.45				95% BCA Bootstrap UCL		13.52
747					95% Standard Bootstrap UCL	13.45				95% Bootstrap-t UCL		13.65
748					95% Hall's Bootstrap UCL	13.54				95% Percentile Bootstrap UCL		13.4
749					90% Chebyshev(Mean, Sd) UCL	14.79				95% Chebyshev(Mean, Sd) UCL		16.13
750					97.5% Chebyshev(Mean, Sd) UCL	17.99				99% Chebyshev(Mean, Sd) UCL		21.66
751												
752					**Suggested UCL to Use**							
753					95% Student's-t UCL	13.52						
754												
755	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
756	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
757	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
758												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Chromium
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:19:43 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_q.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.002	Mean	0.0308
Maximum	0.127	Median	0.0191
SD	0.035	Std. Error of Mean	0.0073
Coefficient of Variation	1.135	Skewness	1.654

Normal GOF Test

Shapiro Wilk Test Statistic	0.785	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0434	95% Adjusted-CLT UCL (Chen-1995)	0.0455
		95% Modified-t UCL (Johnson-1978)	0.0438

Gamma GOF Test

A-D Test Statistic	0.309	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.776	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.103	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.188	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.874	k star (bias corrected MLE)	0.789
Theta hat (MLE)	0.0353	Theta star (bias corrected MLE)	0.0391
nu hat (MLE)	40.19	nu star (bias corrected)	36.28
MLE Mean (bias corrected)	0.0308	MLE Sd (bias corrected)	0.0347
		Approximate Chi Square Value (0.05)	23.49
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	22.75

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0476	95% Adjusted Gamma UCL	0.0492

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.102	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-6.215				Mean of logged Data	-4.151
60						Maximum of Logged Data	-2.064				SD of logged Data	1.286
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.0803				90% Chebyshev (MVUE) UCL	0.0662
64						95% Chebyshev (MVUE) UCL	0.0808				97.5% Chebyshev (MVUE) UCL	0.101
65						99% Chebyshev (MVUE) UCL	0.141					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0428				95% BCA Bootstrap UCL	0.0461
72						95% Standard Bootstrap UCL	0.0429				95% Bootstrap-t UCL	0.0498
73						95% Hall's Bootstrap UCL	0.0492				95% Percentile Bootstrap UCL	0.0435
74						90% Chebyshev(Mean, Sd) UCL	0.0527				95% Chebyshev(Mean, Sd) UCL	0.0626
75						97.5% Chebyshev(Mean, Sd) UCL	0.0764				99% Chebyshev(Mean, Sd) UCL	0.103
76												
77	**Suggested UCL to Use**											
78						95% Adjusted Gamma UCL	0.0492					
79												
80	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
81	**Please verify the data were collected from random locations.**											
82	**If the data were collected using judgmental or other non-random methods,**											
83	**then contact a statistician to correctly calculate UCLs.**											
84												
85	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
86	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
88												
89												
90	**ResultValue (apw-03)**											
91												
92	**General Statistics**											
93						Total Number of Observations	23				Number of Distinct Observations	14
94											Number of Missing Observations	0
95						Minimum	0.001				Mean	0.00418
96						Maximum	0.0241				Median	0.002
97						SD	0.00514				Std. Error of Mean	0.00107
98						Coefficient of Variation	1.232				Skewness	3.016
99												
100	**Normal GOF Test**											
101						Shapiro Wilk Test Statistic	0.599				**Shapiro Wilk GOF Test**	
102						1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level	
103						Lilliefors Test Statistic	0.316				**Lilliefors GOF Test**	
104						1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level	
105	**Data Not Normal at 1% Significance Level**											
106												
107	**Assuming Normal Distribution**											
108						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
109						95% Student's-t UCL	0.00602				95% Adjusted-CLT UCL (Chen-1995)	0.00666
110											95% Modified-t UCL (Johnson-1978)	0.00613

111												
112						**Gamma GOF Test**						
113					A-D Test Statistic	1.851		**Anderson-Darling Gamma GOF Test**				
114					5% A-D Critical Value	0.762		Data Not Gamma Distributed at 5% Significance Level				
115					K-S Test Statistic	0.283		**Kolmogorov-Smirnov Gamma GOF Test**				
116					5% K-S Critical Value	0.185		Data Not Gamma Distributed at 5% Significance Level				
117					**Data Not Gamma Distributed at 5% Significance Level**							
118												
119					**Gamma Statistics**							
120					k hat (MLE)	1.37		k star (bias corrected MLE)	1.22			
121					Theta hat (MLE)	0.00305		Theta star (bias corrected MLE)	0.00342			
122					nu hat (MLE)	63.03		nu star (bias corrected)	56.14			
123					MLE Mean (bias corrected)	0.00418		MLE Sd (bias corrected)	0.00378			
124								Approximate Chi Square Value (0.05)	39.92			
125					Adjusted Level of Significance	0.0389		Adjusted Chi Square Value	38.93			
126												
127					**Assuming Gamma Distribution**							
128					95% Approximate Gamma UCL	0.00587		95% Adjusted Gamma UCL	0.00602			
129												
130					**Lognormal GOF Test**							
131					Shapiro Wilk Test Statistic	0.877		**Shapiro Wilk Lognormal GOF Test**				
132					10% Shapiro Wilk Critical Value	0.928		Data Not Lognormal at 10% Significance Level				
133					Lilliefors Test Statistic	0.257		**Lilliefors Lognormal GOF Test**				
134					10% Lilliefors Critical Value	0.165		Data Not Lognormal at 10% Significance Level				
135					**Data Not Lognormal at 10% Significance Level**							
136												
137					**Lognormal Statistics**							
138					Minimum of Logged Data	-6.908		Mean of logged Data	-5.886			
139					Maximum of Logged Data	-3.726		SD of logged Data	0.825			
140												
141					**Assuming Lognormal Distribution**							
142					95% H-UCL	0.00586		90% Chebyshev (MVUE) UCL	0.006			
143					95% Chebyshev (MVUE) UCL	0.00698		97.5% Chebyshev (MVUE) UCL	0.00834			
144					99% Chebyshev (MVUE) UCL	0.011						
145												
146					**Nonparametric Distribution Free UCL Statistics**							
147					**Data do not follow a Discernible Distribution**							
148												
149					**Nonparametric Distribution Free UCLs**							
150					95% CLT UCL	0.00594		95% BCA Bootstrap UCL	0.00691			
151					95% Standard Bootstrap UCL	0.00589		95% Bootstrap-t UCL	0.00792			
152					95% Hall's Bootstrap UCL	0.0127		95% Percentile Bootstrap UCL	0.0061			
153					90% Chebyshev(Mean, Sd) UCL	0.00739		95% Chebyshev(Mean, Sd) UCL	0.00885			
154					97.5% Chebyshev(Mean, Sd) UCL	0.0109		99% Chebyshev(Mean, Sd) UCL	0.0148			
155												
156					**Suggested UCL to Use**							
157					95% Student's-t UCL	0.00602						
158												
159					**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**							
160					**Please verify the data were collected from random locations.**							
161					**If the data were collected using judgmental or other non-random methods,**							
162					**then contact a statistician to correctly calculate UCLs.**							
163												
164					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
165					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							

166	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
167												
168												
169	**ResultValue (apw-05)**											
170												
171	**General Statistics**											
172						Total Number of Observations	12			Number of Distinct Observations	7	
173										Number of Missing Observations	0	
174						Minimum	0.001			Mean	0.0033	
175						Maximum	0.0137			Median	0.0015	
176						SD	0.00391			Std. Error of Mean	0.00113	
177						Coefficient of Variation	1.186			Skewness	2.158	
178												
179	**Normal GOF Test**											
180						Shapiro Wilk Test Statistic	0.656			**Shapiro Wilk GOF Test**		
181						1% Shapiro Wilk Critical Value	0.805			Data Not Normal at 1% Significance Level		
182						Lilliefors Test Statistic	0.335			**Lilliefors GOF Test**		
183						1% Lilliefors Critical Value	0.281			Data Not Normal at 1% Significance Level		
184	**Data Not Normal at 1% Significance Level**											
185												
186	**Assuming Normal Distribution**											
187					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
188						95% Student's-t UCL	0.00533			95% Adjusted-CLT UCL (Chen-1995)	0.00591	
189										95% Modified-t UCL (Johnson-1978)	0.00545	
190												
191	**Gamma GOF Test**											
192						A-D Test Statistic	1.227			**Anderson-Darling Gamma GOF Test**		
193						5% A-D Critical Value	0.751			Data Not Gamma Distributed at 5% Significance Level		
194						K-S Test Statistic	0.329			**Kolmogorov-Smirnov Gamma GOF Test**		
195						5% K-S Critical Value	0.251			Data Not Gamma Distributed at 5% Significance Level		
196	**Data Not Gamma Distributed at 5% Significance Level**											
197												
198	**Gamma Statistics**											
199						k hat (MLE)	1.275			k star (bias corrected MLE)	1.012	
200						Theta hat (MLE)	0.00259			Theta star (bias corrected MLE)	0.00326	
201						nu hat (MLE)	30.6			nu star (bias corrected)	24.28	
202						MLE Mean (bias corrected)	0.0033			MLE Sd (bias corrected)	0.00328	
203										Approximate Chi Square Value (0.05)	14.07	
204						Adjusted Level of Significance	0.029			Adjusted Chi Square Value	12.89	
205												
206	**Assuming Gamma Distribution**											
207						95% Approximate Gamma UCL	0.0057			95% Adjusted Gamma UCL	0.00622	
208												
209	**Lognormal GOF Test**											
210						Shapiro Wilk Test Statistic	0.817			**Shapiro Wilk Lognormal GOF Test**		
211						10% Shapiro Wilk Critical Value	0.883			Data Not Lognormal at 10% Significance Level		
212						Lilliefors Test Statistic	0.292			**Lilliefors Lognormal GOF Test**		
213						10% Lilliefors Critical Value	0.223			Data Not Lognormal at 10% Significance Level		
214	**Data Not Lognormal at 10% Significance Level**											
215												
216	**Lognormal Statistics**											
217						Minimum of Logged Data	-6.908			Mean of logged Data	-6.155	
218						Maximum of Logged Data	-4.29			SD of logged Data	0.89	
219												
220	**Assuming Lognormal Distribution**											

221				95% H-UCL	0.00654				90% Chebyshev (MVUE) UCL	0.00549		
222				95% Chebyshev (MVUE) UCL	0.00661				97.5% Chebyshev (MVUE) UCL	0.00816		
223				99% Chebyshev (MVUE) UCL	0.0112							
224												
225						**Nonparametric Distribution Free UCL Statistics**							
226						**Data do not follow a Discernible Distribution**							
227												
228						**Nonparametric Distribution Free UCLs**							
229				95% CLT UCL	0.00516				95% BCA Bootstrap UCL	0.00579		
230				95% Standard Bootstrap UCL	0.00506				95% Bootstrap-t UCL	0.00969		
231				95% Hall's Bootstrap UCL	0.0132				95% Percentile Bootstrap UCL	0.00519		
232				90% Chebyshev(Mean, Sd) UCL	0.00669				95% Chebyshev(Mean, Sd) UCL	0.00823		
233				97.5% Chebyshev(Mean, Sd) UCL	0.0104				99% Chebyshev(Mean, Sd) UCL	0.0145		
234												
235						**Suggested UCL to Use**							
236				95% Student's-t UCL	0.00533							
237												
238						**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**							
239						**Please verify the data were collected from random locations.**							
240						**If the data were collected using judgmental or other non-random methods,**							
241						**then contact a statistician to correctly calculate UCLs.**							
242												
243						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
244						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
245						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
246												
247												
248	**ResultValue (apw-05r)**											
249												
250						**General Statistics**							
251				Total Number of Observations	10				Number of Distinct Observations	2		
252									Number of Missing Observations	0		
253				Minimum	0.002				Mean	0.00211		
254				Maximum	0.0031				Median	0.002		
255				SD	3.4785E-4				Std. Error of Mean	1.1000E-4		
256				Coefficient of Variation	0.165				Skewness	3.162		
257												
258						**Normal GOF Test**							
259				Shapiro Wilk Test Statistic	0.366				**Shapiro Wilk GOF Test**			
260				1% Shapiro Wilk Critical Value	0.781				Data Not Normal at 1% Significance Level			
261				Lilliefors Test Statistic	0.524				**Lilliefors GOF Test**			
262				1% Lilliefors Critical Value	0.304				Data Not Normal at 1% Significance Level			
263						**Data Not Normal at 1% Significance Level**							
264												
265						**Assuming Normal Distribution**							
266				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
267				95% Student's-t UCL	0.00231				95% Adjusted-CLT UCL (Chen-1995)	0.00241		
268									95% Modified-t UCL (Johnson-1978)	0.00233		
269												
270						**Gamma GOF Test**							
271				A-D Test Statistic	3.297				**Anderson-Darling Gamma GOF Test**			
272				5% A-D Critical Value	0.724				Data Not Gamma Distributed at 5% Significance Level			
273				K-S Test Statistic	0.531				**Kolmogorov-Smirnov Gamma GOF Test**			
274				5% K-S Critical Value	0.266				Data Not Gamma Distributed at 5% Significance Level			
275						**Data Not Gamma Distributed at 5% Significance Level**							

276												
277						**Gamma Statistics**						
278					k hat (MLE)	51.63				k star (bias corrected MLE)	36.21	
279					Theta hat (MLE)	4.0867E-5				Theta star (bias corrected MLE)	5.8273E-5	
280					nu hat (MLE)	1033				nu star (bias corrected)	724.2	
281					MLE Mean (bias corrected)	0.00211				MLE Sd (bias corrected)	3.5065E-4	
282										Approximate Chi Square Value (0.05)	662.7	
283					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value	652.5	
284												
285						**Assuming Gamma Distribution**						
286					95% Approximate Gamma UCL	0.00231				95% Adjusted Gamma UCL	0.00234	
287												
288						**Lognormal GOF Test**						
289					Shapiro Wilk Test Statistic	0.366				**Shapiro Wilk Lognormal GOF Test**		
290					10% Shapiro Wilk Critical Value	0.869				Data Not Lognormal at 10% Significance Level		
291					Lilliefors Test Statistic	0.524				**Lilliefors Lognormal GOF Test**		
292					10% Lilliefors Critical Value	0.241				Data Not Lognormal at 10% Significance Level		
293						**Data Not Lognormal at 10% Significance Level**						
294												
295						**Lognormal Statistics**						
296					Minimum of Logged Data	-6.215				Mean of logged Data	-6.171	
297					Maximum of Logged Data	-5.776				SD of logged Data	0.139	
298												
299						**Assuming Lognormal Distribution**						
300					95% H-UCL	0.0023				90% Chebyshev (MVUE) UCL	0.00239	
301					95% Chebyshev (MVUE) UCL	0.00251				97.5% Chebyshev (MVUE) UCL	0.00269	
302					99% Chebyshev (MVUE) UCL	0.00303						
303												
304						**Nonparametric Distribution Free UCL Statistics**						
305						**Data do not follow a Discernible Distribution**						
306												
307						**Nonparametric Distribution Free UCLs**						
308					95% CLT UCL	0.00229				95% BCA Bootstrap UCL	N/A	
309					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL	N/A	
310					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A	
311					90% Chebyshev(Mean, Sd) UCL	0.00244				95% Chebyshev(Mean, Sd) UCL	0.00259	
312					97.5% Chebyshev(Mean, Sd) UCL	0.0028				99% Chebyshev(Mean, Sd) UCL	0.0032	
313												
314						**Suggested UCL to Use**						
315					95% Student's-t UCL	0.00231						
316												
317	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
318	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
319	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
320												
321												
322	**ResultValue (apw-06d)**											
323												
324						**General Statistics**						
325					Total Number of Observations	22				Number of Distinct Observations	12	
326										Number of Missing Observations	0	
327					Minimum	0.001				Mean	0.00981	
328					Maximum	0.0945				Median	0.002	
329					SD	0.0242				Std. Error of Mean	0.00516	
330					Coefficient of Variation	2.468				Skewness	3.13	

331												
332						**Normal GOF Test**						
333					Shapiro Wilk Test Statistic	0.396		**Shapiro Wilk GOF Test**				
334					1% Shapiro Wilk Critical Value	0.878		Data Not Normal at 1% Significance Level				
335					Lilliefors Test Statistic	0.429		**Lilliefors GOF Test**				
336					1% Lilliefors Critical Value	0.214		Data Not Normal at 1% Significance Level				
337					**Data Not Normal at 1% Significance Level**							
338												
339					**Assuming Normal Distribution**							
340					**95% Normal UCL**			**95% UCLs (Adjusted for Skewness)**				
341					95% Student's-t UCL	0.0187		95% Adjusted-CLT UCL (Chen-1995)	0.022			
342								95% Modified-t UCL (Johnson-1978)	0.0193			
343												
344					**Gamma GOF Test**							
345					A-D Test Statistic	4.169		**Anderson-Darling Gamma GOF Test**				
346					5% A-D Critical Value	0.805		Data Not Gamma Distributed at 5% Significance Level				
347					K-S Test Statistic	0.378		**Kolmogorov-Smirnov Gamma GOF Test**				
348					5% K-S Critical Value	0.196		Data Not Gamma Distributed at 5% Significance Level				
349					**Data Not Gamma Distributed at 5% Significance Level**							
350												
351					**Gamma Statistics**							
352					k hat (MLE)	0.498		k star (bias corrected MLE)	0.461			
353					Theta hat (MLE)	0.0197		Theta star (bias corrected MLE)	0.0213			
354					nu hat (MLE)	21.93		nu star (bias corrected)	20.27			
355					MLE Mean (bias corrected)	0.00981		MLE Sd (bias corrected)	0.0144			
356								Approximate Chi Square Value (0.05)	11.05			
357					Adjusted Level of Significance	0.0386		Adjusted Chi Square Value	10.55			
358												
359					**Assuming Gamma Distribution**							
360					95% Approximate Gamma UCL	0.018		95% Adjusted Gamma UCL	0.0188			
361												
362					**Lognormal GOF Test**							
363					Shapiro Wilk Test Statistic	0.714		**Shapiro Wilk Lognormal GOF Test**				
364					10% Shapiro Wilk Critical Value	0.926		Data Not Lognormal at 10% Significance Level				
365					Lilliefors Test Statistic	0.327		**Lilliefors Lognormal GOF Test**				
366					10% Lilliefors Critical Value	0.169		Data Not Lognormal at 10% Significance Level				
367					**Data Not Lognormal at 10% Significance Level**							
368												
369					**Lognormal Statistics**							
370					Minimum of Logged Data	-6.908		Mean of logged Data	-5.9			
371					Maximum of Logged Data	-2.359		SD of logged Data	1.25			
372												
373					**Assuming Lognormal Distribution**							
374					95% H-UCL	0.0134		90% Chebyshev (MVUE) UCL	0.0109			
375					95% Chebyshev (MVUE) UCL	0.0133		97.5% Chebyshev (MVUE) UCL	0.0167			
376					99% Chebyshev (MVUE) UCL	0.0232						
377												
378					**Nonparametric Distribution Free UCL Statistics**							
379					**Data do not follow a Discernible Distribution**							
380												
381					**Nonparametric Distribution Free UCLs**							
382					95% CLT UCL	0.0183		95% BCA Bootstrap UCL	0.0233			
383					95% Standard Bootstrap UCL	0.018		95% Bootstrap-t UCL	0.108			
384					95% Hall's Bootstrap UCL	0.0845		95% Percentile Bootstrap UCL	0.0187			
385					90% Chebyshev(Mean, Sd) UCL	0.0253		95% Chebyshev(Mean, Sd) UCL	0.0323			

386				97.5% Chebyshev(Mean, Sd) UCL	0.042					99% Chebyshev(Mean, Sd) UCL	0.0611	
387												
388					**Suggested UCL to Use**							
389				95% Student's-t UCL	0.0187							
390												
391					**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**							
392					**Please verify the data were collected from random locations.**							
393					**If the data were collected using judgmental or other non-random methods,**							
394					**then contact a statistician to correctly calculate UCLs.**							
395												
396					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
397					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
398					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
399												
400												
401	**ResultValue (apw-06s)**											
402												
403					**General Statistics**							
404				Total Number of Observations	23					Number of Distinct Observations	13	
405										Number of Missing Observations	0	
406				Minimum	0.001					Mean	0.00433	
407				Maximum	0.0326					Median	0.002	
408				SD	0.00704					Std. Error of Mean	0.00147	
409				Coefficient of Variation	1.628					Skewness	3.49	
410												
411					**Normal GOF Test**							
412				Shapiro Wilk Test Statistic	0.474					**Shapiro Wilk GOF Test**		
413				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
414				Lilliefors Test Statistic	0.368					**Lilliefors GOF Test**		
415				1% Lilliefors Critical Value	0.209					Data Not Normal at 1% Significance Level		
416					**Data Not Normal at 1% Significance Level**							
417												
418					**Assuming Normal Distribution**							
419				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
420				95% Student's-t UCL	0.00685					95% Adjusted-CLT UCL (Chen-1995)	0.00788	
421										95% Modified-t UCL (Johnson-1978)	0.00702	
422												
423					**Gamma GOF Test**							
424				A-D Test Statistic	2.684					**Anderson-Darling Gamma GOF Test**		
425				5% A-D Critical Value	0.768					Data Not Gamma Distributed at 5% Significance Level		
426				K-S Test Statistic	0.317					**Kolmogorov-Smirnov Gamma GOF Test**		
427				5% K-S Critical Value	0.186					Data Not Gamma Distributed at 5% Significance Level		
428					**Data Not Gamma Distributed at 5% Significance Level**							
429												
430					**Gamma Statistics**							
431				k hat (MLE)	1.076					k star (bias corrected MLE)	0.965	
432				Theta hat (MLE)	0.00402					Theta star (bias corrected MLE)	0.00448	
433				nu hat (MLE)	49.51					nu star (bias corrected)	44.39	
434				MLE Mean (bias corrected)	0.00433					MLE Sd (bias corrected)	0.0044	
435										Approximate Chi Square Value (0.05)	30.11	
436				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	29.25	
437												
438					**Assuming Gamma Distribution**							
439				95% Approximate Gamma UCL	0.00638					95% Adjusted Gamma UCL	0.00656	
440												

441	**Lognormal GOF Test**											
442					Shapiro Wilk Test Statistic	0.823	**Shapiro Wilk Lognormal GOF Test**					
443					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
444					Lilliefors Test Statistic	0.238	**Lilliefors Lognormal GOF Test**					
445					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
446	**Data Not Lognormal at 10% Significance Level**											
447												
448	**Lognormal Statistics**											
449					Minimum of Logged Data	-6.908				Mean of logged Data	-5.975	
450					Maximum of Logged Data	-3.423				SD of logged Data	0.865	
451												
452	**Assuming Lognormal Distribution**											
453					95% H-UCL	0.00571				90% Chebyshev (MVUE) UCL	0.00578	
454					95% Chebyshev (MVUE) UCL	0.00675				97.5% Chebyshev (MVUE) UCL	0.00811	
455					99% Chebyshev (MVUE) UCL	0.0108						
456												
457	**Nonparametric Distribution Free UCL Statistics**											
458	**Data do not follow a Discernible Distribution**											
459												
460	**Nonparametric Distribution Free UCLs**											
461					95% CLT UCL	0.00674				95% BCA Bootstrap UCL	0.00834	
462					95% Standard Bootstrap UCL	0.00673				95% Bootstrap-t UCL	0.0147	
463					95% Hall's Bootstrap UCL	0.0168				95% Percentile Bootstrap UCL	0.00693	
464					90% Chebyshev(Mean, Sd) UCL	0.00873				95% Chebyshev(Mean, Sd) UCL	0.0107	
465					97.5% Chebyshev(Mean, Sd) UCL	0.0135				99% Chebyshev(Mean, Sd) UCL	0.0189	
466												
467	**Suggested UCL to Use**											
468					95% Student's-t UCL	0.00685						
469												
470	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
471	**Please verify the data were collected from random locations.**											
472	**If the data were collected using judgmental or other non-random methods,**											
473	**then contact a statistician to correctly calculate UCLs.**											
474												
475	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
476	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
477	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
478												
479												
480	**ResultValue (apw-07)**											
481												
482	**General Statistics**											
483					Total Number of Observations	22				Number of Distinct Observations	12	
484										Number of Missing Observations	0	
485					Minimum	0.001				Mean	0.00374	
486					Maximum	0.0329				Median	0.002	
487					SD	0.00666				Std. Error of Mean	0.00142	
488					Coefficient of Variation	1.783				Skewness	4.37	
489												
490	**Normal GOF Test**											
491					Shapiro Wilk Test Statistic	0.378	**Shapiro Wilk GOF Test**					
492					1% Shapiro Wilk Critical Value	0.878	Data Not Normal at 1% Significance Level					
493					Lilliefors Test Statistic	0.342	**Lilliefors GOF Test**					
494					1% Lilliefors Critical Value	0.214	Data Not Normal at 1% Significance Level					
495	**Data Not Normal at 1% Significance Level**											

496												
497	**Assuming Normal Distribution**											
498	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
499			95% Student's-t UCL		0.00618			95% Adjusted-CLT UCL (Chen-1995)				0.00749
500								95% Modified-t UCL (Johnson-1978)				0.0064
501												
502	**Gamma GOF Test**											
503			A-D Test Statistic		2.691		**Anderson-Darling Gamma GOF Test**					
504			5% A-D Critical Value		0.766		Data Not Gamma Distributed at 5% Significance Level					
505			K-S Test Statistic		0.295		**Kolmogorov-Smirnov Gamma GOF Test**					
506			5% K-S Critical Value		0.19		Data Not Gamma Distributed at 5% Significance Level					
507	**Data Not Gamma Distributed at 5% Significance Level**											
508												
509	**Gamma Statistics**											
510			k hat (MLE)		1.184			k star (bias corrected MLE)				1.053
511			Theta hat (MLE)		0.00316			Theta star (bias corrected MLE)				0.00355
512			nu hat (MLE)		52.11			nu star (bias corrected)				46.33
513			MLE Mean (bias corrected)		0.00374			MLE Sd (bias corrected)				0.00364
514								Approximate Chi Square Value (0.05)				31.72
515			Adjusted Level of Significance		0.0386			Adjusted Chi Square Value				30.81
516												
517	**Assuming Gamma Distribution**											
518			95% Approximate Gamma UCL		0.00546			95% Adjusted Gamma UCL				0.00562
519												
520	**Lognormal GOF Test**											
521			Shapiro Wilk Test Statistic		0.8		**Shapiro Wilk Lognormal GOF Test**					
522			10% Shapiro Wilk Critical Value		0.926		Data Not Lognormal at 10% Significance Level					
523			Lilliefors Test Statistic		0.232		**Lilliefors Lognormal GOF Test**					
524			10% Lilliefors Critical Value		0.169		Data Not Lognormal at 10% Significance Level					
525	**Data Not Lognormal at 10% Significance Level**											
526												
527	**Lognormal Statistics**											
528			Minimum of Logged Data		-6.908			Mean of logged Data				-6.068
529			Maximum of Logged Data		-3.414			SD of logged Data				0.781
530												
531	**Assuming Lognormal Distribution**											
532			95% H-UCL		0.00465			90% Chebyshev (MVUE) UCL				0.00476
533			95% Chebyshev (MVUE) UCL		0.00552			97.5% Chebyshev (MVUE) UCL				0.00657
534			99% Chebyshev (MVUE) UCL		0.00863							
535												
536	**Nonparametric Distribution Free UCL Statistics**											
537	**Data do not follow a Discernible Distribution**											
538												
539	**Nonparametric Distribution Free UCLs**											
540			95% CLT UCL		0.00607			95% BCA Bootstrap UCL				0.00792
541			95% Standard Bootstrap UCL		0.00597			95% Bootstrap-t UCL				0.0144
542			95% Hall's Bootstrap UCL		0.0139			95% Percentile Bootstrap UCL				0.00642
543			90% Chebyshev(Mean, Sd) UCL		0.008			95% Chebyshev(Mean, Sd) UCL				0.00993
544			97.5% Chebyshev(Mean, Sd) UCL		0.0126			99% Chebyshev(Mean, Sd) UCL				0.0179
545												
546	**Suggested UCL to Use**											
547			95% Student's-t UCL		0.00618							
548												
549	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
550	**Please verify the data were collected from random locations.**											

551	**If the data were collected using judgmental or other non-random methods,**											
552	**then contact a statistician to correctly calculate UCLs.**											
553												
554	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
555	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
556	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
557												
558												
559	**ResultValue (apw-08)**											
560												
561	**General Statistics**											
562						Total Number of Observations	23			Number of Distinct Observations	16	
563										Number of Missing Observations	0	
564						Minimum	0.001			Mean	0.00293	
565						Maximum	0.0082			Median	0.00204	
566						SD	0.00204			Std. Error of Mean	4.2479E-4	
567						Coefficient of Variation	0.695			Skewness	1.441	
568												
569	**Normal GOF Test**											
570						Shapiro Wilk Test Statistic	0.803			**Shapiro Wilk GOF Test**		
571						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
572						Lilliefors Test Statistic	0.25			**Lilliefors GOF Test**		
573						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
574	**Data Not Normal at 1% Significance Level**											
575												
576	**Assuming Normal Distribution**											
577	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
578						95% Student's-t UCL	0.00366			95% Adjusted-CLT UCL (Chen-1995)	0.00377	
579										95% Modified-t UCL (Johnson-1978)	0.00368	
580												
581	**Gamma GOF Test**											
582						A-D Test Statistic	0.994			**Anderson-Darling Gamma GOF Test**		
583						5% A-D Critical Value	0.752			Data Not Gamma Distributed at 5% Significance Level		
584						K-S Test Statistic	0.19			**Kolmogorov-Smirnov Gamma GOF Test**		
585						5% K-S Critical Value	0.183			Data Not Gamma Distributed at 5% Significance Level		
586	**Data Not Gamma Distributed at 5% Significance Level**											
587												
588	**Gamma Statistics**											
589						k hat (MLE)	2.718			k star (bias corrected MLE)	2.392	
590						Theta hat (MLE)	0.00108			Theta star (bias corrected MLE)	0.00123	
591						nu hat (MLE)	125			nu star (bias corrected)	110.1	
592						MLE Mean (bias corrected)	0.00293			MLE Sd (bias corrected)	0.0019	
593										Approximate Chi Square Value (0.05)	86.84	
594						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	85.34	
595												
596	**Assuming Gamma Distribution**											
597						95% Approximate Gamma UCL	0.00372			95% Adjusted Gamma UCL	0.00378	
598												
599	**Lognormal GOF Test**											
600						Shapiro Wilk Test Statistic	0.921			**Shapiro Wilk Lognormal GOF Test**		
601						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
602						Lilliefors Test Statistic	0.154			**Lilliefors Lognormal GOF Test**		
603						10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level		
604	**Data appear Approximate Lognormal at 10% Significance Level**											
605												

606	**Lognormal Statistics**											
607					Minimum of Logged Data	-6.908				Mean of logged Data	-6.027	
608					Maximum of Logged Data	-4.804				SD of logged Data	0.622	
609												
610	**Assuming Lognormal Distribution**											
611					95% H-UCL	0.00386				90% Chebyshev (MVUE) UCL	0.00409	
612					95% Chebyshev (MVUE) UCL	0.00464				97.5% Chebyshev (MVUE) UCL	0.00539	
613					99% Chebyshev (MVUE) UCL	0.00686						
614												
615	**Nonparametric Distribution Free UCL Statistics**											
616	**Data appear to follow a Discernible Distribution**											
617												
618	**Nonparametric Distribution Free UCLs**											
619					95% CLT UCL	0.00363				95% BCA Bootstrap UCL	0.0038	
620					95% Standard Bootstrap UCL	0.00363				95% Bootstrap-t UCL	0.00394	
621					95% Hall's Bootstrap UCL	0.0038				95% Percentile Bootstrap UCL	0.00368	
622					90% Chebyshev(Mean, Sd) UCL	0.00421				95% Chebyshev(Mean, Sd) UCL	0.00478	
623					97.5% Chebyshev(Mean, Sd) UCL	0.00559				99% Chebyshev(Mean, Sd) UCL	0.00716	
624												
625	**Suggested UCL to Use**											
626					95% H-UCL	0.00386						
627												
628	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
629	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
630	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
631												
632												
633	**ResultValue (apw-10d)**											
634												
635	**General Statistics**											
636					Total Number of Observations	23				Number of Distinct Observations	11	
637										Number of Missing Observations	0	
638					Minimum	0.001				Mean	0.00287	
639					Maximum	0.0148				Median	0.002	
640					SD	0.00299				Std. Error of Mean	6.2439E-4	
641					Coefficient of Variation	1.045				Skewness	3.313	
642												
643	**Normal GOF Test**											
644					Shapiro Wilk Test Statistic	0.557				**Shapiro Wilk GOF Test**		
645					1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
646					Lilliefors Test Statistic	0.344				**Lilliefors GOF Test**		
647					1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
648	**Data Not Normal at 1% Significance Level**											
649												
650	**Assuming Normal Distribution**											
651					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
652					95% Student's-t UCL	0.00394				95% Adjusted-CLT UCL (Chen-1995)	0.00435	
653										95% Modified-t UCL (Johnson-1978)	0.00401	
654												
655	**Gamma GOF Test**											
656					A-D Test Statistic	2.014				**Anderson-Darling Gamma GOF Test**		
657					5% A-D Critical Value	0.754				Data Not Gamma Distributed at 5% Significance Level		
658					K-S Test Statistic	0.288				**Kolmogorov-Smirnov Gamma GOF Test**		
659					5% K-S Critical Value	0.184				Data Not Gamma Distributed at 5% Significance Level		
660	**Data Not Gamma Distributed at 5% Significance Level**											

661												
662						**Gamma Statistics**							
663						k hat (MLE)	2.052			k star (bias corrected MLE)	1.814	
664						Theta hat (MLE)	0.0014			Theta star (bias corrected MLE)	0.00158	
665						nu hat (MLE)	94.41			nu star (bias corrected)	83.43	
666						MLE Mean (bias corrected)	0.00287			MLE Sd (bias corrected)	0.00213	
667										Approximate Chi Square Value (0.05)	63.38	
668						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	62.11	
669												
670						**Assuming Gamma Distribution**							
671						95% Approximate Gamma UCL	0.00377			95% Adjusted Gamma UCL	0.00385	
672												
673						**Lognormal GOF Test**							
674						Shapiro Wilk Test Statistic	0.852			**Shapiro Wilk Lognormal GOF Test**		
675						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
676						Lilliefors Test Statistic	0.24			**Lilliefors Lognormal GOF Test**		
677						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
678						**Data Not Lognormal at 10% Significance Level**							
679												
680						**Lognormal Statistics**							
681						Minimum of Logged Data	-6.908			Mean of logged Data	-6.118	
682						Maximum of Logged Data	-4.213			SD of logged Data	0.646	
683												
684						**Assuming Lognormal Distribution**							
685						95% H-UCL	0.00363			90% Chebyshev (MVUE) UCL	0.00384	
686						95% Chebyshev (MVUE) UCL	0.00436			97.5% Chebyshev (MVUE) UCL	0.00509	
687						99% Chebyshev (MVUE) UCL	0.00651					
688												
689						**Nonparametric Distribution Free UCL Statistics**							
690						**Data do not follow a Discernible Distribution**							
691												
692						**Nonparametric Distribution Free UCLs**							
693						95% CLT UCL	0.00389			95% BCA Bootstrap UCL	0.0045	
694						95% Standard Bootstrap UCL	0.00386			95% Bootstrap-t UCL	0.00578	
695						95% Hall's Bootstrap UCL	0.00827			95% Percentile Bootstrap UCL	0.00396	
696						90% Chebyshev(Mean, Sd) UCL	0.00474			95% Chebyshev(Mean, Sd) UCL	0.00559	
697						97.5% Chebyshev(Mean, Sd) UCL	0.00676			99% Chebyshev(Mean, Sd) UCL	0.00908	
698												
699						**Suggested UCL to Use**							
700						95% Student's-t UCL	0.00394					
701												
702						**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**							
703						**Please verify the data were collected from random locations.**							
704						**If the data were collected using judgmental or other non-random methods,**							
705						**then contact a statistician to correctly calculate UCLs.**							
706												
707						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
708						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
709						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
710												
711												
712	**ResultValue (apw-10s)**											
713												
714						**General Statistics**							
715						Total Number of Observations	23			Number of Distinct Observations	12	

716											Number of Missing Observations	0
717					Minimum	0.001					Mean	0.00307
718					Maximum	0.015					Median	0.002
719					SD	0.00333					Std. Error of Mean	6.9442E-4
720					Coefficient of Variation	1.085					Skewness	2.754
721												
722						**Normal GOF Test**						
723					Shapiro Wilk Test Statistic	0.557			**Shapiro Wilk GOF Test**			
724					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
725					Lilliefors Test Statistic	0.369			**Lilliefors GOF Test**			
726					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
727						**Data Not Normal at 1% Significance Level**						
728												
729						**Assuming Normal Distribution**						
730					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
731					95% Student's-t UCL	0.00426			95% Adjusted-CLT UCL (Chen-1995)			0.00464
732									95% Modified-t UCL (Johnson-1978)			0.00433
733												
734						**Gamma GOF Test**						
735					A-D Test Statistic	2.856			**Anderson-Darling Gamma GOF Test**			
736					5% A-D Critical Value	0.757			Data Not Gamma Distributed at 5% Significance Level			
737					K-S Test Statistic	0.307			**Kolmogorov-Smirnov Gamma GOF Test**			
738					5% K-S Critical Value	0.184			Data Not Gamma Distributed at 5% Significance Level			
739						**Data Not Gamma Distributed at 5% Significance Level**						
740												
741						**Gamma Statistics**						
742					k hat (MLE)	1.826			k star (bias corrected MLE)			1.617
743					Theta hat (MLE)	0.00168			Theta star (bias corrected MLE)			0.0019
744					nu hat (MLE)	83.98			nu star (bias corrected)			74.36
745					MLE Mean (bias corrected)	0.00307			MLE Sd (bias corrected)			0.00241
746									Approximate Chi Square Value (0.05)			55.5
747					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value			54.32
748												
749						**Assuming Gamma Distribution**						
750					95% Approximate Gamma UCL	0.00411			95% Adjusted Gamma UCL			0.0042
751												
752						**Lognormal GOF Test**						
753					Shapiro Wilk Test Statistic	0.797			**Shapiro Wilk Lognormal GOF Test**			
754					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
755					Lilliefors Test Statistic	0.272			**Lilliefors Lognormal GOF Test**			
756					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
757						**Data Not Lognormal at 10% Significance Level**						
758												
759						**Lognormal Statistics**						
760					Minimum of Logged Data	-6.908			Mean of logged Data			-6.084
761					Maximum of Logged Data	-4.2			SD of logged Data			0.68
762												
763						**Assuming Lognormal Distribution**						
764					95% H-UCL	0.00392			90% Chebyshev (MVUE) UCL			0.00413
765					95% Chebyshev (MVUE) UCL	0.00471			97.5% Chebyshev (MVUE) UCL			0.00553
766					99% Chebyshev (MVUE) UCL	0.00712						
767												
768						**Nonparametric Distribution Free UCL Statistics**						
769						**Data do not follow a Discernible Distribution**						
770												

	A	B	C	D	E	F	G	H	I	J	K	L
771	**Nonparametric Distribution Free UCLs**											
772					95% CLT UCL	0.00421				95% BCA Bootstrap UCL		0.00479
773					95% Standard Bootstrap UCL	0.00418				95% Bootstrap-t UCL		0.00529
774					95% Hall's Bootstrap UCL	0.00431				95% Percentile Bootstrap UCL		0.00424
775					90% Chebyshev(Mean, Sd) UCL	0.00515				95% Chebyshev(Mean, Sd) UCL		0.0061
776					97.5% Chebyshev(Mean, Sd) UCL	0.00741				99% Chebyshev(Mean, Sd) UCL		0.00998
777												
778	**Suggested UCL to Use**											
779					95% Student's-t UCL	0.00426						
780												
781	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
782	**Please verify the data were collected from random locations.**											
783	**If the data were collected using judgmental or other non-random methods,**											
784	**then contact a statistician to correctly calculate UCLs.**											
785												
786	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
787	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
788	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
789												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Cobalt
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:20:10 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_s.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	22	Number of Distinct Observations	17
		Number of Missing Observations	0
Minimum	0.001	Mean	0.00378
Maximum	0.0117	Median	0.00251
SD	0.00319	Std. Error of Mean	6.7937E-4
Coefficient of Variation	0.842	Skewness	1.561

Normal GOF Test

Shapiro Wilk Test Statistic	0.783	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.878	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.212	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.00495	95% Adjusted-CLT UCL (Chen-1995)	0.00514
		95% Modified-t UCL (Johnson-1978)	0.00499

Gamma GOF Test

A-D Test Statistic	0.661	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.149	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.188	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.9	k star (bias corrected MLE)	1.671
Theta hat (MLE)	0.00199	Theta star (bias corrected MLE)	0.00226
nu hat (MLE)	83.59	nu star (bias corrected)	73.53
MLE Mean (bias corrected)	0.00378	MLE Sd (bias corrected)	0.00293
		Approximate Chi Square Value (0.05)	54.78
Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	53.57

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.00508	95% Adjusted Gamma UCL	0.00519

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.944	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.926	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.106	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.169	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-6.908			Mean of logged Data	-5.863	
60						Maximum of Logged Data	-4.448			SD of logged Data	0.757	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.00551			90% Chebyshev (MVUE) UCL	0.00567	
64						95% Chebyshev (MVUE) UCL	0.00656			97.5% Chebyshev (MVUE) UCL	0.00778	
65						99% Chebyshev (MVUE) UCL	0.0102					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0049			95% BCA Bootstrap UCL	0.0051	
72						95% Standard Bootstrap UCL	0.00491			95% Bootstrap-t UCL	0.00544	
73						95% Hall's Bootstrap UCL	0.00509			95% Percentile Bootstrap UCL	0.00491	
74						90% Chebyshev(Mean, Sd) UCL	0.00582			95% Chebyshev(Mean, Sd) UCL	0.00674	
75						97.5% Chebyshev(Mean, Sd) UCL	0.00803			99% Chebyshev(Mean, Sd) UCL	0.0105	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.00495					
79												
80	When a data set follows an approximate distribution passing only one of the GOF tests,											
81	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
82												
83	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
84	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
85	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	23			Number of Distinct Observations	6	
92										Number of Missing Observations	0	
93						Minimum	5.0000E-4			Mean	0.00143	
94						Maximum	0.0021			Median	0.0014	
95						SD	5.1207E-4			Std. Error of Mean	1.0677E-4	
96						Coefficient of Variation	0.358			Skewness	0.0651	
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.803			**Shapiro Wilk GOF Test**		
100						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
101						Lilliefors Test Statistic	0.278			**Lilliefors GOF Test**		
102						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
103	**Data Not Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
107						95% Student's-t UCL	0.00161			95% Adjusted-CLT UCL (Chen-1995)	0.00161	
108										95% Modified-t UCL (Johnson-1978)	0.00161	
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	2.038	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.267	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level						
115	**Data Not Gamma Distributed at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	7.529	k star (bias corrected MLE)	6.576					
119				Theta hat (MLE)	1.8998E-4	Theta star (bias corrected MLE)	2.1752E-4					
120				nu hat (MLE)	346.3	nu star (bias corrected)	302.5					
121				MLE Mean (bias corrected)	0.00143	MLE Sd (bias corrected)	5.5780E-4					
122						Approximate Chi Square Value (0.05)	263.2					
123				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	260.6					
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	0.00164	95% Adjusted Gamma UCL	0.00166					
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.812	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.25	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
133	**Data Not Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	-7.601	Mean of logged Data	-6.618					
137				Maximum of Logged Data	-6.166	SD of logged Data	0.389					
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	0.00169	90% Chebyshev (MVUE) UCL	0.00179					
141				95% Chebyshev (MVUE) UCL	0.00196	97.5% Chebyshev (MVUE) UCL	0.00218					
142				99% Chebyshev (MVUE) UCL	0.00262							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data do not follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	0.00161	95% BCA Bootstrap UCL	0.0016					
149				95% Standard Bootstrap UCL	0.0016	95% Bootstrap-t UCL	0.00161					
150				95% Hall's Bootstrap UCL	0.00159	95% Percentile Bootstrap UCL	0.00161					
151				90% Chebyshev(Mean, Sd) UCL	0.00175	95% Chebyshev(Mean, Sd) UCL	0.0019					
152				97.5% Chebyshev(Mean, Sd) UCL	0.0021	99% Chebyshev(Mean, Sd) UCL	0.00249					
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	0.00161							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12	Number of Distinct Observations	2					

166											Number of Missing Observations	0
167					Minimum	0.001					Mean	0.00103
168					Maximum	0.0013					Median	0.001
169					SD	8.6603E-5					Std. Error of Mean	2.5000E-5
170					Coefficient of Variation	0.0845					Skewness	3.464
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.327			**Shapiro Wilk GOF Test**			
174					1% Shapiro Wilk Critical Value	0.805			Data Not Normal at 1% Significance Level			
175					Lilliefors Test Statistic	0.53			**Lilliefors GOF Test**			
176					1% Lilliefors Critical Value	0.281			Data Not Normal at 1% Significance Level			
177						**Data Not Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
181					95% Student's-t UCL	0.00107			95% Adjusted-CLT UCL (Chen-1995)			0.00109
182									95% Modified-t UCL (Johnson-1978)			0.00107
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	4.085			**Anderson-Darling Gamma GOF Test**			
186					5% A-D Critical Value	0.731			Data Not Gamma Distributed at 5% Significance Level			
187					K-S Test Statistic	0.535			**Kolmogorov-Smirnov Gamma GOF Test**			
188					5% K-S Critical Value	0.245			Data Not Gamma Distributed at 5% Significance Level			
189						**Data Not Gamma Distributed at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	176.9			k star (bias corrected MLE)			132.7
193					Theta hat (MLE)	5.7938E-6			Theta star (bias corrected MLE)			7.7219E-6
194					nu hat (MLE)	4246			nu star (bias corrected)			3186
195					MLE Mean (bias corrected)	0.00103			MLE Sd (bias corrected)			8.8966E-5
196									Approximate Chi Square Value (0.05)			3056
197					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			3036
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	0.00107			95% Adjusted Gamma UCL			0.00108
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.327			**Shapiro Wilk Lognormal GOF Test**			
204					10% Shapiro Wilk Critical Value	0.883			Data Not Lognormal at 10% Significance Level			
205					Lilliefors Test Statistic	0.53			**Lilliefors Lognormal GOF Test**			
206					10% Lilliefors Critical Value	0.223			Data Not Lognormal at 10% Significance Level			
207						**Data Not Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	-6.908			Mean of logged Data			-6.886
211					Maximum of Logged Data	-6.645			SD of logged Data			0.0757
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	N/A			90% Chebyshev (MVUE) UCL			0.00109
215					95% Chebyshev (MVUE) UCL	0.00112			97.5% Chebyshev (MVUE) UCL			0.00116
216					99% Chebyshev (MVUE) UCL	0.00125						
217												
218						**Nonparametric Distribution Free UCL Statistics**						
219						**Data do not follow a Discernible Distribution**						
220												

221	**Nonparametric Distribution Free UCLs**											
222					95% CLT UCL	0.00107				95% BCA Bootstrap UCL	N/A	
223					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL	N/A	
224					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A	
225					90% Chebyshev(Mean, Sd) UCL	0.0011				95% Chebyshev(Mean, Sd) UCL	0.00113	
226					97.5% Chebyshev(Mean, Sd) UCL	0.00118				99% Chebyshev(Mean, Sd) UCL	0.00127	
227												
228	**Suggested UCL to Use**											
229					95% Student's-t UCL	0.00107						
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235												
236	**ResultValue (apw-05r)**											
237												
238	**General Statistics**											
239					Total Number of Observations	11				Number of Distinct Observations	2	
240										Number of Missing Observations	0	
241					Minimum	0.001				Mean	0.00173	
242					Maximum	0.002				Median	0.002	
243					SD	4.6710E-4				Std. Error of Mean	1.4084E-4	
244					Coefficient of Variation	0.27				Skewness	-1.189	
245												
246	**Normal GOF Test**											
247					Shapiro Wilk Test Statistic	0.572				**Shapiro Wilk GOF Test**		
248					1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level		
249					Lilliefors Test Statistic	0.448				**Lilliefors GOF Test**		
250					1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level		
251	**Data Not Normal at 1% Significance Level**											
252												
253	**Assuming Normal Distribution**											
254					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
255					95% Student's-t UCL	0.00198				95% Adjusted-CLT UCL (Chen-1995)	0.0019	
256										95% Modified-t UCL (Johnson-1978)	0.00197	
257												
258	**Gamma GOF Test**											
259					A-D Test Statistic	2.529				**Anderson-Darling Gamma GOF Test**		
260					5% A-D Critical Value	0.729				Data Not Gamma Distributed at 5% Significance Level		
261					K-S Test Statistic	0.458				**Kolmogorov-Smirnov Gamma GOF Test**		
262					5% K-S Critical Value	0.255				Data Not Gamma Distributed at 5% Significance Level		
263	**Data Not Gamma Distributed at 5% Significance Level**											
264												
265	**Gamma Statistics**											
266					k hat (MLE)	11.95				k star (bias corrected MLE)	8.749	
267					Theta hat (MLE)	1.4458E-4				Theta star (bias corrected MLE)	1.9743E-4	
268					nu hat (MLE)	262.8				nu star (bias corrected)	192.5	
269					MLE Mean (bias corrected)	0.00173				MLE Sd (bias corrected)	5.8396E-4	
270										Approximate Chi Square Value (0.05)	161.4	
271					Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	156.7	
272												
273	**Assuming Gamma Distribution**											
274					95% Approximate Gamma UCL	0.00206				95% Adjusted Gamma UCL	0.00212	
275												

276	**Lognormal GOF Test**											
277					Shapiro Wilk Test Statistic	0.572	**Shapiro Wilk Lognormal GOF Test**					
278					10% Shapiro Wilk Critical Value	0.876	Data Not Lognormal at 10% Significance Level					
279					Lilliefors Test Statistic	0.448	**Lilliefors Lognormal GOF Test**					
280					10% Lilliefors Critical Value	0.231	Data Not Lognormal at 10% Significance Level					
281	**Data Not Lognormal at 10% Significance Level**											
282												
283	**Lognormal Statistics**											
284					Minimum of Logged Data	-6.908				Mean of logged Data	-6.404	
285					Maximum of Logged Data	-6.215				SD of logged Data	0.324	
286												
287	**Assuming Lognormal Distribution**											
288					95% H-UCL	0.00214				90% Chebyshev (MVUE) UCL	0.00225	
289					95% Chebyshev (MVUE) UCL	0.00248				97.5% Chebyshev (MVUE) UCL	0.0028	
290					99% Chebyshev (MVUE) UCL	0.00344						
291												
292	**Nonparametric Distribution Free UCL Statistics**											
293	**Data do not follow a Discernible Distribution**											
294												
295	**Nonparametric Distribution Free UCLs**											
296					95% CLT UCL	0.00196				95% BCA Bootstrap UCL	N/A	
297					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL	N/A	
298					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A	
299					90% Chebyshev(Mean, Sd) UCL	0.00215				95% Chebyshev(Mean, Sd) UCL	0.00234	
300					97.5% Chebyshev(Mean, Sd) UCL	0.00261				99% Chebyshev(Mean, Sd) UCL	0.00313	
301												
302	**Suggested UCL to Use**											
303					95% Student's-t UCL	0.00198						
304												
305	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
306	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
307	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
308												
309	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
310	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
311												
312												
313	**ResultValue (apw-06d)**											
314												
315	**General Statistics**											
316					Total Number of Observations	22				Number of Distinct Observations	7	
317										Number of Missing Observations	0	
318					Minimum	0.001				Mean	0.00184	
319					Maximum	0.0054				Median	0.00165	
320					SD	0.00109				Std. Error of Mean	2.3333E-4	
321					Coefficient of Variation	0.596				Skewness	1.966	
322												
323	**Normal GOF Test**											
324					Shapiro Wilk Test Statistic	0.742	**Shapiro Wilk GOF Test**					
325					1% Shapiro Wilk Critical Value	0.878	Data Not Normal at 1% Significance Level					
326					Lilliefors Test Statistic	0.259	**Lilliefors GOF Test**					
327					1% Lilliefors Critical Value	0.214	Data Not Normal at 1% Significance Level					
328	**Data Not Normal at 1% Significance Level**											
329												
330	**Assuming Normal Distribution**											

331	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
332				95% Student's-t UCL	0.00224				95% Adjusted-CLT UCL (Chen-1995)	0.00233		
333									95% Modified-t UCL (Johnson-1978)	0.00226		
334												
335	**Gamma GOF Test**											
336				A-D Test Statistic	1.431		**Anderson-Darling Gamma GOF Test**					
337				5% A-D Critical Value	0.747		Data Not Gamma Distributed at 5% Significance Level					
338				K-S Test Statistic	0.189		**Kolmogorov-Smirnov Gamma GOF Test**					
339				5% K-S Critical Value	0.186		Data Not Gamma Distributed at 5% Significance Level					
340	**Data Not Gamma Distributed at 5% Significance Level**											
341												
342	**Gamma Statistics**											
343				k hat (MLE)	4.04				k star (bias corrected MLE)	3.519		
344				Theta hat (MLE)	4.5492E-4				Theta star (bias corrected MLE)	5.2221E-4		
345				nu hat (MLE)	177.7				nu star (bias corrected)	154.8		
346				MLE Mean (bias corrected)	0.00184				MLE Sd (bias corrected)	9.7963E-4		
347									Approximate Chi Square Value (0.05)	127.1		
348				Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	125.2		
349												
350	**Assuming Gamma Distribution**											
351				95% Approximate Gamma UCL	0.00224				95% Adjusted Gamma UCL	0.00227		
352												
353	**Lognormal GOF Test**											
354				Shapiro Wilk Test Statistic	0.847		**Shapiro Wilk Lognormal GOF Test**					
355				10% Shapiro Wilk Critical Value	0.926		Data Not Lognormal at 10% Significance Level					
356				Lilliefors Test Statistic	0.198		**Lilliefors Lognormal GOF Test**					
357				10% Lilliefors Critical Value	0.169		Data Not Lognormal at 10% Significance Level					
358	**Data Not Lognormal at 10% Significance Level**											
359												
360	**Lognormal Statistics**											
361				Minimum of Logged Data	-6.908				Mean of logged Data	-6.428		
362				Maximum of Logged Data	-5.221				SD of logged Data	0.493		
363												
364	**Assuming Lognormal Distribution**											
365				95% H-UCL	0.00226				90% Chebyshev (MVUE) UCL	0.00241		
366				95% Chebyshev (MVUE) UCL	0.00267				97.5% Chebyshev (MVUE) UCL	0.00305		
367				99% Chebyshev (MVUE) UCL	0.00378							
368												
369	**Nonparametric Distribution Free UCL Statistics**											
370	**Data do not follow a Discernible Distribution**											
371												
372	**Nonparametric Distribution Free UCLs**											
373				95% CLT UCL	0.00222				95% BCA Bootstrap UCL	0.00234		
374				95% Standard Bootstrap UCL	0.00222				95% Bootstrap-t UCL	0.00242		
375				95% Hall's Bootstrap UCL	0.00254				95% Percentile Bootstrap UCL	0.00226		
376				90% Chebyshev(Mean, Sd) UCL	0.00254				95% Chebyshev(Mean, Sd) UCL	0.00285		
377				97.5% Chebyshev(Mean, Sd) UCL	0.00329				99% Chebyshev(Mean, Sd) UCL	0.00416		
378												
379	**Suggested UCL to Use**											
380				95% Student's-t UCL	0.00224							
381												
382	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
383	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
384	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
385												

386												
387	**ResultValue (apw-06s)**											
388												
389						**General Statistics**						
390					Total Number of Observations	23			Number of Distinct Observations	3		
391									Number of Missing Observations	0		
392					Minimum	2.0000E-4			Mean	0.00131		
393					Maximum	0.002			Median	0.001		
394					SD	5.3877E-4			Std. Error of Mean	1.1234E-4		
395					Coefficient of Variation	0.41			Skewness	0.25		
396												
397						**Normal GOF Test**						
398					Shapiro Wilk Test Statistic	0.718			**Shapiro Wilk GOF Test**			
399					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
400					Lilliefors Test Statistic	0.372			**Lilliefors GOF Test**			
401					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
402						**Data Not Normal at 1% Significance Level**						
403												
404						**Assuming Normal Distribution**						
405					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
406					95% Student's-t UCL	0.00151			95% Adjusted-CLT UCL (Chen-1995)	0.0015		
407									95% Modified-t UCL (Johnson-1978)	0.00151		
408												
409						**Gamma GOF Test**						
410					A-D Test Statistic	2.983			**Anderson-Darling Gamma GOF Test**			
411					5% A-D Critical Value	0.746			Data Not Gamma Distributed at 5% Significance Level			
412					K-S Test Statistic	0.321			**Kolmogorov-Smirnov Gamma GOF Test**			
413					5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level			
414						**Data Not Gamma Distributed at 5% Significance Level**						
415												
416						**Gamma Statistics**						
417					k hat (MLE)	5.1			k star (bias corrected MLE)	4.464		
418					Theta hat (MLE)	2.5745E-4			Theta star (bias corrected MLE)	2.9415E-4		
419					nu hat (MLE)	234.6			nu star (bias corrected)	205.3		
420					MLE Mean (bias corrected)	0.00131			MLE Sd (bias corrected)	6.2147E-4		
421									Approximate Chi Square Value (0.05)	173.2		
422					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	171		
423												
424						**Assuming Gamma Distribution**						
425					95% Approximate Gamma UCL	0.00156			95% Adjusted Gamma UCL	0.00158		
426												
427						**Lognormal GOF Test**						
428					Shapiro Wilk Test Statistic	0.669			**Shapiro Wilk Lognormal GOF Test**			
429					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
430					Lilliefors Test Statistic	0.326			**Lilliefors Lognormal GOF Test**			
431					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
432						**Data Not Lognormal at 10% Significance Level**						
433												
434						**Lognormal Statistics**						
435					Minimum of Logged Data	-8.517			Mean of logged Data	-6.737		
436					Maximum of Logged Data	-6.215			SD of logged Data	0.512		
437												
438						**Assuming Lognormal Distribution**						
439					95% H-UCL	0.00168			90% Chebyshev (MVUE) UCL	0.00179		
440					95% Chebyshev (MVUE) UCL	0.00199			97.5% Chebyshev (MVUE) UCL	0.00228		

441				99% Chebyshev (MVUE) UCL	0.00283							
442												
443					**Nonparametric Distribution Free UCL Statistics**							
444					**Data do not follow a Discernible Distribution**							
445												
446					**Nonparametric Distribution Free UCLs**							
447				95% CLT UCL	0.0015			95% BCA Bootstrap UCL	N/A			
448				95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A			
449				95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A			
450				90% Chebyshev(Mean, Sd) UCL	0.00165			95% Chebyshev(Mean, Sd) UCL	0.0018			
451				97.5% Chebyshev(Mean, Sd) UCL	0.00201			99% Chebyshev(Mean, Sd) UCL	0.00243			
452												
453					**Suggested UCL to Use**							
454				95% Student's-t UCL	0.00151							
455												
456					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
457					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
458					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
459												
460												
461	**ResultValue (apw-07)**											
462												
463					**General Statistics**							
464				Total Number of Observations	22			Number of Distinct Observations	3			
465								Number of Missing Observations	0			
466				Minimum	0.001			Mean	0.00133			
467				Maximum	0.002			Median	0.001			
468				SD	4.7146E-4			Std. Error of Mean	1.0052E-4			
469				Coefficient of Variation	0.354			Skewness	0.788			
470												
471					**Normal GOF Test**							
472				Shapiro Wilk Test Statistic	0.624			**Shapiro Wilk GOF Test**				
473				1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level				
474				Lilliefors Test Statistic	0.396			**Lilliefors GOF Test**				
475				1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level				
476					**Data Not Normal at 1% Significance Level**							
477												
478					**Assuming Normal Distribution**							
479					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
480				95% Student's-t UCL	0.0015			95% Adjusted-CLT UCL (Chen-1995)	0.00152			
481								95% Modified-t UCL (Johnson-1978)	0.00151			
482												
483					**Gamma GOF Test**							
484				A-D Test Statistic	4.101			**Anderson-Darling Gamma GOF Test**				
485				5% A-D Critical Value	0.744			Data Not Gamma Distributed at 5% Significance Level				
486				K-S Test Statistic	0.403			**Kolmogorov-Smirnov Gamma GOF Test**				
487				5% K-S Critical Value	0.185			Data Not Gamma Distributed at 5% Significance Level				
488					**Data Not Gamma Distributed at 5% Significance Level**							
489												
490					**Gamma Statistics**							
491				k hat (MLE)	9.41			k star (bias corrected MLE)	8.157			
492				Theta hat (MLE)	1.4153E-4			Theta star (bias corrected MLE)	1.6326E-4			
493				nu hat (MLE)	414.1			nu star (bias corrected)	358.9			
494				MLE Mean (bias corrected)	0.00133			MLE Sd (bias corrected)	4.6630E-4			
495								Approximate Chi Square Value (0.05)	316			

496				Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	313	
497												
498					**Assuming Gamma Distribution**							
499				95% Approximate Gamma UCL	0.00151					95% Adjusted Gamma UCL	0.00153	
500												
501					**Lognormal GOF Test**							
502				Shapiro Wilk Test Statistic	0.629			**Shapiro Wilk Lognormal GOF Test**				
503				10% Shapiro Wilk Critical Value	0.926			Data Not Lognormal at 10% Significance Level				
504				Lilliefors Test Statistic	0.398			**Lilliefors Lognormal GOF Test**				
505				10% Lilliefors Critical Value	0.169			Data Not Lognormal at 10% Significance Level				
506					**Data Not Lognormal at 10% Significance Level**							
507												
508					**Lognormal Statistics**							
509				Minimum of Logged Data	-6.908					Mean of logged Data	-6.675	
510				Maximum of Logged Data	-6.215					SD of logged Data	0.327	
511												
512					**Assuming Lognormal Distribution**							
513				95% H-UCL	0.00152					90% Chebyshev (MVUE) UCL	0.00161	
514				95% Chebyshev (MVUE) UCL	0.00174					97.5% Chebyshev (MVUE) UCL	0.00192	
515				99% Chebyshev (MVUE) UCL	0.00226							
516												
517					**Nonparametric Distribution Free UCL Statistics**							
518					**Data do not follow a Discernible Distribution**							
519												
520					**Nonparametric Distribution Free UCLs**							
521				95% CLT UCL	0.0015					95% BCA Bootstrap UCL	N/A	
522				95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A	
523				95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A	
524				90% Chebyshev(Mean, Sd) UCL	0.00163					95% Chebyshev(Mean, Sd) UCL	0.00177	
525				97.5% Chebyshev(Mean, Sd) UCL	0.00196					99% Chebyshev(Mean, Sd) UCL	0.00233	
526												
527					**Suggested UCL to Use**							
528				95% Student's-t UCL	0.0015							
529												
530	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
531	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
532	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
533												
534												
535	**ResultValue (apw-08)**											
536												
537					**General Statistics**							
538				Total Number of Observations	23					Number of Distinct Observations	9	
539										Number of Missing Observations	0	
540				Minimum	0.001					Mean	0.0016	
541				Maximum	0.0021					Median	0.0017	
542				SD	4.3325E-4					Std. Error of Mean	9.0339E-5	
543				Coefficient of Variation	0.272					Skewness	-0.298	
544												
545					**Normal GOF Test**							
546				Shapiro Wilk Test Statistic	0.806			**Shapiro Wilk GOF Test**				
547				1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level				
548				Lilliefors Test Statistic	0.259			**Lilliefors GOF Test**				
549				1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level				
550					**Data Not Normal at 1% Significance Level**							

551												
552	**Assuming Normal Distribution**											
553	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
554			95% Student's-t UCL		0.00175			95% Adjusted-CLT UCL (Chen-1995)				0.00174
555								95% Modified-t UCL (Johnson-1978)				0.00175
556												
557	**Gamma GOF Test**											
558			A-D Test Statistic		1.889		**Anderson-Darling Gamma GOF Test**					
559			5% A-D Critical Value		0.743		Data Not Gamma Distributed at 5% Significance Level					
560			K-S Test Statistic		0.26		**Kolmogorov-Smirnov Gamma GOF Test**					
561			5% K-S Critical Value		0.181		Data Not Gamma Distributed at 5% Significance Level					
562	**Data Not Gamma Distributed at 5% Significance Level**											
563												
564	**Gamma Statistics**											
565			k hat (MLE)		12.96			k star (bias corrected MLE)				11.3
566			Theta hat (MLE)		1.2314E-4			Theta star (bias corrected MLE)				1.4125E-4
567			nu hat (MLE)		596.1			nu star (bias corrected)				519.6
568			MLE Mean (bias corrected)		0.0016			MLE Sd (bias corrected)				4.7475E-4
569								Approximate Chi Square Value (0.05)				467.8
570			Adjusted Level of Significance		0.0389			Adjusted Chi Square Value				464.2
571												
572	**Assuming Gamma Distribution**											
573			95% Approximate Gamma UCL		0.00177			95% Adjusted Gamma UCL				0.00179
574												
575	**Lognormal GOF Test**											
576			Shapiro Wilk Test Statistic		0.802		**Shapiro Wilk Lognormal GOF Test**					
577			10% Shapiro Wilk Critical Value		0.928		Data Not Lognormal at 10% Significance Level					
578			Lilliefors Test Statistic		0.252		**Lilliefors Lognormal GOF Test**					
579			10% Lilliefors Critical Value		0.165		Data Not Lognormal at 10% Significance Level					
580	**Data Not Lognormal at 10% Significance Level**											
581												
582	**Lognormal Statistics**											
583			Minimum of Logged Data		-6.908			Mean of logged Data				-6.48
584			Maximum of Logged Data		-6.166			SD of logged Data				0.293
585												
586	**Assuming Lognormal Distribution**											
587			95% H-UCL		0.00179			90% Chebyshev (MVUE) UCL				0.0019
588			95% Chebyshev (MVUE) UCL		0.00203			97.5% Chebyshev (MVUE) UCL				0.00222
589			99% Chebyshev (MVUE) UCL		0.00258							
590												
591	**Nonparametric Distribution Free UCL Statistics**											
592	**Data do not follow a Discernible Distribution**											
593												
594	**Nonparametric Distribution Free UCLs**											
595			95% CLT UCL		0.00174			95% BCA Bootstrap UCL				0.00173
596			95% Standard Bootstrap UCL		0.00174			95% Bootstrap-t UCL				0.00174
597			95% Hall's Bootstrap UCL		0.00173			95% Percentile Bootstrap UCL				0.00173
598			90% Chebyshev(Mean, Sd) UCL		0.00187			95% Chebyshev(Mean, Sd) UCL				0.00199
599			97.5% Chebyshev(Mean, Sd) UCL		0.00216			99% Chebyshev(Mean, Sd) UCL				0.00249
600												
601	**Suggested UCL to Use**											
602			95% Student's-t UCL		0.00175							
603												
604	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
605	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

606	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
607												
608	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
609	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
610												
611												
612	**ResultValue (apw-10d)**											
613												
614	**General Statistics**											
615						Total Number of Observations	23			Number of Distinct Observations	20	
616										Number of Missing Observations	0	
617						Minimum	0.0013			Mean	0.00304	
618						Maximum	0.007			Median	0.0028	
619						SD	0.00114			Std. Error of Mean	2.3828E-4	
620						Coefficient of Variation	0.376			Skewness	2.013	
621												
622	**Normal GOF Test**											
623						Shapiro Wilk Test Statistic	0.819			**Shapiro Wilk GOF Test**		
624						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
625						Lilliefors Test Statistic	0.201			**Lilliefors GOF Test**		
626						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
627	**Data appear Approximate Normal at 1% Significance Level**											
628												
629	**Assuming Normal Distribution**											
630					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
631						95% Student's-t UCL	0.00345			95% Adjusted-CLT UCL (Chen-1995)	0.00354	
632										95% Modified-t UCL (Johnson-1978)	0.00346	
633												
634	**Gamma GOF Test**											
635						A-D Test Statistic	0.77			**Anderson-Darling Gamma GOF Test**		
636						5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level		
637						K-S Test Statistic	0.155			**Kolmogorov-Smirnov Gamma GOF Test**		
638						5% K-S Critical Value	0.182			Detected data appear Gamma Distributed at 5% Significance Level		
639	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
640												
641	**Gamma Statistics**											
642						k hat (MLE)	9.03			k star (bias corrected MLE)	7.881	
643						Theta hat (MLE)	3.3633E-4			Theta star (bias corrected MLE)	3.8535E-4	
644						nu hat (MLE)	415.4			nu star (bias corrected)	362.5	
645						MLE Mean (bias corrected)	0.00304			MLE Sd (bias corrected)	0.00108	
646										Approximate Chi Square Value (0.05)	319.4	
647						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	316.5	
648												
649	**Assuming Gamma Distribution**											
650						95% Approximate Gamma UCL	0.00345			95% Adjusted Gamma UCL	0.00348	
651												
652	**Lognormal GOF Test**											
653						Shapiro Wilk Test Statistic	0.94			**Shapiro Wilk Lognormal GOF Test**		
654						10% Shapiro Wilk Critical Value	0.928			Data appear Lognormal at 10% Significance Level		
655						Lilliefors Test Statistic	0.167			**Lilliefors Lognormal GOF Test**		
656						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
657	**Data appear Approximate Lognormal at 10% Significance Level**											
658												
659	**Lognormal Statistics**											
660						Minimum of Logged Data	-6.645			Mean of logged Data	-5.853	

661				Maximum of Logged Data	-4.962					SD of logged Data	0.336	
662												
663					**Assuming Lognormal Distribution**							
664				95% H-UCL	0.00347					90% Chebyshev (MVUE) UCL	0.00368	
665				95% Chebyshev (MVUE) UCL	0.00397					97.5% Chebyshev (MVUE) UCL	0.00438	
666				99% Chebyshev (MVUE) UCL	0.00518							
667												
668					**Nonparametric Distribution Free UCL Statistics**							
669					**Data appear to follow a Discernible Distribution**							
670												
671					**Nonparametric Distribution Free UCLs**							
672				95% CLT UCL	0.00343					95% BCA Bootstrap UCL	0.00355	
673				95% Standard Bootstrap UCL	0.00342					95% Bootstrap-t UCL	0.00365	
674				95% Hall's Bootstrap UCL	0.00556					95% Percentile Bootstrap UCL	0.00345	
675				90% Chebyshev(Mean, Sd) UCL	0.00375					95% Chebyshev(Mean, Sd) UCL	0.00408	
676				97.5% Chebyshev(Mean, Sd) UCL	0.00453					99% Chebyshev(Mean, Sd) UCL	0.00541	
677												
678					**Suggested UCL to Use**							
679				95% Student's-t UCL	0.00345							
680												
681					When a data set follows an approximate distribution passing only one of the GOF tests,							
682					it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL							
683												
684					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
685					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
686					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
687												
688												
689	**ResultValue (apw-10s)**											
690												
691					**General Statistics**							
692				Total Number of Observations	23					Number of Distinct Observations	5	
693										Number of Missing Observations	0	
694				Minimum	6.0000E-4					Mean	0.00145	
695				Maximum	0.0021					Median	0.0013	
696				SD	5.2472E-4					Std. Error of Mean	1.0941E-4	
697				Coefficient of Variation	0.361					Skewness	0.106	
698												
699					**Normal GOF Test**							
700				Shapiro Wilk Test Statistic	0.769					**Shapiro Wilk GOF Test**		
701				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
702				Lilliefors Test Statistic	0.287					**Lilliefors GOF Test**		
703				1% Lilliefors Critical Value	0.209					Data Not Normal at 1% Significance Level		
704					**Data Not Normal at 1% Significance Level**							
705												
706					**Assuming Normal Distribution**							
707				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
708				95% Student's-t UCL	0.00164					95% Adjusted-CLT UCL (Chen-1995)	0.00163	
709										95% Modified-t UCL (Johnson-1978)	0.00164	
710												
711					**Gamma GOF Test**							
712				A-D Test Statistic	2.489					**Anderson-Darling Gamma GOF Test**		
713				5% A-D Critical Value	0.745					Data Not Gamma Distributed at 5% Significance Level		
714				K-S Test Statistic	0.288					**Kolmogorov-Smirnov Gamma GOF Test**		
715				5% K-S Critical Value	0.182					Data Not Gamma Distributed at 5% Significance Level		

716	**Data Not Gamma Distributed at 5% Significance Level**											
717												
718	**Gamma Statistics**											
719						k hat (MLE)	7.643			k star (bias corrected MLE)	6.675	
720						Theta hat (MLE)	1.9001E-4			Theta star (bias corrected MLE)	2.1756E-4	
721						nu hat (MLE)	351.6			nu star (bias corrected)	307	
722						MLE Mean (bias corrected)	0.00145			MLE Sd (bias corrected)	5.6208E-4	
723										Approximate Chi Square Value (0.05)	267.4	
724						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	264.8	
725												
726	**Assuming Gamma Distribution**											
727						95% Approximate Gamma UCL	0.00167			95% Adjusted Gamma UCL	0.00168	
728												
729	**Lognormal GOF Test**											
730						Shapiro Wilk Test Statistic	0.791			**Shapiro Wilk Lognormal GOF Test**		
731						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
732						Lilliefors Test Statistic	0.28			**Lilliefors Lognormal GOF Test**		
733						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
734	**Data Not Lognormal at 10% Significance Level**											
735												
736	**Lognormal Statistics**											
737						Minimum of Logged Data	-7.419			Mean of logged Data	-6.602	
738						Maximum of Logged Data	-6.166			SD of logged Data	0.381	
739												
740	**Assuming Lognormal Distribution**											
741						95% H-UCL	0.0017			90% Chebyshev (MVUE) UCL	0.00181	
742						95% Chebyshev (MVUE) UCL	0.00197			97.5% Chebyshev (MVUE) UCL	0.00219	
743						99% Chebyshev (MVUE) UCL	0.00263					
744												
745	**Nonparametric Distribution Free UCL Statistics**											
746	**Data do not follow a Discernible Distribution**											
747												
748	**Nonparametric Distribution Free UCLs**											
749						95% CLT UCL	0.00163			95% BCA Bootstrap UCL	0.00163	
750						95% Standard Bootstrap UCL	0.00162			95% Bootstrap-t UCL	0.00164	
751						95% Hall's Bootstrap UCL	0.00162			95% Percentile Bootstrap UCL	0.00163	
752						90% Chebyshev(Mean, Sd) UCL	0.00178			95% Chebyshev(Mean, Sd) UCL	0.00193	
753						97.5% Chebyshev(Mean, Sd) UCL	0.00214			99% Chebyshev(Mean, Sd) UCL	0.00254	
754												
755	**Suggested UCL to Use**											
756						95% Student's-t UCL	0.00164					
757												
758	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
759	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
760	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
761												

UCL Statistics for Uncensored Full Data Sets		
User Selected Options	Dissolved Solids	
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:20:35 PM	
From File	ProUCL_Input_UpgradientDowngradient_Split_u.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	21
		Number of Missing Observations	0
Minimum	775	Mean	859.7
Maximum	934	Median	858
SD	47.02	Std. Error of Mean	9.805
Coefficient of Variation	0.0547	Skewness	-0.0933

Normal GOF Test

Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.102	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	876.5	95% Adjusted-CLT UCL (Chen-1995)	875.6
		95% Modified-t UCL (Johnson-1978)	876.5

Gamma GOF Test

A-D Test Statistic	0.254	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.105	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	347.4	k star (bias corrected MLE)	302.1
Theta hat (MLE)	2.474	Theta star (bias corrected MLE)	2.845
nu hat (MLE)	15982	nu star (bias corrected)	13899
MLE Mean (bias corrected)	859.7	MLE Sd (bias corrected)	49.46
		Approximate Chi Square Value (0.05)	13625
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	13606

Assuming Gamma Distribution

95% Approximate Gamma UCL	876.9	95% Adjusted Gamma UCL	878.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0987	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	6.653			Mean of logged Data		6.755
60						Maximum of Logged Data	6.839			SD of logged Data		0.055
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	N/A			90% Chebyshev (MVUE) UCL		889.2
64						95% Chebyshev (MVUE) UCL	902.6			97.5% Chebyshev (MVUE) UCL		921.2
65						99% Chebyshev (MVUE) UCL	957.7					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	875.8			95% BCA Bootstrap UCL		875.4
72						95% Standard Bootstrap UCL	875.2			95% Bootstrap-t UCL		875.6
73						95% Hall's Bootstrap UCL	875.1			95% Percentile Bootstrap UCL		875.4
74						90% Chebyshev(Mean, Sd) UCL	889.1			95% Chebyshev(Mean, Sd) UCL		902.4
75						97.5% Chebyshev(Mean, Sd) UCL	920.9			99% Chebyshev(Mean, Sd) UCL		957.2
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	876.5					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
85	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	23			Number of Distinct Observations		23
92										Number of Missing Observations		0
93						Minimum	450			Mean		550.3
94						Maximum	724			Median		541
95						SD	66.63			Std. Error of Mean		13.89
96						Coefficient of Variation	0.121			Skewness		0.626
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.965			**Shapiro Wilk GOF Test**		
100						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
101						Lilliefors Test Statistic	0.077			**Lilliefors GOF Test**		
102						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
103	**Data appear Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
107						95% Student's-t UCL	574.1			95% Adjusted-CLT UCL (Chen-1995)		575
108										95% Modified-t UCL (Johnson-1978)		574.4
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	0.155	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.064	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
115	**Detected data appear Gamma Distributed at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	73.41	k star (bias corrected MLE)	63.86					
119				Theta hat (MLE)	7.496	Theta star (bias corrected MLE)	8.616					
120				nu hat (MLE)	3377	nu star (bias corrected)	2938					
121				MLE Mean (bias corrected)	550.3	MLE Sd (bias corrected)	68.86					
122						Approximate Chi Square Value (0.05)	2813					
123				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	2804					
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	574.7	95% Adjusted Gamma UCL	576.5					
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.98	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.0575	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
133	**Data appear Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	6.109	Mean of logged Data	6.304					
137				Maximum of Logged Data	6.585	SD of logged Data	0.119					
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	575	90% Chebyshev (MVUE) UCL	591.2					
141				95% Chebyshev (MVUE) UCL	609.8	97.5% Chebyshev (MVUE) UCL	635.6					
142				99% Chebyshev (MVUE) UCL	686.2							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data appear to follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	573.1	95% BCA Bootstrap UCL	576					
149				95% Standard Bootstrap UCL	572.4	95% Bootstrap-t UCL	574.5					
150				95% Hall's Bootstrap UCL	575.8	95% Percentile Bootstrap UCL	573.7					
151				90% Chebyshev(Mean, Sd) UCL	591.9	95% Chebyshev(Mean, Sd) UCL	610.8					
152				97.5% Chebyshev(Mean, Sd) UCL	637	99% Chebyshev(Mean, Sd) UCL	688.5					
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	574.1							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12	Number of Distinct Observations	11					

166											Number of Missing Observations	0
167					Minimum	552					Mean	754.3
168					Maximum	842					Median	791
169					SD	87.05					Std. Error of Mean	25.13
170					Coefficient of Variation	0.115					Skewness	-1.295
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.869					**Shapiro Wilk GOF Test**	
174					1% Shapiro Wilk Critical Value	0.805					Data appear Normal at 1% Significance Level	
175					Lilliefors Test Statistic	0.242					**Lilliefors GOF Test**	
176					1% Lilliefors Critical Value	0.281					Data appear Normal at 1% Significance Level	
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
181					95% Student's-t UCL	799.5					95% Adjusted-CLT UCL (Chen-1995)	785.6
182											95% Modified-t UCL (Johnson-1978)	797.9
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.72					**Anderson-Darling Gamma GOF Test**	
186					5% A-D Critical Value	0.73					Detected data appear Gamma Distributed at 5% Significance Level	
187					K-S Test Statistic	0.253					**Kolmogorov-Smirnov Gamma GOF Test**	
188					5% K-S Critical Value	0.245					Data Not Gamma Distributed at 5% Significance Level	
189						**Detected data follow Appr. Gamma Distribution at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	74.07					k star (bias corrected MLE)	55.61
193					Theta hat (MLE)	10.18					Theta star (bias corrected MLE)	13.57
194					nu hat (MLE)	1778					nu star (bias corrected)	1335
195					MLE Mean (bias corrected)	754.3					MLE Sd (bias corrected)	101.2
196											Approximate Chi Square Value (0.05)	1251
197					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	1238
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	804.9					95% Adjusted Gamma UCL	812.9
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.838					**Shapiro Wilk Lognormal GOF Test**	
204					10% Shapiro Wilk Critical Value	0.883					Data Not Lognormal at 10% Significance Level	
205					Lilliefors Test Statistic	0.248					**Lilliefors Lognormal GOF Test**	
206					10% Lilliefors Critical Value	0.223					Data Not Lognormal at 10% Significance Level	
207						**Data Not Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	6.314					Mean of logged Data	6.619
211					Maximum of Logged Data	6.736					SD of logged Data	0.125
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	807.7					90% Chebyshev (MVUE) UCL	836.3
215					95% Chebyshev (MVUE) UCL	873.3					97.5% Chebyshev (MVUE) UCL	924.6
216					99% Chebyshev (MVUE) UCL	1025						
217												
218						**Nonparametric Distribution Free UCL Statistics**						
219						**Data appear to follow a Discernible Distribution**						
220												

221	**Nonparametric Distribution Free UCLs**											
222					95% CLT UCL	795.7				95% BCA Bootstrap UCL	786.2	
223					95% Standard Bootstrap UCL	793.6				95% Bootstrap-t UCL	789.4	
224					95% Hall's Bootstrap UCL	785.9				95% Percentile Bootstrap UCL	792.5	
225					90% Chebyshev(Mean, Sd) UCL	829.7				95% Chebyshev(Mean, Sd) UCL	863.9	
226					97.5% Chebyshev(Mean, Sd) UCL	911.3				99% Chebyshev(Mean, Sd) UCL	1004	
227												
228	**Suggested UCL to Use**											
229					95% Student's-t UCL	799.5						
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
236	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
237												
238												
239	**ResultValue (apw-05r)**											
240												
241	**General Statistics**											
242					Total Number of Observations	11				Number of Distinct Observations	10	
243										Number of Missing Observations	0	
244					Minimum	354				Mean	624.5	
245					Maximum	764				Median	680	
246					SD	129.5				Std. Error of Mean	39.06	
247					Coefficient of Variation	0.207				Skewness	-1.043	
248												
249	**Normal GOF Test**											
250					Shapiro Wilk Test Statistic	0.866				**Shapiro Wilk GOF Test**		
251					1% Shapiro Wilk Critical Value	0.792				Data appear Normal at 1% Significance Level		
252					Lilliefors Test Statistic	0.294				**Lilliefors GOF Test**		
253					1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level		
254	**Data appear Approximate Normal at 1% Significance Level**											
255												
256	**Assuming Normal Distribution**											
257	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
258					95% Student's-t UCL	695.3				95% Adjusted-CLT UCL (Chen-1995)	675.6	
259										95% Modified-t UCL (Johnson-1978)	693.2	
260												
261	**Gamma GOF Test**											
262					A-D Test Statistic	0.828				**Anderson-Darling Gamma GOF Test**		
263					5% A-D Critical Value	0.729				Data Not Gamma Distributed at 5% Significance Level		
264					K-S Test Statistic	0.311				**Kolmogorov-Smirnov Gamma GOF Test**		
265					5% K-S Critical Value	0.255				Data Not Gamma Distributed at 5% Significance Level		
266	**Data Not Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269					k hat (MLE)	21.62				k star (bias corrected MLE)	15.78	
270					Theta hat (MLE)	28.88				Theta star (bias corrected MLE)	39.56	
271					nu hat (MLE)	475.6				nu star (bias corrected)	347.2	
272					MLE Mean (bias corrected)	624.5				MLE Sd (bias corrected)	157.2	
273										Approximate Chi Square Value (0.05)	305.1	
274					Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	298.6	
275												

276	**Assuming Gamma Distribution**											
277				95% Approximate Gamma UCL	710.8			95% Adjusted Gamma UCL	726.2			
278												
279	**Lognormal GOF Test**											
280				Shapiro Wilk Test Statistic	0.825			**Shapiro Wilk Lognormal GOF Test**				
281				10% Shapiro Wilk Critical Value	0.876			Data Not Lognormal at 10% Significance Level				
282				Lilliefors Test Statistic	0.306			**Lilliefors Lognormal GOF Test**				
283				10% Lilliefors Critical Value	0.231			Data Not Lognormal at 10% Significance Level				
284	**Data Not Lognormal at 10% Significance Level**											
285												
286	**Lognormal Statistics**											
287				Minimum of Logged Data	5.869			Mean of logged Data	6.414			
288				Maximum of Logged Data	6.639			SD of logged Data	0.237			
289												
290	**Assuming Lognormal Distribution**											
291				95% H-UCL	723			90% Chebyshev (MVUE) UCL	760.7			
292				95% Chebyshev (MVUE) UCL	821.8			97.5% Chebyshev (MVUE) UCL	906.6			
293				99% Chebyshev (MVUE) UCL	1073							
294												
295	**Nonparametric Distribution Free UCL Statistics**											
296	**Data appear to follow a Discernible Distribution**											
297												
298	**Nonparametric Distribution Free UCLs**											
299				95% CLT UCL	688.7			95% BCA Bootstrap UCL	676.6			
300				95% Standard Bootstrap UCL	686.3			95% Bootstrap-t UCL	682			
301				95% Hall's Bootstrap UCL	674.6			95% Percentile Bootstrap UCL	683.8			
302				90% Chebyshev(Mean, Sd) UCL	741.6			95% Chebyshev(Mean, Sd) UCL	794.7			
303				97.5% Chebyshev(Mean, Sd) UCL	868.4			99% Chebyshev(Mean, Sd) UCL	1013			
304												
305	**Suggested UCL to Use**											
306				95% Student's-t UCL	695.3							
307												
308	When a data set follows an approximate distribution passing only one of the GOF tests,											
309	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
310												
311	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
312	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
313	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
314												
315	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
316	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
317												
318												
319	**ResultValue (apw-06d)**											
320												
321	**General Statistics**											
322				Total Number of Observations	22			Number of Distinct Observations	19			
323								Number of Missing Observations	0			
324				Minimum	482			Mean	586.8			
325				Maximum	735			Median	566.5			
326				SD	61.87			Std. Error of Mean	13.19			
327				Coefficient of Variation	0.105			Skewness	1.061			
328												
329	**Normal GOF Test**											
330				Shapiro Wilk Test Statistic	0.876			**Shapiro Wilk GOF Test**				

331			1% Shapiro Wilk Critical Value			0.878		Data Not Normal at 1% Significance Level				
332			Lilliefors Test Statistic			0.252		**Lilliefors GOF Test**				
333			1% Lilliefors Critical Value			0.214		Data Not Normal at 1% Significance Level				
334			**Data Not Normal at 1% Significance Level**									
335												
336			**Assuming Normal Distribution**									
337			**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**				
338			95% Student's-t UCL			609.5		95% Adjusted-CLT UCL (Chen-1995)			611.7	
339								95% Modified-t UCL (Johnson-1978)			610	
340												
341			**Gamma GOF Test**									
342			A-D Test Statistic			1.185		**Anderson-Darling Gamma GOF Test**				
343			5% A-D Critical Value			0.741		Data Not Gamma Distributed at 5% Significance Level				
344			K-S Test Statistic			0.238		**Kolmogorov-Smirnov Gamma GOF Test**				
345			5% K-S Critical Value			0.185		Data Not Gamma Distributed at 5% Significance Level				
346			**Data Not Gamma Distributed at 5% Significance Level**									
347												
348			**Gamma Statistics**									
349			k hat (MLE)			99.52		k star (bias corrected MLE)			85.98	
350			Theta hat (MLE)			5.897		Theta star (bias corrected MLE)			6.825	
351			nu hat (MLE)			4379		nu star (bias corrected)			3783	
352			MLE Mean (bias corrected)			586.8		MLE Sd (bias corrected)			63.29	
353								Approximate Chi Square Value (0.05)			3641	
354			Adjusted Level of Significance			0.0386		Adjusted Chi Square Value			3631	
355												
356			**Assuming Gamma Distribution**									
357			95% Approximate Gamma UCL			609.7		95% Adjusted Gamma UCL			611.4	
358												
359			**Lognormal GOF Test**									
360			Shapiro Wilk Test Statistic			0.901		**Shapiro Wilk Lognormal GOF Test**				
361			10% Shapiro Wilk Critical Value			0.926		Data Not Lognormal at 10% Significance Level				
362			Lilliefors Test Statistic			0.232		**Lilliefors Lognormal GOF Test**				
363			10% Lilliefors Critical Value			0.169		Data Not Lognormal at 10% Significance Level				
364			**Data Not Lognormal at 10% Significance Level**									
365												
366			**Lognormal Statistics**									
367			Minimum of Logged Data			6.178		Mean of logged Data			6.37	
368			Maximum of Logged Data			6.6		SD of logged Data			0.101	
369												
370			**Assuming Lognormal Distribution**									
371			95% H-UCL			609.7		90% Chebyshev (MVUE) UCL			624.9	
372			95% Chebyshev (MVUE) UCL			642.1		97.5% Chebyshev (MVUE) UCL			666.1	
373			99% Chebyshev (MVUE) UCL			713.2						
374												
375			**Nonparametric Distribution Free UCL Statistics**									
376			**Data do not follow a Discernible Distribution**									
377												
378			**Nonparametric Distribution Free UCLs**									
379			95% CLT UCL			608.5		95% BCA Bootstrap UCL			611	
380			95% Standard Bootstrap UCL			608.3		95% Bootstrap-t UCL			615.8	
381			95% Hall's Bootstrap UCL			615.7		95% Percentile Bootstrap UCL			609	
382			90% Chebyshev(Mean, Sd) UCL			626.4		95% Chebyshev(Mean, Sd) UCL			644.3	
383			97.5% Chebyshev(Mean, Sd) UCL			669.2		99% Chebyshev(Mean, Sd) UCL			718.1	
384												
385			**Suggested UCL to Use**									

95% Student's-t UCL	609.5	

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ResultValue (apw-06s)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	481	Mean	598.2
Maximum	692	Median	599
SD	56.09	Std. Error of Mean	11.7
Coefficient of Variation	0.0938	Skewness	-0.291

Normal GOF Test

Shapiro Wilk Test Statistic	0.977	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.107	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	618.3	95% Adjusted-CLT UCL (Chen-1995)	616.7
		95% Modified-t UCL (Johnson-1978)	618.1

Gamma GOF Test

A-D Test Statistic	0.226	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.12	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	115.9	k star (bias corrected MLE)	100.8
Theta hat (MLE)	5.163	Theta star (bias corrected MLE)	5.936
nu hat (MLE)	5329	nu star (bias corrected)	4635
MLE Mean (bias corrected)	598.2	MLE Sd (bias corrected)	59.59
		Approximate Chi Square Value (0.05)	4478
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	4467

Assuming Gamma Distribution

95% Approximate Gamma UCL	619.2	95% Adjusted Gamma UCL	620.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.125	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

441				Minimum of Logged Data	6.176					Mean of logged Data	6.39	
442				Maximum of Logged Data	6.54					SD of logged Data	0.0958	
443												
444				**Assuming Lognormal Distribution**								
445				95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	634.1	
446				95% Chebyshev (MVUE) UCL	650.4					97.5% Chebyshev (MVUE) UCL	672.9	
447				99% Chebyshev (MVUE) UCL	717.3							
448												
449				**Nonparametric Distribution Free UCL Statistics**								
450				**Data appear to follow a Discernible Distribution**								
451												
452				**Nonparametric Distribution Free UCLs**								
453				95% CLT UCL	617.4					95% BCA Bootstrap UCL	616.2	
454				95% Standard Bootstrap UCL	617.5					95% Bootstrap-t UCL	617.6	
455				95% Hall's Bootstrap UCL	616.9					95% Percentile Bootstrap UCL	617.8	
456				90% Chebyshev(Mean, Sd) UCL	633.3					95% Chebyshev(Mean, Sd) UCL	649.2	
457				97.5% Chebyshev(Mean, Sd) UCL	671.2					99% Chebyshev(Mean, Sd) UCL	714.6	
458												
459				**Suggested UCL to Use**								
460				95% Student's-t UCL	618.3							
461												
462				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
463				Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.								
464				However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.								
465												
466				**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**								
467				**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**								
468												
469												
470	**ResultValue (apw-07)**											
471												
472				**General Statistics**								
473				Total Number of Observations	22					Number of Distinct Observations	21	
474										Number of Missing Observations	0	
475				Minimum	624					Mean	739	
476				Maximum	824					Median	738.5	
477				SD	49.58					Std. Error of Mean	10.57	
478				Coefficient of Variation	0.0671					Skewness	-0.356	
479												
480				**Normal GOF Test**								
481				Shapiro Wilk Test Statistic	0.962					**Shapiro Wilk GOF Test**		
482				1% Shapiro Wilk Critical Value	0.878					Data appear Normal at 1% Significance Level		
483				Lilliefors Test Statistic	0.157					**Lilliefors GOF Test**		
484				1% Lilliefors Critical Value	0.214					Data appear Normal at 1% Significance Level		
485				**Data appear Normal at 1% Significance Level**								
486												
487				**Assuming Normal Distribution**								
488				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
489				95% Student's-t UCL	757.1					95% Adjusted-CLT UCL (Chen-1995)	755.5	
490										95% Modified-t UCL (Johnson-1978)	757	
491												
492				**Gamma GOF Test**								
493				A-D Test Statistic	0.449					**Anderson-Darling Gamma GOF Test**		
494				5% A-D Critical Value	0.741					Detected data appear Gamma Distributed at 5% Significance Level		
495				K-S Test Statistic	0.155					**Kolmogorov-Smirnov Gamma GOF Test**		

496				5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level						
497	**Detected data appear Gamma Distributed at 5% Significance Level**											
498												
499	**Gamma Statistics**											
500				k hat (MLE)	228.1					k star (bias corrected MLE)	197	
501				Theta hat (MLE)	3.24					Theta star (bias corrected MLE)	3.751	
502				nu hat (MLE)	10036					nu star (bias corrected)	8669	
503				MLE Mean (bias corrected)	739					MLE Sd (bias corrected)	52.65	
504										Approximate Chi Square Value (0.05)	8453	
505				Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	8438	
506												
507	**Assuming Gamma Distribution**											
508				95% Approximate Gamma UCL	757.8					95% Adjusted Gamma UCL	759.2	
509												
510	**Lognormal GOF Test**											
511				Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**						
512				10% Shapiro Wilk Critical Value	0.926	Data appear Lognormal at 10% Significance Level						
513				Lilliefors Test Statistic	0.161	**Lilliefors Lognormal GOF Test**						
514				10% Lilliefors Critical Value	0.169	Data appear Lognormal at 10% Significance Level						
515	**Data appear Lognormal at 10% Significance Level**											
516												
517	**Lognormal Statistics**											
518				Minimum of Logged Data	6.436					Mean of logged Data	6.603	
519				Maximum of Logged Data	6.714					SD of logged Data	0.0682	
520												
521	**Assuming Lognormal Distribution**											
522				95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	771.2	
523				95% Chebyshev (MVUE) UCL	785.8					97.5% Chebyshev (MVUE) UCL	806.1	
524				99% Chebyshev (MVUE) UCL	845.9							
525												
526	**Nonparametric Distribution Free UCL Statistics**											
527	**Data appear to follow a Discernible Distribution**											
528												
529	**Nonparametric Distribution Free UCLs**											
530				95% CLT UCL	756.3					95% BCA Bootstrap UCL	753.7	
531				95% Standard Bootstrap UCL	755.4					95% Bootstrap-t UCL	755.9	
532				95% Hall's Bootstrap UCL	755.5					95% Percentile Bootstrap UCL	754.8	
533				90% Chebyshev(Mean, Sd) UCL	770.7					95% Chebyshev(Mean, Sd) UCL	785	
534				97.5% Chebyshev(Mean, Sd) UCL	805					99% Chebyshev(Mean, Sd) UCL	844.1	
535												
536	**Suggested UCL to Use**											
537				95% Student's-t UCL	757.1							
538												
539	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
540	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
541	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
542												
543	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
544	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
545												
546												
547	**ResultValue (apw-08)**											
548												
549	**General Statistics**											
550				Total Number of Observations	23					Number of Distinct Observations	22	

551											Number of Missing Observations	0
552					Minimum	370					Mean	412.4
553					Maximum	466					Median	418
554					SD	29.93					Std. Error of Mean	6.241
555					Coefficient of Variation	0.0726					Skewness	-0.00267
556												
557						**Normal GOF Test**						
558					Shapiro Wilk Test Statistic	0.943					**Shapiro Wilk GOF Test**	
559					1% Shapiro Wilk Critical Value	0.881					Data appear Normal at 1% Significance Level	
560					Lilliefors Test Statistic	0.106					**Lilliefors GOF Test**	
561					1% Lilliefors Critical Value	0.209					Data appear Normal at 1% Significance Level	
562						**Data appear Normal at 1% Significance Level**						
563												
564						**Assuming Normal Distribution**						
565					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
566					95% Student's-t UCL	423.2					95% Adjusted-CLT UCL (Chen-1995)	422.7
567											95% Modified-t UCL (Johnson-1978)	423.2
568												
569						**Gamma GOF Test**						
570					A-D Test Statistic	0.457					**Anderson-Darling Gamma GOF Test**	
571					5% A-D Critical Value	0.74					Detected data appear Gamma Distributed at 5% Significance Level	
572					K-S Test Statistic	0.112					**Kolmogorov-Smirnov Gamma GOF Test**	
573					5% K-S Critical Value	0.181					Detected data appear Gamma Distributed at 5% Significance Level	
574						**Detected data appear Gamma Distributed at 5% Significance Level**						
575												
576						**Gamma Statistics**						
577					k hat (MLE)	197.7					k star (bias corrected MLE)	172
578					Theta hat (MLE)	2.086					Theta star (bias corrected MLE)	2.398
579					nu hat (MLE)	9095					nu star (bias corrected)	7910
580					MLE Mean (bias corrected)	412.4					MLE Sd (bias corrected)	31.45
581											Approximate Chi Square Value (0.05)	7704
582					Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	7690
583												
584						**Assuming Gamma Distribution**						
585					95% Approximate Gamma UCL	423.4					95% Adjusted Gamma UCL	424.3
586												
587						**Lognormal GOF Test**						
588					Shapiro Wilk Test Statistic	0.94					**Shapiro Wilk Lognormal GOF Test**	
589					10% Shapiro Wilk Critical Value	0.928					Data appear Lognormal at 10% Significance Level	
590					Lilliefors Test Statistic	0.108					**Lilliefors Lognormal GOF Test**	
591					10% Lilliefors Critical Value	0.165					Data appear Lognormal at 10% Significance Level	
592						**Data appear Lognormal at 10% Significance Level**						
593												
594						**Lognormal Statistics**						
595					Minimum of Logged Data	5.914					Mean of logged Data	6.02
596					Maximum of Logged Data	6.144					SD of logged Data	0.0728
597												
598						**Assuming Lognormal Distribution**						
599					95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	431.2
600					95% Chebyshev (MVUE) UCL	439.8					97.5% Chebyshev (MVUE) UCL	451.6
601					99% Chebyshev (MVUE) UCL	474.8						
602												
603						**Nonparametric Distribution Free UCL Statistics**						
604						**Data appear to follow a Discernible Distribution**						
605												

606	**Nonparametric Distribution Free UCLs**											
607					95% CLT UCL	422.7				95% BCA Bootstrap UCL	422.8	
608					95% Standard Bootstrap UCL	422.9				95% Bootstrap-t UCL	423.8	
609					95% Hall's Bootstrap UCL	423.1				95% Percentile Bootstrap UCL	422.7	
610					90% Chebyshev(Mean, Sd) UCL	431.2				95% Chebyshev(Mean, Sd) UCL	439.6	
611					97.5% Chebyshev(Mean, Sd) UCL	451.4				99% Chebyshev(Mean, Sd) UCL	474.5	
612												
613	**Suggested UCL to Use**											
614					95% Student's-t UCL	423.2						
615												
616	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
617	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
618	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
619												
620	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
621	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
622												
623												
624	**ResultValue (apw-10d)**											
625												
626	**General Statistics**											
627					Total Number of Observations	23				Number of Distinct Observations	17	
628										Number of Missing Observations	0	
629					Minimum	351				Mean	455	
630					Maximum	512				Median	454	
631					SD	28.27				Std. Error of Mean	5.895	
632					Coefficient of Variation	0.0621				Skewness	-1.97	
633												
634	**Normal GOF Test**											
635					Shapiro Wilk Test Statistic	0.776				**Shapiro Wilk GOF Test**		
636					1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
637					Lilliefors Test Statistic	0.235				**Lilliefors GOF Test**		
638					1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
639	**Data Not Normal at 1% Significance Level**											
640												
641	**Assuming Normal Distribution**											
642					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
643					95% Student's-t UCL	465.2				95% Adjusted-CLT UCL (Chen-1995)	462.2	
644										95% Modified-t UCL (Johnson-1978)	464.8	
645												
646	**Gamma GOF Test**											
647					A-D Test Statistic	1.755				**Anderson-Darling Gamma GOF Test**		
648					5% A-D Critical Value	0.74				Data Not Gamma Distributed at 5% Significance Level		
649					K-S Test Statistic	0.245				**Kolmogorov-Smirnov Gamma GOF Test**		
650					5% K-S Critical Value	0.181				Data Not Gamma Distributed at 5% Significance Level		
651	**Data Not Gamma Distributed at 5% Significance Level**											
652												
653	**Gamma Statistics**											
654					k hat (MLE)	247.3				k star (bias corrected MLE)	215.1	
655					Theta hat (MLE)	1.84				Theta star (bias corrected MLE)	2.115	
656					nu hat (MLE)	11378				nu star (bias corrected)	9895	
657					MLE Mean (bias corrected)	455				MLE Sd (bias corrected)	31.03	
658										Approximate Chi Square Value (0.05)	9665	
659					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	9649	
660												

661	**Assuming Gamma Distribution**											
662				95% Approximate Gamma UCL	465.9				95% Adjusted Gamma UCL	466.7		
663												
664	**Lognormal GOF Test**											
665				Shapiro Wilk Test Statistic	0.727	**Shapiro Wilk Lognormal GOF Test**						
666				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
667				Lilliefors Test Statistic	0.255	**Lilliefors Lognormal GOF Test**						
668				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
669	**Data Not Lognormal at 10% Significance Level**											
670												
671	**Lognormal Statistics**											
672				Minimum of Logged Data	5.861				Mean of logged Data	6.118		
673				Maximum of Logged Data	6.238				SD of logged Data	0.0666		
674												
675	**Assuming Lognormal Distribution**											
676				95% H-UCL	N/A				90% Chebyshev (MVUE) UCL	474.1		
677				95% Chebyshev (MVUE) UCL	482.7				97.5% Chebyshev (MVUE) UCL	494.6		
678				99% Chebyshev (MVUE) UCL	518.1							
679												
680	**Nonparametric Distribution Free UCL Statistics**											
681	**Data do not follow a Discernible Distribution**											
682												
683	**Nonparametric Distribution Free UCLs**											
684				95% CLT UCL	464.7				95% BCA Bootstrap UCL	462.3		
685				95% Standard Bootstrap UCL	464.6				95% Bootstrap-t UCL	463.2		
686				95% Hall's Bootstrap UCL	463.4				95% Percentile Bootstrap UCL	464.4		
687				90% Chebyshev(Mean, Sd) UCL	472.7				95% Chebyshev(Mean, Sd) UCL	480.7		
688				97.5% Chebyshev(Mean, Sd) UCL	491.9				99% Chebyshev(Mean, Sd) UCL	513.7		
689												
690	**Suggested UCL to Use**											
691				95% Student's-t UCL	465.2							
692												
693	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
694	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
695	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
696												
697	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
698	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
699												
700												
701	**ResultValue (apw-10s)**											
702												
703	**General Statistics**											
704				Total Number of Observations	23				Number of Distinct Observations	18		
705									Number of Missing Observations	0		
706				Minimum	678				Mean	746.2		
707				Maximum	900				Median	750		
708				SD	45.91				Std. Error of Mean	9.573		
709				Coefficient of Variation	0.0615				Skewness	1.465		
710												
711	**Normal GOF Test**											
712				Shapiro Wilk Test Statistic	0.869	**Shapiro Wilk GOF Test**						
713				1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level						
714				Lilliefors Test Statistic	0.187	**Lilliefors GOF Test**						
715				1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L
716	**Data appear Approximate Normal at 1% Significance Level**											
717												
718	**Assuming Normal Distribution**											
719	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
720	95% Student's-t UCL					762.6	95% Adjusted-CLT UCL (Chen-1995)					765
721							95% Modified-t UCL (Johnson-1978)					763.1
722												
723	**Gamma GOF Test**											
724	A-D Test Statistic					0.603	**Anderson-Darling Gamma GOF Test**					
725	5% A-D Critical Value					0.74	Detected data appear Gamma Distributed at 5% Significance Level					
726	K-S Test Statistic					0.175	**Kolmogorov-Smirnov Gamma GOF Test**					
727	5% K-S Critical Value					0.181	Detected data appear Gamma Distributed at 5% Significance Level					
728	**Detected data appear Gamma Distributed at 5% Significance Level**											
729												
730	**Gamma Statistics**											
731	k hat (MLE)					289.1	k star (bias corrected MLE)					251.4
732	Theta hat (MLE)					2.581	Theta star (bias corrected MLE)					2.968
733	nu hat (MLE)					13299	nu star (bias corrected)					11566
734	MLE Mean (bias corrected)					746.2	MLE Sd (bias corrected)					47.06
735							Approximate Chi Square Value (0.05)					11317
736	Adjusted Level of Significance					0.0389	Adjusted Chi Square Value					11299
737												
738	**Assuming Gamma Distribution**											
739	95% Approximate Gamma UCL					762.6	95% Adjusted Gamma UCL					763.8
740												
741	**Lognormal GOF Test**											
742	Shapiro Wilk Test Statistic					0.896	**Shapiro Wilk Lognormal GOF Test**					
743	10% Shapiro Wilk Critical Value					0.928	Data Not Lognormal at 10% Significance Level					
744	Lilliefors Test Statistic					0.176	**Lilliefors Lognormal GOF Test**					
745	10% Lilliefors Critical Value					0.165	Data Not Lognormal at 10% Significance Level					
746	**Data Not Lognormal at 10% Significance Level**											
747												
748	**Lognormal Statistics**											
749	Minimum of Logged Data					6.519	Mean of logged Data					6.613
750	Maximum of Logged Data					6.802	SD of logged Data					0.0595
751												
752	**Assuming Lognormal Distribution**											
753	95% H-UCL					N/A	90% Chebyshev (MVUE) UCL					773.9
754	95% Chebyshev (MVUE) UCL					786.5	97.5% Chebyshev (MVUE) UCL					804
755	99% Chebyshev (MVUE) UCL					838.3						
756												
757	**Nonparametric Distribution Free UCL Statistics**											
758	**Data appear to follow a Discernible Distribution**											
759												
760	**Nonparametric Distribution Free UCLs**											
761	95% CLT UCL					761.9	95% BCA Bootstrap UCL					764.3
762	95% Standard Bootstrap UCL					761.6	95% Bootstrap-t UCL					765.2
763	95% Hall's Bootstrap UCL					773.9	95% Percentile Bootstrap UCL					762.4
764	90% Chebyshev(Mean, Sd) UCL					774.9	95% Chebyshev(Mean, Sd) UCL					787.9
765	97.5% Chebyshev(Mean, Sd) UCL					806	99% Chebyshev(Mean, Sd) UCL					841.4
766												
767	**Suggested UCL to Use**											
768	95% Student's-t UCL					762.6						
769												
770	When a data set follows an approximate distribution passing only one of the GOF tests,											

	A	B	C	D	E	F	G	H	I	J	K	L
771	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
772												
773	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
774	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
775	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
776												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Fluoride
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:21:03 PM
From File	ProUCL_Input_UpgradientDowngradient_Split_w.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	21	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	0.197	Mean	0.24
Maximum	0.264	Median	0.24
SD	0.0171	Std. Error of Mean	0.00374
Coefficient of Variation	0.0714	Skewness	-0.7

Normal GOF Test

Shapiro Wilk Test Statistic	0.937	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.873	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.219	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.246	95% Adjusted-CLT UCL (Chen-1995)	0.245
		95% Modified-t UCL (Johnson-1978)	0.246

Gamma GOF Test

A-D Test Statistic	0.558	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.184	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.189	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	198.4	k star (bias corrected MLE)	170.1
Theta hat (MLE)	0.00121	Theta star (bias corrected MLE)	0.00141
nu hat (MLE)	8331	nu star (bias corrected)	7142
MLE Mean (bias corrected)	0.24	MLE Sd (bias corrected)	0.0184
		Approximate Chi Square Value (0.05)	6947
Adjusted Level of Significance	0.0383	Adjusted Chi Square Value	6932

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.246	95% Adjusted Gamma UCL	0.247

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.923	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.188	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.173	Data Not Lognormal at 10% Significance Level

56	**Data Not Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-1.625				Mean of logged Data	-1.431
60						Maximum of Logged Data	-1.332				SD of logged Data	0.0735
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	N/A				90% Chebyshev (MVUE) UCL	0.251
64						95% Chebyshev (MVUE) UCL	0.256				97.5% Chebyshev (MVUE) UCL	0.264
65						99% Chebyshev (MVUE) UCL	0.278					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.246				95% BCA Bootstrap UCL	0.245
72						95% Standard Bootstrap UCL	0.246				95% Bootstrap-t UCL	0.245
73						95% Hall's Bootstrap UCL	0.245				95% Percentile Bootstrap UCL	0.245
74						90% Chebyshev(Mean, Sd) UCL	0.251				95% Chebyshev(Mean, Sd) UCL	0.256
75						97.5% Chebyshev(Mean, Sd) UCL	0.263				99% Chebyshev(Mean, Sd) UCL	0.277
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.246					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
85	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	21				Number of Distinct Observations	16
92											Number of Missing Observations	0
93						Minimum	0.2				Mean	0.271
94						Maximum	0.37				Median	0.27
95						SD	0.0408				Std. Error of Mean	0.0089
96						Coefficient of Variation	0.15				Skewness	0.418
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.957				**Shapiro Wilk GOF Test**	
100						1% Shapiro Wilk Critical Value	0.873				Data appear Normal at 1% Significance Level	
101						Lilliefors Test Statistic	0.179				**Lilliefors GOF Test**	
102						1% Lilliefors Critical Value	0.219				Data appear Normal at 1% Significance Level	
103	**Data appear Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
107						95% Student's-t UCL	0.286				95% Adjusted-CLT UCL (Chen-1995)	0.287
108											95% Modified-t UCL (Johnson-1978)	0.287
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	0.344	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.161	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.189	Detected data appear Gamma Distributed at 5% Significance Level						
115	**Detected data appear Gamma Distributed at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	46.73	k star (bias corrected MLE)	40.08					
119				Theta hat (MLE)	0.0058	Theta star (bias corrected MLE)	0.00676					
120				nu hat (MLE)	1963	nu star (bias corrected)	1684					
121				MLE Mean (bias corrected)	0.271	MLE Sd (bias corrected)	0.0428					
122						Approximate Chi Square Value (0.05)	1589					
123				Adjusted Level of Significance	0.0383	Adjusted Chi Square Value	1582					
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	0.287	95% Adjusted Gamma UCL	0.288					
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.923	Data appear Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.159	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.173	Data appear Lognormal at 10% Significance Level						
133	**Data appear Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	-1.609	Mean of logged Data	-1.316					
137				Maximum of Logged Data	-0.994	SD of logged Data	0.15					
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	0.288	90% Chebyshev (MVUE) UCL	0.298					
141				95% Chebyshev (MVUE) UCL	0.31	97.5% Chebyshev (MVUE) UCL	0.327					
142				99% Chebyshev (MVUE) UCL	0.36							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data appear to follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	0.286	95% BCA Bootstrap UCL	0.286					
149				95% Standard Bootstrap UCL	0.285	95% Bootstrap-t UCL	0.287					
150				95% Hall's Bootstrap UCL	0.288	95% Percentile Bootstrap UCL	0.286					
151				90% Chebyshev(Mean, Sd) UCL	0.298	95% Chebyshev(Mean, Sd) UCL	0.31					
152				97.5% Chebyshev(Mean, Sd) UCL	0.327	99% Chebyshev(Mean, Sd) UCL	0.36					
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	0.286							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12	Number of Distinct Observations	6					

166											Number of Missing Observations	0
167					Minimum	0.32					Mean	0.336
168					Maximum	0.37					Median	0.33
169					SD	0.0168					Std. Error of Mean	0.00484
170					Coefficient of Variation	0.0499					Skewness	0.938
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.868			**Shapiro Wilk GOF Test**			
174					1% Shapiro Wilk Critical Value	0.805			Data appear Normal at 1% Significance Level			
175					Lilliefors Test Statistic	0.219			**Lilliefors GOF Test**			
176					1% Lilliefors Critical Value	0.281			Data appear Normal at 1% Significance Level			
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
181					95% Student's-t UCL	0.345			95% Adjusted-CLT UCL (Chen-1995)	0.345		
182									95% Modified-t UCL (Johnson-1978)	0.345		
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.632			**Anderson-Darling Gamma GOF Test**			
186					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
187					K-S Test Statistic	0.222			**Kolmogorov-Smirnov Gamma GOF Test**			
188					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
189						**Detected data appear Gamma Distributed at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	448.4			k star (bias corrected MLE)	336.3		
193					Theta hat (MLE)	7.4900E-4			Theta star (bias corrected MLE)	9.9851E-4		
194					nu hat (MLE)	10761			nu star (bias corrected)	8072		
195					MLE Mean (bias corrected)	0.336			MLE Sd (bias corrected)	0.0183		
196									Approximate Chi Square Value (0.05)	7864		
197					Adjusted Level of Significance	0.029			Adjusted Chi Square Value	7833		
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	0.345			95% Adjusted Gamma UCL	0.346		
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.874			**Shapiro Wilk Lognormal GOF Test**			
204					10% Shapiro Wilk Critical Value	0.883			Data Not Lognormal at 10% Significance Level			
205					Lilliefors Test Statistic	0.214			**Lilliefors Lognormal GOF Test**			
206					10% Lilliefors Critical Value	0.223			Data appear Lognormal at 10% Significance Level			
207						**Data appear Approximate Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	-1.139			Mean of logged Data	-1.092		
211					Maximum of Logged Data	-0.994			SD of logged Data	0.049		
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	N/A			90% Chebyshev (MVUE) UCL	0.35		
215					95% Chebyshev (MVUE) UCL	0.357			97.5% Chebyshev (MVUE) UCL	0.366		
216					99% Chebyshev (MVUE) UCL	0.383						
217												
218						**Nonparametric Distribution Free UCL Statistics**							
219						**Data appear to follow a Discernible Distribution**							
220												

221	**Nonparametric Distribution Free UCLs**											
222				95% CLT UCL	0.344			95% BCA Bootstrap UCL	0.343			
223				95% Standard Bootstrap UCL	0.343			95% Bootstrap-t UCL	0.347			
224				95% Hall's Bootstrap UCL	0.346			95% Percentile Bootstrap UCL	0.343			
225				90% Chebyshev(Mean, Sd) UCL	0.35			95% Chebyshev(Mean, Sd) UCL	0.357			
226				97.5% Chebyshev(Mean, Sd) UCL	0.366			99% Chebyshev(Mean, Sd) UCL	0.384			
227												
228	**Suggested UCL to Use**											
229				95% Student's-t UCL	0.345							
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235												
236	**ResultValue (apw-05r)**											
237												
238	**General Statistics**											
239				Total Number of Observations	10			Number of Distinct Observations	10			
240								Number of Missing Observations	0			
241				Minimum	0.15			Mean	0.294			
242				Maximum	0.38			Median	0.299			
243				SD	0.0747			Std. Error of Mean	0.0236			
244				Coefficient of Variation	0.254			Skewness	-0.833			
245												
246	**Normal GOF Test**											
247				Shapiro Wilk Test Statistic	0.922			**Shapiro Wilk GOF Test**				
248				1% Shapiro Wilk Critical Value	0.781			Data appear Normal at 1% Significance Level				
249				Lilliefors Test Statistic	0.174			**Lilliefors GOF Test**				
250				1% Lilliefors Critical Value	0.304			Data appear Normal at 1% Significance Level				
251	**Data appear Normal at 1% Significance Level**											
252												
253	**Assuming Normal Distribution**											
254				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
255				95% Student's-t UCL	0.337			95% Adjusted-CLT UCL (Chen-1995)	0.326			
256								95% Modified-t UCL (Johnson-1978)	0.336			
257												
258	**Gamma GOF Test**											
259				A-D Test Statistic	0.506			**Anderson-Darling Gamma GOF Test**				
260				5% A-D Critical Value	0.725			Detected data appear Gamma Distributed at 5% Significance Level				
261				K-S Test Statistic	0.21			**Kolmogorov-Smirnov Gamma GOF Test**				
262				5% K-S Critical Value	0.266			Detected data appear Gamma Distributed at 5% Significance Level				
263	**Detected data appear Gamma Distributed at 5% Significance Level**											
264												
265	**Gamma Statistics**											
266				k hat (MLE)	14.29			k star (bias corrected MLE)	10.07			
267				Theta hat (MLE)	0.0206			Theta star (bias corrected MLE)	0.0292			
268				nu hat (MLE)	285.9			nu star (bias corrected)	201.5			
269				MLE Mean (bias corrected)	0.294			MLE Sd (bias corrected)	0.0926			
270								Approximate Chi Square Value (0.05)	169.6			
271				Adjusted Level of Significance	0.0267			Adjusted Chi Square Value	164.5			
272												
273	**Assuming Gamma Distribution**											
274				95% Approximate Gamma UCL	0.349			95% Adjusted Gamma UCL	0.36			
275												

276	**Lognormal GOF Test**											
277					Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk Lognormal GOF Test**					
278					10% Shapiro Wilk Critical Value	0.869	Data Not Lognormal at 10% Significance Level					
279					Lilliefors Test Statistic	0.225	**Lilliefors Lognormal GOF Test**					
280					10% Lilliefors Critical Value	0.241	Data appear Lognormal at 10% Significance Level					
281	**Data appear Approximate Lognormal at 10% Significance Level**											
282												
283	**Lognormal Statistics**											
284					Minimum of Logged Data	-1.897	Mean of logged Data	-1.26				
285					Maximum of Logged Data	-0.968	SD of logged Data	0.296				
286												
287	**Assuming Lognormal Distribution**											
288					95% H-UCL	0.36	90% Chebyshev (MVUE) UCL	0.378				
289					95% Chebyshev (MVUE) UCL	0.416	97.5% Chebyshev (MVUE) UCL	0.468				
290					99% Chebyshev (MVUE) UCL	0.571						
291												
292	**Nonparametric Distribution Free UCL Statistics**											
293	**Data appear to follow a Discernible Distribution**											
294												
295	**Nonparametric Distribution Free UCLs**											
296					95% CLT UCL	0.333	95% BCA Bootstrap UCL	0.326				
297					95% Standard Bootstrap UCL	0.331	95% Bootstrap-t UCL	0.333				
298					95% Hall's Bootstrap UCL	0.328	95% Percentile Bootstrap UCL	0.33				
299					90% Chebyshev(Mean, Sd) UCL	0.365	95% Chebyshev(Mean, Sd) UCL	0.397				
300					97.5% Chebyshev(Mean, Sd) UCL	0.441	99% Chebyshev(Mean, Sd) UCL	0.529				
301												
302	**Suggested UCL to Use**											
303					95% Student's-t UCL	0.337						
304												
305	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
306	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
307	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
308												
309	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
310	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
311												
312												
313	**ResultValue (apw-06d)**											
314												
315	**General Statistics**											
316					Total Number of Observations	21	Number of Distinct Observations	12				
317							Number of Missing Observations	0				
318					Minimum	0.15	Mean	0.213				
319					Maximum	0.249	Median	0.212				
320					SD	0.0223	Std. Error of Mean	0.00486				
321					Coefficient of Variation	0.105	Skewness	-1.132				
322												
323	**Normal GOF Test**											
324					Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk GOF Test**					
325					1% Shapiro Wilk Critical Value	0.873	Data appear Normal at 1% Significance Level					
326					Lilliefors Test Statistic	0.191	**Lilliefors GOF Test**					
327					1% Lilliefors Critical Value	0.219	Data appear Normal at 1% Significance Level					
328	**Data appear Normal at 1% Significance Level**											
329												
330	**Assuming Normal Distribution**											

331	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
332				95% Student's-t UCL		0.221				95% Adjusted-CLT UCL (Chen-1995)		0.219
333										95% Modified-t UCL (Johnson-1978)		0.221
334												
335	**Gamma GOF Test**											
336				A-D Test Statistic		0.921	**Anderson-Darling Gamma GOF Test**					
337				5% A-D Critical Value		0.74	Data Not Gamma Distributed at 5% Significance Level					
338				K-S Test Statistic		0.204	**Kolmogorov-Smirnov Gamma GOF Test**					
339				5% K-S Critical Value		0.189	Data Not Gamma Distributed at 5% Significance Level					
340	**Data Not Gamma Distributed at 5% Significance Level**											
341												
342	**Gamma Statistics**											
343				k hat (MLE)		87.09				k star (bias corrected MLE)		74.68
344				Theta hat (MLE)		0.00244				Theta star (bias corrected MLE)		0.00285
345				nu hat (MLE)		3658				nu star (bias corrected)		3136
346				MLE Mean (bias corrected)		0.213				MLE Sd (bias corrected)		0.0246
347										Approximate Chi Square Value (0.05)		3007
348				Adjusted Level of Significance		0.0383				Adjusted Chi Square Value		2998
349												
350	**Assuming Gamma Distribution**											
351				95% Approximate Gamma UCL		0.222				95% Adjusted Gamma UCL		0.222
352												
353	**Lognormal GOF Test**											
354				Shapiro Wilk Test Statistic		0.854	**Shapiro Wilk Lognormal GOF Test**					
355				10% Shapiro Wilk Critical Value		0.923	Data Not Lognormal at 10% Significance Level					
356				Lilliefors Test Statistic		0.217	**Lilliefors Lognormal GOF Test**					
357				10% Lilliefors Critical Value		0.173	Data Not Lognormal at 10% Significance Level					
358	**Data Not Lognormal at 10% Significance Level**											
359												
360	**Lognormal Statistics**											
361				Minimum of Logged Data		-1.897				Mean of logged Data		-1.554
362				Maximum of Logged Data		-1.39				SD of logged Data		0.113
363												
364	**Assuming Lognormal Distribution**											
365				95% H-UCL		0.222				90% Chebyshev (MVUE) UCL		0.228
366				95% Chebyshev (MVUE) UCL		0.236				97.5% Chebyshev (MVUE) UCL		0.245
367				99% Chebyshev (MVUE) UCL		0.265						
368												
369	**Nonparametric Distribution Free UCL Statistics**											
370	**Data appear to follow a Discernible Distribution**											
371												
372	**Nonparametric Distribution Free UCLs**											
373				95% CLT UCL		0.221				95% BCA Bootstrap UCL		0.22
374				95% Standard Bootstrap UCL		0.22				95% Bootstrap-t UCL		0.22
375				95% Hall's Bootstrap UCL		0.22				95% Percentile Bootstrap UCL		0.22
376				90% Chebyshev(Mean, Sd) UCL		0.227				95% Chebyshev(Mean, Sd) UCL		0.234
377				97.5% Chebyshev(Mean, Sd) UCL		0.243				99% Chebyshev(Mean, Sd) UCL		0.261
378												
379	**Suggested UCL to Use**											
380				95% Student's-t UCL		0.221						
381												
382	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
383	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
384	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
385												

386	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
387	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
388												
389												
390	ResultValue (apw-06s)											
391												
392	General Statistics											
393					Total Number of Observations	23			Number of Distinct Observations	17		
394									Number of Missing Observations	0		
395					Minimum	0.15			Mean	0.267		
396					Maximum	0.41			Median	0.26		
397					SD	0.0538			Std. Error of Mean	0.0112		
398					Coefficient of Variation	0.202			Skewness	0.0495		
399												
400	Normal GOF Test											
401					Shapiro Wilk Test Statistic	0.917			Shapiro Wilk GOF Test			
402					1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level			
403					Lilliefors Test Statistic	0.174			Lilliefors GOF Test			
404					1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level			
405	Data appear Normal at 1% Significance Level											
406												
407	Assuming Normal Distribution											
408					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
409					95% Student's-t UCL	0.286			95% Adjusted-CLT UCL (Chen-1995)	0.285		
410									95% Modified-t UCL (Johnson-1978)	0.286		
411												
412	Gamma GOF Test											
413					A-D Test Statistic	0.947			Anderson-Darling Gamma GOF Test			
414					5% A-D Critical Value	0.742			Data Not Gamma Distributed at 5% Significance Level			
415					K-S Test Statistic	0.195			Kolmogorov-Smirnov Gamma GOF Test			
416					5% K-S Critical Value	0.181			Data Not Gamma Distributed at 5% Significance Level			
417	Data Not Gamma Distributed at 5% Significance Level											
418												
419	Gamma Statistics											
420					k hat (MLE)	23.62			k star (bias corrected MLE)	20.57		
421					Theta hat (MLE)	0.0113			Theta star (bias corrected MLE)	0.013		
422					nu hat (MLE)	1087			nu star (bias corrected)	946.3		
423					MLE Mean (bias corrected)	0.267			MLE Sd (bias corrected)	0.0588		
424									Approximate Chi Square Value (0.05)	875.9		
425					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	871		
426												
427	Assuming Gamma Distribution											
428					95% Approximate Gamma UCL	0.288			95% Adjusted Gamma UCL	0.29		
429												
430	Lognormal GOF Test											
431					Shapiro Wilk Test Statistic	0.87			Shapiro Wilk Lognormal GOF Test			
432					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
433					Lilliefors Test Statistic	0.213			Lilliefors Lognormal GOF Test			
434					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
435	Data Not Lognormal at 10% Significance Level											
436												
437	Lognormal Statistics											
438					Minimum of Logged Data	-1.897			Mean of logged Data	-1.343		
439					Maximum of Logged Data	-0.892			SD of logged Data	0.218		
440												

441	**Assuming Lognormal Distribution**											
442					95% H-UCL	0.29				90% Chebyshev (MVUE) UCL	0.304	
443					95% Chebyshev (MVUE) UCL	0.32				97.5% Chebyshev (MVUE) UCL	0.343	
444					99% Chebyshev (MVUE) UCL	0.389						
445												
446	**Nonparametric Distribution Free UCL Statistics**											
447	**Data appear to follow a Discernible Distribution**											
448												
449	**Nonparametric Distribution Free UCLs**											
450					95% CLT UCL	0.285				95% BCA Bootstrap UCL	0.286	
451					95% Standard Bootstrap UCL	0.285				95% Bootstrap-t UCL	0.286	
452					95% Hall's Bootstrap UCL	0.288				95% Percentile Bootstrap UCL	0.284	
453					90% Chebyshev(Mean, Sd) UCL	0.3				95% Chebyshev(Mean, Sd) UCL	0.315	
454					97.5% Chebyshev(Mean, Sd) UCL	0.337				99% Chebyshev(Mean, Sd) UCL	0.378	
455												
456	**Suggested UCL to Use**											
457					95% Student's-t UCL	0.286						
458												
459	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
460	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
461	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
462												
463												
464	**ResultValue (apw-07)**											
465												
466	**General Statistics**											
467					Total Number of Observations	22				Number of Distinct Observations	12	
468										Number of Missing Observations	0	
469					Minimum	0.15				Mean	0.191	
470					Maximum	0.35				Median	0.185	
471					SD	0.039				Std. Error of Mean	0.00832	
472					Coefficient of Variation	0.204				Skewness	3.397	
473												
474	**Normal GOF Test**											
475					Shapiro Wilk Test Statistic	0.614				**Shapiro Wilk GOF Test**		
476					1% Shapiro Wilk Critical Value	0.878				Data Not Normal at 1% Significance Level		
477					Lilliefors Test Statistic	0.317				**Lilliefors GOF Test**		
478					1% Lilliefors Critical Value	0.214				Data Not Normal at 1% Significance Level		
479	**Data Not Normal at 1% Significance Level**											
480												
481	**Assuming Normal Distribution**											
482					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
483					95% Student's-t UCL	0.205				95% Adjusted-CLT UCL (Chen-1995)	0.211	
484										95% Modified-t UCL (Johnson-1978)	0.206	
485												
486	**Gamma GOF Test**											
487					A-D Test Statistic	1.796				**Anderson-Darling Gamma GOF Test**		
488					5% A-D Critical Value	0.742				Data Not Gamma Distributed at 5% Significance Level		
489					K-S Test Statistic	0.28				**Kolmogorov-Smirnov Gamma GOF Test**		
490					5% K-S Critical Value	0.185				Data Not Gamma Distributed at 5% Significance Level		
491	**Data Not Gamma Distributed at 5% Significance Level**											
492												
493	**Gamma Statistics**											
494					k hat (MLE)	33.66				k star (bias corrected MLE)	29.1	
495					Theta hat (MLE)	0.00567				Theta star (bias corrected MLE)	0.00656	

496					nu hat (MLE)	1481				nu star (bias corrected)		1280
497					MLE Mean (bias corrected)	0.191				MLE Sd (bias corrected)		0.0354
498										Approximate Chi Square Value (0.05)		1198
499					Adjusted Level of Significance	0.0386				Adjusted Chi Square Value		1192
500												
501					**Assuming Gamma Distribution**							
502					95% Approximate Gamma UCL	0.204				95% Adjusted Gamma UCL		0.205
503												
504					**Lognormal GOF Test**							
505					Shapiro Wilk Test Statistic	0.743				**Shapiro Wilk Lognormal GOF Test**		
506					10% Shapiro Wilk Critical Value	0.926				Data Not Lognormal at 10% Significance Level		
507					Lilliefors Test Statistic	0.264				**Lilliefors Lognormal GOF Test**		
508					10% Lilliefors Critical Value	0.169				Data Not Lognormal at 10% Significance Level		
509					**Data Not Lognormal at 10% Significance Level**							
510												
511					**Lognormal Statistics**							
512					Minimum of Logged Data	-1.897				Mean of logged Data		-1.671
513					Maximum of Logged Data	-1.05				SD of logged Data		0.166
514												
515					**Assuming Lognormal Distribution**							
516					95% H-UCL	0.203				90% Chebyshev (MVUE) UCL		0.211
517					95% Chebyshev (MVUE) UCL	0.22				97.5% Chebyshev (MVUE) UCL		0.233
518					99% Chebyshev (MVUE) UCL	0.258						
519												
520					**Nonparametric Distribution Free UCL Statistics**							
521					**Data do not follow a Discernible Distribution**							
522												
523					**Nonparametric Distribution Free UCLs**							
524					95% CLT UCL	0.205				95% BCA Bootstrap UCL		0.215
525					95% Standard Bootstrap UCL	0.204				95% Bootstrap-t UCL		0.219
526					95% Hall's Bootstrap UCL	0.266				95% Percentile Bootstrap UCL		0.205
527					90% Chebyshev(Mean, Sd) UCL	0.216				95% Chebyshev(Mean, Sd) UCL		0.227
528					97.5% Chebyshev(Mean, Sd) UCL	0.243				99% Chebyshev(Mean, Sd) UCL		0.274
529												
530					**Suggested UCL to Use**							
531					95% Student's-t UCL	0.205						
532												
533					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
534					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
535					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
536												
537												
538	**ResultValue (apw-08)**											
539												
540					**General Statistics**							
541					Total Number of Observations	22				Number of Distinct Observations		11
542										Number of Missing Observations		0
543					Minimum	0.232				Mean		0.275
544					Maximum	0.336				Median		0.28
545					SD	0.0242				Std. Error of Mean		0.00517
546					Coefficient of Variation	0.0882				Skewness		0.403
547												
548					**Normal GOF Test**							
549					Shapiro Wilk Test Statistic	0.957				**Shapiro Wilk GOF Test**		
550					1% Shapiro Wilk Critical Value	0.878				Data appear Normal at 1% Significance Level		

551				Lilliefors Test Statistic	0.14	**Lilliefors GOF Test**						
552				1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level						
553	**Data appear Normal at 1% Significance Level**											
554												
555	**Assuming Normal Distribution**											
556	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
557				95% Student's-t UCL	0.284	95% Adjusted-CLT UCL (Chen-1995)	0.284					
558						95% Modified-t UCL (Johnson-1978)	0.284					
559												
560	**Gamma GOF Test**											
561				A-D Test Statistic	0.405	**Anderson-Darling Gamma GOF Test**						
562				5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level						
563				K-S Test Statistic	0.141	**Kolmogorov-Smirnov Gamma GOF Test**						
564				5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level						
565	**Detected data appear Gamma Distributed at 5% Significance Level**											
566												
567	**Gamma Statistics**											
568				k hat (MLE)	136.4	k star (bias corrected MLE)	117.8					
569				Theta hat (MLE)	0.00202	Theta star (bias corrected MLE)	0.00233					
570				nu hat (MLE)	6000	nu star (bias corrected)	5183					
571				MLE Mean (bias corrected)	0.275	MLE Sd (bias corrected)	0.0253					
572						Approximate Chi Square Value (0.05)	5016					
573				Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	5004					
574												
575	**Assuming Gamma Distribution**											
576				95% Approximate Gamma UCL	0.284	95% Adjusted Gamma UCL	0.285					
577												
578	**Lognormal GOF Test**											
579				Shapiro Wilk Test Statistic	0.965	**Shapiro Wilk Lognormal GOF Test**						
580				10% Shapiro Wilk Critical Value	0.926	Data appear Lognormal at 10% Significance Level						
581				Lilliefors Test Statistic	0.144	**Lilliefors Lognormal GOF Test**						
582				10% Lilliefors Critical Value	0.169	Data appear Lognormal at 10% Significance Level						
583	**Data appear Lognormal at 10% Significance Level**											
584												
585	**Lognormal Statistics**											
586				Minimum of Logged Data	-1.461	Mean of logged Data	-1.295					
587				Maximum of Logged Data	-1.091	SD of logged Data	0.0875					
588												
589	**Assuming Lognormal Distribution**											
590				95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	0.29					
591				95% Chebyshev (MVUE) UCL	0.297	97.5% Chebyshev (MVUE) UCL	0.307					
592				99% Chebyshev (MVUE) UCL	0.326							
593												
594	**Nonparametric Distribution Free UCL Statistics**											
595	**Data appear to follow a Discernible Distribution**											
596												
597	**Nonparametric Distribution Free UCLs**											
598				95% CLT UCL	0.283	95% BCA Bootstrap UCL	0.284					
599				95% Standard Bootstrap UCL	0.283	95% Bootstrap-t UCL	0.284					
600				95% Hall's Bootstrap UCL	0.284	95% Percentile Bootstrap UCL	0.284					
601				90% Chebyshev(Mean, Sd) UCL	0.29	95% Chebyshev(Mean, Sd) UCL	0.297					
602				97.5% Chebyshev(Mean, Sd) UCL	0.307	99% Chebyshev(Mean, Sd) UCL	0.326					
603												
604	**Suggested UCL to Use**											
605				95% Student's-t UCL	0.284							

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ResultValue (apw-10d)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	5
		Number of Missing Observations	0
Minimum	0.1	Mean	0.124
Maximum	0.15	Median	0.12
SD	0.0213	Std. Error of Mean	0.00444
Coefficient of Variation	0.171	Skewness	0.207

Normal GOF Test

Shapiro Wilk Test Statistic	0.8	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.234	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.132	95% Adjusted-CLT UCL (Chen-1995)	0.132
		95% Modified-t UCL (Johnson-1978)	0.132

Gamma GOF Test

A-D Test Statistic	1.756	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.236	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	35.96	k star (bias corrected MLE)	31.3
Theta hat (MLE)	0.00346	Theta star (bias corrected MLE)	0.00397
nu hat (MLE)	1654	nu star (bias corrected)	1440
MLE Mean (bias corrected)	0.124	MLE Sd (bias corrected)	0.0222
		Approximate Chi Square Value (0.05)	1353
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	1347

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.132	95% Adjusted Gamma UCL	0.133

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.811	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.229	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.303	Mean of logged Data	-2.099

661				Maximum of Logged Data	-1.897					SD of logged Data	0.171	
662												
663					**Assuming Lognormal Distribution**							
664				95% H-UCL	0.133					90% Chebyshev (MVUE) UCL	0.138	
665				95% Chebyshev (MVUE) UCL	0.144					97.5% Chebyshev (MVUE) UCL	0.152	
666				99% Chebyshev (MVUE) UCL	0.169							
667												
668					**Nonparametric Distribution Free UCL Statistics**							
669					**Data do not follow a Discernible Distribution**							
670												
671					**Nonparametric Distribution Free UCLs**							
672				95% CLT UCL	0.132					95% BCA Bootstrap UCL	0.132	
673				95% Standard Bootstrap UCL	0.131					95% Bootstrap-t UCL	0.132	
674				95% Hall's Bootstrap UCL	0.131					95% Percentile Bootstrap UCL	0.132	
675				90% Chebyshev(Mean, Sd) UCL	0.138					95% Chebyshev(Mean, Sd) UCL	0.144	
676				97.5% Chebyshev(Mean, Sd) UCL	0.152					99% Chebyshev(Mean, Sd) UCL	0.169	
677												
678					**Suggested UCL to Use**							
679				95% Student's-t UCL	0.132							
680												
681					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
682					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
683					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
684												
685												
686	**ResultValue (apw-10s)**											
687												
688					**General Statistics**							
689				Total Number of Observations	23					Number of Distinct Observations	11	
690										Number of Missing Observations	0	
691				Minimum	0.15					Mean	0.178	
692				Maximum	0.265					Median	0.17	
693				SD	0.0328					Std. Error of Mean	0.00684	
694				Coefficient of Variation	0.184					Skewness	1.504	
695												
696					**Normal GOF Test**							
697				Shapiro Wilk Test Statistic	0.802					**Shapiro Wilk GOF Test**		
698				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
699				Lilliefors Test Statistic	0.246					**Lilliefors GOF Test**		
700				1% Lilliefors Critical Value	0.209					Data Not Normal at 1% Significance Level		
701					**Data Not Normal at 1% Significance Level**							
702												
703					**Assuming Normal Distribution**							
704					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
705				95% Student's-t UCL	0.19					95% Adjusted-CLT UCL (Chen-1995)	0.191	
706										95% Modified-t UCL (Johnson-1978)	0.19	
707												
708					**Gamma GOF Test**							
709				A-D Test Statistic	1.405					**Anderson-Darling Gamma GOF Test**		
710				5% A-D Critical Value	0.742					Data Not Gamma Distributed at 5% Significance Level		
711				K-S Test Statistic	0.235					**Kolmogorov-Smirnov Gamma GOF Test**		
712				5% K-S Critical Value	0.181					Data Not Gamma Distributed at 5% Significance Level		
713					**Data Not Gamma Distributed at 5% Significance Level**							
714												
715					**Gamma Statistics**							

716					k hat (MLE)	35.05				k star (bias corrected MLE)		30.51
717					Theta hat (MLE)	0.00507				Theta star (bias corrected MLE)		0.00583
718					nu hat (MLE)	1612				nu star (bias corrected)		1403
719					MLE Mean (bias corrected)	0.178				MLE Sd (bias corrected)		0.0322
720										Approximate Chi Square Value (0.05)		1317
721					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		1311
722												
723					**Assuming Gamma Distribution**							
724					95% Approximate Gamma UCL	0.189				95% Adjusted Gamma UCL		0.19
725												
726					**Lognormal GOF Test**							
727					Shapiro Wilk Test Statistic	0.842				**Shapiro Wilk Lognormal GOF Test**		
728					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
729					Lilliefors Test Statistic	0.225				**Lilliefors Lognormal GOF Test**		
730					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
731					**Data Not Lognormal at 10% Significance Level**							
732												
733					**Lognormal Statistics**							
734					Minimum of Logged Data	-1.897				Mean of logged Data		-1.741
735					Maximum of Logged Data	-1.328				SD of logged Data		0.168
736												
737					**Assuming Lognormal Distribution**							
738					95% H-UCL	0.189				90% Chebyshev (MVUE) UCL		0.196
739					95% Chebyshev (MVUE) UCL	0.205				97.5% Chebyshev (MVUE) UCL		0.217
740					99% Chebyshev (MVUE) UCL	0.24						
741												
742					**Nonparametric Distribution Free UCL Statistics**							
743					**Data do not follow a Discernible Distribution**							
744												
745					**Nonparametric Distribution Free UCLs**							
746					95% CLT UCL	0.189				95% BCA Bootstrap UCL		0.191
747					95% Standard Bootstrap UCL	0.189				95% Bootstrap-t UCL		0.194
748					95% Hall's Bootstrap UCL	0.192				95% Percentile Bootstrap UCL		0.189
749					90% Chebyshev(Mean, Sd) UCL	0.198				95% Chebyshev(Mean, Sd) UCL		0.208
750					97.5% Chebyshev(Mean, Sd) UCL	0.221				99% Chebyshev(Mean, Sd) UCL		0.246
751												
752					**Suggested UCL to Use**							
753					95% Student's-t UCL	0.19						
754												
755	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
756	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
757	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
758												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Lead
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:21:44 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.002	Mean	0.00897
Maximum	0.0323	Median	0.0057
SD	0.00835	Std. Error of Mean	0.00174
Coefficient of Variation	0.931	Skewness	1.435

Normal GOF Test

Shapiro Wilk Test Statistic	0.807	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.222	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.012	95% Adjusted-CLT UCL (Chen-1995)	0.0124
		95% Modified-t UCL (Johnson-1978)	0.012

Gamma GOF Test

A-D Test Statistic	0.783	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.16	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.446	k star (bias corrected MLE)	1.286
Theta hat (MLE)	0.0062	Theta star (bias corrected MLE)	0.00697
nu hat (MLE)	66.49	nu star (bias corrected)	59.15
MLE Mean (bias corrected)	0.00897	MLE Sd (bias corrected)	0.00791
		Approximate Chi Square Value (0.05)	42.47
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	41.45

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0125	95% Adjusted Gamma UCL	0.0128

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.146	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Approximate Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-6.215			Mean of logged Data	-5.098	
60						Maximum of Logged Data	-3.433			SD of logged Data	0.892	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.0143			90% Chebyshev (MVUE) UCL	0.0144	
64						95% Chebyshev (MVUE) UCL	0.0169			97.5% Chebyshev (MVUE) UCL	0.0203	
65						99% Chebyshev (MVUE) UCL	0.0271					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0118			95% BCA Bootstrap UCL	0.0123	
72						95% Standard Bootstrap UCL	0.0118			95% Bootstrap-t UCL	0.0129	
73						95% Hall's Bootstrap UCL	0.0126			95% Percentile Bootstrap UCL	0.012	
74						90% Chebyshev(Mean, Sd) UCL	0.0142			95% Chebyshev(Mean, Sd) UCL	0.0166	
75						97.5% Chebyshev(Mean, Sd) UCL	0.0198			99% Chebyshev(Mean, Sd) UCL	0.0263	
76												
77	**Suggested UCL to Use**											
78						95% Adjusted Gamma UCL	0.0128					
79												
80	When a data set follows an approximate distribution passing only one of the GOF tests,											
81	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
82												
83	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
84	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
85	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	23			Number of Distinct Observations	8	
92										Number of Missing Observations	0	
93						Minimum	0.001			Mean	0.00183	
94						Maximum	0.0044			Median	0.002	
95						SD	9.6229E-4			Std. Error of Mean	2.0065E-4	
96						Coefficient of Variation	0.524			Skewness	1.457	
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.774			**Shapiro Wilk GOF Test**		
100						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
101						Lilliefors Test Statistic	0.218			**Lilliefors GOF Test**		
102						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
103	**Data Not Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
107						95% Student's-t UCL	0.00218			95% Adjusted-CLT UCL (Chen-1995)	0.00223	
108										95% Modified-t UCL (Johnson-1978)	0.00219	
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	1.639	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.237	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level						
115	**Data Not Gamma Distributed at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	4.591	k star (bias corrected MLE)	4.021					
119				Theta hat (MLE)	3.9966E-4	Theta star (bias corrected MLE)	4.5630E-4					
120				nu hat (MLE)	211.2	nu star (bias corrected)	185					
121				MLE Mean (bias corrected)	0.00183	MLE Sd (bias corrected)	9.1499E-4					
122						Approximate Chi Square Value (0.05)	154.5					
123				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	152.5					
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	0.0022	95% Adjusted Gamma UCL	0.00223					
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.831	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.243	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
133	**Data Not Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	-6.908	Mean of logged Data	-6.414					
137				Maximum of Logged Data	-5.426	SD of logged Data	0.473					
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	0.00223	90% Chebyshev (MVUE) UCL	0.00238					
141				95% Chebyshev (MVUE) UCL	0.00264	97.5% Chebyshev (MVUE) UCL	0.00299					
142				99% Chebyshev (MVUE) UCL	0.00368							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data do not follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	0.00216	95% BCA Bootstrap UCL	0.00223					
149				95% Standard Bootstrap UCL	0.00216	95% Bootstrap-t UCL	0.0023					
150				95% Hall's Bootstrap UCL	0.00243	95% Percentile Bootstrap UCL	0.00218					
151				90% Chebyshev(Mean, Sd) UCL	0.00244	95% Chebyshev(Mean, Sd) UCL	0.00271					
152				97.5% Chebyshev(Mean, Sd) UCL	0.00309	99% Chebyshev(Mean, Sd) UCL	0.00383					
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	0.00218							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12	Number of Distinct Observations	1					

166							Number of Missing Observations	0				
167					Minimum	0.001		Mean	0.001			
168					Maximum	0.001		Median	0.001			
169												
170	**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**											
171	**ProUCL (or any other software) should not be used on such a data set!**											
172	**The data set for variable ResultValue (apw-05) was not processed!**											
173												
174	**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**											
175	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
176												
177												
178												
179	**ResultValue (apw-05r)**											
180												
181	**General Statistics**											
182					Total Number of Observations	11		Number of Distinct Observations	4			
183								Number of Missing Observations	0			
184					Minimum	0.0011		Mean	0.00201			
185					Maximum	0.0026		Median	0.002			
186					SD	3.6145E-4		Std. Error of Mean	1.0898E-4			
187					Coefficient of Variation	0.18		Skewness	-1.261			
188												
189	**Normal GOF Test**											
190					Shapiro Wilk Test Statistic	0.71	**Shapiro Wilk GOF Test**					
191					1% Shapiro Wilk Critical Value	0.792	Data Not Normal at 1% Significance Level					
192					Lilliefors Test Statistic	0.402	**Lilliefors GOF Test**					
193					1% Lilliefors Critical Value	0.291	Data Not Normal at 1% Significance Level					
194	**Data Not Normal at 1% Significance Level**											
195												
196	**Assuming Normal Distribution**											
197	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
198					95% Student's-t UCL	0.0022		95% Adjusted-CLT UCL (Chen-1995)	0.00214			
199								95% Modified-t UCL (Johnson-1978)	0.0022			
200												
201	**Gamma GOF Test**											
202					A-D Test Statistic	1.888	**Anderson-Darling Gamma GOF Test**					
203					5% A-D Critical Value	0.729	Data Not Gamma Distributed at 5% Significance Level					
204					K-S Test Statistic	0.428	**Kolmogorov-Smirnov Gamma GOF Test**					
205					5% K-S Critical Value	0.255	Data Not Gamma Distributed at 5% Significance Level					
206	**Data Not Gamma Distributed at 5% Significance Level**											
207												
208	**Gamma Statistics**											
209					k hat (MLE)	27.57		k star (bias corrected MLE)	20.11			
210					Theta hat (MLE)	7.2765E-5		Theta star (bias corrected MLE)	9.9750E-5			
211					nu hat (MLE)	606.6		nu star (bias corrected)	442.5			
212					MLE Mean (bias corrected)	0.00201		MLE Sd (bias corrected)	4.4736E-4			
213								Approximate Chi Square Value (0.05)	394.7			
214					Adjusted Level of Significance	0.0278		Adjusted Chi Square Value	387.4			
215												
216	**Assuming Gamma Distribution**											
217					95% Approximate Gamma UCL	0.00225		95% Adjusted Gamma UCL	0.00229			
218												
219	**Lognormal GOF Test**											
220					Shapiro Wilk Test Statistic	0.64	**Shapiro Wilk Lognormal GOF Test**					

221			10% Shapiro Wilk Critical Value		0.876	Data Not Lognormal at 10% Significance Level						
222			Lilliefors Test Statistic		0.437	**Lilliefors Lognormal GOF Test**						
223			10% Lilliefors Critical Value		0.231	Data Not Lognormal at 10% Significance Level						
224	**Data Not Lognormal at 10% Significance Level**											
225												
226	**Lognormal Statistics**											
227			Minimum of Logged Data		-6.812			Mean of logged Data		-6.23		
228			Maximum of Logged Data		-5.952			SD of logged Data		0.213		
229												
230	**Assuming Lognormal Distribution**											
231			95% H-UCL		0.00229			90% Chebyshev (MVUE) UCL		0.0024		
232			95% Chebyshev (MVUE) UCL		0.00258			97.5% Chebyshev (MVUE) UCL		0.00282		
233			99% Chebyshev (MVUE) UCL		0.0033							
234												
235	**Nonparametric Distribution Free UCL Statistics**											
236	**Data do not follow a Discernible Distribution**											
237												
238	**Nonparametric Distribution Free UCLs**											
239			95% CLT UCL		0.00219			95% BCA Bootstrap UCL		N/A		
240			95% Standard Bootstrap UCL		N/A			95% Bootstrap-t UCL		N/A		
241			95% Hall's Bootstrap UCL		N/A			95% Percentile Bootstrap UCL		N/A		
242			90% Chebyshev(Mean, Sd) UCL		0.00233			95% Chebyshev(Mean, Sd) UCL		0.00248		
243			97.5% Chebyshev(Mean, Sd) UCL		0.00269			99% Chebyshev(Mean, Sd) UCL		0.00309		
244												
245	**Suggested UCL to Use**											
246			95% Student's-t UCL		0.0022							
247												
248	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
249	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
250	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
251												
252	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
253	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
254												
255												
256	**ResultValue (apw-06d)**											
257												
258	**General Statistics**											
259			Total Number of Observations		22			Number of Distinct Observations		4		
260								Number of Missing Observations		0		
261			Minimum		0.001			Mean		0.0014		
262			Maximum		0.002			Median		0.001		
263			SD		4.8206E-4			Std. Error of Mean		1.0278E-4		
264			Coefficient of Variation		0.344			Skewness		0.449		
265												
266	**Normal GOF Test**											
267			Shapiro Wilk Test Statistic		0.673	**Shapiro Wilk GOF Test**						
268			1% Shapiro Wilk Critical Value		0.878	Data Not Normal at 1% Significance Level						
269			Lilliefors Test Statistic		0.342	**Lilliefors GOF Test**						
270			1% Lilliefors Critical Value		0.214	Data Not Normal at 1% Significance Level						
271	**Data Not Normal at 1% Significance Level**											
272												
273	**Assuming Normal Distribution**											
274	**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**				
275			95% Student's-t UCL		0.00158			95% Adjusted-CLT UCL (Chen-1995)		0.00158		

276											95% Modified-t UCL (Johnson-1978)	0.00158
277												
278	**Gamma GOF Test**											
279					A-D Test Statistic	3.42	**Anderson-Darling Gamma GOF Test**					
280					5% A-D Critical Value	0.744	Data Not Gamma Distributed at 5% Significance Level					
281					K-S Test Statistic	0.35	**Kolmogorov-Smirnov Gamma GOF Test**					
282					5% K-S Critical Value	0.185	Data Not Gamma Distributed at 5% Significance Level					
283	**Data Not Gamma Distributed at 5% Significance Level**											
284												
285	**Gamma Statistics**											
286					k hat (MLE)	9.293	k star (bias corrected MLE)	8.056				
287					Theta hat (MLE)	1.5065E-4	Theta star (bias corrected MLE)	1.7378E-4				
288					nu hat (MLE)	408.9	nu star (bias corrected)	354.5				
289					MLE Mean (bias corrected)	0.0014	MLE Sd (bias corrected)	4.9325E-4				
290							Approximate Chi Square Value (0.05)	311.8				
291					Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	308.9				
292												
293	**Assuming Gamma Distribution**											
294					95% Approximate Gamma UCL	0.00159	95% Adjusted Gamma UCL	0.00161				
295												
296	**Lognormal GOF Test**											
297					Shapiro Wilk Test Statistic	0.677	**Shapiro Wilk Lognormal GOF Test**					
298					10% Shapiro Wilk Critical Value	0.926	Data Not Lognormal at 10% Significance Level					
299					Lilliefors Test Statistic	0.345	**Lilliefors Lognormal GOF Test**					
300					10% Lilliefors Critical Value	0.169	Data Not Lognormal at 10% Significance Level					
301	**Data Not Lognormal at 10% Significance Level**											
302												
303	**Lognormal Statistics**											
304					Minimum of Logged Data	-6.908	Mean of logged Data	-6.626				
305					Maximum of Logged Data	-6.215	SD of logged Data	0.335				
306												
307	**Assuming Lognormal Distribution**											
308					95% H-UCL	0.00161	90% Chebyshev (MVUE) UCL	0.0017				
309					95% Chebyshev (MVUE) UCL	0.00184	97.5% Chebyshev (MVUE) UCL	0.00203				
310					99% Chebyshev (MVUE) UCL	0.00241						
311												
312	**Nonparametric Distribution Free UCL Statistics**											
313	**Data do not follow a Discernible Distribution**											
314												
315	**Nonparametric Distribution Free UCLs**											
316					95% CLT UCL	0.00157	95% BCA Bootstrap UCL	N/A				
317					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				
318					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A				
319					90% Chebyshev(Mean, Sd) UCL	0.00171	95% Chebyshev(Mean, Sd) UCL	0.00185				
320					97.5% Chebyshev(Mean, Sd) UCL	0.00204	99% Chebyshev(Mean, Sd) UCL	0.00242				
321												
322	**Suggested UCL to Use**											
323					95% Student's-t UCL	0.00158						
324												
325	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
326	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
327	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
328												
329												
330	**ResultValue (apw-06s)**											

331												
332						**General Statistics**						
333					Total Number of Observations	23				Number of Distinct Observations	3	
334										Number of Missing Observations	0	
335					Minimum	0.001				Mean	0.00143	
336					Maximum	0.0028				Median	0.001	
337					SD	5.6666E-4				Std. Error of Mean	1.1816E-4	
338					Coefficient of Variation	0.397				Skewness	0.827	
339												
340						**Normal GOF Test**						
341					Shapiro Wilk Test Statistic	0.692				**Shapiro Wilk GOF Test**		
342					1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
343					Lilliefors Test Statistic	0.383				**Lilliefors GOF Test**		
344					1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
345						**Data Not Normal at 1% Significance Level**						
346												
347						**Assuming Normal Distribution**						
348					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
349					95% Student's-t UCL	0.00163				95% Adjusted-CLT UCL (Chen-1995)	0.00164	
350										95% Modified-t UCL (Johnson-1978)	0.00163	
351												
352						**Gamma GOF Test**						
353					A-D Test Statistic	3.771				**Anderson-Darling Gamma GOF Test**		
354					5% A-D Critical Value	0.745				Data Not Gamma Distributed at 5% Significance Level		
355					K-S Test Statistic	0.393				**Kolmogorov-Smirnov Gamma GOF Test**		
356					5% K-S Critical Value	0.182				Data Not Gamma Distributed at 5% Significance Level		
357						**Data Not Gamma Distributed at 5% Significance Level**						
358												
359						**Gamma Statistics**						
360					k hat (MLE)	7.401				k star (bias corrected MLE)	6.465	
361					Theta hat (MLE)	1.9268E-4				Theta star (bias corrected MLE)	2.2059E-4	
362					nu hat (MLE)	340.5				nu star (bias corrected)	297.4	
363					MLE Mean (bias corrected)	0.00143				MLE Sd (bias corrected)	5.6087E-4	
364										Approximate Chi Square Value (0.05)	258.4	
365					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	255.8	
366												
367						**Assuming Gamma Distribution**						
368					95% Approximate Gamma UCL	0.00164				95% Adjusted Gamma UCL	0.00166	
369												
370						**Lognormal GOF Test**						
371					Shapiro Wilk Test Statistic	0.679				**Shapiro Wilk Lognormal GOF Test**		
372					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
373					Lilliefors Test Statistic	0.388				**Lilliefors Lognormal GOF Test**		
374					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
375						**Data Not Lognormal at 10% Significance Level**						
376												
377						**Lognormal Statistics**						
378					Minimum of Logged Data	-6.908				Mean of logged Data	-6.622	
379					Maximum of Logged Data	-5.878				SD of logged Data	0.371	
380												
381						**Assuming Lognormal Distribution**						
382					95% H-UCL	0.00165				90% Chebyshev (MVUE) UCL	0.00176	
383					95% Chebyshev (MVUE) UCL	0.00191				97.5% Chebyshev (MVUE) UCL	0.00212	
384					99% Chebyshev (MVUE) UCL	0.00254						
385												

386	**Nonparametric Distribution Free UCL Statistics**											
387	**Data do not follow a Discernible Distribution**											
388												
389	**Nonparametric Distribution Free UCLs**											
390				95% CLT UCL	0.00162			95% BCA Bootstrap UCL	N/A			
391				95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A			
392				95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A			
393				90% Chebyshev(Mean, Sd) UCL	0.00178			95% Chebyshev(Mean, Sd) UCL	0.00194			
394				97.5% Chebyshev(Mean, Sd) UCL	0.00216			99% Chebyshev(Mean, Sd) UCL	0.0026			
395												
396	**Suggested UCL to Use**											
397				95% Student's-t UCL	0.00163							
398												
399	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
400	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
401	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
402												
403												
404	**ResultValue (apw-07)**											
405												
406	**General Statistics**											
407				Total Number of Observations	22			Number of Distinct Observations	3			
408								Number of Missing Observations	0			
409				Minimum	0.001			Mean	0.00161			
410				Maximum	0.0074			Median	0.001			
411				SD	0.00138			Std. Error of Mean	2.9350E-4			
412				Coefficient of Variation	0.856			Skewness	3.844			
413												
414	**Normal GOF Test**											
415				Shapiro Wilk Test Statistic	0.453			**Shapiro Wilk GOF Test**				
416				1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level				
417				Lilliefors Test Statistic	0.343			**Lilliefors GOF Test**				
418				1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level				
419	**Data Not Normal at 1% Significance Level**											
420												
421	**Assuming Normal Distribution**											
422				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
423				95% Student's-t UCL	0.00211			95% Adjusted-CLT UCL (Chen-1995)	0.00235			
424								95% Modified-t UCL (Johnson-1978)	0.00215			
425												
426	**Gamma GOF Test**											
427				A-D Test Statistic	3.364			**Anderson-Darling Gamma GOF Test**				
428				5% A-D Critical Value	0.749			Data Not Gamma Distributed at 5% Significance Level				
429				K-S Test Statistic	0.36			**Kolmogorov-Smirnov Gamma GOF Test**				
430				5% K-S Critical Value	0.187			Data Not Gamma Distributed at 5% Significance Level				
431	**Data Not Gamma Distributed at 5% Significance Level**											
432												
433	**Gamma Statistics**											
434				k hat (MLE)	3.203			k star (bias corrected MLE)	2.797			
435				Theta hat (MLE)	5.0236E-4			Theta star (bias corrected MLE)	5.7537E-4			
436				nu hat (MLE)	140.9			nu star (bias corrected)	123.1			
437				MLE Mean (bias corrected)	0.00161			MLE Sd (bias corrected)	9.6220E-4			
438								Approximate Chi Square Value (0.05)	98.43			
439				Adjusted Level of Significance	0.0386			Adjusted Chi Square Value	96.79			
440												

441	**Assuming Gamma Distribution**											
442				95% Approximate Gamma UCL		0.00201				95% Adjusted Gamma UCL		0.00205
443												
444	**Lognormal GOF Test**											
445				Shapiro Wilk Test Statistic		0.637		**Shapiro Wilk Lognormal GOF Test**				
446				10% Shapiro Wilk Critical Value		0.926		Data Not Lognormal at 10% Significance Level				
447				Lilliefors Test Statistic		0.37		**Lilliefors Lognormal GOF Test**				
448				10% Lilliefors Critical Value		0.169		Data Not Lognormal at 10% Significance Level				
449	**Data Not Lognormal at 10% Significance Level**											
450												
451	**Lognormal Statistics**											
452				Minimum of Logged Data		-6.908				Mean of logged Data		-6.596
453				Maximum of Logged Data		-4.906				SD of logged Data		0.499
454												
455	**Assuming Lognormal Distribution**											
456				95% H-UCL		0.00192				90% Chebyshev (MVUE) UCL		0.00205
457				95% Chebyshev (MVUE) UCL		0.00228				97.5% Chebyshev (MVUE) UCL		0.0026
458				99% Chebyshev (MVUE) UCL		0.00323						
459												
460	**Nonparametric Distribution Free UCL Statistics**											
461	**Data do not follow a Discernible Distribution**											
462												
463	**Nonparametric Distribution Free UCLs**											
464				95% CLT UCL		0.00209				95% BCA Bootstrap UCL		N/A
465				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
466				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
467				90% Chebyshev(Mean, Sd) UCL		0.00249				95% Chebyshev(Mean, Sd) UCL		0.00289
468				97.5% Chebyshev(Mean, Sd) UCL		0.00344				99% Chebyshev(Mean, Sd) UCL		0.00453
469												
470	**Suggested UCL to Use**											
471				95% Student's-t UCL		0.00211						
472												
473	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
474	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
475	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
476												
477												
478	**ResultValue (apw-08)**											
479												
480	**General Statistics**											
481				Total Number of Observations		23				Number of Distinct Observations		7
482										Number of Missing Observations		0
483				Minimum		0.001				Mean		0.00155
484				Maximum		0.0028				Median		0.0015
485				SD		5.6879E-4				Std. Error of Mean		1.1860E-4
486				Coefficient of Variation		0.366				Skewness		0.422
487												
488	**Normal GOF Test**											
489				Shapiro Wilk Test Statistic		0.806		**Shapiro Wilk GOF Test**				
490				1% Shapiro Wilk Critical Value		0.881		Data Not Normal at 1% Significance Level				
491				Lilliefors Test Statistic		0.269		**Lilliefors GOF Test**				
492				1% Lilliefors Critical Value		0.209		Data Not Normal at 1% Significance Level				
493	**Data Not Normal at 1% Significance Level**											
494												
495	**Assuming Normal Distribution**											

496	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
497				95% Student's-t UCL		0.00176				95% Adjusted-CLT UCL (Chen-1995)		0.00176
498										95% Modified-t UCL (Johnson-1978)		0.00176
499												
500	**Gamma GOF Test**											
501				A-D Test Statistic		2.254	**Anderson-Darling Gamma GOF Test**					
502				5% A-D Critical Value		0.745	Data Not Gamma Distributed at 5% Significance Level					
503				K-S Test Statistic		0.283	**Kolmogorov-Smirnov Gamma GOF Test**					
504				5% K-S Critical Value		0.182	Data Not Gamma Distributed at 5% Significance Level					
505	**Data Not Gamma Distributed at 5% Significance Level**											
506												
507	**Gamma Statistics**											
508				k hat (MLE)		7.901				k star (bias corrected MLE)		6.899
509				Theta hat (MLE)		1.9646E-4				Theta star (bias corrected MLE)		2.2499E-4
510				nu hat (MLE)		363.4				nu star (bias corrected)		317.4
511				MLE Mean (bias corrected)		0.00155				MLE Sd (bias corrected)		5.9095E-4
512										Approximate Chi Square Value (0.05)		277.1
513				Adjusted Level of Significance		0.0389				Adjusted Chi Square Value		274.4
514												
515	**Assuming Gamma Distribution**											
516				95% Approximate Gamma UCL		0.00178				95% Adjusted Gamma UCL		0.0018
517												
518	**Lognormal GOF Test**											
519				Shapiro Wilk Test Statistic		0.787	**Shapiro Wilk Lognormal GOF Test**					
520				10% Shapiro Wilk Critical Value		0.928	Data Not Lognormal at 10% Significance Level					
521				Lilliefors Test Statistic		0.281	**Lilliefors Lognormal GOF Test**					
522				10% Lilliefors Critical Value		0.165	Data Not Lognormal at 10% Significance Level					
523	**Data Not Lognormal at 10% Significance Level**											
524												
525	**Lognormal Statistics**											
526				Minimum of Logged Data		-6.908				Mean of logged Data		-6.533
527				Maximum of Logged Data		-5.878				SD of logged Data		0.368
528												
529	**Assuming Lognormal Distribution**											
530				95% H-UCL		0.0018				90% Chebyshev (MVUE) UCL		0.00192
531				95% Chebyshev (MVUE) UCL		0.00208				97.5% Chebyshev (MVUE) UCL		0.00231
532				99% Chebyshev (MVUE) UCL		0.00276						
533												
534	**Nonparametric Distribution Free UCL Statistics**											
535	**Data do not follow a Discernible Distribution**											
536												
537	**Nonparametric Distribution Free UCLs**											
538				95% CLT UCL		0.00175				95% BCA Bootstrap UCL		0.00176
539				95% Standard Bootstrap UCL		0.00174				95% Bootstrap-t UCL		0.00176
540				95% Hall's Bootstrap UCL		0.00175				95% Percentile Bootstrap UCL		0.00174
541				90% Chebyshev(Mean, Sd) UCL		0.00191				95% Chebyshev(Mean, Sd) UCL		0.00207
542				97.5% Chebyshev(Mean, Sd) UCL		0.00229				99% Chebyshev(Mean, Sd) UCL		0.00273
543												
544	**Suggested UCL to Use**											
545				95% Student's-t UCL		0.00176						
546												
547	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
548	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
549	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
550												

551												
552	**ResultValue (apw-10d)**											
553												
554						**General Statistics**							
555					Total Number of Observations	23			Number of Distinct Observations	2		
556									Number of Missing Observations	0		
557					Minimum	0.001			Mean	0.00139		
558					Maximum	0.002			Median	0.001		
559					SD	4.9901E-4			Std. Error of Mean	1.0405E-4		
560					Coefficient of Variation	0.359			Skewness	0.477		
561												
562						**Normal GOF Test**						
563					Shapiro Wilk Test Statistic	0.623			**Shapiro Wilk GOF Test**			
564					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
565					Lilliefors Test Statistic	0.392			**Lilliefors GOF Test**			
566					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
567						**Data Not Normal at 1% Significance Level**						
568												
569						**Assuming Normal Distribution**						
570					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
571					95% Student's-t UCL	0.00157			95% Adjusted-CLT UCL (Chen-1995)	0.00157		
572									95% Modified-t UCL (Johnson-1978)	0.00157		
573												
574						**Gamma GOF Test**						
575					A-D Test Statistic	4.394			**Anderson-Darling Gamma GOF Test**			
576					5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level			
577					K-S Test Statistic	0.398			**Kolmogorov-Smirnov Gamma GOF Test**			
578					5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level			
579						**Data Not Gamma Distributed at 5% Significance Level**						
580												
581						**Gamma Statistics**						
582					k hat (MLE)	8.636			k star (bias corrected MLE)	7.539		
583					Theta hat (MLE)	1.6110E-4			Theta star (bias corrected MLE)	1.8455E-4		
584					nu hat (MLE)	397.3			nu star (bias corrected)	346.8		
585					MLE Mean (bias corrected)	0.00139			MLE Sd (bias corrected)	5.0672E-4		
586									Approximate Chi Square Value (0.05)	304.6		
587					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	301.8		
588												
589						**Assuming Gamma Distribution**							
590					95% Approximate Gamma UCL	0.00158			95% Adjusted Gamma UCL	0.0016		
591												
592						**Lognormal GOF Test**						
593					Shapiro Wilk Test Statistic	0.623			**Shapiro Wilk Lognormal GOF Test**			
594					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
595					Lilliefors Test Statistic	0.392			**Lilliefors Lognormal GOF Test**			
596					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
597						**Data Not Lognormal at 10% Significance Level**							
598												
599						**Lognormal Statistics**						
600					Minimum of Logged Data	-6.908			Mean of logged Data	-6.637		
601					Maximum of Logged Data	-6.215			SD of logged Data	0.346		
602												
603						**Assuming Lognormal Distribution**							
604					95% H-UCL	0.0016			90% Chebyshev (MVUE) UCL	0.00169		
605					95% Chebyshev (MVUE) UCL	0.00183			97.5% Chebyshev (MVUE) UCL	0.00203		

606				99% Chebyshev (MVUE) UCL	0.0024							
607												
608					**Nonparametric Distribution Free UCL Statistics**							
609					**Data do not follow a Discernible Distribution**							
610												
611					**Nonparametric Distribution Free UCLs**							
612				95% CLT UCL	0.00156			95% BCA Bootstrap UCL	N/A			
613				95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A			
614				95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A			
615				90% Chebyshev(Mean, Sd) UCL	0.0017			95% Chebyshev(Mean, Sd) UCL	0.00184			
616				97.5% Chebyshev(Mean, Sd) UCL	0.00204			99% Chebyshev(Mean, Sd) UCL	0.00243			
617												
618					**Suggested UCL to Use**							
619				95% Student's-t UCL	0.00157							
620												
621					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
622					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
623					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
624												
625												
626	**ResultValue (apw-10s)**											
627												
628					**General Statistics**							
629				Total Number of Observations	23			Number of Distinct Observations	7			
630								Number of Missing Observations	0			
631				Minimum	7.0000E-4			Mean	0.00161			
632				Maximum	0.0043			Median	0.0014			
633				SD	8.3301E-4			Std. Error of Mean	1.7370E-4			
634				Coefficient of Variation	0.516			Skewness	1.729			
635												
636					**Normal GOF Test**							
637				Shapiro Wilk Test Statistic	0.771			**Shapiro Wilk GOF Test**				
638				1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level				
639				Lilliefors Test Statistic	0.247			**Lilliefors GOF Test**				
640				1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level				
641					**Data Not Normal at 1% Significance Level**							
642												
643					**Assuming Normal Distribution**							
644					**95% Normal UCL**			**95% UCLs (Adjusted for Skewness)**				
645				95% Student's-t UCL	0.00191			95% Adjusted-CLT UCL (Chen-1995)	0.00197			
646								95% Modified-t UCL (Johnson-1978)	0.00192			
647												
648					**Gamma GOF Test**							
649				A-D Test Statistic	1.644			**Anderson-Darling Gamma GOF Test**				
650				5% A-D Critical Value	0.747			Data Not Gamma Distributed at 5% Significance Level				
651				K-S Test Statistic	0.274			**Kolmogorov-Smirnov Gamma GOF Test**				
652				5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level				
653					**Data Not Gamma Distributed at 5% Significance Level**							
654												
655					**Gamma Statistics**							
656				k hat (MLE)	4.929			k star (bias corrected MLE)	4.315			
657				Theta hat (MLE)	3.2727E-4			Theta star (bias corrected MLE)	3.7383E-4			
658				nu hat (MLE)	226.7			nu star (bias corrected)	198.5			
659				MLE Mean (bias corrected)	0.00161			MLE Sd (bias corrected)	7.7654E-4			
660								Approximate Chi Square Value (0.05)	166.9			

661				Adjusted Level of Significance		0.0389					Adjusted Chi Square Value	164.8
662												
663						**Assuming Gamma Distribution**							
664				95% Approximate Gamma UCL		0.00192					95% Adjusted Gamma UCL	0.00194
665												
666						**Lognormal GOF Test**							
667				Shapiro Wilk Test Statistic		0.861			**Shapiro Wilk Lognormal GOF Test**			
668				10% Shapiro Wilk Critical Value		0.928			Data Not Lognormal at 10% Significance Level			
669				Lilliefors Test Statistic		0.273			**Lilliefors Lognormal GOF Test**			
670				10% Lilliefors Critical Value		0.165			Data Not Lognormal at 10% Significance Level			
671						**Data Not Lognormal at 10% Significance Level**							
672												
673						**Lognormal Statistics**							
674				Minimum of Logged Data		-7.264					Mean of logged Data	-6.534
675				Maximum of Logged Data		-5.449					SD of logged Data	0.453
676												
677						**Assuming Lognormal Distribution**							
678				95% H-UCL		0.00194					90% Chebyshev (MVUE) UCL	0.00207
679				95% Chebyshev (MVUE) UCL		0.00228					97.5% Chebyshev (MVUE) UCL	0.00258
680				99% Chebyshev (MVUE) UCL		0.00315						
681												
682						**Nonparametric Distribution Free UCL Statistics**							
683						**Data do not follow a Discernible Distribution**							
684												
685						**Nonparametric Distribution Free UCLs**							
686				95% CLT UCL		0.0019					95% BCA Bootstrap UCL	0.00195
687				95% Standard Bootstrap UCL		0.00189					95% Bootstrap-t UCL	0.00202
688				95% Hall's Bootstrap UCL		0.00215					95% Percentile Bootstrap UCL	0.0019
689				90% Chebyshev(Mean, Sd) UCL		0.00213					95% Chebyshev(Mean, Sd) UCL	0.00237
690				97.5% Chebyshev(Mean, Sd) UCL		0.0027					99% Chebyshev(Mean, Sd) UCL	0.00334
691												
692						**Suggested UCL to Use**							
693				95% Student's-t UCL		0.00191						
694												
695						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
696						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
697						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
698												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Lithium
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:22:13 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	0
Minimum	0.0386	Mean	0.048
Maximum	0.0647	Median	0.0459
SD	0.00678	Std. Error of Mean	0.00141
Coefficient of Variation	0.141	Skewness	0.836

Normal GOF Test

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.146	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0505	95% Adjusted-CLT UCL (Chen-1995)	0.0506
		95% Modified-t UCL (Johnson-1978)	0.0505

Gamma GOF Test

A-D Test Statistic	0.382	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.136	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	55.26	k star (bias corrected MLE)	48.08
Theta hat (MLE)	8.6939E-4	Theta star (bias corrected MLE)	9.9919E-4
nu hat (MLE)	2542	nu star (bias corrected)	2212
MLE Mean (bias corrected)	0.048	MLE Sd (bias corrected)	0.00693
		Approximate Chi Square Value (0.05)	2104
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	2096

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0505	95% Adjusted Gamma UCL	0.0507

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.128	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-3.255			Mean of logged Data	-3.045	
60						Maximum of Logged Data	-2.738			SD of logged Data	0.136	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.0505			90% Chebyshev (MVUE) UCL	0.0521	
64						95% Chebyshev (MVUE) UCL	0.054			97.5% Chebyshev (MVUE) UCL	0.0566	
65						99% Chebyshev (MVUE) UCL	0.0616					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0504			95% BCA Bootstrap UCL	0.0505	
72						95% Standard Bootstrap UCL	0.0504			95% Bootstrap-t UCL	0.0509	
73						95% Hall's Bootstrap UCL	0.0508			95% Percentile Bootstrap UCL	0.0504	
74						90% Chebyshev(Mean, Sd) UCL	0.0523			95% Chebyshev(Mean, Sd) UCL	0.0542	
75						97.5% Chebyshev(Mean, Sd) UCL	0.0569			99% Chebyshev(Mean, Sd) UCL	0.0621	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.0505					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	21	
89										Number of Missing Observations	0	
90						Minimum	0.0239			Mean	0.03	
91						Maximum	0.0361			Median	0.0307	
92						SD	0.00347			Std. Error of Mean	7.2339E-4	
93						Coefficient of Variation	0.116			Skewness	-0.0533	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.968			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.105			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
100	**Data appear Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	0.0312			95% Adjusted-CLT UCL (Chen-1995)	0.0312	
105										95% Modified-t UCL (Johnson-1978)	0.0312	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	0.308			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.12			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
112	**Detected data appear Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	76.89					k star (bias corrected MLE)	66.89	
116				Theta hat (MLE)	3.8982E-4					Theta star (bias corrected MLE)	4.4809E-4	
117				nu hat (MLE)	3537					nu star (bias corrected)	3077	
118				MLE Mean (bias corrected)	0.03					MLE Sd (bias corrected)	0.00366	
119										Approximate Chi Square Value (0.05)	2949	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	2940	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	0.0313					95% Adjusted Gamma UCL	0.0314	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.964	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.124	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
130	**Data appear Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	-3.734					Mean of logged Data	-3.514	
134				Maximum of Logged Data	-3.321					SD of logged Data	0.117	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	0.0313					90% Chebyshev (MVUE) UCL	0.0322	
138				95% Chebyshev (MVUE) UCL	0.0332					97.5% Chebyshev (MVUE) UCL	0.0346	
139				99% Chebyshev (MVUE) UCL	0.0373							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data appear to follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	0.0312					95% BCA Bootstrap UCL	0.0312	
146				95% Standard Bootstrap UCL	0.0311					95% Bootstrap-t UCL	0.0311	
147				95% Hall's Bootstrap UCL	0.0311					95% Percentile Bootstrap UCL	0.0311	
148				90% Chebyshev(Mean, Sd) UCL	0.0321					95% Chebyshev(Mean, Sd) UCL	0.0331	
149				97.5% Chebyshev(Mean, Sd) UCL	0.0345					99% Chebyshev(Mean, Sd) UCL	0.0372	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	0.0312							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
159	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12					Number of Distinct Observations	12	

166											Number of Missing Observations	0
167					Minimum	0.0331					Mean	0.0397
168					Maximum	0.0443					Median	0.0402
169					SD	0.00303					Std. Error of Mean	8.7378E-4
170					Coefficient of Variation	0.0762					Skewness	-0.742
171												
172					**Normal GOF Test**							
173					Shapiro Wilk Test Statistic	0.948			**Shapiro Wilk GOF Test**			
174					1% Shapiro Wilk Critical Value	0.805			Data appear Normal at 1% Significance Level			
175					Lilliefors Test Statistic	0.197			**Lilliefors GOF Test**			
176					1% Lilliefors Critical Value	0.281			Data appear Normal at 1% Significance Level			
177					**Data appear Normal at 1% Significance Level**							
178												
179					**Assuming Normal Distribution**							
180					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
181					95% Student's-t UCL	0.0413			95% Adjusted-CLT UCL (Chen-1995)			0.0409
182									95% Modified-t UCL (Johnson-1978)			0.0412
183												
184					**Gamma GOF Test**							
185					A-D Test Statistic	0.395			**Anderson-Darling Gamma GOF Test**			
186					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
187					K-S Test Statistic	0.206			**Kolmogorov-Smirnov Gamma GOF Test**			
188					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
189					**Detected data appear Gamma Distributed at 5% Significance Level**							
190												
191					**Gamma Statistics**							
192					k hat (MLE)	180.5			k star (bias corrected MLE)			135.4
193					Theta hat (MLE)	2.1996E-4			Theta star (bias corrected MLE)			2.9315E-4
194					nu hat (MLE)	4332			nu star (bias corrected)			3250
195					MLE Mean (bias corrected)	0.0397			MLE Sd (bias corrected)			0.00341
196									Approximate Chi Square Value (0.05)			3119
197					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			3099
198												
199					**Assuming Gamma Distribution**							
200					95% Approximate Gamma UCL	0.0414			95% Adjusted Gamma UCL			0.0416
201												
202					**Lognormal GOF Test**							
203					Shapiro Wilk Test Statistic	0.93			**Shapiro Wilk Lognormal GOF Test**			
204					10% Shapiro Wilk Critical Value	0.883			Data appear Lognormal at 10% Significance Level			
205					Lilliefors Test Statistic	0.213			**Lilliefors Lognormal GOF Test**			
206					10% Lilliefors Critical Value	0.223			Data appear Lognormal at 10% Significance Level			
207					**Data appear Lognormal at 10% Significance Level**							
208												
209					**Lognormal Statistics**							
210					Minimum of Logged Data	-3.408			Mean of logged Data			-3.229
211					Maximum of Logged Data	-3.117			SD of logged Data			0.0786
212												
213					**Assuming Lognormal Distribution**							
214					95% H-UCL	N/A			90% Chebyshev (MVUE) UCL			0.0424
215					95% Chebyshev (MVUE) UCL	0.0436			97.5% Chebyshev (MVUE) UCL			0.0453
216					99% Chebyshev (MVUE) UCL	0.0487						
217												
218					**Nonparametric Distribution Free UCL Statistics**							
219					**Data appear to follow a Discernible Distribution**							
220												

221	**Nonparametric Distribution Free UCLs**											
222				95% CLT UCL	0.0411			95% BCA Bootstrap UCL	0.0409			
223				95% Standard Bootstrap UCL	0.0411			95% Bootstrap-t UCL	0.0411			
224				95% Hall's Bootstrap UCL	0.041			95% Percentile Bootstrap UCL	0.041			
225				90% Chebyshev(Mean, Sd) UCL	0.0423			95% Chebyshev(Mean, Sd) UCL	0.0435			
226				97.5% Chebyshev(Mean, Sd) UCL	0.0452			99% Chebyshev(Mean, Sd) UCL	0.0484			
227												
228	**Suggested UCL to Use**											
229				95% Student's-t UCL	0.0413							
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
236	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
237												
238												
239	**ResultValue (apw-05r)**											
240												
241	**General Statistics**											
242				Total Number of Observations	11			Number of Distinct Observations	11			
243								Number of Missing Observations	0			
244				Minimum	0.0179			Mean	0.0347			
245				Maximum	0.0523			Median	0.0367			
246				SD	0.00934			Std. Error of Mean	0.00282			
247				Coefficient of Variation	0.27			Skewness	-0.0304			
248												
249	**Normal GOF Test**											
250				Shapiro Wilk Test Statistic	0.969			**Shapiro Wilk GOF Test**				
251				1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level				
252				Lilliefors Test Statistic	0.151			**Lilliefors GOF Test**				
253				1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level				
254	**Data appear Normal at 1% Significance Level**											
255												
256	**Assuming Normal Distribution**											
257				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
258				95% Student's-t UCL	0.0398			95% Adjusted-CLT UCL (Chen-1995)	0.0393			
259								95% Modified-t UCL (Johnson-1978)	0.0398			
260												
261	**Gamma GOF Test**											
262				A-D Test Statistic	0.345			**Anderson-Darling Gamma GOF Test**				
263				5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level				
264				K-S Test Statistic	0.187			**Kolmogorov-Smirnov Gamma GOF Test**				
265				5% K-S Critical Value	0.255			Detected data appear Gamma Distributed at 5% Significance Level				
266	**Detected data appear Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269				k hat (MLE)	13.79			k star (bias corrected MLE)	10.09			
270				Theta hat (MLE)	0.00251			Theta star (bias corrected MLE)	0.00343			
271				nu hat (MLE)	303.5			nu star (bias corrected)	222			
272				MLE Mean (bias corrected)	0.0347			MLE Sd (bias corrected)	0.0109			
273								Approximate Chi Square Value (0.05)	188.6			
274				Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	183.5			
275												

276	**Assuming Gamma Distribution**											
277				95% Approximate Gamma UCL		0.0408				95% Adjusted Gamma UCL		0.0419
278												
279	**Lognormal GOF Test**											
280				Shapiro Wilk Test Statistic		0.938		**Shapiro Wilk Lognormal GOF Test**				
281				10% Shapiro Wilk Critical Value		0.876		Data appear Lognormal at 10% Significance Level				
282				Lilliefors Test Statistic		0.199		**Lilliefors Lognormal GOF Test**				
283				10% Lilliefors Critical Value		0.231		Data appear Lognormal at 10% Significance Level				
284	**Data appear Lognormal at 10% Significance Level**											
285												
286	**Lognormal Statistics**											
287				Minimum of Logged Data		-4.023				Mean of logged Data		-3.399
288				Maximum of Logged Data		-2.951				SD of logged Data		0.294
289												
290	**Assuming Lognormal Distribution**											
291				95% H-UCL		0.0418				90% Chebyshev (MVUE) UCL		0.044
292				95% Chebyshev (MVUE) UCL		0.0483				97.5% Chebyshev (MVUE) UCL		0.0541
293				99% Chebyshev (MVUE) UCL		0.0656						
294												
295	**Nonparametric Distribution Free UCL Statistics**											
296	**Data appear to follow a Discernible Distribution**											
297												
298	**Nonparametric Distribution Free UCLs**											
299				95% CLT UCL		0.0393				95% BCA Bootstrap UCL		0.0391
300				95% Standard Bootstrap UCL		0.0391				95% Bootstrap-t UCL		0.0396
301				95% Hall's Bootstrap UCL		0.0399				95% Percentile Bootstrap UCL		0.039
302				90% Chebyshev(Mean, Sd) UCL		0.0431				95% Chebyshev(Mean, Sd) UCL		0.0469
303				97.5% Chebyshev(Mean, Sd) UCL		0.0522				99% Chebyshev(Mean, Sd) UCL		0.0627
304												
305	**Suggested UCL to Use**											
306				95% Student's-t UCL		0.0398						
307												
308	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
309	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
310	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
311												
312	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
313	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
314												
315												
316	**ResultValue (apw-06d)**											
317												
318	**General Statistics**											
319				Total Number of Observations		22				Number of Distinct Observations		19
320										Number of Missing Observations		0
321				Minimum		0.0148				Mean		0.017
322				Maximum		0.0199				Median		0.0169
323				SD		0.00117				Std. Error of Mean		2.4967E-4
324				Coefficient of Variation		0.069				Skewness		0.335
325												
326	**Normal GOF Test**											
327				Shapiro Wilk Test Statistic		0.967		**Shapiro Wilk GOF Test**				
328				1% Shapiro Wilk Critical Value		0.878		Data appear Normal at 1% Significance Level				
329				Lilliefors Test Statistic		0.111		**Lilliefors GOF Test**				
330				1% Lilliefors Critical Value		0.214		Data appear Normal at 1% Significance Level				

331	**Data appear Normal at 1% Significance Level**											
332												
333	**Assuming Normal Distribution**											
334	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
335				95% Student's-t UCL		0.0174			95% Adjusted-CLT UCL (Chen-1995)			0.0174
336									95% Modified-t UCL (Johnson-1978)			0.0174
337												
338	**Gamma GOF Test**											
339				A-D Test Statistic		0.26	**Anderson-Darling Gamma GOF Test**					
340				5% A-D Critical Value		0.741	Detected data appear Gamma Distributed at 5% Significance Level					
341				K-S Test Statistic		0.106	**Kolmogorov-Smirnov Gamma GOF Test**					
342				5% K-S Critical Value		0.185	Detected data appear Gamma Distributed at 5% Significance Level					
343	**Detected data appear Gamma Distributed at 5% Significance Level**											
344												
345	**Gamma Statistics**											
346				k hat (MLE)		221.8			k star (bias corrected MLE)			191.5
347				Theta hat (MLE)		7.6560E-5			Theta star (bias corrected MLE)			8.8634E-5
348				nu hat (MLE)		9757			nu star (bias corrected)			8428
349				MLE Mean (bias corrected)		0.017			MLE Sd (bias corrected)			0.00123
350									Approximate Chi Square Value (0.05)			8215
351				Adjusted Level of Significance		0.0386			Adjusted Chi Square Value			8200
352												
353	**Assuming Gamma Distribution**											
354				95% Approximate Gamma UCL		0.0174			95% Adjusted Gamma UCL			0.0174
355												
356	**Lognormal GOF Test**											
357				Shapiro Wilk Test Statistic		0.97	**Shapiro Wilk Lognormal GOF Test**					
358				10% Shapiro Wilk Critical Value		0.926	Data appear Lognormal at 10% Significance Level					
359				Lilliefors Test Statistic		0.112	**Lilliefors Lognormal GOF Test**					
360				10% Lilliefors Critical Value		0.169	Data appear Lognormal at 10% Significance Level					
361	**Data appear Lognormal at 10% Significance Level**											
362												
363	**Lognormal Statistics**											
364				Minimum of Logged Data		-4.213			Mean of logged Data			-4.078
365				Maximum of Logged Data		-3.917			SD of logged Data			0.0687
366												
367	**Assuming Lognormal Distribution**											
368				95% H-UCL		N/A			90% Chebyshev (MVUE) UCL			0.0177
369				95% Chebyshev (MVUE) UCL		0.0181			97.5% Chebyshev (MVUE) UCL			0.0185
370				99% Chebyshev (MVUE) UCL		0.0195						
371												
372	**Nonparametric Distribution Free UCL Statistics**											
373	**Data appear to follow a Discernible Distribution**											
374												
375	**Nonparametric Distribution Free UCLs**											
376				95% CLT UCL		0.0174			95% BCA Bootstrap UCL			0.0174
377				95% Standard Bootstrap UCL		0.0174			95% Bootstrap-t UCL			0.0175
378				95% Hall's Bootstrap UCL		0.0175			95% Percentile Bootstrap UCL			0.0174
379				90% Chebyshev(Mean, Sd) UCL		0.0177			95% Chebyshev(Mean, Sd) UCL			0.0181
380				97.5% Chebyshev(Mean, Sd) UCL		0.0185			99% Chebyshev(Mean, Sd) UCL			0.0195
381												
382	**Suggested UCL to Use**											
383				95% Student's-t UCL		0.0174						
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

386	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
387	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
388												
389												
390	**ResultValue (apw-06s)**											
391												
392	**General Statistics**											
393						Total Number of Observations	23			Number of Distinct Observations	23	
394										Number of Missing Observations	0	
395						Minimum	0.0295			Mean	0.0398	
396						Maximum	0.0564			Median	0.0408	
397						SD	0.00554			Std. Error of Mean	0.00116	
398						Coefficient of Variation	0.139			Skewness	0.714	
399												
400	**Normal GOF Test**											
401						Shapiro Wilk Test Statistic	0.9			**Shapiro Wilk GOF Test**		
402						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
403						Lilliefors Test Statistic	0.208			**Lilliefors GOF Test**		
404						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
405	**Data appear Normal at 1% Significance Level**											
406												
407	**Assuming Normal Distribution**											
408						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
409						95% Student's-t UCL	0.0418			95% Adjusted-CLT UCL (Chen-1995)	0.0419	
410										95% Modified-t UCL (Johnson-1978)	0.0418	
411												
412	**Gamma GOF Test**											
413						A-D Test Statistic	0.886			**Anderson-Darling Gamma GOF Test**		
414						5% A-D Critical Value	0.741			Data Not Gamma Distributed at 5% Significance Level		
415						K-S Test Statistic	0.189			**Kolmogorov-Smirnov Gamma GOF Test**		
416						5% K-S Critical Value	0.181			Data Not Gamma Distributed at 5% Significance Level		
417	**Data Not Gamma Distributed at 5% Significance Level**											
418												
419	**Gamma Statistics**											
420						k hat (MLE)	55.1			k star (bias corrected MLE)	47.94	
421						Theta hat (MLE)	7.2210E-4			Theta star (bias corrected MLE)	8.2991E-4	
422						nu hat (MLE)	2535			nu star (bias corrected)	2205	
423						MLE Mean (bias corrected)	0.0398			MLE Sd (bias corrected)	0.00575	
424										Approximate Chi Square Value (0.05)	2097	
425						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	2090	
426												
427	**Assuming Gamma Distribution**											
428						95% Approximate Gamma UCL	0.0418			95% Adjusted Gamma UCL	0.042	
429												
430	**Lognormal GOF Test**											
431						Shapiro Wilk Test Statistic	0.92			**Shapiro Wilk Lognormal GOF Test**		
432						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
433						Lilliefors Test Statistic	0.187			**Lilliefors Lognormal GOF Test**		
434						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
435	**Data Not Lognormal at 10% Significance Level**											
436												
437	**Lognormal Statistics**											
438						Minimum of Logged Data	-3.523			Mean of logged Data	-3.233	
439						Maximum of Logged Data	-2.875			SD of logged Data	0.138	
440												

441	**Assuming Lognormal Distribution**											
442					95% H-UCL	0.0419			90% Chebyshev (MVUE) UCL	0.0432		
443					95% Chebyshev (MVUE) UCL	0.0448			97.5% Chebyshev (MVUE) UCL	0.0469		
444					99% Chebyshev (MVUE) UCL	0.0512						
445												
446	**Nonparametric Distribution Free UCL Statistics**											
447	**Data appear to follow a Discernible Distribution**											
448												
449	**Nonparametric Distribution Free UCLs**											
450					95% CLT UCL	0.0417			95% BCA Bootstrap UCL	0.0417		
451					95% Standard Bootstrap UCL	0.0416			95% Bootstrap-t UCL	0.0419		
452					95% Hall's Bootstrap UCL	0.0424			95% Percentile Bootstrap UCL	0.0416		
453					90% Chebyshev(Mean, Sd) UCL	0.0433			95% Chebyshev(Mean, Sd) UCL	0.0448		
454					97.5% Chebyshev(Mean, Sd) UCL	0.047			99% Chebyshev(Mean, Sd) UCL	0.0513		
455												
456	**Suggested UCL to Use**											
457					95% Student's-t UCL	0.0418						
458												
459	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
460	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
461	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
462												
463												
464	**ResultValue (apw-07)**											
465												
466	**General Statistics**											
467					Total Number of Observations	22			Number of Distinct Observations	19		
468									Number of Missing Observations	0		
469					Minimum	0.0141			Mean	0.0169		
470					Maximum	0.0231			Median	0.0171		
471					SD	0.00213			Std. Error of Mean	4.5384E-4		
472					Coefficient of Variation	0.126			Skewness	0.966		
473												
474	**Normal GOF Test**											
475					Shapiro Wilk Test Statistic	0.915			**Shapiro Wilk GOF Test**			
476					1% Shapiro Wilk Critical Value	0.878			Data appear Normal at 1% Significance Level			
477					Lilliefors Test Statistic	0.123			**Lilliefors GOF Test**			
478					1% Lilliefors Critical Value	0.214			Data appear Normal at 1% Significance Level			
479	**Data appear Normal at 1% Significance Level**											
480												
481	**Assuming Normal Distribution**											
482					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
483					95% Student's-t UCL	0.0177			95% Adjusted-CLT UCL (Chen-1995)	0.0177		
484									95% Modified-t UCL (Johnson-1978)	0.0177		
485												
486	**Gamma GOF Test**											
487					A-D Test Statistic	0.412			**Anderson-Darling Gamma GOF Test**			
488					5% A-D Critical Value	0.742			Detected data appear Gamma Distributed at 5% Significance Level			
489					K-S Test Statistic	0.129			**Kolmogorov-Smirnov Gamma GOF Test**			
490					5% K-S Critical Value	0.185			Detected data appear Gamma Distributed at 5% Significance Level			
491	**Detected data appear Gamma Distributed at 5% Significance Level**											
492												
493	**Gamma Statistics**											
494					k hat (MLE)	69.46			k star (bias corrected MLE)	60.02		
495					Theta hat (MLE)	2.4332E-4			Theta star (bias corrected MLE)	2.8160E-4		

496					nu hat (MLE)	3056				nu star (bias corrected)		2641
497					MLE Mean (bias corrected)	0.0169				MLE Sd (bias corrected)		0.00218
498										Approximate Chi Square Value (0.05)		2522
499					Adjusted Level of Significance	0.0386				Adjusted Chi Square Value		2514
500												
501					**Assuming Gamma Distribution**							
502					95% Approximate Gamma UCL	0.0177				95% Adjusted Gamma UCL		0.0178
503												
504					**Lognormal GOF Test**							
505					Shapiro Wilk Test Statistic	0.941				**Shapiro Wilk Lognormal GOF Test**		
506					10% Shapiro Wilk Critical Value	0.926				Data appear Lognormal at 10% Significance Level		
507					Lilliefors Test Statistic	0.123				**Lilliefors Lognormal GOF Test**		
508					10% Lilliefors Critical Value	0.169				Data appear Lognormal at 10% Significance Level		
509					**Data appear Lognormal at 10% Significance Level**							
510												
511					**Lognormal Statistics**							
512					Minimum of Logged Data	-4.262				Mean of logged Data		-4.088
513					Maximum of Logged Data	-3.768				SD of logged Data		0.122
514												
515					**Assuming Lognormal Distribution**							
516					95% H-UCL	0.0177				90% Chebyshev (MVUE) UCL		0.0182
517					95% Chebyshev (MVUE) UCL	0.0188				97.5% Chebyshev (MVUE) UCL		0.0196
518					99% Chebyshev (MVUE) UCL	0.0213						
519												
520					**Nonparametric Distribution Free UCL Statistics**							
521					**Data appear to follow a Discernible Distribution**							
522												
523					**Nonparametric Distribution Free UCLs**							
524					95% CLT UCL	0.0176				95% BCA Bootstrap UCL		0.0177
525					95% Standard Bootstrap UCL	0.0176				95% Bootstrap-t UCL		0.0178
526					95% Hall's Bootstrap UCL	0.018				95% Percentile Bootstrap UCL		0.0177
527					90% Chebyshev(Mean, Sd) UCL	0.0183				95% Chebyshev(Mean, Sd) UCL		0.0189
528					97.5% Chebyshev(Mean, Sd) UCL	0.0197				99% Chebyshev(Mean, Sd) UCL		0.0214
529												
530					**Suggested UCL to Use**							
531					95% Student's-t UCL	0.0177						
532												
533					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
534					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
535					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
536												
537												
538	**ResultValue (apw-08)**											
539												
540					**General Statistics**							
541					Total Number of Observations	23				Number of Distinct Observations		18
542										Number of Missing Observations		0
543					Minimum	0.0142				Mean		0.0182
544					Maximum	0.0223				Median		0.0181
545					SD	0.00244				Std. Error of Mean		5.0787E-4
546					Coefficient of Variation	0.134				Skewness		-0.05
547												
548					**Normal GOF Test**							
549					Shapiro Wilk Test Statistic	0.957				**Shapiro Wilk GOF Test**		
550					1% Shapiro Wilk Critical Value	0.881				Data appear Normal at 1% Significance Level		

	A	B	C	D	E	F	G	H	I	J	K	L
551					Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**					
552					1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level					
553	**Data appear Normal at 1% Significance Level**											
554												
555	**Assuming Normal Distribution**											
556	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
557					95% Student's-t UCL	0.0191	95% Adjusted-CLT UCL (Chen-1995)					0.0191
558							95% Modified-t UCL (Johnson-1978)					0.0191
559												
560	**Gamma GOF Test**											
561					A-D Test Statistic	0.359	**Anderson-Darling Gamma GOF Test**					
562					5% A-D Critical Value	0.741	Detected data appear Gamma Distributed at 5% Significance Level					
563					K-S Test Statistic	0.128	**Kolmogorov-Smirnov Gamma GOF Test**					
564					5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level					
565	**Detected data appear Gamma Distributed at 5% Significance Level**											
566												
567	**Gamma Statistics**											
568					k hat (MLE)	57.6	k star (bias corrected MLE)					50.12
569					Theta hat (MLE)	3.1665E-4	Theta star (bias corrected MLE)					3.6393E-4
570					nu hat (MLE)	2650	nu star (bias corrected)					2305
571					MLE Mean (bias corrected)	0.0182	MLE Sd (bias corrected)					0.00258
572							Approximate Chi Square Value (0.05)					2195
573					Adjusted Level of Significance	0.0389	Adjusted Chi Square Value					2187
574												
575	**Assuming Gamma Distribution**											
576					95% Approximate Gamma UCL	0.0192	95% Adjusted Gamma UCL					0.0192
577												
578	**Lognormal GOF Test**											
579					Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk Lognormal GOF Test**					
580					10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level					
581					Lilliefors Test Statistic	0.121	**Lilliefors Lognormal GOF Test**					
582					10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level					
583	**Data appear Lognormal at 10% Significance Level**											
584												
585	**Lognormal Statistics**											
586					Minimum of Logged Data	-4.255	Mean of logged Data					-4.013
587					Maximum of Logged Data	-3.803	SD of logged Data					0.136
588												
589	**Assuming Lognormal Distribution**											
590					95% H-UCL	0.0192	90% Chebyshev (MVUE) UCL					0.0198
591					95% Chebyshev (MVUE) UCL	0.0205	97.5% Chebyshev (MVUE) UCL					0.0215
592					99% Chebyshev (MVUE) UCL	0.0234						
593												
594	**Nonparametric Distribution Free UCL Statistics**											
595	**Data appear to follow a Discernible Distribution**											
596												
597	**Nonparametric Distribution Free UCLs**											
598					95% CLT UCL	0.0191	95% BCA Bootstrap UCL					0.0191
599					95% Standard Bootstrap UCL	0.0191	95% Bootstrap-t UCL					0.0192
600					95% Hall's Bootstrap UCL	0.0191	95% Percentile Bootstrap UCL					0.0191
601					90% Chebyshev(Mean, Sd) UCL	0.0198	95% Chebyshev(Mean, Sd) UCL					0.0205
602					97.5% Chebyshev(Mean, Sd) UCL	0.0214	99% Chebyshev(Mean, Sd) UCL					0.0233
603												
604	**Suggested UCL to Use**											
605					95% Student's-t UCL	0.0191						

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

ResultValue (apw-10d)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	0.0113	Mean	0.0147
Maximum	0.018	Median	0.0147
SD	0.00122	Std. Error of Mean	2.5474E-4
Coefficient of Variation	0.0829	Skewness	-0.376

Normal GOF Test

Shapiro Wilk Test Statistic	0.874	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.198	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0152	95% Adjusted-CLT UCL (Chen-1995)	0.0151
		95% Modified-t UCL (Johnson-1978)	0.0152

Gamma GOF Test

A-D Test Statistic	1.224	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.205	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	146.6	k star (bias corrected MLE)	127.5
Theta hat (MLE)	1.0056E-4	Theta star (bias corrected MLE)	1.1562E-4
nu hat (MLE)	6744	nu star (bias corrected)	5866
MLE Mean (bias corrected)	0.0147	MLE Sd (bias corrected)	0.00131
		Approximate Chi Square Value (0.05)	5689
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	5676

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0152	95% Adjusted Gamma UCL	0.0152

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.855	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

661												
662						**Lognormal Statistics**							
663						Minimum of Logged Data	-4.483				Mean of logged Data	-4.22
664						Maximum of Logged Data	-4.017				SD of logged Data	0.0855
665												
666						**Assuming Lognormal Distribution**							
667						95% H-UCL	N/A				90% Chebyshev (MVUE) UCL	0.0155
668						95% Chebyshev (MVUE) UCL	0.0159				97.5% Chebyshev (MVUE) UCL	0.0164
669						99% Chebyshev (MVUE) UCL	0.0174					
670												
671						**Nonparametric Distribution Free UCL Statistics**							
672						**Data appear to follow a Discernible Distribution**							
673												
674						**Nonparametric Distribution Free UCLs**							
675						95% CLT UCL	0.0152				95% BCA Bootstrap UCL	0.0151
676						95% Standard Bootstrap UCL	0.0151				95% Bootstrap-t UCL	0.0151
677						95% Hall's Bootstrap UCL	0.0152				95% Percentile Bootstrap UCL	0.0151
678						90% Chebyshev(Mean, Sd) UCL	0.0155				95% Chebyshev(Mean, Sd) UCL	0.0159
679						97.5% Chebyshev(Mean, Sd) UCL	0.0163				99% Chebyshev(Mean, Sd) UCL	0.0173
680												
681						**Suggested UCL to Use**							
682						95% Student's-t UCL	0.0152					
683												
684						When a data set follows an approximate distribution passing only one of the GOF tests,						
685						it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL						
686												
687						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
688						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.						
689						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
690												
691						**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**						
692						**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**						
693												
694												
695	**ResultValue (apw-10s)**											
696												
697						**General Statistics**							
698						Total Number of Observations	23				Number of Distinct Observations	18
699											Number of Missing Observations	0
700						Minimum	0.0263				Mean	0.0303
701						Maximum	0.0401				Median	0.0297
702						SD	0.00301				Std. Error of Mean	6.2768E-4
703						Coefficient of Variation	0.0992				Skewness	1.667
704												
705						**Normal GOF Test**						
706						Shapiro Wilk Test Statistic	0.873				**Shapiro Wilk GOF Test**	
707						1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level	
708						Lilliefors Test Statistic	0.153				**Lilliefors GOF Test**	
709						1% Lilliefors Critical Value	0.209				Data appear Normal at 1% Significance Level	
710						**Data appear Approximate Normal at 1% Significance Level**							
711												
712						**Assuming Normal Distribution**							
713						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
714						95% Student's-t UCL	0.0314				95% Adjusted-CLT UCL (Chen-1995)	0.0316
715											95% Modified-t UCL (Johnson-1978)	0.0315

716												
717	**Gamma GOF Test**											
718					A-D Test Statistic	0.615	**Anderson-Darling Gamma GOF Test**					
719					5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level					
720					K-S Test Statistic	0.144	**Kolmogorov-Smirnov Gamma GOF Test**					
721					5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level					
722	**Detected data appear Gamma Distributed at 5% Significance Level**											
723												
724	**Gamma Statistics**											
725					k hat (MLE)	115.4	k star (bias corrected MLE)	100.3				
726					Theta hat (MLE)	2.6307E-4	Theta star (bias corrected MLE)	3.0244E-4				
727					nu hat (MLE)	5307	nu star (bias corrected)	4616				
728					MLE Mean (bias corrected)	0.0303	MLE Sd (bias corrected)	0.00303				
729							Approximate Chi Square Value (0.05)	4459				
730					Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	4448				
731												
732	**Assuming Gamma Distribution**											
733					95% Approximate Gamma UCL	0.0314	95% Adjusted Gamma UCL	0.0315				
734												
735	**Lognormal GOF Test**											
736					Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**					
737					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
738					Lilliefors Test Statistic	0.138	**Lilliefors Lognormal GOF Test**					
739					10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level					
740	**Data appear Approximate Lognormal at 10% Significance Level**											
741												
742	**Lognormal Statistics**											
743					Minimum of Logged Data	-3.638	Mean of logged Data	-3.499				
744					Maximum of Logged Data	-3.216	SD of logged Data	0.0935				
745												
746	**Assuming Lognormal Distribution**											
747					95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	0.0321				
748					95% Chebyshev (MVUE) UCL	0.0329	97.5% Chebyshev (MVUE) UCL	0.034				
749					99% Chebyshev (MVUE) UCL	0.0362						
750												
751	**Nonparametric Distribution Free UCL Statistics**											
752	**Data appear to follow a Discernible Distribution**											
753												
754	**Nonparametric Distribution Free UCLs**											
755					95% CLT UCL	0.0314	95% BCA Bootstrap UCL	0.0316				
756					95% Standard Bootstrap UCL	0.0314	95% Bootstrap-t UCL	0.0318				
757					95% Hall's Bootstrap UCL	0.0324	95% Percentile Bootstrap UCL	0.0314				
758					90% Chebyshev(Mean, Sd) UCL	0.0322	95% Chebyshev(Mean, Sd) UCL	0.0331				
759					97.5% Chebyshev(Mean, Sd) UCL	0.0343	99% Chebyshev(Mean, Sd) UCL	0.0366				
760												
761	**Suggested UCL to Use**											
762					95% Student's-t UCL	0.0314						
763												
764	When a data set follows an approximate distribution passing only one of the GOF tests,											
765	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
766												
767	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
768	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
769	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
770												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Molybdenum
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:22:50 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	21
		Number of Missing Observations	0
Minimum	0.0951	Mean	0.175
Maximum	0.332	Median	0.165
SD	0.05	Std. Error of Mean	0.0104
Coefficient of Variation	0.286	Skewness	1.318

Normal GOF Test

Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.153	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.193	95% Adjusted-CLT UCL (Chen-1995)	0.195
		95% Modified-t UCL (Johnson-1978)	0.193

Gamma GOF Test

A-D Test Statistic	0.254	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.117	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	14.17	k star (bias corrected MLE)	12.35
Theta hat (MLE)	0.0124	Theta star (bias corrected MLE)	0.0142
nu hat (MLE)	651.8	nu star (bias corrected)	568.1
MLE Mean (bias corrected)	0.175	MLE Sd (bias corrected)	0.0498
		Approximate Chi Square Value (0.05)	513.8
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	510.1

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.194	95% Adjusted Gamma UCL	0.195

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.982	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.1	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-2.353			Mean of logged Data	-1.778	
60						Maximum of Logged Data	-1.103			SD of logged Data	0.27	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.194			90% Chebyshev (MVUE) UCL	0.205	
64						95% Chebyshev (MVUE) UCL	0.218			97.5% Chebyshev (MVUE) UCL	0.237	
65						99% Chebyshev (MVUE) UCL	0.274					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.192			95% BCA Bootstrap UCL	0.194	
72						95% Standard Bootstrap UCL	0.192			95% Bootstrap-t UCL	0.196	
73						95% Hall's Bootstrap UCL	0.202			95% Percentile Bootstrap UCL	0.193	
74						90% Chebyshev(Mean, Sd) UCL	0.206			95% Chebyshev(Mean, Sd) UCL	0.22	
75						97.5% Chebyshev(Mean, Sd) UCL	0.24			99% Chebyshev(Mean, Sd) UCL	0.279	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.193					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	22	
89										Number of Missing Observations	0	
90						Minimum	0.0262			Mean	0.0622	
91						Maximum	0.0849			Median	0.0621	
92						SD	0.0147			Std. Error of Mean	0.00306	
93						Coefficient of Variation	0.236			Skewness	-0.844	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.936			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.145			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
100	**Data appear Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	0.0674			95% Adjusted-CLT UCL (Chen-1995)	0.0667	
105										95% Modified-t UCL (Johnson-1978)	0.0674	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	0.933			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.743			Data Not Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.185			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level						
112	**Data Not Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	15.02					k star (bias corrected MLE)	13.09	
116				Theta hat (MLE)	0.00414					Theta star (bias corrected MLE)	0.00475	
117				nu hat (MLE)	691.1					nu star (bias corrected)	602.2	
118				MLE Mean (bias corrected)	0.0622					MLE Sd (bias corrected)	0.0172	
119										Approximate Chi Square Value (0.05)	546.3	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	542.5	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	0.0686					95% Adjusted Gamma UCL	0.0691	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.842	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.21	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
130	**Data Not Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	-3.642					Mean of logged Data	-2.811	
134				Maximum of Logged Data	-2.466					SD of logged Data	0.284	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	0.0699					90% Chebyshev (MVUE) UCL	0.0738	
138				95% Chebyshev (MVUE) UCL	0.0789					97.5% Chebyshev (MVUE) UCL	0.0859	
139				99% Chebyshev (MVUE) UCL	0.0998							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data appear to follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	0.0672					95% BCA Bootstrap UCL	0.0666	
146				95% Standard Bootstrap UCL	0.0672					95% Bootstrap-t UCL	0.0669	
147				95% Hall's Bootstrap UCL	0.0668					95% Percentile Bootstrap UCL	0.0671	
148				90% Chebyshev(Mean, Sd) UCL	0.0714					95% Chebyshev(Mean, Sd) UCL	0.0755	
149				97.5% Chebyshev(Mean, Sd) UCL	0.0813					99% Chebyshev(Mean, Sd) UCL	0.0926	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	0.0674							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
159	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12					Number of Distinct Observations	12	

166							Number of Missing Observations					0
167					Minimum	0.168				Mean		0.212
168					Maximum	0.249				Median		0.21
169					SD	0.028				Std. Error of Mean		0.00808
170					Coefficient of Variation	0.132				Skewness		-0.154
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.935	**Shapiro Wilk GOF Test**					
174					1% Shapiro Wilk Critical Value	0.805	Data appear Normal at 1% Significance Level					
175					Lilliefors Test Statistic	0.128	**Lilliefors GOF Test**					
176					1% Lilliefors Critical Value	0.281	Data appear Normal at 1% Significance Level					
177						**Data appear Normal at 1% Significance Level**							
178												
179						**Assuming Normal Distribution**							
180					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
181					95% Student's-t UCL	0.227	95% Adjusted-CLT UCL (Chen-1995)					0.225
182							95% Modified-t UCL (Johnson-1978)					0.227
183												
184						**Gamma GOF Test**							
185					A-D Test Statistic	0.325	**Anderson-Darling Gamma GOF Test**					
186					5% A-D Critical Value	0.73	Detected data appear Gamma Distributed at 5% Significance Level					
187					K-S Test Statistic	0.137	**Kolmogorov-Smirnov Gamma GOF Test**					
188					5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level					
189						**Detected data appear Gamma Distributed at 5% Significance Level**							
190												
191						**Gamma Statistics**							
192					k hat (MLE)	61.27	k star (bias corrected MLE)					46.01
193					Theta hat (MLE)	0.00346	Theta star (bias corrected MLE)					0.00461
194					nu hat (MLE)	1470	nu star (bias corrected)					1104
195					MLE Mean (bias corrected)	0.212	MLE Sd (bias corrected)					0.0313
196							Approximate Chi Square Value (0.05)					1028
197					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					1017
198												
199						**Assuming Gamma Distribution**							
200					95% Approximate Gamma UCL	0.228	95% Adjusted Gamma UCL					0.23
201												
202						**Lognormal GOF Test**							
203					Shapiro Wilk Test Statistic	0.931	**Shapiro Wilk Lognormal GOF Test**					
204					10% Shapiro Wilk Critical Value	0.883	Data appear Lognormal at 10% Significance Level					
205					Lilliefors Test Statistic	0.127	**Lilliefors Lognormal GOF Test**					
206					10% Lilliefors Critical Value	0.223	Data appear Lognormal at 10% Significance Level					
207						**Data appear Lognormal at 10% Significance Level**							
208												
209						**Lognormal Statistics**							
210					Minimum of Logged Data	-1.784	Mean of logged Data					-1.559
211					Maximum of Logged Data	-1.39	SD of logged Data					0.135
212												
213						**Assuming Lognormal Distribution**							
214					95% H-UCL	0.228	90% Chebyshev (MVUE) UCL					0.237
215					95% Chebyshev (MVUE) UCL	0.248	97.5% Chebyshev (MVUE) UCL					0.264
216					99% Chebyshev (MVUE) UCL	0.294						
217												
218						**Nonparametric Distribution Free UCL Statistics**							
219						**Data appear to follow a Discernible Distribution**							
220												

221	**Nonparametric Distribution Free UCLs**											
222				95% CLT UCL	0.225			95% BCA Bootstrap UCL	0.224			
223				95% Standard Bootstrap UCL	0.225			95% Bootstrap-t UCL	0.227			
224				95% Hall's Bootstrap UCL	0.225			95% Percentile Bootstrap UCL	0.224			
225				90% Chebyshev(Mean, Sd) UCL	0.236			95% Chebyshev(Mean, Sd) UCL	0.247			
226				97.5% Chebyshev(Mean, Sd) UCL	0.263			99% Chebyshev(Mean, Sd) UCL	0.293			
227												
228	**Suggested UCL to Use**											
229				95% Student's-t UCL	0.227							
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
236	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
237												
238												
239	**ResultValue (apw-05r)**											
240												
241	**General Statistics**											
242				Total Number of Observations	11			Number of Distinct Observations	10			
243								Number of Missing Observations	0			
244				Minimum	0.109			Mean	0.182			
245				Maximum	0.227			Median	0.185			
246				SD	0.0402			Std. Error of Mean	0.0121			
247				Coefficient of Variation	0.22			Skewness	-0.64			
248												
249	**Normal GOF Test**											
250				Shapiro Wilk Test Statistic	0.917			**Shapiro Wilk GOF Test**				
251				1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level				
252				Lilliefors Test Statistic	0.163			**Lilliefors GOF Test**				
253				1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level				
254	**Data appear Normal at 1% Significance Level**											
255												
256	**Assuming Normal Distribution**											
257	**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**				
258				95% Student's-t UCL	0.204			95% Adjusted-CLT UCL (Chen-1995)	0.2			
259								95% Modified-t UCL (Johnson-1978)	0.204			
260												
261	**Gamma GOF Test**											
262				A-D Test Statistic	0.467			**Anderson-Darling Gamma GOF Test**				
263				5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level				
264				K-S Test Statistic	0.192			**Kolmogorov-Smirnov Gamma GOF Test**				
265				5% K-S Critical Value	0.255			Detected data appear Gamma Distributed at 5% Significance Level				
266	**Detected data appear Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269				k hat (MLE)	20.09			k star (bias corrected MLE)	14.67			
270				Theta hat (MLE)	0.00908			Theta star (bias corrected MLE)	0.0124			
271				nu hat (MLE)	441.9			nu star (bias corrected)	322.7			
272				MLE Mean (bias corrected)	0.182			MLE Sd (bias corrected)	0.0476			
273								Approximate Chi Square Value (0.05)	282.1			
274				Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	275.9			
275												

276	**Assuming Gamma Distribution**											
277				95% Approximate Gamma UCL		0.209				95% Adjusted Gamma UCL		0.213
278												
279	**Lognormal GOF Test**											
280				Shapiro Wilk Test Statistic		0.891		**Shapiro Wilk Lognormal GOF Test**				
281				10% Shapiro Wilk Critical Value		0.876		Data appear Lognormal at 10% Significance Level				
282				Lilliefors Test Statistic		0.201		**Lilliefors Lognormal GOF Test**				
283				10% Lilliefors Critical Value		0.231		Data appear Lognormal at 10% Significance Level				
284	**Data appear Lognormal at 10% Significance Level**											
285												
286	**Lognormal Statistics**											
287				Minimum of Logged Data		-2.216				Mean of logged Data		-1.727
288				Maximum of Logged Data		-1.483				SD of logged Data		0.243
289												
290	**Assuming Lognormal Distribution**											
291				95% H-UCL		0.212				90% Chebyshev (MVUE) UCL		0.223
292				95% Chebyshev (MVUE) UCL		0.241				97.5% Chebyshev (MVUE) UCL		0.267
293				99% Chebyshev (MVUE) UCL		0.317						
294												
295	**Nonparametric Distribution Free UCL Statistics**											
296	**Data appear to follow a Discernible Distribution**											
297												
298	**Nonparametric Distribution Free UCLs**											
299				95% CLT UCL		0.202				95% BCA Bootstrap UCL		0.2
300				95% Standard Bootstrap UCL		0.201				95% Bootstrap-t UCL		0.202
301				95% Hall's Bootstrap UCL		0.2				95% Percentile Bootstrap UCL		0.201
302				90% Chebyshev(Mean, Sd) UCL		0.219				95% Chebyshev(Mean, Sd) UCL		0.235
303				97.5% Chebyshev(Mean, Sd) UCL		0.258				99% Chebyshev(Mean, Sd) UCL		0.303
304												
305	**Suggested UCL to Use**											
306				95% Student's-t UCL		0.204						
307												
308	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
309	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
310	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
311												
312	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
313	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
314												
315												
316	**ResultValue (apw-06d)**											
317												
318	**General Statistics**											
319				Total Number of Observations		22				Number of Distinct Observations		22
320										Number of Missing Observations		0
321				Minimum		0.0461				Mean		0.0601
322				Maximum		0.072				Median		0.0604
323				SD		0.00764				Std. Error of Mean		0.00163
324				Coefficient of Variation		0.127				Skewness		-0.371
325												
326	**Normal GOF Test**											
327				Shapiro Wilk Test Statistic		0.946		**Shapiro Wilk GOF Test**				
328				1% Shapiro Wilk Critical Value		0.878		Data appear Normal at 1% Significance Level				
329				Lilliefors Test Statistic		0.128		**Lilliefors GOF Test**				
330				1% Lilliefors Critical Value		0.214		Data appear Normal at 1% Significance Level				

331	**Data appear Normal at 1% Significance Level**											
332												
333	**Assuming Normal Distribution**											
334	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
335				95% Student's-t UCL		0.0629				95% Adjusted-CLT UCL (Chen-1995)		0.0627
336										95% Modified-t UCL (Johnson-1978)		0.0629
337												
338	**Gamma GOF Test**											
339				A-D Test Statistic		0.486	**Anderson-Darling Gamma GOF Test**					
340				5% A-D Critical Value		0.742	Detected data appear Gamma Distributed at 5% Significance Level					
341				K-S Test Statistic		0.144	**Kolmogorov-Smirnov Gamma GOF Test**					
342				5% K-S Critical Value		0.185	Detected data appear Gamma Distributed at 5% Significance Level					
343	**Detected data appear Gamma Distributed at 5% Significance Level**											
344												
345	**Gamma Statistics**											
346				k hat (MLE)		61.92				k star (bias corrected MLE)		53.51
347				Theta hat (MLE)		9.7080E-4				Theta star (bias corrected MLE)		0.00112
348				nu hat (MLE)		2725				nu star (bias corrected)		2354
349				MLE Mean (bias corrected)		0.0601				MLE Sd (bias corrected)		0.00822
350										Approximate Chi Square Value (0.05)		2243
351				Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		2235
352												
353	**Assuming Gamma Distribution**											
354				95% Approximate Gamma UCL		0.0631				95% Adjusted Gamma UCL		0.0633
355												
356	**Lognormal GOF Test**											
357				Shapiro Wilk Test Statistic		0.925	**Shapiro Wilk Lognormal GOF Test**					
358				10% Shapiro Wilk Critical Value		0.926	Data Not Lognormal at 10% Significance Level					
359				Lilliefors Test Statistic		0.154	**Lilliefors Lognormal GOF Test**					
360				10% Lilliefors Critical Value		0.169	Data appear Lognormal at 10% Significance Level					
361	**Data appear Approximate Lognormal at 10% Significance Level**											
362												
363	**Lognormal Statistics**											
364				Minimum of Logged Data		-3.077				Mean of logged Data		-2.82
365				Maximum of Logged Data		-2.631				SD of logged Data		0.132
366												
367	**Assuming Lognormal Distribution**											
368				95% H-UCL		0.0632				90% Chebyshev (MVUE) UCL		0.0652
369				95% Chebyshev (MVUE) UCL		0.0675				97.5% Chebyshev (MVUE) UCL		0.0707
370				99% Chebyshev (MVUE) UCL		0.077						
371												
372	**Nonparametric Distribution Free UCL Statistics**											
373	**Data appear to follow a Discernible Distribution**											
374												
375	**Nonparametric Distribution Free UCLs**											
376				95% CLT UCL		0.0628				95% BCA Bootstrap UCL		0.0629
377				95% Standard Bootstrap UCL		0.0628				95% Bootstrap-t UCL		0.0629
378				95% Hall's Bootstrap UCL		0.0628				95% Percentile Bootstrap UCL		0.0628
379				90% Chebyshev(Mean, Sd) UCL		0.065				95% Chebyshev(Mean, Sd) UCL		0.0672
380				97.5% Chebyshev(Mean, Sd) UCL		0.0703				99% Chebyshev(Mean, Sd) UCL		0.0763
381												
382	**Suggested UCL to Use**											
383				95% Student's-t UCL		0.0629						
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

ResultValue (apw-06s)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	23
		Number of Missing Observations	0
Minimum	0.171	Mean	0.243
Maximum	0.324	Median	0.243
SD	0.0454	Std. Error of Mean	0.00947
Coefficient of Variation	0.187	Skewness	0.165

Normal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.0901	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.259	95% Adjusted-CLT UCL (Chen-1995)	0.259
		95% Modified-t UCL (Johnson-1978)	0.259

Gamma GOF Test

A-D Test Statistic	0.263	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0885	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	29.58	k star (bias corrected MLE)	25.75
Theta hat (MLE)	0.00821	Theta star (bias corrected MLE)	0.00943
nu hat (MLE)	1361	nu star (bias corrected)	1185
MLE Mean (bias corrected)	0.243	MLE Sd (bias corrected)	0.0479
		Approximate Chi Square Value (0.05)	1106
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	1100

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.26	95% Adjusted Gamma UCL	0.262

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0821	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Lognormal Statistics

441				Minimum of Logged Data	-1.766					Mean of logged Data	-1.432	
442				Maximum of Logged Data	-1.127					SD of logged Data	0.19	
443												
444				**Assuming Lognormal Distribution**								
445				95% H-UCL	0.261					90% Chebyshev (MVUE) UCL	0.272	
446				95% Chebyshev (MVUE) UCL	0.285					97.5% Chebyshev (MVUE) UCL	0.303	
447				99% Chebyshev (MVUE) UCL	0.339							
448												
449				**Nonparametric Distribution Free UCL Statistics**								
450				**Data appear to follow a Discernible Distribution**								
451												
452				**Nonparametric Distribution Free UCLs**								
453				95% CLT UCL	0.259					95% BCA Bootstrap UCL	0.258	
454				95% Standard Bootstrap UCL	0.258					95% Bootstrap-t UCL	0.261	
455				95% Hall's Bootstrap UCL	0.26					95% Percentile Bootstrap UCL	0.258	
456				90% Chebyshev(Mean, Sd) UCL	0.271					95% Chebyshev(Mean, Sd) UCL	0.284	
457				97.5% Chebyshev(Mean, Sd) UCL	0.302					99% Chebyshev(Mean, Sd) UCL	0.337	
458												
459				**Suggested UCL to Use**								
460				95% Student's-t UCL	0.259							
461												
462				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
463				Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.								
464				However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.								
465												
466												
467	**ResultValue (apw-07)**											
468												
469				**General Statistics**								
470				Total Number of Observations	22					Number of Distinct Observations	13	
471										Number of Missing Observations	0	
472				Minimum	0.0023					Mean	0.0039	
473				Maximum	0.005					Median	0.00365	
474				SD	9.2761E-4					Std. Error of Mean	1.9777E-4	
475				Coefficient of Variation	0.238					Skewness	-0.0114	
476												
477				**Normal GOF Test**								
478				Shapiro Wilk Test Statistic	0.874					**Shapiro Wilk GOF Test**		
479				1% Shapiro Wilk Critical Value	0.878					Data Not Normal at 1% Significance Level		
480				Lilliefors Test Statistic	0.199					**Lilliefors GOF Test**		
481				1% Lilliefors Critical Value	0.214					Data appear Normal at 1% Significance Level		
482				**Data appear Approximate Normal at 1% Significance Level**								
483												
484				**Assuming Normal Distribution**								
485				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
486				95% Student's-t UCL	0.00424					95% Adjusted-CLT UCL (Chen-1995)	0.00423	
487										95% Modified-t UCL (Johnson-1978)	0.00424	
488												
489				**Gamma GOF Test**								
490				A-D Test Statistic	1.013					**Anderson-Darling Gamma GOF Test**		
491				5% A-D Critical Value	0.741					Data Not Gamma Distributed at 5% Significance Level		
492				K-S Test Statistic	0.197					**Kolmogorov-Smirnov Gamma GOF Test**		
493				5% K-S Critical Value	0.185					Data Not Gamma Distributed at 5% Significance Level		
494				**Data Not Gamma Distributed at 5% Significance Level**								
495												

496	**Gamma Statistics**											
497					k hat (MLE)	17.88				k star (bias corrected MLE)	15.47	
498					Theta hat (MLE)	2.1834E-4				Theta star (bias corrected MLE)	2.5232E-4	
499					nu hat (MLE)	786.9				nu star (bias corrected)	680.9	
500					MLE Mean (bias corrected)	0.0039				MLE Sd (bias corrected)	9.9256E-4	
501										Approximate Chi Square Value (0.05)	621.4	
502					Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	617.1	
503												
504	**Assuming Gamma Distribution**											
505					95% Approximate Gamma UCL	0.00428				95% Adjusted Gamma UCL	0.00431	
506												
507	**Lognormal GOF Test**											
508					Shapiro Wilk Test Statistic	0.889				**Shapiro Wilk Lognormal GOF Test**		
509					10% Shapiro Wilk Critical Value	0.926				Data Not Lognormal at 10% Significance Level		
510					Lilliefors Test Statistic	0.187				**Lilliefors Lognormal GOF Test**		
511					10% Lilliefors Critical Value	0.169				Data Not Lognormal at 10% Significance Level		
512	**Data Not Lognormal at 10% Significance Level**											
513												
514	**Lognormal Statistics**											
515					Minimum of Logged Data	-6.075				Mean of logged Data	-5.574	
516					Maximum of Logged Data	-5.298				SD of logged Data	0.246	
517												
518	**Assuming Lognormal Distribution**											
519					95% H-UCL	0.00431				90% Chebyshev (MVUE) UCL	0.00453	
520					95% Chebyshev (MVUE) UCL	0.00481				97.5% Chebyshev (MVUE) UCL	0.0052	
521					99% Chebyshev (MVUE) UCL	0.00597						
522												
523	**Nonparametric Distribution Free UCL Statistics**											
524	**Data appear to follow a Discernible Distribution**											
525												
526	**Nonparametric Distribution Free UCLs**											
527					95% CLT UCL	0.00423				95% BCA Bootstrap UCL	0.0042	
528					95% Standard Bootstrap UCL	0.00422				95% Bootstrap-t UCL	0.00424	
529					95% Hall's Bootstrap UCL	0.00421				95% Percentile Bootstrap UCL	0.00421	
530					90% Chebyshev(Mean, Sd) UCL	0.0045				95% Chebyshev(Mean, Sd) UCL	0.00477	
531					97.5% Chebyshev(Mean, Sd) UCL	0.00514				99% Chebyshev(Mean, Sd) UCL	0.00587	
532												
533	**Suggested UCL to Use**											
534					95% Student's-t UCL	0.00424						
535												
536	When a data set follows an approximate distribution passing only one of the GOF tests,											
537	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
538												
539	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
540	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
541	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
542												
543	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
544	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
545												
546												
547	**ResultValue (apw-08)**											
548												
549	**General Statistics**											
550					Total Number of Observations	23				Number of Distinct Observations	4	

551											Number of Missing Observations	0
552					Minimum	0.001					Mean	0.00255
553					Maximum	0.005					Median	0.0015
554					SD	0.00184					Std. Error of Mean	3.8334E-4
555					Coefficient of Variation	0.72					Skewness	0.646
556												
557						**Normal GOF Test**						
558					Shapiro Wilk Test Statistic	0.676			**Shapiro Wilk GOF Test**			
559					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
560					Lilliefors Test Statistic	0.369			**Lilliefors GOF Test**			
561					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
562						**Data Not Normal at 1% Significance Level**						
563												
564						**Assuming Normal Distribution**						
565					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
566					95% Student's-t UCL	0.00321			95% Adjusted-CLT UCL (Chen-1995)			0.00324
567									95% Modified-t UCL (Johnson-1978)			0.00322
568												
569						**Gamma GOF Test**						
570					A-D Test Statistic	2.988			**Anderson-Darling Gamma GOF Test**			
571					5% A-D Critical Value	0.754			Data Not Gamma Distributed at 5% Significance Level			
572					K-S Test Statistic	0.339			**Kolmogorov-Smirnov Gamma GOF Test**			
573					5% K-S Critical Value	0.184			Data Not Gamma Distributed at 5% Significance Level			
574						**Data Not Gamma Distributed at 5% Significance Level**						
575												
576						**Gamma Statistics**						
577					k hat (MLE)	2.189			k star (bias corrected MLE)			1.933
578					Theta hat (MLE)	0.00117			Theta star (bias corrected MLE)			0.00132
579					nu hat (MLE)	100.7			nu star (bias corrected)			88.9
580					MLE Mean (bias corrected)	0.00255			MLE Sd (bias corrected)			0.00184
581									Approximate Chi Square Value (0.05)			68.16
582					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value			66.85
583												
584						**Assuming Gamma Distribution**						
585					95% Approximate Gamma UCL	0.00333			95% Adjusted Gamma UCL			0.00339
586												
587						**Lognormal GOF Test**						
588					Shapiro Wilk Test Statistic	0.741			**Shapiro Wilk Lognormal GOF Test**			
589					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
590					Lilliefors Test Statistic	0.31			**Lilliefors Lognormal GOF Test**			
591					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
592						**Data Not Lognormal at 10% Significance Level**						
593												
594						**Lognormal Statistics**						
595					Minimum of Logged Data	-6.908			Mean of logged Data			-6.216
596					Maximum of Logged Data	-5.298			SD of logged Data			0.704
597												
598						**Assuming Lognormal Distribution**						
599					95% H-UCL	0.00354			90% Chebyshev (MVUE) UCL			0.00372
600					95% Chebyshev (MVUE) UCL	0.00426			97.5% Chebyshev (MVUE) UCL			0.00501
601					99% Chebyshev (MVUE) UCL	0.00648						
602												
603						**Nonparametric Distribution Free UCL Statistics**						
604						**Data do not follow a Discernible Distribution**						
605												

606	**Nonparametric Distribution Free UCLs**											
607					95% CLT UCL	0.00318				95% BCA Bootstrap UCL	N/A	
608					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL	N/A	
609					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A	
610					90% Chebyshev(Mean, Sd) UCL	0.0037				95% Chebyshev(Mean, Sd) UCL	0.00422	
611					97.5% Chebyshev(Mean, Sd) UCL	0.00495				99% Chebyshev(Mean, Sd) UCL	0.00637	
612												
613	**Suggested UCL to Use**											
614					95% Student's-t UCL	0.00321						
615												
616	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
617	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
618	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
619												
620												
621	**ResultValue (apw-10d)**											
622												
623	**General Statistics**											
624					Total Number of Observations	23				Number of Distinct Observations	4	
625										Number of Missing Observations	0	
626					Minimum	0.001				Mean	0.0026	
627					Maximum	0.005				Median	0.0015	
628					SD	0.00182				Std. Error of Mean	3.7855E-4	
629					Coefficient of Variation	0.697				Skewness	0.596	
630												
631	**Normal GOF Test**											
632					Shapiro Wilk Test Statistic	0.701				**Shapiro Wilk GOF Test**		
633					1% Shapiro Wilk Critical Value	0.881				Data Not Normal at 1% Significance Level		
634					Lilliefors Test Statistic	0.337				**Lilliefors GOF Test**		
635					1% Lilliefors Critical Value	0.209				Data Not Normal at 1% Significance Level		
636	**Data Not Normal at 1% Significance Level**											
637												
638	**Assuming Normal Distribution**											
639					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
640					95% Student's-t UCL	0.00325				95% Adjusted-CLT UCL (Chen-1995)	0.00328	
641										95% Modified-t UCL (Johnson-1978)	0.00326	
642												
643	**Gamma GOF Test**											
644					A-D Test Statistic	2.627				**Anderson-Darling Gamma GOF Test**		
645					5% A-D Critical Value	0.754				Data Not Gamma Distributed at 5% Significance Level		
646					K-S Test Statistic	0.311				**Kolmogorov-Smirnov Gamma GOF Test**		
647					5% K-S Critical Value	0.184				Data Not Gamma Distributed at 5% Significance Level		
648	**Data Not Gamma Distributed at 5% Significance Level**											
649												
650	**Gamma Statistics**											
651					k hat (MLE)	2.272				k star (bias corrected MLE)	2.005	
652					Theta hat (MLE)	0.00115				Theta star (bias corrected MLE)	0.0013	
653					nu hat (MLE)	104.5				nu star (bias corrected)	92.22	
654					MLE Mean (bias corrected)	0.0026				MLE Sd (bias corrected)	0.00184	
655										Approximate Chi Square Value (0.05)	71.07	
656					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	69.73	
657												
658	**Assuming Gamma Distribution**											
659					95% Approximate Gamma UCL	0.00338				95% Adjusted Gamma UCL	0.00344	
660												

661	**Lognormal GOF Test**											
662				Shapiro Wilk Test Statistic	0.764	**Shapiro Wilk Lognormal GOF Test**						
663				10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level						
664				Lilliefors Test Statistic	0.284	**Lilliefors Lognormal GOF Test**						
665				10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level						
666	**Data Not Lognormal at 10% Significance Level**											
667												
668	**Lognormal Statistics**											
669				Minimum of Logged Data	-6.908	Mean of logged Data	-6.186					
670				Maximum of Logged Data	-5.298	SD of logged Data	0.697					
671												
672	**Assuming Lognormal Distribution**											
673				95% H-UCL	0.00362	90% Chebyshev (MVUE) UCL	0.0038					
674				95% Chebyshev (MVUE) UCL	0.00435	97.5% Chebyshev (MVUE) UCL	0.00511					
675				99% Chebyshev (MVUE) UCL	0.0066							
676												
677	**Nonparametric Distribution Free UCL Statistics**											
678	**Data do not follow a Discernible Distribution**											
679												
680	**Nonparametric Distribution Free UCLs**											
681				95% CLT UCL	0.00323	95% BCA Bootstrap UCL	N/A					
682				95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A					
683				95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A					
684				90% Chebyshev(Mean, Sd) UCL	0.00374	95% Chebyshev(Mean, Sd) UCL	0.00425					
685				97.5% Chebyshev(Mean, Sd) UCL	0.00497	99% Chebyshev(Mean, Sd) UCL	0.00637					
686												
687	**Suggested UCL to Use**											
688				95% Student's-t UCL	0.00325							
689												
690	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
691	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
692	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
693												
694												
695	**ResultValue (apw-10s)**											
696												
697	**General Statistics**											
698				Total Number of Observations	23	Number of Distinct Observations	6					
699						Number of Missing Observations	0					
700				Minimum	0.001	Mean	0.00263					
701				Maximum	0.005	Median	0.0015					
702				SD	0.00179	Std. Error of Mean	3.7391E-4					
703				Coefficient of Variation	0.683	Skewness	0.61					
704												
705	**Normal GOF Test**											
706				Shapiro Wilk Test Statistic	0.704	**Shapiro Wilk GOF Test**						
707				1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level						
708				Lilliefors Test Statistic	0.306	**Lilliefors GOF Test**						
709				1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level						
710	**Data Not Normal at 1% Significance Level**											
711												
712	**Assuming Normal Distribution**											
713	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
714				95% Student's-t UCL	0.00327	95% Adjusted-CLT UCL (Chen-1995)	0.00329					
715						95% Modified-t UCL (Johnson-1978)	0.00328					

716												
717	**Gamma GOF Test**											
718					A-D Test Statistic	2.529	**Anderson-Darling Gamma GOF Test**					
719					5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level					
720					K-S Test Statistic	0.265	**Kolmogorov-Smirnov Gamma GOF Test**					
721					5% K-S Critical Value	0.183	Data Not Gamma Distributed at 5% Significance Level					
722	**Data Not Gamma Distributed at 5% Significance Level**											
723												
724	**Gamma Statistics**											
725					k hat (MLE)	2.384	k star (bias corrected MLE)	2.102				
726					Theta hat (MLE)	0.0011	Theta star (bias corrected MLE)	0.00125				
727					nu hat (MLE)	109.7	nu star (bias corrected)	96.69				
728					MLE Mean (bias corrected)	0.00263	MLE Sd (bias corrected)	0.00181				
729							Approximate Chi Square Value (0.05)	75.01				
730					Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	73.63				
731												
732	**Assuming Gamma Distribution**											
733					95% Approximate Gamma UCL	0.00339	95% Adjusted Gamma UCL	0.00345				
734												
735	**Lognormal GOF Test**											
736					Shapiro Wilk Test Statistic	0.777	**Shapiro Wilk Lognormal GOF Test**					
737					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
738					Lilliefors Test Statistic	0.248	**Lilliefors Lognormal GOF Test**					
739					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
740	**Data Not Lognormal at 10% Significance Level**											
741												
742	**Lognormal Statistics**											
743					Minimum of Logged Data	-6.908	Mean of logged Data	-6.166				
744					Maximum of Logged Data	-5.298	SD of logged Data	0.678				
745												
746	**Assuming Lognormal Distribution**											
747					95% H-UCL	0.0036	90% Chebyshev (MVUE) UCL	0.00379				
748					95% Chebyshev (MVUE) UCL	0.00433	97.5% Chebyshev (MVUE) UCL	0.00507				
749					99% Chebyshev (MVUE) UCL	0.00654						
750												
751	**Nonparametric Distribution Free UCL Statistics**											
752	**Data do not follow a Discernible Distribution**											
753												
754	**Nonparametric Distribution Free UCLs**											
755					95% CLT UCL	0.00324	95% BCA Bootstrap UCL	0.00327				
756					95% Standard Bootstrap UCL	0.00322	95% Bootstrap-t UCL	0.0033				
757					95% Hall's Bootstrap UCL	0.00321	95% Percentile Bootstrap UCL	0.00324				
758					90% Chebyshev(Mean, Sd) UCL	0.00375	95% Chebyshev(Mean, Sd) UCL	0.00426				
759					97.5% Chebyshev(Mean, Sd) UCL	0.00496	99% Chebyshev(Mean, Sd) UCL	0.00635				
760												
761	**Suggested UCL to Use**											
762					95% Student's-t UCL	0.00327						
763												
764	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
765	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
766	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
767												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Nickel
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:23:23 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	0
Minimum	0.00237	Mean	0.0287
Maximum	0.0725	Median	0.0263
SD	0.0225	Std. Error of Mean	0.00678
Coefficient of Variation	0.782	Skewness	0.929

Normal GOF Test

Shapiro Wilk Test Statistic	0.908	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.792	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.214	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.291	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.041	95% Adjusted-CLT UCL (Chen-1995)	0.0419
		95% Modified-t UCL (Johnson-1978)	0.0413

Gamma GOF Test

A-D Test Statistic	0.216	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.119	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.26	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.469	k star (bias corrected MLE)	1.129
Theta hat (MLE)	0.0196	Theta star (bias corrected MLE)	0.0255
nu hat (MLE)	32.32	nu star (bias corrected)	24.84
MLE Mean (bias corrected)	0.0287	MLE Sd (bias corrected)	0.0271
		Approximate Chi Square Value (0.05)	14.49
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	13.21

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0493	95% Adjusted Gamma UCL	0.054

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-6.045				Mean of logged Data	-3.927
60						Maximum of Logged Data	-2.624				SD of logged Data	1.044
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.0941				90% Chebyshev (MVUE) UCL	0.0636
64						95% Chebyshev (MVUE) UCL	0.078				97.5% Chebyshev (MVUE) UCL	0.0981
65						99% Chebyshev (MVUE) UCL	0.137					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0399				95% BCA Bootstrap UCL	0.0417
72						95% Standard Bootstrap UCL	0.0395				95% Bootstrap-t UCL	0.0469
73						95% Hall's Bootstrap UCL	0.0524				95% Percentile Bootstrap UCL	0.0402
74						90% Chebyshev(Mean, Sd) UCL	0.0491				95% Chebyshev(Mean, Sd) UCL	0.0583
75						97.5% Chebyshev(Mean, Sd) UCL	0.0711				99% Chebyshev(Mean, Sd) UCL	0.0962
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.041					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	11				Number of Distinct Observations	9
89											Number of Missing Observations	0
90						Minimum	0.001				Mean	0.00326
91						Maximum	0.01				Median	0.0025
92						SD	0.00271				Std. Error of Mean	8.1801E-4
93						Coefficient of Variation	0.831				Skewness	1.732
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.806				**Shapiro Wilk GOF Test**	
97						1% Shapiro Wilk Critical Value	0.792				Data appear Normal at 1% Significance Level	
98						Lilliefors Test Statistic	0.233				**Lilliefors GOF Test**	
99						1% Lilliefors Critical Value	0.291				Data appear Normal at 1% Significance Level	
100	**Data appear Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
104						95% Student's-t UCL	0.00475				95% Adjusted-CLT UCL (Chen-1995)	0.00507
105											95% Modified-t UCL (Johnson-1978)	0.00482
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	0.39				**Anderson-Darling Gamma GOF Test**	
109						5% A-D Critical Value	0.739				Detected data appear Gamma Distributed at 5% Significance Level	
110						K-S Test Statistic	0.163				**Kolmogorov-Smirnov Gamma GOF Test**	

111				5% K-S Critical Value	0.259	Detected data appear Gamma Distributed at 5% Significance Level						
112	**Detected data appear Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	2					k star (bias corrected MLE)	1.515	
116				Theta hat (MLE)	0.00163					Theta star (bias corrected MLE)	0.00215	
117				nu hat (MLE)	44					nu star (bias corrected)	33.33	
118				MLE Mean (bias corrected)	0.00326					MLE Sd (bias corrected)	0.00265	
119										Approximate Chi Square Value (0.05)	21.13	
120				Adjusted Level of Significance	0.0278					Adjusted Chi Square Value	19.56	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	0.00515					95% Adjusted Gamma UCL	0.00556	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.932	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.158	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level						
130	**Data appear Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	-6.908					Mean of logged Data	-5.995	
134				Maximum of Logged Data	-4.605					SD of logged Data	0.76	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	0.00615					90% Chebyshev (MVUE) UCL	0.00553	
138				95% Chebyshev (MVUE) UCL	0.00657					97.5% Chebyshev (MVUE) UCL	0.00802	
139				99% Chebyshev (MVUE) UCL	0.0109							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data appear to follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	0.00461					95% BCA Bootstrap UCL	0.00514	
146				95% Standard Bootstrap UCL	0.00457					95% Bootstrap-t UCL	0.00578	
147				95% Hall's Bootstrap UCL	0.00649					95% Percentile Bootstrap UCL	0.0047	
148				90% Chebyshev(Mean, Sd) UCL	0.00572					95% Chebyshev(Mean, Sd) UCL	0.00683	
149				97.5% Chebyshev(Mean, Sd) UCL	0.00837					99% Chebyshev(Mean, Sd) UCL	0.0114	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	0.00475							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158												
159	**ResultValue (apw-05)**											
160												
161	**General Statistics**											
162				Total Number of Observations	10					Number of Distinct Observations	8	
163										Number of Missing Observations	0	
164				Minimum	0.001					Mean	0.0026	
165				Maximum	0.0074					Median	0.00205	

166					SD	0.00204					Std. Error of Mean	6.4533E-4
167					Coefficient of Variation	0.785					Skewness	1.658
168												
169					**Normal GOF Test**							
170					Shapiro Wilk Test Statistic	0.8	**Shapiro Wilk GOF Test**					
171					1% Shapiro Wilk Critical Value	0.781	Data appear Normal at 1% Significance Level					
172					Lilliefors Test Statistic	0.258	**Lilliefors GOF Test**					
173					1% Lilliefors Critical Value	0.304	Data appear Normal at 1% Significance Level					
174					**Data appear Normal at 1% Significance Level**							
175												
176					**Assuming Normal Distribution**							
177					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
178					95% Student's-t UCL	0.00378	95% Adjusted-CLT UCL (Chen-1995)	0.00402				
179							95% Modified-t UCL (Johnson-1978)	0.00384				
180												
181					**Gamma GOF Test**							
182					A-D Test Statistic	0.499	**Anderson-Darling Gamma GOF Test**					
183					5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Level					
184					K-S Test Statistic	0.189	**Kolmogorov-Smirnov Gamma GOF Test**					
185					5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level					
186					**Detected data appear Gamma Distributed at 5% Significance Level**							
187												
188					**Gamma Statistics**							
189					k hat (MLE)	2.293	k star (bias corrected MLE)	1.672				
190					Theta hat (MLE)	0.00113	Theta star (bias corrected MLE)	0.00156				
191					nu hat (MLE)	45.86	nu star (bias corrected)	33.43				
192					MLE Mean (bias corrected)	0.0026	MLE Sd (bias corrected)	0.00201				
193							Approximate Chi Square Value (0.05)	21.21				
194					Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	19.54				
195												
196					**Assuming Gamma Distribution**							
197					95% Approximate Gamma UCL	0.0041	95% Adjusted Gamma UCL	0.00445				
198												
199					**Lognormal GOF Test**							
200					Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk Lognormal GOF Test**					
201					10% Shapiro Wilk Critical Value	0.869	Data appear Lognormal at 10% Significance Level					
202					Lilliefors Test Statistic	0.18	**Lilliefors Lognormal GOF Test**					
203					10% Lilliefors Critical Value	0.241	Data appear Lognormal at 10% Significance Level					
204					**Data appear Lognormal at 10% Significance Level**							
205												
206					**Lognormal Statistics**							
207					Minimum of Logged Data	-6.908	Mean of logged Data	-6.186				
208					Maximum of Logged Data	-4.906	SD of logged Data	0.699				
209												
210					**Assuming Lognormal Distribution**							
211					95% H-UCL	0.00473	90% Chebyshev (MVUE) UCL	0.0043				
212					95% Chebyshev (MVUE) UCL	0.00509	97.5% Chebyshev (MVUE) UCL	0.00618				
213					99% Chebyshev (MVUE) UCL	0.00834						
214												
215					**Nonparametric Distribution Free UCL Statistics**							
216					**Data appear to follow a Discernible Distribution**							
217												
218					**Nonparametric Distribution Free UCLs**							
219					95% CLT UCL	0.00366	95% BCA Bootstrap UCL	0.00397				
220					95% Standard Bootstrap UCL	0.00362	95% Bootstrap-t UCL	0.0046				

221				95% Hall's Bootstrap UCL	0.00593				95% Percentile Bootstrap UCL		0.00371	
222				90% Chebyshev(Mean, Sd) UCL	0.00454				95% Chebyshev(Mean, Sd) UCL		0.00541	
223				97.5% Chebyshev(Mean, Sd) UCL	0.00663				99% Chebyshev(Mean, Sd) UCL		0.00902	
224												
225					**Suggested UCL to Use**							
226				95% Student's-t UCL	0.00378							
227												
228	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
229	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
230	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
231												
232												
233	**ResultValue (apw-05r)**											
234												
235					**General Statistics**							
236				Total Number of Observations	1				Number of Distinct Observations		1	
237									Number of Missing Observations		0	
238				Minimum	0.002				Mean		0.002	
239				Maximum	0.002				Median		0.002	
240												
241	**Warning: This data set only has 1 observations!**											
242	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
243	**The data set for variable ResultValue (apw-05r) was not processed!**											
244												
245	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
246	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
247												
248												
249												
250	**ResultValue (apw-06d)**											
251												
252					**General Statistics**							
253				Total Number of Observations	10				Number of Distinct Observations		9	
254									Number of Missing Observations		0	
255				Minimum	0.0017				Mean		0.0037	
256				Maximum	0.0093				Median		0.00265	
257				SD	0.00274				Std. Error of Mean		8.6642E-4	
258				Coefficient of Variation	0.742				Skewness		1.654	
259												
260					**Normal GOF Test**							
261				Shapiro Wilk Test Statistic	0.7				**Shapiro Wilk GOF Test**			
262				1% Shapiro Wilk Critical Value	0.781				Data Not Normal at 1% Significance Level			
263				Lilliefors Test Statistic	0.372				**Lilliefors GOF Test**			
264				1% Lilliefors Critical Value	0.304				Data Not Normal at 1% Significance Level			
265					**Data Not Normal at 1% Significance Level**							
266												
267					**Assuming Normal Distribution**							
268				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
269				95% Student's-t UCL	0.00528				95% Adjusted-CLT UCL (Chen-1995)		0.0056	
270									95% Modified-t UCL (Johnson-1978)		0.00536	
271												
272					**Gamma GOF Test**							
273				A-D Test Statistic	1.009				**Anderson-Darling Gamma GOF Test**			
274				5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level			
275				K-S Test Statistic	0.314				**Kolmogorov-Smirnov Gamma GOF Test**			

276				5% K-S Critical Value	0.269	Data Not Gamma Distributed at 5% Significance Level						
277	**Data Not Gamma Distributed at 5% Significance Level**											
278												
279	**Gamma Statistics**											
280				k hat (MLE)	2.848					k star (bias corrected MLE)	2.06	
281				Theta hat (MLE)	0.0013					Theta star (bias corrected MLE)	0.00179	
282				nu hat (MLE)	56.95					nu star (bias corrected)	41.2	
283				MLE Mean (bias corrected)	0.0037					MLE Sd (bias corrected)	0.00257	
284										Approximate Chi Square Value (0.05)	27.49	
285				Adjusted Level of Significance	0.0267					Adjusted Chi Square Value	25.56	
286												
287	**Assuming Gamma Distribution**											
288				95% Approximate Gamma UCL	0.00554					95% Adjusted Gamma UCL	0.00596	
289												
290	**Lognormal GOF Test**											
291				Shapiro Wilk Test Statistic	0.83	**Shapiro Wilk Lognormal GOF Test**						
292				10% Shapiro Wilk Critical Value	0.869	Data Not Lognormal at 10% Significance Level						
293				Lilliefors Test Statistic	0.272	**Lilliefors Lognormal GOF Test**						
294				10% Lilliefors Critical Value	0.241	Data Not Lognormal at 10% Significance Level						
295	**Data Not Lognormal at 10% Significance Level**											
296												
297	**Lognormal Statistics**											
298				Minimum of Logged Data	-6.377					Mean of logged Data	-5.787	
299				Maximum of Logged Data	-4.678					SD of logged Data	0.595	
300												
301	**Assuming Lognormal Distribution**											
302				95% H-UCL	0.00585					90% Chebyshev (MVUE) UCL	0.00567	
303				95% Chebyshev (MVUE) UCL	0.00661					97.5% Chebyshev (MVUE) UCL	0.00791	
304				99% Chebyshev (MVUE) UCL	0.0105							
305												
306	**Nonparametric Distribution Free UCL Statistics**											
307	**Data do not follow a Discernible Distribution**											
308												
309	**Nonparametric Distribution Free UCLs**											
310				95% CLT UCL	0.00512					95% BCA Bootstrap UCL	0.00555	
311				95% Standard Bootstrap UCL	0.00505					95% Bootstrap-t UCL	0.00995	
312				95% Hall's Bootstrap UCL	0.0151					95% Percentile Bootstrap UCL	0.00508	
313				90% Chebyshev(Mean, Sd) UCL	0.00629					95% Chebyshev(Mean, Sd) UCL	0.00747	
314				97.5% Chebyshev(Mean, Sd) UCL	0.00911					99% Chebyshev(Mean, Sd) UCL	0.0123	
315												
316	**Suggested UCL to Use**											
317				95% Student's-t UCL	0.00528							
318												
319	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
320	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
321	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
322												
323												
324	**ResultValue (apw-06s)**											
325												
326	**General Statistics**											
327				Total Number of Observations	11					Number of Distinct Observations	9	
328										Number of Missing Observations	0	
329				Minimum	0.001					Mean	0.00257	
330				Maximum	0.009					Median	0.0021	

331					SD	0.00223					Std. Error of Mean	6.7178E-4
332					Coefficient of Variation	0.866					Skewness	2.821
333												
334					**Normal GOF Test**							
335					Shapiro Wilk Test Statistic	0.622	**Shapiro Wilk GOF Test**					
336					1% Shapiro Wilk Critical Value	0.792	Data Not Normal at 1% Significance Level					
337					Lilliefors Test Statistic	0.316	**Lilliefors GOF Test**					
338					1% Lilliefors Critical Value	0.291	Data Not Normal at 1% Significance Level					
339					**Data Not Normal at 1% Significance Level**							
340												
341					**Assuming Normal Distribution**							
342					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
343					95% Student's-t UCL	0.00379	95% Adjusted-CLT UCL (Chen-1995)	0.00429				
344							95% Modified-t UCL (Johnson-1978)	0.00389				
345												
346					**Gamma GOF Test**							
347					A-D Test Statistic	0.819	**Anderson-Darling Gamma GOF Test**					
348					5% A-D Critical Value	0.736	Data Not Gamma Distributed at 5% Significance Level					
349					K-S Test Statistic	0.215	**Kolmogorov-Smirnov Gamma GOF Test**					
350					5% K-S Critical Value	0.258	Detected data appear Gamma Distributed at 5% Significance Level					
351					**Detected data follow Appr. Gamma Distribution at 5% Significance Level**							
352												
353					**Gamma Statistics**							
354					k hat (MLE)	2.623	k star (bias corrected MLE)	1.968				
355					Theta hat (MLE)	9.8080E-4	Theta star (bias corrected MLE)	0.00131				
356					nu hat (MLE)	57.71	nu star (bias corrected)	43.3				
357					MLE Mean (bias corrected)	0.00257	MLE Sd (bias corrected)	0.00183				
358							Approximate Chi Square Value (0.05)	29.21				
359					Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	27.34				
360												
361					**Assuming Gamma Distribution**							
362					95% Approximate Gamma UCL	0.00381	95% Adjusted Gamma UCL	0.00408				
363												
364					**Lognormal GOF Test**							
365					Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk Lognormal GOF Test**					
366					10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level					
367					Lilliefors Test Statistic	0.167	**Lilliefors Lognormal GOF Test**					
368					10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level					
369					**Data appear Lognormal at 10% Significance Level**							
370												
371					**Lognormal Statistics**							
372					Minimum of Logged Data	-6.908	Mean of logged Data	-6.165				
373					Maximum of Logged Data	-4.711	SD of logged Data	0.6				
374												
375					**Assuming Lognormal Distribution**							
376					95% H-UCL	0.0039	90% Chebyshev (MVUE) UCL	0.00385				
377					95% Chebyshev (MVUE) UCL	0.00447	97.5% Chebyshev (MVUE) UCL	0.00534				
378					99% Chebyshev (MVUE) UCL	0.00704						
379												
380					**Nonparametric Distribution Free UCL Statistics**							
381					**Data appear to follow a Discernible Distribution**							
382												
383					**Nonparametric Distribution Free UCLs**							
384					95% CLT UCL	0.00368	95% BCA Bootstrap UCL	0.0044				
385					95% Standard Bootstrap UCL	0.00361	95% Bootstrap-t UCL	0.00587				

386				95% Hall's Bootstrap UCL	0.00836				95% Percentile Bootstrap UCL			0.00379
387				90% Chebyshev(Mean, Sd) UCL	0.00459				95% Chebyshev(Mean, Sd) UCL			0.0055
388				97.5% Chebyshev(Mean, Sd) UCL	0.00677				99% Chebyshev(Mean, Sd) UCL			0.00926
389												
390					**Suggested UCL to Use**							
391				95% Adjusted Gamma UCL	0.00408							
392												
393					When a data set follows an approximate distribution passing only one of the GOF tests,							
394					it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL							
395												
396					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
397					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
398					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
399												
400												
401	**ResultValue (apw-07)**											
402												
403					**General Statistics**							
404				Total Number of Observations	11				Number of Distinct Observations			7
405									Number of Missing Observations			0
406				Minimum	0.001				Mean			0.00293
407				Maximum	0.015				Median			0.0013
408				SD	0.00415				Std. Error of Mean			0.00125
409				Coefficient of Variation	1.416				Skewness			2.944
410												
411					**Normal GOF Test**							
412				Shapiro Wilk Test Statistic	0.535				**Shapiro Wilk GOF Test**			
413				1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level			
414				Lilliefors Test Statistic	0.321				**Lilliefors GOF Test**			
415				1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level			
416					**Data Not Normal at 1% Significance Level**							
417												
418					**Assuming Normal Distribution**							
419				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
420				95% Student's-t UCL	0.00519				95% Adjusted-CLT UCL (Chen-1995)			0.00617
421									95% Modified-t UCL (Johnson-1978)			0.00538
422												
423					**Gamma GOF Test**							
424				A-D Test Statistic	1.437				**Anderson-Darling Gamma GOF Test**			
425				5% A-D Critical Value	0.748				Data Not Gamma Distributed at 5% Significance Level			
426				K-S Test Statistic	0.291				**Kolmogorov-Smirnov Gamma GOF Test**			
427				5% K-S Critical Value	0.261				Data Not Gamma Distributed at 5% Significance Level			
428					**Data Not Gamma Distributed at 5% Significance Level**							
429												
430					**Gamma Statistics**							
431				k hat (MLE)	1.2				k star (bias corrected MLE)			0.933
432				Theta hat (MLE)	0.00244				Theta star (bias corrected MLE)			0.00314
433				nu hat (MLE)	26.4				nu star (bias corrected)			20.53
434				MLE Mean (bias corrected)	0.00293				MLE Sd (bias corrected)			0.00303
435									Approximate Chi Square Value (0.05)			11.24
436				Adjusted Level of Significance	0.0278				Adjusted Chi Square Value			10.14
437												
438					**Assuming Gamma Distribution**							
439				95% Approximate Gamma UCL	0.00535				95% Adjusted Gamma UCL			0.00593
440												

441	**Lognormal GOF Test**											
442					Shapiro Wilk Test Statistic	0.76	**Shapiro Wilk Lognormal GOF Test**					
443					10% Shapiro Wilk Critical Value	0.876	Data Not Lognormal at 10% Significance Level					
444					Lilliefors Test Statistic	0.257	**Lilliefors Lognormal GOF Test**					
445					10% Lilliefors Critical Value	0.231	Data Not Lognormal at 10% Significance Level					
446	**Data Not Lognormal at 10% Significance Level**											
447												
448	**Lognormal Statistics**											
449					Minimum of Logged Data	-6.908				Mean of logged Data	-6.305	
450					Maximum of Logged Data	-4.2				SD of logged Data	0.865	
451												
452	**Assuming Lognormal Distribution**											
453					95% H-UCL	0.00563				90% Chebyshev (MVUE) UCL	0.00464	
454					95% Chebyshev (MVUE) UCL	0.00558				97.5% Chebyshev (MVUE) UCL	0.0069	
455					99% Chebyshev (MVUE) UCL	0.00948						
456												
457	**Nonparametric Distribution Free UCL Statistics**											
458	**Data do not follow a Discernible Distribution**											
459												
460	**Nonparametric Distribution Free UCLs**											
461					95% CLT UCL	0.00498				95% BCA Bootstrap UCL	0.00657	
462					95% Standard Bootstrap UCL	0.00488				95% Bootstrap-t UCL	0.012	
463					95% Hall's Bootstrap UCL	0.0119				95% Percentile Bootstrap UCL	0.00517	
464					90% Chebyshev(Mean, Sd) UCL	0.00668				95% Chebyshev(Mean, Sd) UCL	0.00838	
465					97.5% Chebyshev(Mean, Sd) UCL	0.0107				99% Chebyshev(Mean, Sd) UCL	0.0154	
466												
467	**Suggested UCL to Use**											
468					95% Student's-t UCL	0.00519						
469												
470	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
471	**Please verify the data were collected from random locations.**											
472	**If the data were collected using judgmental or other non-random methods,**											
473	**then contact a statistician to correctly calculate UCLs.**											
474												
475	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
476	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
477	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
478												
479												
480	**ResultValue (apw-08)**											
481												
482	**General Statistics**											
483					Total Number of Observations	11				Number of Distinct Observations	9	
484										Number of Missing Observations	0	
485					Minimum	0.0026				Mean	0.00404	
486					Maximum	0.0077				Median	0.00354	
487					SD	0.00172				Std. Error of Mean	5.1842E-4	
488					Coefficient of Variation	0.426				Skewness	1.17	
489												
490	**Normal GOF Test**											
491					Shapiro Wilk Test Statistic	0.839	**Shapiro Wilk GOF Test**					
492					1% Shapiro Wilk Critical Value	0.792	Data appear Normal at 1% Significance Level					
493					Lilliefors Test Statistic	0.201	**Lilliefors GOF Test**					
494					1% Lilliefors Critical Value	0.291	Data appear Normal at 1% Significance Level					
495	**Data appear Normal at 1% Significance Level**											

496												
497	**Assuming Normal Distribution**											
498	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
499				95% Student's-t UCL	0.00498				95% Adjusted-CLT UCL (Chen-1995)	0.00509		
500									95% Modified-t UCL (Johnson-1978)	0.00501		
501												
502	**Gamma GOF Test**											
503				A-D Test Statistic	0.612		**Anderson-Darling Gamma GOF Test**					
504				5% A-D Critical Value	0.731		Detected data appear Gamma Distributed at 5% Significance Level					
505				K-S Test Statistic	0.214		**Kolmogorov-Smirnov Gamma GOF Test**					
506				5% K-S Critical Value	0.256		Detected data appear Gamma Distributed at 5% Significance Level					
507	**Detected data appear Gamma Distributed at 5% Significance Level**											
508												
509	**Gamma Statistics**											
510				k hat (MLE)	7.052				k star (bias corrected MLE)	5.189		
511				Theta hat (MLE)	5.7288E-4				Theta star (bias corrected MLE)	7.7851E-4		
512				nu hat (MLE)	155.1				nu star (bias corrected)	114.2		
513				MLE Mean (bias corrected)	0.00404				MLE Sd (bias corrected)	0.00177		
514									Approximate Chi Square Value (0.05)	90.5		
515				Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	87.07		
516												
517	**Assuming Gamma Distribution**											
518				95% Approximate Gamma UCL	0.0051				95% Adjusted Gamma UCL	0.0053		
519												
520	**Lognormal GOF Test**											
521				Shapiro Wilk Test Statistic	0.877		**Shapiro Wilk Lognormal GOF Test**					
522				10% Shapiro Wilk Critical Value	0.876		Data appear Lognormal at 10% Significance Level					
523				Lilliefors Test Statistic	0.202		**Lilliefors Lognormal GOF Test**					
524				10% Lilliefors Critical Value	0.231		Data appear Lognormal at 10% Significance Level					
525	**Data appear Lognormal at 10% Significance Level**											
526												
527	**Lognormal Statistics**											
528				Minimum of Logged Data	-5.952				Mean of logged Data	-5.584		
529				Maximum of Logged Data	-4.867				SD of logged Data	0.388		
530												
531	**Assuming Lognormal Distribution**											
532				95% H-UCL	0.0052				90% Chebyshev (MVUE) UCL	0.00545		
533				95% Chebyshev (MVUE) UCL	0.0061				97.5% Chebyshev (MVUE) UCL	0.007		
534				99% Chebyshev (MVUE) UCL	0.00876							
535												
536	**Nonparametric Distribution Free UCL Statistics**											
537	**Data appear to follow a Discernible Distribution**											
538												
539	**Nonparametric Distribution Free UCLs**											
540				95% CLT UCL	0.00489				95% BCA Bootstrap UCL	0.00511		
541				95% Standard Bootstrap UCL	0.00487				95% Bootstrap-t UCL	0.00545		
542				95% Hall's Bootstrap UCL	0.00519				95% Percentile Bootstrap UCL	0.00495		
543				90% Chebyshev(Mean, Sd) UCL	0.0056				95% Chebyshev(Mean, Sd) UCL	0.0063		
544				97.5% Chebyshev(Mean, Sd) UCL	0.00728				99% Chebyshev(Mean, Sd) UCL	0.0092		
545												
546	**Suggested UCL to Use**											
547				95% Student's-t UCL	0.00498							
548												
549	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
550	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

	A	B	C	D	E	F	G	H	I	J	K	L
551	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
552												
553												
554	**ResultValue (apw-10d)**											
555												
556	**General Statistics**											
557					Total Number of Observations	11			Number of Distinct Observations	11		
558									Number of Missing Observations	0		
559					Minimum	0.0025			Mean	0.00603		
560					Maximum	0.0095			Median	0.0063		
561					SD	0.00194			Std. Error of Mean	5.8579E-4		
562					Coefficient of Variation	0.322			Skewness	-0.204		
563												
564	**Normal GOF Test**											
565					Shapiro Wilk Test Statistic	0.979			**Shapiro Wilk GOF Test**			
566					1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level			
567					Lilliefors Test Statistic	0.14			**Lilliefors GOF Test**			
568					1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level			
569	**Data appear Normal at 1% Significance Level**											
570												
571	**Assuming Normal Distribution**											
572				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
573					95% Student's-t UCL	0.00709			95% Adjusted-CLT UCL (Chen-1995)	0.00695		
574									95% Modified-t UCL (Johnson-1978)	0.00709		
575												
576	**Gamma GOF Test**											
577					A-D Test Statistic	0.35			**Anderson-Darling Gamma GOF Test**			
578					5% A-D Critical Value	0.73			Detected data appear Gamma Distributed at 5% Significance Level			
579					K-S Test Statistic	0.179			**Kolmogorov-Smirnov Gamma GOF Test**			
580					5% K-S Critical Value	0.256			Detected data appear Gamma Distributed at 5% Significance Level			
581	**Detected data appear Gamma Distributed at 5% Significance Level**											
582												
583	**Gamma Statistics**											
584					k hat (MLE)	8.935			k star (bias corrected MLE)	6.559		
585					Theta hat (MLE)	6.7488E-4			Theta star (bias corrected MLE)	9.1938E-4		
586					nu hat (MLE)	196.6			nu star (bias corrected)	144.3		
587					MLE Mean (bias corrected)	0.00603			MLE Sd (bias corrected)	0.00235		
588									Approximate Chi Square Value (0.05)	117.5		
589					Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	113.6		
590												
591	**Assuming Gamma Distribution**											
592					95% Approximate Gamma UCL	0.0074			95% Adjusted Gamma UCL	0.00766		
593												
594	**Lognormal GOF Test**											
595					Shapiro Wilk Test Statistic	0.914			**Shapiro Wilk Lognormal GOF Test**			
596					10% Shapiro Wilk Critical Value	0.876			Data appear Lognormal at 10% Significance Level			
597					Lilliefors Test Statistic	0.208			**Lilliefors Lognormal GOF Test**			
598					10% Lilliefors Critical Value	0.231			Data appear Lognormal at 10% Significance Level			
599	**Data appear Lognormal at 10% Significance Level**											
600												
601	**Lognormal Statistics**											
602					Minimum of Logged Data	-5.991			Mean of logged Data	-5.168		
603					Maximum of Logged Data	-4.656			SD of logged Data	0.375		
604												
605	**Assuming Lognormal Distribution**											

606					95% H-UCL	0.00777				90% Chebyshev (MVUE) UCL		0.00816
607					95% Chebyshev (MVUE) UCL	0.0091				97.5% Chebyshev (MVUE) UCL		0.0104
608					99% Chebyshev (MVUE) UCL	0.013						
609												
610					**Nonparametric Distribution Free UCL Statistics**							
611					**Data appear to follow a Discernible Distribution**							
612												
613					**Nonparametric Distribution Free UCLs**							
614					95% CLT UCL	0.00699				95% BCA Bootstrap UCL		0.00695
615					95% Standard Bootstrap UCL	0.00694				95% Bootstrap-t UCL		0.00707
616					95% Hall's Bootstrap UCL	0.00708				95% Percentile Bootstrap UCL		0.00695
617					90% Chebyshev(Mean, Sd) UCL	0.00779				95% Chebyshev(Mean, Sd) UCL		0.00858
618					97.5% Chebyshev(Mean, Sd) UCL	0.00969				99% Chebyshev(Mean, Sd) UCL		0.0119
619												
620					**Suggested UCL to Use**							
621					95% Student's-t UCL	0.00709						
622												
623					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
624					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
625					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
626												
627					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
628					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
629												
630												
631	**ResultValue (apw-10s)**											
632												
633					**General Statistics**							
634					Total Number of Observations	11				Number of Distinct Observations		7
635										Number of Missing Observations		0
636					Minimum	0.001				Mean		0.00179
637					Maximum	0.0051				Median		0.0014
638					SD	0.00126				Std. Error of Mean		3.8078E-4
639					Coefficient of Variation	0.705				Skewness		2.194
640												
641					**Normal GOF Test**							
642					Shapiro Wilk Test Statistic	0.684				**Shapiro Wilk GOF Test**		
643					1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level		
644					Lilliefors Test Statistic	0.318				**Lilliefors GOF Test**		
645					1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level		
646					**Data Not Normal at 1% Significance Level**							
647												
648					**Assuming Normal Distribution**							
649					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
650					95% Student's-t UCL	0.00248				95% Adjusted-CLT UCL (Chen-1995)		0.00269
651										95% Modified-t UCL (Johnson-1978)		0.00252
652												
653					**Gamma GOF Test**							
654					A-D Test Statistic	1.046				**Anderson-Darling Gamma GOF Test**		
655					5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level		
656					K-S Test Statistic	0.28				**Kolmogorov-Smirnov Gamma GOF Test**		
657					5% K-S Critical Value	0.257				Data Not Gamma Distributed at 5% Significance Level		
658					**Data Not Gamma Distributed at 5% Significance Level**							
659												
660					**Gamma Statistics**							

661					k hat (MLE)	3.402				k star (bias corrected MLE)		2.535
662					Theta hat (MLE)	5.2649E-4				Theta star (bias corrected MLE)		7.0661E-4
663					nu hat (MLE)	74.84				nu star (bias corrected)		55.76
664					MLE Mean (bias corrected)	0.00179				MLE Sd (bias corrected)		0.00112
665										Approximate Chi Square Value (0.05)		39.6
666					Adjusted Level of Significance	0.0278				Adjusted Chi Square Value		37.39
667												
668					**Assuming Gamma Distribution**							
669					95% Approximate Gamma UCL	0.00252				95% Adjusted Gamma UCL		0.00267
670												
671					**Lognormal GOF Test**							
672					Shapiro Wilk Test Statistic	0.812				**Shapiro Wilk Lognormal GOF Test**		
673					10% Shapiro Wilk Critical Value	0.876				Data Not Lognormal at 10% Significance Level		
674					Lilliefors Test Statistic	0.245				**Lilliefors Lognormal GOF Test**		
675					10% Lilliefors Critical Value	0.231				Data Not Lognormal at 10% Significance Level		
676					**Data Not Lognormal at 10% Significance Level**							
677												
678					**Lognormal Statistics**							
679					Minimum of Logged Data	-6.908				Mean of logged Data		-6.479
680					Maximum of Logged Data	-5.279				SD of logged Data		0.531
681												
682					**Assuming Lognormal Distribution**							
683					95% H-UCL	0.00256				90% Chebyshev (MVUE) UCL		0.0026
684					95% Chebyshev (MVUE) UCL	0.00299				97.5% Chebyshev (MVUE) UCL		0.00353
685					99% Chebyshev (MVUE) UCL	0.00458						
686												
687					**Nonparametric Distribution Free UCL Statistics**							
688					**Data do not follow a Discernible Distribution**							
689												
690					**Nonparametric Distribution Free UCLs**							
691					95% CLT UCL	0.00242				95% BCA Bootstrap UCL		0.00271
692					95% Standard Bootstrap UCL	0.00239				95% Bootstrap-t UCL		0.00389
693					95% Hall's Bootstrap UCL	0.00516				95% Percentile Bootstrap UCL		0.00244
694					90% Chebyshev(Mean, Sd) UCL	0.00293				95% Chebyshev(Mean, Sd) UCL		0.00345
695					97.5% Chebyshev(Mean, Sd) UCL	0.00417				99% Chebyshev(Mean, Sd) UCL		0.00558
696												
697					**Suggested UCL to Use**							
698					95% Student's-t UCL	0.00248						
699												
700					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
701					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
702					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
703												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	pH
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:25:50 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	21
		Number of Missing Observations	0
Minimum	6.9	Mean	7.171
Maximum	7.67	Median	7.14
SD	0.186	Std. Error of Mean	0.0387
Coefficient of Variation	0.0259	Skewness	1.13

Normal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.157	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7.238	95% Adjusted-CLT UCL (Chen-1995)	7.245
		95% Modified-t UCL (Johnson-1978)	7.239

Gamma GOF Test

A-D Test Statistic	0.67	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.157	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1589	k star (bias corrected MLE)	1381
Theta hat (MLE)	0.00451	Theta star (bias corrected MLE)	0.00519
nu hat (MLE)	73076	nu star (bias corrected)	63546
MLE Mean (bias corrected)	7.171	MLE Sd (bias corrected)	0.193
		Approximate Chi Square Value (0.05)	62961
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	62919

Assuming Gamma Distribution

95% Approximate Gamma UCL	7.238	95% Adjusted Gamma UCL	7.243

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.926	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.151	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Approximate Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	1.932			Mean of logged Data	1.97	
60						Maximum of Logged Data	2.037			SD of logged Data	0.0255	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	N/A			90% Chebyshev (MVUE) UCL	7.286	
64						95% Chebyshev (MVUE) UCL	7.338			97.5% Chebyshev (MVUE) UCL	7.41	
65						99% Chebyshev (MVUE) UCL	7.551					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	7.235			95% BCA Bootstrap UCL	7.248	
72						95% Standard Bootstrap UCL	7.233			95% Bootstrap-t UCL	7.25	
73						95% Hall's Bootstrap UCL	7.249			95% Percentile Bootstrap UCL	7.235	
74						90% Chebyshev(Mean, Sd) UCL	7.287			95% Chebyshev(Mean, Sd) UCL	7.34	
75						97.5% Chebyshev(Mean, Sd) UCL	7.413			99% Chebyshev(Mean, Sd) UCL	7.556	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	7.238					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	21	
89										Number of Missing Observations	0	
90						Minimum	7.21			Mean	7.685	
91						Maximum	8.11			Median	7.77	
92						SD	0.275			Std. Error of Mean	0.0573	
93						Coefficient of Variation	0.0358			Skewness	-0.259	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.939			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.159			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
100	**Data appear Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	7.783			95% Adjusted-CLT UCL (Chen-1995)	7.776	
105										95% Modified-t UCL (Johnson-1978)	7.783	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	0.6			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.74			Detected data appear Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.165			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level						
112	**Detected data appear Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	812.3					k star (bias corrected MLE)	706.4	
116				Theta hat (MLE)	0.00946					Theta star (bias corrected MLE)	0.0109	
117				nu hat (MLE)	37367					nu star (bias corrected)	32494	
118				MLE Mean (bias corrected)	7.685					MLE Sd (bias corrected)	0.289	
119										Approximate Chi Square Value (0.05)	32076	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	32046	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	7.785					95% Adjusted Gamma UCL	7.792	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.165	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
130	**Data appear Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	1.975					Mean of logged Data	2.039	
134				Maximum of Logged Data	2.093					SD of logged Data	0.0359	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	7.858	
138				95% Chebyshev (MVUE) UCL	7.936					97.5% Chebyshev (MVUE) UCL	8.045	
139				99% Chebyshev (MVUE) UCL	8.258							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data appear to follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	7.779					95% BCA Bootstrap UCL	7.772	
146				95% Standard Bootstrap UCL	7.776					95% Bootstrap-t UCL	7.777	
147				95% Hall's Bootstrap UCL	7.772					95% Percentile Bootstrap UCL	7.776	
148				90% Chebyshev(Mean, Sd) UCL	7.857					95% Chebyshev(Mean, Sd) UCL	7.935	
149				97.5% Chebyshev(Mean, Sd) UCL	8.043					99% Chebyshev(Mean, Sd) UCL	8.255	
150												
151	**Suggested UCL to Use**											
152				95% Student's-t UCL	7.783							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
159	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12					Number of Distinct Observations	9	

166											Number of Missing Observations	0
167					Minimum	7.18					Mean	7.305
168					Maximum	7.55					Median	7.3
169					SD	0.0934					Std. Error of Mean	0.027
170					Coefficient of Variation	0.0128					Skewness	1.64
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.862					**Shapiro Wilk GOF Test**	
174					1% Shapiro Wilk Critical Value	0.805					Data appear Normal at 1% Significance Level	
175					Lilliefors Test Statistic	0.229					**Lilliefors GOF Test**	
176					1% Lilliefors Critical Value	0.281					Data appear Normal at 1% Significance Level	
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
181					95% Student's-t UCL	7.353					95% Adjusted-CLT UCL (Chen-1995)	7.363
182											95% Modified-t UCL (Johnson-1978)	7.356
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.747					**Anderson-Darling Gamma GOF Test**	
186					5% A-D Critical Value	0.731					Data Not Gamma Distributed at 5% Significance Level	
187					K-S Test Statistic	0.226					**Kolmogorov-Smirnov Gamma GOF Test**	
188					5% K-S Critical Value	0.245					Detected data appear Gamma Distributed at 5% Significance Level	
189						**Detected data follow Appr. Gamma Distribution at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	6754					k star (bias corrected MLE)	5065
193					Theta hat (MLE)	0.00108					Theta star (bias corrected MLE)	0.00144
194					nu hat (MLE)	162087					nu star (bias corrected)	121567
195					MLE Mean (bias corrected)	7.305					MLE Sd (bias corrected)	0.103
196											Approximate Chi Square Value (0.05)	120757
197					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	120633
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	7.354					95% Adjusted Gamma UCL	7.362
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.867					**Shapiro Wilk Lognormal GOF Test**	
204					10% Shapiro Wilk Critical Value	0.883					Data Not Lognormal at 10% Significance Level	
205					Lilliefors Test Statistic	0.226					**Lilliefors Lognormal GOF Test**	
206					10% Lilliefors Critical Value	0.223					Data Not Lognormal at 10% Significance Level	
207						**Data Not Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	1.971					Mean of logged Data	1.988
211					Maximum of Logged Data	2.022					SD of logged Data	0.0127
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	7.385
215					95% Chebyshev (MVUE) UCL	7.421					97.5% Chebyshev (MVUE) UCL	7.472
216					99% Chebyshev (MVUE) UCL	7.571						
217												
218						**Nonparametric Distribution Free UCL Statistics**						
219						**Data appear to follow a Discernible Distribution**						
220												

221	**Nonparametric Distribution Free UCLs**											
222				95% CLT UCL	7.349			95% BCA Bootstrap UCL	7.358			
223				95% Standard Bootstrap UCL	7.346			95% Bootstrap-t UCL	7.373			
224				95% Hall's Bootstrap UCL	7.572			95% Percentile Bootstrap UCL	7.348			
225				90% Chebyshev(Mean, Sd) UCL	7.386			95% Chebyshev(Mean, Sd) UCL	7.422			
226				97.5% Chebyshev(Mean, Sd) UCL	7.473			99% Chebyshev(Mean, Sd) UCL	7.573			
227												
228	**Suggested UCL to Use**											
229				95% Student's-t UCL	7.353							
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235												
236	**ResultValue (apw-05r)**											
237												
238	**General Statistics**											
239				Total Number of Observations	11			Number of Distinct Observations	10			
240								Number of Missing Observations	0			
241				Minimum	7.27			Mean	7.551			
242				Maximum	8			Median	7.56			
243				SD	0.211			Std. Error of Mean	0.0637			
244				Coefficient of Variation	0.028			Skewness	0.783			
245												
246	**Normal GOF Test**											
247				Shapiro Wilk Test Statistic	0.949			**Shapiro Wilk GOF Test**				
248				1% Shapiro Wilk Critical Value	0.792			Data appear Normal at 1% Significance Level				
249				Lilliefors Test Statistic	0.135			**Lilliefors GOF Test**				
250				1% Lilliefors Critical Value	0.291			Data appear Normal at 1% Significance Level				
251	**Data appear Normal at 1% Significance Level**											
252												
253	**Assuming Normal Distribution**											
254	**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**				
255				95% Student's-t UCL	7.666			95% Adjusted-CLT UCL (Chen-1995)	7.672			
256								95% Modified-t UCL (Johnson-1978)	7.669			
257												
258	**Gamma GOF Test**											
259				A-D Test Statistic	0.256			**Anderson-Darling Gamma GOF Test**				
260				5% A-D Critical Value	0.726			Detected data appear Gamma Distributed at 5% Significance Level				
261				K-S Test Statistic	0.127			**Kolmogorov-Smirnov Gamma GOF Test**				
262				5% K-S Critical Value	0.254			Detected data appear Gamma Distributed at 5% Significance Level				
263	**Detected data appear Gamma Distributed at 5% Significance Level**											
264												
265	**Gamma Statistics**											
266				k hat (MLE)	1422			k star (bias corrected MLE)	1034			
267				Theta hat (MLE)	0.00531			Theta star (bias corrected MLE)	0.0073			
268				nu hat (MLE)	31290			nu star (bias corrected)	22758			
269				MLE Mean (bias corrected)	7.551			MLE Sd (bias corrected)	0.235			
270								Approximate Chi Square Value (0.05)	22408			
271				Adjusted Level of Significance	0.0278			Adjusted Chi Square Value	22351			
272												
273	**Assuming Gamma Distribution**											
274				95% Approximate Gamma UCL	7.669			95% Adjusted Gamma UCL	7.688			
275												

276	**Lognormal GOF Test**											
277					Shapiro Wilk Test Statistic	0.954	**Shapiro Wilk Lognormal GOF Test**					
278					10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level					
279					Lilliefors Test Statistic	0.13	**Lilliefors Lognormal GOF Test**					
280					10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level					
281	**Data appear Lognormal at 10% Significance Level**											
282												
283	**Lognormal Statistics**											
284					Minimum of Logged Data	1.984				Mean of logged Data	2.021	
285					Maximum of Logged Data	2.079				SD of logged Data	0.0277	
286												
287	**Assuming Lognormal Distribution**											
288					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL	7.74	
289					95% Chebyshev (MVUE) UCL	7.826				97.5% Chebyshev (MVUE) UCL	7.945	
290					99% Chebyshev (MVUE) UCL	8.179						
291												
292	**Nonparametric Distribution Free UCL Statistics**											
293	**Data appear to follow a Discernible Distribution**											
294												
295	**Nonparametric Distribution Free UCLs**											
296					95% CLT UCL	7.656				95% BCA Bootstrap UCL	7.665	
297					95% Standard Bootstrap UCL	7.65				95% Bootstrap-t UCL	7.69	
298					95% Hall's Bootstrap UCL	7.709				95% Percentile Bootstrap UCL	7.655	
299					90% Chebyshev(Mean, Sd) UCL	7.742				95% Chebyshev(Mean, Sd) UCL	7.828	
300					97.5% Chebyshev(Mean, Sd) UCL	7.949				99% Chebyshev(Mean, Sd) UCL	8.184	
301												
302	**Suggested UCL to Use**											
303					95% Student's-t UCL	7.666						
304												
305	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
306	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
307	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
308												
309												
310	**ResultValue (apw-06d)**											
311												
312	**General Statistics**											
313					Total Number of Observations	22				Number of Distinct Observations	18	
314										Number of Missing Observations	0	
315					Minimum	7.19				Mean	7.375	
316					Maximum	7.73				Median	7.33	
317					SD	0.175				Std. Error of Mean	0.0374	
318					Coefficient of Variation	0.0238				Skewness	0.752	
319												
320	**Normal GOF Test**											
321					Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk GOF Test**					
322					1% Shapiro Wilk Critical Value	0.878	Data appear Normal at 1% Significance Level					
323					Lilliefors Test Statistic	0.172	**Lilliefors GOF Test**					
324					1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level					
325	**Data appear Normal at 1% Significance Level**											
326												
327	**Assuming Normal Distribution**											
328	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
329					95% Student's-t UCL	7.44				95% Adjusted-CLT UCL (Chen-1995)	7.443	
330										95% Modified-t UCL (Johnson-1978)	7.441	

331												
332						**Gamma GOF Test**						
333					A-D Test Statistic	0.921	**Anderson-Darling Gamma GOF Test**					
334					5% A-D Critical Value	0.741	Data Not Gamma Distributed at 5% Significance Level					
335					K-S Test Statistic	0.178	**Kolmogorov-Smirnov Gamma GOF Test**					
336					5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level					
337					**Detected data follow Appr. Gamma Distribution at 5% Significance Level**							
338												
339					**Gamma Statistics**							
340					k hat (MLE)	1875	k star (bias corrected MLE)	1619				
341					Theta hat (MLE)	0.00393	Theta star (bias corrected MLE)	0.00455				
342					nu hat (MLE)	82497	nu star (bias corrected)	71248				
343					MLE Mean (bias corrected)	7.375	MLE Sd (bias corrected)	0.183				
344							Approximate Chi Square Value (0.05)	70629				
345					Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	70583				
346												
347					**Assuming Gamma Distribution**							
348					95% Approximate Gamma UCL	7.44	95% Adjusted Gamma UCL	7.445				
349												
350					**Lognormal GOF Test**							
351					Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk Lognormal GOF Test**					
352					10% Shapiro Wilk Critical Value	0.926	Data Not Lognormal at 10% Significance Level					
353					Lilliefors Test Statistic	0.172	**Lilliefors Lognormal GOF Test**					
354					10% Lilliefors Critical Value	0.169	Data Not Lognormal at 10% Significance Level					
355					**Data Not Lognormal at 10% Significance Level**							
356												
357					**Lognormal Statistics**							
358					Minimum of Logged Data	1.973	Mean of logged Data	1.998				
359					Maximum of Logged Data	2.045	SD of logged Data	0.0236				
360												
361					**Assuming Lognormal Distribution**							
362					95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	7.487				
363					95% Chebyshev (MVUE) UCL	7.537	97.5% Chebyshev (MVUE) UCL	7.607				
364					99% Chebyshev (MVUE) UCL	7.744						
365												
366					**Nonparametric Distribution Free UCL Statistics**							
367					**Data appear to follow a Discernible Distribution**							
368												
369					**Nonparametric Distribution Free UCLs**							
370					95% CLT UCL	7.437	95% BCA Bootstrap UCL	7.444				
371					95% Standard Bootstrap UCL	7.436	95% Bootstrap-t UCL	7.448				
372					95% Hall's Bootstrap UCL	7.443	95% Percentile Bootstrap UCL	7.437				
373					90% Chebyshev(Mean, Sd) UCL	7.488	95% Chebyshev(Mean, Sd) UCL	7.538				
374					97.5% Chebyshev(Mean, Sd) UCL	7.609	99% Chebyshev(Mean, Sd) UCL	7.747				
375												
376					**Suggested UCL to Use**							
377					95% Student's-t UCL	7.44						
378												
379	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
380	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
381	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
382												
383												
384	**ResultValue (apw-06s)**											
385												

386	**General Statistics**											
387					Total Number of Observations	23				Number of Distinct Observations		21
388										Number of Missing Observations		0
389					Minimum	7.02				Mean		7.24
390					Maximum	7.67				Median		7.2
391					SD	0.188				Std. Error of Mean		0.0393
392					Coefficient of Variation	0.026				Skewness		1.136
393												
394	**Normal GOF Test**											
395					Shapiro Wilk Test Statistic	0.877	**Shapiro Wilk GOF Test**					
396					1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level					
397					Lilliefors Test Statistic	0.154	**Lilliefors GOF Test**					
398					1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level					
399	**Data appear Approximate Normal at 1% Significance Level**											
400												
401	**Assuming Normal Distribution**											
402	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
403					95% Student's-t UCL	7.307				95% Adjusted-CLT UCL (Chen-1995)		7.314
404										95% Modified-t UCL (Johnson-1978)		7.309
405												
406	**Gamma GOF Test**											
407					A-D Test Statistic	0.931	**Anderson-Darling Gamma GOF Test**					
408					5% A-D Critical Value	0.74	Data Not Gamma Distributed at 5% Significance Level					
409					K-S Test Statistic	0.154	**Kolmogorov-Smirnov Gamma GOF Test**					
410					5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level					
411	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
412												
413	**Gamma Statistics**											
414					k hat (MLE)	1571				k star (bias corrected MLE)		1366
415					Theta hat (MLE)	0.00461				Theta star (bias corrected MLE)		0.0053
416					nu hat (MLE)	72264				nu star (bias corrected)		62839
417					MLE Mean (bias corrected)	7.24				MLE Sd (bias corrected)		0.196
418										Approximate Chi Square Value (0.05)		62257
419					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		62216
420												
421	**Assuming Gamma Distribution**											
422					95% Approximate Gamma UCL	7.307				95% Adjusted Gamma UCL		7.312
423												
424	**Lognormal GOF Test**											
425					Shapiro Wilk Test Statistic	0.884	**Shapiro Wilk Lognormal GOF Test**					
426					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
427					Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**					
428					10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level					
429	**Data appear Approximate Lognormal at 10% Significance Level**											
430												
431	**Lognormal Statistics**											
432					Minimum of Logged Data	1.949				Mean of logged Data		1.979
433					Maximum of Logged Data	2.037				SD of logged Data		0.0257
434												
435	**Assuming Lognormal Distribution**											
436					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL		7.356
437					95% Chebyshev (MVUE) UCL	7.409				97.5% Chebyshev (MVUE) UCL		7.482
438					99% Chebyshev (MVUE) UCL	7.625						
439												
440	**Nonparametric Distribution Free UCL Statistics**											

441	**Data appear to follow a Discernible Distribution**											
442												
443	**Nonparametric Distribution Free UCLs**											
444				95% CLT UCL	7.304			95% BCA Bootstrap UCL	7.309			
445				95% Standard Bootstrap UCL	7.302			95% Bootstrap-t UCL	7.321			
446				95% Hall's Bootstrap UCL	7.315			95% Percentile Bootstrap UCL	7.304			
447				90% Chebyshev(Mean, Sd) UCL	7.357			95% Chebyshev(Mean, Sd) UCL	7.411			
448				97.5% Chebyshev(Mean, Sd) UCL	7.485			99% Chebyshev(Mean, Sd) UCL	7.63			
449												
450	**Suggested UCL to Use**											
451				95% Student's-t UCL	7.307							
452												
453	When a data set follows an approximate distribution passing only one of the GOF tests,											
454	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
455												
456	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
457	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
458	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
459												
460												
461	**ResultValue (apw-07)**											
462												
463	**General Statistics**											
464				Total Number of Observations	22			Number of Distinct Observations	18			
465								Number of Missing Observations	0			
466				Minimum	6.78			Mean	6.961			
467				Maximum	7.31			Median	6.935			
468				SD	0.145			Std. Error of Mean	0.0309			
469				Coefficient of Variation	0.0208			Skewness	1.045			
470												
471	**Normal GOF Test**											
472				Shapiro Wilk Test Statistic	0.898			**Shapiro Wilk GOF Test**				
473				1% Shapiro Wilk Critical Value	0.878			Data appear Normal at 1% Significance Level				
474				Lilliefors Test Statistic	0.167			**Lilliefors GOF Test**				
475				1% Lilliefors Critical Value	0.214			Data appear Normal at 1% Significance Level				
476	**Data appear Normal at 1% Significance Level**											
477												
478	**Assuming Normal Distribution**											
479	**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**				
480				95% Student's-t UCL	7.015			95% Adjusted-CLT UCL (Chen-1995)	7.02			
481								95% Modified-t UCL (Johnson-1978)	7.016			
482												
483	**Gamma GOF Test**											
484				A-D Test Statistic	0.823			**Anderson-Darling Gamma GOF Test**				
485				5% A-D Critical Value	0.741			Data Not Gamma Distributed at 5% Significance Level				
486				K-S Test Statistic	0.176			**Kolmogorov-Smirnov Gamma GOF Test**				
487				5% K-S Critical Value	0.185			Detected data appear Gamma Distributed at 5% Significance Level				
488	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
489												
490	**Gamma Statistics**											
491				k hat (MLE)	2447			k star (bias corrected MLE)	2113			
492				Theta hat (MLE)	0.00284			Theta star (bias corrected MLE)	0.00329			
493				nu hat (MLE)	107669			nu star (bias corrected)	92988			
494				MLE Mean (bias corrected)	6.961			MLE Sd (bias corrected)	0.151			
495								Approximate Chi Square Value (0.05)	92280			

496				Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	92227	
497												
498					**Assuming Gamma Distribution**							
499				95% Approximate Gamma UCL	7.015					95% Adjusted Gamma UCL	7.019	
500												
501					**Lognormal GOF Test**							
502				Shapiro Wilk Test Statistic	0.903			**Shapiro Wilk Lognormal GOF Test**				
503				10% Shapiro Wilk Critical Value	0.926			Data Not Lognormal at 10% Significance Level				
504				Lilliefors Test Statistic	0.167			**Lilliefors Lognormal GOF Test**				
505				10% Lilliefors Critical Value	0.169			Data appear Lognormal at 10% Significance Level				
506					**Data appear Approximate Lognormal at 10% Significance Level**							
507												
508					**Lognormal Statistics**							
509				Minimum of Logged Data	1.914					Mean of logged Data	1.94	
510				Maximum of Logged Data	1.989					SD of logged Data	0.0206	
511												
512					**Assuming Lognormal Distribution**							
513				95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	7.053	
514				95% Chebyshev (MVUE) UCL	7.095					97.5% Chebyshev (MVUE) UCL	7.153	
515				99% Chebyshev (MVUE) UCL	7.266							
516												
517					**Nonparametric Distribution Free UCL Statistics**							
518					**Data appear to follow a Discernible Distribution**							
519												
520					**Nonparametric Distribution Free UCLs**							
521				95% CLT UCL	7.012					95% BCA Bootstrap UCL	7.022	
522				95% Standard Bootstrap UCL	7.013					95% Bootstrap-t UCL	7.029	
523				95% Hall's Bootstrap UCL	7.024					95% Percentile Bootstrap UCL	7.016	
524				90% Chebyshev(Mean, Sd) UCL	7.054					95% Chebyshev(Mean, Sd) UCL	7.096	
525				97.5% Chebyshev(Mean, Sd) UCL	7.154					99% Chebyshev(Mean, Sd) UCL	7.269	
526												
527					**Suggested UCL to Use**							
528				95% Student's-t UCL	7.015							
529												
530					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
531					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
532					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
533												
534												
535	**ResultValue (apw-08)**											
536												
537					**General Statistics**							
538				Total Number of Observations	23					Number of Distinct Observations	18	
539										Number of Missing Observations	0	
540				Minimum	7					Mean	7.268	
541				Maximum	7.68					Median	7.25	
542				SD	0.195					Std. Error of Mean	0.0407	
543				Coefficient of Variation	0.0268					Skewness	0.614	
544												
545					**Normal GOF Test**							
546				Shapiro Wilk Test Statistic	0.94			**Shapiro Wilk GOF Test**				
547				1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level				
548				Lilliefors Test Statistic	0.104			**Lilliefors GOF Test**				
549				1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level				
550					**Data appear Normal at 1% Significance Level**							

551												
552	**Assuming Normal Distribution**											
553	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
554			95% Student's-t UCL		7.338			95% Adjusted-CLT UCL (Chen-1995)			7.34	
555								95% Modified-t UCL (Johnson-1978)			7.339	
556												
557	**Gamma GOF Test**											
558			A-D Test Statistic		0.445		**Anderson-Darling Gamma GOF Test**					
559			5% A-D Critical Value		0.74		Detected data appear Gamma Distributed at 5% Significance Level					
560			K-S Test Statistic		0.105		**Kolmogorov-Smirnov Gamma GOF Test**					
561			5% K-S Critical Value		0.181		Detected data appear Gamma Distributed at 5% Significance Level					
562	**Detected data appear Gamma Distributed at 5% Significance Level**											
563												
564	**Gamma Statistics**											
565			k hat (MLE)		1465			k star (bias corrected MLE)			1274	
566			Theta hat (MLE)		0.00496			Theta star (bias corrected MLE)			0.0057	
567			nu hat (MLE)		67397			nu star (bias corrected)			58608	
568			MLE Mean (bias corrected)		7.268			MLE Sd (bias corrected)			0.204	
569								Approximate Chi Square Value (0.05)			58046	
570			Adjusted Level of Significance		0.0389			Adjusted Chi Square Value			58005	
571												
572	**Assuming Gamma Distribution**											
573			95% Approximate Gamma UCL		7.338			95% Adjusted Gamma UCL			7.343	
574												
575	**Lognormal GOF Test**											
576			Shapiro Wilk Test Statistic		0.943		**Shapiro Wilk Lognormal GOF Test**					
577			10% Shapiro Wilk Critical Value		0.928		Data appear Lognormal at 10% Significance Level					
578			Lilliefors Test Statistic		0.0991		**Lilliefors Lognormal GOF Test**					
579			10% Lilliefors Critical Value		0.165		Data appear Lognormal at 10% Significance Level					
580	**Data appear Lognormal at 10% Significance Level**											
581												
582	**Lognormal Statistics**											
583			Minimum of Logged Data		1.946			Mean of logged Data			1.983	
584			Maximum of Logged Data		2.039			SD of logged Data			0.0267	
585												
586	**Assuming Lognormal Distribution**											
587			95% H-UCL		N/A			90% Chebyshev (MVUE) UCL			7.389	
588			95% Chebyshev (MVUE) UCL		7.444			97.5% Chebyshev (MVUE) UCL			7.52	
589			99% Chebyshev (MVUE) UCL		7.67							
590												
591	**Nonparametric Distribution Free UCL Statistics**											
592	**Data appear to follow a Discernible Distribution**											
593												
594	**Nonparametric Distribution Free UCLs**											
595			95% CLT UCL		7.335			95% BCA Bootstrap UCL			7.337	
596			95% Standard Bootstrap UCL		7.334			95% Bootstrap-t UCL			7.348	
597			95% Hall's Bootstrap UCL		7.344			95% Percentile Bootstrap UCL			7.334	
598			90% Chebyshev(Mean, Sd) UCL		7.39			95% Chebyshev(Mean, Sd) UCL			7.445	
599			97.5% Chebyshev(Mean, Sd) UCL		7.522			99% Chebyshev(Mean, Sd) UCL			7.672	
600												
601	**Suggested UCL to Use**											
602			95% Student's-t UCL		7.338							
603												
604	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
605	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

606	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
607												
608												
609	**ResultValue (apw-10d)**											
610												
611	**General Statistics**											
612						Total Number of Observations	23			Number of Distinct Observations	19	
613										Number of Missing Observations	0	
614						Minimum	6.98			Mean	7.249	
615						Maximum	7.66			Median	7.21	
616						SD	0.209			Std. Error of Mean	0.0436	
617						Coefficient of Variation	0.0288			Skewness	0.733	
618												
619	**Normal GOF Test**											
620						Shapiro Wilk Test Statistic	0.904			**Shapiro Wilk GOF Test**		
621						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
622						Lilliefors Test Statistic	0.166			**Lilliefors GOF Test**		
623						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
624	**Data appear Normal at 1% Significance Level**											
625												
626	**Assuming Normal Distribution**											
627	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
628						95% Student's-t UCL	7.324			95% Adjusted-CLT UCL (Chen-1995)	7.328	
629										95% Modified-t UCL (Johnson-1978)	7.325	
630												
631	**Gamma GOF Test**											
632						A-D Test Statistic	0.77			**Anderson-Darling Gamma GOF Test**		
633						5% A-D Critical Value	0.74			Data Not Gamma Distributed at 5% Significance Level		
634						K-S Test Statistic	0.171			**Kolmogorov-Smirnov Gamma GOF Test**		
635						5% K-S Critical Value	0.181			Detected data appear Gamma Distributed at 5% Significance Level		
636	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
637												
638	**Gamma Statistics**											
639						k hat (MLE)	1273			k star (bias corrected MLE)	1107	
640						Theta hat (MLE)	0.00569			Theta star (bias corrected MLE)	0.00655	
641						nu hat (MLE)	58564			nu star (bias corrected)	50927	
642						MLE Mean (bias corrected)	7.249			MLE Sd (bias corrected)	0.218	
643										Approximate Chi Square Value (0.05)	50403	
644						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	50365	
645												
646	**Assuming Gamma Distribution**											
647						95% Approximate Gamma UCL	7.324			95% Adjusted Gamma UCL	7.33	
648												
649	**Lognormal GOF Test**											
650						Shapiro Wilk Test Statistic	0.909			**Shapiro Wilk Lognormal GOF Test**		
651						10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level		
652						Lilliefors Test Statistic	0.166			**Lilliefors Lognormal GOF Test**		
653						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
654	**Data Not Lognormal at 10% Significance Level**											
655												
656	**Lognormal Statistics**											
657						Minimum of Logged Data	1.943			Mean of logged Data	1.98	
658						Maximum of Logged Data	2.036			SD of logged Data	0.0286	
659												
660	**Assuming Lognormal Distribution**											

661				95% H-UCL	N/A					90% Chebyshev (MVUE) UCL		7.379
662				95% Chebyshev (MVUE) UCL	7.437					97.5% Chebyshev (MVUE) UCL		7.519
663				99% Chebyshev (MVUE) UCL	7.679							
664												
665					**Nonparametric Distribution Free UCL Statistics**							
666					**Data appear to follow a Discernible Distribution**							
667												
668					**Nonparametric Distribution Free UCLs**							
669				95% CLT UCL	7.321					95% BCA Bootstrap UCL		7.324
670				95% Standard Bootstrap UCL	7.319					95% Bootstrap-t UCL		7.337
671				95% Hall's Bootstrap UCL	7.328					95% Percentile Bootstrap UCL		7.319
672				90% Chebyshev(Mean, Sd) UCL	7.38					95% Chebyshev(Mean, Sd) UCL		7.439
673				97.5% Chebyshev(Mean, Sd) UCL	7.521					99% Chebyshev(Mean, Sd) UCL		7.683
674												
675					**Suggested UCL to Use**							
676				95% Student's-t UCL	7.324							
677												
678	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
679	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
680	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
681												
682												
683	**ResultValue (apw-10s)**											
684												
685					**General Statistics**							
686				Total Number of Observations	23					Number of Distinct Observations		17
687										Number of Missing Observations		0
688				Minimum	6.91					Mean		7.102
689				Maximum	7.58					Median		7.06
690				SD	0.161					Std. Error of Mean		0.0335
691				Coefficient of Variation	0.0226					Skewness		1.21
692												
693					**Normal GOF Test**							
694				Shapiro Wilk Test Statistic	0.874					**Shapiro Wilk GOF Test**		
695				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
696				Lilliefors Test Statistic	0.195					**Lilliefors GOF Test**		
697				1% Lilliefors Critical Value	0.209					Data appear Normal at 1% Significance Level		
698					**Data appear Approximate Normal at 1% Significance Level**							
699												
700					**Assuming Normal Distribution**							
701					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
702				95% Student's-t UCL	7.16					95% Adjusted-CLT UCL (Chen-1995)		7.166
703										95% Modified-t UCL (Johnson-1978)		7.161
704												
705					**Gamma GOF Test**							
706				A-D Test Statistic	0.94					**Anderson-Darling Gamma GOF Test**		
707				5% A-D Critical Value	0.74					Data Not Gamma Distributed at 5% Significance Level		
708				K-S Test Statistic	0.202					**Kolmogorov-Smirnov Gamma GOF Test**		
709				5% K-S Critical Value	0.181					Data Not Gamma Distributed at 5% Significance Level		
710					**Data Not Gamma Distributed at 5% Significance Level**							
711												
712					**Gamma Statistics**							
713				k hat (MLE)	2073					k star (bias corrected MLE)		1803
714				Theta hat (MLE)	0.00343					Theta star (bias corrected MLE)		0.00394
715				nu hat (MLE)	95359					nu star (bias corrected)		82922

716					MLE Mean (bias corrected)	7.102					MLE Sd (bias corrected)	0.167
717											Approximate Chi Square Value (0.05)	82254
718					Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	82205
719												
720					**Assuming Gamma Distribution**							
721					95% Approximate Gamma UCL	7.16					95% Adjusted Gamma UCL	7.164
722												
723					**Lognormal GOF Test**							
724					Shapiro Wilk Test Statistic	0.88			**Shapiro Wilk Lognormal GOF Test**			
725					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
726					Lilliefors Test Statistic	0.195			**Lilliefors Lognormal GOF Test**			
727					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
728					**Data Not Lognormal at 10% Significance Level**							
729												
730					**Lognormal Statistics**							
731					Minimum of Logged Data	1.933					Mean of logged Data	1.96
732					Maximum of Logged Data	2.026					SD of logged Data	0.0224
733												
734					**Assuming Lognormal Distribution**							
735					95% H-UCL	N/A					90% Chebyshev (MVUE) UCL	7.202
736					95% Chebyshev (MVUE) UCL	7.247					97.5% Chebyshev (MVUE) UCL	7.309
737					99% Chebyshev (MVUE) UCL	7.432						
738												
739					**Nonparametric Distribution Free UCL Statistics**							
740					**Data appear to follow a Discernible Distribution**							
741												
742					**Nonparametric Distribution Free UCLs**							
743					95% CLT UCL	7.157					95% BCA Bootstrap UCL	7.163
744					95% Standard Bootstrap UCL	7.156					95% Bootstrap-t UCL	7.173
745					95% Hall's Bootstrap UCL	7.179					95% Percentile Bootstrap UCL	7.159
746					90% Chebyshev(Mean, Sd) UCL	7.203					95% Chebyshev(Mean, Sd) UCL	7.248
747					97.5% Chebyshev(Mean, Sd) UCL	7.312					99% Chebyshev(Mean, Sd) UCL	7.436
748												
749					**Suggested UCL to Use**							
750					95% Student's-t UCL	7.16						
751												
752					When a data set follows an approximate distribution passing only one of the GOF tests,							
753					it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL							
754												
755					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
756					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
757					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
758												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Radium 226-228
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:23:51 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	22	Number of Distinct Observations	21
		Number of Missing Observations	0
Minimum	0.03	Mean	1.293
Maximum	4.09	Median	1.21
SD	0.991	Std. Error of Mean	0.211
Coefficient of Variation	0.767	Skewness	1.242

Normal GOF Test

Shapiro Wilk Test Statistic	0.902	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.878	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.166	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1.656	95% Adjusted-CLT UCL (Chen-1995)	1.7
		95% Modified-t UCL (Johnson-1978)	1.666

Gamma GOF Test

A-D Test Statistic	0.244	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.759	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.104	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.189	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.501	k star (bias corrected MLE)	1.326
Theta hat (MLE)	0.861	Theta star (bias corrected MLE)	0.975
nu hat (MLE)	66.03	nu star (bias corrected)	58.36
MLE Mean (bias corrected)	1.293	MLE Sd (bias corrected)	1.122
		Approximate Chi Square Value (0.05)	41.79
Adjusted Level of Significance	0.0386	Adjusted Chi Square Value	40.75

Assuming Gamma Distribution

95% Approximate Gamma UCL	1.805	95% Adjusted Gamma UCL	1.851

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.885	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.926	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.136	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.169	Data appear Lognormal at 10% Significance Level

56	**Data appear Approximate Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-3.507			Mean of logged Data	-0.112	
60						Maximum of Logged Data	1.409			SD of logged Data	1.06	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	2.906			90% Chebyshev (MVUE) UCL	2.676	
64						95% Chebyshev (MVUE) UCL	3.204			97.5% Chebyshev (MVUE) UCL	3.936	
65						99% Chebyshev (MVUE) UCL	5.376					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	1.64			95% BCA Bootstrap UCL	1.697	
72						95% Standard Bootstrap UCL	1.638			95% Bootstrap-t UCL	1.736	
73						95% Hall's Bootstrap UCL	1.781			95% Percentile Bootstrap UCL	1.646	
74						90% Chebyshev(Mean, Sd) UCL	1.927			95% Chebyshev(Mean, Sd) UCL	2.214	
75						97.5% Chebyshev(Mean, Sd) UCL	2.612			99% Chebyshev(Mean, Sd) UCL	3.395	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	1.656					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84												
85	**ResultValue (apw-03)**											
86												
87	**General Statistics**											
88						Total Number of Observations	23			Number of Distinct Observations	21	
89										Number of Missing Observations	0	
90						Minimum	0.37			Mean	1.155	
91						Maximum	3.18			Median	0.901	
92						SD	0.681			Std. Error of Mean	0.142	
93						Coefficient of Variation	0.589			Skewness	1.733	
94												
95	**Normal GOF Test**											
96						Shapiro Wilk Test Statistic	0.808			**Shapiro Wilk GOF Test**		
97						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
98						Lilliefors Test Statistic	0.268			**Lilliefors GOF Test**		
99						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
100	**Data Not Normal at 1% Significance Level**											
101												
102	**Assuming Normal Distribution**											
103	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
104						95% Student's-t UCL	1.399			95% Adjusted-CLT UCL (Chen-1995)	1.443	
105										95% Modified-t UCL (Johnson-1978)	1.407	
106												
107	**Gamma GOF Test**											
108						A-D Test Statistic	0.831			**Anderson-Darling Gamma GOF Test**		
109						5% A-D Critical Value	0.749			Data Not Gamma Distributed at 5% Significance Level		
110						K-S Test Statistic	0.198			**Kolmogorov-Smirnov Gamma GOF Test**		

111				5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level						
112	**Data Not Gamma Distributed at 5% Significance Level**											
113												
114	**Gamma Statistics**											
115				k hat (MLE)	3.859					k star (bias corrected MLE)	3.384	
116				Theta hat (MLE)	0.299					Theta star (bias corrected MLE)	0.341	
117				nu hat (MLE)	177.5					nu star (bias corrected)	155.7	
118				MLE Mean (bias corrected)	1.155					MLE Sd (bias corrected)	0.628	
119										Approximate Chi Square Value (0.05)	127.8	
120				Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	126	
121												
122	**Assuming Gamma Distribution**											
123				95% Approximate Gamma UCL	1.406					95% Adjusted Gamma UCL	1.427	
124												
125	**Lognormal GOF Test**											
126				Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk Lognormal GOF Test**						
127				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
128				Lilliefors Test Statistic	0.164	**Lilliefors Lognormal GOF Test**						
129				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
130	**Data appear Lognormal at 10% Significance Level**											
131												
132	**Lognormal Statistics**											
133				Minimum of Logged Data	-0.994					Mean of logged Data	0.00881	
134				Maximum of Logged Data	1.157					SD of logged Data	0.518	
135												
136	**Assuming Lognormal Distribution**											
137				95% H-UCL	1.437					90% Chebyshev (MVUE) UCL	1.533	
138				95% Chebyshev (MVUE) UCL	1.708					97.5% Chebyshev (MVUE) UCL	1.951	
139				99% Chebyshev (MVUE) UCL	2.429							
140												
141	**Nonparametric Distribution Free UCL Statistics**											
142	**Data appear to follow a Discernible Distribution**											
143												
144	**Nonparametric Distribution Free UCLs**											
145				95% CLT UCL	1.388					95% BCA Bootstrap UCL	1.487	
146				95% Standard Bootstrap UCL	1.384					95% Bootstrap-t UCL	1.528	
147				95% Hall's Bootstrap UCL	1.554					95% Percentile Bootstrap UCL	1.39	
148				90% Chebyshev(Mean, Sd) UCL	1.581					95% Chebyshev(Mean, Sd) UCL	1.774	
149				97.5% Chebyshev(Mean, Sd) UCL	2.041					99% Chebyshev(Mean, Sd) UCL	2.567	
150												
151	**Suggested UCL to Use**											
152				95% H-UCL	1.437							
153												
154	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
155	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
156	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
157												
158												
159	**ResultValue (apw-05)**											
160												
161	**General Statistics**											
162				Total Number of Observations	11					Number of Distinct Observations	11	
163										Number of Missing Observations	0	
164				Minimum	0.6					Mean	1.048	
165				Maximum	1.75					Median	0.99	

166					SD	0.415					Std. Error of Mean	0.125
167					Coefficient of Variation	0.396					Skewness	0.581
168												
169					**Normal GOF Test**							
170					Shapiro Wilk Test Statistic	0.904	**Shapiro Wilk GOF Test**					
171					1% Shapiro Wilk Critical Value	0.792	Data appear Normal at 1% Significance Level					
172					Lilliefors Test Statistic	0.147	**Lilliefors GOF Test**					
173					1% Lilliefors Critical Value	0.291	Data appear Normal at 1% Significance Level					
174					**Data appear Normal at 1% Significance Level**							
175												
176					**Assuming Normal Distribution**							
177					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
178					95% Student's-t UCL	1.275	95% Adjusted-CLT UCL (Chen-1995)	1.278				
179							95% Modified-t UCL (Johnson-1978)	1.279				
180												
181					**Gamma GOF Test**							
182					A-D Test Statistic	0.35	**Anderson-Darling Gamma GOF Test**					
183					5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level					
184					K-S Test Statistic	0.159	**Kolmogorov-Smirnov Gamma GOF Test**					
185					5% K-S Critical Value	0.256	Detected data appear Gamma Distributed at 5% Significance Level					
186					**Detected data appear Gamma Distributed at 5% Significance Level**							
187												
188					**Gamma Statistics**							
189					k hat (MLE)	7.229	k star (bias corrected MLE)	5.318				
190					Theta hat (MLE)	0.145	Theta star (bias corrected MLE)	0.197				
191					nu hat (MLE)	159	nu star (bias corrected)	117				
192					MLE Mean (bias corrected)	1.048	MLE Sd (bias corrected)	0.455				
193							Approximate Chi Square Value (0.05)	93.03				
194					Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	89.55				
195												
196					**Assuming Gamma Distribution**							
197					95% Approximate Gamma UCL	1.319	95% Adjusted Gamma UCL	1.37				
198												
199					**Lognormal GOF Test**							
200					Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk Lognormal GOF Test**					
201					10% Shapiro Wilk Critical Value	0.876	Data appear Lognormal at 10% Significance Level					
202					Lilliefors Test Statistic	0.156	**Lilliefors Lognormal GOF Test**					
203					10% Lilliefors Critical Value	0.231	Data appear Lognormal at 10% Significance Level					
204					**Data appear Lognormal at 10% Significance Level**							
205												
206					**Lognormal Statistics**							
207					Minimum of Logged Data	-0.511	Mean of logged Data	-0.0235				
208					Maximum of Logged Data	0.56	SD of logged Data	0.395				
209												
210					**Assuming Lognormal Distribution**							
211					95% H-UCL	1.363	90% Chebyshev (MVUE) UCL	1.427				
212					95% Chebyshev (MVUE) UCL	1.599	97.5% Chebyshev (MVUE) UCL	1.838				
213					99% Chebyshev (MVUE) UCL	2.306						
214												
215					**Nonparametric Distribution Free UCL Statistics**							
216					**Data appear to follow a Discernible Distribution**							
217												
218					**Nonparametric Distribution Free UCLs**							
219					95% CLT UCL	1.254	95% BCA Bootstrap UCL	1.271				
220					95% Standard Bootstrap UCL	1.249	95% Bootstrap-t UCL	1.319				

221				95% Hall's Bootstrap UCL	1.265				95% Percentile Bootstrap UCL	1.256		
222				90% Chebyshev(Mean, Sd) UCL	1.424				95% Chebyshev(Mean, Sd) UCL	1.594		
223				97.5% Chebyshev(Mean, Sd) UCL	1.83				99% Chebyshev(Mean, Sd) UCL	2.293		
224												
225				**Suggested UCL to Use**								
226				95% Student's-t UCL	1.275							
227												
228	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
229	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
230	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
231												
232												
233	**ResultValue (apw-05r)**											
234												
235				**General Statistics**								
236				Total Number of Observations	11				Number of Distinct Observations	11		
237									Number of Missing Observations	0		
238				Minimum	0.473				Mean	1.688		
239				Maximum	6.34				Median	0.88		
240				SD	1.828				Std. Error of Mean	0.551		
241				Coefficient of Variation	1.082				Skewness	2.085		
242												
243				**Normal GOF Test**								
244				Shapiro Wilk Test Statistic	0.681				**Shapiro Wilk GOF Test**			
245				1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level			
246				Lilliefors Test Statistic	0.349				**Lilliefors GOF Test**			
247				1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level			
248				**Data Not Normal at 1% Significance Level**								
249												
250				**Assuming Normal Distribution**								
251				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
252				95% Student's-t UCL	2.687				95% Adjusted-CLT UCL (Chen-1995)	2.965		
253									95% Modified-t UCL (Johnson-1978)	2.745		
254												
255				**Gamma GOF Test**								
256				A-D Test Statistic	0.985				**Anderson-Darling Gamma GOF Test**			
257				5% A-D Critical Value	0.742				Data Not Gamma Distributed at 5% Significance Level			
258				K-S Test Statistic	0.302				**Kolmogorov-Smirnov Gamma GOF Test**			
259				5% K-S Critical Value	0.26				Data Not Gamma Distributed at 5% Significance Level			
260				**Data Not Gamma Distributed at 5% Significance Level**								
261												
262				**Gamma Statistics**								
263				k hat (MLE)	1.5				k star (bias corrected MLE)	1.152		
264				Theta hat (MLE)	1.125				Theta star (bias corrected MLE)	1.466		
265				nu hat (MLE)	33				nu star (bias corrected)	25.33		
266				MLE Mean (bias corrected)	1.688				MLE Sd (bias corrected)	1.573		
267									Approximate Chi Square Value (0.05)	14.87		
268				Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	13.58		
269												
270				**Assuming Gamma Distribution**								
271				95% Approximate Gamma UCL	2.877				95% Adjusted Gamma UCL	3.151		
272												
273				**Lognormal GOF Test**								
274				Shapiro Wilk Test Statistic	0.872				**Shapiro Wilk Lognormal GOF Test**			
275				10% Shapiro Wilk Critical Value	0.876				Data Not Lognormal at 10% Significance Level			

276				Lilliefors Test Statistic	0.247	**Lilliefors Lognormal GOF Test**						
277				10% Lilliefors Critical Value	0.231	Data Not Lognormal at 10% Significance Level						
278	**Data Not Lognormal at 10% Significance Level**											
279												
280	**Lognormal Statistics**											
281				Minimum of Logged Data	-0.749					Mean of logged Data	0.155	
282				Maximum of Logged Data	1.847					SD of logged Data	0.822	
283												
284	**Assuming Lognormal Distribution**											
285				95% H-UCL	3.273					90% Chebyshev (MVUE) UCL	2.8	
286				95% Chebyshev (MVUE) UCL	3.355					97.5% Chebyshev (MVUE) UCL	4.125	
287				99% Chebyshev (MVUE) UCL	5.637							
288												
289	**Nonparametric Distribution Free UCL Statistics**											
290	**Data do not follow a Discernible Distribution**											
291												
292	**Nonparametric Distribution Free UCLs**											
293				95% CLT UCL	2.595					95% BCA Bootstrap UCL	2.958	
294				95% Standard Bootstrap UCL	2.567					95% Bootstrap-t UCL	4.945	
295				95% Hall's Bootstrap UCL	6.177					95% Percentile Bootstrap UCL	2.677	
296				90% Chebyshev(Mean, Sd) UCL	3.341					95% Chebyshev(Mean, Sd) UCL	4.09	
297				97.5% Chebyshev(Mean, Sd) UCL	5.129					99% Chebyshev(Mean, Sd) UCL	7.171	
298												
299	**Suggested UCL to Use**											
300				95% Student's-t UCL	2.687							
301												
302	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
303	**Please verify the data were collected from random locations.**											
304	**If the data were collected using judgmental or other non-random methods,**											
305	**then contact a statistician to correctly calculate UCLs.**											
306												
307	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
308	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
309	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
310												
311												
312	**ResultValue (apw-06d)**											
313												
314	**General Statistics**											
315				Total Number of Observations	22					Number of Distinct Observations	20	
316										Number of Missing Observations	0	
317				Minimum	0.44					Mean	1.441	
318				Maximum	2.8					Median	1.45	
319				SD	0.612					Std. Error of Mean	0.13	
320				Coefficient of Variation	0.425					Skewness	0.686	
321												
322	**Normal GOF Test**											
323				Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk GOF Test**						
324				1% Shapiro Wilk Critical Value	0.878	Data appear Normal at 1% Significance Level						
325				Lilliefors Test Statistic	0.155	**Lilliefors GOF Test**						
326				1% Lilliefors Critical Value	0.214	Data appear Normal at 1% Significance Level						
327	**Data appear Normal at 1% Significance Level**											
328												
329	**Assuming Normal Distribution**											
330	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						

331				95% Student's-t UCL	1.666				95% Adjusted-CLT UCL (Chen-1995)			1.676
332									95% Modified-t UCL (Johnson-1978)			1.669
333												
334						**Gamma GOF Test**							
335				A-D Test Statistic	0.37			**Anderson-Darling Gamma GOF Test**				
336				5% A-D Critical Value	0.746			Detected data appear Gamma Distributed at 5% Significance Level				
337				K-S Test Statistic	0.124			**Kolmogorov-Smirnov Gamma GOF Test**				
338				5% K-S Critical Value	0.186			Detected data appear Gamma Distributed at 5% Significance Level				
339						**Detected data appear Gamma Distributed at 5% Significance Level**							
340												
341						**Gamma Statistics**							
342				k hat (MLE)	5.751			k star (bias corrected MLE)				4.997
343				Theta hat (MLE)	0.251			Theta star (bias corrected MLE)				0.288
344				nu hat (MLE)	253			nu star (bias corrected)				219.9
345				MLE Mean (bias corrected)	1.441			MLE Sd (bias corrected)				0.645
346								Approximate Chi Square Value (0.05)				186.6
347				Adjusted Level of Significance	0.0386			Adjusted Chi Square Value				184.3
348												
349						**Assuming Gamma Distribution**							
350				95% Approximate Gamma UCL	1.699			95% Adjusted Gamma UCL				1.72
351												
352						**Lognormal GOF Test**							
353				Shapiro Wilk Test Statistic	0.96			**Shapiro Wilk Lognormal GOF Test**				
354				10% Shapiro Wilk Critical Value	0.926			Data appear Lognormal at 10% Significance Level				
355				Lilliefors Test Statistic	0.126			**Lilliefors Lognormal GOF Test**				
356				10% Lilliefors Critical Value	0.169			Data appear Lognormal at 10% Significance Level				
357						**Data appear Lognormal at 10% Significance Level**							
358												
359						**Lognormal Statistics**							
360				Minimum of Logged Data	-0.821			Mean of logged Data				0.276
361				Maximum of Logged Data	1.03			SD of logged Data				0.445
362												
363						**Assuming Lognormal Distribution**							
364				95% H-UCL	1.758			90% Chebyshev (MVUE) UCL				1.873
365				95% Chebyshev (MVUE) UCL	2.065			97.5% Chebyshev (MVUE) UCL				2.332
366				99% Chebyshev (MVUE) UCL	2.857							
367												
368						**Nonparametric Distribution Free UCL Statistics**							
369						**Data appear to follow a Discernible Distribution**							
370												
371						**Nonparametric Distribution Free UCLs**							
372				95% CLT UCL	1.656			95% BCA Bootstrap UCL				1.68
373				95% Standard Bootstrap UCL	1.654			95% Bootstrap-t UCL				1.701
374				95% Hall's Bootstrap UCL	1.708			95% Percentile Bootstrap UCL				1.655
375				90% Chebyshev(Mean, Sd) UCL	1.833			95% Chebyshev(Mean, Sd) UCL				2.01
376				97.5% Chebyshev(Mean, Sd) UCL	2.256			99% Chebyshev(Mean, Sd) UCL				2.739
377												
378						**Suggested UCL to Use**							
379				95% Student's-t UCL	1.666							
380												
381	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
382	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
383	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
384												
385												

386	ResultValue (apw-06s)											
387												
388						General Statistics						
389					Total Number of Observations	23			Number of Distinct Observations	23		
390									Number of Missing Observations	0		
391					Minimum	0.11			Mean	1.136		
392					Maximum	2.93			Median	1.04		
393					SD	0.65			Std. Error of Mean	0.136		
394					Coefficient of Variation	0.573			Skewness	1.204		
395												
396						Normal GOF Test						
397					Shapiro Wilk Test Statistic	0.915			Shapiro Wilk GOF Test			
398					1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level			
399					Lilliefors Test Statistic	0.165			Lilliefors GOF Test			
400					1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level			
401						Data appear Normal at 1% Significance Level						
402												
403						Assuming Normal Distribution						
404					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
405					95% Student's-t UCL	1.369			95% Adjusted-CLT UCL (Chen-1995)	1.396		
406									95% Modified-t UCL (Johnson-1978)	1.375		
407												
408						Gamma GOF Test						
409					A-D Test Statistic	0.298			Anderson-Darling Gamma GOF Test			
410					5% A-D Critical Value	0.751			Detected data appear Gamma Distributed at 5% Significance Level			
411					K-S Test Statistic	0.101			Kolmogorov-Smirnov Gamma GOF Test			
412					5% K-S Critical Value	0.183			Detected data appear Gamma Distributed at 5% Significance Level			
413						Detected data appear Gamma Distributed at 5% Significance Level						
414												
415						Gamma Statistics						
416					k hat (MLE)	2.963			k star (bias corrected MLE)	2.606		
417					Theta hat (MLE)	0.383			Theta star (bias corrected MLE)	0.436		
418					nu hat (MLE)	136.3			nu star (bias corrected)	119.9		
419					MLE Mean (bias corrected)	1.136			MLE Sd (bias corrected)	0.704		
420									Approximate Chi Square Value (0.05)	95.59		
421					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	94.02		
422												
423						Assuming Gamma Distribution						
424					95% Approximate Gamma UCL	1.425			95% Adjusted Gamma UCL	1.449		
425												
426						Lognormal GOF Test						
427					Shapiro Wilk Test Statistic	0.91			Shapiro Wilk Lognormal GOF Test			
428					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
429					Lilliefors Test Statistic	0.137			Lilliefors Lognormal GOF Test			
430					10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level			
431						Data appear Approximate Lognormal at 10% Significance Level						
432												
433						Lognormal Statistics						
434					Minimum of Logged Data	-2.207			Mean of logged Data	-0.0505		
435					Maximum of Logged Data	1.075			SD of logged Data	0.679		
436												
437						Assuming Lognormal Distribution						
438					95% H-UCL	1.633			90% Chebyshev (MVUE) UCL	1.72		
439					95% Chebyshev (MVUE) UCL	1.963			97.5% Chebyshev (MVUE) UCL	2.3		
440					99% Chebyshev (MVUE) UCL	2.963						

441												
442						**Nonparametric Distribution Free UCL Statistics**							
443						**Data appear to follow a Discernible Distribution**							
444												
445						**Nonparametric Distribution Free UCLs**							
446						95% CLT UCL	1.359				95% BCA Bootstrap UCL	1.397
447						95% Standard Bootstrap UCL	1.357				95% Bootstrap-t UCL	1.416
448						95% Hall's Bootstrap UCL	1.471				95% Percentile Bootstrap UCL	1.37
449						90% Chebyshev(Mean, Sd) UCL	1.543				95% Chebyshev(Mean, Sd) UCL	1.727
450						97.5% Chebyshev(Mean, Sd) UCL	1.983				99% Chebyshev(Mean, Sd) UCL	2.486
451												
452						**Suggested UCL to Use**							
453						95% Student's-t UCL	1.369					
454												
455						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
456						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
457						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
458												
459												
460	**ResultValue (apw-07)**											
461												
462						**General Statistics**							
463						Total Number of Observations	22				Number of Distinct Observations	19
464											Number of Missing Observations	0
465						Minimum	0.39				Mean	1.253
466						Maximum	2.7				Median	1.175
467						SD	0.574				Std. Error of Mean	0.122
468						Coefficient of Variation	0.458				Skewness	0.738
469												
470						**Normal GOF Test**							
471						Shapiro Wilk Test Statistic	0.958				**Shapiro Wilk GOF Test**	
472						1% Shapiro Wilk Critical Value	0.878				Data appear Normal at 1% Significance Level	
473						Lilliefors Test Statistic	0.129				**Lilliefors GOF Test**	
474						1% Lilliefors Critical Value	0.214				Data appear Normal at 1% Significance Level	
475						**Data appear Normal at 1% Significance Level**							
476												
477						**Assuming Normal Distribution**							
478						**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**	
479						95% Student's-t UCL	1.464				95% Adjusted-CLT UCL (Chen-1995)	1.475
480											95% Modified-t UCL (Johnson-1978)	1.467
481												
482						**Gamma GOF Test**							
483						A-D Test Statistic	0.138				**Anderson-Darling Gamma GOF Test**	
484						5% A-D Critical Value	0.746				Detected data appear Gamma Distributed at 5% Significance Level	
485						K-S Test Statistic	0.0851				**Kolmogorov-Smirnov Gamma GOF Test**	
486						5% K-S Critical Value	0.186				Detected data appear Gamma Distributed at 5% Significance Level	
487						**Detected data appear Gamma Distributed at 5% Significance Level**							
488												
489						**Gamma Statistics**							
490						k hat (MLE)	4.88				k star (bias corrected MLE)	4.245
491						Theta hat (MLE)	0.257				Theta star (bias corrected MLE)	0.295
492						nu hat (MLE)	214.7				nu star (bias corrected)	186.8
493						MLE Mean (bias corrected)	1.253				MLE Sd (bias corrected)	0.608
494											Approximate Chi Square Value (0.05)	156.2
495						Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	154.1

496												
497						**Assuming Gamma Distribution**							
498					95% Approximate Gamma UCL	1.499			95% Adjusted Gamma UCL	1.519		
499												
500						**Lognormal GOF Test**							
501					Shapiro Wilk Test Statistic	0.979			**Shapiro Wilk Lognormal GOF Test**			
502					10% Shapiro Wilk Critical Value	0.926			Data appear Lognormal at 10% Significance Level			
503					Lilliefors Test Statistic	0.116			**Lilliefors Lognormal GOF Test**			
504					10% Lilliefors Critical Value	0.169			Data appear Lognormal at 10% Significance Level			
505						**Data appear Lognormal at 10% Significance Level**							
506												
507						**Lognormal Statistics**							
508					Minimum of Logged Data	-0.942			Mean of logged Data	0.12		
509					Maximum of Logged Data	0.993			SD of logged Data	0.487		
510												
511						**Assuming Lognormal Distribution**							
512					95% H-UCL	1.567			90% Chebyshev (MVUE) UCL	1.669		
513					95% Chebyshev (MVUE) UCL	1.853			97.5% Chebyshev (MVUE) UCL	2.109		
514					99% Chebyshev (MVUE) UCL	2.613						
515												
516						**Nonparametric Distribution Free UCL Statistics**							
517						**Data appear to follow a Discernible Distribution**							
518												
519						**Nonparametric Distribution Free UCLs**							
520					95% CLT UCL	1.455			95% BCA Bootstrap UCL	1.486		
521					95% Standard Bootstrap UCL	1.456			95% Bootstrap-t UCL	1.513		
522					95% Hall's Bootstrap UCL	1.516			95% Percentile Bootstrap UCL	1.467		
523					90% Chebyshev(Mean, Sd) UCL	1.621			95% Chebyshev(Mean, Sd) UCL	1.787		
524					97.5% Chebyshev(Mean, Sd) UCL	2.018			99% Chebyshev(Mean, Sd) UCL	2.472		
525												
526						**Suggested UCL to Use**							
527					95% Student's-t UCL	1.464						
528												
529						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
530						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
531						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
532												
533												
534	**ResultValue (apw-08)**											
535												
536						**General Statistics**							
537					Total Number of Observations	23			Number of Distinct Observations	22		
538									Number of Missing Observations	0		
539					Minimum	0.247			Mean	1.061		
540					Maximum	2.39			Median	1.04		
541					SD	0.537			Std. Error of Mean	0.112		
542					Coefficient of Variation	0.506			Skewness	0.56		
543												
544						**Normal GOF Test**							
545					Shapiro Wilk Test Statistic	0.952			**Shapiro Wilk GOF Test**			
546					1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level			
547					Lilliefors Test Statistic	0.12			**Lilliefors GOF Test**			
548					1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level			
549						**Data appear Normal at 1% Significance Level**							
550												

551	**Assuming Normal Distribution**											
552	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
553				95% Student's-t UCL		1.253				95% Adjusted-CLT UCL (Chen-1995)		1.259
554										95% Modified-t UCL (Johnson-1978)		1.255
555												
556	**Gamma GOF Test**											
557				A-D Test Statistic		0.521	**Anderson-Darling Gamma GOF Test**					
558				5% A-D Critical Value		0.75	Detected data appear Gamma Distributed at 5% Significance Level					
559				K-S Test Statistic		0.138	**Kolmogorov-Smirnov Gamma GOF Test**					
560				5% K-S Critical Value		0.183	Detected data appear Gamma Distributed at 5% Significance Level					
561	**Detected data appear Gamma Distributed at 5% Significance Level**											
562												
563	**Gamma Statistics**											
564				k hat (MLE)		3.456				k star (bias corrected MLE)		3.034
565				Theta hat (MLE)		0.307				Theta star (bias corrected MLE)		0.35
566				nu hat (MLE)		159				nu star (bias corrected)		139.6
567				MLE Mean (bias corrected)		1.061				MLE Sd (bias corrected)		0.609
568										Approximate Chi Square Value (0.05)		113.3
569				Adjusted Level of Significance		0.0389				Adjusted Chi Square Value		111.6
570												
571	**Assuming Gamma Distribution**											
572				95% Approximate Gamma UCL		1.307				95% Adjusted Gamma UCL		1.327
573												
574	**Lognormal GOF Test**											
575				Shapiro Wilk Test Statistic		0.912	**Shapiro Wilk Lognormal GOF Test**					
576				10% Shapiro Wilk Critical Value		0.928	Data Not Lognormal at 10% Significance Level					
577				Lilliefors Test Statistic		0.169	**Lilliefors Lognormal GOF Test**					
578				10% Lilliefors Critical Value		0.165	Data Not Lognormal at 10% Significance Level					
579	**Data Not Lognormal at 10% Significance Level**											
580												
581	**Lognormal Statistics**											
582				Minimum of Logged Data		-1.398				Mean of logged Data		-0.0926
583				Maximum of Logged Data		0.871				SD of logged Data		0.612
584												
585	**Assuming Lognormal Distribution**											
586				95% H-UCL		1.441				90% Chebyshev (MVUE) UCL		1.529
587				95% Chebyshev (MVUE) UCL		1.729				97.5% Chebyshev (MVUE) UCL		2.006
588				99% Chebyshev (MVUE) UCL		2.55						
589												
590	**Nonparametric Distribution Free UCL Statistics**											
591	**Data appear to follow a Discernible Distribution**											
592												
593	**Nonparametric Distribution Free UCLs**											
594				95% CLT UCL		1.245				95% BCA Bootstrap UCL		1.263
595				95% Standard Bootstrap UCL		1.24				95% Bootstrap-t UCL		1.271
596				95% Hall's Bootstrap UCL		1.29				95% Percentile Bootstrap UCL		1.24
597				90% Chebyshev(Mean, Sd) UCL		1.397				95% Chebyshev(Mean, Sd) UCL		1.549
598				97.5% Chebyshev(Mean, Sd) UCL		1.76				99% Chebyshev(Mean, Sd) UCL		2.175
599												
600	**Suggested UCL to Use**											
601				95% Student's-t UCL		1.253						
602												
603	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
604	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
605	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
606												
607												
608	**ResultValue (apw-10d)**											
609												
610						**General Statistics**						
611					Total Number of Observations	23			Number of Distinct Observations	21		
612									Number of Missing Observations	0		
613					Minimum	0.163			Mean	1.076		
614					Maximum	2.21			Median	1.03		
615					SD	0.503			Std. Error of Mean	0.105		
616					Coefficient of Variation	0.468			Skewness	0.298		
617												
618						**Normal GOF Test**						
619					Shapiro Wilk Test Statistic	0.974			**Shapiro Wilk GOF Test**			
620					1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level			
621					Lilliefors Test Statistic	0.113			**Lilliefors GOF Test**			
622					1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level			
623						**Data appear Normal at 1% Significance Level**						
624												
625						**Assuming Normal Distribution**						
626					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
627					95% Student's-t UCL	1.256			95% Adjusted-CLT UCL (Chen-1995)	1.255		
628									95% Modified-t UCL (Johnson-1978)	1.257		
629												
630						**Gamma GOF Test**						
631					A-D Test Statistic	0.317			**Anderson-Darling Gamma GOF Test**			
632					5% A-D Critical Value	0.749			Detected data appear Gamma Distributed at 5% Significance Level			
633					K-S Test Statistic	0.127			**Kolmogorov-Smirnov Gamma GOF Test**			
634					5% K-S Critical Value	0.182			Detected data appear Gamma Distributed at 5% Significance Level			
635						**Detected data appear Gamma Distributed at 5% Significance Level**						
636												
637						**Gamma Statistics**						
638					k hat (MLE)	3.906			k star (bias corrected MLE)	3.426		
639					Theta hat (MLE)	0.275			Theta star (bias corrected MLE)	0.314		
640					nu hat (MLE)	179.7			nu star (bias corrected)	157.6		
641					MLE Mean (bias corrected)	1.076			MLE Sd (bias corrected)	0.581		
642									Approximate Chi Square Value (0.05)	129.6		
643					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	127.7		
644												
645						**Assuming Gamma Distribution**						
646					95% Approximate Gamma UCL	1.309			95% Adjusted Gamma UCL	1.328		
647												
648						**Lognormal GOF Test**						
649					Shapiro Wilk Test Statistic	0.914			**Shapiro Wilk Lognormal GOF Test**			
650					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
651					Lilliefors Test Statistic	0.12			**Lilliefors Lognormal GOF Test**			
652					10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level			
653						**Data appear Approximate Lognormal at 10% Significance Level**						
654												
655						**Lognormal Statistics**						
656					Minimum of Logged Data	-1.814			Mean of logged Data	-0.0602		
657					Maximum of Logged Data	0.793			SD of logged Data	0.583		
658												
659						**Assuming Lognormal Distribution**						
660					95% H-UCL	1.439			90% Chebyshev (MVUE) UCL	1.531		

661				95% Chebyshev (MVUE) UCL	1.723					97.5% Chebyshev (MVUE) UCL	1.99	
662				99% Chebyshev (MVUE) UCL	2.514							
663												
664					**Nonparametric Distribution Free UCL Statistics**							
665					**Data appear to follow a Discernible Distribution**							
666												
667					**Nonparametric Distribution Free UCLs**							
668				95% CLT UCL	1.249					95% BCA Bootstrap UCL	1.259	
669				95% Standard Bootstrap UCL	1.244					95% Bootstrap-t UCL	1.265	
670				95% Hall's Bootstrap UCL	1.26					95% Percentile Bootstrap UCL	1.246	
671				90% Chebyshev(Mean, Sd) UCL	1.391					95% Chebyshev(Mean, Sd) UCL	1.533	
672				97.5% Chebyshev(Mean, Sd) UCL	1.731					99% Chebyshev(Mean, Sd) UCL	2.12	
673												
674					**Suggested UCL to Use**							
675				95% Student's-t UCL	1.256							
676												
677					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
678					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
679					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
680												
681												
682	**ResultValue (apw-10s)**											
683												
684					**General Statistics**							
685				Total Number of Observations	23					Number of Distinct Observations	21	
686										Number of Missing Observations	0	
687				Minimum	0.37					Mean	1.575	
688				Maximum	4.83					Median	1.24	
689				SD	1.029					Std. Error of Mean	0.214	
690				Coefficient of Variation	0.653					Skewness	1.588	
691												
692					**Normal GOF Test**							
693				Shapiro Wilk Test Statistic	0.863					**Shapiro Wilk GOF Test**		
694				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
695				Lilliefors Test Statistic	0.225					**Lilliefors GOF Test**		
696				1% Lilliefors Critical Value	0.209					Data Not Normal at 1% Significance Level		
697					**Data Not Normal at 1% Significance Level**							
698												
699					**Assuming Normal Distribution**							
700					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
701				95% Student's-t UCL	1.944					95% Adjusted-CLT UCL (Chen-1995)	2.004	
702										95% Modified-t UCL (Johnson-1978)	1.955	
703												
704					**Gamma GOF Test**							
705				A-D Test Statistic	0.308					**Anderson-Darling Gamma GOF Test**		
706				5% A-D Critical Value	0.751					Detected data appear Gamma Distributed at 5% Significance Level		
707				K-S Test Statistic	0.169					**Kolmogorov-Smirnov Gamma GOF Test**		
708				5% K-S Critical Value	0.183					Detected data appear Gamma Distributed at 5% Significance Level		
709					**Detected data appear Gamma Distributed at 5% Significance Level**							
710												
711					**Gamma Statistics**							
712				k hat (MLE)	2.875					k star (bias corrected MLE)	2.529	
713				Theta hat (MLE)	0.548					Theta star (bias corrected MLE)	0.623	
714				nu hat (MLE)	132.3					nu star (bias corrected)	116.3	
715				MLE Mean (bias corrected)	1.575					MLE Sd (bias corrected)	0.991	

716											Approximate Chi Square Value (0.05)	92.44
717					Adjusted Level of Significance	0.0389					Adjusted Chi Square Value	90.89
718												
719					**Assuming Gamma Distribution**							
720					95% Approximate Gamma UCL	1.983					95% Adjusted Gamma UCL	2.016
721												
722					**Lognormal GOF Test**							
723					Shapiro Wilk Test Statistic	0.986			**Shapiro Wilk Lognormal GOF Test**			
724					10% Shapiro Wilk Critical Value	0.928			Data appear Lognormal at 10% Significance Level			
725					Lilliefors Test Statistic	0.129			**Lilliefors Lognormal GOF Test**			
726					10% Lilliefors Critical Value	0.165			Data appear Lognormal at 10% Significance Level			
727					**Data appear Lognormal at 10% Significance Level**							
728												
729					**Lognormal Statistics**							
730					Minimum of Logged Data	-0.994					Mean of logged Data	0.271
731					Maximum of Logged Data	1.575					SD of logged Data	0.623
732												
733					**Assuming Lognormal Distribution**							
734					95% H-UCL	2.101					90% Chebyshev (MVUE) UCL	2.227
735					95% Chebyshev (MVUE) UCL	2.522					97.5% Chebyshev (MVUE) UCL	2.931
736					99% Chebyshev (MVUE) UCL	3.735						
737												
738					**Nonparametric Distribution Free UCL Statistics**							
739					**Data appear to follow a Discernible Distribution**							
740												
741					**Nonparametric Distribution Free UCLs**							
742					95% CLT UCL	1.928					95% BCA Bootstrap UCL	2.014
743					95% Standard Bootstrap UCL	1.917					95% Bootstrap-t UCL	2.033
744					95% Hall's Bootstrap UCL	2.117					95% Percentile Bootstrap UCL	1.939
745					90% Chebyshev(Mean, Sd) UCL	2.219					95% Chebyshev(Mean, Sd) UCL	2.51
746					97.5% Chebyshev(Mean, Sd) UCL	2.915					99% Chebyshev(Mean, Sd) UCL	3.709
747												
748					**Suggested UCL to Use**							
749					95% Adjusted Gamma UCL	2.016						
750												
751	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
752	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
753	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
754												

1	**UCL Statistics for Uncensored Full Data Sets**	
2		
3	User Selected Options	Selenium
4	Date/Time of Computation	ProUCL 5.2 2/27/2026 1:24:26 PM
5	From File	ProUCL_Input_UpgradientDowngradient_Split.xls
6	Full Precision	OFF
7	Confidence Coefficient	95%
8	Number of Bootstrap Operations	2000
9		
10		
11	**ResultValue (apw-02)**	
12		
13	**General Statistics**	

14	Total Number of Observations	23	Number of Distinct Observations 4
15			Number of Missing Observations 0
16	Minimum	0.001	Mean 0.00215
17	Maximum	0.02	Median 0.001
18	SD	0.00392	Std. Error of Mean 8.1696E-4
19	Coefficient of Variation	1.82	Skewness 4.688
20			
21	**Normal GOF Test**		
22	Shapiro Wilk Test Statistic	0.295	**Shapiro Wilk GOF Test**
23	1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level
24	Lilliefors Test Statistic	0.472	**Lilliefors GOF Test**
25	1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level
26	**Data Not Normal at 1% Significance Level**		
27			
28	**Assuming Normal Distribution**		
29	**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**
30	95% Student's-t UCL	0.00356	95% Adjusted-CLT UCL (Chen-1995) 0.00435
31			95% Modified-t UCL (Johnson-1978) 0.00369
32			
33	**Gamma GOF Test**		
34	A-D Test Statistic	4.647	**Anderson-Darling Gamma GOF Test**
35	5% A-D Critical Value	0.763	Data Not Gamma Distributed at 5% Significance Level
36	K-S Test Statistic	0.375	**Kolmogorov-Smirnov Gamma GOF Test**
37	5% K-S Critical Value	0.185	Data Not Gamma Distributed at 5% Significance Level
38	**Data Not Gamma Distributed at 5% Significance Level**		
39			
40	**Gamma Statistics**		
41	k hat (MLE)	1.369	k star (bias corrected MLE) 1.22
42	Theta hat (MLE)	0.00157	Theta star (bias corrected MLE) 0.00176
43	nu hat (MLE)	62.99	nu star (bias corrected) 56.1
44	MLE Mean (bias corrected)	0.00215	MLE Sd (bias corrected) 0.00195
45			Approximate Chi Square Value (0.05) 39.89
46	Adjusted Level of Significance	0.0389	Adjusted Chi Square Value 38.9
47			
48	**Assuming Gamma Distribution**		
49	95% Approximate Gamma UCL	0.00303	95% Adjusted Gamma UCL 0.0031
50			
51	**Lognormal GOF Test**		
52	Shapiro Wilk Test Statistic	0.558	**Shapiro Wilk Lognormal GOF Test**
53	10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
54	Lilliefors Test Statistic	0.316	**Lilliefors Lognormal GOF Test**
55	10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

56	**Data Not Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	-6.908			Mean of logged Data	-6.549	
60						Maximum of Logged Data	-3.912			SD of logged Data	0.659	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	0.0024			90% Chebyshev (MVUE) UCL	0.00253	
64						95% Chebyshev (MVUE) UCL	0.00288			97.5% Chebyshev (MVUE) UCL	0.00336	
65						99% Chebyshev (MVUE) UCL	0.00432					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	0.0035			95% BCA Bootstrap UCL	N/A	
72						95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A	
73						95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A	
74						90% Chebyshev(Mean, Sd) UCL	0.0046			95% Chebyshev(Mean, Sd) UCL	0.00571	
75						97.5% Chebyshev(Mean, Sd) UCL	0.00725			99% Chebyshev(Mean, Sd) UCL	0.0103	
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	0.00356					
79												
80	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
81	**Please verify the data were collected from random locations.**											
82	**If the data were collected using judgmental or other non-random methods,**											
83	**then contact a statistician to correctly calculate UCLs.**											
84												
85	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
86	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
88												
89												
90	**ResultValue (apw-03)**											
91												
92	**General Statistics**											
93						Total Number of Observations	23			Number of Distinct Observations	4	
94										Number of Missing Observations	0	
95						Minimum	0.001			Mean	0.00139	
96						Maximum	0.002			Median	0.001	
97						SD	4.9074E-4			Std. Error of Mean	1.0233E-4	
98						Coefficient of Variation	0.353			Skewness	0.477	
99												
100	**Normal GOF Test**											
101						Shapiro Wilk Test Statistic	0.643			**Shapiro Wilk GOF Test**		
102						1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level		
103						Lilliefors Test Statistic	0.353			**Lilliefors GOF Test**		
104						1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level		
105	**Data Not Normal at 1% Significance Level**											
106												
107	**Assuming Normal Distribution**											
108						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
109						95% Student's-t UCL	0.00157			95% Adjusted-CLT UCL (Chen-1995)	0.00157	
110										95% Modified-t UCL (Johnson-1978)	0.00157	

111												
112	**Gamma GOF Test**											
113					A-D Test Statistic	4.062	**Anderson-Darling Gamma GOF Test**					
114					5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level					
115					K-S Test Statistic	0.359	**Kolmogorov-Smirnov Gamma GOF Test**					
116					5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level					
117	**Data Not Gamma Distributed at 5% Significance Level**											
118												
119	**Gamma Statistics**											
120					k hat (MLE)	8.921	k star (bias corrected MLE)	7.786				
121					Theta hat (MLE)	1.5597E-4	Theta star (bias corrected MLE)	1.7869E-4				
122					nu hat (MLE)	410.3	nu star (bias corrected)	358.2				
123					MLE Mean (bias corrected)	0.00139	MLE Sd (bias corrected)	4.9862E-4				
124							Approximate Chi Square Value (0.05)	315.3				
125					Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	312.4				
126												
127	**Assuming Gamma Distribution**											
128					95% Approximate Gamma UCL	0.00158	95% Adjusted Gamma UCL	0.0016				
129												
130	**Lognormal GOF Test**											
131					Shapiro Wilk Test Statistic	0.644	**Shapiro Wilk Lognormal GOF Test**					
132					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
133					Lilliefors Test Statistic	0.354	**Lilliefors Lognormal GOF Test**					
134					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
135	**Data Not Lognormal at 10% Significance Level**											
136												
137	**Lognormal Statistics**											
138					Minimum of Logged Data	-6.908	Mean of logged Data	-6.635				
139					Maximum of Logged Data	-6.215	SD of logged Data	0.34				
140												
141	**Assuming Lognormal Distribution**											
142					95% H-UCL	0.00159	90% Chebyshev (MVUE) UCL	0.00169				
143					95% Chebyshev (MVUE) UCL	0.00183	97.5% Chebyshev (MVUE) UCL	0.00202				
144					99% Chebyshev (MVUE) UCL	0.00239						
145												
146	**Nonparametric Distribution Free UCL Statistics**											
147	**Data do not follow a Discernible Distribution**											
148												
149	**Nonparametric Distribution Free UCLs**											
150					95% CLT UCL	0.00156	95% BCA Bootstrap UCL	N/A				
151					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				
152					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A				
153					90% Chebyshev(Mean, Sd) UCL	0.0017	95% Chebyshev(Mean, Sd) UCL	0.00184				
154					97.5% Chebyshev(Mean, Sd) UCL	0.00203	99% Chebyshev(Mean, Sd) UCL	0.00241				
155												
156	**Suggested UCL to Use**											
157					95% Student's-t UCL	0.00157						
158												
159	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
160	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
161	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
162												
163												
164	**ResultValue (apw-05)**											
165												

166					**General Statistics**							
167				Total Number of Observations	12				Number of Distinct Observations	1		
168									Number of Missing Observations	0		
169				Minimum	0.001				Mean	0.001		
170				Maximum	0.001				Median	0.001		
171												
172					**Warning: There is only one distinct observation value in this data set - resulting in '0' variance!**							
173					**ProUCL (or any other software) should not be used on such a data set!**							
174					**The data set for variable ResultValue (apw-05) was not processed!**							
175												
176					**If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.**							
177					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
178												
179												
180												
181	**ResultValue (apw-05r)**											
182												
183					**General Statistics**							
184				Total Number of Observations	11				Number of Distinct Observations	2		
185									Number of Missing Observations	0		
186				Minimum	0.001				Mean	0.00173		
187				Maximum	0.002				Median	0.002		
188				SD	4.6710E-4				Std. Error of Mean	1.4084E-4		
189				Coefficient of Variation	0.27				Skewness	-1.189		
190												
191					**Normal GOF Test**							
192				Shapiro Wilk Test Statistic	0.572				**Shapiro Wilk GOF Test**			
193				1% Shapiro Wilk Critical Value	0.792				Data Not Normal at 1% Significance Level			
194				Lilliefors Test Statistic	0.448				**Lilliefors GOF Test**			
195				1% Lilliefors Critical Value	0.291				Data Not Normal at 1% Significance Level			
196					**Data Not Normal at 1% Significance Level**							
197												
198					**Assuming Normal Distribution**							
199					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
200				95% Student's-t UCL	0.00198				95% Adjusted-CLT UCL (Chen-1995)	0.0019		
201									95% Modified-t UCL (Johnson-1978)	0.00197		
202												
203					**Gamma GOF Test**							
204				A-D Test Statistic	2.529				**Anderson-Darling Gamma GOF Test**			
205				5% A-D Critical Value	0.729				Data Not Gamma Distributed at 5% Significance Level			
206				K-S Test Statistic	0.458				**Kolmogorov-Smirnov Gamma GOF Test**			
207				5% K-S Critical Value	0.255				Data Not Gamma Distributed at 5% Significance Level			
208					**Data Not Gamma Distributed at 5% Significance Level**							
209												
210					**Gamma Statistics**							
211				k hat (MLE)	11.95				k star (bias corrected MLE)	8.749		
212				Theta hat (MLE)	1.4458E-4				Theta star (bias corrected MLE)	1.9743E-4		
213				nu hat (MLE)	262.8				nu star (bias corrected)	192.5		
214				MLE Mean (bias corrected)	0.00173				MLE Sd (bias corrected)	5.8396E-4		
215									Approximate Chi Square Value (0.05)	161.4		
216				Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	156.7		
217												
218					**Assuming Gamma Distribution**							
219				95% Approximate Gamma UCL	0.00206				95% Adjusted Gamma UCL	0.00212		
220												

221	**Lognormal GOF Test**											
222					Shapiro Wilk Test Statistic	0.572	**Shapiro Wilk Lognormal GOF Test**					
223					10% Shapiro Wilk Critical Value	0.876	Data Not Lognormal at 10% Significance Level					
224					Lilliefors Test Statistic	0.448	**Lilliefors Lognormal GOF Test**					
225					10% Lilliefors Critical Value	0.231	Data Not Lognormal at 10% Significance Level					
226	**Data Not Lognormal at 10% Significance Level**											
227												
228	**Lognormal Statistics**											
229					Minimum of Logged Data	-6.908				Mean of logged Data	-6.404	
230					Maximum of Logged Data	-6.215				SD of logged Data	0.324	
231												
232	**Assuming Lognormal Distribution**											
233					95% H-UCL	0.00214				90% Chebyshev (MVUE) UCL	0.00225	
234					95% Chebyshev (MVUE) UCL	0.00248				97.5% Chebyshev (MVUE) UCL	0.0028	
235					99% Chebyshev (MVUE) UCL	0.00344						
236												
237	**Nonparametric Distribution Free UCL Statistics**											
238	**Data do not follow a Discernible Distribution**											
239												
240	**Nonparametric Distribution Free UCLs**											
241					95% CLT UCL	0.00196				95% BCA Bootstrap UCL	N/A	
242					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL	N/A	
243					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A	
244					90% Chebyshev(Mean, Sd) UCL	0.00215				95% Chebyshev(Mean, Sd) UCL	0.00234	
245					97.5% Chebyshev(Mean, Sd) UCL	0.00261				99% Chebyshev(Mean, Sd) UCL	0.00313	
246												
247	**Suggested UCL to Use**											
248					95% Student's-t UCL	0.00198						
249												
250	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
251	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
252	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
253												
254	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
255	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
256												
257												
258	**ResultValue (apw-06d)**											
259												
260	**General Statistics**											
261					Total Number of Observations	22				Number of Distinct Observations	2	
262										Number of Missing Observations	0	
263					Minimum	0.001				Mean	0.00136	
264					Maximum	0.002				Median	0.001	
265					SD	4.9237E-4				Std. Error of Mean	1.0497E-4	
266					Coefficient of Variation	0.361				Skewness	0.609	
267												
268	**Normal GOF Test**											
269					Shapiro Wilk Test Statistic	0.614	**Shapiro Wilk GOF Test**					
270					1% Shapiro Wilk Critical Value	0.878	Data Not Normal at 1% Significance Level					
271					Lilliefors Test Statistic	0.406	**Lilliefors GOF Test**					
272					1% Lilliefors Critical Value	0.214	Data Not Normal at 1% Significance Level					
273	**Data Not Normal at 1% Significance Level**											
274												
275	**Assuming Normal Distribution**											

276	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
277				95% Student's-t UCL	0.00154				95% Adjusted-CLT UCL (Chen-1995)	0.00155		
278									95% Modified-t UCL (Johnson-1978)	0.00155		
279												
280	**Gamma GOF Test**											
281				A-D Test Statistic	4.348		**Anderson-Darling Gamma GOF Test**					
282				5% A-D Critical Value	0.744		Data Not Gamma Distributed at 5% Significance Level					
283				K-S Test Statistic	0.412		**Kolmogorov-Smirnov Gamma GOF Test**					
284				5% K-S Critical Value	0.185		Data Not Gamma Distributed at 5% Significance Level					
285	**Data Not Gamma Distributed at 5% Significance Level**											
286												
287	**Gamma Statistics**											
288				k hat (MLE)	8.769				k star (bias corrected MLE)	7.604		
289				Theta hat (MLE)	1.5551E-4				Theta star (bias corrected MLE)	1.7934E-4		
290				nu hat (MLE)	385.8				nu star (bias corrected)	334.6		
291				MLE Mean (bias corrected)	0.00136				MLE Sd (bias corrected)	4.9453E-4		
292									Approximate Chi Square Value (0.05)	293.2		
293				Adjusted Level of Significance	0.0386				Adjusted Chi Square Value	290.3		
294												
295	**Assuming Gamma Distribution**											
296				95% Approximate Gamma UCL	0.00156				95% Adjusted Gamma UCL	0.00157		
297												
298	**Lognormal GOF Test**											
299				Shapiro Wilk Test Statistic	0.614		**Shapiro Wilk Lognormal GOF Test**					
300				10% Shapiro Wilk Critical Value	0.926		Data Not Lognormal at 10% Significance Level					
301				Lilliefors Test Statistic	0.406		**Lilliefors Lognormal GOF Test**					
302				10% Lilliefors Critical Value	0.169		Data Not Lognormal at 10% Significance Level					
303	**Data Not Lognormal at 10% Significance Level**											
304												
305	**Lognormal Statistics**											
306				Minimum of Logged Data	-6.908				Mean of logged Data	-6.656		
307				Maximum of Logged Data	-6.215				SD of logged Data	0.341		
308												
309	**Assuming Lognormal Distribution**											
310				95% H-UCL	0.00157				90% Chebyshev (MVUE) UCL	0.00166		
311				95% Chebyshev (MVUE) UCL	0.0018				97.5% Chebyshev (MVUE) UCL	0.00199		
312				99% Chebyshev (MVUE) UCL	0.00236							
313												
314	**Nonparametric Distribution Free UCL Statistics**											
315	**Data do not follow a Discernible Distribution**											
316												
317	**Nonparametric Distribution Free UCLs**											
318				95% CLT UCL	0.00154				95% BCA Bootstrap UCL	N/A		
319				95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL	N/A		
320				95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL	N/A		
321				90% Chebyshev(Mean, Sd) UCL	0.00168				95% Chebyshev(Mean, Sd) UCL	0.00182		
322				97.5% Chebyshev(Mean, Sd) UCL	0.00202				99% Chebyshev(Mean, Sd) UCL	0.00241		
323												
324	**Suggested UCL to Use**											
325				95% Student's-t UCL	0.00154							
326												
327	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
328	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
329	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
330												

331												
332	**ResultValue (apw-06s)**											
333												
334						**General Statistics**							
335					Total Number of Observations	23			Number of Distinct Observations	2		
336									Number of Missing Observations	0		
337					Minimum	0.001			Mean	0.00135		
338					Maximum	0.002			Median	0.001		
339					SD	4.8698E-4			Std. Error of Mean	1.0154E-4		
340					Coefficient of Variation	0.361			Skewness	0.684		
341												
342						**Normal GOF Test**						
343					Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk GOF Test**			
344					1% Shapiro Wilk Critical Value	0.881			Data Not Normal at 1% Significance Level			
345					Lilliefors Test Statistic	0.415			**Lilliefors GOF Test**			
346					1% Lilliefors Critical Value	0.209			Data Not Normal at 1% Significance Level			
347						**Data Not Normal at 1% Significance Level**						
348												
349						**Assuming Normal Distribution**						
350					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
351					95% Student's-t UCL	0.00152			95% Adjusted-CLT UCL (Chen-1995)	0.00153		
352									95% Modified-t UCL (Johnson-1978)	0.00152		
353												
354						**Gamma GOF Test**						
355					A-D Test Statistic	4.647			**Anderson-Darling Gamma GOF Test**			
356					5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level			
357					K-S Test Statistic	0.42			**Kolmogorov-Smirnov Gamma GOF Test**			
358					5% K-S Critical Value	0.182			Data Not Gamma Distributed at 5% Significance Level			
359						**Data Not Gamma Distributed at 5% Significance Level**						
360												
361						**Gamma Statistics**						
362					k hat (MLE)	8.874			k star (bias corrected MLE)	7.746		
363					Theta hat (MLE)	1.5188E-4			Theta star (bias corrected MLE)	1.7401E-4		
364					nu hat (MLE)	408.2			nu star (bias corrected)	356.3		
365					MLE Mean (bias corrected)	0.00135			MLE Sd (bias corrected)	4.8428E-4		
366									Approximate Chi Square Value (0.05)	313.6		
367					Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	310.7		
368												
369						**Assuming Gamma Distribution**							
370					95% Approximate Gamma UCL	0.00153			95% Adjusted Gamma UCL	0.00155		
371												
372						**Lognormal GOF Test**						
373					Shapiro Wilk Test Statistic	0.606			**Shapiro Wilk Lognormal GOF Test**			
374					10% Shapiro Wilk Critical Value	0.928			Data Not Lognormal at 10% Significance Level			
375					Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**			
376					10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level			
377						**Data Not Lognormal at 10% Significance Level**							
378												
379						**Lognormal Statistics**							
380					Minimum of Logged Data	-6.908			Mean of logged Data	-6.667		
381					Maximum of Logged Data	-6.215			SD of logged Data	0.338		
382												
383						**Assuming Lognormal Distribution**							
384					95% H-UCL	0.00154			90% Chebyshev (MVUE) UCL	0.00163		
385					95% Chebyshev (MVUE) UCL	0.00176			97.5% Chebyshev (MVUE) UCL	0.00195		

386				99% Chebyshev (MVUE) UCL	0.0023							
387												
388						**Nonparametric Distribution Free UCL Statistics**							
389						**Data do not follow a Discernible Distribution**							
390												
391						**Nonparametric Distribution Free UCLs**							
392				95% CLT UCL	0.00151			95% BCA Bootstrap UCL	N/A			
393				95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A			
394				95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A			
395				90% Chebyshev(Mean, Sd) UCL	0.00165			95% Chebyshev(Mean, Sd) UCL	0.00179			
396				97.5% Chebyshev(Mean, Sd) UCL	0.00198			99% Chebyshev(Mean, Sd) UCL	0.00236			
397												
398						**Suggested UCL to Use**							
399				95% Student's-t UCL	0.00152							
400												
401						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
402						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
403						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
404												
405												
406	**ResultValue (apw-07)**											
407												
408						**General Statistics**							
409				Total Number of Observations	22			Number of Distinct Observations	2			
410								Number of Missing Observations	0			
411				Minimum	0.001			Mean	0.00132			
412				Maximum	0.002			Median	0.001			
413				SD	4.7673E-4			Std. Error of Mean	1.0164E-4			
414				Coefficient of Variation	0.362			Skewness	0.839			
415												
416						**Normal GOF Test**							
417				Shapiro Wilk Test Statistic	0.592			**Shapiro Wilk GOF Test**				
418				1% Shapiro Wilk Critical Value	0.878			Data Not Normal at 1% Significance Level				
419				Lilliefors Test Statistic	0.43			**Lilliefors GOF Test**				
420				1% Lilliefors Critical Value	0.214			Data Not Normal at 1% Significance Level				
421						**Data Not Normal at 1% Significance Level**							
422												
423						**Assuming Normal Distribution**							
424				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
425				95% Student's-t UCL	0.00149			95% Adjusted-CLT UCL (Chen-1995)	0.0015			
426								95% Modified-t UCL (Johnson-1978)	0.0015			
427												
428						**Gamma GOF Test**							
429				A-D Test Statistic	4.657			**Anderson-Darling Gamma GOF Test**				
430				5% A-D Critical Value	0.744			Data Not Gamma Distributed at 5% Significance Level				
431				K-S Test Statistic	0.435			**Kolmogorov-Smirnov Gamma GOF Test**				
432				5% K-S Critical Value	0.185			Data Not Gamma Distributed at 5% Significance Level				
433						**Data Not Gamma Distributed at 5% Significance Level**							
434												
435						**Gamma Statistics**							
436				k hat (MLE)	9.139			k star (bias corrected MLE)	7.923			
437				Theta hat (MLE)	1.4424E-4			Theta star (bias corrected MLE)	1.6637E-4			
438				nu hat (MLE)	402.1			nu star (bias corrected)	348.6			
439				MLE Mean (bias corrected)	0.00132			MLE Sd (bias corrected)	4.6830E-4			
440								Approximate Chi Square Value (0.05)	306.4			

441					Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	303.4
442												
443						**Assuming Gamma Distribution**							
444					95% Approximate Gamma UCL	0.0015					95% Adjusted Gamma UCL	0.00151
445												
446						**Lognormal GOF Test**							
447					Shapiro Wilk Test Statistic	0.592			**Shapiro Wilk Lognormal GOF Test**			
448					10% Shapiro Wilk Critical Value	0.926			Data Not Lognormal at 10% Significance Level			
449					Lilliefors Test Statistic	0.43			**Lilliefors Lognormal GOF Test**			
450					10% Lilliefors Critical Value	0.169			Data Not Lognormal at 10% Significance Level			
451						**Data Not Lognormal at 10% Significance Level**							
452												
453						**Lognormal Statistics**							
454					Minimum of Logged Data	-6.908					Mean of logged Data	-6.687
455					Maximum of Logged Data	-6.215					SD of logged Data	0.33
456												
457						**Assuming Lognormal Distribution**							
458					95% H-UCL	0.00151					90% Chebyshev (MVUE) UCL	0.0016
459					95% Chebyshev (MVUE) UCL	0.00172					97.5% Chebyshev (MVUE) UCL	0.0019
460					99% Chebyshev (MVUE) UCL	0.00225						
461												
462						**Nonparametric Distribution Free UCL Statistics**							
463						**Data do not follow a Discernible Distribution**							
464												
465						**Nonparametric Distribution Free UCLs**							
466					95% CLT UCL	0.00149					95% BCA Bootstrap UCL	N/A
467					95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A
468					95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A
469					90% Chebyshev(Mean, Sd) UCL	0.00162					95% Chebyshev(Mean, Sd) UCL	0.00176
470					97.5% Chebyshev(Mean, Sd) UCL	0.00195					99% Chebyshev(Mean, Sd) UCL	0.00233
471												
472						**Suggested UCL to Use**							
473					95% Student's-t UCL	0.00149						
474												
475						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
476						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
477						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
478												
479												
480	**ResultValue (apw-08)**											
481												
482						**General Statistics**							
483					Total Number of Observations	23					Number of Distinct Observations	21
484											Number of Missing Observations	0
485					Minimum	0.0036					Mean	0.0139
486					Maximum	0.0221					Median	0.0141
487					SD	0.00452					Std. Error of Mean	9.4196E-4
488					Coefficient of Variation	0.326					Skewness	-0.591
489												
490						**Normal GOF Test**							
491					Shapiro Wilk Test Statistic	0.958			**Shapiro Wilk GOF Test**			
492					1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level			
493					Lilliefors Test Statistic	0.155			**Lilliefors GOF Test**			
494					1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level			
495						**Data appear Normal at 1% Significance Level**							

496												
497	**Assuming Normal Distribution**											
498	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
499			95% Student's-t UCL		0.0155			95% Adjusted-CLT UCL (Chen-1995)				0.0153
500								95% Modified-t UCL (Johnson-1978)				0.0155
501												
502	**Gamma GOF Test**											
503			A-D Test Statistic		1.006		**Anderson-Darling Gamma GOF Test**					
504			5% A-D Critical Value		0.745		Data Not Gamma Distributed at 5% Significance Level					
505			K-S Test Statistic		0.213		**Kolmogorov-Smirnov Gamma GOF Test**					
506			5% K-S Critical Value		0.182		Data Not Gamma Distributed at 5% Significance Level					
507	**Data Not Gamma Distributed at 5% Significance Level**											
508												
509	**Gamma Statistics**											
510			k hat (MLE)		7.17			k star (bias corrected MLE)				6.264
511			Theta hat (MLE)		0.00193			Theta star (bias corrected MLE)				0.00221
512			nu hat (MLE)		329.8			nu star (bias corrected)				288.1
513			MLE Mean (bias corrected)		0.0139			MLE Sd (bias corrected)				0.00554
514								Approximate Chi Square Value (0.05)				249.8
515			Adjusted Level of Significance		0.0389			Adjusted Chi Square Value				247.2
516												
517	**Assuming Gamma Distribution**											
518			95% Approximate Gamma UCL		0.016			95% Adjusted Gamma UCL				0.0162
519												
520	**Lognormal GOF Test**											
521			Shapiro Wilk Test Statistic		0.835		**Shapiro Wilk Lognormal GOF Test**					
522			10% Shapiro Wilk Critical Value		0.928		Data Not Lognormal at 10% Significance Level					
523			Lilliefors Test Statistic		0.238		**Lilliefors Lognormal GOF Test**					
524			10% Lilliefors Critical Value		0.165		Data Not Lognormal at 10% Significance Level					
525	**Data Not Lognormal at 10% Significance Level**											
526												
527	**Lognormal Statistics**											
528			Minimum of Logged Data		-5.627			Mean of logged Data				-4.35
529			Maximum of Logged Data		-3.812			SD of logged Data				0.428
530												
531	**Assuming Lognormal Distribution**											
532			95% H-UCL		0.0169			90% Chebyshev (MVUE) UCL				0.018
533			95% Chebyshev (MVUE) UCL		0.0197			97.5% Chebyshev (MVUE) UCL				0.0222
534			99% Chebyshev (MVUE) UCL		0.027							
535												
536	**Nonparametric Distribution Free UCL Statistics**											
537	**Data appear to follow a Discernible Distribution**											
538												
539	**Nonparametric Distribution Free UCLs**											
540			95% CLT UCL		0.0154			95% BCA Bootstrap UCL				0.0153
541			95% Standard Bootstrap UCL		0.0154			95% Bootstrap-t UCL				0.0154
542			95% Hall's Bootstrap UCL		0.0153			95% Percentile Bootstrap UCL				0.0154
543			90% Chebyshev(Mean, Sd) UCL		0.0167			95% Chebyshev(Mean, Sd) UCL				0.018
544			97.5% Chebyshev(Mean, Sd) UCL		0.0197			99% Chebyshev(Mean, Sd) UCL				0.0232
545												
546	**Suggested UCL to Use**											
547			95% Student's-t UCL		0.0155							
548												
549	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
550	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

551	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
552												
553	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
554	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
555												
556												
557	**ResultValue (apw-10d)**											
558												
559	**General Statistics**											
560						Total Number of Observations	23			Number of Distinct Observations	12	
561										Number of Missing Observations	0	
562						Minimum	0.001			Mean	0.00178	
563						Maximum	0.0033			Median	0.0016	
564						SD	6.2790E-4			Std. Error of Mean	1.3093E-4	
565						Coefficient of Variation	0.354			Skewness	0.717	
566												
567	**Normal GOF Test**											
568						Shapiro Wilk Test Statistic	0.918			**Shapiro Wilk GOF Test**		
569						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
570						Lilliefors Test Statistic	0.143			**Lilliefors GOF Test**		
571						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
572	**Data appear Normal at 1% Significance Level**											
573												
574	**Assuming Normal Distribution**											
575						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
576						95% Student's-t UCL	0.002			95% Adjusted-CLT UCL (Chen-1995)	0.00201	
577										95% Modified-t UCL (Johnson-1978)	0.002	
578												
579	**Gamma GOF Test**											
580						A-D Test Statistic	0.524			**Anderson-Darling Gamma GOF Test**		
581						5% A-D Critical Value	0.745			Detected data appear Gamma Distributed at 5% Significance Level		
582						K-S Test Statistic	0.16			**Kolmogorov-Smirnov Gamma GOF Test**		
583						5% K-S Critical Value	0.182			Detected data appear Gamma Distributed at 5% Significance Level		
584	**Detected data appear Gamma Distributed at 5% Significance Level**											
585												
586	**Gamma Statistics**											
587						k hat (MLE)	8.741			k star (bias corrected MLE)	7.63	
588						Theta hat (MLE)	2.0309E-4			Theta star (bias corrected MLE)	2.3267E-4	
589						nu hat (MLE)	402.1			nu star (bias corrected)	351	
590						MLE Mean (bias corrected)	0.00178			MLE Sd (bias corrected)	6.4268E-4	
591										Approximate Chi Square Value (0.05)	308.6	
592						Adjusted Level of Significance	0.0389			Adjusted Chi Square Value	305.7	
593												
594	**Assuming Gamma Distribution**											
595						95% Approximate Gamma UCL	0.00202			95% Adjusted Gamma UCL	0.00204	
596												
597	**Lognormal GOF Test**											
598						Shapiro Wilk Test Statistic	0.944			**Shapiro Wilk Lognormal GOF Test**		
599						10% Shapiro Wilk Critical Value	0.928			Data appear Lognormal at 10% Significance Level		
600						Lilliefors Test Statistic	0.173			**Lilliefors Lognormal GOF Test**		
601						10% Lilliefors Critical Value	0.165			Data Not Lognormal at 10% Significance Level		
602	**Data appear Approximate Lognormal at 10% Significance Level**											
603												
604	**Lognormal Statistics**											
605						Minimum of Logged Data	-6.908			Mean of logged Data	-6.392	

606				Maximum of Logged Data	-5.714					SD of logged Data	0.349	
607												
608					**Assuming Lognormal Distribution**							
609				95% H-UCL	0.00204					90% Chebyshev (MVUE) UCL	0.00217	
610				95% Chebyshev (MVUE) UCL	0.00235					97.5% Chebyshev (MVUE) UCL	0.0026	
611				99% Chebyshev (MVUE) UCL	0.00308							
612												
613					**Nonparametric Distribution Free UCL Statistics**							
614					**Data appear to follow a Discernible Distribution**							
615												
616					**Nonparametric Distribution Free UCLs**							
617				95% CLT UCL	0.00199					95% BCA Bootstrap UCL	0.00201	
618				95% Standard Bootstrap UCL	0.00199					95% Bootstrap-t UCL	0.00203	
619				95% Hall's Bootstrap UCL	0.00202					95% Percentile Bootstrap UCL	0.00199	
620				90% Chebyshev(Mean, Sd) UCL	0.00217					95% Chebyshev(Mean, Sd) UCL	0.00235	
621				97.5% Chebyshev(Mean, Sd) UCL	0.00259					99% Chebyshev(Mean, Sd) UCL	0.00308	
622												
623					**Suggested UCL to Use**							
624				95% Student's-t UCL	0.002							
625												
626					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
627					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
628					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
629												
630												
631	**ResultValue (apw-10s)**											
632												
633					**General Statistics**							
634				Total Number of Observations	23					Number of Distinct Observations	2	
635										Number of Missing Observations	0	
636				Minimum	0.001					Mean	0.00135	
637				Maximum	0.002					Median	0.001	
638				SD	4.8698E-4					Std. Error of Mean	1.0154E-4	
639				Coefficient of Variation	0.361					Skewness	0.684	
640												
641					**Normal GOF Test**							
642				Shapiro Wilk Test Statistic	0.606					**Shapiro Wilk GOF Test**		
643				1% Shapiro Wilk Critical Value	0.881					Data Not Normal at 1% Significance Level		
644				Lilliefors Test Statistic	0.415					**Lilliefors GOF Test**		
645				1% Lilliefors Critical Value	0.209					Data Not Normal at 1% Significance Level		
646					**Data Not Normal at 1% Significance Level**							
647												
648					**Assuming Normal Distribution**							
649				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
650				95% Student's-t UCL	0.00152					95% Adjusted-CLT UCL (Chen-1995)	0.00153	
651										95% Modified-t UCL (Johnson-1978)	0.00152	
652												
653					**Gamma GOF Test**							
654				A-D Test Statistic	4.647					**Anderson-Darling Gamma GOF Test**		
655				5% A-D Critical Value	0.745					Data Not Gamma Distributed at 5% Significance Level		
656				K-S Test Statistic	0.42					**Kolmogorov-Smirnov Gamma GOF Test**		
657				5% K-S Critical Value	0.182					Data Not Gamma Distributed at 5% Significance Level		
658					**Data Not Gamma Distributed at 5% Significance Level**							
659												
660					**Gamma Statistics**							

661					k hat (MLE)	8.874				k star (bias corrected MLE)		7.746
662					Theta hat (MLE)	1.5188E-4				Theta star (bias corrected MLE)		1.7401E-4
663					nu hat (MLE)	408.2				nu star (bias corrected)		356.3
664					MLE Mean (bias corrected)	0.00135				MLE Sd (bias corrected)		4.8428E-4
665										Approximate Chi Square Value (0.05)		313.6
666					Adjusted Level of Significance	0.0389				Adjusted Chi Square Value		310.7
667												
668					**Assuming Gamma Distribution**							
669					95% Approximate Gamma UCL	0.00153				95% Adjusted Gamma UCL		0.00155
670												
671					**Lognormal GOF Test**							
672					Shapiro Wilk Test Statistic	0.606				**Shapiro Wilk Lognormal GOF Test**		
673					10% Shapiro Wilk Critical Value	0.928				Data Not Lognormal at 10% Significance Level		
674					Lilliefors Test Statistic	0.415				**Lilliefors Lognormal GOF Test**		
675					10% Lilliefors Critical Value	0.165				Data Not Lognormal at 10% Significance Level		
676					**Data Not Lognormal at 10% Significance Level**							
677												
678					**Lognormal Statistics**							
679					Minimum of Logged Data	-6.908				Mean of logged Data		-6.667
680					Maximum of Logged Data	-6.215				SD of logged Data		0.338
681												
682					**Assuming Lognormal Distribution**							
683					95% H-UCL	0.00154				90% Chebyshev (MVUE) UCL		0.00163
684					95% Chebyshev (MVUE) UCL	0.00176				97.5% Chebyshev (MVUE) UCL		0.00195
685					99% Chebyshev (MVUE) UCL	0.0023						
686												
687					**Nonparametric Distribution Free UCL Statistics**							
688					**Data do not follow a Discernible Distribution**							
689												
690					**Nonparametric Distribution Free UCLs**							
691					95% CLT UCL	0.00151				95% BCA Bootstrap UCL		N/A
692					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
693					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
694					90% Chebyshev(Mean, Sd) UCL	0.00165				95% Chebyshev(Mean, Sd) UCL		0.00179
695					97.5% Chebyshev(Mean, Sd) UCL	0.00198				99% Chebyshev(Mean, Sd) UCL		0.00236
696												
697					**Suggested UCL to Use**							
698					95% Student's-t UCL	0.00152						
699												
700	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
701	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
702	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
703												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Sulfate
Date/Time of Computation	ProUCL 5.2 2/27/2026 2:12:22 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	21
		Number of Missing Observations	0
Minimum	376	Mean	448.5
Maximum	510	Median	459
SD	39.96	Std. Error of Mean	8.332
Coefficient of Variation	0.0891	Skewness	-0.135

Normal GOF Test

Shapiro Wilk Test Statistic	0.963	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.125	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	462.8	95% Adjusted-CLT UCL (Chen-1995)	462
		95% Modified-t UCL (Johnson-1978)	462.8

Gamma GOF Test

A-D Test Statistic	0.285	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.137	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	129.9	k star (bias corrected MLE)	113
Theta hat (MLE)	3.452	Theta star (bias corrected MLE)	3.968
nu hat (MLE)	5978	nu star (bias corrected)	5199
MLE Mean (bias corrected)	448.5	MLE Sd (bias corrected)	42.19
		Approximate Chi Square Value (0.05)	5033
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	5021

Assuming Gamma Distribution

95% Approximate Gamma UCL	463.4	95% Adjusted Gamma UCL	464.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.961	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	5.93			Mean of logged Data		6.102
60						Maximum of Logged Data	6.234			SD of logged Data		0.0901
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	N/A			90% Chebyshev (MVUE) UCL		473.9
64						95% Chebyshev (MVUE) UCL	485.3			97.5% Chebyshev (MVUE) UCL		501.2
65						99% Chebyshev (MVUE) UCL	532.5					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	462.2			95% BCA Bootstrap UCL		461.3
72						95% Standard Bootstrap UCL	462			95% Bootstrap-t UCL		462
73						95% Hall's Bootstrap UCL	461.2			95% Percentile Bootstrap UCL		462.2
74						90% Chebyshev(Mean, Sd) UCL	473.5			95% Chebyshev(Mean, Sd) UCL		484.8
75						97.5% Chebyshev(Mean, Sd) UCL	500.6			99% Chebyshev(Mean, Sd) UCL		531.4
76												
77	**Suggested UCL to Use**											
78						95% Student's-t UCL	462.8					
79												
80	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
81	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
82	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
83												
84	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
85	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
86												
87												
88	**ResultValue (apw-03)**											
89												
90	**General Statistics**											
91						Total Number of Observations	23			Number of Distinct Observations		23
92										Number of Missing Observations		0
93						Minimum	80.1			Mean		229
94						Maximum	393			Median		226
95						SD	70.02			Std. Error of Mean		14.6
96						Coefficient of Variation	0.306			Skewness		0.0943
97												
98	**Normal GOF Test**											
99						Shapiro Wilk Test Statistic	0.991			**Shapiro Wilk GOF Test**		
100						1% Shapiro Wilk Critical Value	0.881			Data appear Normal at 1% Significance Level		
101						Lilliefors Test Statistic	0.0718			**Lilliefors GOF Test**		
102						1% Lilliefors Critical Value	0.209			Data appear Normal at 1% Significance Level		
103	**Data appear Normal at 1% Significance Level**											
104												
105	**Assuming Normal Distribution**											
106						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
107						95% Student's-t UCL	254.1			95% Adjusted-CLT UCL (Chen-1995)		253.3
108										95% Modified-t UCL (Johnson-1978)		254.1
109												
110	**Gamma GOF Test**											

111				A-D Test Statistic	0.255	**Anderson-Darling Gamma GOF Test**						
112				5% A-D Critical Value	0.744	Detected data appear Gamma Distributed at 5% Significance Level						
113				K-S Test Statistic	0.0896	**Kolmogorov-Smirnov Gamma GOF Test**						
114				5% K-S Critical Value	0.182	Detected data appear Gamma Distributed at 5% Significance Level						
115	**Detected data appear Gamma Distributed at 5% Significance Level**											
116												
117	**Gamma Statistics**											
118				k hat (MLE)	9.883	k star (bias corrected MLE)	8.623					
119				Theta hat (MLE)	23.17	Theta star (bias corrected MLE)	26.56					
120				nu hat (MLE)	454.6	nu star (bias corrected)	396.6					
121				MLE Mean (bias corrected)	229	MLE Sd (bias corrected)	77.99					
122						Approximate Chi Square Value (0.05)	351.5					
123				Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	348.4					
124												
125	**Assuming Gamma Distribution**											
126				95% Approximate Gamma UCL	258.4	95% Adjusted Gamma UCL	260.7					
127												
128	**Lognormal GOF Test**											
129				Shapiro Wilk Test Statistic	0.942	**Shapiro Wilk Lognormal GOF Test**						
130				10% Shapiro Wilk Critical Value	0.928	Data appear Lognormal at 10% Significance Level						
131				Lilliefors Test Statistic	0.109	**Lilliefors Lognormal GOF Test**						
132				10% Lilliefors Critical Value	0.165	Data appear Lognormal at 10% Significance Level						
133	**Data appear Lognormal at 10% Significance Level**											
134												
135	**Lognormal Statistics**											
136				Minimum of Logged Data	4.383	Mean of logged Data	5.382					
137				Maximum of Logged Data	5.974	SD of logged Data	0.345					
138												
139	**Assuming Lognormal Distribution**											
140				95% H-UCL	264.6	90% Chebyshev (MVUE) UCL	280.9					
141				95% Chebyshev (MVUE) UCL	303.9	97.5% Chebyshev (MVUE) UCL	335.7					
142				99% Chebyshev (MVUE) UCL	398.3							
143												
144	**Nonparametric Distribution Free UCL Statistics**											
145	**Data appear to follow a Discernible Distribution**											
146												
147	**Nonparametric Distribution Free UCLs**											
148				95% CLT UCL	253	95% BCA Bootstrap UCL	251.4					
149				95% Standard Bootstrap UCL	252.2	95% Bootstrap-t UCL	253.9					
150				95% Hall's Bootstrap UCL	253.8	95% Percentile Bootstrap UCL	252.8					
151				90% Chebyshev(Mean, Sd) UCL	272.8	95% Chebyshev(Mean, Sd) UCL	292.6					
152				97.5% Chebyshev(Mean, Sd) UCL	320.2	99% Chebyshev(Mean, Sd) UCL	374.3					
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL	254.1							
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
159	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
160												
161												
162	**ResultValue (apw-05)**											
163												
164	**General Statistics**											
165				Total Number of Observations	12	Number of Distinct Observations	12					

166											Number of Missing Observations	0
167					Minimum	224					Mean	376.9
168					Maximum	460					Median	387.5
169					SD	62.26					Std. Error of Mean	17.97
170					Coefficient of Variation	0.165					Skewness	-1.338
171												
172						**Normal GOF Test**						
173					Shapiro Wilk Test Statistic	0.891					**Shapiro Wilk GOF Test**	
174					1% Shapiro Wilk Critical Value	0.805					Data appear Normal at 1% Significance Level	
175					Lilliefors Test Statistic	0.257					**Lilliefors GOF Test**	
176					1% Lilliefors Critical Value	0.281					Data appear Normal at 1% Significance Level	
177						**Data appear Normal at 1% Significance Level**						
178												
179						**Assuming Normal Distribution**						
180					**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
181					95% Student's-t UCL	409.2					95% Adjusted-CLT UCL (Chen-1995)	399.1
182											95% Modified-t UCL (Johnson-1978)	408
183												
184						**Gamma GOF Test**						
185					A-D Test Statistic	0.748					**Anderson-Darling Gamma GOF Test**	
186					5% A-D Critical Value	0.731					Data Not Gamma Distributed at 5% Significance Level	
187					K-S Test Statistic	0.28					**Kolmogorov-Smirnov Gamma GOF Test**	
188					5% K-S Critical Value	0.245					Data Not Gamma Distributed at 5% Significance Level	
189						**Data Not Gamma Distributed at 5% Significance Level**						
190												
191						**Gamma Statistics**						
192					k hat (MLE)	33.58					k star (bias corrected MLE)	25.24
193					Theta hat (MLE)	11.22					Theta star (bias corrected MLE)	14.93
194					nu hat (MLE)	806					nu star (bias corrected)	605.8
195					MLE Mean (bias corrected)	376.9					MLE Sd (bias corrected)	75.02
196											Approximate Chi Square Value (0.05)	549.7
197					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	541.6
198												
199						**Assuming Gamma Distribution**						
200					95% Approximate Gamma UCL	415.4					95% Adjusted Gamma UCL	421.6
201												
202						**Lognormal GOF Test**						
203					Shapiro Wilk Test Statistic	0.818					**Shapiro Wilk Lognormal GOF Test**	
204					10% Shapiro Wilk Critical Value	0.883					Data Not Lognormal at 10% Significance Level	
205					Lilliefors Test Statistic	0.287					**Lilliefors Lognormal GOF Test**	
206					10% Lilliefors Critical Value	0.223					Data Not Lognormal at 10% Significance Level	
207						**Data Not Lognormal at 10% Significance Level**						
208												
209						**Lognormal Statistics**						
210					Minimum of Logged Data	5.412					Mean of logged Data	5.917
211					Maximum of Logged Data	6.131					SD of logged Data	0.19
212												
213						**Assuming Lognormal Distribution**						
214					95% H-UCL	419.9					90% Chebyshev (MVUE) UCL	439.7
215					95% Chebyshev (MVUE) UCL	467.9					97.5% Chebyshev (MVUE) UCL	507
216					99% Chebyshev (MVUE) UCL	583.8						
217												
218						**Nonparametric Distribution Free UCL Statistics**						
219						**Data appear to follow a Discernible Distribution**						
220												

221	**Nonparametric Distribution Free UCLs**											
222					95% CLT UCL	406.5				95% BCA Bootstrap UCL	398.4	
223					95% Standard Bootstrap UCL	405.4				95% Bootstrap-t UCL	403.2	
224					95% Hall's Bootstrap UCL	401.7				95% Percentile Bootstrap UCL	402.8	
225					90% Chebyshev(Mean, Sd) UCL	430.8				95% Chebyshev(Mean, Sd) UCL	455.3	
226					97.5% Chebyshev(Mean, Sd) UCL	489.2				99% Chebyshev(Mean, Sd) UCL	555.8	
227												
228	**Suggested UCL to Use**											
229					95% Student's-t UCL	409.2						
230												
231	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
232	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
233	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
234												
235	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
236	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
237												
238												
239	**ResultValue (apw-05r)**											
240												
241	**General Statistics**											
242					Total Number of Observations	11				Number of Distinct Observations	10	
243										Number of Missing Observations	0	
244					Minimum	70.5				Mean	261.6	
245					Maximum	373				Median	330	
246					SD	114.3				Std. Error of Mean	34.46	
247					Coefficient of Variation	0.437				Skewness	-0.784	
248												
249	**Normal GOF Test**											
250					Shapiro Wilk Test Statistic	0.819				**Shapiro Wilk GOF Test**		
251					1% Shapiro Wilk Critical Value	0.792				Data appear Normal at 1% Significance Level		
252					Lilliefors Test Statistic	0.288				**Lilliefors GOF Test**		
253					1% Lilliefors Critical Value	0.291				Data appear Normal at 1% Significance Level		
254	**Data appear Normal at 1% Significance Level**											
255												
256	**Assuming Normal Distribution**											
257	**95% Normal UCL**									**95% UCLs (Adjusted for Skewness)**		
258					95% Student's-t UCL	324				95% Adjusted-CLT UCL (Chen-1995)	309.6	
259										95% Modified-t UCL (Johnson-1978)	322.7	
260												
261	**Gamma GOF Test**											
262					A-D Test Statistic	1.097				**Anderson-Darling Gamma GOF Test**		
263					5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level		
264					K-S Test Statistic	0.323				**Kolmogorov-Smirnov Gamma GOF Test**		
265					5% K-S Critical Value	0.256				Data Not Gamma Distributed at 5% Significance Level		
266	**Data Not Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269					k hat (MLE)	3.987				k star (bias corrected MLE)	2.96	
270					Theta hat (MLE)	65.61				Theta star (bias corrected MLE)	88.36	
271					nu hat (MLE)	87.71				nu star (bias corrected)	65.13	
272					MLE Mean (bias corrected)	261.6				MLE Sd (bias corrected)	152	
273										Approximate Chi Square Value (0.05)	47.56	
274					Adjusted Level of Significance	0.0278				Adjusted Chi Square Value	45.12	
275												

276	**Assuming Gamma Distribution**											
277				95% Approximate Gamma UCL	358.2				95% Adjusted Gamma UCL	377.6		
278												
279	**Lognormal GOF Test**											
280				Shapiro Wilk Test Statistic	0.784		**Shapiro Wilk Lognormal GOF Test**					
281				10% Shapiro Wilk Critical Value	0.876		Data Not Lognormal at 10% Significance Level					
282				Lilliefors Test Statistic	0.322		**Lilliefors Lognormal GOF Test**					
283				10% Lilliefors Critical Value	0.231		Data Not Lognormal at 10% Significance Level					
284	**Data Not Lognormal at 10% Significance Level**											
285												
286	**Lognormal Statistics**											
287				Minimum of Logged Data	4.256				Mean of logged Data	5.436		
288				Maximum of Logged Data	5.922				SD of logged Data	0.595		
289												
290	**Assuming Lognormal Distribution**											
291				95% H-UCL	422.6				90% Chebyshev (MVUE) UCL	417.8		
292				95% Chebyshev (MVUE) UCL	485.1				97.5% Chebyshev (MVUE) UCL	578.7		
293				99% Chebyshev (MVUE) UCL	762.4							
294												
295	**Nonparametric Distribution Free UCL Statistics**											
296	**Data appear to follow a Discernible Distribution**											
297												
298	**Nonparametric Distribution Free UCLs**											
299				95% CLT UCL	318.3				95% BCA Bootstrap UCL	309.9		
300				95% Standard Bootstrap UCL	316.3				95% Bootstrap-t UCL	314.3		
301				95% Hall's Bootstrap UCL	306.4				95% Percentile Bootstrap UCL	314.7		
302				90% Chebyshev(Mean, Sd) UCL	365				95% Chebyshev(Mean, Sd) UCL	411.8		
303				97.5% Chebyshev(Mean, Sd) UCL	476.8				99% Chebyshev(Mean, Sd) UCL	604.5		
304												
305	**Suggested UCL to Use**											
306				95% Student's-t UCL	324							
307												
308	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
309	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
310	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
311												
312	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
313	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
314												
315												
316	**ResultValue (apw-06d)**											
317												
318	**General Statistics**											
319				Total Number of Observations	22				Number of Distinct Observations	20		
320									Number of Missing Observations	0		
321				Minimum	136				Mean	219.9		
322				Maximum	272				Median	216.5		
323				SD	34.35				Std. Error of Mean	7.323		
324				Coefficient of Variation	0.156				Skewness	-0.321		
325												
326	**Normal GOF Test**											
327				Shapiro Wilk Test Statistic	0.958		**Shapiro Wilk GOF Test**					
328				1% Shapiro Wilk Critical Value	0.878		Data appear Normal at 1% Significance Level					
329				Lilliefors Test Statistic	0.092		**Lilliefors GOF Test**					
330				1% Lilliefors Critical Value	0.214		Data appear Normal at 1% Significance Level					

331	**Data appear Normal at 1% Significance Level**											
332												
333	**Assuming Normal Distribution**											
334	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
335				95% Student's-t UCL		232.5				95% Adjusted-CLT UCL (Chen-1995)		231.4
336										95% Modified-t UCL (Johnson-1978)		232.4
337												
338	**Gamma GOF Test**											
339				A-D Test Statistic		0.325	**Anderson-Darling Gamma GOF Test**					
340				5% A-D Critical Value		0.742	Detected data appear Gamma Distributed at 5% Significance Level					
341				K-S Test Statistic		0.0996	**Kolmogorov-Smirnov Gamma GOF Test**					
342				5% K-S Critical Value		0.185	Detected data appear Gamma Distributed at 5% Significance Level					
343	**Detected data appear Gamma Distributed at 5% Significance Level**											
344												
345	**Gamma Statistics**											
346				k hat (MLE)		40.19				k star (bias corrected MLE)		34.74
347				Theta hat (MLE)		5.472				Theta star (bias corrected MLE)		6.33
348				nu hat (MLE)		1768				nu star (bias corrected)		1529
349				MLE Mean (bias corrected)		219.9				MLE Sd (bias corrected)		37.31
350										Approximate Chi Square Value (0.05)		1439
351				Adjusted Level of Significance		0.0386				Adjusted Chi Square Value		1432
352												
353	**Assuming Gamma Distribution**											
354				95% Approximate Gamma UCL		233.6				95% Adjusted Gamma UCL		234.7
355												
356	**Lognormal GOF Test**											
357				Shapiro Wilk Test Statistic		0.931	**Shapiro Wilk Lognormal GOF Test**					
358				10% Shapiro Wilk Critical Value		0.926	Data appear Lognormal at 10% Significance Level					
359				Lilliefors Test Statistic		0.113	**Lilliefors Lognormal GOF Test**					
360				10% Lilliefors Critical Value		0.169	Data appear Lognormal at 10% Significance Level					
361	**Data appear Lognormal at 10% Significance Level**											
362												
363	**Lognormal Statistics**											
364				Minimum of Logged Data		4.913				Mean of logged Data		5.381
365				Maximum of Logged Data		5.606				SD of logged Data		0.165
366												
367	**Assuming Lognormal Distribution**											
368				95% H-UCL		234.6				90% Chebyshev (MVUE) UCL		243.4
369				95% Chebyshev (MVUE) UCL		254				97.5% Chebyshev (MVUE) UCL		268.7
370				99% Chebyshev (MVUE) UCL		297.5						
371												
372	**Nonparametric Distribution Free UCL Statistics**											
373	**Data appear to follow a Discernible Distribution**											
374												
375	**Nonparametric Distribution Free UCLs**											
376				95% CLT UCL		232				95% BCA Bootstrap UCL		232.5
377				95% Standard Bootstrap UCL		231.9				95% Bootstrap-t UCL		232.2
378				95% Hall's Bootstrap UCL		231.9				95% Percentile Bootstrap UCL		232.3
379				90% Chebyshev(Mean, Sd) UCL		241.9				95% Chebyshev(Mean, Sd) UCL		251.8
380				97.5% Chebyshev(Mean, Sd) UCL		265.6				99% Chebyshev(Mean, Sd) UCL		292.8
381												
382	**Suggested UCL to Use**											
383				95% Student's-t UCL		232.5						
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

ResultValue (apw-06s)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	23
		Number of Missing Observations	0
Minimum	92.6	Mean	194
Maximum	247	Median	208
SD	46.32	Std. Error of Mean	9.659
Coefficient of Variation	0.239	Skewness	-0.744

Normal GOF Test

Shapiro Wilk Test Statistic	0.906	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.16	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	210.6	95% Adjusted-CLT UCL (Chen-1995)	208.3
		95% Modified-t UCL (Johnson-1978)	210.4

Gamma GOF Test

A-D Test Statistic	1.012	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.743	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.19	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	15.45	k star (bias corrected MLE)	13.46
Theta hat (MLE)	12.56	Theta star (bias corrected MLE)	14.41
nu hat (MLE)	710.7	nu star (bias corrected)	619.3
MLE Mean (bias corrected)	194	MLE Sd (bias corrected)	52.88
		Approximate Chi Square Value (0.05)	562.6
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	558.7

Assuming Gamma Distribution

95% Approximate Gamma UCL	213.6	95% Adjusted Gamma UCL	215.1

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.866	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.199	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

441				Minimum of Logged Data	4.528					Mean of logged Data	5.235	
442				Maximum of Logged Data	5.509					SD of logged Data	0.275	
443												
444					**Assuming Lognormal Distribution**							
445				95% H-UCL	216.7					90% Chebyshev (MVUE) UCL	228.5	
446				95% Chebyshev (MVUE) UCL	243.9					97.5% Chebyshev (MVUE) UCL	265.1	
447				99% Chebyshev (MVUE) UCL	306.9							
448												
449					**Nonparametric Distribution Free UCL Statistics**							
450					**Data appear to follow a Discernible Distribution**							
451												
452					**Nonparametric Distribution Free UCLs**							
453				95% CLT UCL	209.9					95% BCA Bootstrap UCL	208.6	
454				95% Standard Bootstrap UCL	209.7					95% Bootstrap-t UCL	209.4	
455				95% Hall's Bootstrap UCL	208.5					95% Percentile Bootstrap UCL	209.9	
456				90% Chebyshev(Mean, Sd) UCL	223					95% Chebyshev(Mean, Sd) UCL	236.1	
457				97.5% Chebyshev(Mean, Sd) UCL	254.3					99% Chebyshev(Mean, Sd) UCL	290.1	
458												
459					**Suggested UCL to Use**							
460				95% Student's-t UCL	210.6							
461												
462					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
463					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
464					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
465												
466					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
467					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
468												
469												
470	**ResultValue (apw-07)**											
471												
472					**General Statistics**							
473				Total Number of Observations	22					Number of Distinct Observations	21	
474										Number of Missing Observations	0	
475				Minimum	34.7					Mean	54.44	
476				Maximum	78					Median	53	
477				SD	12					Std. Error of Mean	2.559	
478				Coefficient of Variation	0.22					Skewness	0.162	
479												
480					**Normal GOF Test**							
481				Shapiro Wilk Test Statistic	0.975					**Shapiro Wilk GOF Test**		
482				1% Shapiro Wilk Critical Value	0.878					Data appear Normal at 1% Significance Level		
483				Lilliefors Test Statistic	0.0987					**Lilliefors GOF Test**		
484				1% Lilliefors Critical Value	0.214					Data appear Normal at 1% Significance Level		
485					**Data appear Normal at 1% Significance Level**							
486												
487					**Assuming Normal Distribution**							
488				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
489				95% Student's-t UCL	58.84					95% Adjusted-CLT UCL (Chen-1995)	58.74	
490										95% Modified-t UCL (Johnson-1978)	58.85	
491												
492					**Gamma GOF Test**							
493				A-D Test Statistic	0.22					**Anderson-Darling Gamma GOF Test**		
494				5% A-D Critical Value	0.74					Detected data appear Gamma Distributed at 5% Significance Level		
495				K-S Test Statistic	0.0947					**Kolmogorov-Smirnov Gamma GOF Test**		

496				5% K-S Critical Value	0.185	Detected data appear Gamma Distributed at 5% Significance Level						
497	**Detected data appear Gamma Distributed at 5% Significance Level**											
498												
499	**Gamma Statistics**											
500				k hat (MLE)	21.16					k star (bias corrected MLE)	18.3	
501				Theta hat (MLE)	2.573					Theta star (bias corrected MLE)	2.974	
502				nu hat (MLE)	931					nu star (bias corrected)	805.4	
503				MLE Mean (bias corrected)	54.44					MLE Sd (bias corrected)	12.72	
504										Approximate Chi Square Value (0.05)	740.6	
505				Adjusted Level of Significance	0.0386					Adjusted Chi Square Value	735.9	
506												
507	**Assuming Gamma Distribution**											
508				95% Approximate Gamma UCL	59.2					95% Adjusted Gamma UCL	59.58	
509												
510	**Lognormal GOF Test**											
511				Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk Lognormal GOF Test**						
512				10% Shapiro Wilk Critical Value	0.926	Data appear Lognormal at 10% Significance Level						
513				Lilliefors Test Statistic	0.093	**Lilliefors Lognormal GOF Test**						
514				10% Lilliefors Critical Value	0.169	Data appear Lognormal at 10% Significance Level						
515	**Data appear Lognormal at 10% Significance Level**											
516												
517	**Lognormal Statistics**											
518				Minimum of Logged Data	3.547					Mean of logged Data	3.973	
519				Maximum of Logged Data	4.357					SD of logged Data	0.225	
520												
521	**Assuming Lognormal Distribution**											
522				95% H-UCL	59.54					90% Chebyshev (MVUE) UCL	62.37	
523				95% Chebyshev (MVUE) UCL	65.96					97.5% Chebyshev (MVUE) UCL	70.93	
524				99% Chebyshev (MVUE) UCL	80.71							
525												
526	**Nonparametric Distribution Free UCL Statistics**											
527	**Data appear to follow a Discernible Distribution**											
528												
529	**Nonparametric Distribution Free UCLs**											
530				95% CLT UCL	58.65					95% BCA Bootstrap UCL	58.72	
531				95% Standard Bootstrap UCL	58.55					95% Bootstrap-t UCL	58.96	
532				95% Hall's Bootstrap UCL	58.66					95% Percentile Bootstrap UCL	58.45	
533				90% Chebyshev(Mean, Sd) UCL	62.11					95% Chebyshev(Mean, Sd) UCL	65.59	
534				97.5% Chebyshev(Mean, Sd) UCL	70.42					99% Chebyshev(Mean, Sd) UCL	79.9	
535												
536	**Suggested UCL to Use**											
537				95% Student's-t UCL	58.84							
538												
539	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
540	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
541	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
542												
543												
544	**ResultValue (apw-08)**											
545												
546	**General Statistics**											
547				Total Number of Observations	23					Number of Distinct Observations	17	
548										Number of Missing Observations	0	
549				Minimum	23					Mean	33.05	
550				Maximum	43					Median	33.4	

551					SD	6.125					Std. Error of Mean	1.277
552					Coefficient of Variation	0.185					Skewness	-0.0862
553												
554					**Normal GOF Test**							
555					Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk GOF Test**					
556					1% Shapiro Wilk Critical Value	0.881	Data appear Normal at 1% Significance Level					
557					Lilliefors Test Statistic	0.182	**Lilliefors GOF Test**					
558					1% Lilliefors Critical Value	0.209	Data appear Normal at 1% Significance Level					
559					**Data appear Normal at 1% Significance Level**							
560												
561					**Assuming Normal Distribution**							
562					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
563					95% Student's-t UCL	35.24	95% Adjusted-CLT UCL (Chen-1995)	35.12				
564							95% Modified-t UCL (Johnson-1978)	35.24				
565												
566					**Gamma GOF Test**							
567					A-D Test Statistic	0.867	**Anderson-Darling Gamma GOF Test**					
568					5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level					
569					K-S Test Statistic	0.19	**Kolmogorov-Smirnov Gamma GOF Test**					
570					5% K-S Critical Value	0.181	Data Not Gamma Distributed at 5% Significance Level					
571					**Data Not Gamma Distributed at 5% Significance Level**							
572												
573					**Gamma Statistics**							
574					k hat (MLE)	29.49	k star (bias corrected MLE)	25.67				
575					Theta hat (MLE)	1.121	Theta star (bias corrected MLE)	1.288				
576					nu hat (MLE)	1356	nu star (bias corrected)	1181				
577					MLE Mean (bias corrected)	33.05	MLE Sd (bias corrected)	6.523				
578							Approximate Chi Square Value (0.05)	1102				
579					Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	1096				
580												
581					**Assuming Gamma Distribution**							
582					95% Approximate Gamma UCL	35.41	95% Adjusted Gamma UCL	35.59				
583												
584					**Lognormal GOF Test**							
585					Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**					
586					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
587					Lilliefors Test Statistic	0.187	**Lilliefors Lognormal GOF Test**					
588					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
589					**Data Not Lognormal at 10% Significance Level**							
590												
591					**Lognormal Statistics**							
592					Minimum of Logged Data	3.135	Mean of logged Data	3.481				
593					Maximum of Logged Data	3.761	SD of logged Data	0.191				
594												
595					**Assuming Lognormal Distribution**							
596					95% H-UCL	35.54	90% Chebyshev (MVUE) UCL	37.03				
597					95% Chebyshev (MVUE) UCL	38.82	97.5% Chebyshev (MVUE) UCL	41.32				
598					99% Chebyshev (MVUE) UCL	46.22						
599												
600					**Nonparametric Distribution Free UCL Statistics**							
601					**Data appear to follow a Discernible Distribution**							
602												
603					**Nonparametric Distribution Free UCLs**							
604					95% CLT UCL	35.15	95% BCA Bootstrap UCL	34.96				
605					95% Standard Bootstrap UCL	35.08	95% Bootstrap-t UCL	35.26				

606				95% Hall's Bootstrap UCL	35.09				95% Percentile Bootstrap UCL	35.05		
607				90% Chebyshev(Mean, Sd) UCL	36.88				95% Chebyshev(Mean, Sd) UCL	38.61		
608				97.5% Chebyshev(Mean, Sd) UCL	41.02				99% Chebyshev(Mean, Sd) UCL	45.75		
609												
610				**Suggested UCL to Use**								
611				95% Student's-t UCL	35.24							
612												
613	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
614	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
615	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
616												
617	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
618	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
619												
620												
621	**ResultValue (apw-10d)**											
622												
623				**General Statistics**								
624				Total Number of Observations	23				Number of Distinct Observations	16		
625									Number of Missing Observations	0		
626				Minimum	26				Mean	38.54		
627				Maximum	44.5				Median	41		
628				SD	5.629				Std. Error of Mean	1.174		
629				Coefficient of Variation	0.146				Skewness	-0.723		
630												
631				**Normal GOF Test**								
632				Shapiro Wilk Test Statistic	0.882				**Shapiro Wilk GOF Test**			
633				1% Shapiro Wilk Critical Value	0.881				Data appear Normal at 1% Significance Level			
634				Lilliefors Test Statistic	0.209				**Lilliefors GOF Test**			
635				1% Lilliefors Critical Value	0.209				Data appear Normal at 1% Significance Level			
636				**Data appear Normal at 1% Significance Level**								
637												
638				**Assuming Normal Distribution**								
639				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
640				95% Student's-t UCL	40.55				95% Adjusted-CLT UCL (Chen-1995)	40.28		
641									95% Modified-t UCL (Johnson-1978)	40.53		
642												
643				**Gamma GOF Test**								
644				A-D Test Statistic	1.117				**Anderson-Darling Gamma GOF Test**			
645				5% A-D Critical Value	0.741				Data Not Gamma Distributed at 5% Significance Level			
646				K-S Test Statistic	0.215				**Kolmogorov-Smirnov Gamma GOF Test**			
647				5% K-S Critical Value	0.181				Data Not Gamma Distributed at 5% Significance Level			
648				**Data Not Gamma Distributed at 5% Significance Level**								
649												
650				**Gamma Statistics**								
651				k hat (MLE)	45.02				k star (bias corrected MLE)	39.18		
652				Theta hat (MLE)	0.856				Theta star (bias corrected MLE)	0.984		
653				nu hat (MLE)	2071				nu star (bias corrected)	1802		
654				MLE Mean (bias corrected)	38.54				MLE Sd (bias corrected)	6.157		
655									Approximate Chi Square Value (0.05)	1705		
656				Adjusted Level of Significance	0.0389				Adjusted Chi Square Value	1698		
657												
658				**Assuming Gamma Distribution**								
659				95% Approximate Gamma UCL	40.75				95% Adjusted Gamma UCL	40.91		
660												

661	**Lognormal GOF Test**											
662					Shapiro Wilk Test Statistic	0.867	**Shapiro Wilk Lognormal GOF Test**					
663					10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level					
664					Lilliefors Test Statistic	0.211	**Lilliefors Lognormal GOF Test**					
665					10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level					
666	**Data Not Lognormal at 10% Significance Level**											
667												
668	**Lognormal Statistics**											
669					Minimum of Logged Data	3.258			Mean of logged Data	3.641		
670					Maximum of Logged Data	3.795			SD of logged Data	0.156		
671												
672	**Assuming Lognormal Distribution**											
673					95% H-UCL	40.88			90% Chebyshev (MVUE) UCL	42.34		
674					95% Chebyshev (MVUE) UCL	44.06			97.5% Chebyshev (MVUE) UCL	46.43		
675					99% Chebyshev (MVUE) UCL	51.11						
676												
677	**Nonparametric Distribution Free UCL Statistics**											
678	**Data appear to follow a Discernible Distribution**											
679												
680	**Nonparametric Distribution Free UCLs**											
681					95% CLT UCL	40.47			95% BCA Bootstrap UCL	40.16		
682					95% Standard Bootstrap UCL	40.39			95% Bootstrap-t UCL	40.39		
683					95% Hall's Bootstrap UCL	40.28			95% Percentile Bootstrap UCL	40.27		
684					90% Chebyshev(Mean, Sd) UCL	42.06			95% Chebyshev(Mean, Sd) UCL	43.66		
685					97.5% Chebyshev(Mean, Sd) UCL	45.87			99% Chebyshev(Mean, Sd) UCL	50.22		
686												
687	**Suggested UCL to Use**											
688					95% Student's-t UCL	40.55						
689												
690	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
691	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
692	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
693												
694	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
695	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
696												
697												
698	**ResultValue (apw-10s)**											
699												
700	**General Statistics**											
701					Total Number of Observations	23			Number of Distinct Observations	4		
702									Number of Missing Observations	0		
703					Minimum	5			Mean	8.746		
704					Maximum	21			Median	10		
705					SD	3.589			Std. Error of Mean	0.748		
706					Coefficient of Variation	0.41			Skewness	1.566		
707												
708	**Normal GOF Test**											
709					Shapiro Wilk Test Statistic	0.679	**Shapiro Wilk GOF Test**					
710					1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level					
711					Lilliefors Test Statistic	0.32	**Lilliefors GOF Test**					
712					1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level					
713	**Data Not Normal at 1% Significance Level**											
714												
715	**Assuming Normal Distribution**											

716	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
717				95% Student's-t UCL		10.03				95% Adjusted-CLT UCL (Chen-1995)		10.24
718										95% Modified-t UCL (Johnson-1978)		10.07
719												
720	**Gamma GOF Test**											
721				A-D Test Statistic		3.048	**Anderson-Darling Gamma GOF Test**					
722				5% A-D Critical Value		0.746	Data Not Gamma Distributed at 5% Significance Level					
723				K-S Test Statistic		0.339	**Kolmogorov-Smirnov Gamma GOF Test**					
724				5% K-S Critical Value		0.182	Data Not Gamma Distributed at 5% Significance Level					
725	**Data Not Gamma Distributed at 5% Significance Level**											
726												
727	**Gamma Statistics**											
728				k hat (MLE)		6.963				k star (bias corrected MLE)		6.084
729				Theta hat (MLE)		1.256				Theta star (bias corrected MLE)		1.438
730				nu hat (MLE)		320.3				nu star (bias corrected)		279.9
731				MLE Mean (bias corrected)		8.746				MLE Sd (bias corrected)		3.546
732										Approximate Chi Square Value (0.05)		242.1
733				Adjusted Level of Significance		0.0389				Adjusted Chi Square Value		239.6
734												
735	**Assuming Gamma Distribution**											
736				95% Approximate Gamma UCL		10.11				95% Adjusted Gamma UCL		10.22
737												
738	**Lognormal GOF Test**											
739				Shapiro Wilk Test Statistic		0.73	**Shapiro Wilk Lognormal GOF Test**					
740				10% Shapiro Wilk Critical Value		0.928	Data Not Lognormal at 10% Significance Level					
741				Lilliefors Test Statistic		0.354	**Lilliefors Lognormal GOF Test**					
742				10% Lilliefors Critical Value		0.165	Data Not Lognormal at 10% Significance Level					
743	**Data Not Lognormal at 10% Significance Level**											
744												
745	**Lognormal Statistics**											
746				Minimum of Logged Data		1.609				Mean of logged Data		2.095
747				Maximum of Logged Data		3.045				SD of logged Data		0.391
748												
749	**Assuming Lognormal Distribution**											
750				95% H-UCL		10.26				90% Chebyshev (MVUE) UCL		10.93
751				95% Chebyshev (MVUE) UCL		11.92				97.5% Chebyshev (MVUE) UCL		13.3
752				99% Chebyshev (MVUE) UCL		16.01						
753												
754	**Nonparametric Distribution Free UCL Statistics**											
755	**Data do not follow a Discernible Distribution**											
756												
757	**Nonparametric Distribution Free UCLs**											
758				95% CLT UCL		9.976				95% BCA Bootstrap UCL		N/A
759				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
760				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
761				90% Chebyshev(Mean, Sd) UCL		10.99				95% Chebyshev(Mean, Sd) UCL		12.01
762				97.5% Chebyshev(Mean, Sd) UCL		13.42				99% Chebyshev(Mean, Sd) UCL		16.19
763												
764	**Suggested UCL to Use**											
765				95% Student's-t UCL		10.03						
766												
767	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
768	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
769	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
770												

UCL Statistics for Uncensored Full Data Sets

User Selected Options	Turbidity
Date/Time of Computation	ProUCL 5.2 2/27/2026 1:25:23 PM
From File	ProUCL_Input_UpgradientDowngradient_Split.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ResultValue (apw-02)

General Statistics

Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	0
Minimum	19.2	Mean	136.9
Maximum	663	Median	104
SD	151.6	Std. Error of Mean	39.14
Coefficient of Variation	1.108	Skewness	3.363

Normal GOF Test

Shapiro Wilk Test Statistic	0.554	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.835	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.337	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.255	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	205.8	95% Adjusted-CLT UCL (Chen-1995)	237.5
		95% Modified-t UCL (Johnson-1978)	211.4

Gamma GOF Test

A-D Test Statistic	0.956	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.75	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.218	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.225	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.745	k star (bias corrected MLE)	1.441
Theta hat (MLE)	78.41	Theta star (bias corrected MLE)	94.99
nu hat (MLE)	52.36	nu star (bias corrected)	43.22
MLE Mean (bias corrected)	136.9	MLE Sd (bias corrected)	114
		Approximate Chi Square Value (0.05)	29.15
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	27.73

Assuming Gamma Distribution

95% Approximate Gamma UCL	202.9	95% Adjusted Gamma UCL	213.3

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.916	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level

56	**Data appear Lognormal at 10% Significance Level**											
57												
58	**Lognormal Statistics**											
59						Minimum of Logged Data	2.955			Mean of logged Data	4.606	
60						Maximum of Logged Data	6.497			SD of logged Data	0.771	
61												
62	**Assuming Lognormal Distribution**											
63						95% H-UCL	220.9			90% Chebyshev (MVUE) UCL	214.9	
64						95% Chebyshev (MVUE) UCL	252.7			97.5% Chebyshev (MVUE) UCL	305.1	
65						99% Chebyshev (MVUE) UCL	408.2					
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution**											
69												
70	**Nonparametric Distribution Free UCLs**											
71						95% CLT UCL	201.2			95% BCA Bootstrap UCL	234.5	
72						95% Standard Bootstrap UCL	197.7			95% Bootstrap-t UCL	327.9	
73						95% Hall's Bootstrap UCL	469.7			95% Percentile Bootstrap UCL	203.8	
74						90% Chebyshev(Mean, Sd) UCL	254.3			95% Chebyshev(Mean, Sd) UCL	307.4	
75						97.5% Chebyshev(Mean, Sd) UCL	381.3			99% Chebyshev(Mean, Sd) UCL	526.3	
76												
77	**Suggested UCL to Use**											
78						95% Adjusted Gamma UCL	213.3					
79												
80	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
81	**Please verify the data were collected from random locations.**											
82	**If the data were collected using judgmental or other non-random methods,**											
83	**then contact a statistician to correctly calculate UCLs.**											
84												
85	When a data set follows an approximate distribution passing only one of the GOF tests,											
86	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
87												
88	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
89	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
90	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
91												
92												
93	**ResultValue (apw-03)**											
94												
95	**General Statistics**											
96						Total Number of Observations	15			Number of Distinct Observations	15	
97										Number of Missing Observations	0	
98						Minimum	1.94			Mean	20.98	
99						Maximum	103			Median	7.34	
100						SD	29.06			Std. Error of Mean	7.504	
101						Coefficient of Variation	1.385			Skewness	1.968	
102												
103	**Normal GOF Test**											
104						Shapiro Wilk Test Statistic	0.683			**Shapiro Wilk GOF Test**		
105						1% Shapiro Wilk Critical Value	0.835			Data Not Normal at 1% Significance Level		
106						Lilliefors Test Statistic	0.347			**Lilliefors GOF Test**		
107						1% Lilliefors Critical Value	0.255			Data Not Normal at 1% Significance Level		
108	**Data Not Normal at 1% Significance Level**											
109												
110	**Assuming Normal Distribution**											

111	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
112				95% Student's-t UCL		34.2				95% Adjusted-CLT UCL (Chen-1995)		37.4
113										95% Modified-t UCL (Johnson-1978)		34.84
114												
115	**Gamma GOF Test**											
116				A-D Test Statistic		1.104	**Anderson-Darling Gamma GOF Test**					
117				5% A-D Critical Value		0.774	Data Not Gamma Distributed at 5% Significance Level					
118				K-S Test Statistic		0.292	**Kolmogorov-Smirnov Gamma GOF Test**					
119				5% K-S Critical Value		0.23	Data Not Gamma Distributed at 5% Significance Level					
120	**Data Not Gamma Distributed at 5% Significance Level**											
121												
122	**Gamma Statistics**											
123				k hat (MLE)		0.779				k star (bias corrected MLE)		0.668
124				Theta hat (MLE)		26.93				Theta star (bias corrected MLE)		31.42
125				nu hat (MLE)		23.38				nu star (bias corrected)		20.03
126				MLE Mean (bias corrected)		20.98				MLE Sd (bias corrected)		25.68
127										Approximate Chi Square Value (0.05)		10.88
128				Adjusted Level of Significance		0.0324				Adjusted Chi Square Value		10.05
129												
130	**Assuming Gamma Distribution**											
131				95% Approximate Gamma UCL		38.65				95% Adjusted Gamma UCL		41.81
132												
133	**Lognormal GOF Test**											
134				Shapiro Wilk Test Statistic		0.907	**Shapiro Wilk Lognormal GOF Test**					
135				10% Shapiro Wilk Critical Value		0.901	Data appear Lognormal at 10% Significance Level					
136				Lilliefors Test Statistic		0.224	**Lilliefors Lognormal GOF Test**					
137				10% Lilliefors Critical Value		0.202	Data Not Lognormal at 10% Significance Level					
138	**Data appear Approximate Lognormal at 10% Significance Level**											
139												
140	**Lognormal Statistics**											
141				Minimum of Logged Data		0.663				Mean of logged Data		2.279
142				Maximum of Logged Data		4.635				SD of logged Data		1.235
143												
144	**Assuming Lognormal Distribution**											
145				95% H-UCL		59.05				90% Chebyshev (MVUE) UCL		40.09
146				95% Chebyshev (MVUE) UCL		49.48				97.5% Chebyshev (MVUE) UCL		62.51
147				99% Chebyshev (MVUE) UCL		88.12						
148												
149	**Nonparametric Distribution Free UCL Statistics**											
150	**Data appear to follow a Discernible Distribution**											
151												
152	**Nonparametric Distribution Free UCLs**											
153				95% CLT UCL		33.33				95% BCA Bootstrap UCL		38.09
154				95% Standard Bootstrap UCL		32.92				95% Bootstrap-t UCL		46.43
155				95% Hall's Bootstrap UCL		35.83				95% Percentile Bootstrap UCL		33.36
156				90% Chebyshev(Mean, Sd) UCL		43.5				95% Chebyshev(Mean, Sd) UCL		53.69
157				97.5% Chebyshev(Mean, Sd) UCL		67.85				99% Chebyshev(Mean, Sd) UCL		95.65
158												
159	**Suggested UCL to Use**											
160				95% H-UCL		59.05						
161												
162	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
163	**Please verify the data were collected from random locations.**											
164	**If the data were collected using judgmental or other non-random methods,**											
165	**then contact a statistician to correctly calculate UCLs.**											

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ResultValue (apw-05)

General Statistics

Total Number of Observations	4	Number of Distinct Observations	4
		Number of Missing Observations	0
Minimum	4.65	Mean	18.46
Maximum	51.8	Median	8.7
SD	22.31	Std. Error of Mean	11.16
Coefficient of Variation	1.208	Skewness	1.953

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.71	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.687	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.411	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.413	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	44.71	95% Adjusted-CLT UCL (Chen-1995)	48.45
		95% Modified-t UCL (Johnson-1978)	46.53

Gamma GOF Test

A-D Test Statistic	0.576	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.665	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.395	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.401	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	1.218	k star (bias corrected MLE)	0.471
Theta hat (MLE)	15.16	Theta star (bias corrected MLE)	39.19
nu hat (MLE)	9.741	nu star (bias corrected)	3.769
MLE Mean (bias corrected)	18.46	MLE Sd (bias corrected)	26.9
		Approximate Chi Square Value (0.05)	0.632
Adjusted Level of Significance	N/A	Adjusted Chi Square Value	N/A

Assuming Gamma Distribution

95% Approximate Gamma UCL	110	95% Adjusted Gamma UCL	N/A

Lognormal GOF Test

221				Shapiro Wilk Test Statistic	0.864	**Shapiro Wilk Lognormal GOF Test**						
222				10% Shapiro Wilk Critical Value	0.792	Data appear Lognormal at 10% Significance Level						
223				Lilliefors Test Statistic	0.339	**Lilliefors Lognormal GOF Test**						
224				10% Lilliefors Critical Value	0.346	Data appear Lognormal at 10% Significance Level						
225				**Data appear Lognormal at 10% Significance Level**								
226				**Note GOF tests may be unreliable for small sample sizes**								
227												
228				**Lognormal Statistics**								
229				Minimum of Logged Data	1.537	Mean of logged Data	2.452					
230				Maximum of Logged Data	3.947	SD of logged Data	1.041					
231												
232				**Assuming Lognormal Distribution**								
233				95% H-UCL	1280	90% Chebyshev (MVUE) UCL	41.34					
234				95% Chebyshev (MVUE) UCL	52.39	97.5% Chebyshev (MVUE) UCL	67.73					
235				99% Chebyshev (MVUE) UCL	97.86							
236												
237				**Nonparametric Distribution Free UCL Statistics**								
238				**Data appear to follow a Discernible Distribution**								
239												
240				**Nonparametric Distribution Free UCLs**								
241				95% CLT UCL	36.81	95% BCA Bootstrap UCL	N/A					
242				95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A					
243				95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A					
244				90% Chebyshev(Mean, Sd) UCL	51.93	95% Chebyshev(Mean, Sd) UCL	67.09					
245				97.5% Chebyshev(Mean, Sd) UCL	88.13	99% Chebyshev(Mean, Sd) UCL	129.5					
246												
247				**Suggested UCL to Use**								
248				95% Student's-t UCL	44.71							
249												
250				**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**								
251				**Please verify the data were collected from random locations.**								
252				**If the data were collected using judgmental or other non-random methods,**								
253				**then contact a statistician to correctly calculate UCLs.**								
254												
255				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.								
256				Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.								
257				However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.								
258												
259												
260	**ResultValue (apw-05r)**											
261												
262				**General Statistics**								
263				Total Number of Observations	11	Number of Distinct Observations	11					
264						Number of Missing Observations	0					
265				Minimum	8.02	Mean	34.36					
266				Maximum	76.1	Median	32.8					
267				SD	20.72	Std. Error of Mean	6.246					
268				Coefficient of Variation	0.603	Skewness	0.913					
269												
270				**Normal GOF Test**								
271				Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**						
272				1% Shapiro Wilk Critical Value	0.792	Data appear Normal at 1% Significance Level						
273				Lilliefors Test Statistic	0.164	**Lilliefors GOF Test**						
274				1% Lilliefors Critical Value	0.291	Data appear Normal at 1% Significance Level						
275				**Data appear Normal at 1% Significance Level**								

276												
277	**Assuming Normal Distribution**											
278	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
279			95% Student's-t UCL		45.68			95% Adjusted-CLT UCL (Chen-1995)			46.47	
280								95% Modified-t UCL (Johnson-1978)			45.96	
281												
282	**Gamma GOF Test**											
283			A-D Test Statistic		0.156		**Anderson-Darling Gamma GOF Test**					
284			5% A-D Critical Value		0.734		Detected data appear Gamma Distributed at 5% Significance Level					
285			K-S Test Statistic		0.101		**Kolmogorov-Smirnov Gamma GOF Test**					
286			5% K-S Critical Value		0.257		Detected data appear Gamma Distributed at 5% Significance Level					
287	**Detected data appear Gamma Distributed at 5% Significance Level**											
288												
289	**Gamma Statistics**											
290			k hat (MLE)		2.951			k star (bias corrected MLE)			2.207	
291			Theta hat (MLE)		11.64			Theta star (bias corrected MLE)			15.57	
292			nu hat (MLE)		64.93			nu star (bias corrected)			48.55	
293			MLE Mean (bias corrected)		34.36			MLE Sd (bias corrected)			23.13	
294								Approximate Chi Square Value (0.05)			33.56	
295			Adjusted Level of Significance		0.0278			Adjusted Chi Square Value			31.54	
296												
297	**Assuming Gamma Distribution**											
298			95% Approximate Gamma UCL		49.71			95% Adjusted Gamma UCL			52.89	
299												
300	**Lognormal GOF Test**											
301			Shapiro Wilk Test Statistic		0.974		**Shapiro Wilk Lognormal GOF Test**					
302			10% Shapiro Wilk Critical Value		0.876		Data appear Lognormal at 10% Significance Level					
303			Lilliefors Test Statistic		0.125		**Lilliefors Lognormal GOF Test**					
304			10% Lilliefors Critical Value		0.231		Data appear Lognormal at 10% Significance Level					
305	**Data appear Lognormal at 10% Significance Level**											
306												
307	**Lognormal Statistics**											
308			Minimum of Logged Data		2.082			Mean of logged Data			3.358	
309			Maximum of Logged Data		4.332			SD of logged Data			0.657	
310												
311	**Assuming Lognormal Distribution**											
312			95% H-UCL		58.69			90% Chebyshev (MVUE) UCL			56.25	
313			95% Chebyshev (MVUE) UCL		65.95			97.5% Chebyshev (MVUE) UCL			79.4	
314			99% Chebyshev (MVUE) UCL		105.8							
315												
316	**Nonparametric Distribution Free UCL Statistics**											
317	**Data appear to follow a Discernible Distribution**											
318												
319	**Nonparametric Distribution Free UCLs**											
320			95% CLT UCL		44.63			95% BCA Bootstrap UCL			45.83	
321			95% Standard Bootstrap UCL		44.29			95% Bootstrap-t UCL			50.9	
322			95% Hall's Bootstrap UCL		58.35			95% Percentile Bootstrap UCL			44.37	
323			90% Chebyshev(Mean, Sd) UCL		53.1			95% Chebyshev(Mean, Sd) UCL			61.58	
324			97.5% Chebyshev(Mean, Sd) UCL		73.37			99% Chebyshev(Mean, Sd) UCL			96.51	
325												
326	**Suggested UCL to Use**											
327			95% Student's-t UCL		45.68							
328												
329	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
330	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											

331	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
332												
333												
334	**ResultValue (apw-06d)**											
335												
336	**General Statistics**											
337					Total Number of Observations	14			Number of Distinct Observations	14		
338									Number of Missing Observations	0		
339					Minimum	1.12			Mean	33.87		
340					Maximum	181			Median	18.35		
341					SD	47.97			Std. Error of Mean	12.82		
342					Coefficient of Variation	1.416			Skewness	2.543		
343												
344	**Normal GOF Test**											
345					Shapiro Wilk Test Statistic	0.674			**Shapiro Wilk GOF Test**			
346					1% Shapiro Wilk Critical Value	0.825			Data Not Normal at 1% Significance Level			
347					Lilliefors Test Statistic	0.272			**Lilliefors GOF Test**			
348					1% Lilliefors Critical Value	0.263			Data Not Normal at 1% Significance Level			
349	**Data Not Normal at 1% Significance Level**											
350												
351	**Assuming Normal Distribution**											
352					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
353					95% Student's-t UCL	56.58			95% Adjusted-CLT UCL (Chen-1995)	64.27		
354									95% Modified-t UCL (Johnson-1978)	58.03		
355												
356	**Gamma GOF Test**											
357					A-D Test Statistic	0.292			**Anderson-Darling Gamma GOF Test**			
358					5% A-D Critical Value	0.771			Detected data appear Gamma Distributed at 5% Significance Level			
359					K-S Test Statistic	0.134			**Kolmogorov-Smirnov Gamma GOF Test**			
360					5% K-S Critical Value	0.238			Detected data appear Gamma Distributed at 5% Significance Level			
361	**Detected data appear Gamma Distributed at 5% Significance Level**											
362												
363	**Gamma Statistics**											
364					k hat (MLE)	0.748			k star (bias corrected MLE)	0.635		
365					Theta hat (MLE)	45.3			Theta star (bias corrected MLE)	53.33		
366					nu hat (MLE)	20.94			nu star (bias corrected)	17.79		
367					MLE Mean (bias corrected)	33.87			MLE Sd (bias corrected)	42.5		
368									Approximate Chi Square Value (0.05)	9.236		
369					Adjusted Level of Significance	0.0312			Adjusted Chi Square Value	8.429		
370												
371	**Assuming Gamma Distribution**											
372					95% Approximate Gamma UCL	65.23			95% Adjusted Gamma UCL	71.47		
373												
374	**Lognormal GOF Test**											
375					Shapiro Wilk Test Statistic	0.989			**Shapiro Wilk Lognormal GOF Test**			
376					10% Shapiro Wilk Critical Value	0.895			Data appear Lognormal at 10% Significance Level			
377					Lilliefors Test Statistic	0.123			**Lilliefors Lognormal GOF Test**			
378					10% Lilliefors Critical Value	0.208			Data appear Lognormal at 10% Significance Level			
379	**Data appear Lognormal at 10% Significance Level**											
380												
381	**Lognormal Statistics**											
382					Minimum of Logged Data	0.113			Mean of logged Data	2.722		
383					Maximum of Logged Data	5.198			SD of logged Data	1.392		
384												
385	**Assuming Lognormal Distribution**											

386				95% H-UCL	153.9				90% Chebyshev (MVUE) UCL	80.26		
387				95% Chebyshev (MVUE) UCL	100.5				97.5% Chebyshev (MVUE) UCL	128.5		
388				99% Chebyshev (MVUE) UCL	183.6							
389												
390					**Nonparametric Distribution Free UCL Statistics**							
391					**Data appear to follow a Discernible Distribution**							
392												
393					**Nonparametric Distribution Free UCLs**							
394				95% CLT UCL	54.96				95% BCA Bootstrap UCL	67.52		
395				95% Standard Bootstrap UCL	54.53				95% Bootstrap-t UCL	80.92		
396				95% Hall's Bootstrap UCL	130.3				95% Percentile Bootstrap UCL	56.6		
397				90% Chebyshev(Mean, Sd) UCL	72.34				95% Chebyshev(Mean, Sd) UCL	89.76		
398				97.5% Chebyshev(Mean, Sd) UCL	113.9				99% Chebyshev(Mean, Sd) UCL	161.4		
399												
400					**Suggested UCL to Use**							
401				95% Adjusted Gamma UCL	71.47							
402												
403					**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**							
404					**Please verify the data were collected from random locations.**							
405					**If the data were collected using judgmental or other non-random methods,**							
406					**then contact a statistician to correctly calculate UCLs.**							
407												
408					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
409					Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.							
410					However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.							
411												
412												
413	**ResultValue (apw-06s)**											
414												
415					**General Statistics**							
416				Total Number of Observations	15				Number of Distinct Observations	15		
417									Number of Missing Observations	0		
418				Minimum	1.26				Mean	16.76		
419				Maximum	87				Median	8.11		
420				SD	22.19				Std. Error of Mean	5.729		
421				Coefficient of Variation	1.324				Skewness	2.596		
422												
423					**Normal GOF Test**							
424				Shapiro Wilk Test Statistic	0.659				**Shapiro Wilk GOF Test**			
425				1% Shapiro Wilk Critical Value	0.835				Data Not Normal at 1% Significance Level			
426				Lilliefors Test Statistic	0.302				**Lilliefors GOF Test**			
427				1% Lilliefors Critical Value	0.255				Data Not Normal at 1% Significance Level			
428					**Data Not Normal at 1% Significance Level**							
429												
430					**Assuming Normal Distribution**							
431				**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**			
432				95% Student's-t UCL	26.85				95% Adjusted-CLT UCL (Chen-1995)	30.28		
433									95% Modified-t UCL (Johnson-1978)	27.49		
434												
435					**Gamma GOF Test**							
436				A-D Test Statistic	0.676				**Anderson-Darling Gamma GOF Test**			
437				5% A-D Critical Value	0.763				Detected data appear Gamma Distributed at 5% Significance Level			
438				K-S Test Statistic	0.249				**Kolmogorov-Smirnov Gamma GOF Test**			
439				5% K-S Critical Value	0.228				Data Not Gamma Distributed at 5% Significance Level			
440					**Detected data follow Appr. Gamma Distribution at 5% Significance Level**							

441												
442						**Gamma Statistics**						
443						k hat (MLE)	1			k star (bias corrected MLE)	0.844	
444						Theta hat (MLE)	16.76			Theta star (bias corrected MLE)	19.85	
445						nu hat (MLE)	29.99			nu star (bias corrected)	25.33	
446						MLE Mean (bias corrected)	16.76			MLE Sd (bias corrected)	18.24	
447										Approximate Chi Square Value (0.05)	14.86	
448						Adjusted Level of Significance	0.0324			Adjusted Chi Square Value	13.88	
449												
450						**Assuming Gamma Distribution**						
451						95% Approximate Gamma UCL	28.55			95% Adjusted Gamma UCL	30.57	
452												
453						**Lognormal GOF Test**						
454						Shapiro Wilk Test Statistic	0.971			**Shapiro Wilk Lognormal GOF Test**		
455						10% Shapiro Wilk Critical Value	0.901			Data appear Lognormal at 10% Significance Level		
456						Lilliefors Test Statistic	0.181			**Lilliefors Lognormal GOF Test**		
457						10% Lilliefors Critical Value	0.202			Data appear Lognormal at 10% Significance Level		
458						**Data appear Lognormal at 10% Significance Level**						
459												
460						**Lognormal Statistics**						
461						Minimum of Logged Data	0.231			Mean of logged Data	2.241	
462						Maximum of Logged Data	4.466			SD of logged Data	1.079	
463												
464						**Assuming Lognormal Distribution**						
465						95% H-UCL	38.54			90% Chebyshev (MVUE) UCL	30.59	
466						95% Chebyshev (MVUE) UCL	37.23			97.5% Chebyshev (MVUE) UCL	46.46	
467						99% Chebyshev (MVUE) UCL	64.57					
468												
469						**Nonparametric Distribution Free UCL Statistics**						
470						**Data appear to follow a Discernible Distribution**						
471												
472						**Nonparametric Distribution Free UCLs**						
473						95% CLT UCL	26.18			95% BCA Bootstrap UCL	31.47	
474						95% Standard Bootstrap UCL	25.88			95% Bootstrap-t UCL	41.52	
475						95% Hall's Bootstrap UCL	60.7			95% Percentile Bootstrap UCL	27.09	
476						90% Chebyshev(Mean, Sd) UCL	33.94			95% Chebyshev(Mean, Sd) UCL	41.73	
477						97.5% Chebyshev(Mean, Sd) UCL	52.54			99% Chebyshev(Mean, Sd) UCL	73.76	
478												
479						**Suggested UCL to Use**						
480						95% Adjusted Gamma UCL	30.57					
481												
482						**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**						
483						**Please verify the data were collected from random locations.**						
484						**If the data were collected using judgmental or other non-random methods,**						
485						**then contact a statistician to correctly calculate UCLs.**						
486												
487						When a data set follows an approximate distribution passing only one of the GOF tests,						
488						it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL						
489												
490						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
491						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.						
492						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
493												
494												
495	**ResultValue (apw-07)**											

496												
497						**General Statistics**						
498					Total Number of Observations	14			Number of Distinct Observations	14		
499									Number of Missing Observations	0		
500					Minimum	3.34			Mean	22.79		
501					Maximum	79.2			Median	12.65		
502					SD	24.27			Std. Error of Mean	6.487		
503					Coefficient of Variation	1.065			Skewness	1.49		
504												
505						**Normal GOF Test**						
506					Shapiro Wilk Test Statistic	0.779			**Shapiro Wilk GOF Test**			
507					1% Shapiro Wilk Critical Value	0.825			Data Not Normal at 1% Significance Level			
508					Lilliefors Test Statistic	0.261			**Lilliefors GOF Test**			
509					1% Lilliefors Critical Value	0.263			Data appear Normal at 1% Significance Level			
510						**Data appear Approximate Normal at 1% Significance Level**						
511												
512						**Assuming Normal Distribution**						
513					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
514					95% Student's-t UCL	34.28			95% Adjusted-CLT UCL (Chen-1995)	36.22		
515									95% Modified-t UCL (Johnson-1978)	34.71		
516												
517						**Gamma GOF Test**						
518					A-D Test Statistic	0.536			**Anderson-Darling Gamma GOF Test**			
519					5% A-D Critical Value	0.757			Detected data appear Gamma Distributed at 5% Significance Level			
520					K-S Test Statistic	0.169			**Kolmogorov-Smirnov Gamma GOF Test**			
521					5% K-S Critical Value	0.234			Detected data appear Gamma Distributed at 5% Significance Level			
522						**Detected data appear Gamma Distributed at 5% Significance Level**						
523												
524						**Gamma Statistics**						
525					k hat (MLE)	1.15			k star (bias corrected MLE)	0.951		
526					Theta hat (MLE)	19.81			Theta star (bias corrected MLE)	23.96		
527					nu hat (MLE)	32.2			nu star (bias corrected)	26.63		
528					MLE Mean (bias corrected)	22.79			MLE Sd (bias corrected)	23.36		
529									Approximate Chi Square Value (0.05)	15.87		
530					Adjusted Level of Significance	0.0312			Adjusted Chi Square Value	14.77		
531												
532						**Assuming Gamma Distribution**						
533					95% Approximate Gamma UCL	38.25			95% Adjusted Gamma UCL	41.08		
534												
535						**Lognormal GOF Test**						
536					Shapiro Wilk Test Statistic	0.945			**Shapiro Wilk Lognormal GOF Test**			
537					10% Shapiro Wilk Critical Value	0.895			Data appear Lognormal at 10% Significance Level			
538					Lilliefors Test Statistic	0.11			**Lilliefors Lognormal GOF Test**			
539					10% Lilliefors Critical Value	0.208			Data appear Lognormal at 10% Significance Level			
540						**Data appear Lognormal at 10% Significance Level**						
541												
542						**Lognormal Statistics**						
543					Minimum of Logged Data	1.206			Mean of logged Data	2.632		
544					Maximum of Logged Data	4.372			SD of logged Data	1.028		
545												
546						**Assuming Lognormal Distribution**						
547					95% H-UCL	52.91			90% Chebyshev (MVUE) UCL	42.42		
548					95% Chebyshev (MVUE) UCL	51.51			97.5% Chebyshev (MVUE) UCL	64.12		
549					99% Chebyshev (MVUE) UCL	88.89						
550												

	A	B	C	D	E	F	G	H	I	J	K	L
551	**Nonparametric Distribution Free UCL Statistics**											
552	**Data appear to follow a Discernible Distribution**											
553												
554	**Nonparametric Distribution Free UCLs**											
555					95% CLT UCL	33.46			95% BCA Bootstrap UCL	34.58		
556					95% Standard Bootstrap UCL	32.69			95% Bootstrap-t UCL	39.25		
557					95% Hall's Bootstrap UCL	38.16			95% Percentile Bootstrap UCL	33.29		
558					90% Chebyshev(Mean, Sd) UCL	42.25			95% Chebyshev(Mean, Sd) UCL	51.07		
559					97.5% Chebyshev(Mean, Sd) UCL	63.3			99% Chebyshev(Mean, Sd) UCL	87.34		
560												
561	**Suggested UCL to Use**											
562					95% Student's-t UCL	34.28						
563												
564	**The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.**											
565	**Please verify the data were collected from random locations.**											
566	**If the data were collected using judgmental or other non-random methods,**											
567	**then contact a statistician to correctly calculate UCLs.**											
568												
569	When a data set follows an approximate distribution passing only one of the GOF tests,											
570	it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL											
571												
572	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
573	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
574	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
575												
576												
577	**ResultValue (apw-08)**											
578												
579	**General Statistics**											
580					Total Number of Observations	15			Number of Distinct Observations	15		
581									Number of Missing Observations	0		
582					Minimum	6.7			Mean	103.7		
583					Maximum	305			Median	119		
584					SD	83.7			Std. Error of Mean	21.61		
585					Coefficient of Variation	0.807			Skewness	0.746		
586												
587	**Normal GOF Test**											
588					Shapiro Wilk Test Statistic	0.894			**Shapiro Wilk GOF Test**			
589					1% Shapiro Wilk Critical Value	0.835			Data appear Normal at 1% Significance Level			
590					Lilliefors Test Statistic	0.154			**Lilliefors GOF Test**			
591					1% Lilliefors Critical Value	0.255			Data appear Normal at 1% Significance Level			
592	**Data appear Normal at 1% Significance Level**											
593												
594	**Assuming Normal Distribution**											
595	**95% Normal UCL**								**95% UCLs (Adjusted for Skewness)**			
596					95% Student's-t UCL	141.8			95% Adjusted-CLT UCL (Chen-1995)	143.7		
597									95% Modified-t UCL (Johnson-1978)	142.5		
598												
599	**Gamma GOF Test**											
600					A-D Test Statistic	0.718			**Anderson-Darling Gamma GOF Test**			
601					5% A-D Critical Value	0.761			Detected data appear Gamma Distributed at 5% Significance Level			
602					K-S Test Statistic	0.212			**Kolmogorov-Smirnov Gamma GOF Test**			
603					5% K-S Critical Value	0.227			Detected data appear Gamma Distributed at 5% Significance Level			
604	**Detected data appear Gamma Distributed at 5% Significance Level**											
605												

606	**Gamma Statistics**											
607					k hat (MLE)	1.128			k star (bias corrected MLE)	0.947		
608					Theta hat (MLE)	91.96			Theta star (bias corrected MLE)	109.6		
609					nu hat (MLE)	33.83			nu star (bias corrected)	28.4		
610					MLE Mean (bias corrected)	103.7			MLE Sd (bias corrected)	106.6		
611									Approximate Chi Square Value (0.05)	17.24		
612					Adjusted Level of Significance	0.0324			Adjusted Chi Square Value	16.17		
613												
614	**Assuming Gamma Distribution**											
615					95% Approximate Gamma UCL	170.8			95% Adjusted Gamma UCL	182.1		
616												
617	**Lognormal GOF Test**											
618					Shapiro Wilk Test Statistic	0.873			**Shapiro Wilk Lognormal GOF Test**			
619					10% Shapiro Wilk Critical Value	0.901			Data Not Lognormal at 10% Significance Level			
620					Lilliefors Test Statistic	0.241			**Lilliefors Lognormal GOF Test**			
621					10% Lilliefors Critical Value	0.202			Data Not Lognormal at 10% Significance Level			
622	**Data Not Lognormal at 10% Significance Level**											
623												
624	**Lognormal Statistics**											
625					Minimum of Logged Data	1.902			Mean of logged Data	4.137		
626					Maximum of Logged Data	5.72			SD of logged Data	1.227		
627												
628	**Assuming Lognormal Distribution**											
629					95% H-UCL	370.3			90% Chebyshev (MVUE) UCL	253.6		
630					95% Chebyshev (MVUE) UCL	312.9			97.5% Chebyshev (MVUE) UCL	395		
631					99% Chebyshev (MVUE) UCL	556.5						
632												
633	**Nonparametric Distribution Free UCL Statistics**											
634	**Data appear to follow a Discernible Distribution**											
635												
636	**Nonparametric Distribution Free UCLs**											
637					95% CLT UCL	139.3			95% BCA Bootstrap UCL	141.5		
638					95% Standard Bootstrap UCL	137.6			95% Bootstrap-t UCL	144.8		
639					95% Hall's Bootstrap UCL	148.7			95% Percentile Bootstrap UCL	138.4		
640					90% Chebyshev(Mean, Sd) UCL	168.5			95% Chebyshev(Mean, Sd) UCL	197.9		
641					97.5% Chebyshev(Mean, Sd) UCL	238.7			99% Chebyshev(Mean, Sd) UCL	318.7		
642												
643	**Suggested UCL to Use**											
644					95% Student's-t UCL	141.8						
645												
646	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
647	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
648	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
649												
650												
651	**ResultValue (apw-10d)**											
652												
653	**General Statistics**											
654					Total Number of Observations	15			Number of Distinct Observations	13		
655									Number of Missing Observations	0		
656					Minimum	4.76			Mean	87.44		
657					Maximum	198			Median	46.9		
658					SD	74.5			Std. Error of Mean	19.23		
659					Coefficient of Variation	0.852			Skewness	0.464		
660												

661	**Normal GOF Test**											
662				Shapiro Wilk Test Statistic	0.838	**Shapiro Wilk GOF Test**						
663				1% Shapiro Wilk Critical Value	0.835	Data appear Normal at 1% Significance Level						
664				Lilliefors Test Statistic	0.244	**Lilliefors GOF Test**						
665				1% Lilliefors Critical Value	0.255	Data appear Normal at 1% Significance Level						
666	**Data appear Normal at 1% Significance Level**											
667												
668	**Assuming Normal Distribution**											
669	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
670				95% Student's-t UCL	121.3			95% Adjusted-CLT UCL (Chen-1995)	121.5			
671								95% Modified-t UCL (Johnson-1978)	121.7			
672												
673	**Gamma GOF Test**											
674				A-D Test Statistic	0.551	**Anderson-Darling Gamma GOF Test**						
675				5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level						
676				K-S Test Statistic	0.192	**Kolmogorov-Smirnov Gamma GOF Test**						
677				5% K-S Critical Value	0.228	Detected data appear Gamma Distributed at 5% Significance Level						
678	**Detected data appear Gamma Distributed at 5% Significance Level**											
679												
680	**Gamma Statistics**											
681				k hat (MLE)	1.081			k star (bias corrected MLE)	0.909			
682				Theta hat (MLE)	80.89			Theta star (bias corrected MLE)	96.17			
683				nu hat (MLE)	32.43			nu star (bias corrected)	27.28			
684				MLE Mean (bias corrected)	87.44			MLE Sd (bias corrected)	91.7			
685								Approximate Chi Square Value (0.05)	16.37			
686				Adjusted Level of Significance	0.0324			Adjusted Chi Square Value	15.33			
687												
688	**Assuming Gamma Distribution**											
689				95% Approximate Gamma UCL	145.7			95% Adjusted Gamma UCL	155.6			
690												
691	**Lognormal GOF Test**											
692				Shapiro Wilk Test Statistic	0.892	**Shapiro Wilk Lognormal GOF Test**						
693				10% Shapiro Wilk Critical Value	0.901	Data Not Lognormal at 10% Significance Level						
694				Lilliefors Test Statistic	0.165	**Lilliefors Lognormal GOF Test**						
695				10% Lilliefors Critical Value	0.202	Data appear Lognormal at 10% Significance Level						
696	**Data appear Approximate Lognormal at 10% Significance Level**											
697												
698	**Lognormal Statistics**											
699				Minimum of Logged Data	1.56			Mean of logged Data	3.942			
700				Maximum of Logged Data	5.288			SD of logged Data	1.239			
701												
702	**Assuming Lognormal Distribution**											
703				95% H-UCL	314.2			90% Chebyshev (MVUE) UCL	212.4			
704				95% Chebyshev (MVUE) UCL	262.3			97.5% Chebyshev (MVUE) UCL	331.5			
705				99% Chebyshev (MVUE) UCL	467.4							
706												
707	**Nonparametric Distribution Free UCL Statistics**											
708	**Data appear to follow a Discernible Distribution**											
709												
710	**Nonparametric Distribution Free UCLs**											
711				95% CLT UCL	119.1			95% BCA Bootstrap UCL	117.5			
712				95% Standard Bootstrap UCL	117.6			95% Bootstrap-t UCL	122.3			
713				95% Hall's Bootstrap UCL	116			95% Percentile Bootstrap UCL	119.4			
714				90% Chebyshev(Mean, Sd) UCL	145.1			95% Chebyshev(Mean, Sd) UCL	171.3			
715				97.5% Chebyshev(Mean, Sd) UCL	207.6			99% Chebyshev(Mean, Sd) UCL	278.8			

716												
717						**Suggested UCL to Use**						
718					95% Student's-t UCL	121.3						
719												
720						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
721						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.						
722						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.						
723												
724												
725	**ResultValue (apw-10s)**											
726												
727						**General Statistics**						
728					Total Number of Observations	15			Number of Distinct Observations	15		
729									Number of Missing Observations	0		
730					Minimum	3.78			Mean	32.43		
731					Maximum	63.6			Median	34.3		
732					SD	22.78			Std. Error of Mean	5.881		
733					Coefficient of Variation	0.702			Skewness	0.112		
734												
735						**Normal GOF Test**						
736					Shapiro Wilk Test Statistic	0.884			**Shapiro Wilk GOF Test**			
737					1% Shapiro Wilk Critical Value	0.835			Data appear Normal at 1% Significance Level			
738					Lilliefors Test Statistic	0.168			**Lilliefors GOF Test**			
739					1% Lilliefors Critical Value	0.255			Data appear Normal at 1% Significance Level			
740						**Data appear Normal at 1% Significance Level**						
741												
742						**Assuming Normal Distribution**						
743					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
744					95% Student's-t UCL	42.79			95% Adjusted-CLT UCL (Chen-1995)	42.28		
745									95% Modified-t UCL (Johnson-1978)	42.81		
746												
747						**Gamma GOF Test**						
748					A-D Test Statistic	0.594			**Anderson-Darling Gamma GOF Test**			
749					5% A-D Critical Value	0.753			Detected data appear Gamma Distributed at 5% Significance Level			
750					K-S Test Statistic	0.166			**Kolmogorov-Smirnov Gamma GOF Test**			
751					5% K-S Critical Value	0.225			Detected data appear Gamma Distributed at 5% Significance Level			
752						**Detected data appear Gamma Distributed at 5% Significance Level**						
753												
754						**Gamma Statistics**						
755					k hat (MLE)	1.564			k star (bias corrected MLE)	1.296		
756					Theta hat (MLE)	20.74			Theta star (bias corrected MLE)	25.03		
757					nu hat (MLE)	46.92			nu star (bias corrected)	38.87		
758					MLE Mean (bias corrected)	32.43			MLE Sd (bias corrected)	28.49		
759									Approximate Chi Square Value (0.05)	25.59		
760					Adjusted Level of Significance	0.0324			Adjusted Chi Square Value	24.27		
761												
762						**Assuming Gamma Distribution**						
763					95% Approximate Gamma UCL	49.26			95% Adjusted Gamma UCL	51.94		
764												
765						**Lognormal GOF Test**						
766					Shapiro Wilk Test Statistic	0.887			**Shapiro Wilk Lognormal GOF Test**			
767					10% Shapiro Wilk Critical Value	0.901			Data Not Lognormal at 10% Significance Level			
768					Lilliefors Test Statistic	0.195			**Lilliefors Lognormal GOF Test**			
769					10% Lilliefors Critical Value	0.202			Data appear Lognormal at 10% Significance Level			
770						**Data appear Approximate Lognormal at 10% Significance Level**						

771												
772	**Lognormal Statistics**											
773					Minimum of Logged Data	1.33				Mean of logged Data	3.126	
774					Maximum of Logged Data	4.153				SD of logged Data	0.977	
775												
776	**Assuming Lognormal Distribution**											
777					95% H-UCL	74.5				90% Chebyshev (MVUE) UCL	64.18	
778					95% Chebyshev (MVUE) UCL	77.32				97.5% Chebyshev (MVUE) UCL	95.56	
779					99% Chebyshev (MVUE) UCL	131.4						
780												
781	**Nonparametric Distribution Free UCL Statistics**											
782	**Data appear to follow a Discernible Distribution**											
783												
784	**Nonparametric Distribution Free UCLs**											
785					95% CLT UCL	42.1				95% BCA Bootstrap UCL	42.1	
786					95% Standard Bootstrap UCL	41.82				95% Bootstrap-t UCL	43	
787					95% Hall's Bootstrap UCL	41.47				95% Percentile Bootstrap UCL	41.81	
788					90% Chebyshev(Mean, Sd) UCL	50.07				95% Chebyshev(Mean, Sd) UCL	58.06	
789					97.5% Chebyshev(Mean, Sd) UCL	69.15				99% Chebyshev(Mean, Sd) UCL	90.94	
790												
791	**Suggested UCL to Use**											
792					95% Student's-t UCL	42.79						
793												
794	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
795	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.											
796	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
797												