Michigan Department of Environment, Great Lakes, and Energy
Quarterly Other Cleanup Authority Report - Summary of Recent Activities and Response Actions
Gelman Sciences Inc. Site
May 10, 2019

This document provides a brief update of activities conducted from October 2018 thru March 2019. Links to other historical information about the Gelman site are also provided below.

2018 Residential Well Sampling

The residential and business water supply well sampling activities for 2018 were completed in August 2018. In 2018, out of 67 water supply wells sampled, none of the water supply wells exceeded the 7.2 parts per billion (ppb) criterion for 1,4-dioxane (Dioxane) in residential drinking water. Dioxane was detected in only two residential wells on the south side of Elizabeth Road at concentrations ranging from 1-2 ppb, well below the 7.2 ppb criterion. Both properties have had previous detections ranging from 1-4 ppb.

In collaboration with the Washtenaw County Health Department (WCHD), the Department of Environment Great Lakes and Energy (EGLE) initiated sampling of residential and business water supply wells within and around the known Dioxane groundwater contamination plume in the 1990's as part of the monitoring activities to evaluate and abate risk of exposure to contamination above the applicable state drinking water criterion (note that there is no applicable federal criterion). Both EGLE and the WCHD annually review which water supply wells should be sampled. The wells are sampled by WCHD, usually once per year with specific wells sampled twice per year. The 2018 sampling activities included wells along Christine Drive (last sampled in 2014), Lakeview Drive (last sampled in 2016), and Rose Drive (last sampled in 2016). As stated above WCHD was able to collect samples at 67 locations.

Washtenaw County communicates results directly to well owners and building occupants. Results (identified by address) for water supply well samples collected since 1998 and including 2018 are posted on the EGLE "Gelman Sciences, Inc. Site of Contamination Information Page" under the "Recent Analytical Data" tab which can be accessed using the link provided below.

Recent Analytical Data

2019 Residential Well Sampling

For 2019, a total of 117 water supply wells are planned to be sampled as part of the ongoing residential and business water supply well sampling program. These include locations along Dexter Road (last sampled in 2017), W. Delhi Road (last sampled in 2014), and Breezewood Court (last sampled in 2014). The 2019

sampling activities also include first time sampling of locations along W. Liberty Road, Saginaw Court, and Westview Way. During the 2019 sampling activities selected locations will also be sampled for Full Scan Volatile Organic Compounds VOCs) and Semi-Volatile Organic Compounds (SVOC). The sampling activities were initiated during the week of April 15 and will be completed by October 2019.

Monitoring Well Sampling

Gelman currently conducts sampling and analysis of approximately 300 monitoring wells (MWs) throughout the site and vicinity.

The MWs have been installed for the specific purpose of monitoring and evaluating the Dioxane contamination in groundwater. The water from these wells is not used for drinking, irrigation or any other purpose. Specific MWs are sampled on a monthly, quarterly, semi-annual, annual, and biennial basis following EGLE approved monitoring plans for specific areas of the site identified as the Western Area, Eastern Area and the Little Lake Area. EGLE collects samples of selected MWs with Gelman (i.e. "split sampling"), periodically, as a check of the quality and accuracy of data submitted by Gelman.

From October 2018 thru March 2019 Gelman collected samples at 431 MW locations as identified below:

- October 117 MWs Sampled
- November 77 MWs Sampled
- December 55 MWs Sampled
- January 84 MWs Sampled
- February 40 MWs Sampled
- March 58 MWs Sampled

Results of monitoring well samples collected by both Gelman and EGLE are posted on the EGLE "Gelman Sciences, Inc. Site of Contamination Information Page" under the "Recent Analytical Data" tab. Historic data and results since 2003 are also posted.

A 2015 map which depicts the locations of the monitoring wells can also be found on the EGLE Gelman webpage under the Maps heading (See link below).

Monitor Well Location Map

Current Remediation Activities

Current remediation activities are performed by Gelman and involve the operation of groundwater extraction wells located at the former Gelman Plant site and elsewhere in Scio Township and the City of Ann Arbor. From October 2018 thru

March 2019 Gelman removed contaminated groundwater at an average rate of 474 gallons per minute from extraction wells.

From October 2018 through March 2019 Gelman pumped and treated approximately 129,275,245 gallons of contaminated groundwater from extraction wells removing 420 pounds of Dioxane as listed below:

	Extraction Wells Operated	Groundwater Pumped	Dioxane Removed
October	14	27,268,274 gallons	77 pounds
November	10	20,244,186 gallons	69 pounds
December	11	20,711,882 gallons	73 pounds
January	12	21,255,350 gallons	77 pounds
February	10	18,335,111 gallons	59 pounds
March	10	21,460,442 gallons	65 pounds

Contaminated groundwater collected from the extraction wells is piped to the Gelman plant and treated using ozone and hydrogen peroxide. The treated groundwater is then discharged to a tributary of Honey Creek under a National Pollutant Discharge Elimination System (NPDES) permit issued by EGLE. The current NPDES permit became effective on February 1, 2016 and will expire on October 1, 2019. The NPDES permit establishes discharge limits for Dioxane and treatment chemicals and byproducts. The current permit's discharge limits for Dioxane are 7 ppb (monthly average) and 22 ppb (daily maximum).

Also, during the October 2018 through March 2019 period Gelman completed routine maintenance on selected extraction wells, completed proper abandonment of extraction well TW-8 and installed TW-28, the replacement extraction for TW-8. Also, during this period maintenance was completed on the treatment system including plumbing upgrades in the Red Pumphouse.

Data and information about the remediation activities can be found in the monthly NPDES monitoring reports and quarterly progress reports submitted by Gelman. Mass reduction (Pounds of 1,4-Dioxane removed) in each of the aquifer systems are identified in the Gelman quarterly progress reports. Historic and current information on pumping rates of extraction wells can be found in the "Average Monthly Extraction Flow Rates" table updated and submitted quarterly by Gelman. The reports and table are posted to the EGLE Gelman web page under the "Selected Documents" tab (See link below).

Selected Documents

A 2015 map which depicts the locations of the extraction wells (purge wells) can also be found on the EGLE Gelman webpage under the Maps heading (See Monitor Well Location Map link on Page 2).

Surface Water and Seep Sampling

On September 18 and 19, 2018 EGLE continued the sampling of surface waters, including ponds, creeks, and drains in and around the site and vicinity for 1,4 dioxane. In addition, samples were collected of water in the Allen Creek Drain system, including the Hanna Nature Area Creek, for additional volatile organic compound (VOC) analysis. The results of the 2018 sampling activities are summarized below. Other 2019 surface water sampling activities are described in the "Recent Investigation" section below:

Surface water samples have been analyzed from:

- Allen Creek (Drain) Tributary in the southwest corner of West Park – 19 ppb. Additional VOCs were not detected
- Allen Creek (Drain) Tributary near Glendale Circle – Not Detected. Additional VOCs were not detected.
- Little Lake – 4.1 ppb
- First Sister Lake – Not Detected
- Second Sister Lake – Not Detected
- Third Sister Lake – 2.9 ppb
- Smith Pond _West – Not Detected
- Smith Pond_ East – Not Detected
- Unnamed Tributary of Honey Creek at Jackson Rd – 3.9 ppb
- Unnamed Tributary of Honey Creek at Park Rd – 3.8 ppb
- Unnamed Tributary of Honey Creek at the Gelman Discharge outfall – 4.9 ppb
- Unnamed Tributary of Honey Creek at the Gelman Discharge outfall (immediately upstream) – 5.2 ppb
- Unnamed Tributary of Honey Creek at the Gelman Discharge outfall (upstream towards Marshy Area) – Not Detected
- Honey Creek/Huron River (HC/HR) confluence – Not Detected
- Honey Creek at Dexter Rd – 2.1 ppb
- Arbor Landing Pond – Not Detected
- West Park Pond – Not Detected
- Hanna Nature Area Creek – Not detected. Additional VOCs were not detected.

Results of surface water samples collected by both Gelman and EGLE are posted on the EGLE Gelman web page under the "Recent Analytical Data" tab (See link below).

EGLE is planning to collect surface water samples at the above referenced locations again in 2019.

Recent Analytical

Recent Investigation(s)

At the request of the Washtenaw County Water Resources Commission, EGLE initiated a six-month sampling investigation of the Allen Creek Drain at 7 specific manhole locations. The locations are summarized below:

Location #1 – Manhole in Westpark (that has been previously sampled as Allen Creek -West Park SW)
Location #2 – Manhole on Chapin Street.
Location #3 – Manhole on Maple Ridge
Location #4 – Manhole on Wildwood Ave
Location #5 – Manhole on Murray Ave
Location #6 – Manhole on Eighth St
Location #7 – Manhole in the ravine in Maryfield/Wildwood Park

During the planning of the investigation EGLE requested that Gelman conduct the investigation using the work plan developed by EGLE. Gelman voluntarily agreed and is conducting the sampling and analysis of the samples for 1,4-dioxane. EGLE is overseeing the sampling activities and collecting samples for Full Scan VOC analysis at the EGLE Environmental Laboratory (EGLE Laboratory) at each of the 7 locations. EGLE is also collecting samples, for 1,4-dioxane analysis at the EGLE Laboratory, from selected locations during each sampling event. To date sampling events have been conducted on February 7, March 12, and April 18, 2019. A summary of the 1,4-dioxane results from these sampling events is provide in the table below.

Location	Concentration Range
West Park SW	15 – 19 ppb
Chapin Street	8.7 – 9.8 ppb
Maple Ridge	ND
Wildwood	ND
Murray	0.98 – 1.3 ppb
Eighth	ND
Maryfield/Wildwood Park	ND

Full analytical results for the specific sampling events will be posted on the EGLE Gelman web page under the "Recent Analytical Data" tab which can be accessed using the link provided below.

Recent Analytical

Other Recent Activities

EGLE attended, provided information, and answered questions at 9 local meetings concerning the Gelman Site from October 2018 through February 2019.

These meetings included:

- Coalition for Action on Remediation of Dioxane (CARD) Monthly Meeting, Washtenaw County Western Service Center, October 2, 2018.
- Coalition for Action on Remediation of Dioxane (CARD) Quarterly Technical Meeting, Washtenaw County Western Service Center, November 13, 2018.
- EPA/Muni-Agency Stakeholder Meeting, Scio Township Offices, October 29, 2018.
- Allen Creek Drain Sample Planning Meeting with the Washtenaw County Water Resources Commissioner, Washtenaw County Western Service Center, November 19, 2018.
- Coalition for Action on Remediation of Dioxane (CARD) Monthly Meeting, Washtenaw County Western Service Center, December 4, 2018.
- Allen Creek Drain Sample Planning Meeting with the Washtenaw County Water Resources Commissioner, Washtenaw County Western Service Center, December 14, 2018.
- Coalition for Action on Remediation of Dioxane (CARD) Monthly Meeting, Washtenaw County Western Service Center, January 2019, 2018.
- Coalition for Action on Remediation of Dioxane (CARD) Quarterly Technical Meeting, Washtenaw County Western Service Center, February 5, 2019.
- Coalition for Action on Remediation of Dioxane (CARD) Monthly Meeting, Washtenaw County Western Service Center, March 5, 2019.

Recent Court Actions

The court ordered confidential negotiations to modify the current Consent Judgement are on-going. The negotiating parties include Gelman, EGLE, the City of Ann Arbor, Washtenaw County, Scio Township, and the Huron River Watershed Council.

Stakeholders Issues

The EPA has identified stakeholder issues of concern to the EGLE Project Manager and has requested EGLE list and track the issues in quarterly reports. Previous and new issues and requests for information are listed below. EGLE has provided initial answers and discussions where possible and will continue to provide information about the issues in future reports as new data and information is made available and evaluated.

Previous Issues

1) EPA is evaluating the potential for Per- and Polyfluoroalkyl Substances (PFAS) contamination at sites around the country.

- Evaluate whether PFAS contamination could be associated with releases from the Gelman Facility.

In March 2018 EGLE requested that Gelman review its records to determine if PFAS was used in the manufacturing processes and provide copies of any such records which indicate use of PFAS. Concurrently EGLE has discussed developing a scope of work to conduct sampling of selected monitoring wells on the Gelman Site property as a next step to evaluate whether PFAS should be identified as a contaminant of concern at the Gelman Site. Data and information will be presented after completion of any sampling activities.

Update – In October 2018 Gelman informed EGLE that the file review was complete and that they did not identify significant use of PFAS containing substances at the Gelman Site. EGLE has requested that Gelman document the file review in a written summary.

In addition, EGLE continues its response to this emerging contaminant throughout the state including within the Huron River Watershed. EGLE began sampling intensively on the Huron River due to the City of Ann Arbor (City) detecting PFAS in the Huron River, which is the main source of the City's drinking water, and the discovery of perfluorooctanesulfonic acid (PFOS) in the river at concentrations greater than the Rule 57 water quality standard of 11 parts per trillion (ppt) of PFOS. Information on the work completed thus far within the Huron River Watershed with respect to PFAS can be found at the link below:

Huron River Watershed PFAS Information

Additionally, EGLE Water Resources Division has obtained effluent samples from various locations within the Huron River Watershed, including from the outfall of the existing Gelman treatment system, as

part of the ongoing investigation with respect to PFAS within the Huron River Watershed.

Update - Sampling at the Gelman outfall was completed on November 27, 2018. Results for the individual PFAS compounds included in the analysis were non-detect. Reporting limits for the individual PFAS compounds, as presented in the laboratory report, ranged from 0.87 to 5.2 parts per trillion (ppt). Results will be posted on the EGLE Gelman web page under the "Recent Analytical Data" tab.

2) EPA points out that it is important to understand the risks posed by soil and sediment contaminated with Dioxane stemming from the Gelman facility. If there are elevated concentrations in those media, that could be an indication of an ongoing source to groundwater and/or surface water. Data from those areas are also essential for any evaluation of risk due to direct contact and/or ingestion exposure for human or ecological exposures. Discuss the following:

- Soil/sediment sampling results for borings collected at Gelman owned parcels through the present, on the original Gelman parcel (including split parcels) and on any nearby parcels that may have been impacted by Gelman's contamination.

- Discuss the risks those levels of 1,4-dioxane pose to human receptors.

  Gelman has voluntarily conducted additional sampling of soils and groundwater on and adjacent to the site property. EGLE is expecting a report summarizing the investigation once Gelman has completed compiling and evaluating the site investigation information and data. This information will be used, as appropriate, to evaluate risk due to direct contact and/or ingestion exposure for human or ecological exposures.

  Update – No new information about the on-property site investigation data and information.

3) 1,4-dioxane contamination in the near surface groundwater can pose a risk through exposure pathways other than the consumption of drinking water. Discuss the following:

   - The status of the sampling and characterization of the shallow groundwater and seeps within the prohibition zone.

     - Detail historical sampling activities targeting the near surface groundwater within the prohibition zone and in the Scio Township area.

       Gelman conducted a shallow groundwater investigation, within the prohibition zone and in Scio Township, using an EGLE developed work *plan in October 2016. The report presenting the data and information can be viewed at Shallow Groundwater Investigation. In summary, twenty-seven soil borings were installed in parts of the City of Ann Arbor and Scio Township using Geoprobe drilling and sampling techniques. Groundwater was encountered in 16 of the 27 soil borings and sampled using temporary monitoring wells. Groundwater was not encountered, within a depth of 20 feet below ground level, in the remaining 11 soil borings. Depth to shallow groundwater is important because, following the proposed risk-based assumptions for Dioxane for the volatilization to indoor air pathway, shallow contaminated groundwater has a lower acceptable risk-based screening number than deep contaminated groundwater. The study was designed to focus on this shallow groundwater to address concerns expressed by the community who were afraid that shallow groundwater may be contaminated and pose an unacceptable risk.*

Dioxane was detected in shallow groundwater at two boring locations in the investigation area at concentrations ranging from 1.9-3.3 ppb. Both locations are within the Prohibition Zone of the Eastern Area of the Gelman Site in the City of Ann Arbor. The concentrations of Dioxane detected in the shallow groundwater were less than EGLE Tier 1 vapor intrusion screening level of 29 ppb identified in the emergency rule adopted shortly after the time of the investigation, and significantly less than the 1,900 ppb screening level for shallow groundwater identified in the proposed rules package in 2017. The concentrations detected were also below the EPA Regional Screening Level (RSL) of 4.6 ppb. This RSL considers a combined exposure through the ingestion, dermal contact, and inhalation pathways.

Based upon an evaluation of all the data and information collected during the shallow groundwater investigation, including groundwater elevations, concentrations in both deep and shallow groundwater in that area, and proposed and current regulatory criteria and screening levels, the concentrations of Dioxane detected in the shallow groundwater in the investigation area currently do not pose an unacceptable risk for the volatilization to indoor air pathway to residences and buildings. Additional comparisons of concentrations of Dioxane detected in shallow groundwater to EPA RSLs for specific pathway exposures, such as inhalation (Inhalation RSL-11 ppb) and skin contact (Dermal RSL-2,300 ppb), also indicate that Dioxane in shallow groundwater in the investigation areas currently does not pose an unacceptable risk.

Update – No new information or discussion.

- Provide the status of any upcoming sampling of shallow groundwater and/or seeps.

As stated above current data and information indicates that Dioxane in shallow groundwater currently does not pose an unacceptable risk and that further investigations are not immediately warranted at this time. EGLE has stated that evaluation of data and information will be ongoing and that additional investigation activities will be identified and completed as needed to evaluate unacceptable risks.

EGLE will continue sampling surface waters, including ponds, creeks, and drains in and around the site and vicinity in 2019 to identify any potential contamination.

4) Michigan has identified the potential risk that the groundwater plume poses to surface water bodies in the vicinity of the 1,4-dioxane plume.

   a. Provide the status of the evaluation the risks posed by this groundwater to surface water (GSI) pathway.

      As discussed in an earlier progress report the Water Quality Values (WQV i.e. GSI criteria) for 1,4 dioxane were updated to 3.5 ppb for surface waters that are protected as a source of drinking water (Human Cancer Value [HCV] – drink) and 280 ppb for surface waters that are not protected as a drinking water sources (HCV non-drink). At this time these changes do not affect the groundwater remedy that is being implemented by Gelman under the current CJ overseen by EGLE and the Washtenaw Circuit Court. The current CJ does not require Gelman to directly address the GSI, in part because the previous GSI criteria were much higher and were not included in the court-ordered remedy. Because of the ongoing court ordered confidential CJ modification negotiations EGLE cannot speculate on how the changed GSI criteria may affect the Gelman remedy in the future.

   b. List those surface water bodies, including Barton Pond that could potentially be impacted by the plume.

      Specific surface water bodies that have been sampled and will continue to be sampled are identified earlier in this report. Current data and information indicates that Barton Pond is not likely to be impacted from groundwater contamination migrating from the Gelman Site. In addition the current CJ requires groundwater sampling of the monitoring well system that is in place. The ongoing sampling of the monitoring well system would detect any changes to the groundwater contamination well before those changes could impact Barton Pond.

Update – No new information or discussion.

5) Ecological Exposure

Provide the status of Ecological exposure evaluation. Discuss the following:

- Historic and current soil, sediment and surface water sampling results of the wetlands area near the Gelman facility, with focus on 1,4-dioxane results.

- Near surface water potential exposure and associated screening levels. Evaluation of ecological risks posed by contamination which stems from the Gelman facility. Include a discussion of potential ecological receptors.

As stated above, Gelman has voluntarily conducted additional sampling of soils and groundwater on and adjacent to the site property. EGLE is expecting a report summarizing the investigation once Gelman has completed compiling and evaluating the site investigation information and data. This information will be used, as appropriate, to evaluate ecological exposures.

Update – No new information about the on-property site investigation data and information.

6) At least one stakeholder has asserted that Gelman was in violation of the current CJ with regard to concentrations of 1,4-dioxane found in MW-103s. Specifically, that concentrations detected in MW-103s, in excess of 85 ppb, trigger the requirement for Gelman to conduct additional investigation activities around MW-103s and submit a contingency plan on how Gelman proposes to address the possible migration of 1,4-dioxane outside the Prohibition Zone (PZ).

The current CJ does not specifically identify trigger requirements for MW-103s. Compliance with the CJ is determined at the PZ boundary, not MW-103s. In response to discussions with Gelman and information provided by Gelman related to EGLE questions and concerns about the increasing concentrations of 1,4-dioxane observed in MW-103s EGLE issued compliance guidance letters in October 2013 and April 2014. Both compliance letters identify the detection of 1,4-dioxane at concentrations above 85 ppb in MW-103s for two consecutive months as the trigger requirement for submittal of a contingency plan. The contingency plan must outline how Gelman proposes to address possible migration of 1,4-dioxane outside the Prohibition Zone to ensure protection of public health and safety. As can be seen on the figure below, the concentrations of 1,4-dioxane observed in MW-103s have not been greater than 85 ppb for two consecutive months since the issuance of the compliance letters. EGLE will continue to review information from MW-103s and adjacent wells to evaluate compliance with the CJ.

Update – For two consecutive months (December 2018 and January 2019) 1,4-dioxane results at MW-103s exceeded 85 ppb. As identified in the October 2013 and April 2014 compliance guidance letters EGLE initiated discussions with Gelman about the preparation and submittal of a contingency plan to outline how Gelman proposes to address possible migration of 1,4-dioxane outside the Prohibition Zone. In those discussions, EGLE and Gelman concluded that the contingency plan requirement in the October 2013 and April 2014 letters had become outdated due to the new statewide generic drinking water cleanup criterion. EGLE and Gelman concluded that any issues relating to the MW-103s results should be resolved through the negotiations between EGLE, the Intervening Plaintiffs, and Gelman to amend the CJ to incorporate the new criterion. Gelman and the AG confirmed this understanding in letters dated January 28, 2019 and March 1, 2019, respectively. Copies of the letters will be posted on the EGLE Gelman web page under the "Selected Documents" tab.

7) Monitoring Well Trends

Provide a statistical evaluation of the trends of monitoring wells at the Gelman Site.

In response to EPA and stakeholder requests to evaluate analytical result trends at monitoring wells EGLE discussed the trend evaluation with Gelman and requested that they provide a trend analysis to EGLE for review. Gelman voluntarily agreed to conduct the trend analysis and to provide a summary report for EGLE review.

EGLE received the Gelman trend analysis report on April 22, 2019. Although EGLE is currently reviewing the report, to be transparent and attentive to stakeholders' questions and concerns the report entitled "Summary of Mann-Kendall Statistical Analysis Results for Select Groundwater Monitoring Wells at the Gelman Sciences Inc. Site-April 2019" is presented in Appendix A of this document.

APPENDIX A

Summary of Mann-Kendall Statistical Analysis Results for Select Groundwater Monitoring Wells at the Gelman Sciences Inc. Site
Scio Township, Michigan
Prepared by Fleis and VandenBrink Engineering Inc.
April 19, 2019

Background

The Mann-Kendall analysis is a statistical procedure that is used for analyzing trends in data over time (Gilbert, 1987). The Mann-Kendall analysis is a nonparametric method, which requires no assumptions regarding the underlying statistical distribution of the data. The test is also not sensitive to the sampling time interval over which the data are collected. For these reasons, the method is well suited for evaluation of concentration trends over time.

Mann-Kendall analyses were used for a select set of monitoring wells associated with the Gelman Sciences Inc. site to estimate 1,4-dioxane concentration trends in groundwater over time and evaluate current plume behavior. The analyses were conducted using the *GSI Mann-Kendall Toolkit for Constituent Trend Analysis, Version 1.0* developed by GSI Environmental Inc. ('Toolkit'). Mann-Kendall analysis results for each well are summarized on a table provided in Appendix 1. Toolkit outputs, which include the data used, Mann-Kendall test results and graphical representations of results, are provided in Appendix 2.

Well Selection

The Michigan Department of Environmental Quality (MDEQ) requested analysis of a select set of monitoring wells associated with the site. Gelman voluntarily added wells to the list. In total, 28 Eastern Area wells and 21 Western Area wells were selected for Mann-Kendall analysis. These selected wells are listed on the summary table provided as Appendix 1. In total, 49 monitoring wells associated with the Gelman Sciences Inc. site were analyzed using the Mann-Kendall statistical method.

Methodology

According to Connor et al. (2014), the Mann-Kendall statistical methodology is not valid for more than 40 sampling events. Therefore, where sample sizes exceeded 40, data sets were chosen to include a select 40 or fewer sampling events using the following intervals:

- ***Last 40***: Includes the full data set or the 40 most recent data points.
- ***Pre-2011***: A subset of the 40 most recent data points and includes data from samples collected before May 1, 2011.
- ***Post-2011***: A subset of the 40 most recent data points and includes data from samples collected on or after May 1, 2011.
- ***Last 8***: Includes the 8 most recent data points.

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Certain data sets were also limited since at least four sampling events are needed to calculate the confidence factor and concentration trend. Therefore, data sets with fewer than 4 events were omitted from analysis.

The Mann-Kendall analyses were completed by entering the appropriate time series 1,4-dioxane concentration data sets for each of the selected monitoring wells into the Toolkit. Where analytical results were nondetect (concentrations below the detection limit), an input of 0.5 times the reporting limit was used. The Toolkit automatically generated Mann-Kendall statistical metrics, including:

- ***The 'S' Statistic***: Indicates whether concentration trend vs. time is generally decreasing (negative S value) or increasing (positive S value).
- ***The Confidence Factor (CF)***: The CF value modifies the S Statistic calculation to indicate the degree of confidence in the trend result, as in 'Decreasing" vs. "Probably Decreasing" or "Increasing" vs. "Probably Increasing." Additionally, if the confidence factor is quite low, due either to considerable variability in concentrations vs. time or little change in concentrations vs. time, the CF is used to apply a preliminary "No Trend" classification, pending consideration of the COV.
- ***The Coefficient of Variation (COV)***: The COV is used to distinguish between a "No Trend" result (significant scatter in concentration trend vs. time) and a "Stable" result (limited variability in concentration vs. time) for datasets with no significant increasing or decreasing trend (e.g. low CF).

Concentration trends for 1,4-dioxane in groundwater were then estimated by the Toolkit according to the following criteria from Aziz et al. (2003):

S Statistic	Confidence In Trend	Trend
$S > 0$	$CF > 95\%$	*Increasing*
$S > 0$	$95\% \geq CF \geq 90\%$	*Probably Increasing*
$S > 0$	$CF < 90\%$	*No Trend*
$S \leq 0$	$CF < 90\%$ and $COV \geq 1$	*No Trend*
$S \leq 0$	$CF < 90\%$ and $COV < 1$	*Stable*
$S < 0$	$95\% \geq CF \geq 90\%$	*Probably Decreasing*
$S < 0$	$CF > 95\%$	*Decreasing*

Source: Aziz et al. (2003).
Note: The user can identify two other categories of data: ND = Dataset where all values are non-detect, and N/A = locations with < 4 sample results.

SUMMARY OF RESULTS

Mann-Kendall test results across the study area were evaluated utilizing the "Post-2011" dataset, where available, to establish a consistent timeframe for comparison purposes. Other datasets, such as "Last 40" and "Last 8", and visual assessments of the data trends were also considered to aid in interpretation of the results for the post-2011 data. A brief description of results and general interpretations follow.

Eastern Area

Results of the Mann-Kendall analysis generally showed decreasing groundwater concentrations of 1,4-dioxane in internal eastern plume wells, extending as far east as MW-103d. As anticipated, Eastern Area wells on the plume periphery exhibited primarily increasing trends as the plume has migrated east within the Prohibition Zone. Just beyond this furthest extent of the shrinking plume core, 1,4-dioxane levels have increased marginally from 9.0 to 9.7 µg/L at MW-112i since 2011. Further north, concentrations have been slowly and steadily increasing to the most recent detected concentrations of 3.3 µg/L at MW-98s and 17 µg/L at MW-98d as the plume has migrated east in this area.

According to post-2011 data, the wells furthest to the north (MW-121d, MW-129d and MW-130i) showed an increasing trend but exhibit low and sporadic detections.

Western Area/Little Lake

Regarding the western portion of the plume downgradient of Little Lake, 1,4-dioxane in groundwater collected from wells in this area exhibited decreasing concentration trends based on post-2011 data, except for MW-61d and MW-93, wells located within the core of the generally degrading Western plume. At MW-61d, 1,4-dioxane concentrations were non-detect (<1 ug/L) from January 2002 to July 2012. More recent trends show a gradual increase at this well after 2012 to a maximum detection of 7 µg/L in the most recent sample collected in November 2018. At MW-93, concentrations increased to a maximum of 11 µg/L in November 2016, and concentrations appear to be steadily decreasing after this time. This is supported by Mann-Kendall analysis of the last eight data points for MW-93, showing a decrease from 8.8 µg/L in April 2017 to 2 µg/L in March 2019.

North of the Gelman site, monitor well MW-133d has exhibited an increasing 1,4-dioxane concentration trend since 2011. However, concentrations have been low (less than 4.2 µg/L) during this period, and Mann-Kendall analysis of the last eight data points suggests a current decreasing trend since April 2017. The other two wells in this cluster (MW-133s and MW-133i) show no trend in post-2011 data.

Two monitor wells located within the former Gelman Sciences property boundary, MW-65i and MW-1 Replacement, are exhibiting increasing trends based on Mann-Kendall analyses of post-2011 data, but the trend analysis results are not consistent with longer term observations. Concentrations are expectedly elevated closer to the former source area near MW-1 Replacement, and a review of data for this well shows an apparent stable trend since 2014. During the last nine sampling events, concentrations at MW-1 Replacement have been steadily decreasing from 4,100 µg/L in February 2017 to 1,800 µg/L in February 2019. At MW-65i, although Mann-Kendall results suggest an increasing trend in post-2011 data, visual assessment and Mann-Kendall analysis of the last 40 data points indicate a clear and substantial decreasing trend: from a maximum concentration of 286 µg/L in January 2002 to 2.6 µg/L most recently in November 2018. Concentrations of 1,4-dioxane at MW-65i have been less than 3 µg/L since August 2008.

ATTACHMENTS

Attachment 1 – Mann-Kendall Statistical Analysis Results Summary Table
Attachment 2 – Mann-Kendall Results and Graphs

REFERENCES

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USEPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance, U.S. Environmental Protection Agency, EPA/530/R/09-007, Washington D.C., March 2009.

Attachment 1 - Mann-Kendall Statistical Analysis Results Summary
806500: Gelman Sciences Inc.
March 2019

Sampling Point ID[1]	Area[1]	Data Set[2]	Sampling Dates		Number of Data Points Used	Total Number of Data Points	First Recorded Sampling Date	Sampling Frequency	COV	MK (S) Statistic	Confidence Factor	1,4-Dioxane Concentration Trend
			From	To								
373 Pinewood Shallow	E	Last 40	05/16/06	10/16/18	40	96	07/24/90	Quarterly	0.66	-680	>99.9%	Decreasing
373 Pinewood Shallow	E	Pre-2011	05/16/06	11/04/10	10	96	07/24/90	Quarterly	0.35	-39	>99.9%	Decreasing
373 Pinewood Shallow	E	Post-2011	05/11/11	10/16/18	30	96	07/24/90	Quarterly	0.29	-345	>99.9%	Decreasing
373 Pinewood Shallow	E	Last 8	01/26/17	10/16/18	8	96	07/24/90	Quarterly	0.08	2	54.8%	No Trend
465 Dupont	E	Last 40	10/28/08	10/25/18	40	105	02/02/98	Quarterly	0.14	-159	96.7%	Decreasing
465 Dupont	E	Pre-2011	10/28/08	11/03/10	9	105	02/02/98	Quarterly	0.11	1	50.0%	No Trend
465 Dupont	E	Post-2011	05/18/11	10/25/18	31	105	02/02/98	Quarterly	0.15	-178	99.9%	Decreasing
465 Dupont	E	Last 8	03/17/17	10/25/18	8	105	02/02/98	Quarterly	0.09	-9	83.2%	Stable
MW-1 Replacement	W	Last 40	10/10/12	02/20/19	29	29	10/10/12	Quarterly	0.31	109	97.9%	Increasing
MW-1 Replacement	W	Last 8	02/17/17	02/20/19	8	29	10/10/12	Quarterly	0.22	-15	95.8%	Decreasing
MW-22	W	Last 40	10/12/06	10/11/18	40	106	07/23/87	Quarterly	1.33	-522	>99.9%	Decreasing
MW-22	W	Pre-2011	10/12/06	10/20/10	9	106	07/23/87	Quarterly	0.70	-20	97.8%	Decreasing
MW-22	W	Post-2011	05/17/11	10/11/18	31	106	07/23/87	Quarterly	0.76	-245	>99.9%	Decreasing
MW-22	W	Last 8	02/17/17	10/11/18	8	106	07/23/87	Quarterly	0.31	26	100.0%	Increasing
MW-31	W	Last 40	02/01/99	08/21/18	40	57	05/16/89	Annual	0.30	-405	>99.9%	Decreasing
MW-31	W	Pre-2011	02/01/99	07/27/10	32	57	05/16/89	Annual	0.16	-126	97.9%	Decreasing
MW-31	W	Post-2011	08/05/11	08/21/18	8	57	05/16/89	Annual	0.30	-25	100.0%	Decreasing
MW-45s	W	Last 40	10/03/03	11/27/18	40	75	04/30/99	Semi-Annual	1.52	-506	>99.9%	Decreasing
MW-45s	W	Pre-2011	10/03/03	04/22/11	25	75	04/30/99	Semi-Annual	1.16	-241	>99.9%	Decreasing
MW-45s	W	Post-2011	10/24/11	11/27/18	15	75	04/30/99	Semi-Annual	0.44	13	72.1%	No Trend
MW-45s	W	Last 8	05/26/15	11/27/18	8	75	04/30/99	Semi-Annual	0.42	-13	92.9%	Probably Decreasing
MW-53i	W	Last 40	11/05/15	01/14/19	40	224	05/30/00	Monthly	0.37	-155	96.4%	Decreasing
MW-53i	W	Last 8	05/06/18	01/14/19	8	224	05/30/00	Monthly	0.35	-13	92.9%	Probably Decreasing
MW-56s	W	Last 40	10/09/06	12/27/18	40	79	09/07/00	Quarterly	0.41	-419	>99.9%	Decreasing
MW-56s	W	Pre-2011	10/09/06	01/05/11	18	79	09/07/00	Quarterly	0.36	-134	>99.9%	Decreasing
MW-56s	W	Post-2011	05/11/11	12/27/18	22	79	09/07/00	Quarterly	0.19	11	61.0%	No Trend
MW-56s	W	Last 8	02/15/17	12/27/18	8	79	09/07/00	Quarterly	0.22	-9	83.2%	Stable
MW-57	W	Last 40	11/08/05	02/20/19	40	60	09/07/00	Quarterly	0.62	207	99.2%	Increasing
MW-57	W	Pre-2011	11/08/05	08/10/10	8	60	09/07/00	Quarterly	1.00	1	50.0%	No Trend
MW-57	W	Post-2011	09/27/11	02/20/19	32	60	09/07/00	Quarterly	0.49	25	65.0%	No Trend
MW-57	W	Last 8	04/20/17	02/20/19	8	60	09/07/00	Quarterly	0.16	1	50.0%	No Trend
MW-61s	W	Last 40	07/25/03	11/08/18	40	64	09/12/00	Semi-Annual	0.48	-659	>99.9%	Decreasing
MW-61s	W	Pre-2011	07/25/03	07/27/10	20	64	09/12/00	Semi-Annual	0.18	-143	>99.9%	Decreasing
MW-61s	W	Post-2011	08/08/11	11/08/18	20	64	09/12/00	Semi-Annual	0.34	-121	>99.9%	Decreasing
MW-61s	W	Last 8	02/04/16	11/08/18	8	64	09/12/00	Semi-Annual	0.34	-12	91.1%	Probably Decreasing
MW-61d	W	Last 40	04/11/03	11/08/18	40	60	09/12/00	Semi-Annual	1.03	487	>99.9%	Increasing
MW-61d	W	Pre-2011	04/11/03	07/27/10	20	60	09/12/00	Semi-Annual	0.00	0	48.7%	Stable
MW-61d	W	Post-2011	08/08/11	11/08/18	20	60	09/12/00	Semi-Annual	0.62	127	>99.9%	Increasing
MW-61d	W	Last 8	02/04/16	11/08/18	8	60	09/12/00	Semi-Annual	0.43	25	100.0%	Increasing
MW-65i	W	Last 40	07/16/01	11/30/18	39	39	07/16/01	Semi-Annual	1.27	-428	>99.9%	Decreasing
MW-65i	W	Pre-2011	07/16/01	07/30/10	23	39	07/16/01	Semi-Annual	0.75	-151	>99.9%	Decreasing
MW-65i	W	Post-2011	09/24/11	11/30/18	16	39	07/16/01	Semi-Annual	0.44	55	99.3%	Increasing
MW-65i	W	Last 8	05/19/15	11/30/18	8	39	07/16/01	Semi-Annual	0.24	9	83.2%	No Trend
MW-71	E	Last 40	10/25/05	11/30/18	40	57	10/17/01	Semi-Annual	0.39	382	>99.9%	Increasing
MW-71	E	Pre-2011	10/25/05	04/14/11	23	57	10/17/01	Semi-Annual	0.28	213	>99.9%	Increasing
MW-71	E	Post-2011	09/21/11	11/30/18	17	57	10/17/01	Semi-Annual	0.42	-8	61.2%	Stable
MW-71	E	Last 8	12/08/15	11/30/18	8	57	10/17/01	Semi-Annual	0.66	-15	95.8%	Decreasing
MW-72s	E	Last 40	10/25/05	11/21/18	40	62	12/24/02	Semi-Annual	0.94	-759	>99.9%	Decreasing
MW-72s	E	Pre-2011	10/25/05	04/01/11	23	62	12/24/02	Semi-Annual	0.56	-252	>99.9%	Decreasing
MW-72s	E	Post-2011	08/01/11	11/21/18	17	62	12/24/02	Semi-Annual	0.71	-122	>99.9%	Decreasing
MW-72s	E	Last 8	05/21/15	11/21/18	8	62	12/24/02	Semi-Annual	0.41	-24	99.9%	Decreasing
MW-76s	E	Last 40	10/25/05	11/21/18	40	118	04/08/02	Monthly	0.94	-759	>99.9%	Decreasing
MW-76s	E	Pre-2011	10/25/05	04/01/11	23	118	04/08/02	Monthly	0.56	-252	>99.9%	Decreasing
MW-76s	E	Post-2011	08/01/11	11/21/18	17	118	04/08/02	Monthly	0.71	-122	>99.9%	Decreasing
MW-76s	E	Last 8	05/21/15	11/21/18	8	118	04/08/02	Monthly	0.41	-24	99.9%	Decreasing
MW-76i	E	Last 40	10/29/15	01/17/19	40	101	04/08/02	Monthly	0.12	-126	92.7%	Probably Decreasing
MW-76i	E	Last 8	06/07/18	01/17/19	8	101	04/08/02	Monthly	0.05	-4	64.0%	Stable
MW-76d	E	Last 40	04/08/02	07/06/15	35	35	04/04/02	Biannual	0.49	368	>99.9%	Increasing
MW-76d	E	Last 8	04/23/09	07/06/15	8	35	04/04/02	Biannual	0.22	9	83.2%	No Trend
MW-81	E	Last 40	11/03/09	02/08/19	40	90	08/06/02	Quarterly	0.31	-623	>99.9%	Decreasing
MW-81	E	Pre-2011	11/03/09	04/08/11	7	90	08/06/02	Quarterly	0.10	5	71.9%	No Trend
MW-81	E	Post-2011	09/23/11	02/08/19	33	90	08/06/02	Quarterly	0.30	-429	>99.9%	Decreasing
MW-81	E	Last 8	08/23/17	02/08/19	8	90	08/06/02	Quarterly	0.37	-8	80.1%	Stable
MW-82s	E	Last 40	01/16/04	09/21/18	40	45	11/07/02	Annual	1.42	726	>99.9%	Increasing
MW-82s	E	Pre-2011	01/16/04	04/14/11	31	45	11/07/02	Annual	2.10	438	>99.9%	Increasing
MW-82s	E	Post-2011	08/02/11	09/21/18	9	45	11/07/02	Annual	0.34	27	99.8%	Increasing
MW-82s	E	Last 8	10/19/11	09/21/18	8	45	11/07/02	Annual	0.32	21	99.6%	Increasing

Sampling Point ID[1]	Area[1]	Data Set[2]	Sampling Dates		Number of Data Points Used	Total Number of Data Points	First Recorded Sampling Date	Sampling Frequency	COV	MK (S) Statistic	Confidence Factor	1,4-Dioxane Concentration Trend
			From	To								
MW-82d	E	Last 40	11/07/02	09/12/16	24	24	11/07/02	Abandoned	0.72	71	95.9%	Increasing
MW-82d	E	Pre-2011	11/07/02	07/15/10	17	24	11/07/02	Abandoned	0.00	0	48.4%	Stable
MW-82d	E	Post-2011	08/02/11	09/12/16	8	24	11/07/02	Abandoned	0.62	3	61.4%	No Trend
MW-85	E	Last 40	02/16/11	10/23/18	40	116	03/14/03	Quarterly	0.42	-607	>99.9%	Decreasing
MW-85	E	Post-2011	05/12/11	10/23/18	37	116	03/14/03	Quarterly	0.43	-567	>99.9%	Decreasing
MW-85	E	Last 8	02/03/17	10/23/18	8	116	03/14/03	Quarterly	0.23	-9	83.2%	Stable
MW-91	E	Last 40	11/14/05	11/16/18	40	53	09/15/03	Semi-Annual	1.34	654	>99.9%	Increasing
MW-91	E	Pre-2011	11/14/05	04/26/11	25	53	09/15/03	Semi-Annual	1.37	229	>99.9%	Increasing
MW-91	E	Post-2011	11/16/11	11/16/18	15	53	09/15/03	Semi-Annual	0.36	50	99.3%	Increasing
MW-91	E	Last 8	05/12/15	11/16/18	8	53	09/15/03	Semi-Annual	0.10	-15	95.8%	Decreasing
MW-92	E	Last 40	01/08/09	11/09/18	40	66	08/30/04	Quarterly	0.31	531	>99.9%	Increasing
MW-92	E	Pre-2011	01/08/09	04/13/11	10	66	08/30/04	Quarterly	0.12	-7	70.0%	Stable
MW-92	E	Post-2011	08/02/11	11/09/18	30	66	08/30/04	Quarterly	0.30	342	>99.9%	Increasing
MW-92	E	Last 8	01/26/17	11/09/18	8	66	08/30/04	Quarterly	0.19	19	98.9%	Increasing
MW-93	W	Last 40	10/30/07	03/08/19	40	47	12/02/04	Quarterly	0.44	20	58.7%	No Trend
MW-93	W	Post-2011	09/17/11	03/08/19	36	47	12/02/04	Quarterly	0.45	107	92.5%	Probably Increasing
MW-93	W	Last 8	04/20/17	03/08/19	8	47	12/02/04	Quarterly	0.50	-22	99.8%	Decreasing
MW-98s	E	Last 40	04/03/06	09/10/18	22	22	04/03/06	Annual	0.93	41	86.9%	No Trend
MW-98s	E	Pre-2011	04/03/06	04/20/11	14	22	04/03/06	Annual	0.00	0	47.8%	Stable
MW-98s	E	Post-2011	11/17/11	09/10/18	8	22	04/03/06	Annual	1.02	13	92.9%	Probably Increasing
MW-98d	E	Last 40	04/03/06	11/12/18	37	37	04/03/06	Semi-Annual	0.40	534	>99.9%	Increasing
MW-98d	E	Pre-2011	04/03/06	04/20/11	21	37	04/03/06	Semi-Annual	0.34	172	>99.9%	Increasing
MW-98d	E	Post-2011	08/03/11	11/12/18	19	37	04/03/06	Semi-Annual	0.20	67	99.9%	Increasing
MW-98d	E	Last 8	05/12/15	11/12/18	8	37	04/03/06	Semi-Annual	0.06	6	72.6%	No Trend
MW-103s	E	Last 40	10/29/15	01/16/19	40	102	04/07/06	Monthly	0.13	34	64.9%	No Trend
MW-103s	E	Last 8	07/07/18	01/16/19	8	102	04/07/06	Monthly	0.14	24	99.9%	Increasing
MW-103d	E	Last 40	07/20/09	12/03/18	40	53	03/22/06	Quarterly	0.30	-591	>99.9%	Decreasing
MW-103d	E	Pre-2011	07/20/09	04/26/11	8	53	03/22/06	Quarterly	0.15	-5	68.3%	Stable
MW-103d	E	Post-2011	09/23/11	12/03/18	32	53	03/22/06	Quarterly	0.23	-350	>99.9%	Decreasing
MW-103d	E	Last 8	01/04/17	12/03/18	8	53	03/22/06	Quarterly	0.07	-11	88.7%	Stable
MW-104	E	Last 40	10/19/09	01/17/19	40	62	04/05/06	Quarterly	0.76	662	>99.9%	Increasing
MW-104	E	Pre-2011	10/19/09	04/20/11	6	62	04/05/06	Quarterly	0.00	0	39.3%	Stable
MW-104	E	Post-2011	08/03/11	01/17/19	34	62	04/05/06	Quarterly	0.61	464	>99.9%	Increasing
MW-104	E	Last 8	03/25/17	01/17/19	8	62	04/05/06	Quarterly	0.15	23	99.9%	Increasing
MW-107	E	Last 40	04/10/09	11/29/18	40	58	11/09/06	Quarterly	0.72	584	>99.9%	Increasing
MW-107	E	Pre-2011	04/10/09	04/13/11	9	58	11/09/06	Quarterly	0.31	28	99.9%	Increasing
MW-107	E	Post-2011	08/04/11	11/29/18	31	58	11/09/06	Quarterly	0.48	292	>99.9%	Increasing
MW-107	E	Last 8	02/16/17	11/29/18	8	58	11/09/06	Quarterly	0.08	-1	50.0%	Stable
MW-108s	E	Last 40	11/06/08	10/18/18	40	55	11/09/06	Quarterly	0.76	-729	>99.9%	Decreasing
MW-108s	E	Pre-2011	11/06/08	04/14/11	11	55	11/09/06	Quarterly	0.16	-35	99.7%	Decreasing
MW-108s	E	Post-2011	10/19/11	10/18/18	29	55	11/09/06	Quarterly	0.47	-375	>99.9%	Decreasing
MW-108s	E	Last 8	02/17/17	10/18/18	8	55	11/09/06	Quarterly	0.05	-16	96.9%	Decreasing
MW-108d	E	Last 40	01/28/09	10/18/18	40	56	11/09/06	Quarterly	0.36	-620	>99.9%	Decreasing
MW-108d	E	Pre-2011	01/28/09	04/14/11	10	56	11/09/06	Quarterly	0.13	-19	94.6%	Probably Decreasing
MW-108d	E	Post-2011	09/21/11	10/18/18	30	56	11/09/06	Quarterly	0.34	-331	>99.9%	Decreasing
MW-108d	E	Last 8	02/17/17	10/18/18	8	56	11/09/06	Quarterly	0.22	-10	86.2%	Stable
MW-110	E	Last 40	04/09/09	11/29/18	40	54	02/12/07	Quarterly	0.43	598	>99.9%	Increasing
MW-110	E	Pre-2011	04/09/09	04/20/11	9	54	02/12/07	Quarterly	0.08	-4	61.9%	Stable
MW-110	E	Post-2011	08/04/11	11/29/18	31	54	02/12/07	Quarterly	0.38	372	>99.9%	Increasing
MW-110	E	Last 8	02/01/17	11/29/18	8	54	02/12/07	Quarterly	0.10	22	99.8%	Increasing
MW-112i	E	Last 40	10/06/15	01/16/19	40	98	05/10/07	Monthly	0.11	240	99.8%	Increasing
MW-112i	E	Last 8	05/06/18	01/16/19	8	98	05/10/07	Monthly	0.06	7	76.4%	No Trend
MW-112d	E	Last 40	04/20/09	03/13/19	40	48	05/10/07	Quarterly	0.28	93	85.7%	No Trend
MW-112d	E	Pre-2011	04/20/09	04/28/11	9	48	05/10/07	Quarterly	0.00	0	46.0%	Stable
MW-112d	E	Post-2011	09/23/11	03/13/19	31	48	05/10/07	Quarterly	0.31	66	86.4%	No Trend
MW-112d	E	Last 8	05/17/17	03/13/19	8	48	05/10/07	Quarterly	0.42	-3	59.4%	Stable
MW-121d	E	Last 40	02/02/10	10/05/18	40	44	01/08/09	Quarterly	0.62	429	>99.9%	Increasing
MW-121d	E	Post-2011	09/23/11	10/05/18	34	44	01/08/09	Quarterly	0.59	321	>99.9%	Increasing
MW-121d	E	Last 8	02/24/17	10/05/18	8	44	01/08/09	Quarterly	0.17	18	98.4%	Increasing
MW-122s	E	Last 40	04/24/09	11/29/18	40	42	12/16/08	Quarterly	0.49	634	>99.9%	Increasing
MW-122s	E	Pre-2011	04/24/09	04/19/11	9	42	12/16/08	Quarterly	0.16	-17	95.1%	Decreasing
MW-122s	E	Post-2011	09/28/11	11/29/18	31	42	12/16/08	Quarterly	0.42	416	>99.9%	Increasing
MW-122s	E	Last 8	01/11/17	11/29/18	8	42	12/16/08	Quarterly	0.17	19	98.9%	Increasing
MW-125	W	Last 40	10/18/10	11/14/18	33	33	02/02/12	Quarterly	0.18	-168	99.6%	Decreasing
MW-125	W	Post-2011	05/13/11	11/14/18	31	33	02/02/12	Quarterly	0.19	-153	99.6%	Decreasing
MW-125	W	Last 8	02/14/17	11/14/18	8	33	02/02/12	Quarterly	0.26	-12	91.1%	Probably Decreasing

Sampling Point ID[1]	Area[1]	Data Set[2]	Sampling Dates		Number of Data Points Used	Total Number of Data Points	First Recorded Sampling Date	Sampling Frequency	COV	MK (S) Statistic	Confidence Factor	1,4-Dioxane Concentration Trend
			From	To								
MW-129d	E	Last 40	02/24/11	01/24/19	37	37	02/24/11	Quarterly	0.45	320	>99.9%	Increasing
MW-129d	E	Post-2011	09/21/11	01/24/19	35	37	02/24/11	Quarterly	0.45	290	>99.9%	Increasing
MW-129d	E	Last 8	01/25/17	01/24/09	8	37	02/24/11	Quarterly	0.37	2	54.8%	No Trend
MW-130i	E	Last 40	03/21/11	02/07/19	33	33	03/21/11	Quarterly	0.83	403	>99.9%	Increasing
MW-130i	E	Post-2011	09/25/11	02/07/19	31	33	03/21/11	Quarterly	0.80	367	>99.9%	Increasing
MW-130i	E	Last 8	04/21/17	02/07/19	8	33	03/21/11	Quarterly	0.10	19	98.9%	Increasing
MW-133s	W	Last 40	03/22/11	01/18/19	33	33	03/22/11	Quarterly	0.32	81	89.2%	No Trend
MW-133s	W	Post-2011	08/18/11	01/18/19	31	33	03/22/11	Quarterly	0.27	21	63.2%	No Trend
MW-133s	W	Last 8	04/13/17	01/18/19	8	33	03/22/11	Quarterly	0.20	1	50.0%	No Trend
MW-133i	W	Last 40	03/22/11	01/18/19	33	33	03/22/11	Quarterly	0.41	119	96.7%	Increasing
MW-133i	W	Post-2011	08/18/11	01/18/19	31	33	03/22/11	Quarterly	0.37	65	86.0%	No Trend
MW-133i	W	Last 8	04/13/17	01/18/19	8	33	03/22/11	Quarterly	0.29	4	64.0%	No Trend
MW-133d	W	Last 40	03/23/11	01/18/19	33	33	03/23/11	Quarterly	0.42	163	99.5%	Increasing
MW-133d	W	Post-2011	08/18/11	01/18/19	31	33	03/23/11	Quarterly	0.35	105	96.2%	Increasing
MW-133d	W	Last 8	04/13/17	01/18/19	8	33	03/23/11	Quarterly	0.60	-16	96.9%	Decreasing
MW-134s	W	Last 40	03/30/11	01/29/19	34	34	03/30/11	Quarterly	0.11	235	>99.9%	Increasing
MW-134s	W	Post-2011	05/12/11	01/29/19	32	34	03/30/11	Quarterly	0.10	173	99.8%	Increasing
MW-134s	W	Last 8	04/12/17	01/29/19	8	34	03/30/11	Quarterly	0.10	-5	68.3%	Stable
MW-134i	W	Last 40	03/30/11	01/29/19	34	34	03/30/11	Quarterly	0.23	208	99.9%	Increasing
MW-134i	W	Post-2011	05/12/11	01/29/19	32	34	03/30/11	Quarterly	0.21	148	99.2%	Increasing
MW-134i	W	Last 8	04/12/17	01/29/19	8	34	03/30/11	Quarterly	0.12	-3	59.4%	Stable
MW-134d	W	Last 40	03/30/11	01/29/19	34	34	03/30/11	Quarterly	0.16	260	>99.9%	Increasing
MW-134d	W	Post-2011	05/12/11	01/29/19	32	34	03/30/11	Quarterly	0.13	200	100.0%	Increasing
MW-134d	W	Last 8	04/12/17	01/29/19	8	34	03/30/11	Quarterly	0.12	14	94.6%	Probably Increasing
MW-138i	W	Last 40	12/08/14	10/29/18	11	11	12/08/14	Semi-Annual	0.12	34	99.6%	Increasing
MW-138i	W	Last 8	04/17/15	10/29/18	8	11	12/08/14	Semi-Annual	0.10	17	97.7%	Increasing
MW-141s	W	Last 40	01/16/15	12/18/18	9	9	01/16/15	Semi-Annual	0.20	-12	87.0%	Stable
MW-141s	W	Last 8	04/17/15	12/18/18	8	9	01/16/15	Semi-Annual	0.22	-11	88.7%	Stable
MW-141d	W	Last 40	01/16/15	11/08/18	10	10	01/16/15	Semi-Annual	0.13	6	66.8%	No Trend
MW-141d	W	Last 8	10/21/15	11/08/18	8	10	01/16/15	Semi-Annual	0.10	-10	86.2%	Stable

Notes:

Mann-Kendall (MK) Test results were obtained using the GSI Mann-Kendall Toolkit for Constituent Trend Analysis, Version 1.0, GSI Environmental Inc., November 2012.

Where sample analytical results were nondetect, an input of 0.5 times the reporting limit was used.

COV = Coefficient of Variation.

[1]E = Eastern Area Well.
W = Western Area Well.

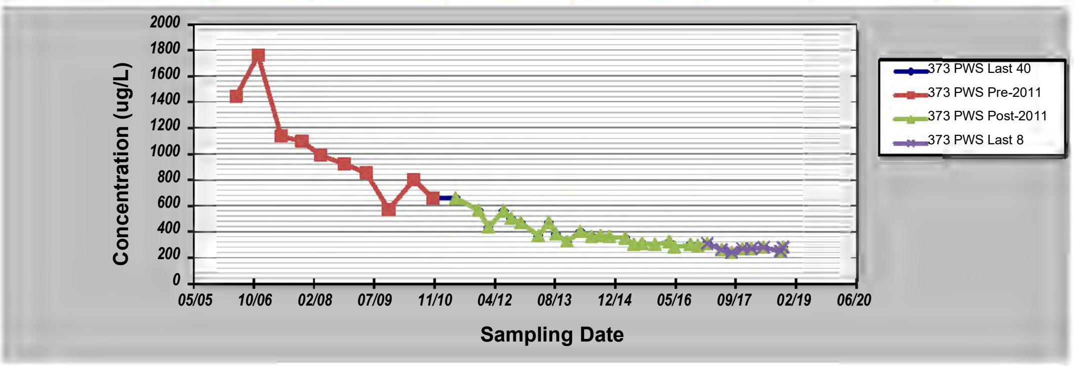
[2]The GSI Mann-Kendall Toolkit is limited to sample sizes between 4 and 40. Therefore, where sample sizes exceeded 40, data sets were chosen to include a select 40 or fewer data points using the following intervals:

Last 40 - Includes the full data set or the 40 most recent data points.
Pre-2011 - A subset of the 40 most recent data points and includes data from samples collected before May 1, 2011.
Post-2011 - A subset of the 40 most recent data points and includes data from samples collected on or after May 1, 2011.
Last 8 - Includes the 8 most recent data points.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 29-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	373 PWS Last 40	373 PWS Pre-2011	373 PWS Post-2011	373 PWS Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	16-May-06	1442	1442					
2	14-Nov-06	1759	1759					
3	25-May-07	1135	1135					
4	13-Nov-07	1097	1097					
5	18-Apr-08	988	988					
6	28-Oct-08	921	921					
7	28-Apr-09	853	853					
8	2-Nov-09	570	570					
9	28-May-10	800	800					
10	4-Nov-10	656	656					
11	11-May-11	659		659				
12	16-Nov-11	565		565				
13	7-Feb-12	433		433				
14	13-Jun-12	560		560				
15	14-Aug-12	501		501				
16	2-Nov-12	470		470				
17	28-Mar-13	368		368				
18	20-Jun-13	470		470				
19	20-Aug-13	380		380				
20	19-Nov-13	325		325				
21	10-Mar-14	400		400				
22	11-Jun-14	360		360				
23	25-Aug-14	370		370				
24	6-Nov-14	360		360				
25	17-Mar-15	350		350				
26	28-May-15	300		300				
27	4-Aug-15	310		310				
28	19-Nov-15	300		300				
29	17-Mar-16	320		320				
30	28-Apr-16	280		280				
31	8-Sep-16	300		300				
32	8-Nov-16	290		290				
33	26-Jan-17	310		310	310			
34	25-May-17	260		260	260			
35	15-Aug-17	240		240	240			
36	13-Nov-17	270		270	270			
37	26-Jan-18	270		270	270			
38	8-May-18	280		280	280			
39	25-Sep-18	250		250	250			
40	16-Oct-18	280		280	280			
Coefficient of Variation:		0.66	0.35	0.29	0.08			
Mann-Kendall Statistic (S):		-680	-39	-345	2			
Confidence Factor:		>99.9%	>99.9%	>99.9%	54.8%			
Concentration Trend:		Decreasing	Decreasing	Decreasing	No Trend			

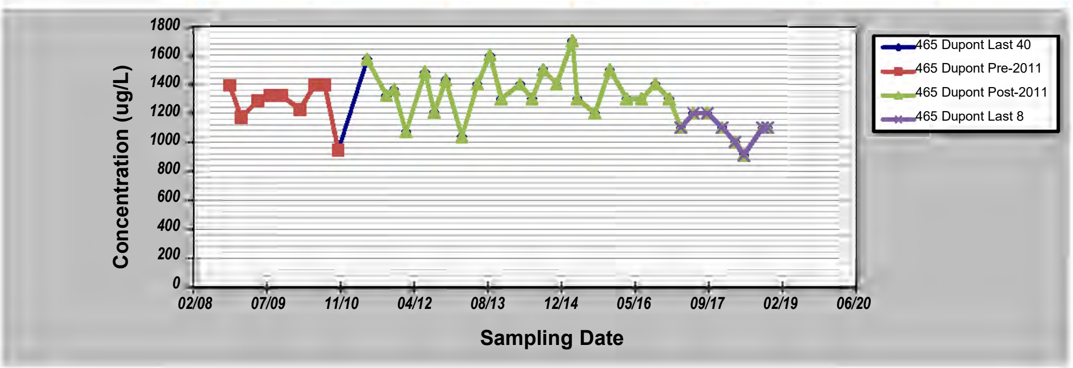


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	29-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	465 Dupont Last 40	465 Dupont Pre-2011	465 Dupont Post-2011	465 Dupont Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	28-Oct-08	1392	1392					
2	13-Jan-09	1173	1173					
3	4-May-09	1284	1284					
4	31-Jul-09	1324	1324					
5	16-Oct-09	1322	1322					
6	16-Feb-10	1223	1223					
7	28-May-10	1395	1395					
8	3-Aug-10	1395	1395					
9	3-Nov-10	944	944					
10	18-May-11	1573		1573				
11	26-Sep-11	1322		1322				
12	16-Nov-11	1362		1362				
13	6-Feb-12	1071		1071				
14	13-Jun-12	1484		1484				
15	16-Aug-12	1208		1208				
16	2-Nov-12	1430		1430				
17	19-Feb-13	1038		1038				
18	4-Jun-13	1400		1400				
19	29-Aug-13	1600		1600				
20	13-Nov-13	1300		1300				
21	20-Mar-14	1400		1400				
22	10-Jun-14	1300		1300				
23	26-Aug-14	1500		1500				
24	25-Nov-14	1400		1400				
25	10-Mar-15	1700		1700				
26	14-Apr-15	1300		1300				
27	11-Aug-15	1200		1200				
28	19-Nov-15	1500		1500				
29	14-Mar-16	1300		1300				
30	22-Jun-16	1300		1300				
31	23-Sep-16	1400		1400				
32	27-Dec-16	1300		1300				
33	17-Mar-17	1100		1100	1100			
34	8-Jun-17	1200		1200	1200			
35	12-Sep-17	1200		1200	1200			
36	20-Dec-17	1100		1100	1100			
37	19-Mar-18	1000		1000	1000			
38	16-May-18	910		910	910			
39	21-Sep-18	1100		1100	1100			
40	25-Oct-18	1100		1100	1100			
Coefficient of Variation:		0.14	0.11	0.15	0.09			
Mann-Kendall Statistic (S):		-159	1	-178	-9			
Confidence Factor:		96.7%	50.0%	99.9%	83.2%			
Concentration Trend:		Decreasing	No Trend	Decreasing	Stable			



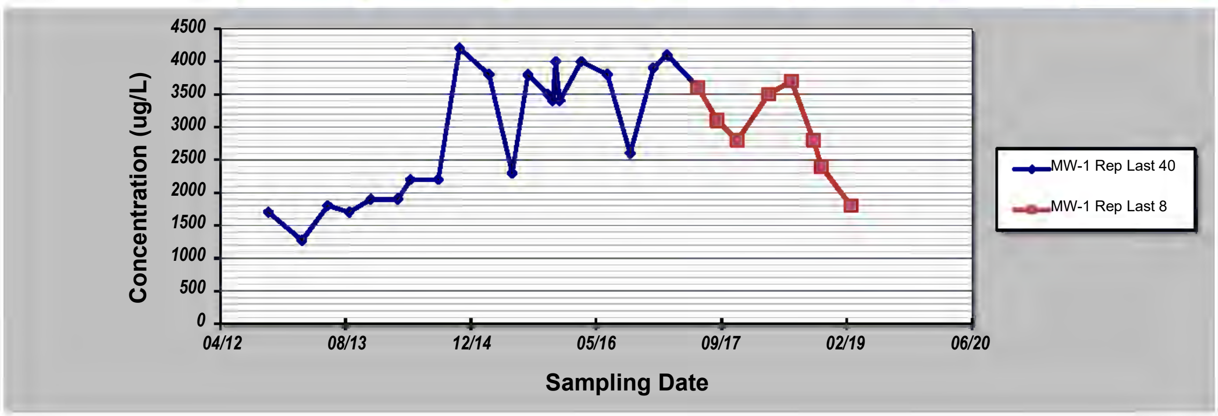
Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-1 Rep Last 40	MW-1 Rep Last 8					
	Sampling Point ID:	1,4-DIOXANE CONCENTRATION (ug/L)						
1	10-Oct-12	1700						
2	21-Feb-13	1272						
3	4-Jun-13	1800						
4	29-Aug-13	1700						
5	22-Nov-13	1900						
6	10-Mar-14	1900						
7	30-Apr-14	2200						
8	19-Aug-14	2200						
9	11-Nov-14	4200						
10	9-Mar-15	3800						
11	10-Jun-15	2300						
12	11-Aug-15	3800						
13	30-Oct-15	3500						
14	19-Nov-15	3400						
15	30-Nov-15	4000						
16	16-Dec-15	3400						
17	11-Mar-16	4000						
18	23-Jun-16	3800						
19	23-Sep-16	2600						
20	23-Dec-16	3900						
21	17-Feb-17	4100						
22	20-Jun-17	3600	3600					
23	5-Sep-17	3100	3100					
24	24-Nov-17	2800	2800					
25	28-Mar-18	3500	3500					
26	28-Jun-18	3700	3700					
27	24-Sep-18	2800	2800					
28	25-Oct-18	2400	2400					
29	20-Feb-19	1800	1800					
30								
	Coefficient of Variation:	0.31	0.22					
	Mann-Kendall Statistic (S):	109	-15					
	Confidence Factor:	97.9%	95.8%					
	Concentration Trend:	Increasing	Decreasing					



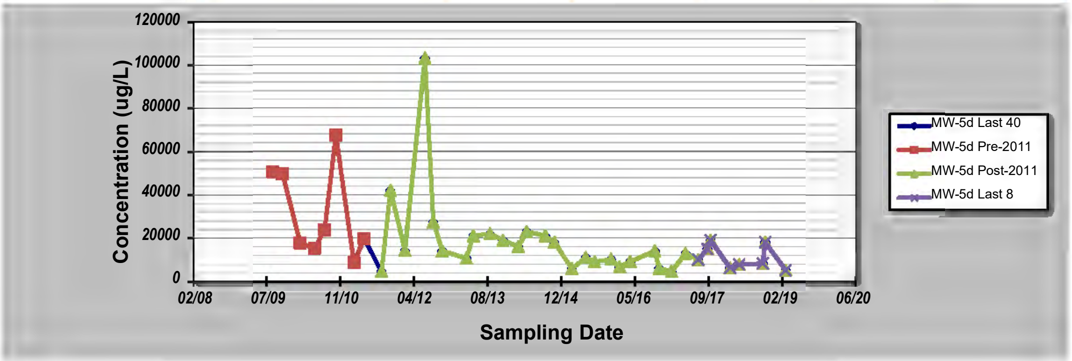
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Point ID:		MW-5d Last 40	MW-5d Pre-2011	MW-5d Post-2011	MW-5d Last 8			
Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (ug/L)						
1	17-Aug-09	50654	50654					
2	21-Oct-09	49688	49688					
3	18-Feb-10	17761	17761					
4	28-May-10	15230	15230					
5	4-Aug-10	23770	23770					
6	20-Oct-10	67500	67500					
7	18-Feb-11	8618	8618					
8	29-Apr-11	19730	19730					
9	25-Aug-11	4484		4484				
10	26-Oct-11	41889		41889				
11	30-Jan-12	14164		14164				
12	15-Jun-12	102983		102983				
13	10-Aug-12	27413		27413				
14	10-Oct-12	14000		14000				
15	22-Mar-13	10647		10647				
16	9-May-13	21000		21000				
17	30-Aug-13	22000		22000				
18	26-Nov-13	19000		19000				
19	10-Mar-14	16000		16000				
20	5-May-14	23000		23000				
21	8-Sep-14	21000		21000				
22	11-Nov-14	18000		18000				
23	9-Mar-15	5800		5800				
24	12-Jun-15	11000		11000				
25	11-Aug-15	9000		9000				
26	30-Nov-15	10200		10200				
27	27-Jan-16	6500		6500				
28	7-Apr-16	9100		9100				
29	22-Sep-16	14000		14000				
30	21-Oct-16	6000		6000				
31	13-Jan-17	4600		4600				
32	18-Apr-17	13000		13000				
33	13-Jul-17	10000		10000	10000			
34	13-Sep-17	15000		15000	15000			
35	5-Oct-17	19000		19000	19000			
36	14-Feb-18	6200		6200	6200			
37	18-Apr-18	7700		7700	7700			
38	24-Sep-18	8200		8200	8200			
39	11-Oct-18	18000		18000	18000			
40	26-Feb-19	5200		5200	5200			
Coefficient of Variation:		0.97	0.67	1.06	0.49			
Mann-Kendall Statistic (S):		-318	-8	-172	-6			
Confidence Factor:		>99.9%	80.1%	99.8%	72.6%			
Concentration Trend:		Decreasing	Stable	Decreasing	Stable			

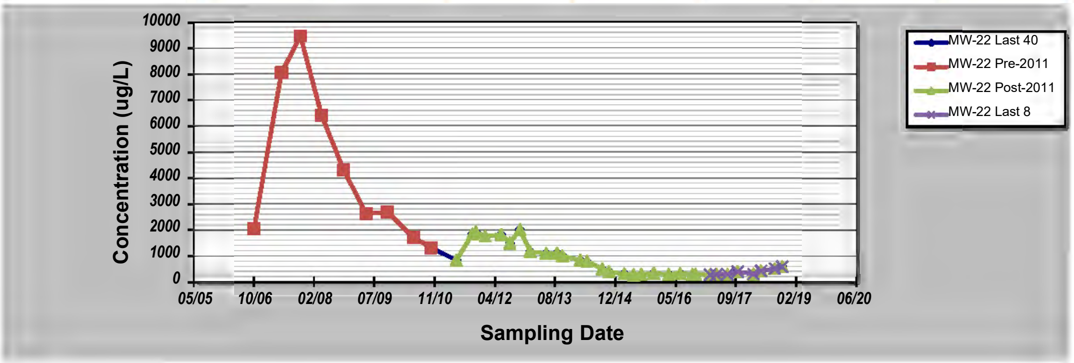


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	29-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-22 Last 40	MW-22 Pre-2011	MW-22 Post-2011	MW-22 Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	12-Oct-06	2053	2053					
2	29-May-07	8046	8046					
3	30-Oct-07	9455	9455					
4	24-Apr-08	6390	6390					
5	24-Oct-08	4296	4296					
6	29-Apr-09	2620	2620					
7	21-Oct-09	2684	2684					
8	28-May-10	1706	1706					
9	20-Oct-10	1312	1312					
10	17-May-11	838		838				
11	27-Sep-11	1829		1829				
12	26-Oct-11	1919		1919				
13	11-Jan-12	1752		1752				
14	23-May-12	1815		1815				
15	2-Aug-12	1489		1489				
16	25-Oct-12	2000		2000				
17	17-Jan-13	1172		1172				
18	31-May-13	1090		1090				
19	30-Aug-13	1100		1100				
20	15-Oct-13	1000		1000				
21	10-Mar-14	830		830				
22	5-May-14	780		780				
23	8-Sep-14	500		500				
24	3-Nov-14	400		400				
25	9-Mar-15	310		310				
26	27-May-15	260		260				
27	29-Jul-15	280		280				
28	9-Nov-15	330		330				
29	14-Mar-16	280		280				
30	16-Jun-16	320		320				
31	27-Sep-16	280		280				
32	21-Oct-16	280		280				
33	17-Feb-17	270		270	270			
34	12-Apr-17	280		280	280			
35	13-Jul-17	290		290	290			
36	5-Oct-17	390		390	390			
37	14-Feb-18	300		300	300			
38	18-Apr-18	420		420	420			
39	9-Aug-18	510		510	510			
40	11-Oct-18	580		580	580			
	Coefficient of Variation:	1.33	0.70	0.76	0.31			
	Mann-Kendall Statistic (S):	-522	-20	-245	26			
	Confidence Factor:	>99.9%	97.8%	>99.9%	100.0%			
	Concentration Trend:	Decreasing	Decreasing	Decreasing	Increasing			



Notes:
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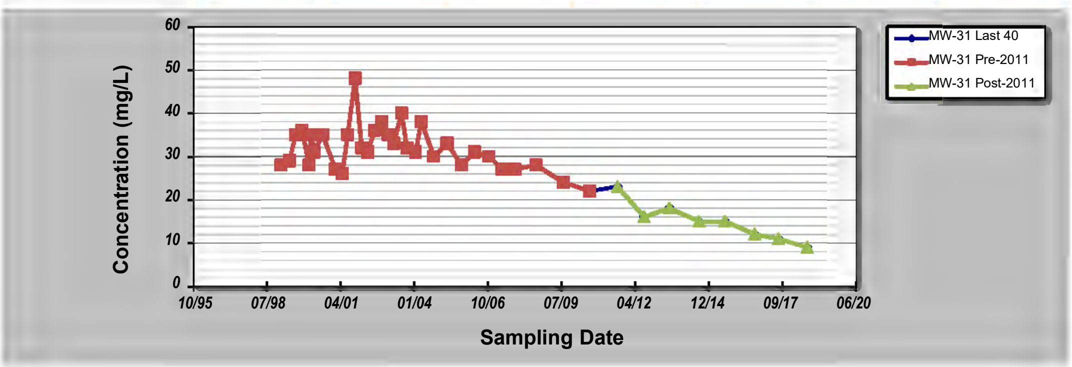
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT

for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	805600
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	mg/L

Sampling Event	Sampling Date	MW-31 Last 40	MW-31 Pre-2011	MW-31 Post-2011				
		1,4-DIOXANE CONCENTRATION (mg/L)						
1	1-Feb-99	28	28					
2	27-May-99	29	29					
3	19-Aug-99	35	35					
4	12-Nov-99	36	36					
5	17-Feb-00	28	28					
6	21-Mar-00	35	35					
7	25-Apr-00	31	31					
8	18-Aug-00	35	35					
9	7-Feb-01	27	27					
10	11-May-01	26	26					
11	27-Jul-01	35	35					
12	2-Nov-01	48	48					
13	30-Jan-02	32	32					
14	22-Apr-02	31	31					
15	23-Jul-02	36	36					
16	31-Oct-02	38	38					
17	28-Jan-03	35	35					
18	11-Apr-03	33	33					
19	28-Jul-03	40	40					
20	6-Oct-03	32	32					
21	2-Feb-04	31	31					
22	20-Apr-04	38	38					
23	7-Oct-04	30	30					
24	5-Apr-05	33	33					
25	14-Oct-05	28	28					
26	11-Apr-06	31	31					
27	25-Oct-06	30	30					
28	17-Apr-07	27	27					
29	9-Oct-07	27	27					
30	24-Jul-08	28	28					
31	28-Jul-09	24	24					
32	27-Jul-10	22	22					
33	5-Aug-11	23		23				
34	1-Aug-12	16		16				
35	9-Jul-13	18		18				
36	15-Aug-14	15		15				
37	30-Jul-15	15		15				
38	8-Sep-16	12		12				
39	27-Jul-17	11		11				
40	21-Aug-18	9		9				
Coefficient of Variation:		0.30	0.16	0.30				
Mann-Kendall Statistic (S):		-405	-126	-25				
Confidence Factor:		>99.9%	97.9%	100.0%				
Concentration Trend:		Decreasing	Decreasing	Decreasing				



Notes:

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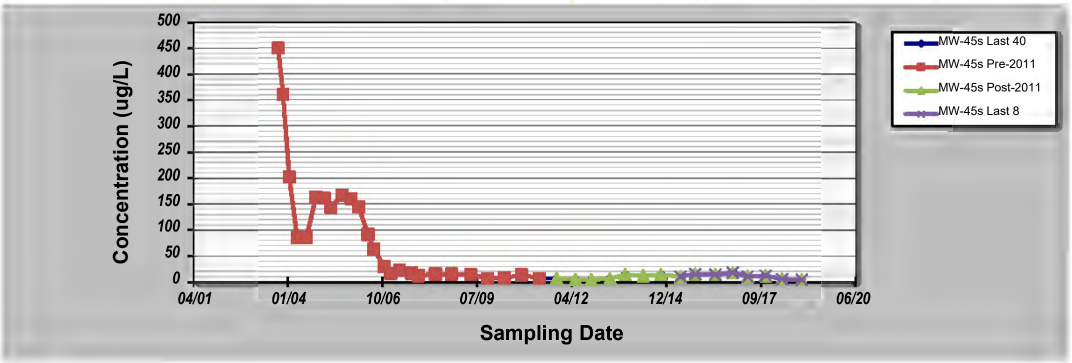
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	29-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-45s Last 40	MW-45s Pre-2011	MW-45s Post-2011	MW-45s Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	3-Oct-03	449	449					
2	22-Nov-03	360	360					
3	29-Jan-04	201	201					
4	22-Apr-04	85	85					
5	28-Jul-04	85	85					
6	5-Nov-04	163	163					
7	2-Feb-05	161	161					
8	15-Apr-05	143	143					
9	10-Aug-05	167	167					
10	9-Nov-05	160	160					
11	2-Feb-06	144	144					
12	10-May-06	91	91					
13	10-Jul-06	63	63					
14	1-Nov-06	29	29					
15	4-Jan-07	16	16					
16	9-Apr-07	22	22					
17	14-Aug-07	17	17					
18	24-Oct-07	12	12					
19	22-Apr-08	15	15					
20	10-Oct-08	15	15					
21	28-Apr-09	14	14					
22	26-Oct-09	7	7					
23	20-Apr-10	8	8					
24	19-Oct-10	13	13					
25	22-Apr-11	7	7					
26	24-Oct-11	7		7				
27	10-May-12	5		5				
28	24-Oct-12	4		4				
29	9-May-13	7		7				
30	16-Oct-13	14		14				
31	28-Apr-14	12		12				
32	30-Oct-14	14		14				
33	26-May-15	10		10	10			
34	27-Oct-15	15		15	15			
35	26-May-16	14		14	14			
36	28-Nov-16	18		18	18			
37	3-May-17	10		10	10			
38	9-Nov-17	12		12	12			
39	4-May-18	5.3		5.3	5.3			
40	27-Nov-18	4.4		4.4	4.4			
	Coefficient of Variation:	1.52	1.16	0.44	0.42			
	Mann-Kendall Statistic (S):	-506	-241	13	-13			
	Confidence Factor:	>99.9%	>99.9%	72.1%	92.9%			
	Concentration Trend:	Decreasing	Decreasing	No Trend	Prob. Decreasing			



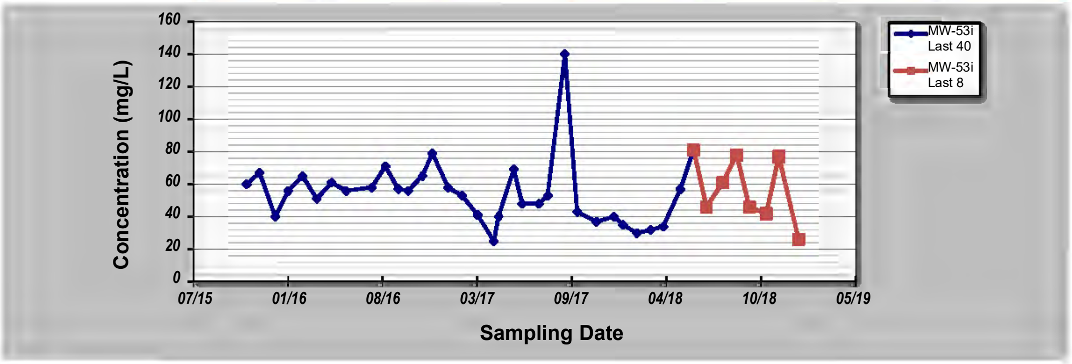
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	805600
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	mg/L

Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (mg/L)						
Sampling Point ID:		MW-53i Last 40	MW-53i Last 8					
1	5-Nov-15	60						
2	2-Dec-15	67						
3	4-Jan-16	40						
4	1-Feb-16	56						
5	2-Mar-16	65						
6	1-Apr-16	51						
7	2-May-16	61						
8	2-Jun-16	56						
9	26-Jul-16	58						
10	24-Aug-16	71						
11	20-Sep-16	57						
12	11-Oct-16	56						
13	10-Nov-16	65						
14	1-Dec-16	79						
15	3-Jan-17	58						
16	2-Feb-17	53						
17	7-Mar-17	41						
18	10-Apr-17	25						
19	20-Apr-17	40						
20	22-May-17	69						
21	9-Jun-17	48						
22	14-Jul-17	48						
23	2-Aug-17	53						
24	7-Sep-17	140						
25	3-Oct-17	43						
26	13-Nov-17	37						
27	20-Dec-17	40						
28	8-Jan-18	35						
29	6-Feb-18	30						
30	7-Mar-18	32						
31	3-Apr-18	34						
32	9-May-18	57						
33	6-Jun-18	81	81					
34	3-Jul-18	46	46					
35	7-Aug-18	61	61					
36	5-Sep-18	78	78					
37	2-Oct-18	46	46					
38	7-Nov-18	42	42					
39	3-Dec-18	77	77					
40	14-Jan-19	26	26					
Coefficient of Variation:		0.37	0.35					
Mann-Kendall Statistic (S):		-155	-13					
Confidence Factor:		96.4%	92.9%					
Concentration Trend:		Decreasing	Prob. Decreasing					



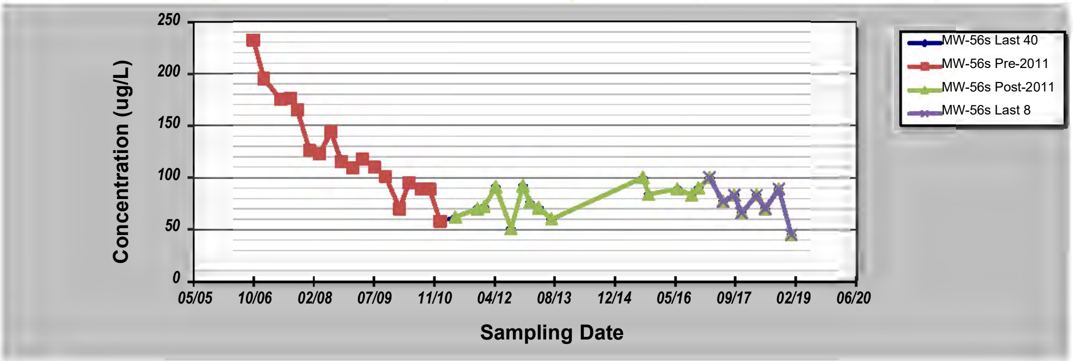
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	31-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-56s Last 40	MW-56s Pre-2011	MW-56s Post-2011	MW-56s Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	9-Oct-06	232	232					
2	3-Jan-07	195	195					
3	22-May-07	175	175					
4	13-Aug-07	176	176					
5	9-Oct-07	165	165					
6	18-Jan-08	126	126					
7	7-Apr-08	123	123					
8	14-Jul-08	144	144					
9	7-Oct-08	115	115					
10	9-Jan-09	109	109					
11	2-Apr-09	118	118					
12	8-Jul-09	110	110					
13	8-Oct-09	101	101					
14	3-Feb-10	70	70					
15	20-Apr-10	95	95					
16	4-Aug-10	89	89					
17	8-Oct-10	89	89					
18	5-Jan-11	58	58					
19	11-May-11	62		62				
20	10-Nov-11	70		70				
21	4-Jan-12	72		72				
22	9-Apr-12	91		91				
23	16-Aug-12	51		51				
24	21-Nov-12	92		92				
25	18-Jan-13	76		76				
26	1-Apr-13	71		71				
27	16-Jul-13	60		60				
28	13-Aug-15	100		100				
29	28-Sep-15	84		84				
30	24-May-16	89		89				
31	23-Sep-16	83		83				
32	17-Nov-16	90		90				
33	15-Feb-17	100		100	100			
34	8-Jun-17	77		77	77			
35	8-Sep-17	83		83	83			
36	9-Nov-17	66		66	66			
37	13-Mar-18	83		83	83			
38	23-May-18	70		70	70			
39	13-Sep-18	89		89	89			
40	27-Dec-18	45		45	45			
Coefficient of Variation:		0.41	0.36	0.19	0.22			
Mann-Kendall Statistic (S):		-419	-134	11	-9			
Confidence Factor:		>99.9%	>99.9%	61.0%	83.2%			
Concentration Trend:		Decreasing	Decreasing	No Trend	Stable			



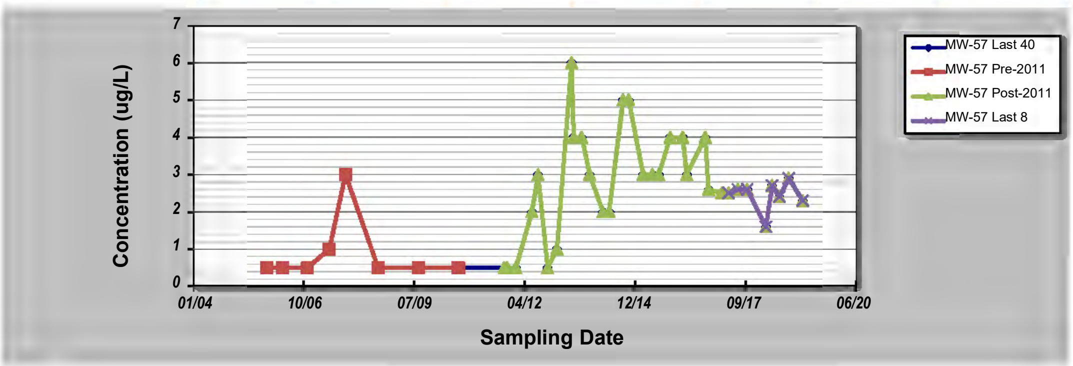
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-57 Last 40	MW-57 Pre-2011	MW-57 Post-2011	MW-57 Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	8-Nov-05	0.5	0.5					
2	4-Apr-06	0.5	0.5					
3	14-Nov-06	0.5	0.5					
4	30-May-07	1	1					
5	24-Oct-07	3	3					
6	13-Aug-08	0.5	0.5					
7	17-Aug-09	0.5	0.5					
8	10-Aug-10	0.5	0.5					
9	27-Sep-11	0.5		0.5				
10	25-Oct-11	0.5		0.5				
11	11-Jan-12	0.5		0.5				
12	5-Jun-12	2		2				
13	31-Jul-12	3		3				
14	25-Oct-12	0.5		0.5				
15	17-Jan-13	1		1				
16	31-May-13	6		6				
17	19-Jun-13	4		4				
18	29-Aug-13	4		4				
19	11-Nov-13	3		3				
20	10-Mar-14	2		2				
21	5-May-14	2		2				
22	8-Sep-14	5		5				
23	29-Oct-14	5		5				
24	9-Mar-15	3		3				
25	1-Jun-15	3		3				
26	28-Jul-15	3		3				
27	9-Nov-15	4		4				
28	1-Mar-16	4		4				
29	7-Apr-16	3		3				
30	22-Sep-16	4		4				
31	21-Oct-16	2.6		2.6				
32	17-Feb-17	2.5		2.5				
33	20-Apr-17	2.5		2.5	2.5			
34	13-Jul-17	2.6		2.6	2.6			
35	5-Oct-17	2.6		2.6	2.6			
36	26-Mar-18	1.6		1.6	1.6			
37	18-May-18	2.7		2.7	2.7			
38	25-Jul-18	2.4		2.4	2.4			
39	16-Oct-18	2.9		2.9	2.9			
40	20-Feb-19	2.3		2.3	2.3			
	Coefficient of Variation:	0.62	1.00	0.49	0.16			
	Mann-Kendall Statistic (S):	207	1	25	1			
	Confidence Factor:	99.2%	50.0%	65.0%	50.0%			
	Concentration Trend:	Increasing	No Trend	No Trend	No Trend			

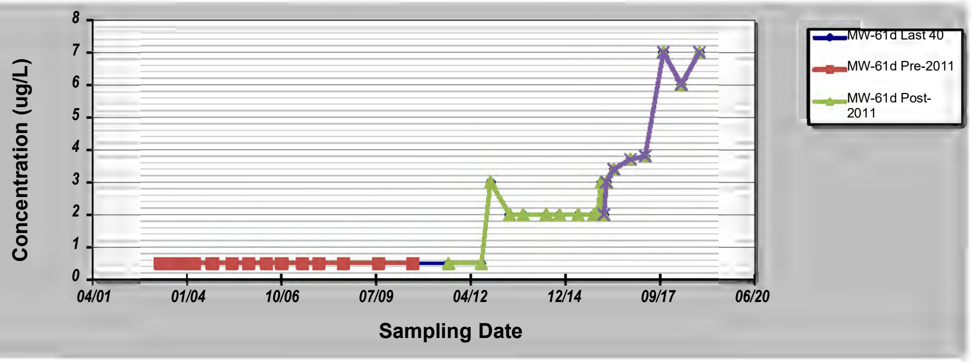


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-61d Last 40	MW-61d Pre-2011	MW-61d Post-2011	MW-61d Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	11-Apr-03	0.5	0.5					
2	25-Jul-03	0.5	0.5					
3	26-Sep-03	0.5	0.5					
4	3-Oct-03	0.5	0.5					
5	25-Nov-03	0.5	0.5					
6	15-Dec-03	0.5	0.5					
7	14-Jan-04	0.5	0.5					
8	18-Feb-04	0.5	0.5					
9	3-Mar-04	0.5	0.5					
10	2-Apr-04	0.5	0.5					
11	8-Oct-04	0.5	0.5					
12	3-May-05	0.5	0.5					
13	28-Oct-05	0.5	0.5					
14	3-May-06	0.5	0.5					
15	12-Oct-06	0.5	0.5					
16	21-May-07	0.5	0.5					
17	5-Nov-07	0.5	0.5					
18	24-Jul-08	0.5	0.5					
19	30-Jul-09	0.5	0.5					
20	27-Jul-10	0.5	0.5					
21	8-Aug-11	0.5		0.5				
22	20-Jul-12	0.5		0.5				
23	25-Oct-12	3		3				
24	15-May-13	2		2				
25	3-Oct-13	2		2				
26	5-Jun-14	2		2				
27	24-Oct-14	2		2				
28	7-May-15	2		2				
29	19-Oct-15	2		2				
30	5-Nov-15	2		2				
31	2-Dec-15	2		2				
32	7-Jan-16	3		3				
33	4-Feb-16	2		2	2			
34	3-Mar-16	3		3	3			
35	19-May-16	3.4		3.4	3.4			
36	10-Nov-16	3.7		3.7	3.7			
37	14-Apr-17	3.8		3.8	3.8			
38	23-Oct-17	7		7	7			
39	1-May-18	6		6	6			
40	8-Nov-18	7		7	7			
	Coefficient of Variation:	1.03	0.00	0.62	0.43			
	Mann-Kendall Statistic (S):	487	0	127	25			
	Confidence Factor:	>99.9%	48.7%	>99.9%	100.0%			
	Concentration Trend:	Increasing	Stable	Increasing	Increasing			



Notes:
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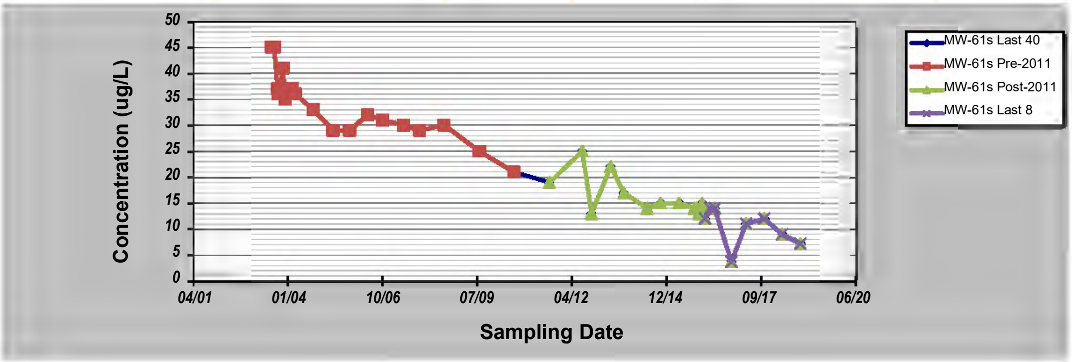
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-61s Last 40	MW-61s Pre-2011	MW-61s Post-2011	MW-61s Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	25-Jul-03	45	45					
2	22-Aug-03	45	45					
3	26-Sep-03	37	37					
4	3-Oct-03	36	36					
5	25-Nov-03	41	41					
6	15-Dec-03	35	35					
7	14-Jan-04	37	37					
8	18-Feb-04	36	36					
9	3-Mar-04	37	37					
10	2-Apr-04	36	36					
11	8-Oct-04	33	33					
12	3-May-05	29	29					
13	28-Oct-05	29	29					
14	3-May-06	32	32					
15	12-Oct-06	31	31					
16	21-May-07	30	30					
17	5-Nov-07	29	29					
18	24-Jul-08	30	30					
19	30-Jul-09	25	25					
20	27-Jul-10	21	21					
21	8-Aug-11	19		19				
22	20-Jul-12	25		25				
23	25-Oct-12	13		13				
24	15-May-13	22		22				
25	3-Oct-13	17		17				
26	5-Jun-14	14		14				
27	24-Oct-14	15		15				
28	7-May-15	15		15				
29	19-Oct-15	14		14				
30	5-Nov-15	14		14				
31	2-Dec-15	13		13				
32	7-Jan-16	15		15				
33	4-Feb-16	12		12	12			
34	28-Mar-16	14		14	14			
35	19-May-16	14		14	14			
36	10-Nov-16	3.7		3.7	3.7			
37	14-Apr-17	11		11	11			
38	23-Oct-17	12		12	12			
39	1-May-18	9		9	9			
40	8-Nov-18	7.2		7.2	7.2			
	Coefficient of Variation:	0.48	0.18	0.34	0.34			
	Mann-Kendall Statistic (S):	-659	-143	-121	-12			
	Confidence Factor:	>99.9%	>99.9%	>99.9%	91.1%			
	Concentration Trend:	Decreasing	Decreasing	Decreasing	Prob. Decreasing			



Notes:
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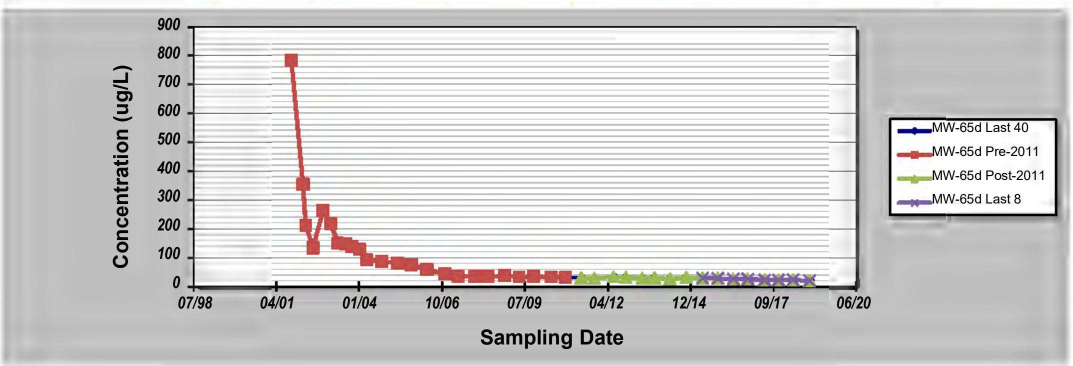
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	**Job ID:**	806500
Facility Name:	Gelman	**Constituent:**	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	**Concentration Units:**	ug/L

Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (ug/L)						
Sampling Point ID:		MW-65d Last 40	MW-65d Pre-2011	MW-65d Post-2011	MW-65d Last 8			
1	22-Oct-01	783	783					
2	11-Mar-02	353	353					
3	11-Apr-02	211	211					
4	9-Jul-02	134	134					
5	8-Nov-02	262	262					
6	6-Feb-03	217	217					
7	6-May-03	149	149					
8	12-Aug-03	147	147					
9	16-Oct-03	139	139					
10	21-Jan-04	128	128					
11	15-Apr-04	92	92					
12	13-Oct-04	87	87					
13	25-Apr-05	81	81					
14	4-Oct-05	76	76					
15	13-Apr-06	58	58					
16	13-Nov-06	44	44					
17	23-Apr-07	36	36					
18	8-Nov-07	35	35					
19	17-Apr-08	35	35					
20	3-Nov-08	37	37					
21	27-Apr-09	33	33					
22	22-Oct-09	34	34					
23	20-May-10	33	33					
24	8-Nov-10	31	31					
25	16-May-11	30		30				
26	24-Oct-11	28		28				
27	12-Jun-12	33		33				
28	8-Nov-12	32		32				
29	21-May-13	29		29				
30	17-Oct-13	30		30				
31	21-Apr-14	26		26				
32	6-Nov-14	31		31				
33	19-May-15	29		29	29			
34	18-Nov-15	28		28	28			
35	25-May-16	26		26	26			
36	14-Nov-16	26		26	26			
37	6-Jun-17	22		22	22			
38	21-Nov-17	22		22	22			
39	16-May-18	23		23	23			
40	30-Nov-18	20		20	20			
Coefficient of Variation:		1.47	1.20	0.14	0.13			
Mann-Kendall Statistic (S):		-708	-252	-79	-22			
Confidence Factor:		>99.9%	>99.9%	>99.9%	99.8%			
Concentration Trend:		Decreasing	Decreasing	Decreasing	Decreasing			

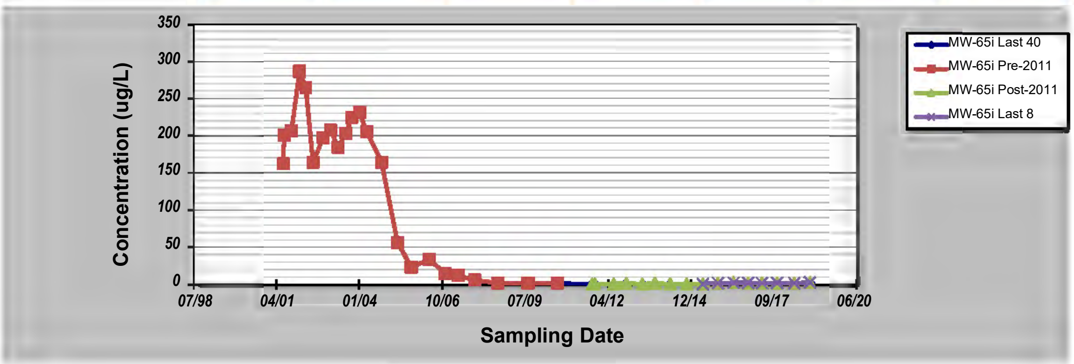


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	29-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-65i Last 40	MW-65i Pre-2011	MW-65i Post-2011	MW-65i Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	16-Jul-01	162	162					
2	22-Jul-01	200	200					
3	22-Oct-01	206	206					
4	25-Jan-02	286	286					
5	11-Apr-02	264	264					
6	9-Jul-02	164	164					
7	8-Nov-02	197	197					
8	6-Feb-03	207	207					
9	6-May-03	184	184					
10	12-Aug-03	203	203					
11	16-Oct-03	224	224					
12	21-Jan-04	231	231					
13	15-Apr-04	205	205					
14	13-Oct-04	164	164					
15	25-Apr-05	56	56					
16	4-Oct-05	23	23					
17	9-May-06	34	34					
18	13-Nov-06	15	15					
19	23-Apr-07	12	12					
20	8-Nov-07	6	6					
21	14-Aug-08	2	2					
22	12-Aug-09	2	2					
23	30-Jul-10	2	2					
24	24-Sep-11	1		1				
25	24-Oct-11	1		1				
26	12-Jun-12	1		1				
27	8-Nov-12	2		2				
28	21-May-13	0.5		0.5				
29	17-Oct-13	2		2				
30	21-Apr-14	0.5		0.5				
31	6-Nov-14	1		1				
32	19-May-15	1		1	1			
33	18-Nov-15	2		2	2			
34	25-May-16	2.4		2.4	2.4			
35	14-Nov-16	2.3		2.3	2.3			
36	2-May-17	1.9		1.9	1.9			
37	30-Oct-17	2.1		2.1	2.1			
38	24-May-18	2		2	2			
39	30-Nov-18	2.6		2.6	2.6			
40								
	Coefficient of Variation:	1.27	0.75	0.44	0.24			
	Mann-Kendall Statistic (S):	-428	-151	55	9			
	Confidence Factor:	>99.9%	>99.9%	99.3%	83.2%			
	Concentration Trend:	Decreasing	Decreasing	Increasing	No Trend			

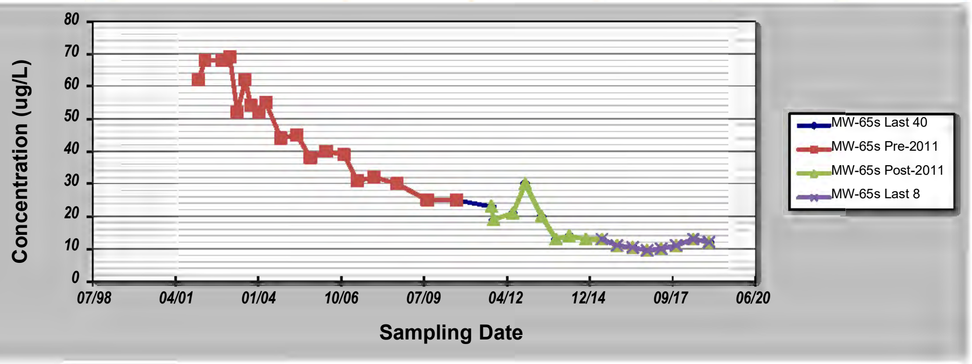


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19 **Job ID:** 806500
Facility Name: Gelman **Constituent:** 1,4-Dioxane
Conducted By: Fleis & VandenBrink **Concentration Units:** ug/L

Sampling Event	Sampling Date	MW-65s Last 40	MW-65s Pre-2011	MW-65s Post-2011	MW-65s Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	25-Jan-02	62	62					
2	11-Apr-02	68	68					
3	8-Nov-02	68	68					
4	6-Feb-03	69	69					
5	6-May-03	52	52					
6	12-Aug-03	62	62					
7	16-Oct-03	54	54					
8	21-Jan-04	52	52					
9	15-Apr-04	55	55					
10	13-Oct-04	44	44					
11	25-Apr-05	45	45					
12	4-Oct-05	38	38					
13	13-Apr-06	40	40					
14	14-Nov-06	39	39					
15	23-Apr-07	31	31					
16	8-Nov-07	32	32					
17	14-Aug-08	30	30					
18	12-Aug-09	25	25					
19	30-Jul-10	25	25					
20	24-Sep-11	23		23				
21	24-Oct-11	19		19				
22	12-Jun-12	21		21				
23	8-Nov-12	30		30				
24	21-May-13	20		20				
25	11-Nov-13	13		13				
26	21-Apr-14	14		14				
27	6-Nov-14	13		13				
28	19-May-15	13		13	13			
29	18-Nov-15	11		11	11			
30	25-May-16	10.5		10.5	10.5			
31	14-Nov-16	9.5		9.5	9.5			
32	2-May-17	10		10	10			
33	30-Oct-17	11		11	11			
34	24-May-18	13		13	13			
35	30-Nov-18	12		12	12			
36								
37								
38								
39								
40								
	Coefficient of Variation:	0.61	0.31	0.38	0.12			
	Mann-Kendall Statistic (S):	-511	-139	-73	2			
	Confidence Factor:	>99.9%	>99.9%	>99.9%	54.8%			
	Concentration Trend:	Decreasing	Decreasing	Decreasing	No Trend			

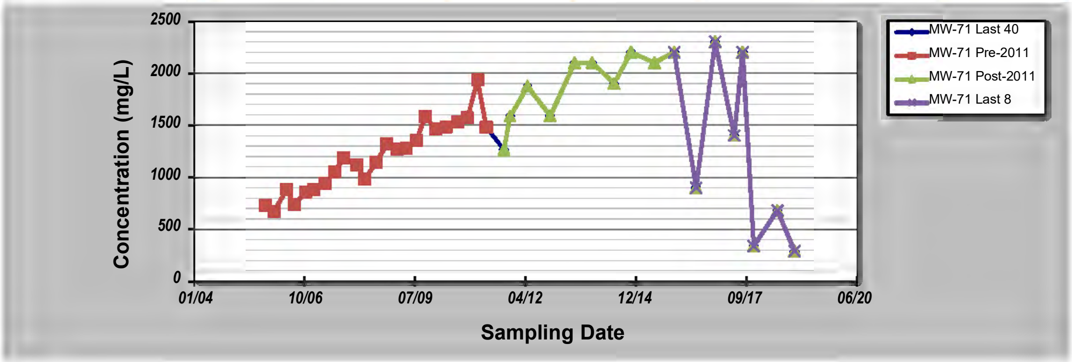


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	805600
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	mg/L

Sampling Event	Sampling Date	MW-71 Last 40	MW-71 Pre-2011	MW-71 Post-2011	MW-71 Last 8			
		1,4-DIOXANE CONCENTRATION (mg/L)						
1	25-Oct-05	728	728					
2	10-Jan-06	672	672					
3	5-May-06	885	885					
4	14-Jul-06	738	738					
5	23-Oct-06	857	857					
6	4-Jan-07	882	882					
7	18-Apr-07	942	942					
8	13-Jul-07	1054	1054					
9	2-Oct-07	1183	1183					
10	31-Jan-08	1119	1119					
11	9-Apr-08	981	981					
12	24-Jul-08	1148	1148					
13	27-Oct-08	1318	1318					
14	27-Jan-09	1268	1268					
15	22-Apr-09	1277	1277					
16	21-Jul-09	1356	1356					
17	8-Oct-09	1582	1582					
18	14-Jan-10	1465	1465					
19	15-Apr-10	1483	1483					
20	28-Jul-10	1532	1532					
21	25-Oct-10	1571	1571					
22	26-Jan-11	1935	1935					
23	14-Apr-11	1481	1481					
24	21-Sep-11	1266		1266				
25	15-Nov-11	1586		1586				
26	20-Apr-12	1874		1874				
27	13-Nov-12	1590		1590				
28	21-Jun-13	2100		2100				
29	26-Nov-13	2100		2100				
30	12-Jun-14	1900		1900				
31	12-Nov-14	2200		2200				
32	11-Jun-15	2100		2100				
33	8-Dec-15	2200		2200	2200			
34	22-Jun-16	900		900	900			
35	13-Dec-16	2300		2300	2300			
36	2-Jun-17	1400		1400	1400			
37	17-Aug-17	2200		2200	2200			
38	24-Nov-17	340		340	340			
39	27-Jun-18	680		680	680			
40	30-Nov-18	290		290	290			
Coefficient of Variation:		0.39	0.28	0.42	0.66			
Mann-Kendall Statistic (S):		382	213	-8	-15			
Confidence Factor:		>99.9%	>99.9%	61.2%	95.8%			
Concentration Trend:		Increasing	Increasing	Stable	Decreasing			

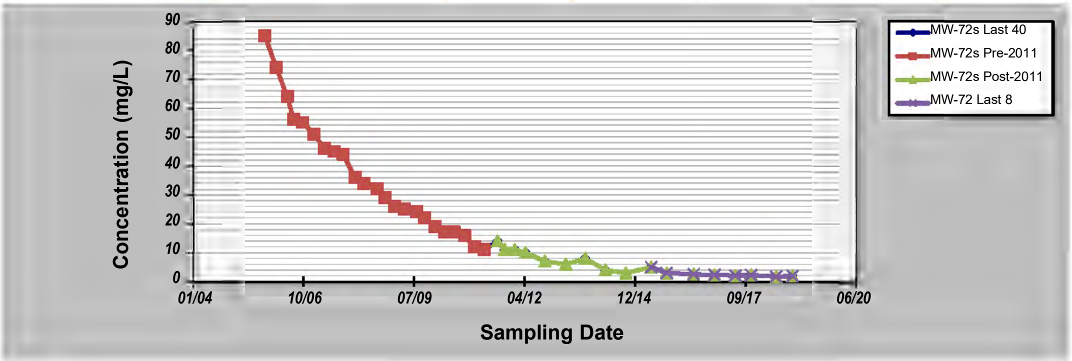


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	805600
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	mg/L

Sampling Event	Sampling Date	MW-72s Last 40	MW-72s Pre-2011	MW-72s Post-2011	MW-72 Last 8			
		1,4-DIOXANE CONCENTRATION (mg/L)						
1	25-Oct-05	85	85					
2	6-Feb-06	74	74					
3	15-May-06	64	64					
4	14-Jul-06	56	56					
5	3-Oct-06	55	55					
6	11-Jan-07	51	51					
7	17-Apr-07	46	46					
8	16-Jul-07	45	45					
9	2-Oct-07	44	44					
10	18-Jan-08	36	36					
11	7-Apr-08	34	34					
12	6-Aug-08	32	32					
13	20-Oct-08	29	29					
14	13-Jan-09	26	26					
15	8-Apr-09	25	25					
16	31-Jul-09	24	24					
17	8-Oct-09	22	22					
18	11-Jan-10	19	19					
19	12-Apr-10	17	17					
20	7-Jul-10	17	17					
21	6-Oct-10	16	16					
22	4-Jan-11	12	12					
23	1-Apr-11	11	11					
24	1-Aug-11	14		14				
25	5-Oct-11	11		11				
26	4-Jan-12	11		11				
27	10-Apr-12	10		10				
28	3-Oct-12	7		7				
29	9-Apr-13	6		6				
30	2-Oct-13	8		8				
31	3-Apr-14	4		4				
32	6-Oct-14	3		3				
33	21-May-15	5		5	5			
34	8-Oct-15	3		3	3			
35	8-Jun-16	2.5		2.5	2.5			
36	14-Dec-16	2.3		2.3	2.3			
37	20-Jun-17	2		2	2			
38	10-Nov-17	2.2		2.2	2.2			
39	26-Jun-18	1.7		1.7	1.7			
40	21-Nov-18	1.9		1.9	1.9			
Coefficient of Variation:		0.94	0.56	0.71	0.41			
Mann-Kendall Statistic (S):		-759	-252	-122	-24			
Confidence Factor:		>99.9%	>99.9%	>99.9%	99.9%			
Concentration Trend:		Decreasing	Decreasing	Decreasing	Decreasing			

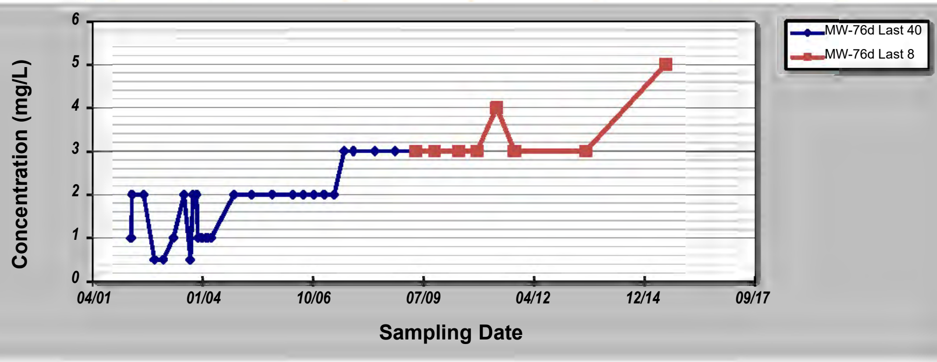


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 25-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 805600
Constituent: 1,4-Dioxane
Concentration Units: mg/L

Sampling Event	Sampling Date	MW-76d Last 40	MW-76d Last 8					
	Sampling Point ID:	1,4-DIOXANE CONCENTRATION (mg/L)						
1	8-Apr-02	1						
2	15-Apr-02	2						
3	30-Jul-02	2						
4	5-Nov-02	0.5						
5	24-Jan-03	0.5						
6	24-Apr-03	1						
7	30-Jul-03	2						
8	26-Sep-03	0.5						
9	20-Oct-03	2						
10	22-Nov-03	2						
11	2-Dec-03	1						
12	8-Jan-04	1						
13	17-Feb-04	1						
14	1-Mar-04	1						
15	1-Apr-04	1						
16	25-Oct-04	2						
17	4-Apr-05	2						
18	5-Oct-05	2						
19	11-Apr-06	2						
20	11-Jul-06	2						
21	18-Oct-06	2						
22	17-Jan-07	2						
23	18-Apr-07	2						
24	18-Jul-07	3						
25	10-Oct-07	3						
26	21-Apr-08	3						
27	21-Oct-08	3						
28	23-Apr-09	3	3					
29	13-Oct-09	3	3					
30	20-May-10	3	3					
31	2-Nov-10	3	3					
32	29-Apr-11	4	4					
33	7-Oct-11	3	3					
34	11-Jul-13	3	3					
35	6-Jul-15	5	5					
36								
37								
38								
39								
40								
	Coefficient of Variation:	0.49	0.22					
	Mann-Kendall Statistic (S):	368	9					
	Confidence Factor:	>99.9%	83.2%					
	Concentration Trend:	Increasing	No Trend					



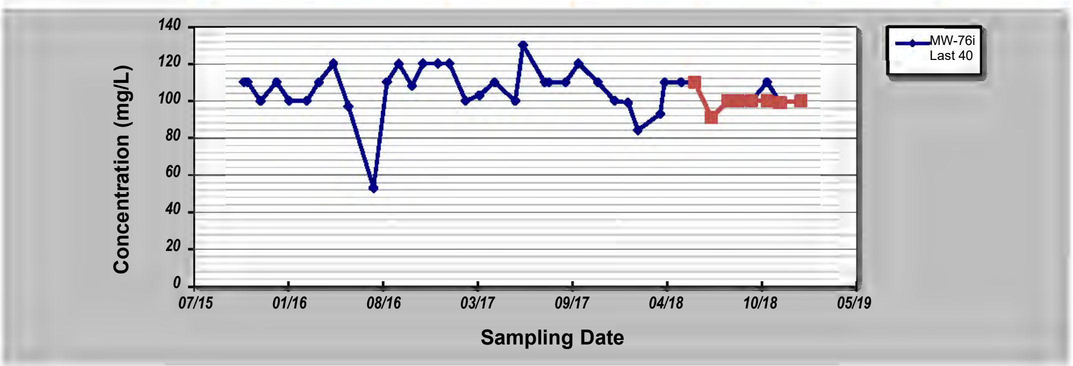
Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 25-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink

Job ID: 805600
Constituent: 1,4-Dioxane
Concentration Units: mg/L

Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (mg/L)	
	Sampling Point ID:	MW-76i Last 40	MW-76i Last 8
1	29-Oct-15	110	
2	6-Nov-15	110	
3	3-Dec-15	100	
4	6-Jan-16	110	
5	2-Feb-16	100	
6	10-Mar-16	100	
7	4-Apr-16	110	
8	5-May-16	120	
9	6-Jun-16	97	
10	29-Jul-16	53	
11	26-Aug-16	110	
12	20-Sep-16	120	
13	18-Oct-16	108	
14	10-Nov-16	120	
15	12-Dec-16	120	
16	5-Jan-17	120	
17	8-Feb-17	100	
18	9-Mar-17	103	
19	10-Apr-17	110	
20	24-May-17	100	
21	9-Jun-17	130	
22	25-Jul-17	110	
23	3-Aug-17	110	
24	7-Sep-17	110	
25	5-Oct-17	120	
26	14-Nov-17	110	
27	20-Dec-17	100	
28	17-Jan-18	99	
29	7-Feb-18	84	
30	26-Mar-18	93	
31	4-Apr-18	110	
32	9-May-18	110	
33	7-Jun-18	110	110
34	12-Jul-18	91	91
35	16-Aug-18	100	100
36	6-Sep-18	100	100
37	4-Oct-18	100	100
38	7-Nov-18	110	100
39	4-Dec-18	99	99
40	17-Jan-19	100	100
	Coefficient of Variation:	0.12	0.05
	Mann-Kendall Statistic (S):	-126	-4
	Confidence Factor:	92.7%	64.0%
	Concentration Trend:	Prob. Decreasing	Stable

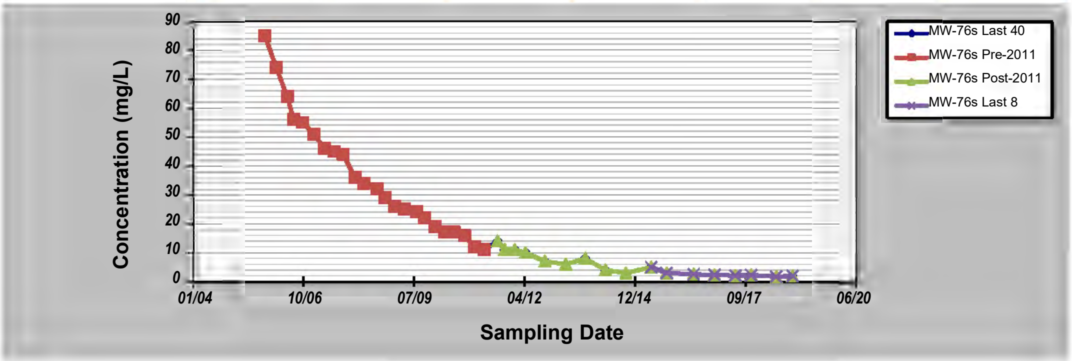


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	805600
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	mg/L

Sampling Event	Sampling Date	MW-76s Last 40	MW-76s Pre-2011	MW-76s Post-2011	MW-76s Last 8			
		1,4-DIOXANE CONCENTRATION (mg/L)						
1	25-Oct-05	85	85					
2	6-Feb-06	74	74					
3	15-May-06	64	64					
4	14-Jul-06	56	56					
5	3-Oct-06	55	55					
6	11-Jan-07	51	51					
7	17-Apr-07	46	46					
8	16-Jul-07	45	45					
9	2-Oct-07	44	44					
10	18-Jan-08	36	36					
11	7-Apr-08	34	34					
12	6-Aug-08	32	32					
13	20-Oct-08	29	29					
14	13-Jan-09	26	26					
15	8-Apr-09	25	25					
16	31-Jul-09	24	24					
17	8-Oct-09	22	22					
18	11-Jan-10	19	19					
19	12-Apr-10	17	17					
20	7-Jul-10	17	17					
21	6-Oct-10	16	16					
22	4-Jan-11	12	12					
23	1-Apr-11	11	11					
24	1-Aug-11	14		14				
25	5-Oct-11	11		11				
26	4-Jan-12	11		11				
27	10-Apr-12	10		10				
28	3-Oct-12	7		7				
29	9-Apr-13	6		6				
30	2-Oct-13	8		8				
31	3-Apr-14	4		4				
32	6-Oct-14	3		3				
33	21-May-15	5		5	5			
34	8-Oct-15	3		3	3			
35	8-Jun-16	2.5		2.5	2.5			
36	14-Dec-16	2.3		2.3	2.3			
37	20-Jun-17	2		2	2			
38	10-Nov-17	2.2		2.2	2.2			
39	26-Jun-18	1.7		1.7	1.7			
40	21-Nov-18	1.9		1.9	1.9			
	Coefficient of Variation:	0.94	0.56	0.71	0.41			
	Mann-Kendall Statistic (S):	-759	-252	-122	-24			
	Confidence Factor:	>99.9%	>99.9%	>99.9%	99.9%			
	Concentration Trend:	Decreasing	Decreasing	Decreasing	Decreasing			

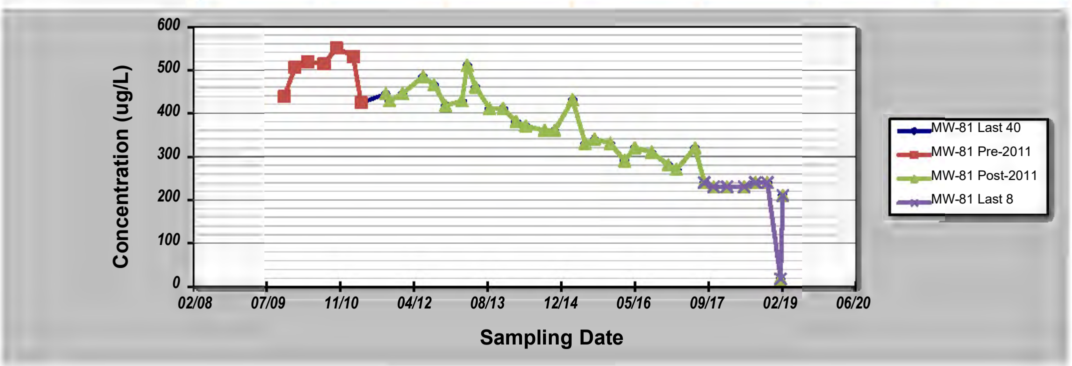


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-81 Last 40	MW-81 Pre-2011	MW-81 Post-2011	MW-81 Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	3-Nov-09	438	438					
2	14-Jan-10	505	505					
3	13-Apr-10	518	518					
4	30-Jul-10	513	513					
5	22-Oct-10	550	550					
6	15-Feb-11	530	530					
7	8-Apr-11	424	424					
8	23-Sep-11	444		444				
9	19-Oct-11	428		428				
10	13-Jan-12	445		445				
11	1-Jun-12	484		484				
12	14-Aug-12	465		465				
13	2-Nov-12	417		417				
14	19-Feb-13	428		428				
15	28-Mar-13	510		510				
16	24-May-13	460		460				
17	27-Aug-13	410		410				
18	25-Nov-13	410		410				
19	24-Feb-14	380		380				
20	29-Apr-14	370		370				
21	4-Sep-14	360		360				
22	11-Nov-14	360		360				
23	13-Mar-15	430		430				
24	8-Jun-15	330		330				
25	10-Aug-15	340		340				
26	24-Nov-15	330		330				
27	29-Feb-16	290		290				
28	9-May-16	320		320				
29	31-Aug-16	310		310				
30	21-Dec-16	280		280				
31	16-Feb-17	270		270				
32	21-Jun-17	320		320				
33	23-Aug-17	240		240	240			
34	27-Oct-17	230		230	230			
35	25-Jan-18	230		230	230			
36	22-May-18	230		230	230			
37	6-Aug-18	240		240	240			
38	25-Oct-18	240		240	240			
39	23-Jan-19	18		18	18			
40	8-Feb-19	210		210	210			
	Coefficient of Variation:	0.31	0.10	0.30	0.37			
	Mann-Kendall Statistic (S):	-623	5	-429	-8			
	Confidence Factor:	>99.9%	71.9%	>99.9%	80.1%			
	Concentration Trend:	Decreasing	No Trend	Decreasing	Stable			

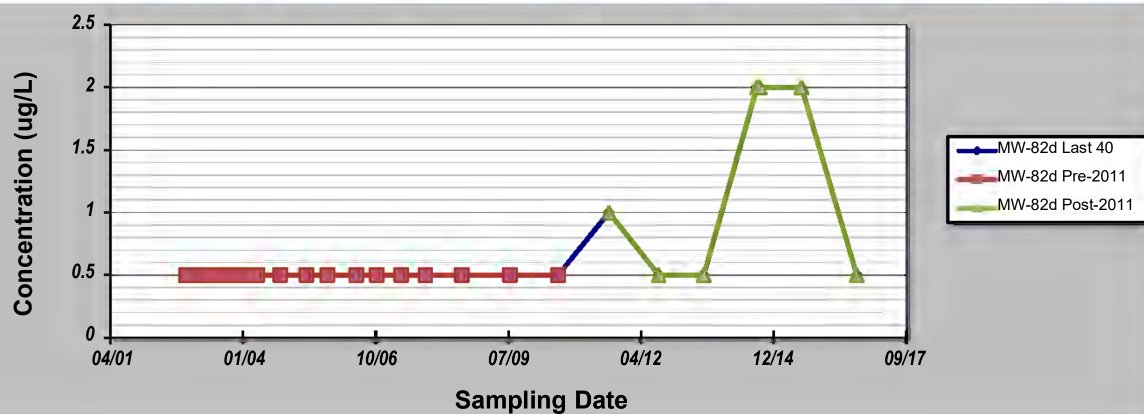


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Point ID:		MW-82d Last 40	MW-82d Pre-2011	MW-82d Post-2011				
Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (ug/L)						
1	7-Nov-02	0.5	0.5					
2	3-Feb-03	0.5	0.5					
3	29-Apr-03	0.5	0.5					
4	8-Aug-03	0.5	0.5					
5	22-Oct-03	0.5	0.5					
6	16-Jan-04	0.5	0.5					
7	30-Apr-04	0.5	0.5					
8	21-Oct-04	0.5	0.5					
9	5-May-05	0.5	0.5					
10	10-Oct-05	0.5	0.5					
11	15-May-06	0.5	0.5					
12	18-Oct-06	0.5	0.5					
13	19-Apr-07	0.5	0.5					
14	17-Oct-07	0.5	0.5					
15	18-Jul-08	0.5	0.5					
16	15-Jul-09	0.5	0.5					
17	15-Jul-10	0.5	0.5					
18	2-Aug-11	1		1				
19	10-Aug-12	0.5		0.5				
20	17-Jul-13	0.5		0.5				
21	22-Aug-14	2		2				
22	12-Sep-14	2		2				
23	24-Jul-15	2		2				
24	12-Sep-16	0.5		0.5				
25								
Coefficient of Variation:		0.72	0.00	0.62				
Mann-Kendall Statistic (S):		71	0	3				
Confidence Factor:		95.9%	48.4%	61.4%				
Concentration Trend:		Increasing	Stable	No Trend				



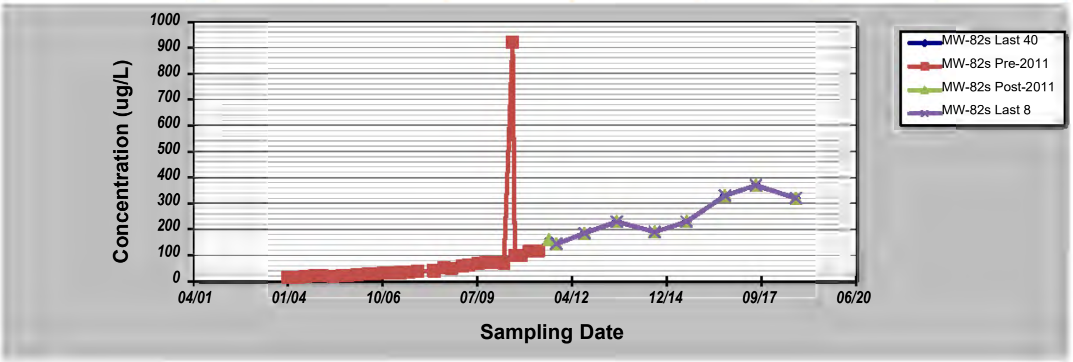
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	24-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-82s Last 40	MW-82s Pre-2011	MW-82s Post-2011	MW-82s Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	16-Jan-04	16	16					
2	30-Apr-04	15	15					
3	13-Jul-04	18	18					
4	21-Oct-04	21	21					
5	10-Jan-05	22	22					
6	5-May-05	19	19					
7	5-Aug-05	23	23					
8	10-Oct-05	23	23					
9	16-Jan-06	25	25					
10	15-May-06	29	29					
11	17-Jul-06	29	29					
12	18-Oct-06	31	31					
13	5-Jan-07	33	33					
14	19-Apr-07	34	34					
15	19-Jul-07	36	36					
16	17-Oct-07	39	39					
17	25-Mar-08	42	42					
18	9-Apr-08	39	39					
19	18-Jul-08	53	53					
20	8-Oct-08	50	50					
21	26-Jan-09	59	59					
22	7-Apr-09	62	62					
23	15-Jul-09	69	69					
24	8-Oct-09	73	73					
25	14-Jan-10	72	72					
26	13-Apr-10	71	71					
27	15-Jul-10	920	920					
28	6-Aug-10	99	99					
29	8-Oct-10	100	100					
30	4-Jan-11	115	115					
31	14-Apr-11	118	118					
32	2-Aug-11	160		160				
33	19-Oct-11	144		144	144			
34	10-Aug-12	185		185	185			
35	17-Jul-13	230		230	230			
36	22-Aug-14	190		190	190			
37	24-Jul-15	230		230	230			
38	1-Sep-16	330		330	330			
39	24-Jul-17	370		370	370			
40	21-Sep-18	320		320	320			
	Coefficient of Variation:	1.42	2.10	0.34	0.32			
	Mann-Kendall Statistic (S):	726	438	27	21			
	Confidence Factor:	>99.9%	>99.9%	99.8%	99.6%			
	Concentration Trend:	Increasing	Increasing	Increasing	Increasing			

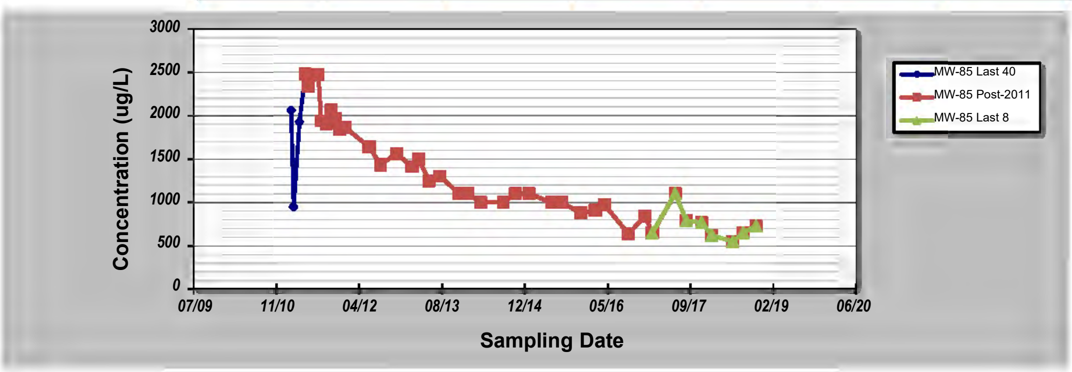


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 25-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-85 Last 40	MW-85 Post-2011	MW-85 Last 8
	Sampling Point ID:	1,4-DIOXANE CONCENTRATION (ug/L)		
1	16-Feb-11	2057		
2	3-Mar-11	952		
3	7-Apr-11	1927		
4	12-May-11	2476	2476	
5	1-Jun-11	2336	2336	
6	29-Jul-11	2470	2470	
7	16-Aug-11	1939	1939	
8	17-Sep-11	1904	1904	
9	17-Oct-11	2061	2061	
10	9-Nov-11	1967	1967	
11	6-Dec-11	1840	1840	
12	6-Jan-12	1863	1863	
13	1-Jun-12	1637	1637	
14	9-Aug-12	1432	1432	
15	13-Nov-12	1560	1560	
16	15-Feb-13	1411	1411	
17	27-Mar-13	1496	1496	
18	28-May-13	1250	1250	
19	2-Aug-13	1300	1300	
20	25-Nov-13	1100	1100	
21	17-Jan-14	1100	1100	
22	4-Apr-14	1000	1000	
23	20-Aug-14	1000	1000	
24	31-Oct-14	1100	1100	
25	22-Jan-15	1100	1100	
26	8-Jun-15	1000	1000	
27	6-Aug-15	1000	1000	
28	30-Nov-15	880	880	
29	26-Feb-16	910	910	
30	22-Apr-16	970	970	
31	12-Sep-16	640	640	
32	21-Dec-16	840	840	
33	3-Feb-17	650	650	650
34	22-Jun-17	1100	1100	1100
35	29-Aug-17	790	790	790
36	28-Nov-17	770	770	770
37	29-Jan-18	620	620	620
38	5-Jun-18	550	550	550
39	6-Aug-18	650	650	650
40	23-Oct-18	730	730	730
	Coefficient of Variation:	0.42	0.43	0.23
	Mann-Kendall Statistic (S):	-607	-567	-9
	Confidence Factor:	>99.9%	>99.9%	83.2%
	Concentration Trend:	Decreasing	Decreasing	Stable



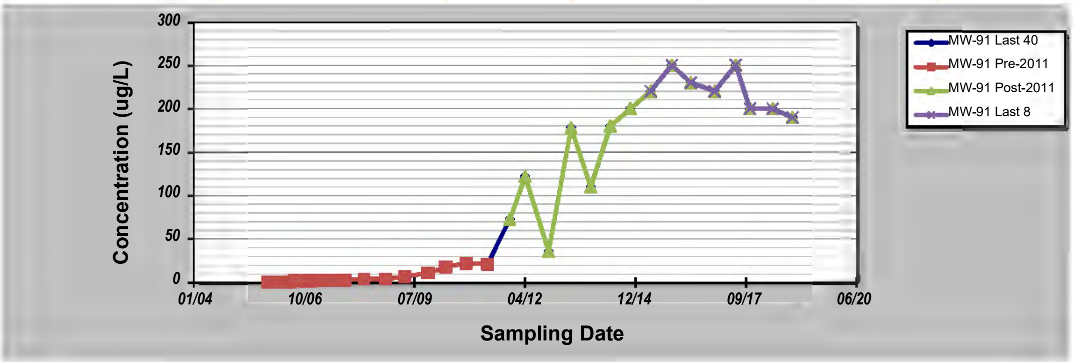
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 29-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-91 Last 40	MW-91 Pre-2011	MW-91 Post-2011	MW-91 Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	14-Nov-05	0.5	0.5					
2	16-Jan-06	0.5	0.5					
3	9-May-06	0.5	0.5					
4	9-Jun-06	0.5	0.5					
5	14-Jul-06	2	2					
6	24-Oct-06	1	1					
7	15-Nov-06	2	2					
8	11-Dec-06	1	1					
9	5-Jan-07	2	2					
10	19-Feb-07	2	2					
11	20-Mar-07	2	2					
12	11-Apr-07	2	2					
13	15-May-07	2	2					
14	11-Jun-07	2	2					
15	9-Jul-07	2	2					
16	6-Aug-07	2	2					
17	6-Sep-07	2	2					
18	15-Oct-07	3	3					
19	4-Apr-08	4	4					
20	14-Oct-08	4	4					
21	7-Apr-09	7	7					
22	6-Nov-09	11	11					
23	13-Apr-10	18	18					
24	14-Oct-10	22	22					
25	26-Apr-11	21	21					
26	16-Nov-11	73		73				
27	2-Apr-12	122		122				
28	31-Oct-12	36		36				
29	24-May-13	178		178				
30	18-Nov-13	110		110				
31	12-May-14	180		180				
32	11-Nov-14	200		200				
33	12-May-15	220		220	220			
34	20-Nov-15	250		250	250			
35	9-May-16	230		230	230			
36	13-Dec-16	220		220	220			
37	20-Jun-17	250		250	250			
38	27-Oct-17	200		200	200			
39	22-May-18	200		200	200			
40	16-Nov-18	190		190	190			
	Coefficient of Variation:	1.34	1.37	0.36	0.10			
	Mann-Kendall Statistic (S):	654	229	50	-15			
	Confidence Factor:	>99.9%	>99.9%	99.3%	95.8%			
	Concentration Trend:	Increasing	Increasing	Increasing	Decreasing			

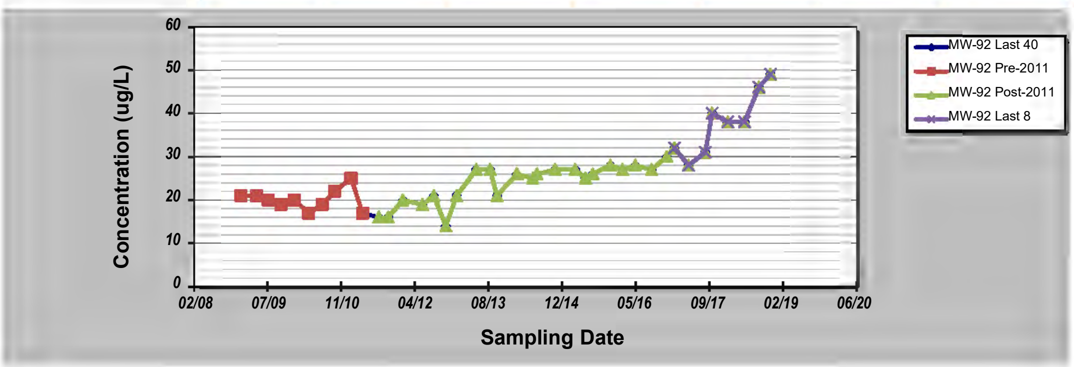


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Point ID:		MW-92 Last 40	MW-92 Pre-2011	MW-92 Post-2011	MW-92 Last 8			
Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (ug/L)						
1	8-Jan-09	21	21					
2	24-Apr-09	21	21					
3	13-Jul-09	20	20					
4	6-Oct-09	19	19					
5	6-Jan-10	20	20					
6	14-Apr-10	17	17					
7	14-Jul-10	19	19					
8	6-Oct-10	22	22					
9	26-Jan-11	25	25					
10	13-Apr-11	17	17					
11	2-Aug-11	16		16				
12	5-Oct-11	16		16				
13	12-Jan-12	20		20				
14	25-May-12	19		19				
15	8-Aug-12	21		21				
16	29-Oct-12	14		14				
17	10-Jan-13	21		21				
18	24-May-13	27		27				
19	26-Aug-13	27		27				
20	10-Oct-13	21		21				
21	24-Feb-14	26		26				
22	11-Jun-14	25		25				
23	10-Jul-14	26		26				
24	10-Nov-14	27		27				
25	25-Mar-15	27		27				
26	4-Jun-15	25		25				
27	24-Jul-15	26		26				
28	20-Nov-15	28		28				
29	10-Feb-16	27		27				
30	6-May-16	28		28				
31	25-Aug-16	27		27				
32	6-Dec-16	30		30				
33	26-Jan-17	32		32	32			
34	2-May-17	28		28	28			
35	23-Aug-17	31		31	31			
36	10-Oct-17	40		40	40			
37	24-Jan-18	38		38	38			
38	16-May-18	38		38	38			
39	23-Aug-18	46		46	46			
40	9-Nov-18	49		49	49			
Coefficient of Variation:		0.31	0.12	0.30	0.19			
Mann-Kendall Statistic (S):		531	-7	342	19			
Confidence Factor:		>99.9%	70.0%	>99.9%	98.9%			
Concentration Trend:		Increasing	Stable	Increasing	Increasing			



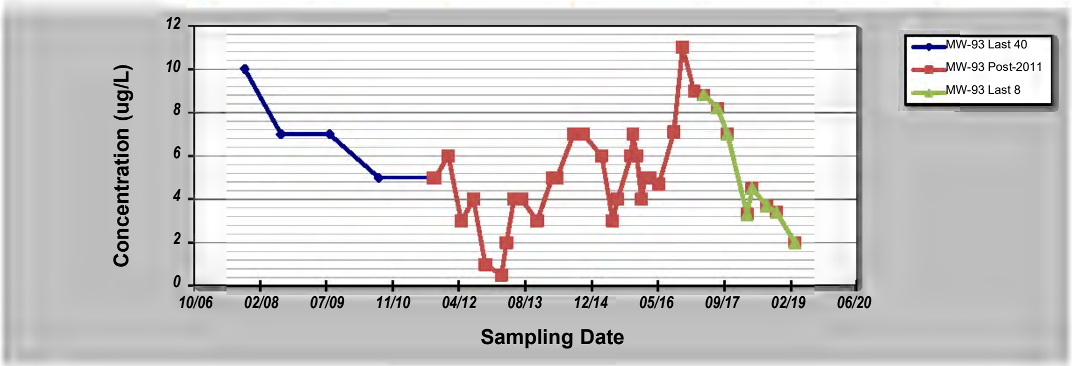
Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink

Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-93 Last 40	MW-93 Post-2011	MW-93 Last 8
		1,4-DIOXANE CONCENTRATION (ug/L)		
1	30-Oct-07	10		
2	29-Jul-08	7		
3	30-Jul-09	7		
4	5-Aug-10	5		
5	17-Sep-11	5	5	
6	6-Oct-11	5	5	
7	10-Jan-12	6	6	
8	18-Apr-12	3	3	
9	19-Jul-12	4	4	
10	17-Oct-12	1	1	
11	13-Feb-13	0.5	0.5	
12	26-Mar-13	2	2	
13	20-May-13	4	4	
14	18-Jul-13	4	4	
15	11-Nov-13	3	3	
16	4-Mar-14	5	5	
17	9-Apr-14	5	5	
18	13-Aug-14	7	7	
19	24-Oct-14	7	7	
20	12-Mar-15	6	6	
21	2-Jun-15	3	3	
22	10-Jul-15	4	4	
23	19-Oct-15	6	6	
24	3-Nov-15	7	7	
25	2-Dec-15	6	6	
26	6-Jan-16	4	4	
27	2-Feb-16	5	5	
28	9-Mar-16	5	5	
29	19-May-16	4.7	4.7	
30	8-Sep-16	7.1	7.1	
31	10-Nov-16	11	11	
32	7-Feb-17	9	9	
33	20-Apr-17	8.8	8.8	8.8
34	2-Aug-17	8.2	8.2	8.2
35	16-Oct-17	7	7	7
36	13-Mar-18	3.3	3.3	3.3
37	19-Apr-18	4.5	4.5	4.5
38	9-Aug-18	3.7	3.7	3.7
39	22-Oct-18	3.4	3.4	3.4
40	8-Mar-19	2	2	2
	Coefficient of Variation:	0.44	0.45	0.50
	Mann-Kendall Statistic (S):	20	107	-22
	Confidence Factor:	58.7%	92.5%	99.8%
	Concentration Trend:	No Trend	Prob. Increasing	Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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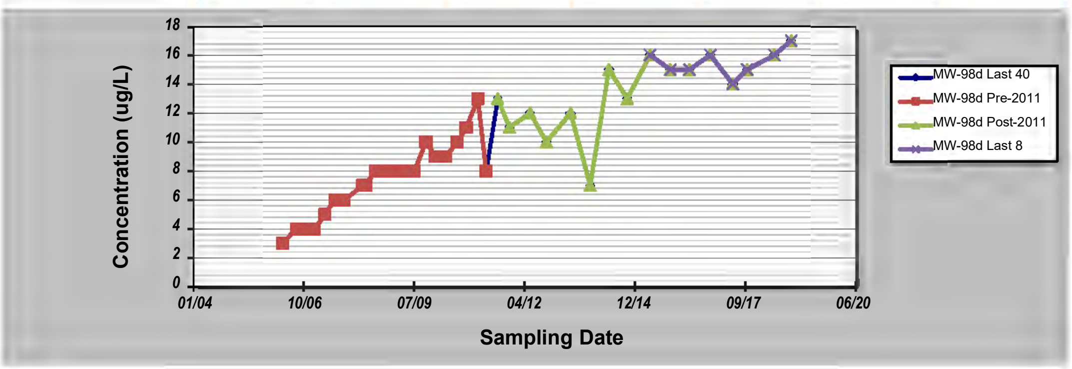
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 24-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-98d Last 40	MW-98d Pre-2011	MW-98d Post-2011	MW-98d Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	3-Apr-06	3	3					
2	2-Aug-06	4	4					
3	27-Oct-06	4	4					
4	15-Jan-07	4	4					
5	19-Apr-07	5	5					
6	17-Jul-07	6	6					
7	12-Oct-07	6	6					
8	25-Mar-08	7	7					
9	22-Apr-08	7	7					
10	18-Jul-08	8	8					
11	6-Nov-08	8	8					
12	25-Feb-09	8	8					
13	9-Apr-09	8	8					
14	10-Jul-09	8	8					
15	21-Oct-09	10	10					
16	15-Jan-10	9	9					
17	19-Apr-10	9	9					
18	30-Jul-10	10	10					
19	22-Oct-10	11	11					
20	4-Feb-11	13	13					
21	20-Apr-11	8	8					
22	3-Aug-11	13		13				
23	17-Nov-11	11		11				
24	22-May-12	12		12				
25	15-Oct-12	10		10				
26	23-May-13	12		12				
27	18-Nov-13	7		7				
28	6-May-14	15		15				
29	20-Oct-14	13		13				
30	12-May-15	16		16	16			
31	13-Nov-15	15		15	15			
32	5-May-16	15		15	15			
33	9-Nov-16	16		16	16			
34	31-May-17	14		14	14			
35	9-Oct-17	15		15	15			
36	12-Jun-18	16		16	16			
37	12-Nov-18	17		17	17			
38								
39								
40								
	Coefficient of Variation:	0.40	0.34	0.20	0.06			
	Mann-Kendall Statistic (S):	534	172	67	6			
	Confidence Factor:	>99.9%	>99.9%	99.9%	72.6%			
	Concentration Trend:	Increasing	Increasing	Increasing	No Trend			

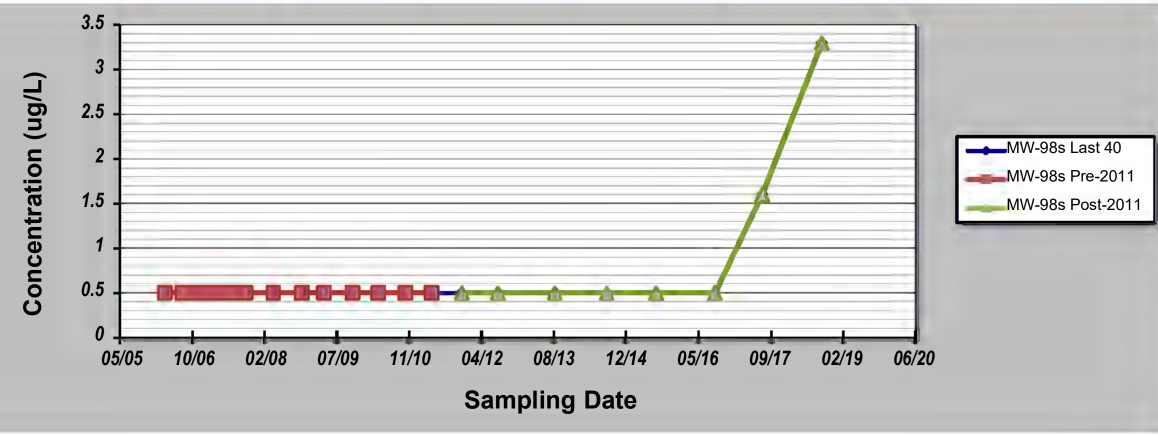


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-98s Last 40	MW-98s Pre-2011	MW-98s Post-2011				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	3-Apr-06	0.5	0.5					
2	2-Aug-06	0.5	0.5					
3	27-Oct-06	0.5	0.5					
4	15-Jan-07	0.5	0.5					
5	19-Apr-07	0.5	0.5					
6	17-Jul-07	0.5	0.5					
7	12-Oct-07	0.5	0.5					
8	22-Apr-08	0.5	0.5					
9	6-Nov-08	0.5	0.5					
10	9-Apr-09	0.5	0.5					
11	21-Oct-09	0.5	0.5					
12	19-Apr-10	0.5	0.5					
13	22-Oct-10	0.5	0.5					
14	20-Apr-11	0.5	0.5					
15	17-Nov-11	0.5		0.5				
16	24-Jul-12	0.5		0.5				
17	21-Aug-13	0.5		0.5				
18	14-Aug-14	0.5		0.5				
19	20-Jul-15	0.5		0.5				
20	1-Sep-16	0.5		0.5				
21	24-Jul-17	1.6		1.6				
22	10-Sep-18	3.3		3.3				
23								
24								
25								
Coefficient of Variation:		0.93	0.00	1.02				
Mann-Kendall Statistic (S):		41	0	13				
Confidence Factor:		86.9%	47.8%	92.9%				
Concentration Trend:		No Trend	Stable	Prob. Increasing				

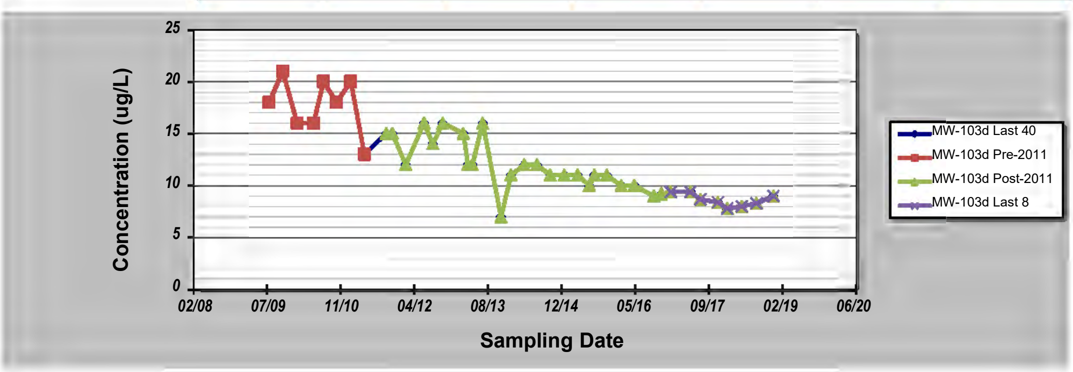


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-103d Last 40	MW-103d Pre-2011	MW-103d Post-2011	MW-103d Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	20-Jul-09	18	18					
2	19-Oct-09	21	21					
3	26-Jan-10	16	16					
4	17-May-10	16	16					
5	23-Jul-10	20	20					
6	20-Oct-10	18	18					
7	25-Jan-11	20	20					
8	26-Apr-11	13	13					
9	23-Sep-11	15		15				
10	2-Nov-11	15		15				
11	2-Feb-12	12		12				
12	5-Jun-12	16		16				
13	3-Aug-12	14		14				
14	9-Oct-12	16		16				
15	26-Feb-13	15		15				
16	29-Mar-13	12		12				
17	29-Apr-13	12		12				
18	8-Jul-13	16		16				
19	8-Nov-13	7		7				
20	15-Jan-14	11		11				
21	16-Apr-14	12		12				
22	11-Jul-14	12		12				
23	8-Oct-14	11		11				
24	12-Jan-15	11		11				
25	14-Apr-15	11		11				
26	2-Jul-15	10		10				
27	5-Aug-15	11		11				
28	29-Oct-15	11		11				
29	3-Feb-16	10		10				
30	3-May-16	10		10				
31	12-Sep-16	9		9				
32	2-Nov-16	9.2		9.2				
33	4-Jan-17	9.4		9.4	9.4			
34	19-May-17	9.4		9.4	9.4			
35	24-Jul-17	8.7		8.7	8.7			
36	20-Nov-17	8.4		8.4	8.4			
37	22-Jan-18	7.8		7.8	7.8			
38	2-May-18	8		8	8			
39	9-Aug-18	8.3		8.3	8.3			
40	3-Dec-18	9		9	9			
Coefficient of Variation:		0.30	0.15	0.23	0.07			
Mann-Kendall Statistic (S):		-591	-5	-350	-11			
Confidence Factor:		>99.9%	68.3%	>99.9%	88.7%			
Concentration Trend:		Decreasing	Stable	Decreasing	Stable			



Notes:
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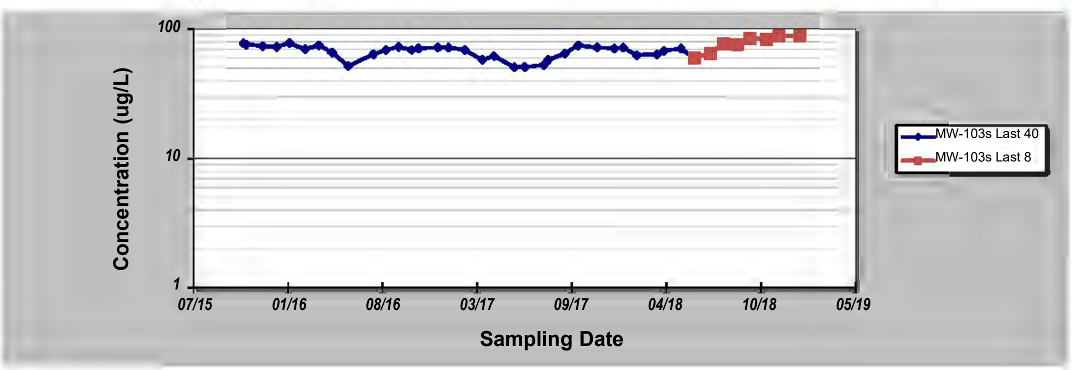
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 24-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-103s Last 40	MW-103s Last 8					
	Sampling Point ID:	1,4-DIOXANE CONCENTRATION (ug/L)						
1	29-Oct-15	78						
2	3-Nov-15	76						
3	8-Dec-15	74						
4	7-Jan-16	73						
5	3-Feb-16	78						
6	7-Mar-16	70						
7	5-Apr-16	75						
8	3-May-16	66						
9	6-Jun-16	52						
10	29-Jul-16	64						
11	25-Aug-16	69						
12	20-Sep-16	73						
13	18-Oct-16	69						
14	2-Nov-16	71						
15	12-Dec-16	72						
16	4-Jan-17	72						
17	8-Feb-17	69						
18	16-Mar-17	58						
19	10-Apr-17	62						
20	23-May-17	51						
21	14-Jun-17	51						
22	24-Jul-17	53						
23	3-Aug-17	58						
24	7-Sep-17	65						
25	5-Oct-17	75						
26	14-Nov-17	72						
27	20-Dec-17	71						
28	8-Jan-18	72						
29	6-Feb-18	63						
30	20-Mar-18	64						
31	4-Apr-18	68						
32	10-May-18	71						
33	7-Jun-18	60	60					
34	11-Jul-18	65	65					
35	9-Aug-18	77	77					
36	6-Sep-18	76	76					
37	3-Oct-18	85	85					
38	7-Nov-18	83	83					
39	3-Dec-18	88	88					
40	16-Jan-19	89	89					
	Coefficient of Variation:	0.13	0.14					
	Mann-Kendall Statistic (S):	34	24					
	Confidence Factor:	64.9%	99.9%					
	Concentration Trend:	No Trend	Increasing					

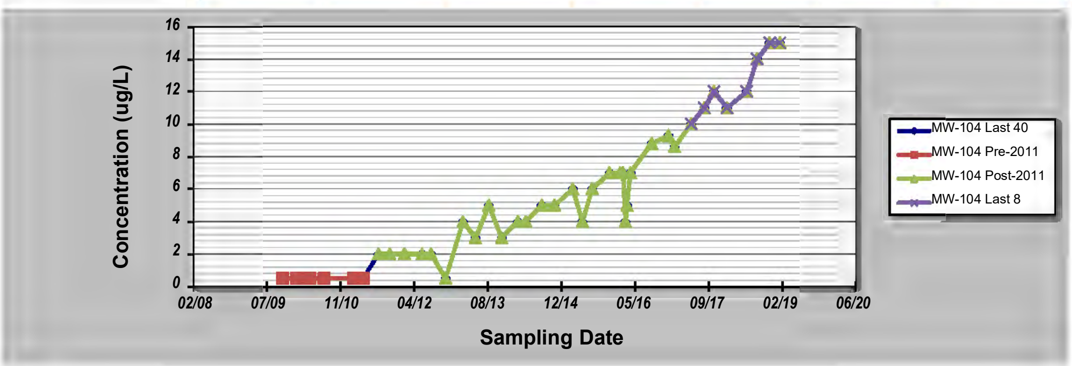


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-104 Last 40	MW-104 Pre-2011	MW-104 Post-2011	MW-104 Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	19-Oct-09	0.5	0.5					
2	25-Jan-10	0.5	0.5					
3	22-Apr-10	0.5	0.5					
4	29-Jul-10	0.5	0.5					
5	15-Feb-11	0.5	0.5					
6	20-Apr-11	0.5	0.5					
7	3-Aug-11	2		2				
8	19-Oct-11	2		2				
9	26-Jan-12	2		2				
10	25-May-12	2		2				
11	24-Jul-12	2		2				
12	31-Oct-12	0.5		0.5				
13	26-Feb-13	4		4				
14	21-May-13	3		3				
15	20-Aug-13	5		5				
16	15-Nov-13	3		3				
17	5-Mar-14	4		4				
18	29-Apr-14	4		4				
19	14-Aug-14	5		5				
20	10-Nov-14	5		5				
21	13-Mar-15	6		6				
22	18-May-15	4		4				
23	24-Jul-15	6		6				
24	18-Nov-15	7		7				
25	29-Jan-16	7		7				
26	18-Feb-16	7		7				
27	4-Mar-16	4		4				
28	16-Mar-16	5		5				
29	7-Apr-16	7		7				
30	30-Aug-16	8.8		8.8				
31	22-Dec-16	9.3		9.3				
32	1-Feb-17	8.6		8.6				
33	25-May-17	10		10	10			
34	22-Aug-17	11		11	11			
35	26-Oct-17	12		12	12			
36	24-Jan-18	11		11	11			
37	8-Jun-18	12		12	12			
38	16-Aug-18	14		14	14			
39	9-Nov-18	15		15	15			
40	17-Jan-19	15		15	15			
	Coefficient of Variation:	0.76	0.00	0.61	0.15			
	Mann-Kendall Statistic (S):	662	0	464	23			
	Confidence Factor:	>99.9%	39.3%	>99.9%	99.9%			
	Concentration Trend:	Increasing	Stable	Increasing	Increasing			



Notes:
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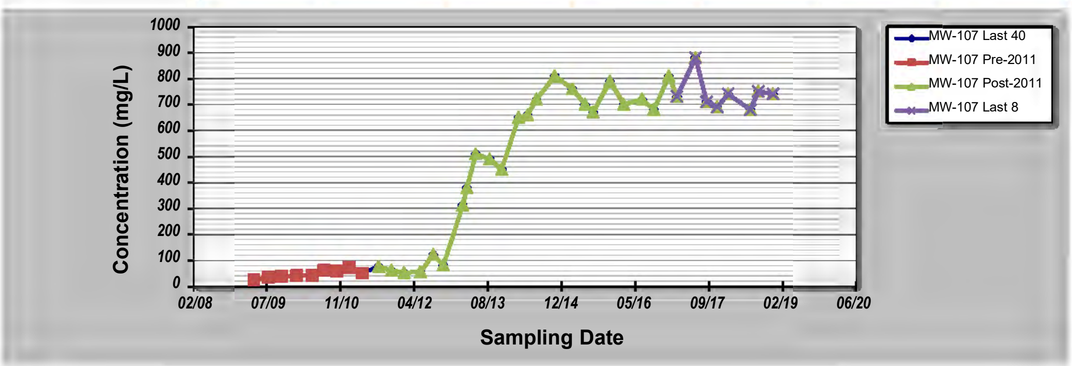
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 29-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 805600
Constituent: 1,4-Dioxane
Concentration Units: mg/L

Sampling Event	Sampling Date	MW-107 Last 40	MW-107 Pre-2011	MW-107 Post-2011	MW-107 Last 8			
		1,4-DIOXANE CONCENTRATION (mg/L)						
1	10-Apr-09	25	25					
2	16-Jul-09	36	36					
3	15-Oct-09	39	39					
4	26-Jan-10	41	41					
5	10-May-10	42	42					
6	29-Jul-10	62	62					
7	22-Oct-10	59	59					
8	18-Jan-11	73	73					
9	13-Apr-11	51	51					
10	4-Aug-11	76		76				
11	31-Oct-11	62		62				
12	24-Jan-12	53		53				
13	14-May-12	56		56				
14	8-Aug-12	122		122				
15	15-Oct-12	81		81				
16	25-Feb-13	312		312				
17	26-Mar-13	379		379				
18	24-May-13	510		510				
19	26-Aug-13	490		490				
20	15-Nov-13	450		450				
21	10-Mar-14	650		650				
22	9-May-14	660		660				
23	10-Jul-14	720		720				
24	10-Nov-14	810		810				
25	10-Mar-15	760		760				
26	4-Jun-15	700		700				
27	27-Jul-15	670		670				
28	19-Nov-15	790		790				
29	22-Feb-16	700		700				
30	24-Jun-16	720		720				
31	12-Sep-16	680		680				
32	23-Dec-16	810		810				
33	16-Feb-17	730		730	730			
34	22-Jun-17	880		880	880			
35	5-Sep-17	710		710	710			
36	17-Nov-17	690		690	690			
37	29-Jan-18	740		740	740			
38	28-Jun-18	680		680	680			
39	21-Aug-18	750		750	750			
40	29-Nov-18	740		740	740			
Coefficient of Variation:		0.72	0.31	0.48	0.08			
Mann-Kendall Statistic (S):		584	28	292	-1			
Confidence Factor:		>99.9%	99.9%	>99.9%	50.0%			
Concentration Trend:		Increasing	Increasing	Increasing	Stable			



Notes:

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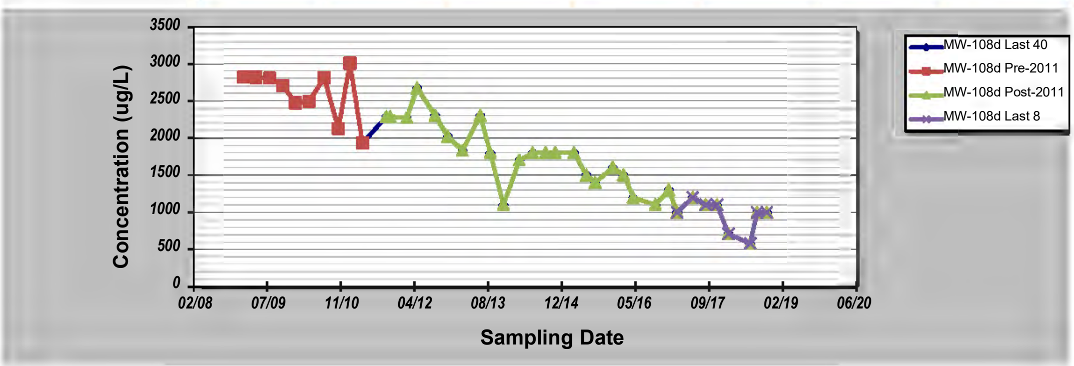
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	29-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-108d Last 40	MW-108d Pre-2011	MW-108d Post-2011	MW-108d Last 8			
	Sampling Point ID:	1,4-DIOXANE CONCENTRATION (ug/L)						
1	28-Jan-09	2816	2816					
2	21-Apr-09	2814	2814					
3	24-Jul-09	2804	2804					
4	20-Oct-09	2700	2700					
5	14-Jan-10	2470	2470					
6	15-Apr-10	2492	2492					
7	28-Jul-10	2807	2807					
8	2-Nov-10	2123	2123					
9	20-Jan-11	3003	3003					
10	14-Apr-11	1929	1929					
11	21-Sep-11	2282		2282				
12	19-Oct-11	2286		2286				
13	9-Feb-12	2269		2269				
14	19-Apr-12	2671		2671				
15	17-Aug-12	2300		2300				
16	13-Nov-12	2020		2020				
17	21-Feb-13	1831		1831				
18	21-Jun-13	2300		2300				
19	28-Aug-13	1800		1800				
20	26-Nov-13	1100		1100				
21	14-Mar-14	1700		1700				
22	12-Jun-14	1800		1800				
23	8-Sep-14	1800		1800				
24	12-Nov-14	1800		1800				
25	18-Mar-15	1800		1800				
26	11-Jun-15	1500		1500				
27	10-Aug-15	1400		1400				
28	8-Dec-15	1600		1600				
29	19-Feb-16	1500		1500				
30	25-Apr-16	1200		1200				
31	22-Sep-16	1100		1100				
32	21-Dec-16	1300		1300				
33	17-Feb-17	1000		1000	1000			
34	2-Jun-17	1200		1200	1200			
35	30-Aug-17	1100		1100	1100			
36	14-Nov-17	1100		1100	1100			
37	1-Feb-18	710		710	710			
38	27-Jun-18	580		580	580			
39	13-Aug-18	1000		1000	1000			
40	18-Oct-18	1000		1000	1000			
	Coefficient of Variation:	0.36	0.13	0.34	0.22			
	Mann-Kendall Statistic (S):	-620	-19	-331	-10			
	Confidence Factor:	>99.9%	94.6%	>99.9%	86.2%			
	Concentration Trend:	Decreasing	Prob. Decreasing	Decreasing	Stable			



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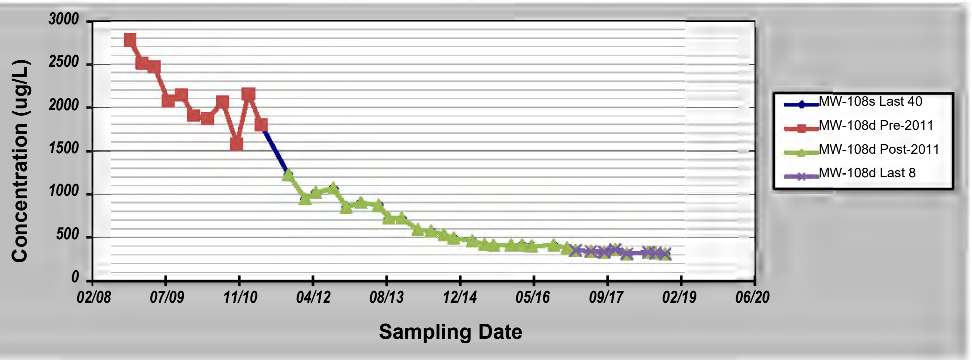
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	29-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-108s Last 40	MW-108d Pre-2011	MW-108d Post-2011	MW-108d Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	6-Nov-08	2775	2775					
2	28-Jan-09	2508	2508					
3	21-Apr-09	2464	2464					
4	24-Jul-09	2070	2070					
5	20-Oct-09	2147	2147					
6	14-Jan-10	1904	1904					
7	15-Apr-10	1868	1868					
8	28-Jul-10	2061	2061					
9	2-Nov-10	1577	1577					
10	20-Jan-11	2157	2157					
11	14-Apr-11	1798	1798					
12	19-Oct-11	1224		1224				
13	9-Feb-12	943		943				
14	19-Apr-12	1014		1014				
15	17-Aug-12	1068		1068				
16	13-Nov-12	850		850				
17	21-Feb-13	900		900				
18	21-Jun-13	870		870				
19	28-Aug-13	720		720				
20	26-Nov-13	720		720				
21	14-Mar-14	590		590				
22	12-Jun-14	570		570				
23	8-Sep-14	530		530				
24	12-Nov-14	490		490				
25	18-Mar-15	460		460				
26	11-Jun-15	420		420				
27	10-Aug-15	410		410				
28	8-Dec-15	410		410				
29	19-Feb-16	410		410				
30	25-Apr-16	400		400				
31	22-Sep-16	410		410				
32	21-Dec-16	380		380				
33	17-Feb-17	350		350	350			
34	2-Jun-17	340		340	340			
35	30-Aug-17	330		330	330			
36	14-Nov-17	360		360	360			
37	1-Feb-18	310		310	310			
38	27-Jun-18	330		330	330			
39	13-Aug-18	320		320	320			
40	18-Oct-18	310		310	310			
Coefficient of Variation:		0.76	0.16	0.47	0.05			
Mann-Kendall Statistic (S):		-729	-35	-375	-16			
Confidence Factor:		>99.9%	99.7%	>99.9%	96.9%			
Concentration Trend:		Decreasing	Decreasing	Decreasing	Decreasing			

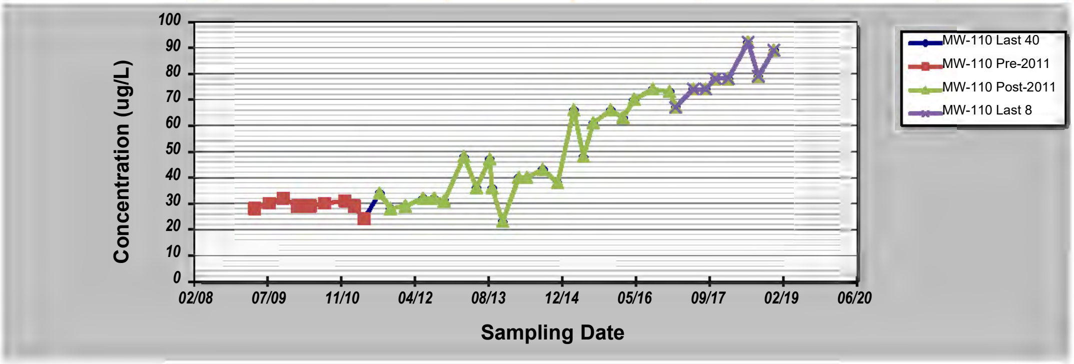


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 25-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-110 Last 40	MW-110 Pre-2011	MW-110 Post-2011	MW-110 Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	9-Apr-09	28	28					
2	14-Jul-09	30	30					
3	19-Oct-09	32	32					
4	25-Jan-10	29	29					
5	22-Apr-10	29	29					
6	29-Jul-10	30	30					
7	13-Dec-10	31	31					
8	15-Feb-11	29	29					
9	20-Apr-11	24	24					
10	4-Aug-11	34		34				
11	17-Oct-11	28		28				
12	26-Jan-12	29		29				
13	25-May-12	32		32				
14	8-Aug-12	32		32				
15	15-Oct-12	31		31				
16	26-Feb-13	48		48				
17	22-May-13	36		36				
18	21-Aug-13	47		47				
19	5-Sep-13	36		36				
20	15-Nov-13	23		23				
21	5-Mar-14	40		40				
22	29-Apr-14	40		40				
23	14-Aug-14	43		43				
24	25-Nov-14	38		38				
25	13-Mar-15	66		66				
26	18-May-15	48		48				
27	24-Jul-15	61		61				
28	18-Nov-15	66		66				
29	9-Feb-16	63		63				
30	26-Apr-16	70		70				
31	30-Aug-16	74		74				
32	22-Dec-16	73		73				
33	1-Feb-17	67		67	67			
34	1-Jun-17	74		74	74			
35	23-Aug-17	74		74	74			
36	27-Oct-17	78		78	78			
37	23-Jan-18	78		78	78			
38	8-Jun-18	92		92	92			
39	16-Aug-18	79		79	79			
40	29-Nov-18	89		89	89			
	Coefficient of Variation:	0.43	0.08	0.38	0.10			
	Mann-Kendall Statistic (S):	598	-4	372	22			
	Confidence Factor:	>99.9%	61.9%	>99.9%	99.8%			
	Concentration Trend:	Increasing	Stable	Increasing	Increasing			

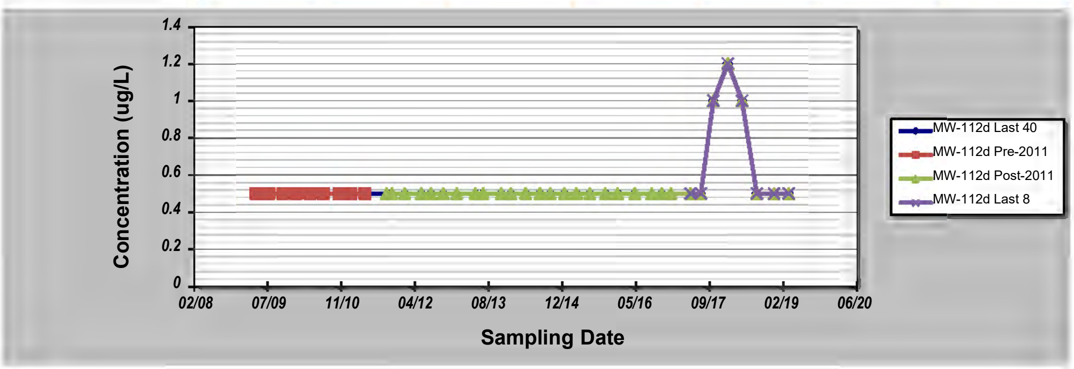


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-112d Last 40	MW-112d Pre-2011	MW-112d Post-2011	MW-112d Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	20-Apr-09	0.5	0.5					
2	16-Jul-09	0.5	0.5					
3	19-Oct-09	0.5	0.5					
4	15-Jan-10	0.5	0.5					
5	19-Apr-10	0.5	0.5					
6	19-Jul-10	0.5	0.5					
7	3-Nov-10	0.5	0.5					
8	25-Jan-11	0.5	0.5					
9	28-Apr-11	0.5	0.5					
10	23-Sep-11	0.5		0.5				
11	28-Oct-11	0.5		0.5				
12	23-Jan-12	0.5		0.5				
13	15-May-12	0.5		0.5				
14	20-Jul-12	0.5		0.5				
15	12-Oct-12	0.5		0.5				
16	11-Jan-13	0.5		0.5				
17	17-May-13	0.5		0.5				
18	8-Jul-13	0.5		0.5				
19	8-Nov-13	0.5		0.5				
20	13-Jan-14	0.5		0.5				
21	22-Apr-14	0.5		0.5				
22	30-Jul-14	0.5		0.5				
23	7-Oct-14	0.5		0.5				
24	12-Jan-15	0.5		0.5				
25	3-Apr-15	0.5		0.5				
26	2-Jul-15	0.5		0.5				
27	16-Oct-15	0.5		0.5				
28	7-Jan-16	0.5		0.5				
29	3-May-16	0.5		0.5				
30	26-Aug-16	0.5		0.5				
31	3-Nov-16	0.5		0.5				
32	4-Jan-17	0.5		0.5				
33	17-May-17	0.5		0.5	0.5			
34	24-Jul-17	0.5		0.5	0.5			
35	18-Oct-17	1		1	1			
36	24-Jan-18	1.2		1.2	1.2			
37	1-May-18	1		1	1			
38	8-Aug-18	0.5		0.5	0.5			
39	4-Dec-18	0.5		0.5	0.5			
40	13-Mar-19	0.5		0.5	0.5			
	Coefficient of Variation:	0.28	0.00	0.31	0.42			
	Mann-Kendall Statistic (S):	93	0	66	-3			
	Confidence Factor:	85.7%	46.0%	86.4%	59.4%			
	Concentration Trend:	No Trend	Stable	No Trend	Stable			



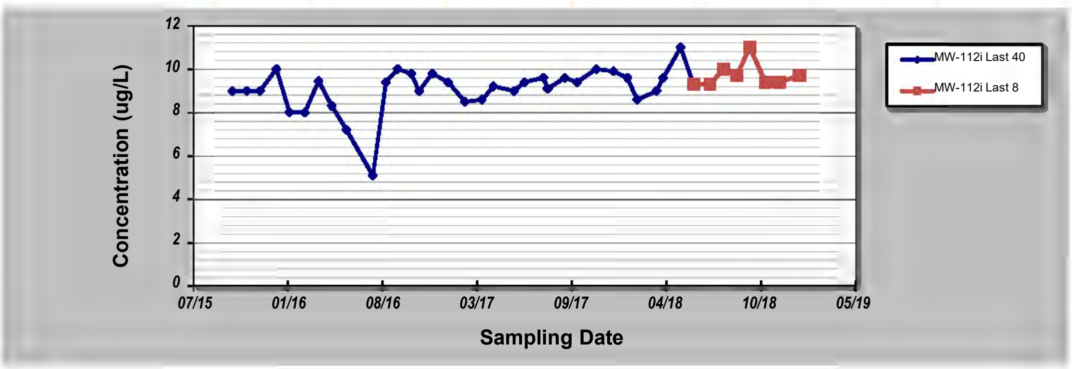
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 24-Jan-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (ug/L)	
	Sampling Point ID:	MW-112i Last 40	MW-112i Last 8
1	6-Oct-15	9	
2	6-Nov-15	9	
3	3-Dec-15	9	
4	7-Jan-16	10	
5	4-Feb-16	8	
6	7-Mar-16	8	
7	5-Apr-16	9.45	
8	3-May-16	8.3	
9	3-Jun-16	7.2	
10	29-Jul-16	5.1	
11	25-Aug-16	9.4	
12	19-Sep-16	10	
13	18-Oct-16	9.8	
14	3-Nov-16	9	
15	1-Dec-16	9.8	
16	4-Jan-17	9.4	
17	8-Feb-17	8.5	
18	16-Mar-17	8.6	
19	10-Apr-17	9.2	
20	23-May-17	9	
21	14-Jun-17	9.4	
22	24-Jul-17	9.6	
23	2-Aug-17	9.1	
24	7-Sep-17	9.6	
25	3-Oct-17	9.4	
26	13-Nov-17	10	
27	19-Dec-17	9.9	
28	17-Jan-18	9.6	
29	7-Feb-18	8.6	
30	20-Mar-18	9	
31	3-Apr-18	9.6	
32	10-May-18	11	
33	6-Jun-18	9.3	9.3
34	11-Jul-18	9.3	9.3
35	8-Aug-18	10	10
36	5-Sep-18	9.7	9.7
37	3-Oct-18	11	11
38	5-Nov-18	9.4	9.4
39	4-Dec-18	9.4	9.4
40	16-Jan-19	9.7	9.7
	Coefficient of Variation:	0.11	0.06
	Mann-Kendall Statistic (S):	240	7
	Confidence Factor:	99.8%	76.4%
	Concentration Trend:	Increasing	No Trend

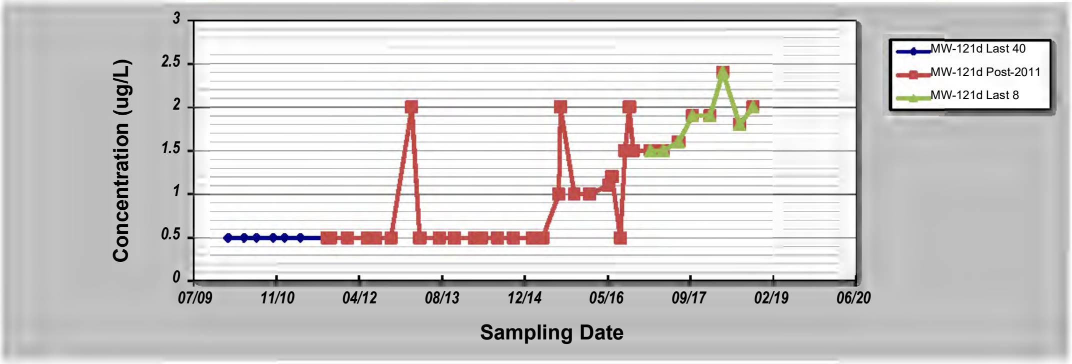


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	25-Jan-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-121d Last 40	MW-121d Post-2011	MW-121d Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	2-Feb-10	0.5						
2	10-May-10	0.5						
3	23-Jul-10	0.5						
4	1-Nov-10	0.5						
5	10-Jan-11	0.5						
6	15-Apr-11	0.5						
7	23-Sep-11	0.5	0.5					
8	13-Oct-11	0.5	0.5					
9	25-Jan-12	0.5	0.5					
10	24-May-12	0.5	0.5					
11	12-Jul-12	0.5	0.5					
12	11-Oct-12	0.5	0.5					
13	14-Feb-13	2	2					
14	3-Apr-13	0.5	0.5					
15	29-Jul-13	0.5	0.5					
16	29-Oct-13	0.5	0.5					
17	26-Feb-14	0.5	0.5					
18	10-Apr-14	0.5	0.5					
19	16-Jul-14	0.5	0.5					
20	20-Oct-14	0.5	0.5					
21	11-Feb-15	0.5	0.5					
22	14-Apr-15	0.5	0.5					
23	21-Jul-15	1	1					
24	31-Jul-15	2	2					
25	22-Oct-15	1	1					
26	22-Jan-16	1	1					
27	16-May-16	1.1	1.1					
28	6-Jun-16	1.2	1.2					
29	26-Jul-16	0.5	0.5					
30	25-Aug-16	1.5	1.5					
31	19-Sep-16	2	2					
32	12-Oct-16	1.5	1.5					
33	24-Jan-17	1.5	1.5	1.5				
34	11-Apr-17	1.5	1.5	1.5				
35	13-Jul-17	1.6	1.6	1.6				
36	5-Oct-17	1.9	1.9	1.9				
37	18-Jan-18	1.9	1.9	1.9				
38	5-Apr-18	2.4	2.4	2.4				
39	16-Jul-18	1.8	1.8	1.8				
40	5-Oct-18	2	2	2				
Coefficient of Variation:		0.62	0.59	0.17				
Mann-Kendall Statistic (S):		429	321	18				
Confidence Factor:		>99.9%	>99.9%	98.4%				
Concentration Trend:		Increasing	Increasing	Increasing				



Notes:
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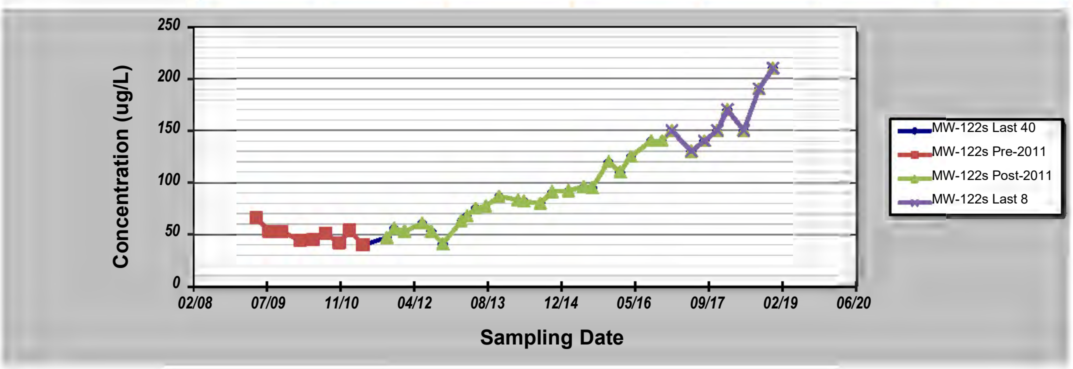
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-122s Last 40	MW-122s Pre-2011	MW-122s Post-2011	MW-122s Last 8			
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	24-Apr-09	66	66					
2	20-Jul-09	53	53					
3	16-Oct-09	53	53					
4	16-Feb-10	44	44					
5	13-May-10	45	45					
6	9-Aug-10	51	51					
7	8-Nov-10	42	42					
8	18-Jan-11	54	54					
9	19-Apr-11	40	40					
10	28-Sep-11	47		47				
11	17-Nov-11	56		56				
12	26-Jan-12	53		53				
13	25-May-12	61		61				
14	25-Jul-12	53		53				
15	11-Oct-12	41		41				
16	14-Feb-13	63		63				
17	26-Mar-13	68		68				
18	22-May-13	75		75				
19	29-Jul-13	77		77				
20	28-Oct-13	87		87				
21	5-Mar-14	83		83				
22	14-Apr-14	82		82				
23	4-Aug-14	80		80				
24	23-Oct-14	91		91				
25	11-Feb-15	92		92				
26	26-May-15	96		96				
27	21-Jul-15	95		95				
28	11-Nov-15	120		120				
29	27-Jan-16	110		110				
30	7-Apr-16	125		125				
31	25-Aug-16	140		140				
32	7-Nov-16	140		140				
33	11-Jan-17	150		150	150			
34	24-May-17	130		130	130			
35	21-Aug-17	140		140	140			
36	16-Nov-17	150		150	150			
37	24-Jan-18	170		170	170			
38	15-May-18	150		150	150			
39	27-Aug-18	190		190	190			
40	29-Nov-18	210		210	210			
	Coefficient of Variation:	0.49	0.16	0.42	0.17			
	Mann-Kendall Statistic (S):	634	-17	416	19			
	Confidence Factor:	>99.9%	95.1%	>99.9%	98.9%			
	Concentration Trend:	Increasing	Decreasing	Increasing	Increasing			

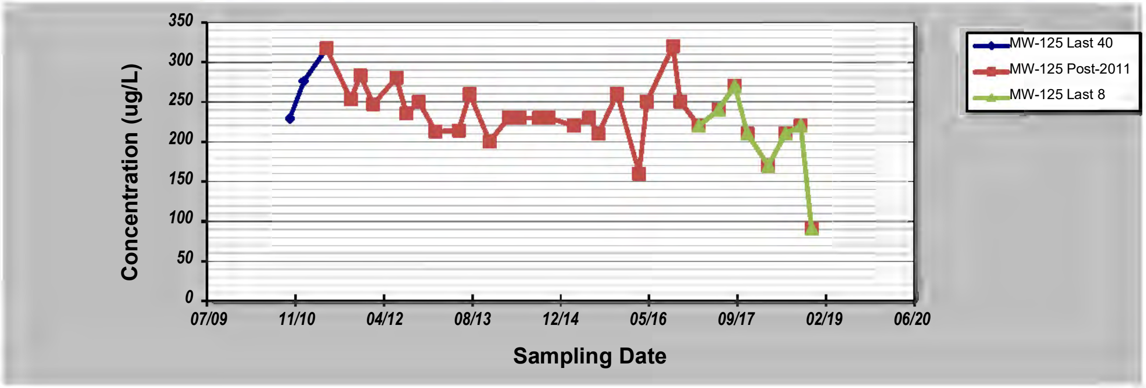


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Point ID:		MW-125 Last 40	MW-125 Post-2011	MW-125 Last 8				
Sampling Event	Sampling Date	1,4-DIOXANE CONCENTRATION (ug/L)						
1	18-Oct-10	229						
2	5-Jan-11	276						
3	13-May-11	317	317					
4	27-Sep-11	253	253					
5	21-Nov-11	283	283					
6	2-Feb-12	247	247					
7	11-Jun-12	280	280					
8	8-Aug-12	235	235					
9	16-Oct-12	250	250					
10	18-Jan-13	213	213					
11	29-May-13	214	214					
12	31-Jul-13	260	260					
13	20-Nov-13	200	200					
14	7-Mar-14	230	230					
15	8-May-14	230	230					
16	27-Aug-14	230	230					
17	21-Oct-14	230	230					
18	11-Mar-15	220	220					
19	5-Jun-15	230	230					
20	29-Jul-15	210	210					
21	10-Nov-15	260	260					
22	15-Mar-16	160	160					
23	27-Apr-16	250	250					
24	22-Sep-16	320	320					
25	2-Nov-16	250	250					
26	14-Feb-17	220	220	220				
27	7-Jun-17	240	240	240				
28	6-Sep-17	270	270	270				
29	16-Nov-17	210	210	210				
30	14-Mar-18	170	170	170				
31	19-Jun-18	210	210	210				
32	14-Sep-18	220	220	220				
33	14-Nov-18	91	91	91				
34								
35								
Coefficient of Variation:		0.18	0.19	0.26				
Mann-Kendall Statistic (S):		-168	-153	-12				
Confidence Factor:		99.6%	99.6%	91.1%				
Concentration Trend:		Decreasing	Decreasing	Prob. Decreasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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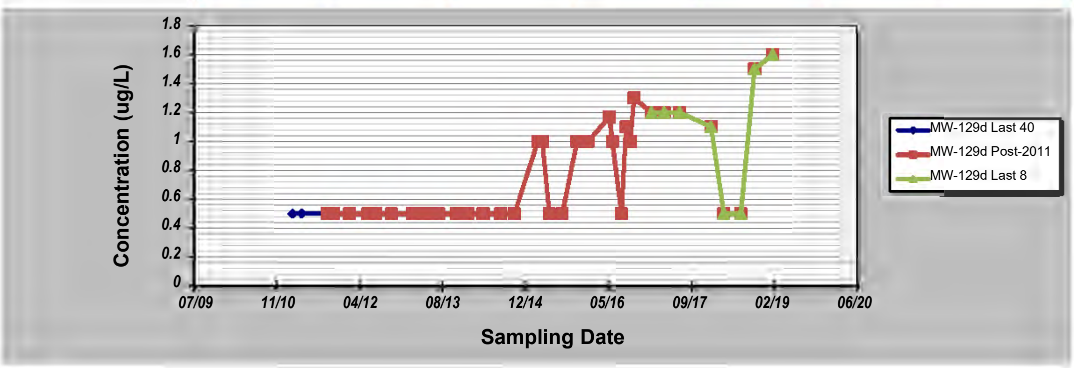
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-129d Last 40	MW-129d Post-2011	MW-129d Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	24-Feb-11	0.5						
2	21-Apr-11	0.5						
3	21-Sep-11	0.5	0.5					
4	31-Oct-11	0.5	0.5					
5	1-Feb-12	0.5	0.5					
6	23-May-12	0.5	0.5					
7	10-Jul-12	0.5	0.5					
8	11-Oct-12	0.5	0.5					
9	14-Feb-13	0.5	0.5					
10	25-Mar-13	0.5	0.5					
11	23-May-13	0.5	0.5					
12	22-Jul-13	0.5	0.5					
13	7-Nov-13	0.5	0.5					
14	16-Jan-14	0.5	0.5					
15	16-Apr-14	0.5	0.5					
16	31-Jul-14	0.5	0.5					
17	22-Oct-14	0.5	0.5					
18	11-Mar-15	1	1					
19	8-Apr-15	1	1					
20	20-May-15	0.5	0.5					
21	5-Aug-15	0.5	0.5					
22	3-Nov-15	1	1					
23	8-Jan-16	1	1					
24	16-May-16	1.17	1.17					
25	3-Jun-16	1	1					
26	28-Jul-16	0.5	0.5					
27	24-Aug-16	1.1	1.1					
28	19-Sep-16	1	1					
29	12-Oct-16	1.3	1.3					
30	25-Jan-17	1.2	1.2	1.2				
31	11-Apr-17	1.2	1.2	1.2				
32	13-Jul-17	1.2	1.2	1.2				
33	19-Jan-18	1.1	1.1	1.1				
34	5-Apr-18	0.5	0.5	0.5				
35	17-Jul-18	0.5	0.5	0.5				
36	8-Oct-18	1.5	1.5	1.5				
37	24-Jan-19	1.6	1.6	1.6				
38								
39								
40								
	Coefficient of Variation:	0.45	0.45	0.37				
	Mann-Kendall Statistic (S):	320	290	2				
	Confidence Factor:	>99.9%	>99.9%	54.8%				
	Concentration Trend:	Increasing	Increasing	No Trend				



Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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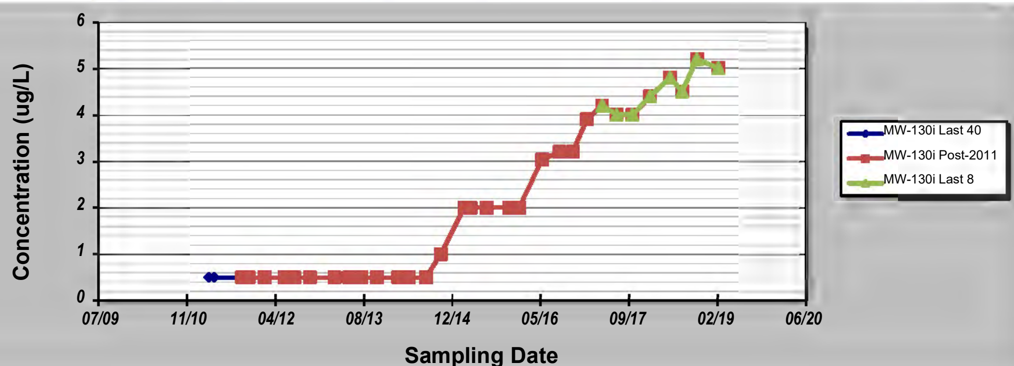
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-130i Last 40	MW-130i Post-2011	MW-130i Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	21-Mar-11	0.5						
2	21-Apr-11	0.5						
3	25-Sep-11	0.5	0.5					
4	1-Nov-11	0.5	0.5					
5	31-Jan-12	0.5	0.5					
6	24-May-12	0.5	0.5					
7	16-Jul-12	0.5	0.5					
8	12-Oct-12	0.5	0.5					
9	1-Mar-13	0.5	0.5					
10	23-May-13	0.5	0.5					
11	29-Jul-13	0.5	0.5					
12	28-Oct-13	0.5	0.5					
13	25-Feb-14	0.5	0.5					
14	23-Apr-14	0.5	0.5					
15	31-Jul-14	0.5	0.5					
16	22-Oct-14	1	1					
17	5-Mar-15	2	2					
18	8-Apr-15	2	2					
19	7-Jul-15	2	2					
20	11-Nov-15	2	2					
21	8-Jan-16	2	2					
22	17-May-16	3.03	3.03					
23	24-Aug-16	3.2	3.2					
24	7-Nov-16	3.2	3.2					
25	25-Jan-17	3.9	3.9					
26	21-Apr-17	4.2	4.2	4.2				
27	13-Jul-17	4	4	4				
28	9-Oct-17	4	4	4				
29	19-Jan-18	4.4	4.4	4.4				
30	10-May-18	4.8	4.8	4.8				
31	17-Jul-18	4.5	4.5	4.5				
32	8-Oct-18	5.2	5.2	5.2				
33	7-Feb-19	5	5	5				
34								
35								
Coefficient of Variation:		0.83	0.80	0.10				
Mann-Kendall Statistic (S):		403	367	19				
Confidence Factor:		>99.9%	>99.9%	98.9%				
Concentration Trend:		Increasing	Increasing	Increasing				

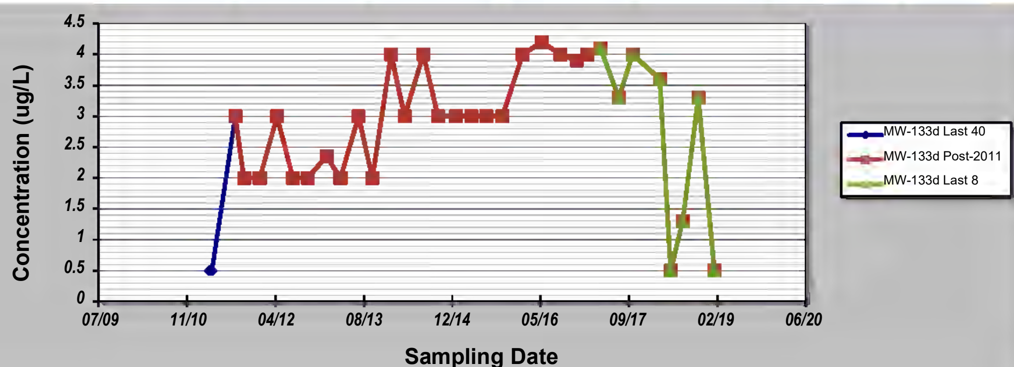


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-133d Last 40	MW-133d Post-2011	MW-133d Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	23-Mar-11	0.5						
2	8-Apr-11	0.5						
3	18-Aug-11	3	3					
4	6-Oct-11	2	2					
5	3-Jan-12	2	2					
6	10-Apr-12	3	3					
7	9-Jul-12	2	2					
8	2-Oct-12	2	2					
9	15-Jan-13	2.35	2.35					
10	4-Apr-13	2	2					
11	15-Jul-13	3	3					
12	1-Oct-13	2	2					
13	15-Jan-14	4	4					
14	2-Apr-14	3	3					
15	16-Jul-14	4	4					
16	7-Oct-14	3	3					
17	16-Jan-15	3	3					
18	13-Apr-15	3	3					
19	8-Jul-15	3	3					
20	7-Oct-15	3	3					
21	29-Jan-16	4	4					
22	17-May-16	4.2	4.2					
23	29-Aug-16	4	4					
24	1-Dec-16	3.9	3.9					
25	31-Jan-17	4	4					
26	13-Apr-17	4.1	4.1	4.1				
27	26-Jul-17	3.3	3.3	3.3				
28	12-Oct-17	4	4	4				
29	16-Mar-18	3.6	3.6	3.6				
30	16-May-18	0.5	0.5	0.5				
31	23-Jul-18	1.3	1.3	1.3				
32	19-Oct-18	3.3	3.3	3.3				
33	18-Jan-19	0.5	0.5	0.5				
34								
35								
Coefficient of Variation:		0.42	0.35	0.60				
Mann-Kendall Statistic (S):		163	105	-16				
Confidence Factor:		99.5%	96.2%	96.9%				
Concentration Trend:		Increasing	Increasing	Decreasing				



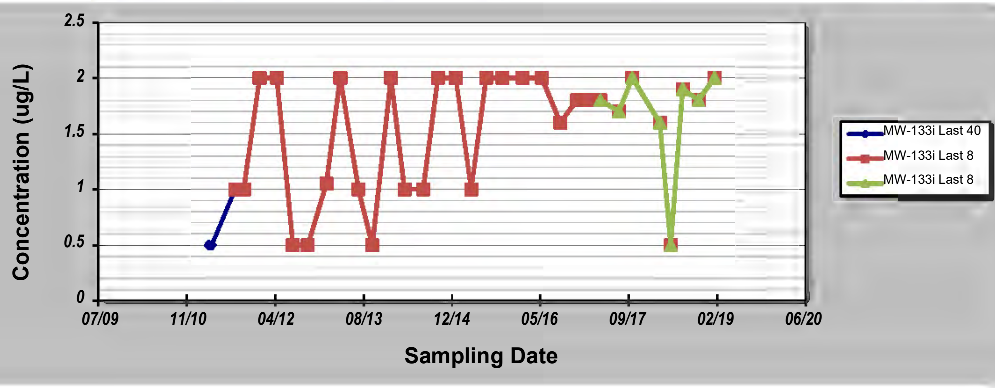
Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink

Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-133i Last 40	MW-133i Last 8	MW-133i Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	22-Mar-11	0.5						
2	8-Apr-11	0.5						
3	18-Aug-11	1	1					
4	6-Oct-11	1	1					
5	3-Jan-12	2	2					
6	10-Apr-12	2	2					
7	9-Jul-12	0.5	0.5					
8	2-Oct-12	0.5	0.5					
9	15-Jan-13	1.05	1.05					
10	4-Apr-13	2	2					
11	15-Jul-13	1	1					
12	1-Oct-13	0.5	0.5					
13	15-Jan-14	2	2					
14	2-Apr-14	1	1					
15	16-Jul-14	1	1					
16	7-Oct-14	2	2					
17	16-Jan-15	2	2					
18	13-Apr-15	1	1					
19	8-Jul-15	2	2					
20	7-Oct-15	2	2					
21	29-Jan-16	2	2					
22	17-May-16	2	2					
23	29-Aug-16	1.6	1.6					
24	1-Dec-16	1.8	1.8					
25	31-Jan-17	1.8	1.8					
26	13-Apr-17	1.8	1.8	1.8				
27	26-Jul-17	1.7	1.7	1.7				
28	10-Oct-17	2	2	2				
29	16-Mar-18	1.6	1.6	1.6				
30	16-May-18	0.5	0.5	0.5				
31	23-Jul-18	1.9	1.9	1.9				
32	19-Oct-18	1.8	1.8	1.8				
33	18-Jan-19	2	2	2				
34								
35								
Coefficient of Variation:		0.41	0.37	0.29				
Mann-Kendall Statistic (S):		119	65	4				
Confidence Factor:		96.7%	86.0%	64.0%				
Concentration Trend:		Increasing	No Trend	No Trend				

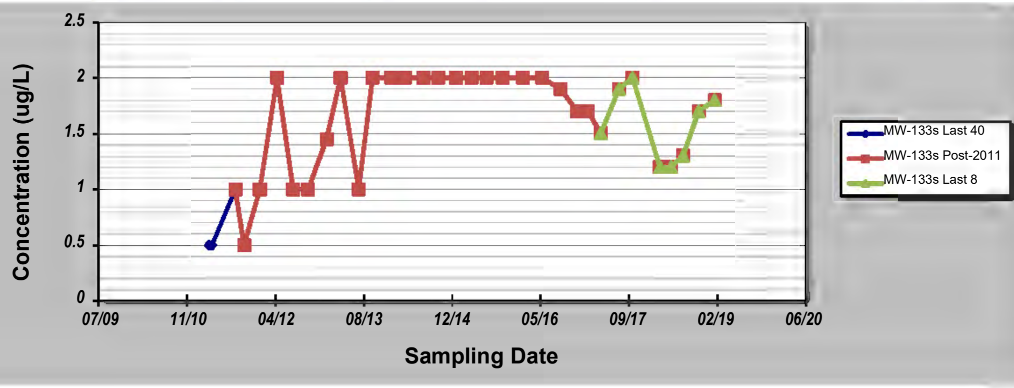


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-133s Last 40	MW-133s Post-2011	MW-133s Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	22-Mar-11	0.5						
2	8-Apr-11	0.5						
3	18-Aug-11	1	1					
4	6-Oct-11	0.5	0.5					
5	3-Jan-12	1	1					
6	10-Apr-12	2	2					
7	9-Jul-12	1	1					
8	2-Oct-12	1	1					
9	15-Jan-13	1.45	1.45					
10	4-Apr-13	2	2					
11	15-Jul-13	1	1					
12	1-Oct-13	2	2					
13	15-Jan-14	2	2					
14	2-Apr-14	2	2					
15	16-Jul-14	2	2					
16	7-Oct-14	2	2					
17	16-Jan-15	2	2					
18	13-Apr-15	2	2					
19	8-Jul-15	2	2					
20	7-Oct-15	2	2					
21	29-Jan-16	2	2					
22	17-May-16	2	2					
23	29-Aug-16	1.9	1.9					
24	1-Dec-16	1.7	1.7					
25	31-Jan-17	1.7	1.7					
26	13-Apr-17	1.5	1.5	1.5				
27	26-Jul-17	1.9	1.9	1.9				
28	10-Oct-17	2	2	2				
29	14-Mar-18	1.2	1.2	1.2				
30	16-May-18	1.2	1.2	1.2				
31	23-Jul-18	1.3	1.3	1.3				
32	19-Oct-18	1.7	1.7	1.7				
33	18-Jan-19	1.8	1.8	1.8				
34								
35								
Coefficient of Variation:		0.32	0.27	0.20				
Mann-Kendall Statistic (S):		81	21	1				
Confidence Factor:		89.2%	63.2%	50.0%				
Concentration Trend:		No Trend	No Trend	No Trend				



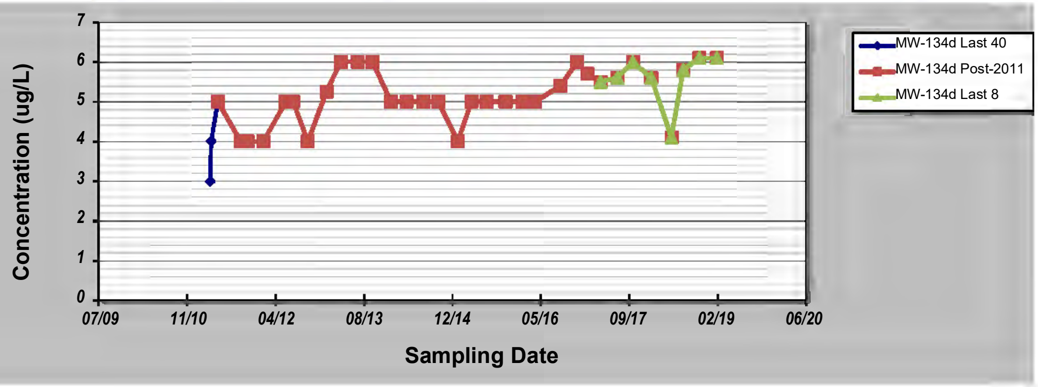
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-134d Last 40	MW-134d Post-2011	MW-134d Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	30-Mar-11	3						
2	5-Apr-11	4						
3	12-May-11	5	5					
4	20-Sep-11	4	4					
5	28-Oct-11	4	4					
6	24-Jan-12	4	4					
7	30-May-12	5	5					
8	10-Jul-12	5	5					
9	2-Oct-12	4	4					
10	15-Jan-13	5.25	5.25					
11	5-Apr-13	6	6					
12	11-Jul-13	6	6					
13	2-Oct-13	6	6					
14	14-Jan-14	5	5					
15	11-Apr-14	5	5					
16	16-Jul-14	5	5					
17	8-Oct-14	5	5					
18	27-Jan-15	4	4					
19	13-Apr-15	5	5					
20	8-Jul-15	5	5					
21	22-Oct-15	5	5					
22	28-Jan-16	5	5					
23	8-Apr-16	5	5					
24	29-Aug-16	5.4	5.4					
25	1-Dec-16	6	6					
26	26-Jan-17	5.7	5.7					
27	12-Apr-17	5.5	5.5	5.5				
28	18-Jul-17	5.6	5.6	5.6				
29	12-Oct-17	6	6	6				
30	23-Jan-18	5.6	5.6	5.6				
31	17-May-18	4.1	4.1	4.1				
32	24-Jul-18	5.8	5.8	5.8				
33	22-Oct-18	6.1	6.1	6.1				
34	29-Jan-19	6.1	6.1	6.1				
35								
Coefficient of Variation:		0.16	0.13	0.12				
Mann-Kendall Statistic (S):		260	200	14				
Confidence Factor:		>99.9%	100.0%	94.6%				
Concentration Trend:		Increasing	Increasing	Prob. Increasing				

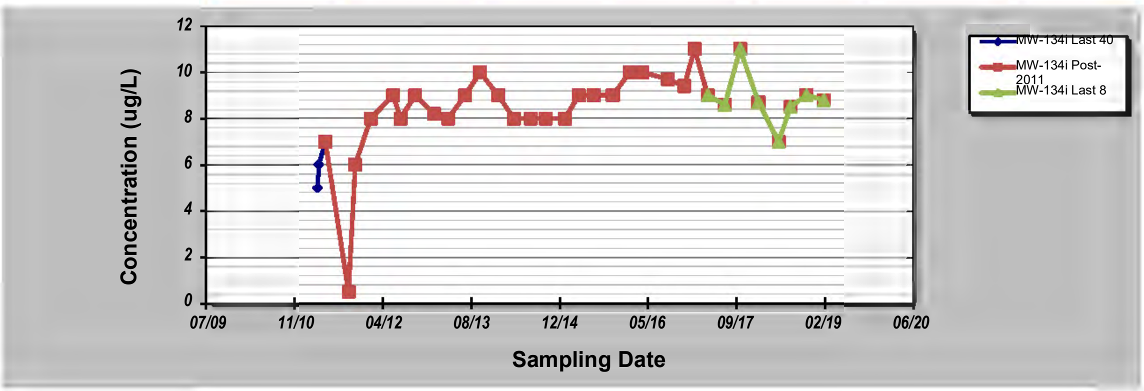


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-134i Last 40	MW-134i Post-2011	MW-134i Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	30-Mar-11	5						
2	5-Apr-11	6						
3	12-May-11	7	7					
4	20-Sep-11	0.5	0.5					
5	28-Oct-11	6	6					
6	24-Jan-12	8	8					
7	30-May-12	9	9					
8	10-Jul-12	8	8					
9	2-Oct-12	9	9					
10	15-Jan-13	8.2	8.2					
11	5-Apr-13	8	8					
12	11-Jul-13	9	9					
13	2-Oct-13	10	10					
14	14-Jan-14	9	9					
15	11-Apr-14	8	8					
16	16-Jul-14	8	8					
17	8-Oct-14	8	8					
18	27-Jan-15	8	8					
19	13-Apr-15	9	9					
20	8-Jul-15	9	9					
21	22-Oct-15	9	9					
22	28-Jan-16	10	10					
23	8-Apr-16	10	10					
24	29-Aug-16	9.7	9.7					
25	1-Dec-16	9.4	9.4					
26	26-Jan-17	11	11					
27	12-Apr-17	9	9	9				
28	18-Jul-17	8.6	8.6	8.6				
29	12-Oct-17	11	11	11				
30	23-Jan-18	8.7	8.7	8.7				
31	17-May-18	7	7	7				
32	24-Jul-18	8.5	8.5	8.5				
33	22-Oct-18	9	9	9				
34	29-Jan-19	8.8	8.8	8.8				
35								
Coefficient of Variation:		0.23	0.21	0.12				
Mann-Kendall Statistic (S):		208	148	-3				
Confidence Factor:		99.9%	99.2%	59.4%				
Concentration Trend:		Increasing	Increasing	Stable				

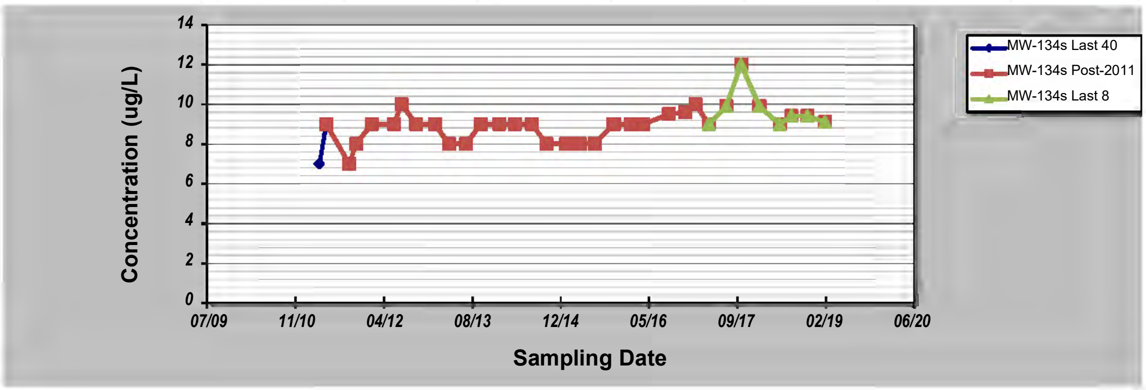


Notes:
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-134s Last 40	MW-134s Post-2011	MW-134s Last 8				
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	30-Mar-11	7						
2	5-Apr-11	7						
3	12-May-11	9	9					
4	20-Sep-11	7	7					
5	28-Oct-11	8	8					
6	24-Jan-12	9	9					
7	30-May-12	9	9					
8	10-Jul-12	10	10					
9	2-Oct-12	9	9					
10	15-Jan-13	9	9					
11	5-Apr-13	8	8					
12	11-Jul-13	8	8					
13	2-Oct-13	9	9					
14	14-Jan-14	9	9					
15	11-Apr-14	9	9					
16	16-Jul-14	9	9					
17	8-Oct-14	8	8					
18	27-Jan-15	8	8					
19	13-Apr-15	8	8					
20	8-Jul-15	8	8					
21	22-Oct-15	9	9					
22	28-Jan-16	9	9					
23	8-Apr-16	9	9					
24	29-Aug-16	9.5	9.5					
25	1-Dec-16	9.6	9.6					
26	26-Jan-17	10	10					
27	12-Apr-17	9	9	9				
28	21-Jul-17	9.9	9.9	9.9				
29	12-Oct-17	12	12	12				
30	23-Jan-18	9.9	9.9	9.9				
31	17-May-18	9	9	9				
32	24-Jul-18	9.4	9.4	9.4				
33	22-Oct-18	9.4	9.4	9.4				
34	29-Jan-19	9.1	9.1	9.1				
35								
Coefficient of Variation:		0.11	0.10	0.10				
Mann-Kendall Statistic (S):		235	173	-5				
Confidence Factor:		>99.9%	99.8%	68.3%				
Concentration Trend:		Increasing	Increasing	Stable				



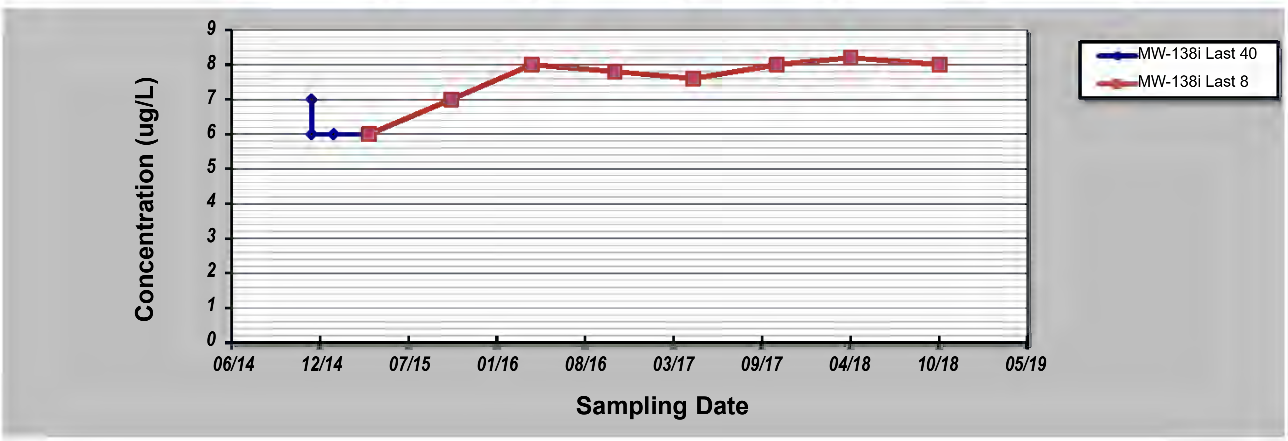
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-138i Last 40	MW-138i Last 8					
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	8-Dec-14	7						
2	8-Dec-14	6						
3	26-Jan-15	6						
4	17-Apr-15	6	6					
5	20-Oct-15	7	7					
6	19-Apr-16	8	8					
7	24-Oct-16	7.8	7.8					
8	19-Apr-17	7.6	7.6					
9	25-Oct-17	8	8					
10	10-Apr-18	8.2	8.2					
11	29-Oct-18	8	8					
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.12	0.10					
Mann-Kendall Statistic (S):		34	17					
Confidence Factor:		99.6%	97.7%					
Concentration Trend:		Increasing	Increasing					



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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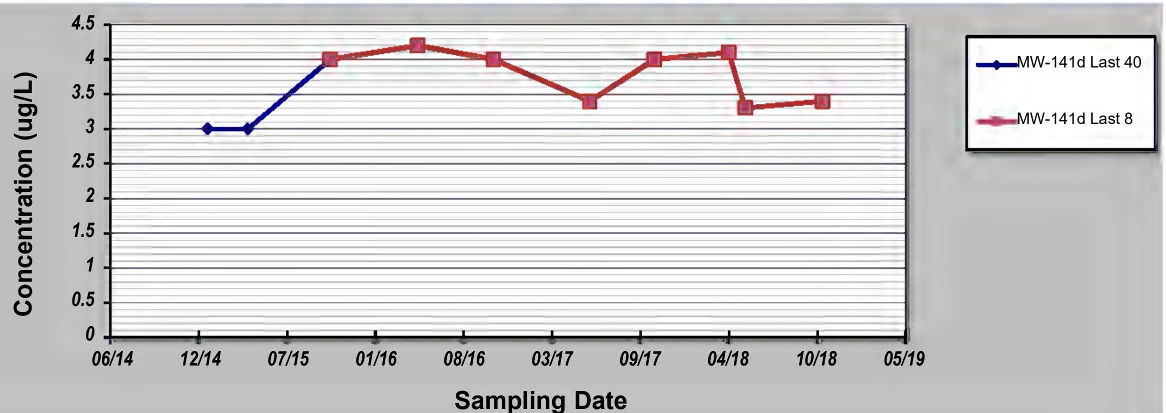
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	22-Mar-19	Job ID:	806500
Facility Name:	Gelman	Constituent:	1,4-Dioxane
Conducted By:	Fleis & VandenBrink	Concentration Units:	ug/L

Sampling Event	Sampling Date	MW-141d Last 40	MW-141d Last 8					
		1,4-DIOXANE CONCENTRATION (ug/L)						
1	16-Jan-15	3						
2	17-Apr-15	3						
3	21-Oct-15	4	4					
4	6-May-16	4.2	4.2					
5	24-Oct-16	4	4					
6	30-May-17	3.4	3.4					
7	23-Oct-17	4	4					
8	9-Apr-18	4.1	4.1					
9	17-May-18	3.3	3.3					
10	8-Nov-18	3.4	3.4					
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
	Coefficient of Variation:	0.13	0.10					
	Mann-Kendall Statistic (S):	6	-10					
	Confidence Factor:	66.8%	86.2%					
	Concentration Trend:	No Trend	Stable					



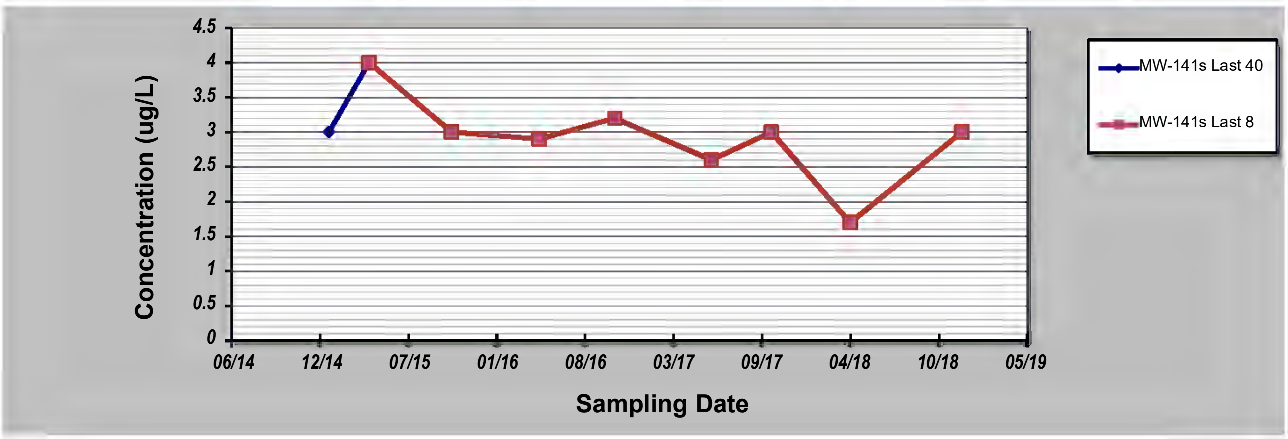
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: 22-Mar-19
Facility Name: Gelman
Conducted By: Fleis & VandenBrink
Job ID: 806500
Constituent: 1,4-Dioxane
Concentration Units: ug/L

Sampling Event	Sampling Date	MW-141s Last 40	MW-141s Last 8					
	Sampling Point ID:	1,4-DIOXANE CONCENTRATION (ug/L)						
1	16-Jan-15	3						
2	17-Apr-15	4	4					
3	21-Oct-15	3	3					
4	6-May-16	2.9	2.9					
5	24-Oct-16	3.2	3.2					
6	30-May-17	2.6	2.6					
7	13-Oct-17	3	3					
8	9-Apr-18	1.7	1.7					
9	18-Dec-18	3	3					
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
	Coefficient of Variation:	0.20	0.22					
	Mann-Kendall Statistic (S):	-12	-11					
	Confidence Factor:	87.0%	88.7%					
	Concentration Trend:	Stable	Stable					



Notes:
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2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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