BRAC Program Management Office East
Philadelphia, Pennsylvania

Final
Annual Remedial Action Operations and Long-Term Monitoring Report - Year 6

Site 5 - Fire Training Area
Groundwater (Operable Unit 2)

Former Naval Air Station Joint Reserve Base Willow Grove
Horsham Township, Pennsylvania

April 2022

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FINAL
ANNUAL REMEDIAL ACTION OPERATIONS AND LONG-TERM MONITORING REPORT - YEAR 6

SITE 5 - FIRE TRAINING AREA GROUNDWATER (OPERABLE UNIT 2)

FORMER NAVAL AIR STATION JOINT RESERVE BASE WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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Acronyms and Abbreviations

°C	Degrees Celsius
BAV1 VC	BAV1 vinyl chloride
bgs	Below ground surface
BRAC	Base Closure and Realignment
cells/L	Cells per liter
cells/mL	Cells per milliliter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chemicals of concern
CSM	Conceptual site model
DCA	Dichloroethane
DCE	Dichloroethene
DHB	*Dehalobacter spp.*
DHC	*Dehalococcoides spp.*
DL	Detection limit
DO	Dissolved oxygen
DoD	Department of Defense
EPA	Environmental Protection Agency
FS	Feasibility Study
H_2S	Hydrogen sulfide
HHRA	Human health risk assessment
ISB	In-situ bioremediation
LOD	Limit of detection

LOQ	Limit of quantitation
LTM	Long-term monitoring
LUC	Land use control
MCL	Maximum contaminant level
µg/L	Microgram per liter
mg/L	Milligram per liter
MNA	Monitored natural attenuation
MSC	Medium Specific Concentration
mS/cm	Millisiemen per centimeter
mV	Millivolt
NA	Not applicable
NASJRB	Naval Air Station Joint Reserve Base
NAVFAC	Naval Facilities Engineering Systems Command
NC	No criterion
NPL	National Priorities List
NTU	Nephelometric turbidity unit
O&M	Operation and maintenance
OM&M	Operation, Maintenance & Monitoring
ORP	Oxidation-reduction potential
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PAH	Polycyclic aromatic hydrocarbon
PCE	Tetrachloroethylene
PFAS	Per- and polyfluoroalkyl substances
PIM	Post-injection monitoring

PMO	Program Management Office
ppm	Parts per million
PQLG	Project quantitation limit goal
qPCR	Quantitative polymerase chain reaction
RA	Remedial Action
RACR	Remedial Action Completion Report
RAO	Remedial action objective
RD	Remedial Design
R-Dase	reductase
RG	Remediation goal
RI	Remedial Investigation
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SIM	Selective ion monitoring
S.U.	Standard unit
TCA	Trichloroethane
TCE	Trichloroethene
TOC	Total organic carbon
UCL	Upper confidence limit
VC	Vinyl chloride
VFA	Volatile fatty acid
VOC	Volatile organic compound

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1.0 Introduction

This Remedial Action (RA) Operations and Long-Term Monitoring (LTM) Report has been prepared under Contract Task Order No. WE04 of Contract N6247016D9008, Comprehensive Long-Term Environmental Action Navy (CLEAN) between Tetra Tech and the U.S. Navy. This Report presents the Year 6 groundwater performance monitoring results; and identifies the RA operations activities for in-situ anaerobic bioremediation at the Site 5 - Fire Training Area Groundwater, Operable Unit (OU) 2, located in the former Naval Air Station Joint Reserve Base (NASJRB) Willow Grove, Horsham Township, Montgomery County, Pennsylvania.

The major components of the Selected Remedy for Site 5 groundwater, as detailed in the Record of Decision (ROD), include in-situ anaerobic bioremediation of contaminated groundwater within the source area, long-term groundwater monitoring, monitored natural attenuation (MNA) of the groundwater plume downgradient of the source area, and implementation of land use controls (LUCs) (Tetra Tech, 2012). Operational requirements for the remedy are detailed in the Operation, Maintenance and Monitoring (OM&M) Plan (Tetra Tech, 2015). Long-term monitoring (LTM) requirements are specified in the OM&M Plan and the Sampling and Analysis Plan (SAP) (Tetra Tech, 2016).

This Report includes details about the annual operation and maintenance (O&M) of the in-situ bioremediation injection system, performance monitoring sampling and analysis and data evaluation, and observations from the annual LUC inspection. This Report has been prepared for the Naval Facilities Engineering Systems Command (NAVFAC) for submittal to the U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (PADEP).

1.1 Objective

The LTM being conducted at Site 5 is designed to collect a defined set of groundwater samples on a regularly scheduled basis for analysis of the Site 5 chemicals of concern (COCs) and natural attenuation parameters. Groundwater monitoring is being conducted to:

- Evaluate and support adjustments to the bioremediation system to maintain geochemical conditions conducive to anaerobic reductive dechlorination within the source area.
- Assess the effectiveness and rate of bioremediation in the source area.

- Assess the effectiveness and rate of attenuation of volatile organic compounds (VOCs) in the source area and the immediate downgradient segment of the plume.
- Confirm that remediation of the source area is complete when VOC COC concentrations throughout the source area are reduced to levels equal to or less than the remediation goals (RGs).

After the source area has been remediated, the Project Team will develop a plan to implement the MNA portion of the remedy for the entire plume and downgradient wells (Tetra Tech, 2016).

The objectives of this report are to:

- Update the status of remedy implementation including O&M activities and present observations from LUC inspections.
- Present the Year 6 results of the Site 5 LTM Program.
- Evaluate these results through trend analysis, where possible, by including results from sampling events conducted prior to implementation of the LTM Program as well as prior data from the LTM Program.
- Discuss progress towards meeting remedial action objectives (RAOs).
- Discuss progress towards meeting an exit strategy for Site 5.
- Provide conclusions and recommendations.

1.2 Report Organization

This LTM Report is organized as follows:

Section 1.0 - Introduction

Section 2.0 - Site Background

Section 3.0 - Selected Remedy and Remedial Action Objectives

Section 4.0 - Monitoring Program

Section 5.0 - Data Evaluation (including a summary of O&M activities and observations from the LUC Inspection)

Section 6.0 - Conclusions and Recommendations

2.0 Site Background

The former NASJRB Willow Grove is located in Horsham Township in Montgomery County, Pennsylvania (Figure 2-1). NASJRB Willow Grove occupied approximately 900 acres of the 1,100 acres the Department of Defense (DoD) maintained at the Air Station. The primary mission of NASJRB Willow Grove was to provide support for operations involving aviation training activities and to train Navy reservists. NASJRB Willow Grove supported other DoD tenants such as the Marine Reserve and the Army Reserve, and shared facilities and services with the Air Force Reserve. NASJRB was placed on the National Priorities List (NPL) in September 1995. The NPL identifies facilities that appear to warrant RA financed under the federal Superfund program. The former NASJRB Willow Grove was selected in 2005 by the Base Closure and Realignment (BRAC) Commission for closure and was officially disestablished on March 30, 2011. The base continued to provide services and facilities, on a limited basis, until September 2011, at which time it was transferred to the BRAC Program Management Office (PMO) and entered caretaker status, which is a non-operational condition in which the facility undergoes limited preservation status to protect it against fire, vandalism/theft, and damage from the elements. Decisions regarding the future use of the land are coordinated by the Horsham Land Reuse Authority (HLRA) for NASJRB Willow Grove.

The Site 5 - Fire Training Area is located in the south-central portion of former NASJRB Willow Grove, approximately midway between Runway 10/28 and State Route 463 (Figure 2-1). The training area was used from 1942 to 1975 for large-scale firefighting exercises, which included the disposal and burning of flammable liquid wastes generated by the Naval Air Station. Wastes (including solvents, paint chemicals, xylenes, toluene, and various petroleum compounds) were consumed at the rate of up to 4,000 or more gallons per year in these firefighting exercises. The area was reportedly used for the drum storage of these flammable materials during the periods between burning exercises. Because of its waste disposal and storage history, Site 5 was included in the NPL designation and subject to investigation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The Fire Training Area is primarily covered by grasses, with some woody and brushy vegetation present within the southern portion of the area. The burn area consisted of a "burning ring" that was a section of a partially buried steel tank, open at the top with an intact bottom below the surrounding grade, which was located in the south-central portion of the site. Site 5 groundwater (OU 2) consists of a groundwater plume

containing multiple VOCs that were historically disposed or spilled near the former drum staging area located to the north of monitoring well cluster 05MW01 (see Figure 2-2).

2.1 Site History

The CERCLA investigation at Site 5 included completion of a Remedial Investigation (RI). The final RI report for Site 5 was completed in February 2002 (Tetra Tech, 2002). The results of the RI indicated that small and isolated areas of VOCs remained in soil at low concentrations and did not serve as a major source of groundwater contamination. Most of the VOCs that serve as the source of the groundwater plume exist within the soil matrix and primary (rock matrix) and secondary (fractures) porosity of the shallow bedrock. The principal contaminants associated with Site 5 groundwater are VOCs and 1,4-dioxane. VOCs detected at levels of potential concern included: trichloroethene (TCE); tetrachloroethene (PCE); benzene; 1,1,1 -trichloroethane (TCA); 1,1,2-TCA; 1,1-dichloroethane (DCA); 1,2-DCA; 1,1-dichloroethene (DCE); 1,2-DCE (total), and cis-1,2-DCE.

A soil removal action for polycyclic aromatic hydrocarbon (PAH)-contaminated soil in the vicinity of the Site 5 burning ring began in December 2005. Initial excavation confirmation samples indicated that PAHs remained at some spots at concentrations greater than cleanup levels. A second round of excavating and confirmation sampling (including sampling and analysis for dioxins as requested by the EPA) was followed by soil backfilling in October 2006. The excavation depth of the removal action was two feet. Results from confirmation samples were evaluated for residual risk to future lifelong residents from exposure to chemicals of potential concern via incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dusts from soil. The increased carcinogenic risk to future lifelong residents was 8.6×10^{-5} which falls within EPA's acceptable risk range. On September 21, 2007, a No Further Action ROD for Site 5 Soil (OU 4) was signed by the Navy and EPA with concurrence from PADEP (Tetra Tech, 2007a).

A *Technical Memorandum of Risk Assessment Evaluation for Site 5 Groundwater (OU2)* included a limited update of the human health risk assessment (HHRA) for groundwater in response to changes in risk assessment methodology (Tetra Tech, 2007b). The revised HHRA estimated unacceptable risk for future adult residents and future lifelong (child and adult) residents exposed to untreated groundwater.

The Feasibility Study (FS) for Site 5 groundwater (OU 2) was finalized in November 2008 (Tetra Tech, 2008a). This FS identified and evaluated five remedial alternatives for Site 5 groundwater to address unacceptable risks identified during the RI. The FS included a remedial alternative of in-situ enhanced biological anaerobic reductive

dehalogenation (bioremediation) and natural attenuation to promote the in-situ remediation of the VOCs in groundwater. Tetra Tech was subsequently assigned to perform a bioremediation pilot test to evaluate the potential efficacy of this remedial alternative. The project plans were documented in the SAP for the bioremediation pilot test at Site 5 (Tetra Tech, 2008b).

Preliminary soil sampling and monitoring well installation for the Site 5 groundwater pilot study commenced in May 2008. In April 2009, Tetra Tech began operation of the treatment phase of the bioremediation pilot study to remediate the groundwater of Site 5. The *Site 5 Pilot Test Report* for groundwater (OU 2) was finalized in May 2011 (Tetra Tech, 2011a). The test report indicated that bioremediation had proven to be an effective strategy in destroying the Site 5 groundwater contaminants through the anaerobic, reductive dechlorination process and that the Site 5 groundwater recirculation system was very effective at distributing the biostimulation amendments throughout the remediation cell.

In June 2011, the *Proposed Remedial Action Plan for Site 5 Groundwater (OU 2)* was finalized (Tetra Tech, 2011b). A public meeting was held to present the Navy's plan for Site 5 groundwater on June 22, 2011. The public comment period was set for June 15 through August 1, 2011 to encourage public participation in the decision. On September 25, 2012, the ROD for Site 5 groundwater (OU 2) was signed by the Navy and EPA with concurrence from PADEP (Tetra Tech, 2012).

The Remedial Designs (RDs) for the installation of additional injection/monitoring wells in the source area and for LUCs for Site 5 were finalized in May 2013 (Tetra Tech; 2013a, 2013b). The RA described in the RD was completed in July 2013. Seven injection/monitoring wells (05MW20 through 05MW26) were installed in the areas with the highest levels of groundwater contamination. The draft Remedial Action Completion Report (RACR) was submitted in November 2013, the draft-final RACR was submitted on May 7, 2014, and the final RACR was signed by Navy and EPA in September 2014 (Tetra Tech, 2014).

Per- and polyfluoroalkyl substances (PFAS), associated with aqueous film forming foam, which was used in firefighting training activities at Site 5, have been detected in soil and groundwater at the Site (Resolution, 2019). These emerging chemicals of environmental concern are being investigated under a separate base initiative and are currently not part of the Site 5 RA or LTM.

2.2 Key Decision Documents

As detailed in Section 2.1, Site History, the site has an extensive investigation history. The key decision documents, which have guided the implementation of the groundwater RA are summarized in Table 2-1.

Table 2-1: Key Decision Documents

INVESTIGATION/DOCUMENT	DATE	COMMENTS
Initial Assessment Study	February 1986	Recommended confirmation study due to history of storage and use of solvent waste at Site 5.
Site Inspection Studies for Sites 1, 2, 3, 4, 5, 6, 7, 8, and 9, Navy Fuel Farm, and ARF Sites 4, 5, 6, and 7	May 1990	Identified VOC contamination in soil and groundwater at Site 5. Recommended an RI/FS to evaluate extent of soil contamination and contaminant migration in groundwater.
RI for Sites 1, 2, 3, and 5	February 1993	Identified groundwater contamination with VOCs at Site 5.
Phase II RI	April 1998	Identified groundwater contamination with VOCs at Site 5.
Site 5 Groundwater (OU 2) RI	February 2002	Identified the presence of a VOC plume associated with storage and handling of solvents at the site and recommended a FS to evaluate remedial alternatives.
HHRA Technical Memorandum	February 2007	Updated risk assessment indicated exposure to groundwater presented unacceptable risks to human health.
Final FS	November 2008	Evaluated of various remedial alternatives.
Site 5 Bioremediation Pilot Test	May 2011	Evaluated the performance and viability of in-situ anaerobic bioremediation as a remedial alternative.
Proposed Remedial Action Plan	June 2011	Invited public review and comment on the preferred alternative for Site 5 groundwater.

INVESTIGATION/DOCUMENT	DATE	COMMENTS
ROD	September 2012	Documented the preferred remedial alternative of in-situ anaerobic bioremediation of source area groundwater, monitored natural attenuation of the downgradient portion of the plume, and implementation of LUCs.
RD for Additional Injection Wells	May 2013	Specified requirements for installation of additional injection/monitoring wells in the Site 5 source area as upgrades to the existing pilot test system.
RD for LUCs	May 2013	Specified requirements for implementation of LUCs for Site 5 groundwater.
RACR	September 2014	Documented that the construction of the groundwater bioremediation component of the remedy selected for Site 5 groundwater (OU 2) in the Final ROD was completed and LUCs were implemented.
OM&M Plan	May 2015	Documented that the remedy selected in the ROD is operating according as designed. Trend analysis indicates that reductive dechlorination of VOC parent compounds is progressing and anaerobic subsurface conditions are suitable.
OM&M Plan	May 2015	Provided details of O&M activities for the in-situ bioremediation systems and outlines monitoring requirements.
SAP for LTM	July 2016	Documented sampling, analytical, data evaluation, and reporting requirements for LTM of source area groundwater.

2.3 Conceptual Site Model

This section provides the conceptual site model (CSM) for Site 5, which identifies contaminant sources, contaminant release mechanisms, transport routes, and receptors under current and future land use scenarios. The VOC contaminant source area is the former drum staging area, where drums of spent solvents were temporarily staged prior to being burned. The majority of the VOCs that serve as the source of the contaminated

groundwater plume exist within the soil matrix and primary (rock matrix) and secondary (fractures) porosity of the shallow bedrock. The contaminated groundwater plume is created by both the downward infiltration of precipitation and the flow of upgradient groundwater that migrates through the residual source in the weathered bedrock. Because of the downward hydraulic gradient, the plume migrates downward within the bedrock as it migrates laterally away from the source area, until it is dominantly restricted to open fractures within the unweathered bedrock.

Potential or Known Sources of Contamination

The VOCs in the Site 5 groundwater are a result of the spillage of spent solvents from drums that were temporarily placed at the drum staging area west of the burn ring. Concentrations of VOCs are greatest at the water table below and immediately downgradient of the staging area, and decrease with both lateral distance away from and vertical depth below this zone of highest contamination.

Contaminant Release Mechanisms and Transportation/Migration Pathways

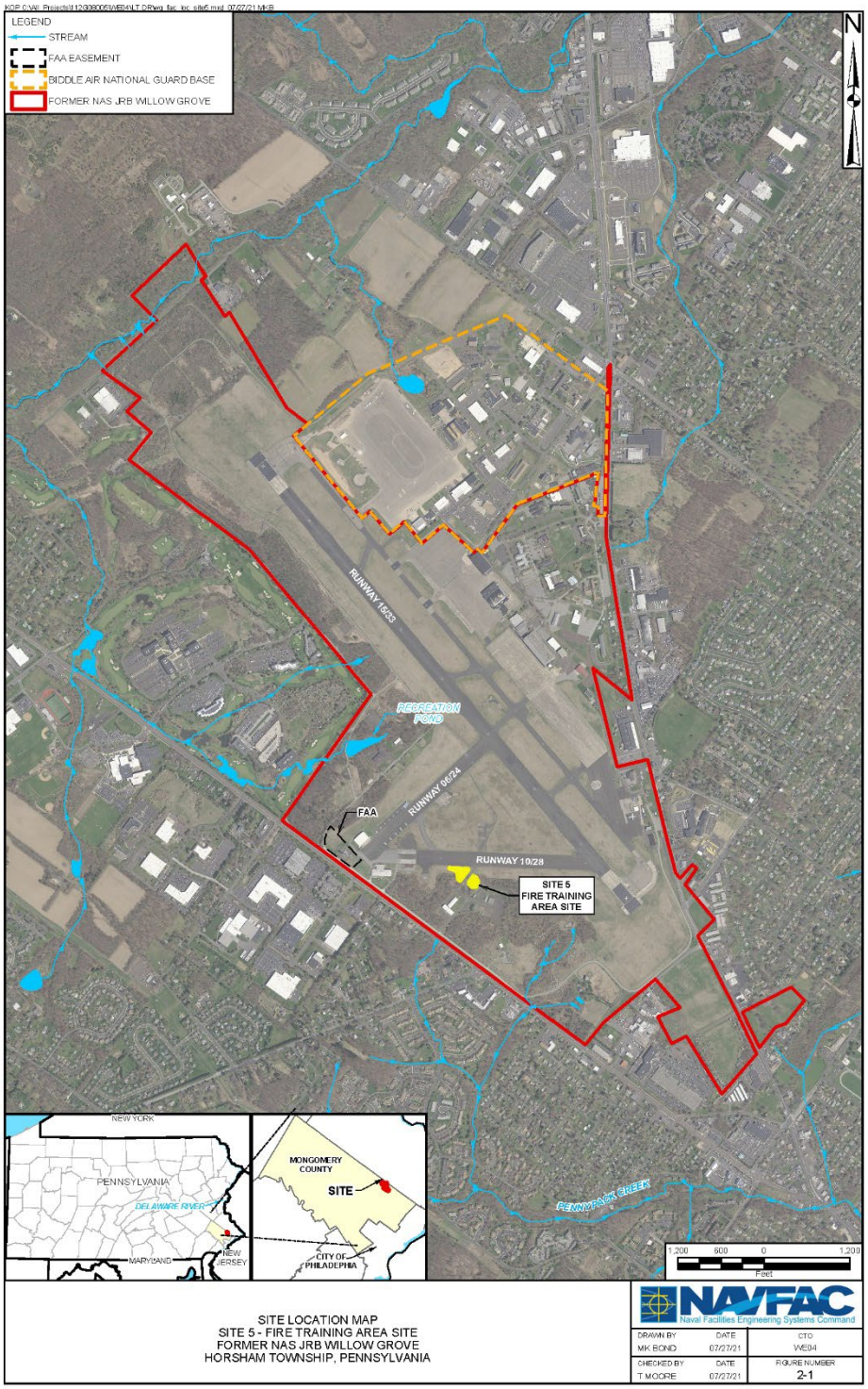
Because of their high vapor pressures and aqueous solubilities and low potential for adsorption to soils, VOCs released to soil are readily lost by volatilization and transported to groundwater by dissolution in infiltrating precipitation. Once in the groundwater, VOCs are transported with groundwater movement through advection and dispersion. The contaminants may migrate at different rates because of contaminant-specific interactions with the geologic matrix that retard their movement. In addition, different zones of dominant chemical compounds may appear in the contaminant plume as COCs degrade into simpler chemical compounds. The chlorinated VOCs, in particular, are subject to anaerobic degradation commonly promoted in groundwater plumes by prevailing geochemical conditions. The degradation products may be more or less toxic than the parent compounds from which they derive. Eventually, chemicals at the leading edge of the contaminant plume will be converted to non-toxic chemicals. With continued degradation, the contaminant plume will ultimately dissipate, leaving no toxic chemicals in the groundwater. Induction of chemically reducing conditions using additives such as lactate can accelerate the rate of degradation.

Land Use, Potential Receptors, and Exposure Pathways

The HHRA concluded that under a future residential land use scenario, exposure to VOCs in the groundwater through ingestion, dermal contact, and inhalation, would pose a potential carcinogenic risk exceeding EPA's target risk range for the future adult and the lifetime (child and adult) resident. Exposure to construction workers by excavation and incidental contact with groundwater was also evaluated; risks were within EPA's target risk range. There are no ecological receptors because Site 5 groundwater does

not discharge to the surface anywhere in the vicinity of the site, nor does it interact with any surface water bodies.

A visual depiction of the CSM is presented on Figure 2-3. Groundwater contours from the November 2020 sampling event are presented on Figure 2-4.



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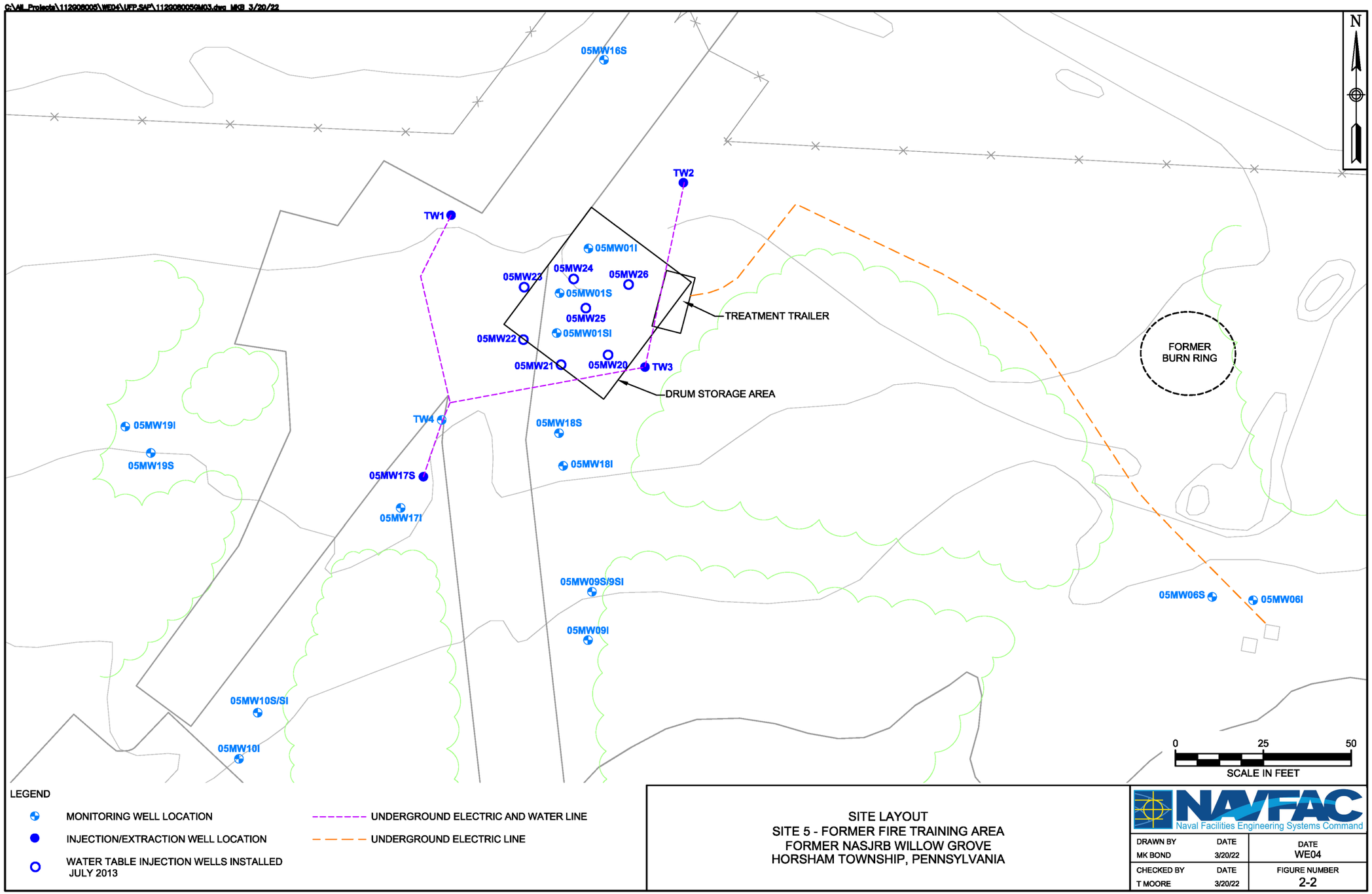
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TW1
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05MW24
05MW26
05MW01S
05MW25
05MW01SI
05MW22
05MW21
05MW20
TW3
TREATMENT TRAILER
DRUM STORAGE AREA
FORMER BURN RING
TW4
05MW18S
05MW19I
05MW19S
05MW18I
05MW17S
05MW17I
05MW09S/9SI
05MW09I
05MW06S
05MW06I
05MW10S/SI
05MW10I
0
25
50
SCALE IN FEET
LEGEND
MONITORING WELL LOCATION
INJECTION/EXTRACTION WELL LOCATION
WATER TABLE INJECTION WELLS INSTALLED JULY 2013
UNDERGROUND ELECTRIC AND WATER LINE
UNDERGROUND ELECTRIC LINE
SITE LAYOUT
SITE 5 - FORMER FIRE TRAINING AREA
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA
NAVFAC
Naval Facilities Engineering Systems Command
DRAWN BY
MK BOND
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2-2

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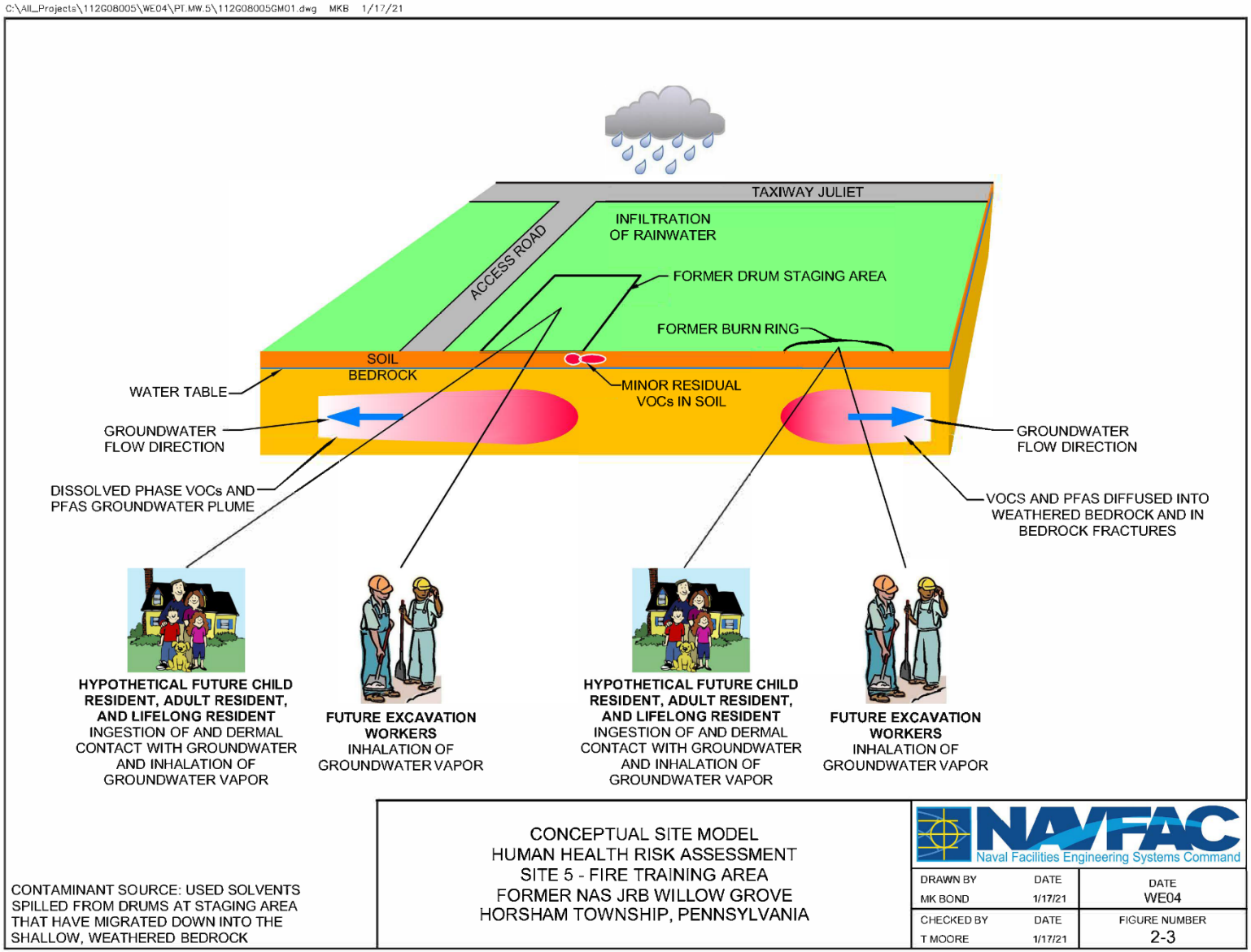
Figure 2-3 Conceptual Site Model Site 5 - Fire Training Area



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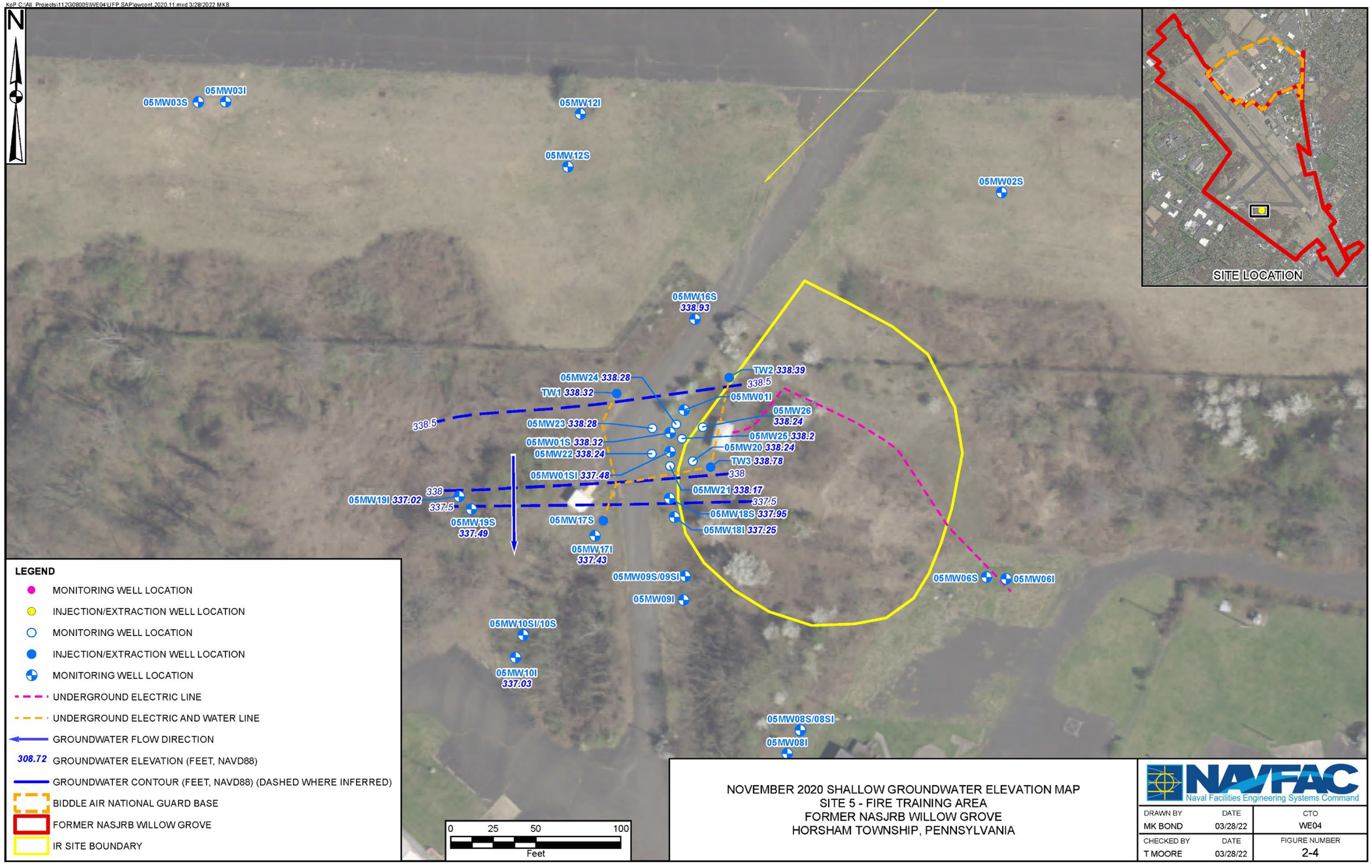

NOVEMBER 2020 SHALLOW GROUNDWATER ELEVATION MAP
SITE 5 - FIRE TRAINING AREA
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

NAVFAC Naval Facilities Engineering Systems Command

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3.0 Selected Remedy and Remedial Action Objectives

3.1 Selected Remedy

The Selected Remedy presented in the ROD for Site 5 groundwater consists of the following major components:

- In-situ anaerobic bioremediation of contaminated groundwater within the source area until VOC concentrations meet established cleanup levels (i.e., RGs).
- MNA of the groundwater plume downgradient of the source area.
- Implementation of LUCs.
- Long-term groundwater monitoring until the plume has attenuated to concentrations that meet the established cleanup levels.

3.1.1 In-Situ Bioremediation Operation

The remedy selected for Site 5 groundwater (OU 2) was implemented in July 2013. Implementation of in-situ bioremediation largely consists of the continued operation of the successful pilot test treatment system with additional injection/monitoring wells installed in 2013. The in-situ bioremediation system consists of a groundwater recirculation and treatment system, and a shallow injection well system. Injection and extraction wells were installed to establish a groundwater recirculation system or bioremediation treatment cell. The treatment system was designed to extract groundwater, add amendments under controlled conditions, and reinject the treated groundwater/amendments. Periodic biostimulation events consisting of the injection of organic substrate are performed to maintain the geochemical conditions necessary for efficient bioremediation. The in-situ anaerobic bioremediation implementation ensures that a large portion of the site's most highly impacted groundwater is most efficiently addressed. Long-term operations and monitoring will be performed to maintain the geochemical conditions necessary for efficient bioremediation until VOC concentrations meet established cleanup levels. The VOCs in the Site 5 source area groundwater will be reduced over time by bioremediation, during which time the co-located halogenated compounds (the CVOCs) will be destroyed through the process of dechlorination. The in-situ anaerobic bioremediation of groundwater at Site 5 is not designed to treat the entire plume, but is targeted to destroy the VOCs in the source area, so over time, concentrations in the overall plume are reduced by reducing or eliminating the

concentrations contributed from the source area. Detailed O&M activities are provided in the OM&M Plan (Tetra Tech, 2015).

3.1.2 Monitored Natural Attenuation and Long-Term Groundwater Monitoring

Groundwater monitoring is being conducted to: evaluate and maintain the proper geochemical conditions within the source area; assess the effectiveness and rate of bioremediation in the source area; assess the effectiveness and rate of attenuation of VOCs in the source area and the down-gradient segment of the plume; and confirm that remediation is complete when VOCs including 1,4-dioxane concentrations throughout the entire extent of the plume are reduced to levels equal to or less than the RGs.

The segment of the groundwater plume located downgradient of the source area will not immediately be impacted by bioremediation, and will initially contain contaminants at concentrations exceeding RGs. Because bioremediation of the diffuse plume outside of the source area is not practical, this segment of the plume will attenuate under natural physical, chemical, and biological processes as the source of the plume is removed through bioremediation. The results of recent sampling events have provided evidence that natural attenuation of the downgradient portion of the plume has begun to occur. The lower concentrations of VOCs in the downgradient portion of the dissolved-phase plume will continue to be monitored to confirm that contaminant concentrations are naturally attenuating. The SAP for in-situ bioremediation LTM provides details of monitoring requirements, sampling procedures, and data evaluation procedures (Tetra Tech, 2016).

3.1.3 Land Use Controls

LUCs implemented within the Site 5 LUC boundary prohibit the use of untreated groundwater, and require that future buildings be constructed in a way that mitigates the potential for vapor intrusion of VOCs from the subsurface into the buildings. LUCs also require that systems be installed which mitigate the potential intrusion of VOCs from the subsurface into existing buildings prior to their reuse, or that the buildings be subject to a vapor intrusion investigation to assess whether an unacceptable risk to future occupants is present. The LUCs will be implemented and maintained by the Navy until concentrations of hazardous substances in groundwater are at levels that allow for unlimited use and unrestricted exposure. When the Site 5 property is transferred to a non-federal entity, the LUCs will consist of deed restrictions to prohibit the use of untreated groundwater and requirements for incorporating vapor intrusion mitigation in buildings until contaminants in the groundwater are at levels that allow for unlimited use

and unrestricted exposure. The use of treated groundwater must be approved by the Navy, EPA, and PADEP. The Site 5 LUC boundary encompasses the entire extent of the groundwater plume, as shown on Figure 3-1. The LUC implementation actions including monitoring and enforcement requirements were provided in the LUC RD (Tetra Tech, 2013b). The Navy will maintain, monitor, and enforce the LUCs according to the LUC RD. Implementation of this remedy will therefore require annual visual inspections and a five-year review with report preparation. A survey of the LUC boundary was performed and is included in the LUC RD. The LUC survey was submitted to Horsham Township on April 24, 2014. The annual LUC inspections are due on the anniversary of the submittal of the LUC survey to Horsham Township. The 2021 Annual LUC Inspection Report is included as Appendix A of this report.

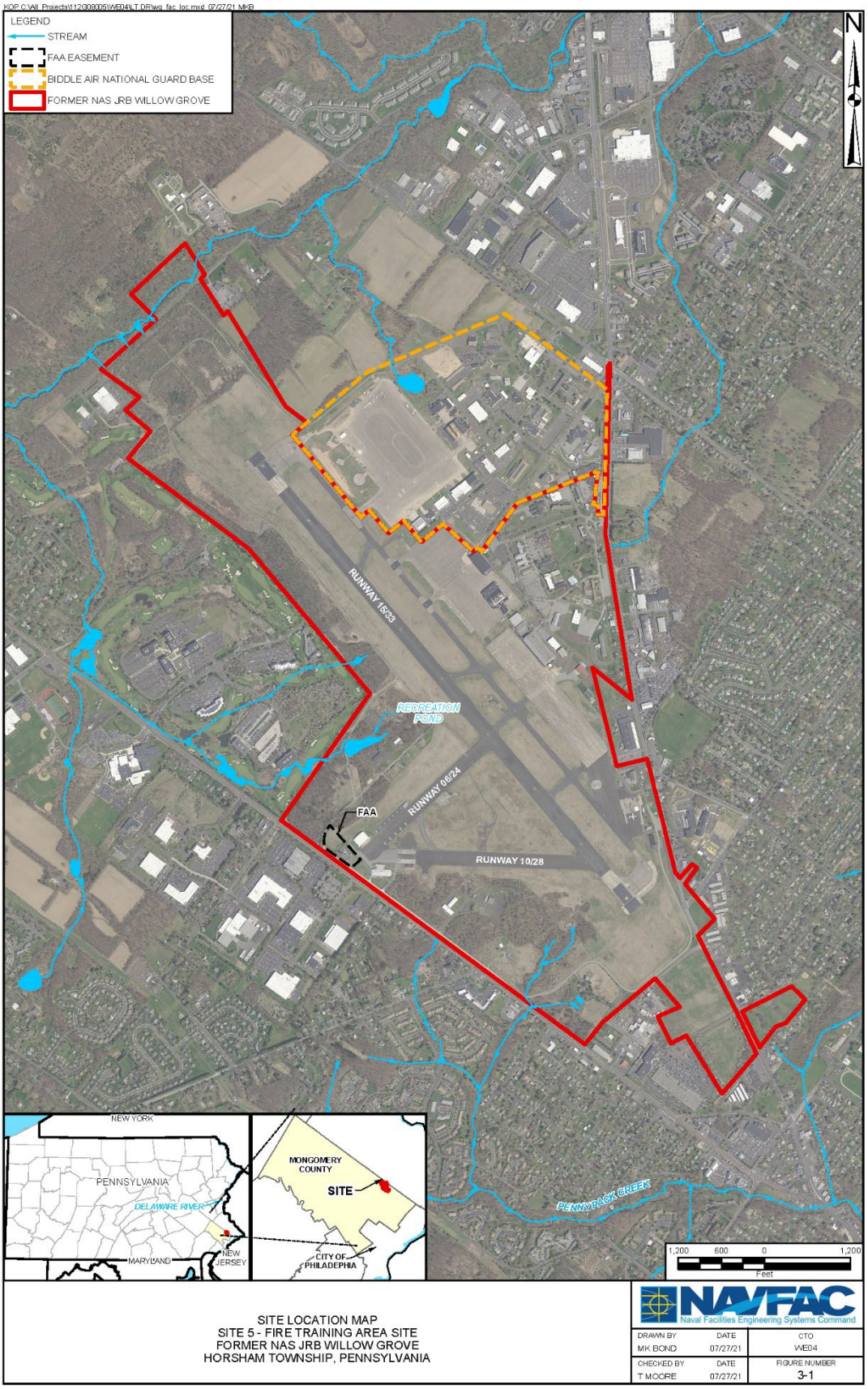
3.2 Remedial Action Objectives

The HHRA concluded that under a future residential land use scenario, exposure to VOCs in the groundwater through ingestion, dermal contact, and inhalation would pose a potential carcinogenic risk exceeding EPA's target risk range for the future adult and the lifetime (child and adult) resident. To address these risks, these RAOs were established in the ROD for Site 5 groundwater:

- Prevent potential human exposures to contaminated groundwater.
- Restore concentrations of COCs in groundwater to less than or equal to the maximum contaminant levels (MCLs) or PADEP Medium Specific Concentrations (MSCs) as applicable.
- Prevent further degradation of groundwater.

The selected remedy eliminates potential unacceptable human exposure to hazardous substances (VOCs) in groundwater and vapors emanating from the contaminated groundwater by reducing VOC concentrations in the groundwater and by implementing LUCs. The remedy does not apply to or address the PFAS compounds that exist at the site and are currently under investigation. The selected remedy is expected to achieve substantial long-term risk reduction and allow the property to be used for the reasonably anticipated future land uses, including open space, recreational, and non-residential (e.g., office space) uses.

Groundwater monitoring is being performed to obtain performance and compliance monitoring data to evaluate progress toward meeting RAOs, and eventually confirm that the in-situ bioremediation RAOs have been achieved.



SITE LOCATION MAP
SITE 5 - FIRE TRAINING AREA SITE
FORMER NAS JRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

Table 3-1 presents the RGs for the Site 5 groundwater COCs and the rationale for RG selection.

Table 3-1: Site 5 Groundwater Remediation Goals

COC	RANGE OF DETECTED CONCENTRATIONS(1) (µg/L)	EXCEEDS MCL?	REMEDIATION GOAL (µg/L)	RATIONALE FOR REMEDIATION GOAL
1,1,1-TCA	2 - 960	Yes	200	MCL
1,1,2-TCA	10	Yes	5	MCL
1,1-DCA	3 - 350	NC	31	MSC
1,1-DCE	6 - 300	Yes	7	MCL
1,2-DCA(2)	3 - 4	No	5	MCL
cis-1,2-DCE	0.51 - 270	Yes	70	MCL
1,4- Dioxane	12 - 21 (3)	NC	6.4	MSC
Benzene	3 - 28	Yes	5	MCL
PCE	1 - 35	Yes	5	MCL
TCE	5 - 300	Yes	5	MCL
Vinyl Chloride (VC)(2)	Not detected	No	2	MCL

Notes:
µg/L - Microgram per liter
MCL - EPA Safe Drinking Water Act Maximum Contaminant Level
MSC - Medium Specific Concentration for Groundwater, Residential Used Aquifers, PA Code 250, Table 1.
NC - No criterion; No MCL available
1 Summer 2005 results, prior to bioremediation pilot test.
2 Breakdown products of parent compounds 1,1,1-TCA, PCE, and TCE that either currently exist in Site 5 groundwater or are expected to be temporarily created (or increase in concentration) as byproducts of the reductive dechlorination process before they are in turn reduced through the same bioremediation process.
3 September 2011 results

3.3 Site Closeout

Through active RAs and natural attenuation processes, groundwater COC concentrations will be reduced to acceptable levels (i.e., the RGs). Through the LTM Program, groundwater at Site 5 and areas near and hydraulically downgradient of the source that have been adversely impacted by COCs will be monitored until the contaminant levels decrease to established RGs. The LTM Program assesses the active RAs that are focused at the source area of the plume. A separate evaluation following MNA will also assess the remaining portions of the plume and the downgradient wells after the concentrations of COCs in the source area have been reduced to acceptable levels as determined by the Project Team. The Project Team will evaluate the qualitative and quantitative data from each round of sampling to determine whether in-situ bioremediation is effectively reducing the concentrations of COCs in the

source area as well as if monitoring should continue and, ultimately, whether the RGs have been met.

The current objective of the LTM Program at Site 5 is to evaluate the performance, progress, and effectiveness of in-situ bioremediation of VOCs at the source area. PFAS detected in Site 5 groundwater are not included in this RA or LTM Program. To achieve this objective, the LTM Program is designed to determine trends in contaminant concentrations over time, and also to verify that contaminant reduction is occurring in the source area. The concentrations of potential daughter products of TCE and PCE, such as cis-1,2-DCE, 1,1-DCE, and vinyl chloride (VC) may increase temporarily as natural processes break down the larger parent (source) compounds. These degradation compounds also naturally attenuate in a similar manner to those VOCs that are identified as COCs in the ROD, and their appearance and disappearance provide a line of evidence that MNA is occurring.

Groundwater conditions in the source area are monitored to ensure that contaminant concentrations are being adequately reduced through the active RAs and/or natural processes. Once that has been accomplished, the downgradient area will be monitored separately for eventual attainment of the RGs, at which point groundwater will become available for unrestricted use; this type of monitoring is outside the current scope of this LTM Program.

Groundwater samples are collected from existing monitoring wells and analyzed for the Site 5 COCs (identified in the ROD), and for MNA parameters. Quarterly and annual groundwater sampling events are occurring at Site 5. However, the actual number of monitoring wells to be sampled, the parameters to be analyzed, and the sampling frequency may change over time depending on sample results, with the approval of EPA and PADEP. At a minimum, the LTM program will be reviewed during the Five-Year Review process. As data are collected and evaluated over the course of the early LTM sampling events, recommendations for optimization of monitoring frequency and analytes in accordance with current Navy and EPA guidance may be appropriate.

The data collected are evaluated to determine whether plume contaminant concentrations are increasing or decreasing and to ensure that in-situ bioremediation and natural attenuation continue to be an effective remedy for Site 5 VOCs. As a component of the remedy for Site 5, LTM is necessary to assess the progress of RAs and MNA, and to monitor plume stability. The LTM results from the periodic monitoring events are used to: evaluate the nature and extent of Site 5 groundwater COC contamination over time; evaluate the temporal and spatial trends in the concentrations of the COCs in the identified groundwater plume; and gather sufficient evidence to support decisions related to RAs and MNA associated with the groundwater COCs

within the plume. To achieve these goals, a total of 20 monitoring wells have been selected for sampling. Sampling parameters are detailed in Section 4.0, Monitoring Program, and results are discussed in Section 5.0, Data Evaluation. The results include the first round of annual performance monitoring which was completed in August 2016.

Based on the information provided in the ROD and as specified in the SAP for LTM, decision rules were developed to govern data use. The decision rules include direct comparisons of laboratory analytical results to the applicable RGs to determine whether the RGs have been met, and the use of statistical analysis to evaluate the trends in the concentrations of the target analytes over time. The RAOs for the COCs in groundwater at Site 5 require COCs to decrease to concentrations less than or equal to the applicable RG as identified in Table 3-1, which was derived from Table 2-3 in the ROD.

Statistical trend analysis using the available statistical tools identified in current EPA guidance is used to monitor data means and trends, and to determine when the Remediation Monitoring Phase and Attainment Monitoring Phase have been completed. EPA's Groundwater Statistical Tool is being used to evaluate mean COC concentrations and data trends on a well-by-well and COC-by-COC basis to determine whether the groundwater restoration RA within the source area is complete.

The decision rules for Site 5 groundwater are:

Decision Rule #1:

- If the analytical results indicate that the concentrations of all COCs collected over a minimum of four consecutive Remediation Phase sampling events at any source area monitoring well location are less than the RGs, then convene the Project Team to determine an appropriate course of action for that particular well (e.g., no change or reduction in sampling frequency); otherwise, continue scheduled monitoring for each well. This rule was established to identify opportunities to optimize the LTM.

Decision Rule #2:

- If an appropriate statistical mean test or trend test based on best professional judgment indicates that the 95 percent upper confidence limit (UCL) on the mean or the 95 percent confidence limit of the upper confidence band of the trend line concentrations of each COC collected over a minimum of four Remediation Phase sampling events at all source area monitoring well locations are less than the RGs, then convene the Project Team to determine an appropriate course of action (e.g., determine the Remediation Monitoring Phase to be complete, halt active in-situ bioremediation injections and monitor for potential rebound, and

begin the Attainment Monitoring Phase of the entire groundwater plume); otherwise, continue scheduled monitoring for each well. This rule was established to identify the time when active RAs may be ceased and the Attainment Monitoring Phase of the entire groundwater plume (under a future SAP) may begin.

Decision Rule #3:

- If an appropriate statistical mean test or trend test based on best professional judgment indicates that the 95 percent UCL on the mean or the 95 percent UCL of the upper confidence band of the trend line concentration of any monitored parameter has increased significantly in the groundwater samples collected over four Remediation Phase sampling events for any monitoring well location, then convene the Project Team to determine an appropriate course of action (e.g., increase frequency of monitoring); otherwise, continue scheduled monitoring for that well. This rule was established to provide an alert when concentrations of target analytes are increasing, regardless of whether the concentrations are greater than, or less than, the RGs. Even if a 95 percent UCL of the mean or the 95 percent confidence limit of the upper confidence band of the trend line COC concentration is less than the applicable RG, an increasing trend could indicate that the concentration will eventually become greater than the RG of a COC at a particular monitoring well.

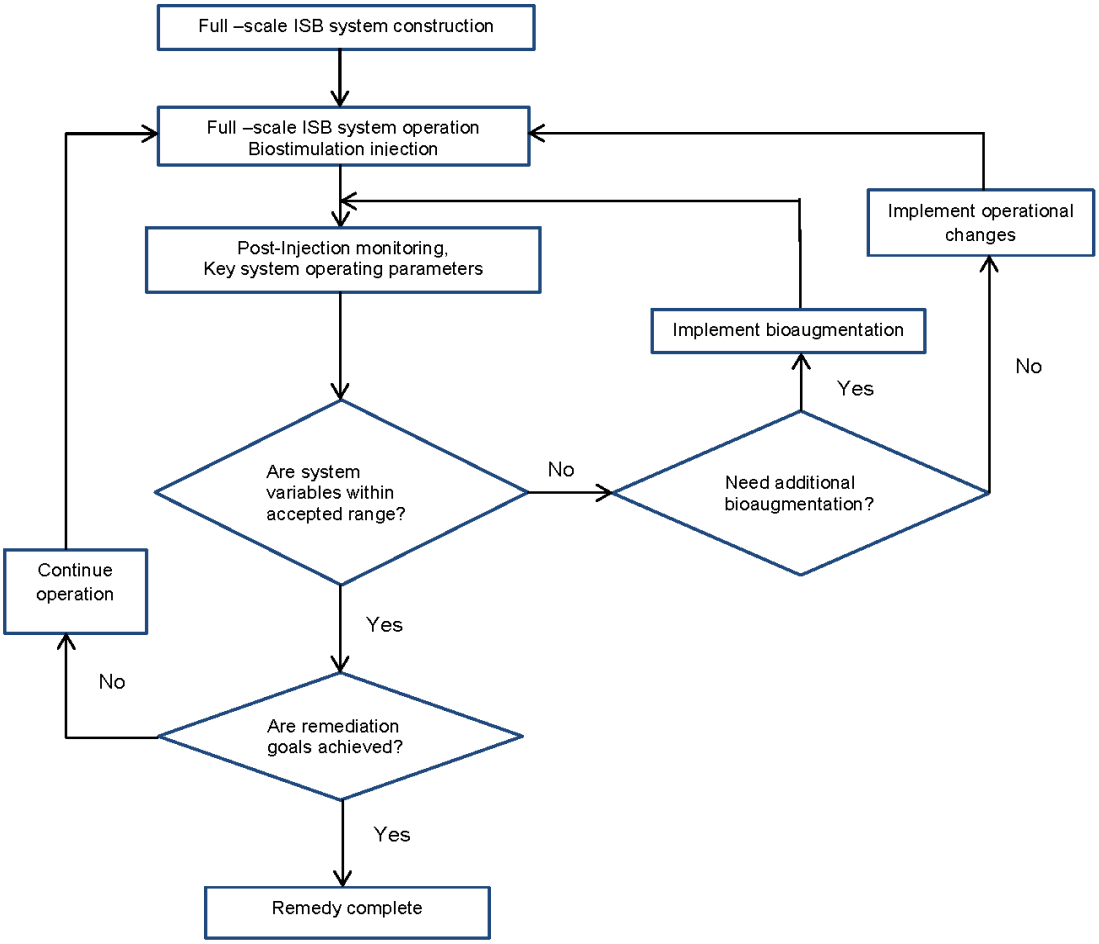
Decision Rule #4:

- If the LTM results show that: (1) the implemented LUCs have been violated and failed to prevent potential human exposure to contaminated groundwater; (2) contaminated groundwater has migrated beyond the monitoring well network to an unacceptable degree; or (3) the groundwater contamination is not attenuating to concentrations below the RGs within 15 years of implementation of the full scale remediation system as expected, then convene the Project Team to evaluate whether additional active remedial measures are needed.

A decision-making flow chart for operation of the in-situ bioremediation system is included as Figure 3-2.

Figure 3-2

DECISION MAKING FLOW CHART
IN SITU BIOREMEDIATION OPERATION AND MAINTENANCE PLAN
SITE 5 - FIRE TRAINING AREA
FORMER NAS JRB WILLOW GROVE, PENNSYLVANIA



ISB - In-situ bioremediation

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4.0 Monitoring Program

The LTM Program includes annual performance monitoring and quarterly process (post-injection) monitoring. In addition, annual LUC inspections are also performed. A total of 20 monitoring wells are included in the monitoring program. As detailed in Section 4.2, analytical requirements vary for individual wells. Annual sampling includes analysis at a fixed-base laboratory for VOCs (including 1,4-dioxane), dissolved gases, metabolic fatty acids, total organic carbon (TOC), and quantitative polymerase chain reaction (qPCR) and genes. Quarterly samples are analyzed using monitoring equipment or field test kits for the field parameters temperature, pH, turbidity, specific conductivity, oxidation reduction potential (ORP), and dissolved oxygen (DO); annually, samples are analyzed for alkalinity, ferrous iron, and hydrogen sulfide (H_2S) using field test kits. These analytes were selected to monitor COCs as well as bioremediation parameters.

4.1 Data Quality Objectives

The objective of the sampling program is to obtain data to determine if the site has met the RAOs as detailed in Section 3.0, Selected Remedy. This section presents the problem definition and inputs and sampling approach required to collect the data to determine if the RAOs have been met.

4.1.1 Problem Definition and Goals

Investigations at Site 5 indicated that groundwater contamination from past operating practices poses unacceptable risk to potential future human receptors from use of groundwater under a residential land use scenario. Target analytes associated with chlorinated solvents and petroleum-based fuels have historically been detected in groundwater at Site 5 at concentrations exceeding EPA MCLs and/or PADEP Groundwater Residential Used Aquifers MSCs.

The Selected Remedy for OU 2 is in-situ anaerobic bioremediation combined with MNA with LTM for the diffuse portion of the plume, and LUCs to prevent human exposure to groundwater until COCs in the groundwater are at levels that allow for unlimited use and unrestricted exposure.

Through active RAs and natural attenuation processes, groundwater COC concentrations will be reduced to acceptable levels (i.e., the RGs). Groundwater at Site 5 and areas near and hydraulically downgradient of the source that have been adversely impacted by COCs will be monitored until the contaminant levels decrease.

The Project Team will evaluate the qualitative and quantitative data from each round of sampling to determine whether in-situ bioremediation is effectively reducing the concentrations of COCs in the source area and monitoring should continue and, ultimately, whether the RGs have been met.

4.1.2 Study Boundaries

The study area horizontal boundaries include the source area of the groundwater plume with COC concentrations exceeding the RGs. The horizontal extent of the groundwater plume that has historically exceeded the RGs covers a distance of about 1,200 feet northwest and hydraulically downgradient of the former drum staging area. The horizontal boundary of the source area where most of the mass of COCs in the groundwater plume is present is limited to within an approximate 200-foot radius from the former drum staging area.

The vertical boundaries of an LTM program are typically defined by the groundwater plume with COC concentrations exceeding the RGs, which migrates laterally away from the site and also moves vertically downward within the aquifer, consistent with the directions of groundwater flow. According to the ROD, the deepest detection of a VOC at a concentration exceeding its RG is 1,1-DCA in monitoring well 03MW08D, which is 173 feet deep and represents the approximate downgradient vertical boundary of the plume. However, the study area vertical boundaries for this bioremediation LTM Program are limited to the deepest monitoring wells within the source area of the plume. The deepest monitoring well included in the LTM well network at Site 5 is well 05MW10I, which is 126 feet deep and represents the vertical extent of sampling to be conducted within the source area of the groundwater plume. The Project Team selected 20 wells from within the source area to monitor for the effectiveness of the anaerobic biodegradation remedy. The most downgradient boundary of the plume (i.e., 03MW08D at 173 feet deep according to the ROD) is outside the current scope of this LTM program, and is expected to be remedied by natural attenuation. The Project Team has agreed to address the downgradient extent of contamination, if necessary, after the source area has been adequately addressed.

4.1.3 Information Inputs

In order to meet the study goals of the investigation, the physical and chemical data to be evaluated at Site 5 are described below:

1. Previously Collected Data: Historical data will be used to supplement newly collected data to present a current CSM that will include the trends of the COCs over time in Annual Performance Reports.

2. Chemical Analysis Data: Groundwater analytical data from existing monitoring wells will be collected during monitoring events and added to the existing Site 5 dataset to determine the spatial extent of COCs. Analytical requirements are presented in Section 4.2.

3. Field Parameters: Field investigation parameters for groundwater will be measured during monitoring events and are listed in Section 4.2.

4. Groundwater Level Measurements: Synoptic groundwater levels will be measured to an accuracy of 0.01 foot in each well on the same day prior to sampling to ensure measurements are representative of the same timeframe.

5. MNA Parameters: Groundwater will be analyzed for select MNA parameters (including fixed-base laboratory analyses) as presented in Section 4.2.

4.2 Sampling Approach

Two types of groundwater monitoring are being performed under the LTM program, process monitoring and performance monitoring, as discussed below.

Process Monitoring: Post-injection monitoring (PIM) events occur approximately quarterly after each biostimulation event. The schedule and monitoring parameters for these events are adjusted based on the results from the previous process monitoring event. Process monitoring events involve the use of field instruments (for the water quality parameters of pH, DO, ORP, conductivity, turbidity, and temperature), and test kits (DO).

Performance Monitoring: Performance monitoring is being performed annually; the first annual event was conducted in August 2016. Future annual events will be scheduled for May of each year. The second event was conducted from May 17, 2017 through May 24, 2017. The third annual event was performed from May 14, 2018 through May 18, 2018; however, due to a laboratory error, several wells were resampled for VOCs only from August 28 through August 30, 2018 in conjunction with the Year 4 first quarterly PIM sampling. The fourth annual event was performed from May 28, 2019 to May 31, 2019. The fifth annual event was performed from May 12, 2020 to May 18, 2020. The sixth annual event was performed from April 26, 2021 to April 29, 2021. Process monitoring parameters, as indicated above, are measured concurrently with performance monitoring parameters. The schedule for performance monitoring events may need to be adjusted based on previous results. These results are used in conjunction with process monitoring results to evaluate: the subsequent frequency of biostimulation and/or bioaugmentation events; any necessary

modifications to the dosage of amendments; injection volumes/durations; recirculation rates; and other operational parameters.

The performance monitoring program generates information to evaluate changes in VOC and degradation/transformation products and if performance standards have been achieved. Performance monitoring parameters are measured by collecting groundwater samples for laboratory analyses and also for test kit analysis of alkalinity, ferrous iron, and H_2S general chemistry parameters.

The following tables summarize the groundwater sampling locations, analytical requirements for each location, analytical methods, and required detection limits (DL) (if applicable).

Table 4-1 lists the groundwater monitoring wells selected for sampling and the analytical requirements for each sample. Well locations are shown on Figure 2-2.

Table 4-1: Sampling Locations and Analytical Requirements

Location	Screen Interval (feet bgs)	Fixed Base Laboratory (Annually)					Process Test (Quarterly)						Field Test (Annually)			
		COC VOCs	Dissolved Gases(1)	TOC	Metabolic Acids(2)	qPCR and genes(3)	Water Level	Temperature	pH	Specific	ORP	DO	DO(4)	Alkalinity (as $CaCO_3$)	Iron (Ferrous)	H_2S
05MW01S	12 - 32	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
05MW01I	74.5 - 84.5	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05MW10I	116 - 126	•					•	•	•	•	•	•				
05MW16S	38 - 48	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05MW17I	84 - 104	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
05MW18S	50 - 70	•					•	•	•	•	•	•				
05MW18I	88 - 108	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05MW19S	68 - 78	•					•	•	•	•	•	•	•	•		
05MW19I	102 - 122	•					•	•	•	•	•	•	•	•		
05MW20	37 - 52	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05MW21	32 - 47	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
05MW22	30 - 45	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
05MW23	36.6 - 51.6	•					•	•	•	•	•	•	•	•		

Location	Screen Interval (feet bgs)	Fixed Base Laboratory (Annually)					Process Test (Quarterly)						Field Test (Annually)			
		COC VOCs	Dissolved Gases[1]	TOC	Metabolic Acids[2]	qPCR and genes[3]	Water Level	Temperature	pH	Specific	ORP	DO	DO[4]	Alkalinity (as $CaCO_3$)	Iron (Ferrous)	H_2S
05MW24	35 - 50	•					•	•	•	•	•	•	•	•		
05MW25	33.5 - 48.5	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05MW26	35 - 50	•					•	•	•	•	•	•	•	•		
05TW01	21 - 75	•	•			•	•	•	•	•	•	•	•	•	•	•
05TW02	20 - 76	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05TW03	20 - 90	•	•	•	•		•	•	•	•	•	•	•	•	•	•
05TW04	20 - 111	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Notes:
bgs - below ground surface
1 Dissolved gases include ethane, ethene, methane, and acetylene.
2 Metabolic acids include lactic, pyruvic, acetic, propionic, and butyric.
3 qPCR and genes include dechlorinating bacteria (*Dehalobacter spp.* [DHB] and *Dehalococcoides spp.* DHC]) and functional genes
4 DO Field test kits used on quarterly basis

The fixed-base laboratory analytical methods and procedures are summarized in Table 4-2. Detailed laboratory methods are provided in the SAP for the LTM program.

Table 4-2: Laboratory Analytical Methods

Matrix	Analytical Group	Analytical and Preparation Method / Eurofins SOP Reference
Groundwater	COC VOCs including Low Level 1,4- Dioxane	SW-846 5030B/8260C/Selective Ion Monitoring (SIM) TA ST-MS-0002
	Dissolved Gases (Methane, Ethane, Ethene, and Acetylene)	RSK SOPs 147/175 PAES SOP - AM20GAx
	TOC	SW-846 9060A PAES SOP - WC21

Matrix	Analytical Group	Analytical and Preparation Method / Eurofins SOP Reference
	Metabolic Acids (Volatile Fatty Acids [VFAs]): Lactic, Pyruvic, Acetic, Propionic, Butyric	Proprietary Method PAES SOP - AM23G
	qPCR and Genes: DHB, DHC, TCE R- Dase, BAV1 vinyl chloride reductase (BAV1 VC R-Dase), and VC R-Dase	Proprietary Method MI SOP - DNA-qPCR

Project reference limits (e.g., RGs, project quantitation limit goals [PQLGs], and laboratory-provided limits of detection) are shown in Table 4-3. The PQLG for each COC is equal to one-third of the corresponding RG.

Table 4-3: Project Reference Limits
COC VOCS By SW-846 Method 8260C (Including Low Level 1,4-Dioxane By 8260-SIM*)

Analyte	RG (µg/L)	PQLG (µg/L)	LABORATORY (EUROFINS) PROVIDED REFERENCE LIMITS		
			LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
1,1,1-TCA	200	67	1.0	0.25	0.069
1,1,2-TCA	5.0	1.7	1.0	0.25	0.15
1,1,2,2-Tetrachloroethane(1)	NA	NA	1.0	0.25	0.098
1,1-DCA	31	10	1.0	0.25	0.068
1,1-DCE	7.0	2.3	1.0	0.25	0.083
1,2-DCA	5.0	1.7	1.0	0.25	0.10
1,4-Dioxane(2)	6.4	2.1	5.0	2.5	1.23
Benzene	5.0	1.7	1.0	0.25	0.064
Chloroethane(1)	NA	NA	2.0	0.25	0.099
Chloroform**	NA	NA	1.0	0.25	0.10
Chloromethane(1)	NA	NA	2.0	0.25	0.077
cis-1,2-DCE	70	23	1.0	0.25	0.087
PCE	5.0	1.7	1.0	0.50	0.18

Analyte	RG (µg/L)	PQLG (µg/L)	LABORATORY (EUROFINS) PROVIDED REFERENCE LIMITS		
			LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
trans-1,2-DCE[1]	NA	NA	1.0	0.25	0.083
TCE	5.0	1.7	1.0	0.50	0.25
VC	2.0	0.67	2.0	0.25	0.084

Notes:
[1] In addition to COC VOCs, chlorinated ethenes and chlorinated ethanes will be monitored to support natural attenuation evaluations.
[2] 1,4-Dioxane will be analyzed separately using Method 8260-SIM.
DL = Detection limit
LOD = Limit of detection
LOQ = Limit of quantitation
NA = Not applicable

Table 4-3: Project Reference Limits (cont.)
TOC for Natural Attenuation Evaluation

Analyte	Project Screening Level (mg/L)	PQLG (mg/L)	LABORATORY (EUROFINS) PROVIDED REFERENCE LIMITS		
			LOQ (mg/L)	LOD (mg/L)	DL (mg/L)
Total Organic Carbon	NA	NA	1	NA	0.035

mg/L = Milligram per liter

Table 4-3: Project Reference Limits (cont.)
Dissolved Gases for Natural Attenuation Evaluation

Analyte	Project Screening Level (µg/L)	PQLG (µg/L)	LABORATORY (EUROFINS) PROVIDED REFERENCE LIMITS		
			LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
Methane	NA	NA	0.50	NA	0.042
Ethane	NA	NA	0.10	NA	0.002
Ethene	NA	NA	0.10	NA	0.003
Acetylene	NA	NA	0.50	NA	0.015

Table 4-3: Project Reference Limits (cont.)
Metabolic Acids (Volatile Fatty Acids [VFAs]) for Natural Attenuation Evaluation

Analyte	Project Screening Level (mg/L)	PQLG (mg/L)	LABORATORY (EUROFINS) PROVIDED REFERENCE LIMITS		
			LOQ (mg/L)	LOD (mg/L)	DL (mg/L)
Lactic	NA	NA	0.07	NA	0.012
Pyruvic	NA	NA	0.15	NA	0.009
Acetic	NA	NA	0.07	NA	0.008
Propionic	NA	NA	0.05	NA	0.011
Butyric	NA	NA	0.05	NA	0.007

Table 4-3: Project Reference Limits (cont.)
qPCR and Genes for Natural Attenuation Evaluation

Analyte	Project Screening Level (cells/L)	PQLG (cells/L)	LABORATORY (MICROBIAL INSIGHTS) PROVIDED REFERENCE LIMITS		
			LOQ (cells/L)	LOD (cells/L)	DL (cells/L)
DHB	NA	NA	500	100	100
DHC	NA	NA	500	100	100
TCE reductase	NA	NA	500	100	100
BAV1 VC reductase	NA	NA	500	100	100
VC reductase	NA	NA	500	100	100

cells/L = Cells per liter

5.0 Data Evaluation

The results from the sixth round of annual groundwater monitoring at Site 5 are presented in this report. Historical results from the previous annual events conducted in 2016, 2017, 2018, 2019, and 2020 and sampling events conducted prior to implementation of the LTM program are also presented and used for trend analysis where appropriate. In addition, the observations from the 2021 LUC inspection are also discussed in this section.

5.1 Sample Results

The sixth annual LTM sampling event was conducted from April 26, 2021 through April 29, 2021. Twenty monitoring wells were sampled and all analyses were conducted in accordance with the approved SAP, and as described in Section 4.2 of this report. Sampling included wells in the treatment area (05MW01 cluster and treatment wells [05TW01 through 05TW04], which are open borehole wells used for either extraction, injection, or monitoring); wells installed in the source area during the 2013 RA activities (05MW20 through 05MW26); and monitoring wells generally either up- or downgradient of the treatment area (05MW10I, 05MW16S, 05MW17I, 05MW18S, 05MW18I, 05MW19S, and 05MW19I). This section provides a summary of the results for field parameters, VOCs, and process monitoring parameters (e.g., VFAs, dissolved gases, qPCR). A complete data summary for all laboratory analyses is included in Appendix B, laboratory reports are included in Appendix C, the data validation reports are included in Appendix D, and the sample logs are included in Appendix E.

5.1.1 Field Parameters and Test Kits

Groundwater samples were collected using low-flow sampling techniques after field parameters (pH, specific conductivity, DO, temperature, ORP, and turbidity) stabilized. Table 5-1 presents the final field parameter readings. Field log sheets showing all field measurements during well purging are included in Appendix E. Although all field parameters are required to be stabilized prior to sampling, several of these, as discussed below, are critical for performance of the in-situ bioremediation system.

Table 5-1: Site 5 Well Parameters (April 2021)

WELL ID	Date	pH (S.U.) 6-8	Conduc-tivity (mS/cm) +/- 3%	Tur-bidity (NTU) +/- 10%	DO (mg/L) <1	Temper-ature (°C) +/- 10%	ORP (mV) <-100	DO Test (ppm)	Alkalinity (ppm)	Ferrous Iron (ppm)	H_2S (ppm) <1
05MW01S	4/28/2021	6.06	0.228	4.88	0.79	16.91	-174.1	0.30	14	1.0	2.0
05MW01SI	4/28/2021	6.67	0.442	6.67	1.85	18.88	-152.0	1.3	12	1.0	0.3
05MW16S	4/26/2021	6.04	0.239	1.95	3.5	17.28	-96.7	0.2	125	0.5	0.1
05MW17I	4/27/2021	6.32	0.259	0.90	0.05	14.99	29.1	0.05	150	0.5	0
05MW18I	4/27/2021	6.61	0.332	19.8	0.33	14.42	-2.2	0.3	20	0	0
05MW19S	4/26/2021	6.29	0.276	12.3	4.40	12.30	83.6	0.9	120	NA	NA
05MW19I	4/26/2021	6.55	0.277	13.3	1.20	13.48	120	1.0	100	NA	NA
05MW20	4/29/2021	6.65	0.426	11.1	1.22	18.98	-74.1	1.0	18	2.5	0.1
05MW21	4/28/2021	5.91	0.230	4.88	0.90	15.95	-144.4	0.8	50	0	2.0
05MW22	4/27/2021	6.87	0.371	20.4	0.00	17.27	-205.2	0.1	30	0	2.0
05MW23	4/27/2021	5.42	0.220	2.65	12.79 [NR]	16.94	-149.0	0.2	12	NA	NA
05MW24	4/28/2021	5.75	0.237	11.8	NA	18.43	NA	1.0	35	NA	NA
05MW25	4/29/2021	6.20	0.244	6.78	1.50	16.03	-112.6	1.0	100	3.5	NA
05MW26	4/28/2021	5.87	0.233	18.2	1.77	26.83	-48.5	1.0	55	NA	NA
05TW01	4/27/2021	6.11	0.250	9.85	0.31	14.10	-22.78	0.3	125	3	0.7

WELL ID	Date	pH (S.U.) 6-8	Conduc-tivity (mS/cm) +/- 3%	Tur-bidity (NTU) +/- 10%	DO (mg/L) <1	Temper-ature (°C) +/- 10%	ORP (mV) <-100	DO Test (ppm)	Alkalinity (ppm)	Ferrous Iron (ppm)	H_2S (ppm) <1
05TW02	4/29/2021	6.21	0.503	76	0.39	14.16	-75.2	0.8	250	3.5	0.3
05TW03	4/29/2021	6.71	0.395	6.14	0.39	13.82	-50.2	0.1	40	2.5	0.1
05TW04	4/28/2021	5.79	0.230	1.61	0.92	14.48	-192	0.1	70	2.5	0

Notes:
°C = Degrees Celsius
ms/cm = Millisiemen per centimeter
mV = Millivolt
NTU = Nephelometric turbidity unit
NR = Non-Reportable
ppm = Parts per million
S.U. = Standard unit

pH: pH concentration is an indicator of the amount of free hydrogen available in a solution. *Dehalococcoides* spp. (DHC), the only genus known to completely degrade PCE to ethene, are inhibited at pH less than 5.5, with complete cessation of biological activity at pH less than 5.0. Optimum conditions for microbial growth are within the pH range of 6.0 to 8 S.U. If the aquifer buffering capacity is low, and acids produced during fermentation cannot be completely neutralized, it may be necessary to limit electron donor loading rates, add buffers, or neutralize the acid with a base (e.g., sodium bicarbonate).

Prior to the start of the pilot test, groundwater pH was too acidic for maintaining the bacterial population. The pH was subsequently raised by injection of sodium bicarbonate as a buffering solution. Sodium bicarbonate is routinely injected during biostimulation events to maintain optimal pH levels. During past operation, pH levels have generally been recorded between 6.0 and 7.0 S.U., which is within the acceptable range. When pH is determined to be suboptimal during quarterly PIM events, sodium bicarbonate is injected as a buffering agent to neutralize the pH. PIM events during Year 6 showed a majority of acceptable pH levels with the exception of five locations (05TW04, 05MW21, 05MW23, 05MW24, and 05MW26) which were slightly less than 6.0 S.U. Compared to 2020, pH decreased overall slightly upgradient and within the treatment area.

Dissolved Oxygen: DO acts as a primary substrate or co-substrate during the initial stages of metabolism. For chlorinated hydrocarbon degradation, anaerobic pathways are more efficient. If DO concentrations are greater than 1.0 mg/L, anaerobic bacteria populations are impacted and reductive dechlorination may not occur. DO is recorded using a water quality meter during well purging to evaluate stabilization; however, the DO evaluation is based on field test kits. DO levels (as measured by test kits) during the April 2021 sampling event were equal to or less than the target DO concentration of 1 mg/L in several of the wells, with a maximum of 4.40 mg/L. DO concentrations were reported at 05MW23 at 12.79 mg/L which is above the saturation limit. This reading has been noted in Table 5-1 and is qualified as such. Based on this, and the deviation from the 2020 readings, there may have been an issue with the unit; this will be monitored during future activities to see if adjustments are needed.

Temperature: Temperature affects the metabolic activity of bacteria, as well as the solubility of geochemical species. Microbes are generally more active and efficient in warmer water. Biochemical processes are accelerated at temperatures greater than approximately 20ºC. Temperatures recorded during the 2021 annual monitoring event ranged from 12.30 to 26.83ºC. Only one temperature reading was over 20ºC during the annual monitoring event. Temperature readings were consistent with the 2020 results.

Oxidation-Reduction Potential: The ORP of groundwater can provide an indication of whether or not anaerobic conditions are present. Negative ORP values represent optimum conditions for reductive dechlorination with a goal of -100 mV or less. ORP is used in conjunction with other geochemical parameters to determine whether groundwater conditions are optimal for anaerobic biodegradation. Positive ORP values in conjunction with elevated levels of DO and the absence of TOC may indicate that additional substrate is required to promote anaerobic dechlorination. ORP results recorded in April 2021 were similar to results from May 2020. Negative ORP values were recorded in fourteen of the monitoring wells, and seven of the wells had an ORP less than the goal of -100 mV. Compared to 2020 data, there were more ORP values in the negative, but there were less values that were greater than the goal off -100 mV (nine in 2020 compared to 7 in 2021) across the upgradient and treatment areas.

Total Alkalinity: Total alkalinity is an indicator of biodegradation and the buffering capacity of the aquifer (neutralization of weak acids). An increase in alkalinity and stable pH indicate that the buffering capacity of the aquifer is sufficient to neutralize metabolic acids produced by degradation of substrates. In low alkalinity aquifers, the pH may drop to levels outside the acceptable range for microbial activity. Concentrations of alkalinity that remain equal to or less than background concentrations in conjunction with pH less than 5 indicate that a buffering agent may be required to sustain high rates of anaerobic dechlorination. Thus, to have optimum conditions for microbial growth, it is essential to have a properly buffered aquifer. pH results at the site were discussed previously in this section. The maximum recorded alkalinity in April 2021 was 250 ppm. Upgradient alkalinity, in general, was similar from the 2020 annual sampling event to the 2021 annual sampling event; however, alkalinity in the treatment area generally decreased.

Sulfate/Sulfide and Ferrous Iron: After DO, nitrate, manganese, and ferric iron have been utilized, anaerobic microbes will utilize sulfate as an electron acceptor, resulting in increases in sulfide and carbon dioxide. Sulfate reduction (along with methanogenesis) is one of the most important reduction pathways that indicate that conditions are favorable for biodegradation of chlorinated hydrocarbons. Sulfide can be present in many forms; the three primary forms are the sulfide ion or dissolved H_2S or H_2S anion. Sulfide typically precipitates with iron minerals, but elevated levels of sulfide may be toxic to dechlorinating microorganisms. With the exception of wells 05MW01S, 05MW21, and 05MW22, H_2S levels during the 2021 annual sampling event were all equal to or less than 1 ppm. Concentrations fluctuated within the treatment area and upgradient; however, values were overall similar to the previous sampling year.

5.1.2 Volatile Organic Compound Results

As shown in Table 3-1, RGs have been established for 11 COCs. This section discusses the results from the April 2021 sampling event in comparison to the RGs established in the ROD as shown in Table 5-2. A complete data summary is included in Appendix B, and laboratory reports are included in Appendix C. Figure 5-1 presents a tag map showing all results exceeding RGs. A total of 21 wells were sampled during this event.

Table 5-2: Site 5 VOC Results (April 2021)

WELL ID	DATE	1,1,1-TCA (200 µg/L)	1,1,2-TCA (5 µg/L)	1,1-DCA (31 µg/L)	1,1-DCE (7 µg/L)	1,2-DCA (5 µg/L)	Benzene (5 µg/L)	Cis-1,2-DCE (70µg/L)	PCE (5 µg/L)	TCE (5 µg/L)	VC (2 µg/L)
05MW01S	4/28/2021	49	0.29J	**65**	2.9	0.4U	0.4U	27	2	**7.7**	**9.6**
05MW01SI	4/28/2021	0.4U	0.8U	0.8U	0.8U	0.4U	0.43J	0.34J	0.4U	0.4U	0.2U
05MW16S	4/26/2021	0.4U	0.8U	3.6	0.8U	0.4U	0.4U	2.6	0.4U	0.4U	0.2U
05MW17I	4/27/2021	7.5	0.3J	18	**12**	0.63J	0.37J	17	0.22J	4.4	**5.2**
05MW18I	4/27/2021	0.4U	0.8U	5.9	3.3	0.4U	0.4U	25	0.4U	1.2	0.2U
05MW19S	4/26/2021	15	0.8U	30	**27**	0.4U	0.4J	27	0.4U	**14**	**6.8**
05MW19I	4/26/2021	5.0	0.8U	23	**25**	0.4U	0.4U	12	1.2	**11**	2.0
05MW20	4/29/2021	0.4U	0.8U	2.1	0.8U	0.4U	0.4U	0.58J	0.4U	0.4U	0.2U
05MW21	4/28/2021	**230**	0.8U	**110**	**36**	0.4U	0.39J	**150**	**21**	**91**	**14**
05MW22	4/27/2021	83	1.5	**92**	**23**	0.4U	0.28J	**140**	3.2	**23**	**13**
05MW23	4/27/2021	1.2	0.8U	18	0.8U	0.36J	0.29J	2.6	0.4U	0.4U	0.2U
05MW24	4/28/2021	3.5	0.8U	22	0.46J	0.4U	0.44J	5.9	0.4U	1.0	**3.1**
05MW25	4/29/2021	3.4J	0.8U	17	1.2	0.4U	0.31J	6.8	0.4U	0.78J	**4.6**
05MW26	4/28/2021	0.4U	0.8U	4.1	0.8U	0.4U	0.23J	1.7	0.4U	0.4U	0.2U
05TW01	4/27/2021	1	0.8U	4.3	0.8U	0.4U	0.4U	2.3	0.4U	0.4U	0.2U
05TW02	4/29/2021	0.4U	0.8U	0.8U	0.8U	0.4U	0.4U	1.8	0.4U	0.4U	0.2U

WELL ID	DATE	1,1,1-TCA (200 µg/L)	1,1,2-TCA (5 µg/L)	1,1-DCA (31 µg/L)	1,1-DCE (7 µg/L)	1,2-DCA (5 µg/L)	Benzene (5 µg/L)	Cis-1,2-DCE (70µg/L)	PCE (5 µg/L)	TCE (5 µg/L)	VC (2 µg/L)
05TW03	4/29/2021	8.5	0.8U	5.2	1.5	0.4U	0.4U	5.4	0.4U	3.0	0.2U
05TW04	4/28/2021	22	0.37J	16	6	0.4U	0.24J	26	0.27J	**9.5**	**3.1**

Results for 1,1,1-TCA ranged from non-detected to 230 µg/L. The only well location with 1,1,1-TCA exceeding the RG of 200 µg/L was well 05MW21 (230 µg/L), which was the highest level measured and is located in the center of the treatment area.

Results for 1,1,2-TCA ranged from non-detected to 1.5 µg/L at well 05MW22. The RG of 5 µg/L was not exceeded in any of the well locations.

1,1-DCA was detected in each well except for 05MW01SI and 05MW10I and ranged from non-detected to 110 µg/L at well 05MW21. The RG of 31 µg/L was exceeded at three wells; the highest levels were detected, as expected, within the source/treatment area (see Figure 5-1). It is possible that the elevated concentration detected at source area well 05MW21 is due to a lack of injection solution reaching the fracture network of 05MW21. Similar to the May 2020 results, the concentration in well 05MW19I continues to be less than the RG and has remained stable at 23 µg/L. Results indicate that this compound is degrading along the groundwater migration pathway.

1,2-DCA was not detected in most wells, and did not exceed the RG of 5 µg/L in any well. 1,2-DCA ranged from non-detected to 0.63 J µg/L at well 05MW17I.

1,1-DCE concentrations ranged from non-detected to 36 µg/L at well 05MW21. The RG of 7 µg/L was exceeded at six wells (05MW17I, 05MW18S, 05MW19S, 05MW19I, 05MW21, and 05MW22).

Results for cis-1,2-DCE ranged from non-detected to 150 µg/L. Two wells (05MW21 at 150 µg/L and 05MW22 at 140 µg/L) exceeded the RG of 70 µg/L. This compound is a degradation product of TCE and PCE. These wells, as discussed below, have the highest levels of these parent compounds. The relatively higher levels of cis-1,2-DCE in the source area wells indicate that biodegradation is occurring in these wells. The lower levels of this compound in the other wells are reflective of the reduced concentrations of the parent compounds in these wells, and further degradation of cis-1,2-DCE to degradation chain end products.

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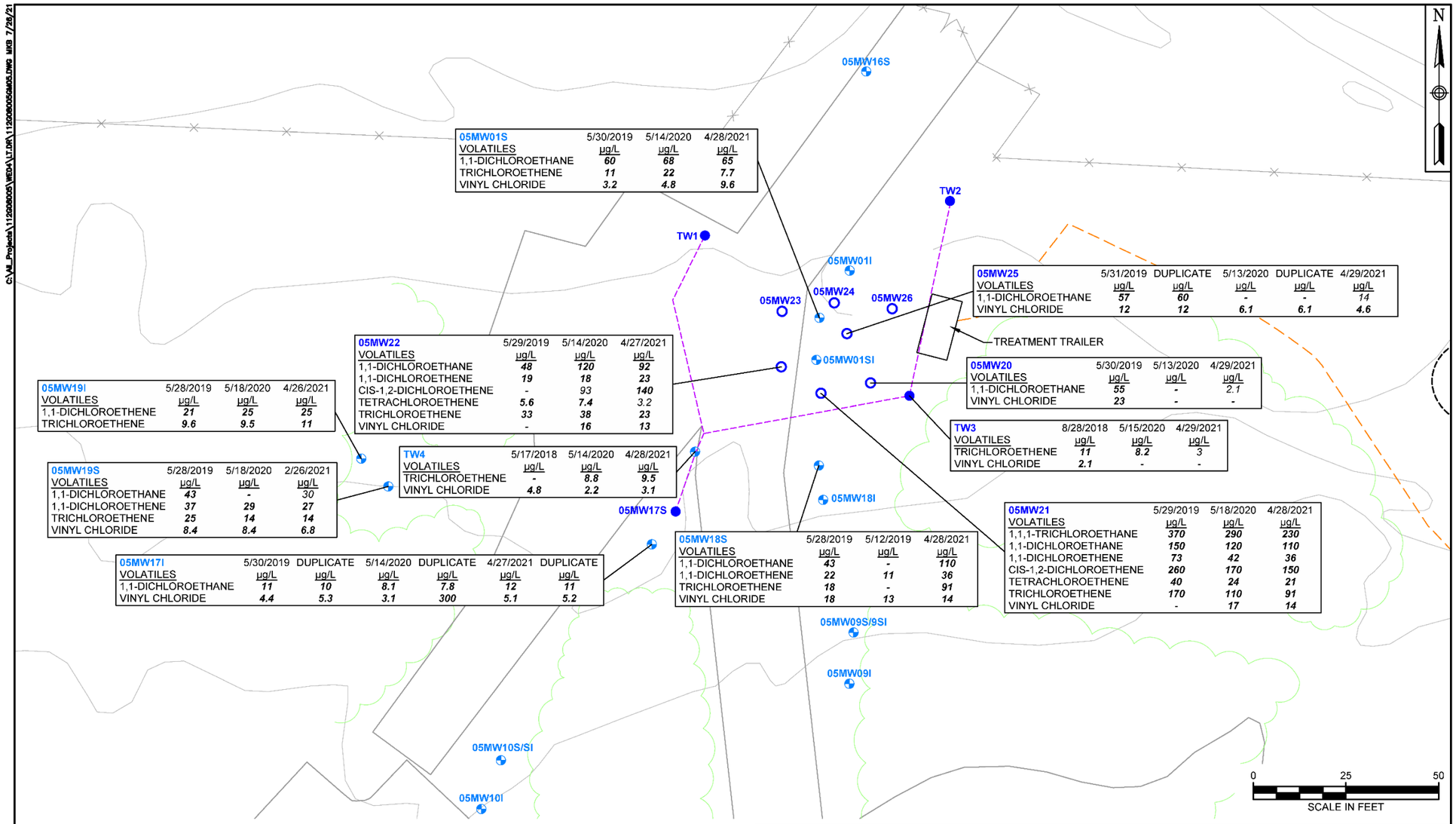

05MW01S	5/30/2019	5/14/2020	4/28/2021
VOLATILES	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	60	68	65
TRICHLOROETHENE	11	22	7.7
VINYL CHLORIDE	3.2	4.8	9.6

05MW25	5/31/2019	DUPLICATE	5/13/2020	DUPLICATE	4/29/2021
VOLATILES	µg/L	µg/L	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	57	60	-	-	14
VINYL CHLORIDE	12	12	6.1	6.1	4.6

05MW22	5/29/2019	5/14/2020	4/27/2021
VOLATILES	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	48	120	92
1,1-DICHLOROETHENE	19	18	23
CIS-1,2-DICHLOROETHENE	-	93	140
TETRACHLOROETHENE	5.6	7.4	3.2
TRICHLOROETHENE	33	38	23
VINYL CHLORIDE	-	16	13

05MW20	5/30/2019	5/13/2020	4/29/2021
VOLATILES	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	55	-	2.1
VINYL CHLORIDE	23	-	-

05MW19I	5/28/2019	5/18/2020	4/26/2021
VOLATILES	µg/L	µg/L	µg/L
1,1-DICHLOROETHENE	21	25	25
TRICHLOROETHENE	9.6	9.5	11

TW3	8/28/2018	5/15/2020	4/29/2021
VOLATILES	µg/L	µg/L	µg/L
TRICHLOROETHENE	11	8.2	3
VINYL CHLORIDE	2.1	-	-

TW4	5/17/2018	5/14/2020	4/28/2021
VOLATILES	µg/L	µg/L	µg/L
TRICHLOROETHENE	-	8.8	9.5
VINYL CHLORIDE	4.8	2.2	3.1

05MW19S	5/28/2019	5/18/2020	2/26/2021
VOLATILES	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	43	-	30
1,1-DICHLOROETHENE	37	29	27
TRICHLOROETHENE	25	14	14
VINYL CHLORIDE	8.4	8.4	6.8

05MW21	5/29/2019	5/18/2020	4/28/2021
VOLATILES	µg/L	µg/L	µg/L
1,1,1-TRICHLOROETHANE	370	290	230
1,1-DICHLOROETHANE	150	120	110
1,1-DICHLOROETHENE	73	42	36
CIS-1,2-DICHLOROETHENE	260	170	150
TETRACHLOROETHENE	40	24	21
TRICHLOROETHENE	170	110	91
VINYL CHLORIDE	-	17	14

05MW17I	5/30/2019	DUPLICATE	5/14/2020	DUPLICATE	4/27/2021	DUPLICATE
VOLATILES	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	11	10	8.1	7.8	12	11
VINYL CHLORIDE	4.4	5.3	3.1	300	5.1	5.2

05MW18S	5/28/2019	5/12/2019	4/28/2021
VOLATILES	µg/L	µg/L	µg/L
1,1-DICHLOROETHANE	43	-	110
1,1-DICHLOROETHENE	22	11	36
TRICHLOROETHENE	18	-	91
VINYL CHLORIDE	18	13	14

LEGEND

- **86** REMEDIATION GOAL EXCEEDANCE
- MONITORING WELL LOCATION
- INJECTION/EXTRACTION WELL LOCATION
- WATER TABLE INJECTION WELLS INSTALLED JULY 2013
- UNDERGROUND ELECTRIC AND WATER LINE
- UNDERGROUND ELECTRIC LINE

SAMPLE RESULTS EXCEEDING
REMEDIATION GOALS
SITE 5 – FIRE TRAINING AREA
FORMER NAS JRB WILLOW GROVE
HORSHAM, PENNSYLVANIA

NAVFAC Naval Facilities Engineering Systems Command

DRAWN BY	DATE	DATE
MK BOND	7/26/21	WE04
CHECKED BY	DATE	FIGURE NUMBER
T MOORE	7/26/21	5-1

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1,4-dioxane was not detected at a concentration greater than the RG of 6.4 µg/L in any well. Concentrations ranged from non-detected to 2.6 µg/L at well 05MW22.

Benzene was either not detected or detected at trace levels. The highest concentration of benzene was detected at well 05MW18S at 0.58 J µg/L, which is less than the RG of 5 µg/L.

The parent compounds TCE and PCE were detected during the Year 6 annual sampling event. TCE concentrations ranged from non-detected to 91 µg/L at well 05MW21. Six wells, as shown on Figure 5-1, had TCE concentrations exceeding the RG of 5 µg/L. PCE ranged from non-detected to 21 µg/L at well 05MW21 which was the only well exceeding the RG of 5 µg/L.

Sampling results for VC, a breakdown product of TCE and PCE, ranged from non-detected to 14 µg/L at well 05MW18S and 05MW21. Nine monitoring wells, as shown on Figure 5-1, had VC concentrations exceeding the RG of 2 µg/L. Elevated levels of VC are expected as this compound is a result of expected degradation of the parent chlorinated compounds.

5.1.3 Process Monitoring Analysis and Results

As discussed in Section 4.0, Monitoring Program, and shown in Table 4-1, 13 wells were also analyzed for dissolved gases. Twelve wells were analyzed for TOC, and metabolic (fatty) acids. Six wells were analyzed for qPCR and functional genes.

Volatile Fatty Acids

VFAs were not observed in any of the wells at detectable concentrations, except for one acid (acetic acid) at 05MW22. This indicates that another injection of bioremediation amendment (Lactoil) may be necessary to provide a carbon source (electron donor material).

Total Organic Carbon

TOC is an indicator of natural organic carbon and of substrate distribution during performance monitoring. TOC concentrations greater than 20 mg/L are desired in the anaerobic treatment zone. Stable or declining TOC levels less than 20 mg/L in conjunction with elevated levels of VOCs and alternate electron acceptors indicate that additional substrate is required to sustain the anaerobic treatment zone.

Results for TOC in wells within the treatment zone or source area range from 1.2 to 29 mg/L. Only one of the nine wells analyzed for TOC within the treatment and source areas have TOC levels in excess of the target concentration of 20 mg/L, indicating that

additional bioremediation amendment (Lactoil) is necessary to ensure an adequate amount of substrate is available for the microbes. The three wells analyzed for TOC that are located outside the treatment area have TOC results ranging from 1.2 to 1.4 mg/L. TOC concentrations largely remained consistent from 2020 levels with some minor increases or decreases.

Dissolved Gases

Because methane is not a chemical component of solvents, its presence provides strong evidence of methanogenic fermentation (and carbon dioxide utilization). Methane levels greater than 1,000 µg/L are desirable, but not required for dechlorination to occur. Methane levels less than 1,000 µg/L and the accumulation of cis-1,2-DCE and VC may indicate that additional substrate is required to shift reducing conditions into an environment suitable for reduction of these compounds.

Methane concentrations from wells in the recirculation area (treatment wells and source area wells) ranged from 410 to 20,000 µg/L, with eleven wells having methane concentrations greater than 1,000 µg/L. Methane concentrations in wells downgradient of the treatment area ranged from 410 to 6,800 µg/L. These results indicated that methanogenic fermentation is ongoing, particularly within the treatment area.

Ethene and possibly ethane signifies the final degradation step of chlorinated ethenes. Concentrations of ethene greater than 0.01 µg/L and ethane greater than 0.1 µg/L provide evidence of such degradation. If elevated levels of ethene or ethane are not observed, potential accumulation of cis-1,2-DCE or VC should be monitored.

Ethene concentrations ranged from non-detected to 4 J µg/L with the highest levels in the source area. Ethane concentrations ranged from non-detected to 1.3 J µg/L at well 05MW25 (within the source area).

qPCR and Functional Genes

Analysis was performed at six wells to identify DHC and specific reductases that have differing dechlorinating capacities. The tertiary lines of evidence employed in this LTM program use qPCR analysis to quantify specific bacterial populations in the groundwater, and to determine whether the bacterial population is sufficiently large and of the right genetic composition for complete reductive dechlorination. qPCR analysis is being conducted during bioremediation to assess the site and evaluate the potential need for bioaugmentation.

There are a variety of microbes responsible for the various steps of chlorinated volatile organic compound degradation. However, DHC is the only bacteria that have been identified which can completely reduce PCE to ethene. Therefore, increasing

concentrations of DHC are a good indication that a complete reductive dechlorination pathway of chlorinated ethenes is present. *Dehalobacter spp.* (DHB) is also important in the reduction of chlorinated ethanes and mediates the dechlorination of 1,1,1-TCA, 1,1,2-TCA and 1,2-DCA to VC and ethane.

The molecular analysis of functional genes present within the DHC in the aquifer also provides critical information. Three genes are important to complete reduction of TCE to ethene: tceA, vcrA, and bvcA. These three genes encode for R-Dase proteins that are necessary to complete the reductive dechlorination pathway. Of these three genes, vcrA and bvcA (both encoding for VC R-Dase), are the most important because they can efficiently reduce VC to ethene, while still capturing the energy necessary for cellular growth. The LTM program includes analysis for these genes.

DHB concentrations ranged from less than 5 to 5,040 cells per milliliter (cells/mL). DHC ranged from 74.6 to 5,290 cells/mL. Genetic analysis showed tceA ranging from 1.9 to 1,090 cells/mL; vcrA ranging from 8.9 cells/mL to 549 cells/mL; and bvcA was not detected in any of the wells. Comparison of bacteria populations to results from the pilot test are discussed in the following section; however, in general, the populations indicate an adequate bacterial population to maintain reductive dechlorination.

5.2 Trend Analysis - Contaminants of Concern and Operating Parameters

This section discusses trends observed for COCs and operational parameters. Although this report documents the sixth annual performance monitoring event, analysis of chemical contamination and process monitoring parameters has been occurring periodically since commencement of treatment during the pilot test in 2009. This section discusses trends of COCs where RGs have been developed, as well as parameters used to evaluate the operation of the bioremediation system.

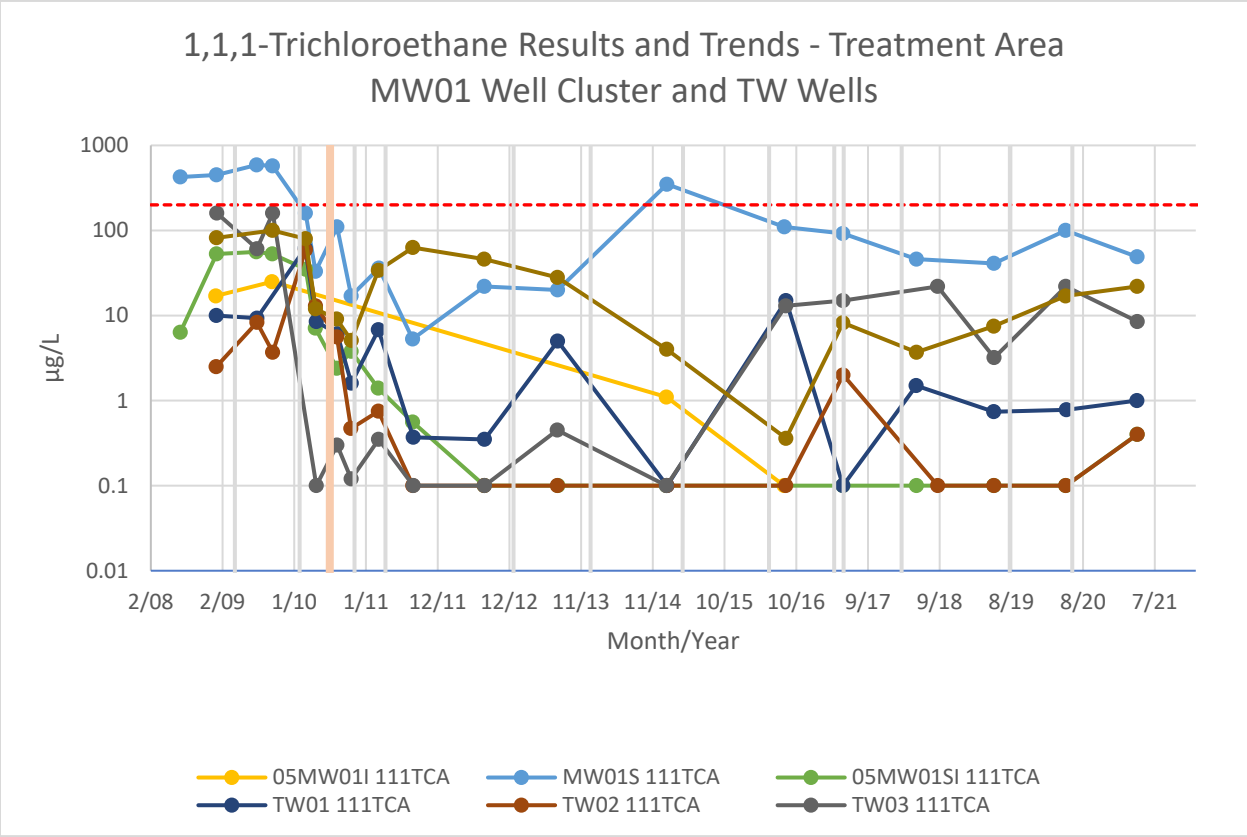
5.2.1 Contaminants of Concern

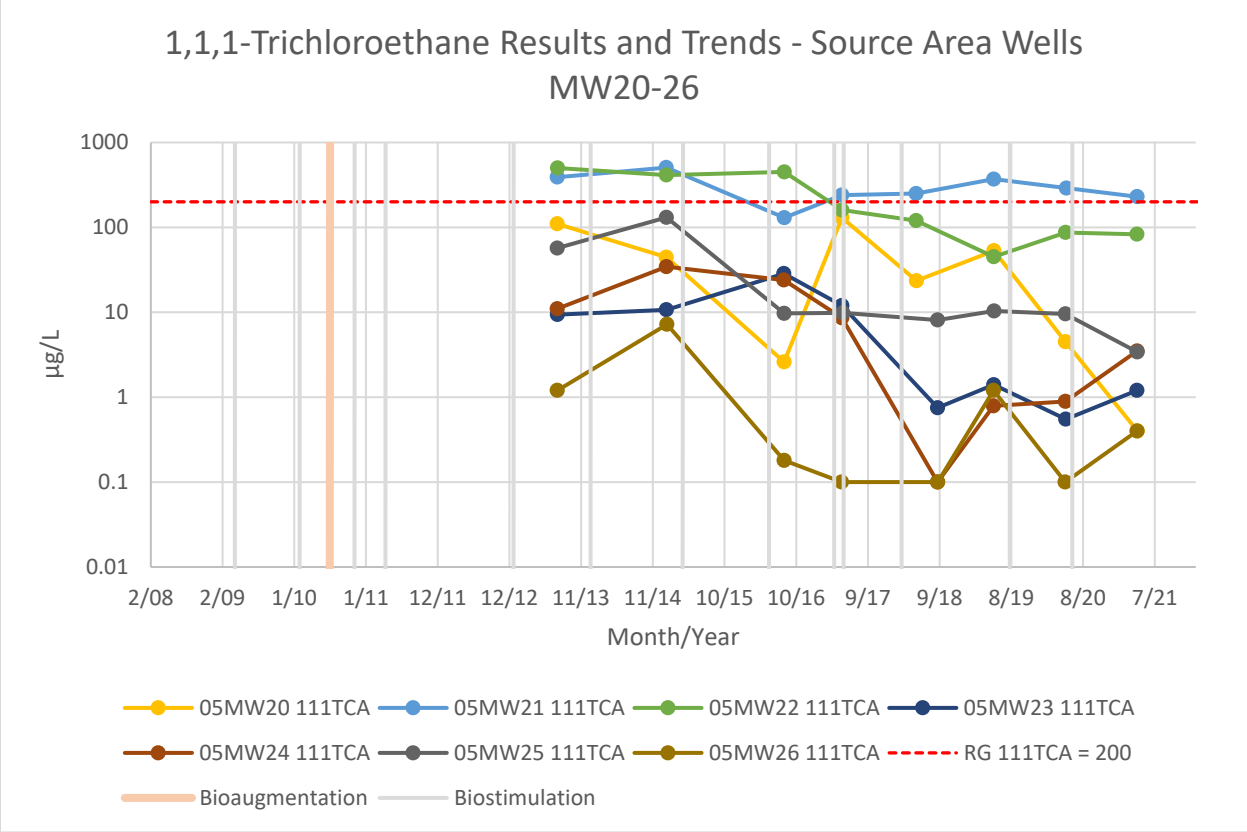
As discussed earlier, and as shown in Tables 3-1 and 4-3, RGs have been established for 11 COCs and 20 wells have been selected for analysis. Trends are presented on the figures below. The figures show a comparison of concentrations of each COC to RGs at each well. The graphs depict: wells in the treatment area (05MW01 cluster and 05TW01 through 05TW04, which are open borehole wells used for either extraction, injection, or monitoring); wells installed in the source area during the 2013 RA activities (05MW20 through 05MW26); and monitoring wells generally either up- or downgradient of the treatment area (05MW10I, 05MW16S, 05MW17I, 05MW18S, 05MW18I, 05MW19S, and 05MW19I). Also

shown on the graphs are vertical lines depicting when bioaugmentation and biostimulation events have occurred.

1,1,1-TCA

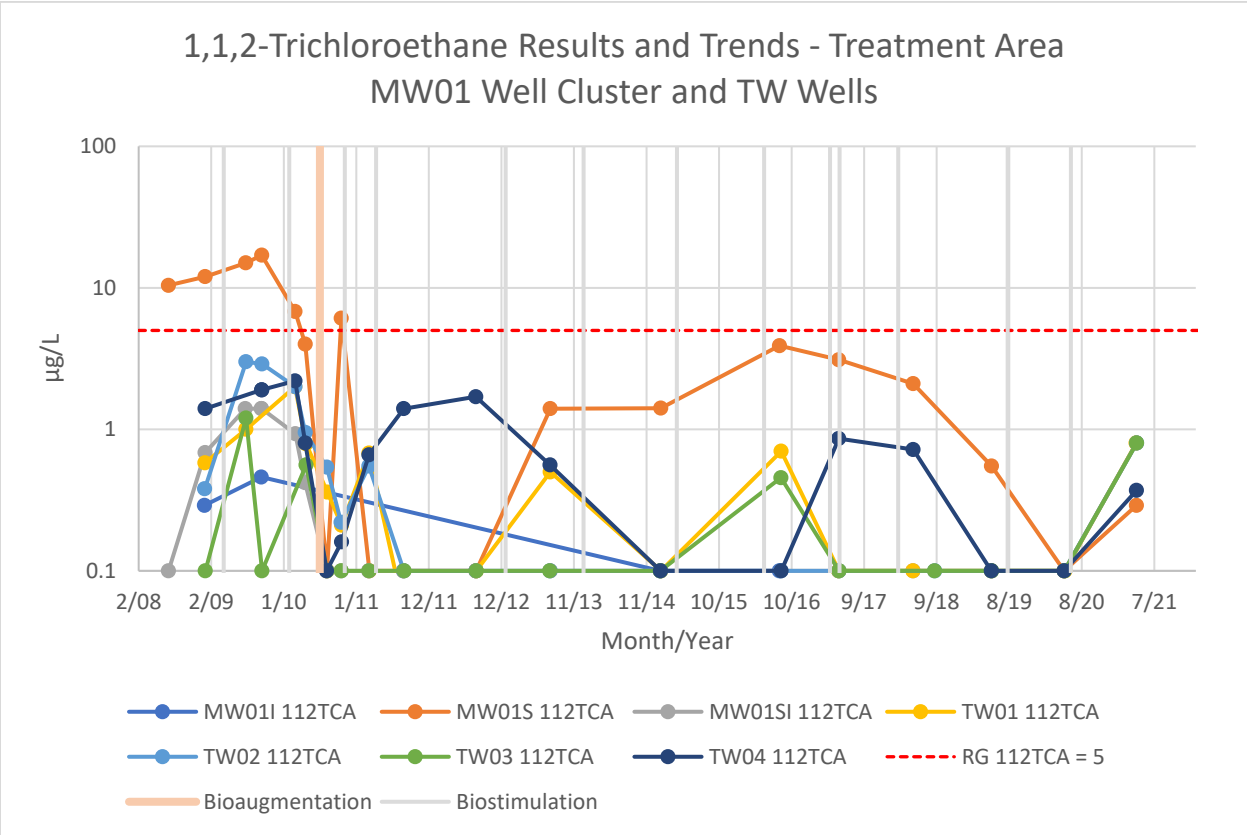
As stated in Section 5.1.2, results for 1,1,1-TCA ranged from non-detected to 230 µg/L at well 05MW21. The only well location with 1,1,1-TCA exceeding the RG of 200 µg/L in April 2021 was source well 05MW21 (230 µg/L). Levels decreased from 290 µg/L in this well since May 2020. Other wells within the treatment and source areas continue to show decreasing trends, particularly the 1,1,1-TCA concentration in well 05MW22 which has remained less than the RG of 200 µg/L for five consecutive sampling events as well as the 1,1,1-TCA concentration in well 05MW20, which decreased from 2019 to 2020 and further decreased in 2021.

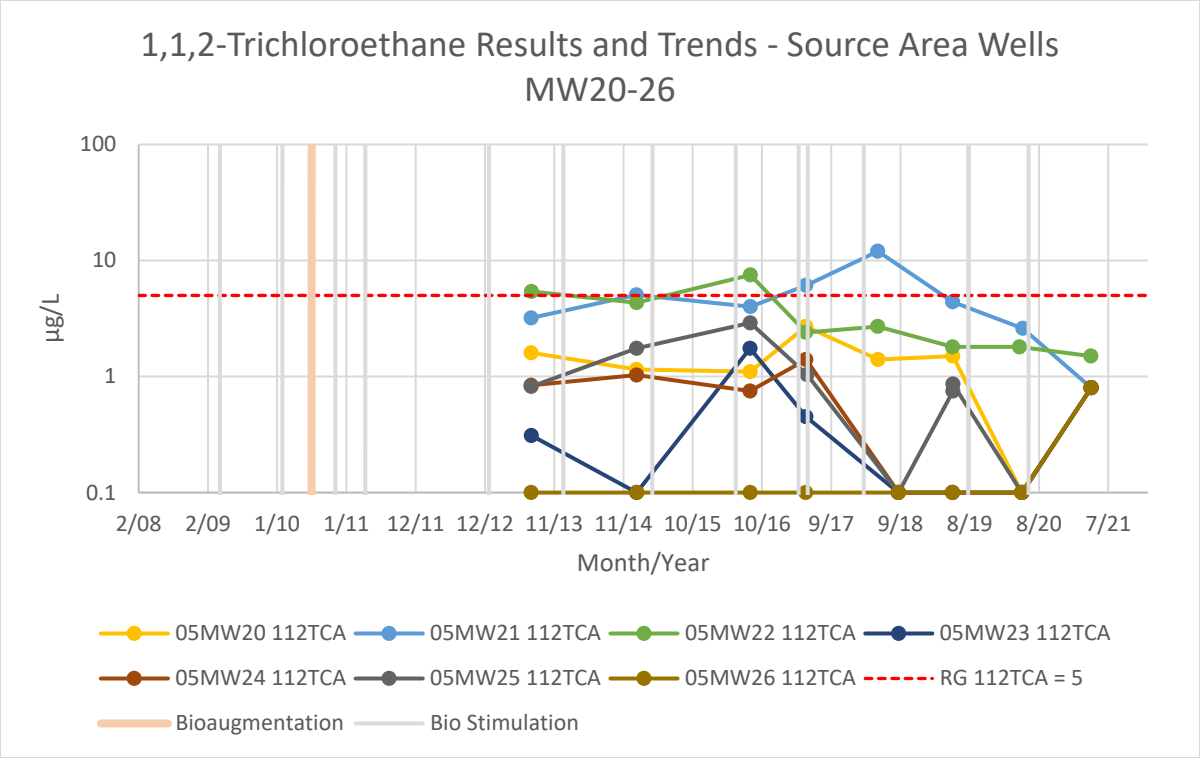


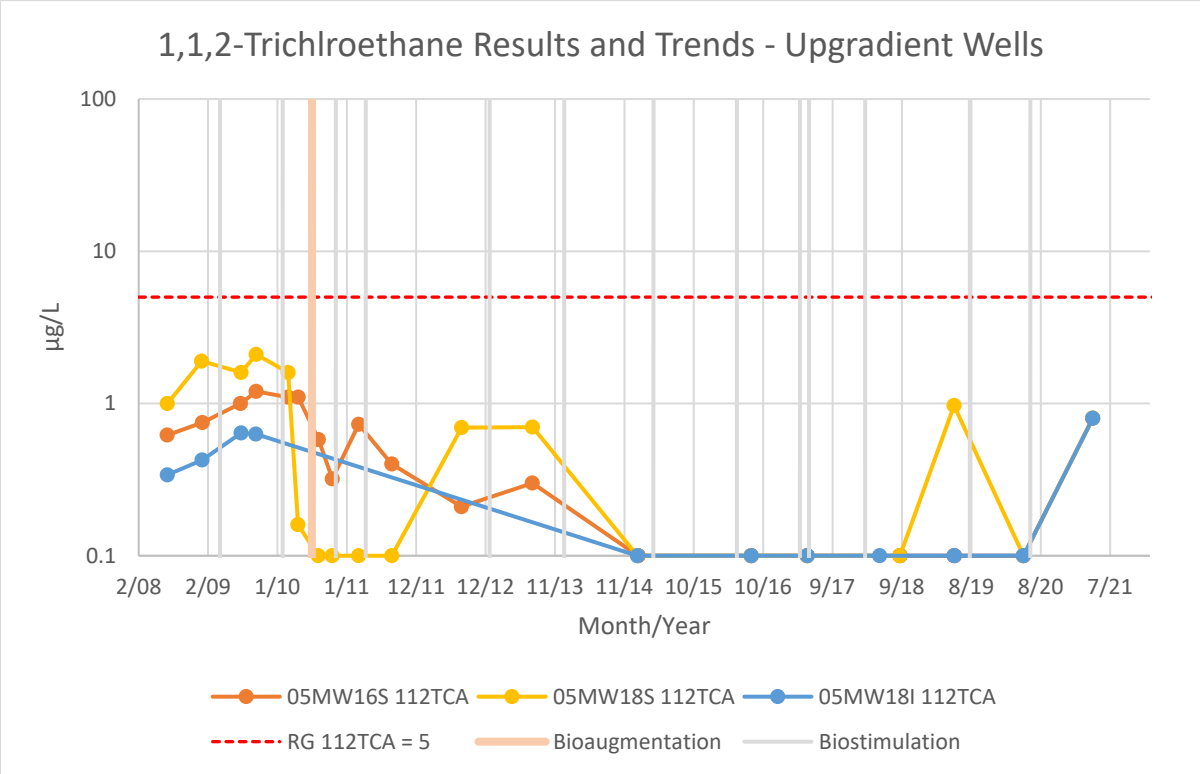

1,1,1-Trichloroethane Results and Trends - Source Area Wells MW20-26
1000
100
10
1
0.1
0.01
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 111TCA
05MW21 111TCA
05MW22 111TCA
05MW23 111TCA
05MW24 111TCA
05MW25 111TCA
05MW26 111TCA
RG 111TCA = 200
Bioaugmentation
Biostimulation

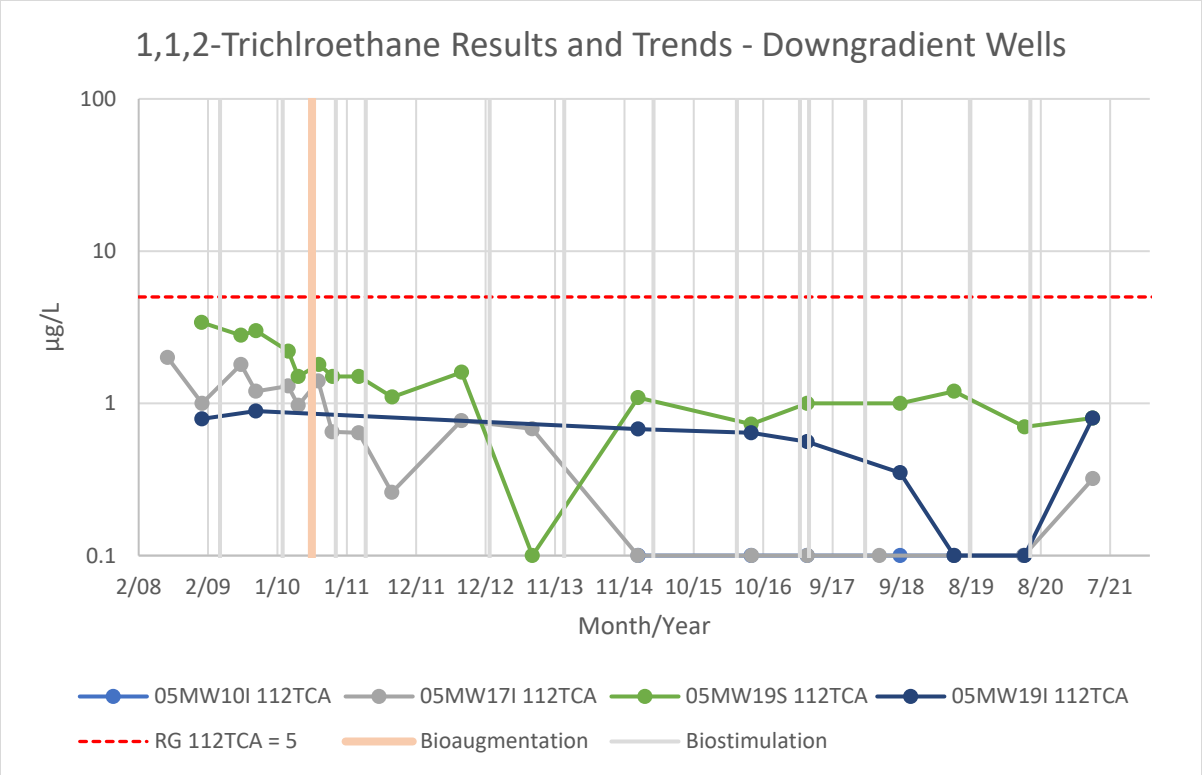
1,1,2-TCA

As stated in Section 5.1.2, none of the 20 monitoring wells sampled in April 2021 had a concentration of 1,1,2-TCA greater than the RG of 5 µg/L. The graphs below show the historical 1,1,2-TCA results for the wells sampled in the LTM program. Linear regression analysis had shown an upward trend in well 05MW21 in 2018; however, the concentration of 1,1,2-TCA decreased to less than the RG of 5 µg/L in 2019 and decreased further in 2021. Several wells during the 2021 sampling event show an increase in concentrations, but remain below the RG.




1,1,2-Trichloroethane Results and Trends - Source Area Wells MW20-26
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 112TCA
05MW21 112TCA
05MW22 112TCA
05MW23 112TCA
05MW24 112TCA
05MW25 112TCA
05MW26 112TCA
RG 112TCA = 5
Bioaugmentation
Bio Stimulation

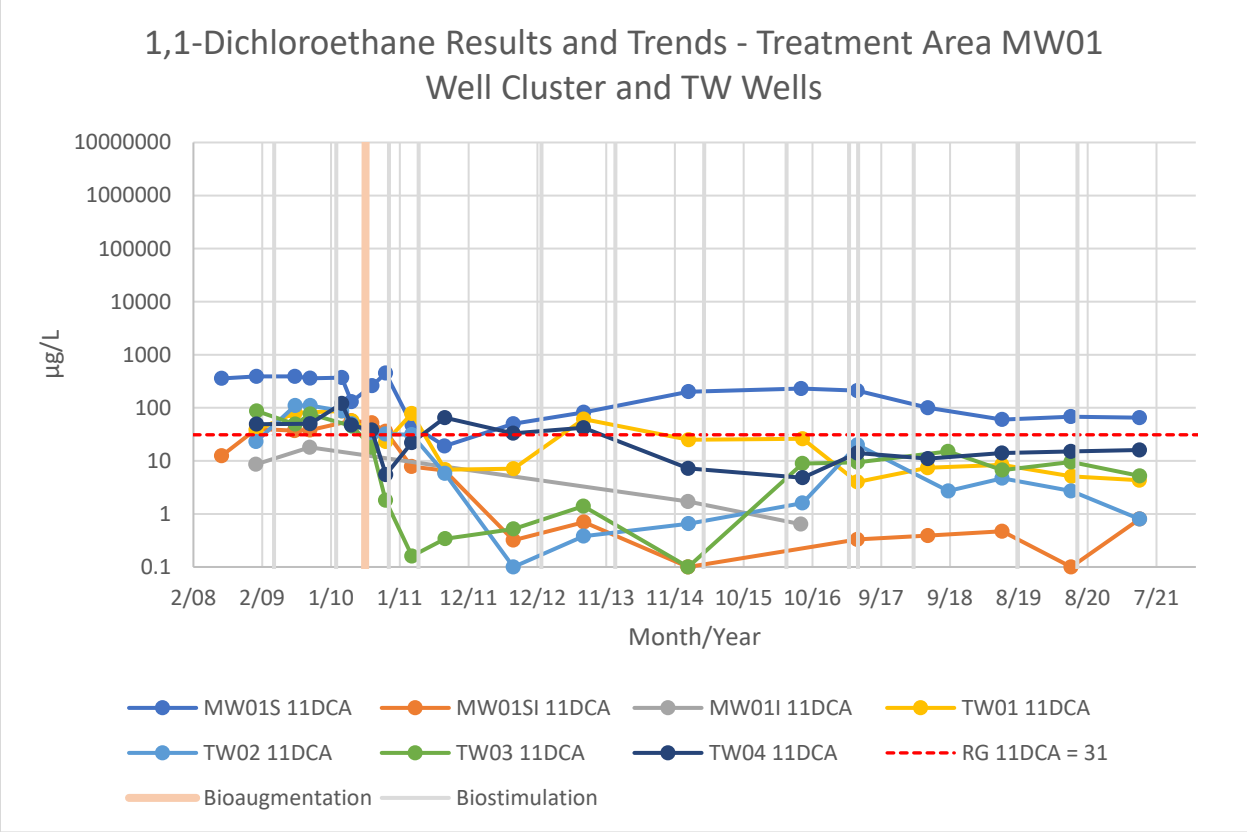

1,1,2-Trichlroethane Results and Trends - Upgradient Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S 112TCA
05MW18S 112TCA
05MW18I 112TCA
RG 112TCA = 5
Bioaugmentation
Biostimulation

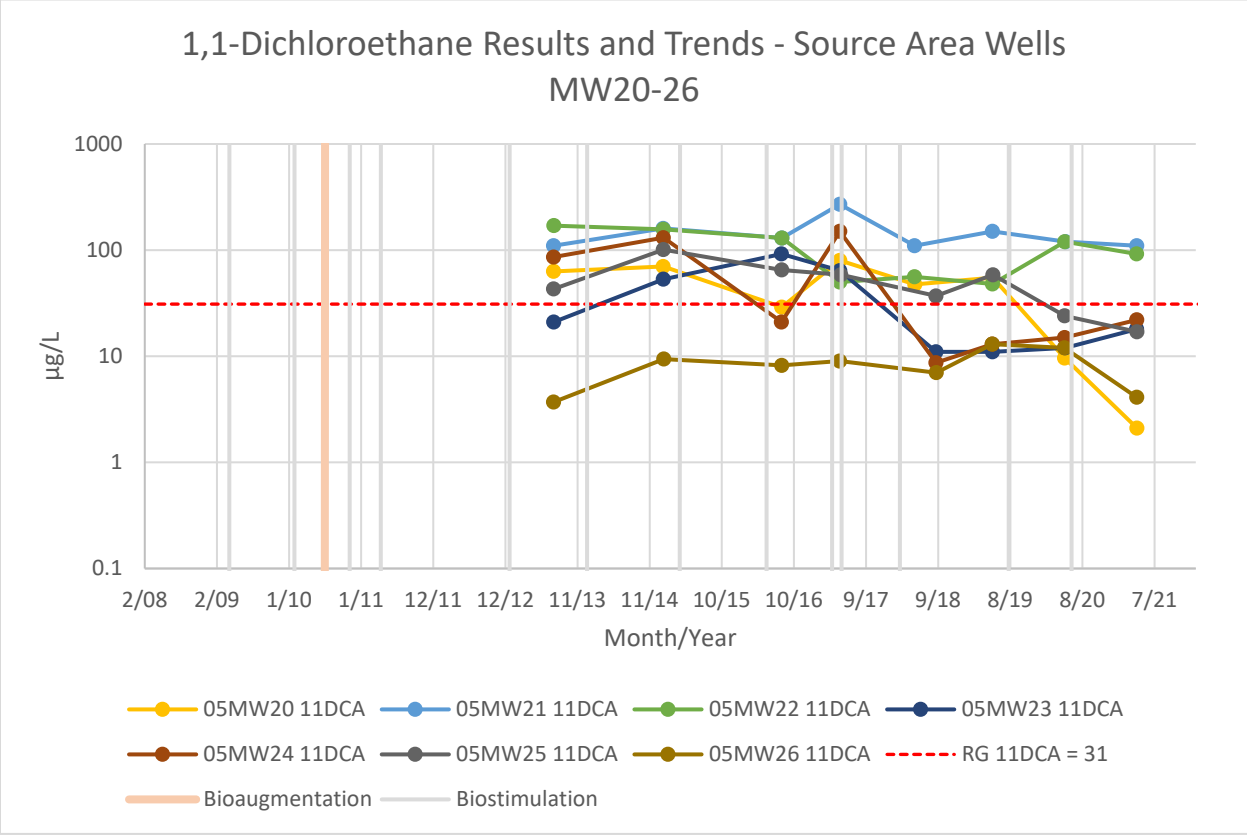

1,1,2-Trichlroethane Results and Trends - Downgradient Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW10I 112TCA
05MW17I 112TCA
05MW19S 112TCA
05MW19I 112TCA
RG 112TCA = 5
Bioaugmentation
Biostimulation

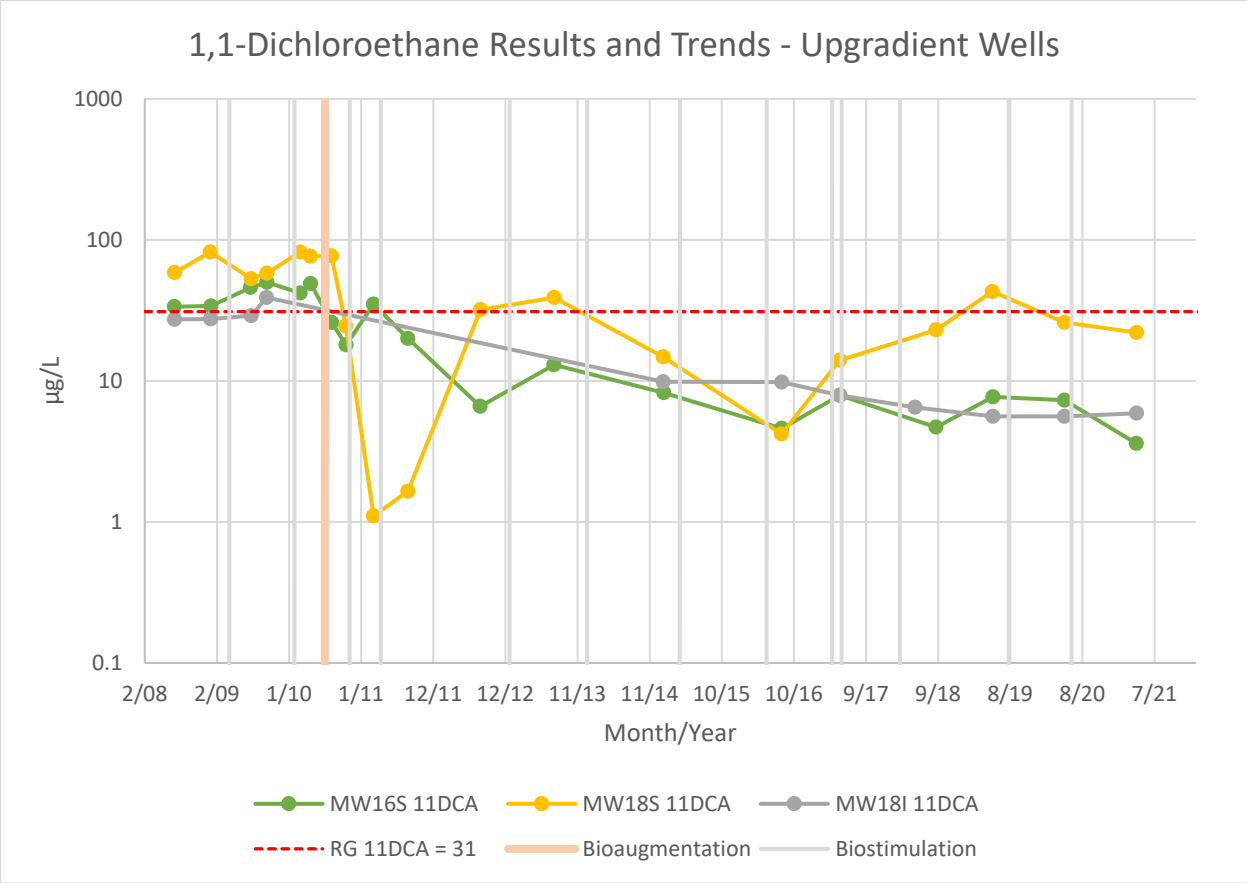
1,1-DCA

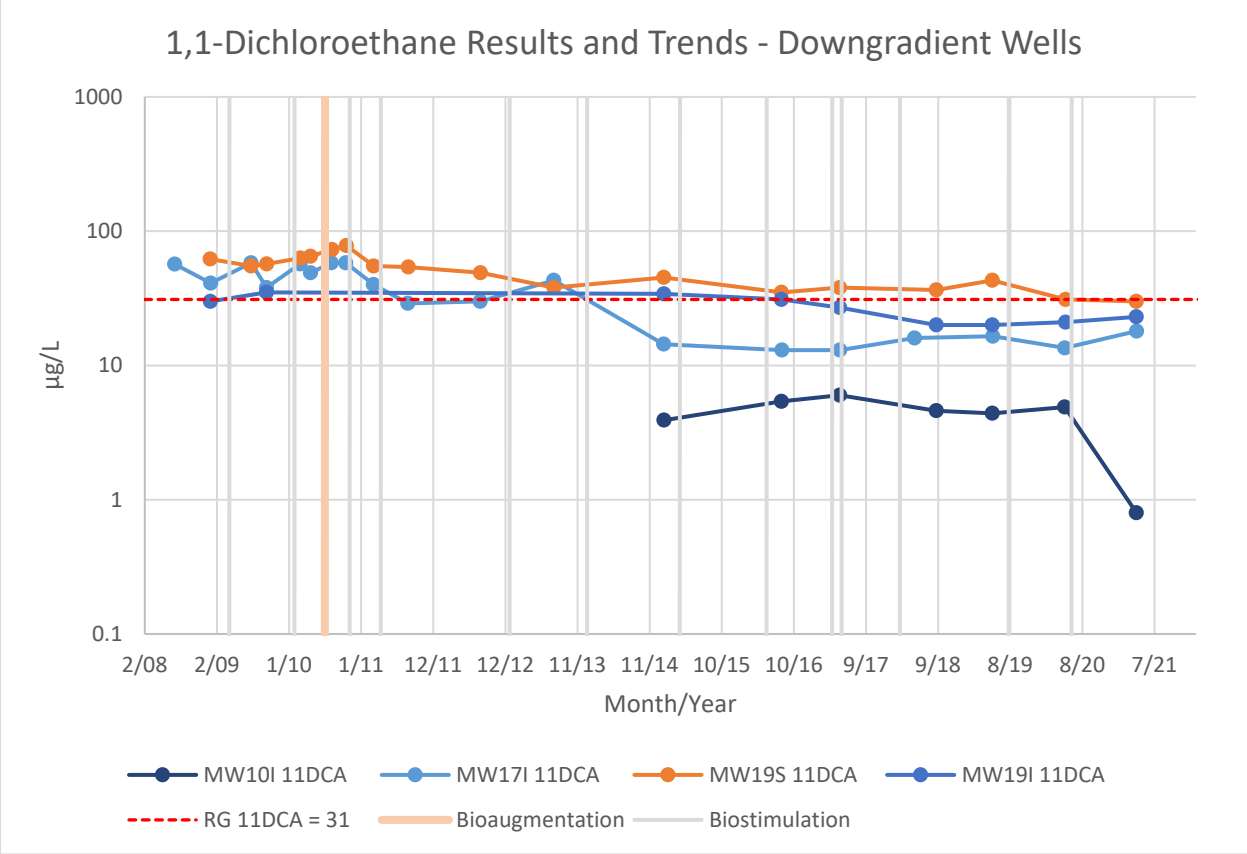
Most of the wells installed prior to or during the pilot test startup in 2008 had 1,1-DCA concentrations exceeding the RG of 31 µg/L when sampled at the time of the pilot test. Five of the seven wells installed in 2013 also had levels of 1,1-DCA greater than the RG during the first sampling of these wells after construction. Results from the sixth annual performance monitoring event continue to show the highest levels in the treatment and source areas. The concentration in well 05MW01S increased slightly in 2021 after trending downward from 2017 to 2019 but is still significantly lower than the peak concentration in 2016 (decreasing from 230 µg/L in 2016 to 65 µg/L in 2021). Concentrations in all other wells in the treatment area are stable or decreasing and below the RG of 31 µg/L. Trends in the wells installed in the source area in 2013 are variable. The concentrations in wells 05MW20 and 05MW25 decreased in 2020 and remain below the RG in 2021 after exceeding the RG in 2019. Wells 05MW20, 05MW23, 05MW24, 05MW25 and 05MW26 have concentrations less than the RG. The concentration in well 05MW22 increased from 48 µg/L in 2019 to 120 µg/L in 2020, and decreased to 92 µg/L in 2021. The concentration in well 05MW21 is above the RG and has remained relatively stable since 2018, after spiking in 2017. The concentration of 1,1-DCA in this well has decreased from 270 µg/L in 2017 to 110 µg/L in 2021.

The concentrations of 1,1-DCA in all of the downgradient wells were less than or equal to the RG of 31 µg/L in 2021. 1,1-DCA has been detected near or greater than the RG in wells 05MW19S and 05MW19I since 2008; however, the concentration in well 05MW19I decreased to less than the RG in 2017 and has remained less than the RG through 2021. The concentration in well 05MW19S has been relatively stable since 2013 and decreased in 2021 to a concentration below the RG of 31 µg/L. The 1,1-DCA concentration in well 05MW18S had been trending up from 2016 to 2019, but decreased to a concentration less than the RG in 2021 (22 µg/L). It should be noted that temporarily increasing concentrations of 1,1-DCA are expected, as this compound results from the breakdown of 1,1,1-TCA.


1,1-Dichloroethane Results and Trends - Treatment Area MW01 Well Cluster and TW Wells
10000000
1000000
100000
10000
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
MW01S 11DCA
MW01SI 11DCA
MW01I 11DCA
TW01 11DCA
TW02 11DCA
TW03 11DCA
TW04 11DCA
RG 11DCA = 31
Bioaugmentation
Biostimulation


1,1-Dichloroethane Results and Trends - Source Area Wells MW20-26
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 11DCA
05MW21 11DCA
05MW22 11DCA
05MW23 11DCA
05MW24 11DCA
05MW25 11DCA
05MW26 11DCA
RG 11DCA = 31
Bioaugmentation
Biostimulation


1,1-Dichloroethane Results and Trends - Upgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
MW16S 11DCA
MW18S 11DCA
MW18I 11DCA
RG 11DCA = 31
Bioaugmentation
Biostimulation

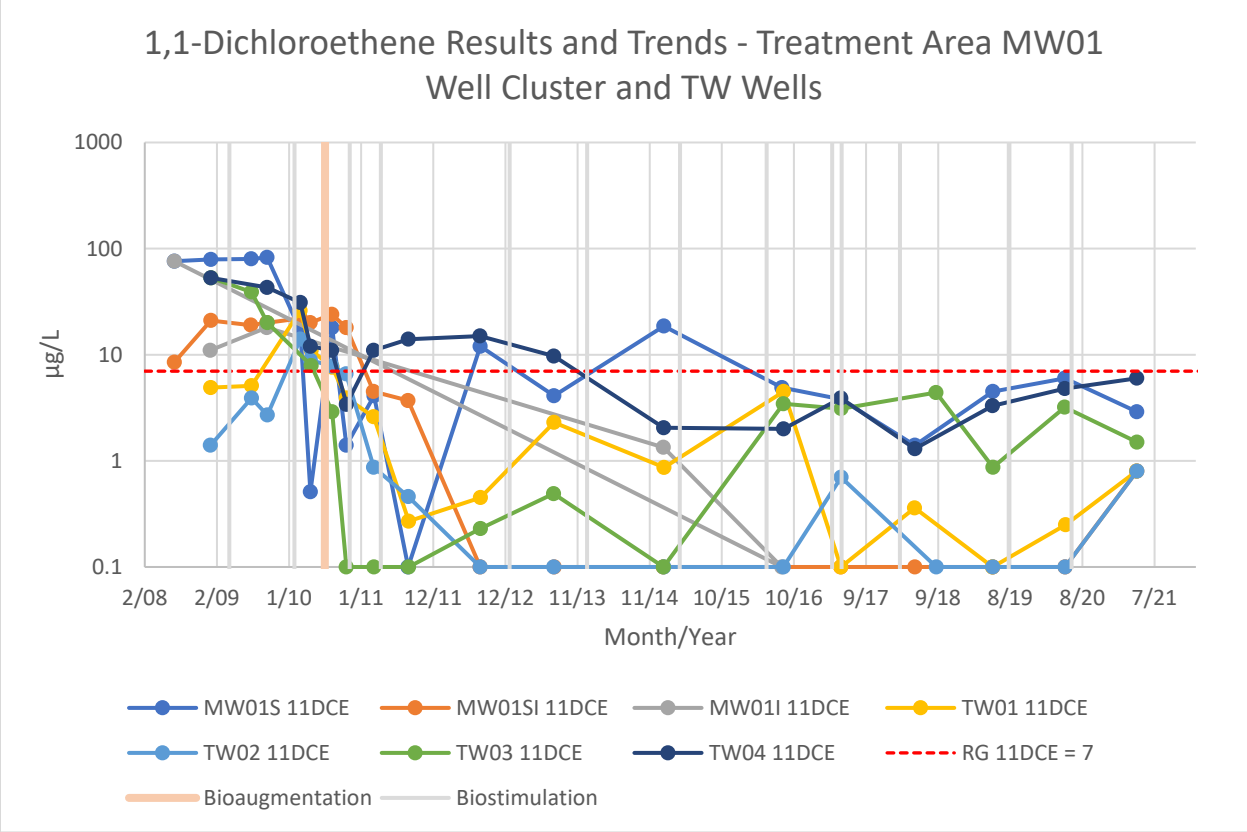


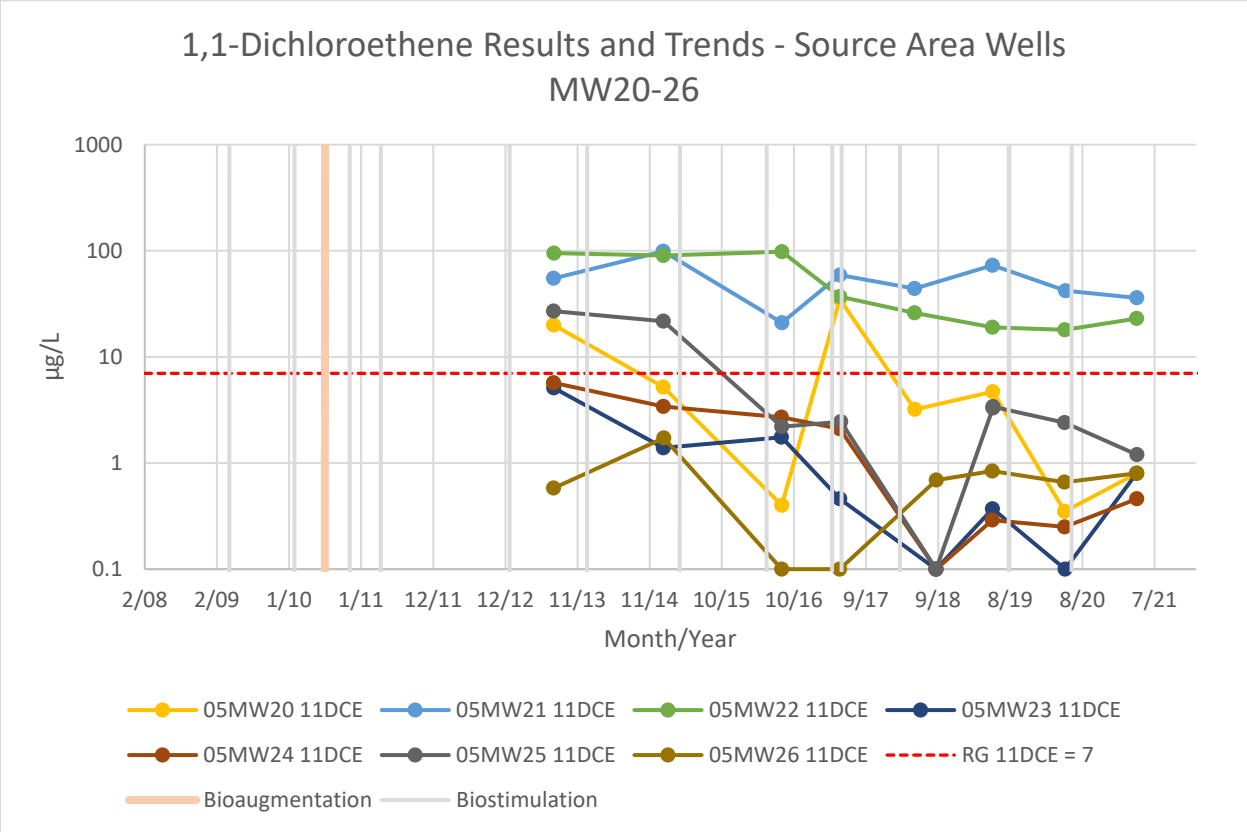
1,2-DCA

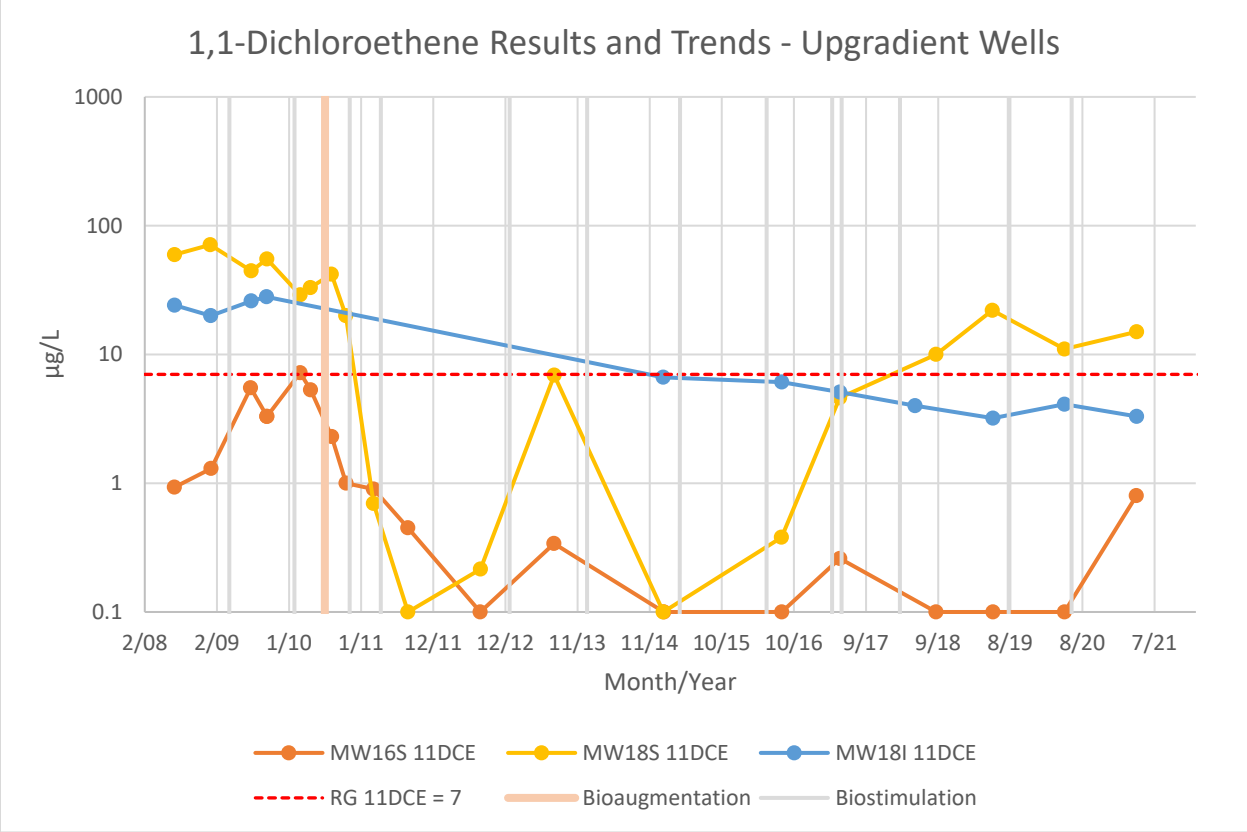
All results for 1,2-DCA from the 2021 sampling event are less than the RG; therefore, a trend analysis has not been conducted for this contaminant. Concentrations of 1,2-DCA have historically been less than the RG of 5 µg/L in all wells.

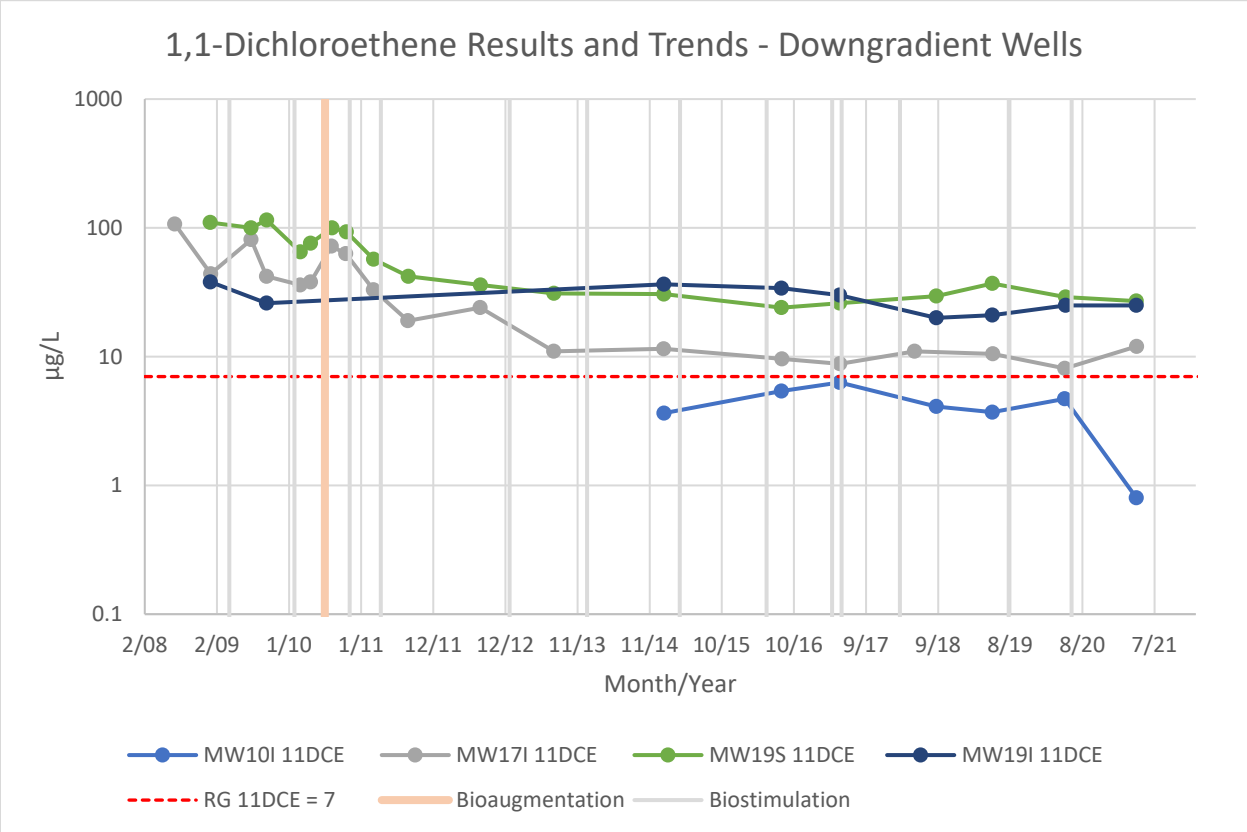
1,1-DCE

1,1-DCE was detected at concentrations greater than the RG of 7 µg/L in wells 05MW21, 05MW22, 05MW17I, 05MW18S, 05MW19S, and 05MW19I during the 2021 LTM sampling event. With the exception of well 05MW18S, these results are generally comparable to previous sampling events. 1,1-DCE concentrations decreased in 2021 in each of the source area wells and well 05MW19S. Concentrations of 1,1-DCE remain below the RG in each of the treatment area wells; however, concentrations increased in wells 05TW01, 05TW02, and 05TW04. Concentrations of 1,1-DCE remained fairly stable in downgradient wells in 2021. Similar to 1,1-DCA, 1,1-DCE is also a breakdown product of 1,1,1-TCA, and temporary increases in this compound are expected during biodegradation.


1,1-Dichloroethene Results and Trends - Treatment Area MW01 Well Cluster and TW Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
MW01S 11DCE
MW01SI 11DCE
MW01I 11DCE
TW01 11DCE
TW02 11DCE
TW03 11DCE
TW04 11DCE
RG 11DCE = 7
Bioaugmentation
Biostimulation

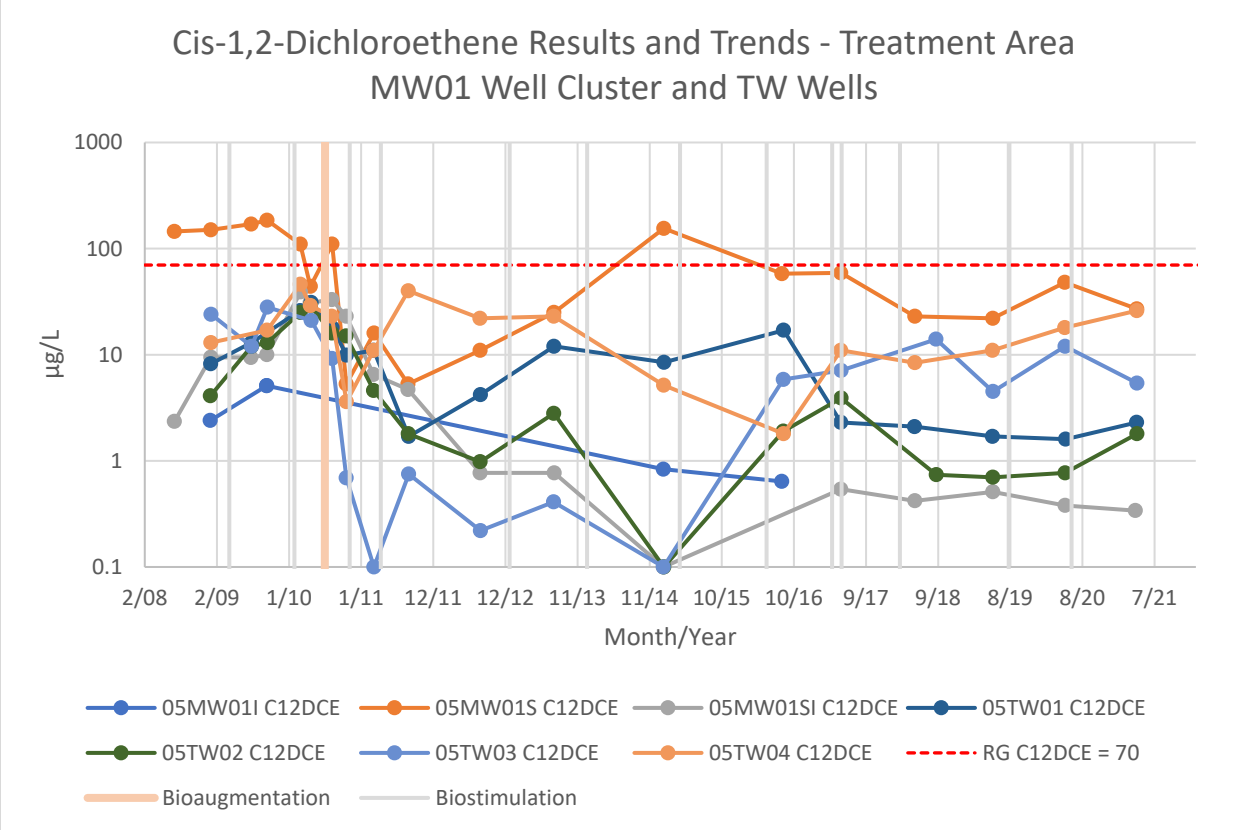

1,1-Dichloroethene Results and Trends - Source Area Wells MW20-26
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 11DCE
05MW21 11DCE
05MW22 11DCE
05MW23 11DCE
05MW24 11DCE
05MW25 11DCE
05MW26 11DCE
RG 11DCE = 7
Bioaugmentation
Biostimulation

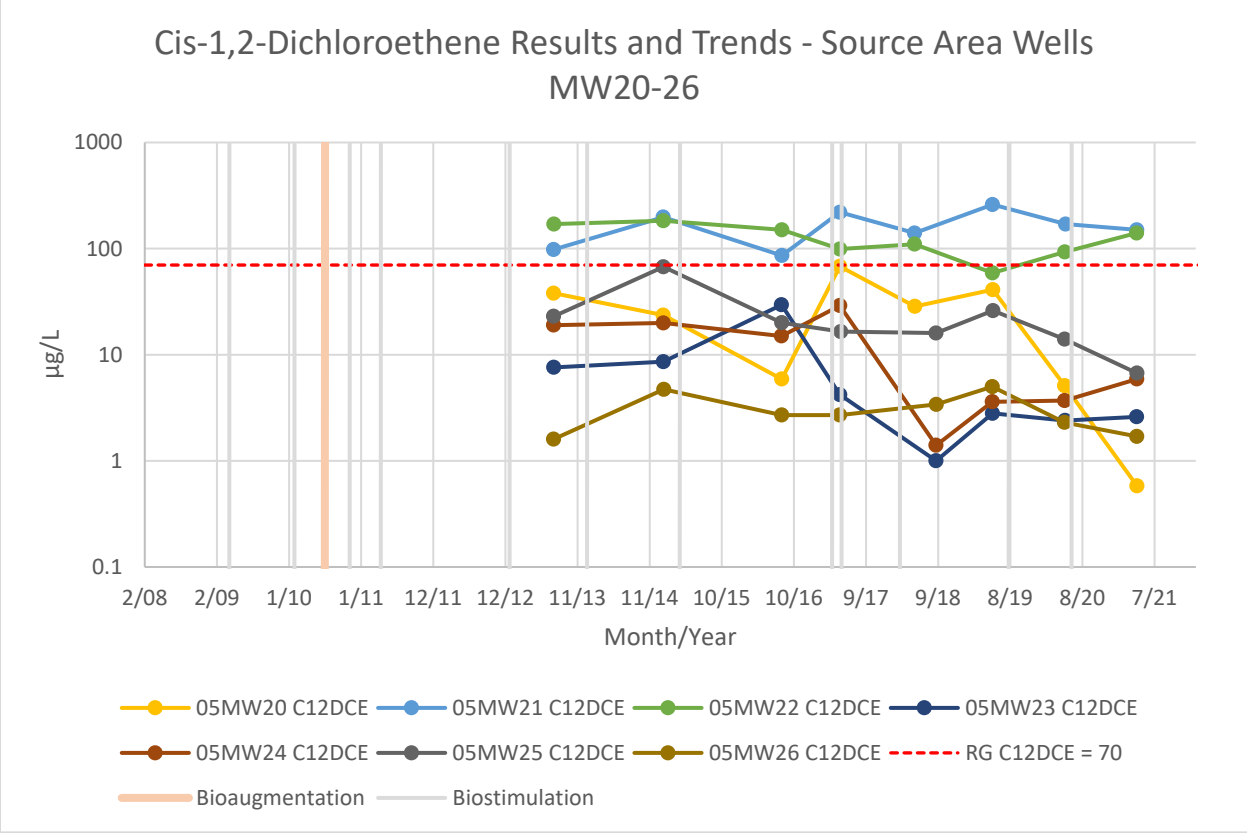

1,1-Dichloroethene Results and Trends - Upgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
MW16S 11DCE
MW18S 11DCE
MW18I 11DCE
RG 11DCE = 7
Bioaugmentation
Biostimulation

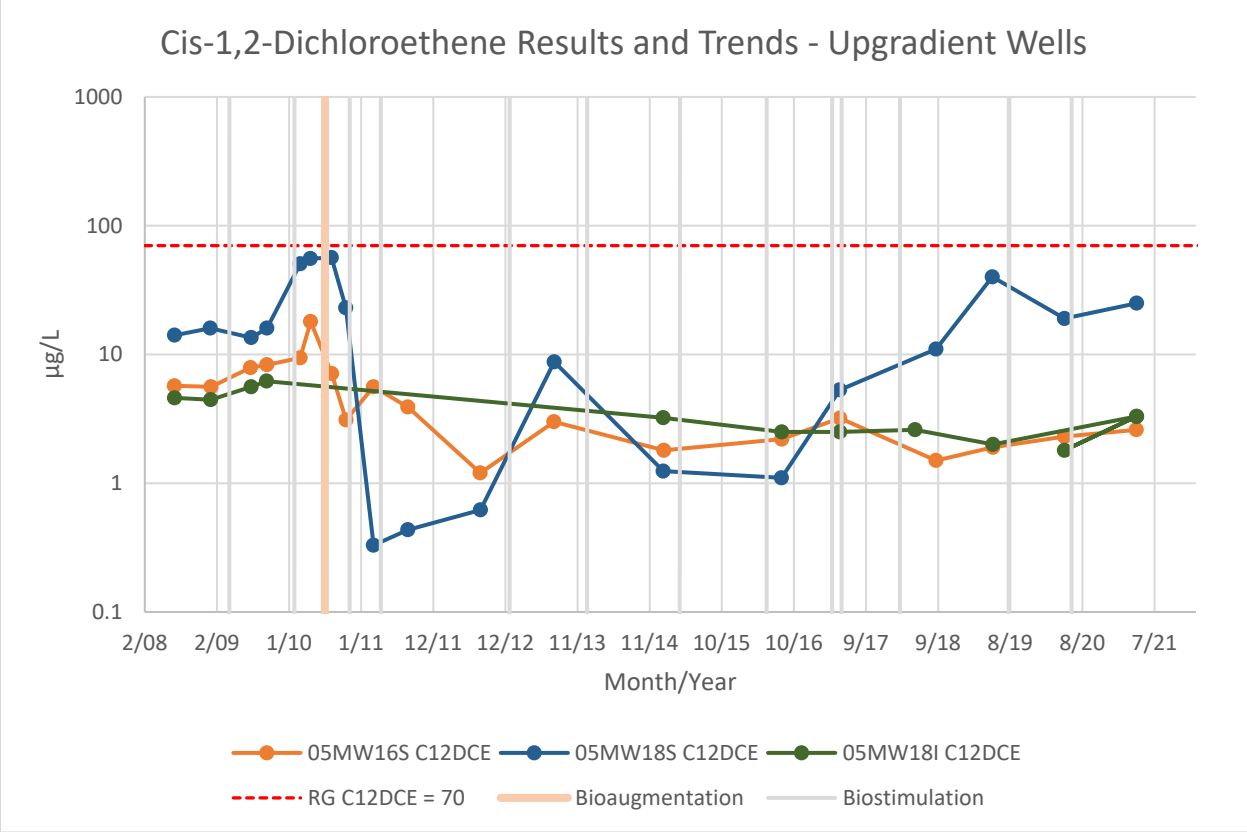

1,1-Dichloroethene Results and Trends - Downgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
MW10I 11DCE
MW17I 11DCE
MW19S 11DCE
MW19I 11DCE
RG 11DCE = 7
Bioaugmentation
Biostimulation

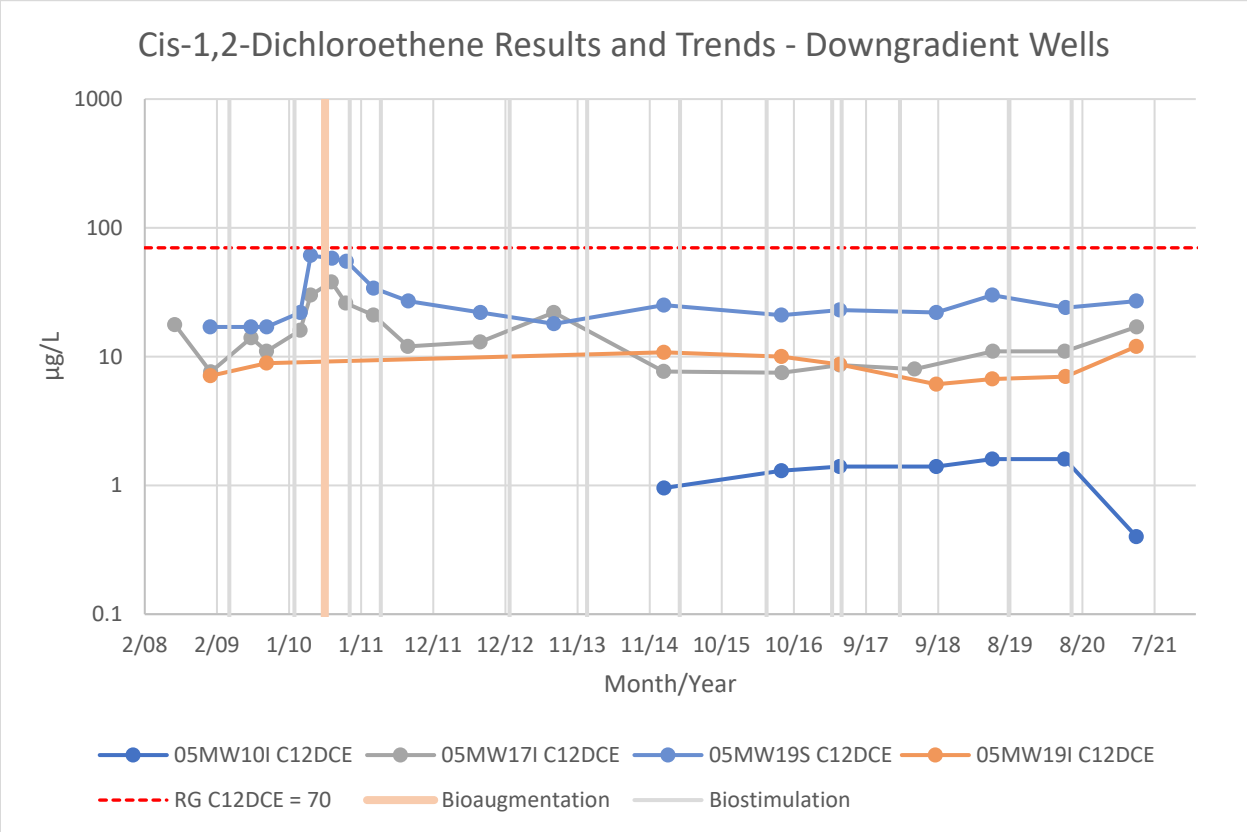
cis-1,2-DCE

cis-1,2-DCE was detected at concentrations greater than the RG of 70 µg/L in two samples (05MW21 and 05MW22) during the 2021 sampling event. A decreasing trend had been observed in well 05MW22, with the cis-1,2-DCE concentration in this well falling to a concentration less than the RG of 70 µg/L in 2019; however, the concentration increased in 2020 and continued to increase in 2021 to over the RG (140 µg/L). Although the concentration decreased from 2020 to 2021, there is an overall upward trend of this compound in well 05MW21 when compared to startup levels. All other wells have historically had concentrations less than the RG. Concentrations of cis-1,2-DCE in source area wells 05TW01, 05TW02, and 05TW04 increased from 2020 to 2021 but remain below the RG. A stable or upward trend of this compound are expected as long as PCE and TCE are present in the source area.


Cis-1,2-Dichloroethene Results and Trends - Treatment Area
MW01 Well Cluster and TW Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW01I C12DCE
05MW01S C12DCE
05MW01SI C12DCE
05TW01 C12DCE
05TW02 C12DCE
05TW03 C12DCE
05TW04 C12DCE
RG C12DCE = 70
Bioaugmentation
Biostimulation

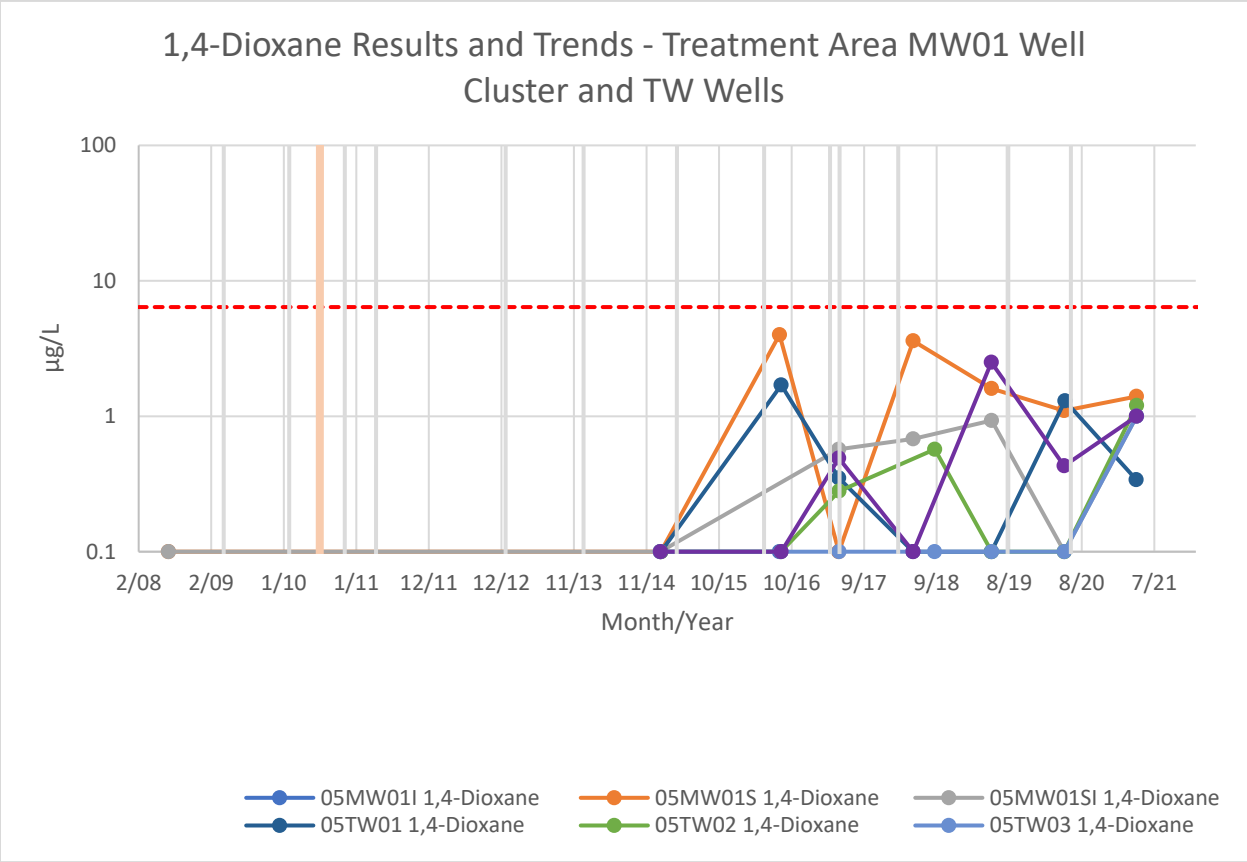

Cis-1,2-Dichloroethene Results and Trends - Source Area Wells
MW20-26
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 C12DCE
05MW21 C12DCE
05MW22 C12DCE
05MW23 C12DCE
05MW24 C12DCE
05MW25 C12DCE
05MW26 C12DCE
RG C12DCE = 70
Bioaugmentation
Biostimulation

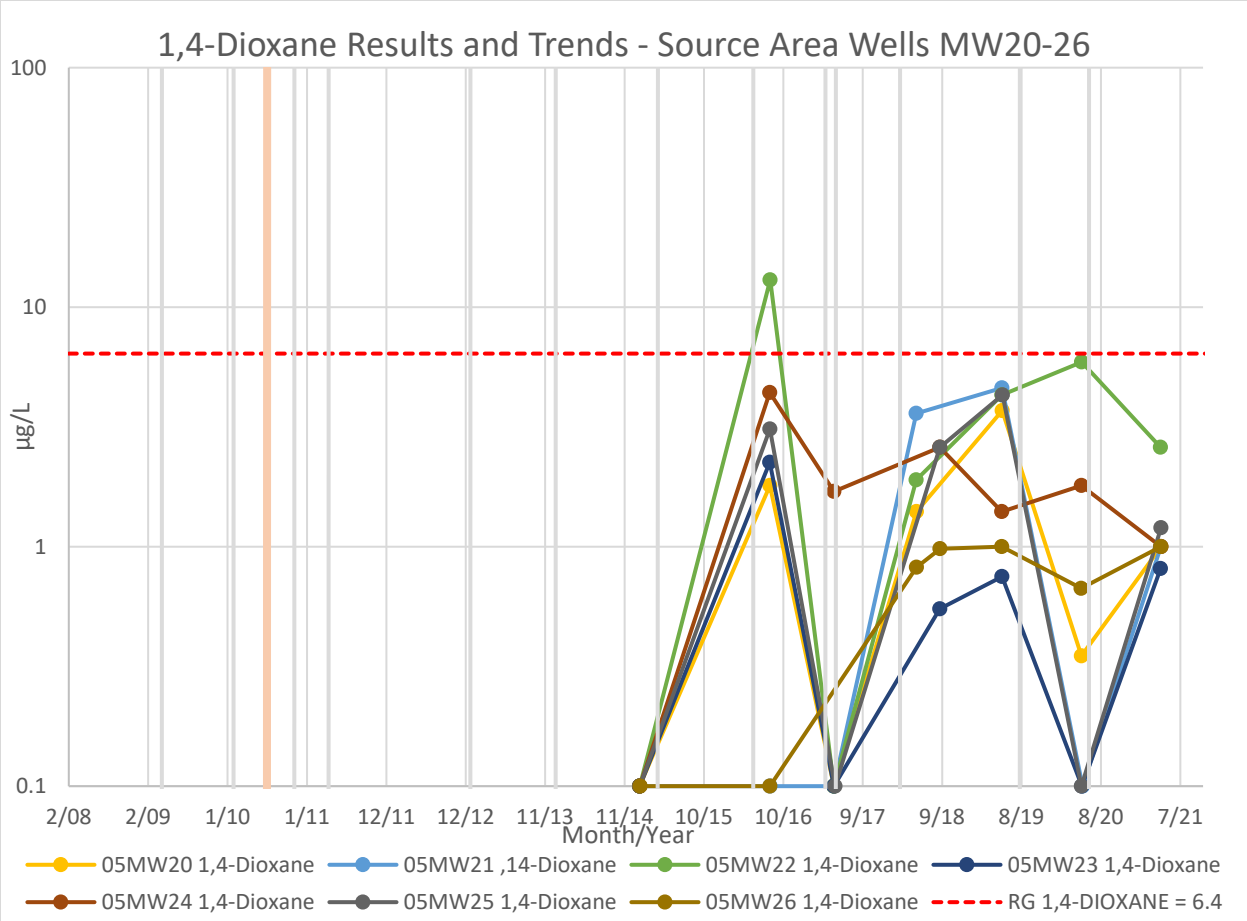

Cis-1,2-Dichloroethene Results and Trends - Upgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S C12DCE
05MW18S C12DCE
05MW18I C12DCE
RG C12DCE = 70
Bioaugmentation
Biostimulation

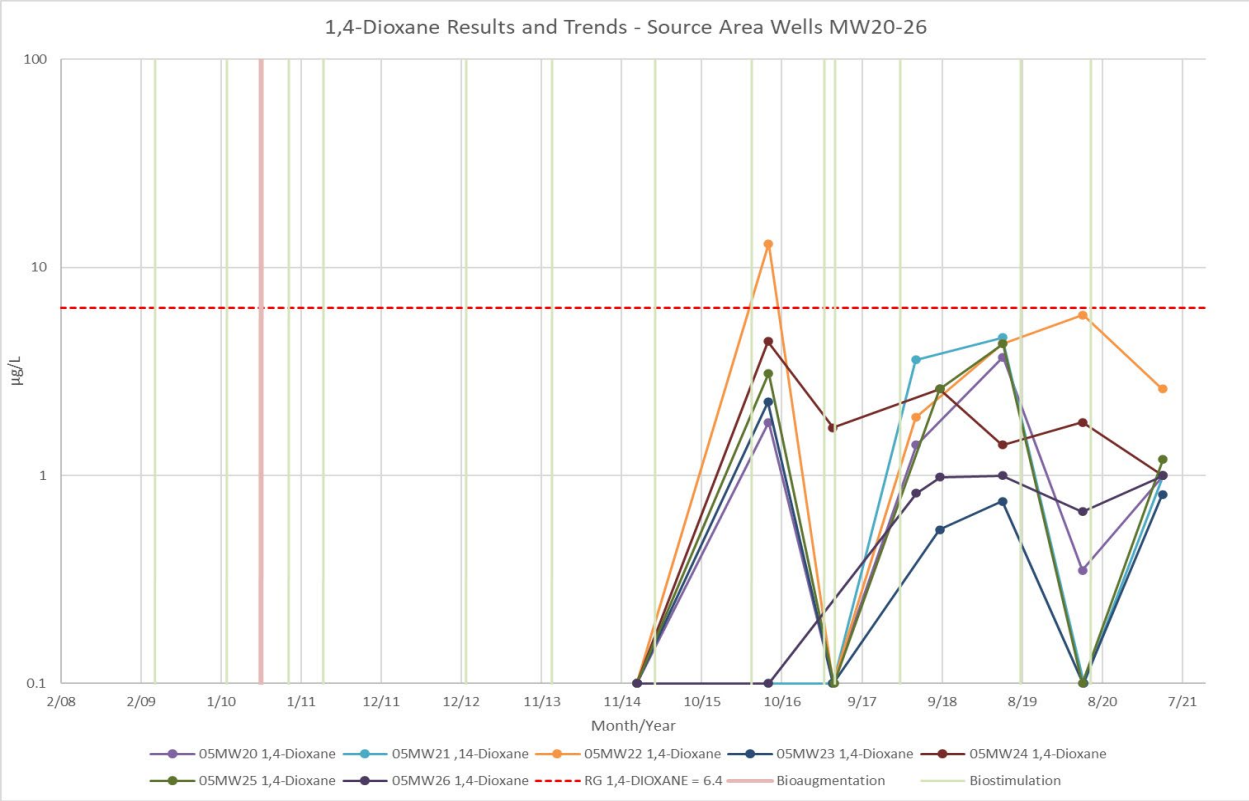

Cis-1,2-Dichloroethene Results and Trends - Downgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW10I C12DCE
05MW17I C12DCE
05MW19S C12DCE
05MW19I C12DCE
RG C12DCE = 70
Bioaugmentation
Biostimulation

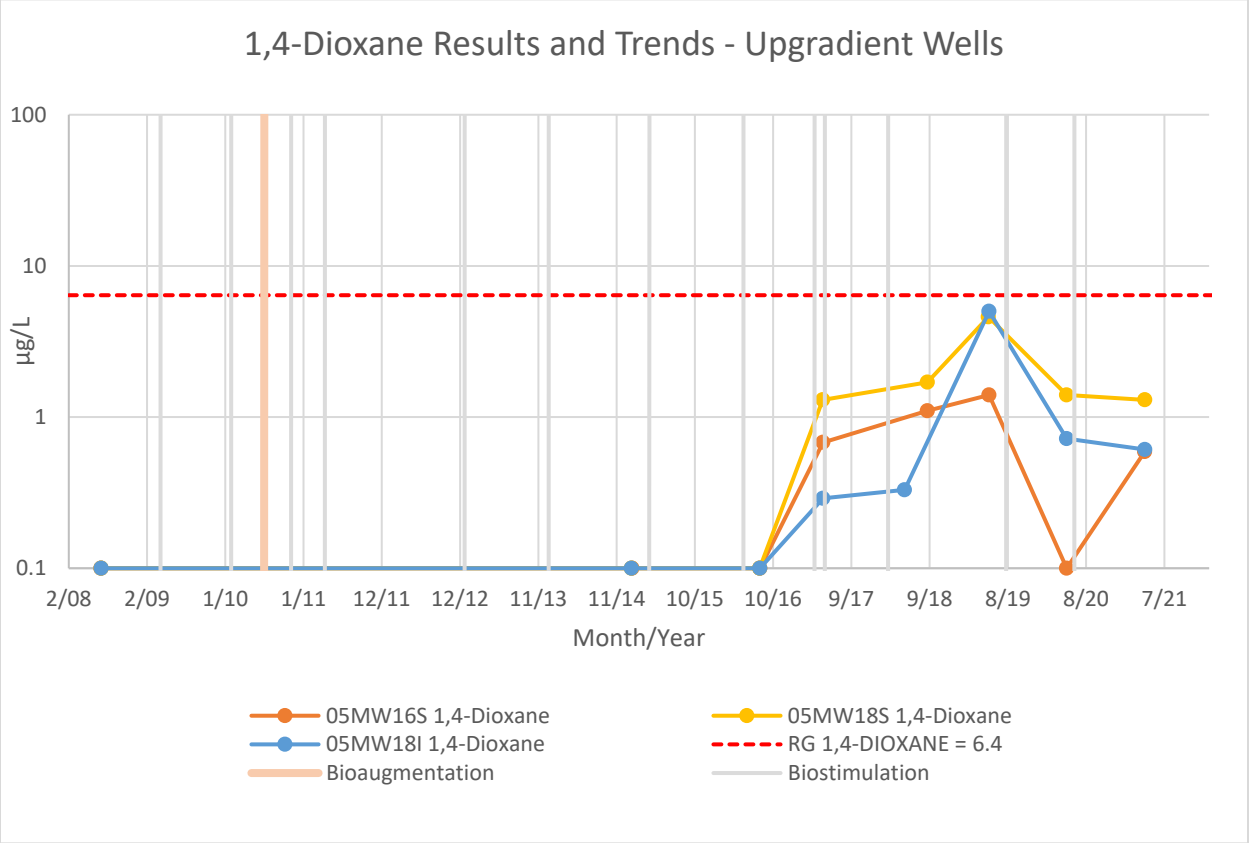
1.4 Dioxane

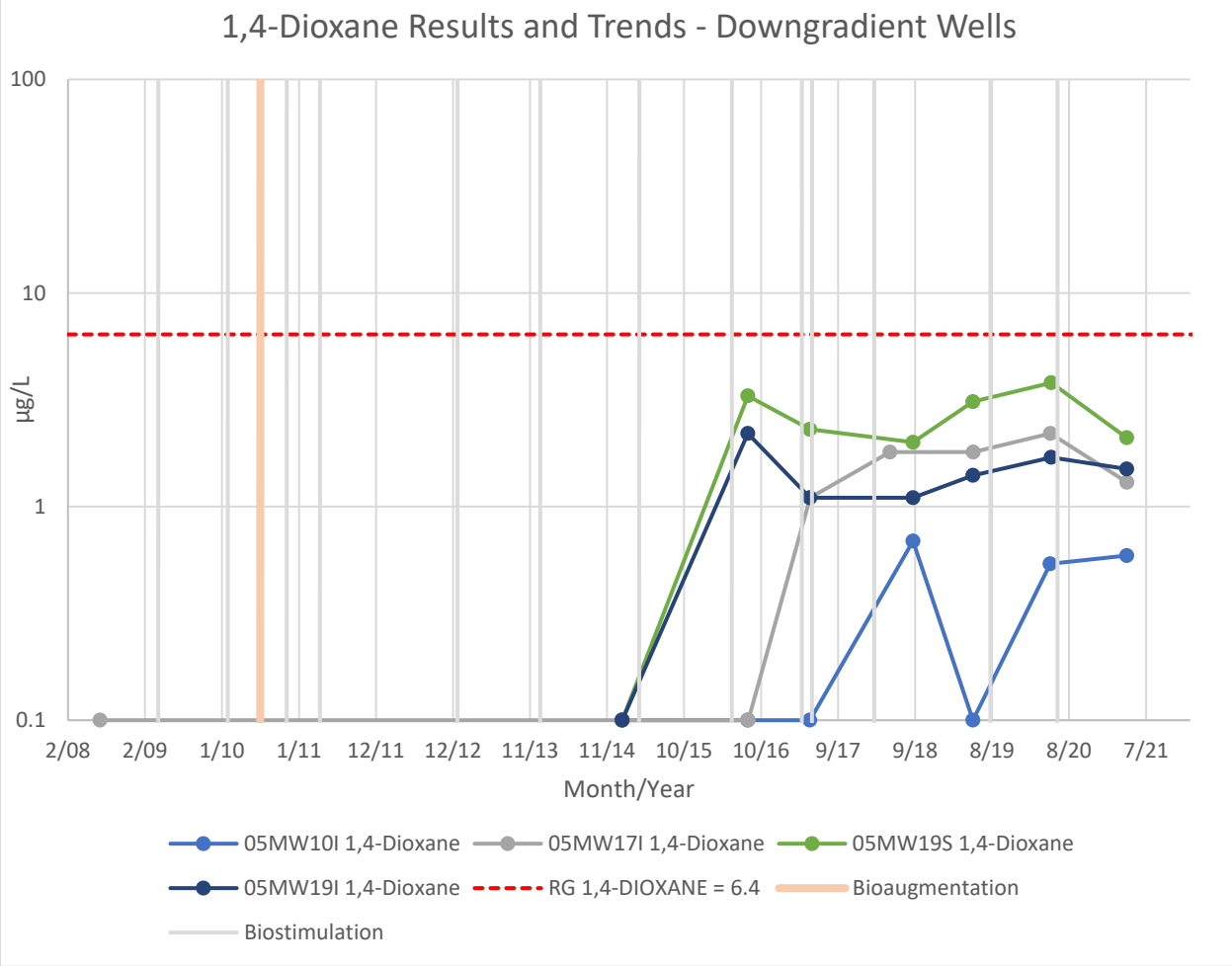
1,4-Dioxane was not detected at concentrations greater than the RG of 6.4 µg/L in any well in 2021. Concentrations ranged from non-detect to 2.6 µg/L (05MW22). In 2016, one well (05MW22) had a concentration of 1,4-dioxane greater than the RG. Since this occurrence, no samples collected have had concentrations greater than the RG.




1,4-Dioxane Results and Trends - Source Area Wells MW20-26
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 1,4-Dioxane
05MW21 ,14-Dioxane
05MW22 1,4-Dioxane
05MW23 1,4-Dioxane
05MW24 1,4-Dioxane
05MW25 1,4-Dioxane
05MW26 1,4-Dioxane
RG 1,4-DIOXANE = 6.4


1,4-Dioxane Results and Trends - Source Area Wells MW20-26
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 1,4-Dioxane
05MW21 ,14-Dioxane
05MW22 1,4-Dioxane
05MW23 1,4-Dioxane
05MW24 1,4-Dioxane
05MW25 1,4-Dioxane
05MW26 1,4-Dioxane
RG 1,4-DIOXANE = 6.4
Bioaugmentation
Biostimulation


1,4-Dioxane Results and Trends - Upgradient Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S 1,4-Dioxane
05MW18S 1,4-Dioxane
05MW18I 1,4-Dioxane
RG 1,4-DIOXANE = 6.4
Bioaugmentation
Biostimulation



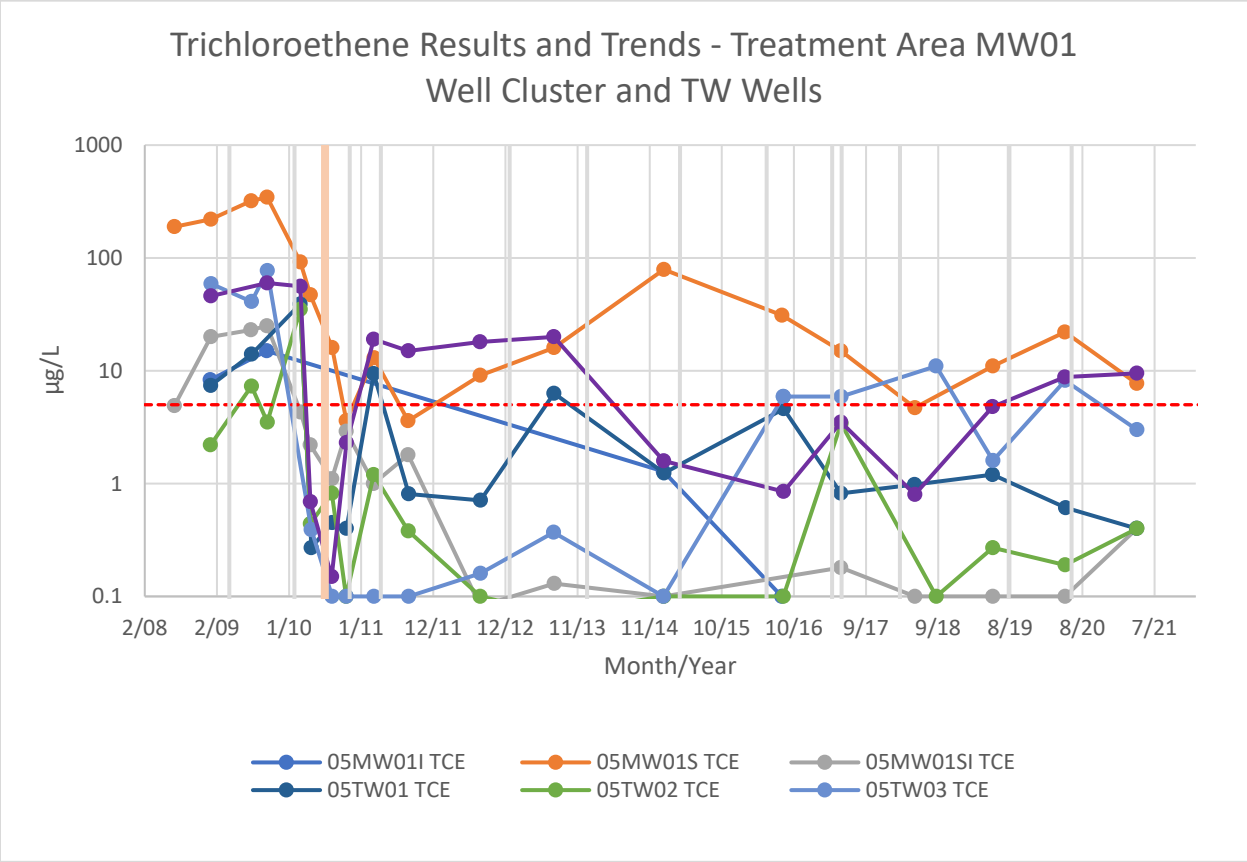
Benzene

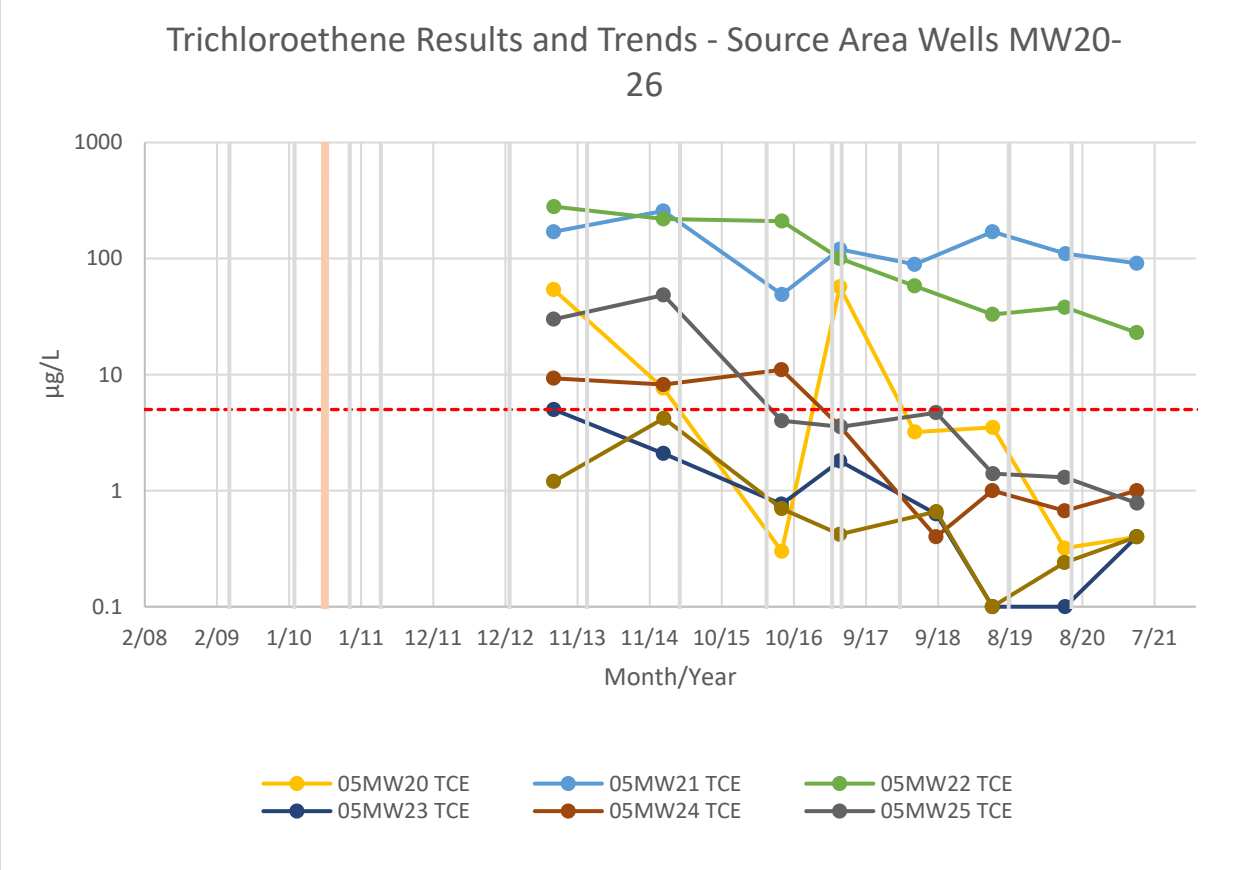
All benzene results from the 2021 sampling event are less than the RG; therefore, a trend analysis has not been conducted for this contaminant. Concentrations of benzene have historically been less than the RG of 5 µg/L in all wells.

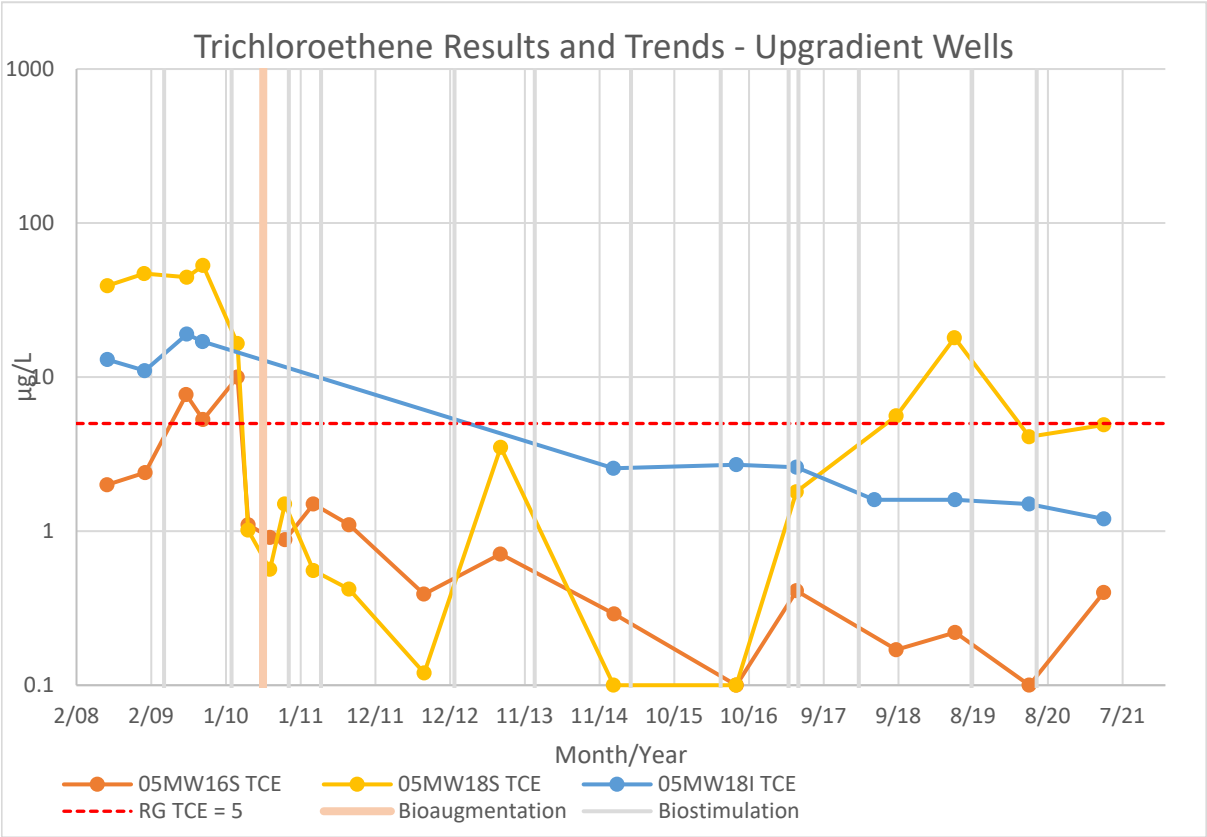
TCE

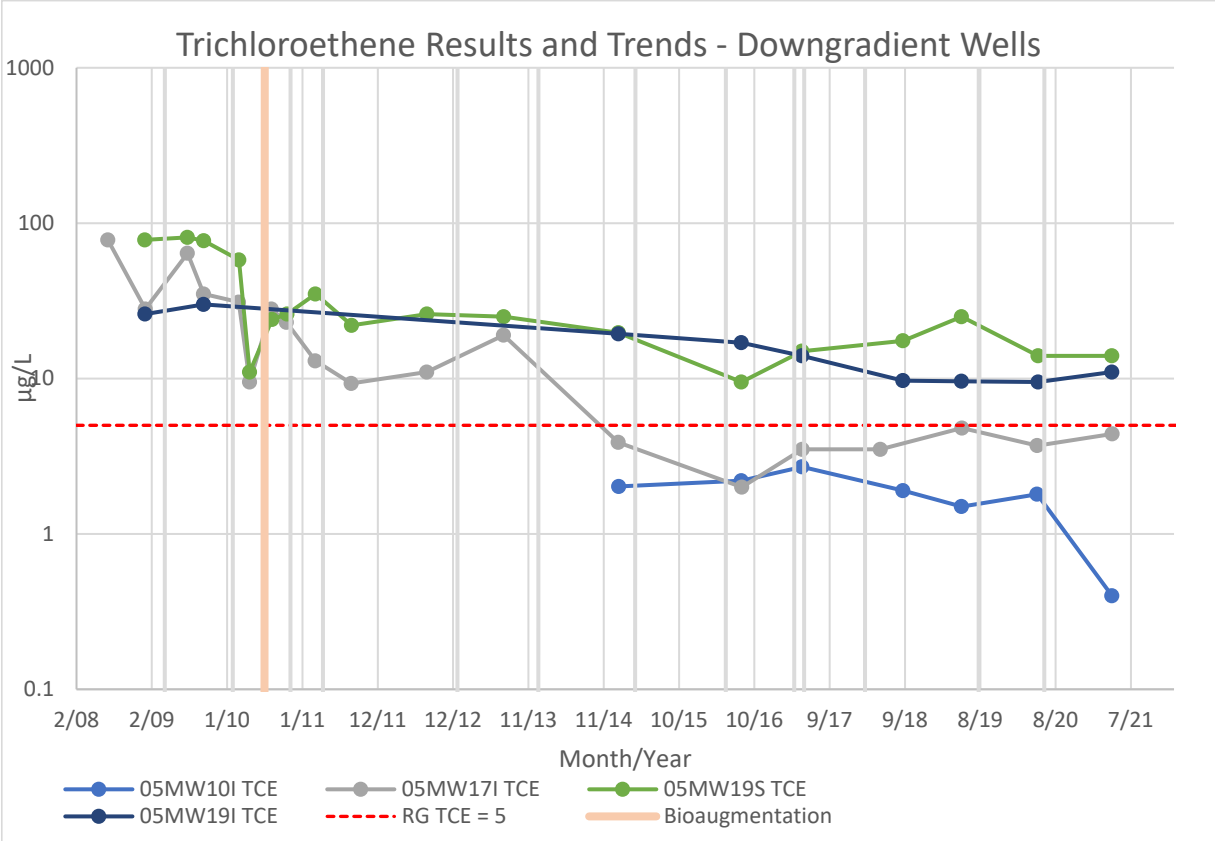
In general, TCE concentrations are trending downward since the start of the pilot test in 2009. With the exception of two wells (including 05MW16S, which is upgradient of the source area), all wells had concentrations of TCE greater than the RG of 5 µg/L in 2008. Six of the seven wells constructed in the source area in 2013 had concentrations equal to or greater than the RG when first sampled. Results from the April 2021 sampling event show TCE concentrations are greater than the RG in four wells in the source/treatment area, including only two of the seven wells installed in 2013, and two downgradient wells (05MW19S and 05MW19I). TCE in well 05MW20 returned to a concentration less than the RG during the 2018 sampling event after being detected at a concentration greater than the RG in 2017 and decreased to a concentration of

0.58 J µg/L in 2021. The concentration of TCE in well 05MW18S decreased to less than the RG in 2020 and remained below the RG in 2021 after exceeding the RG in 2018 and 2019. TCE has also decreased to less than the RG in 2021 in 05TW03 after exceeding the RG in 2020.



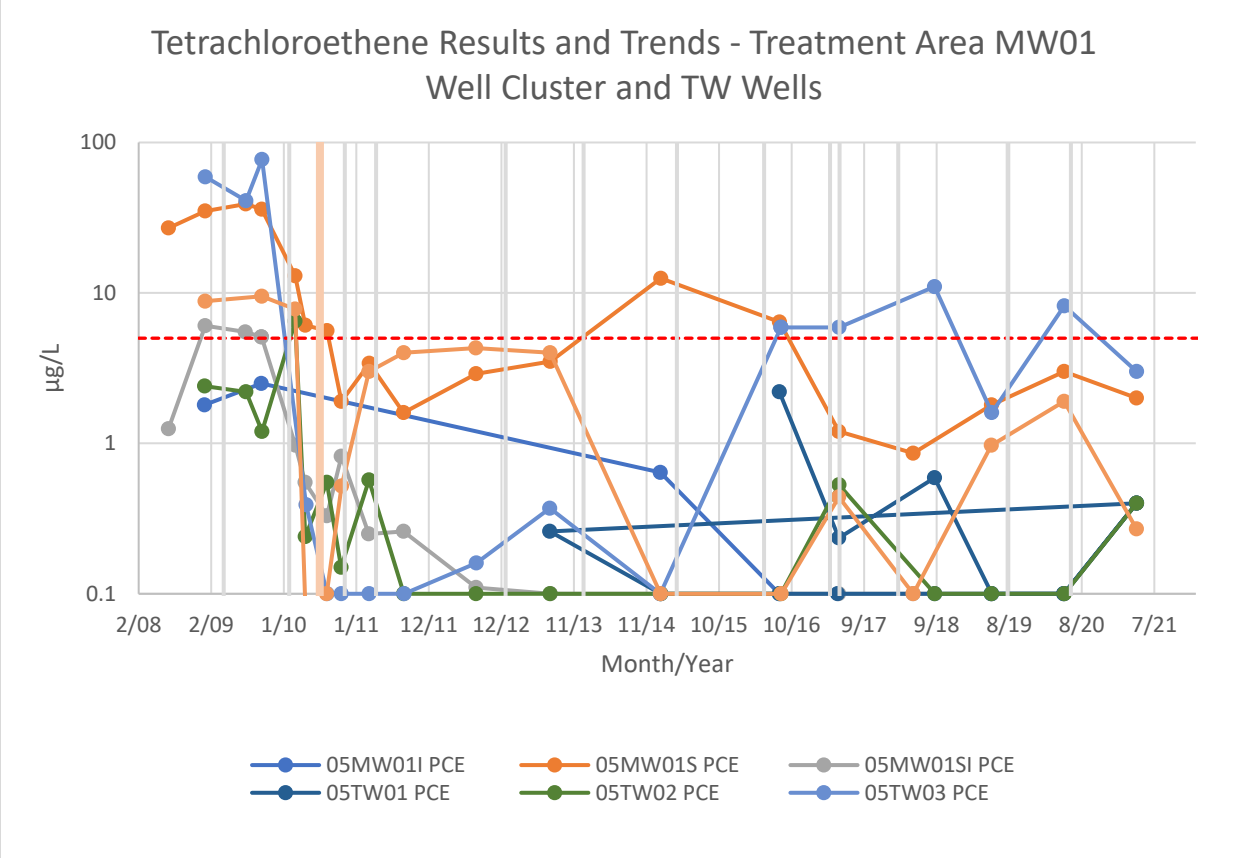

Trichloroethene Results and Trends - Source Area Wells MW20-26
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 TCE
05MW21 TCE
05MW22 TCE
05MW23 TCE
05MW24 TCE
05MW25 TCE

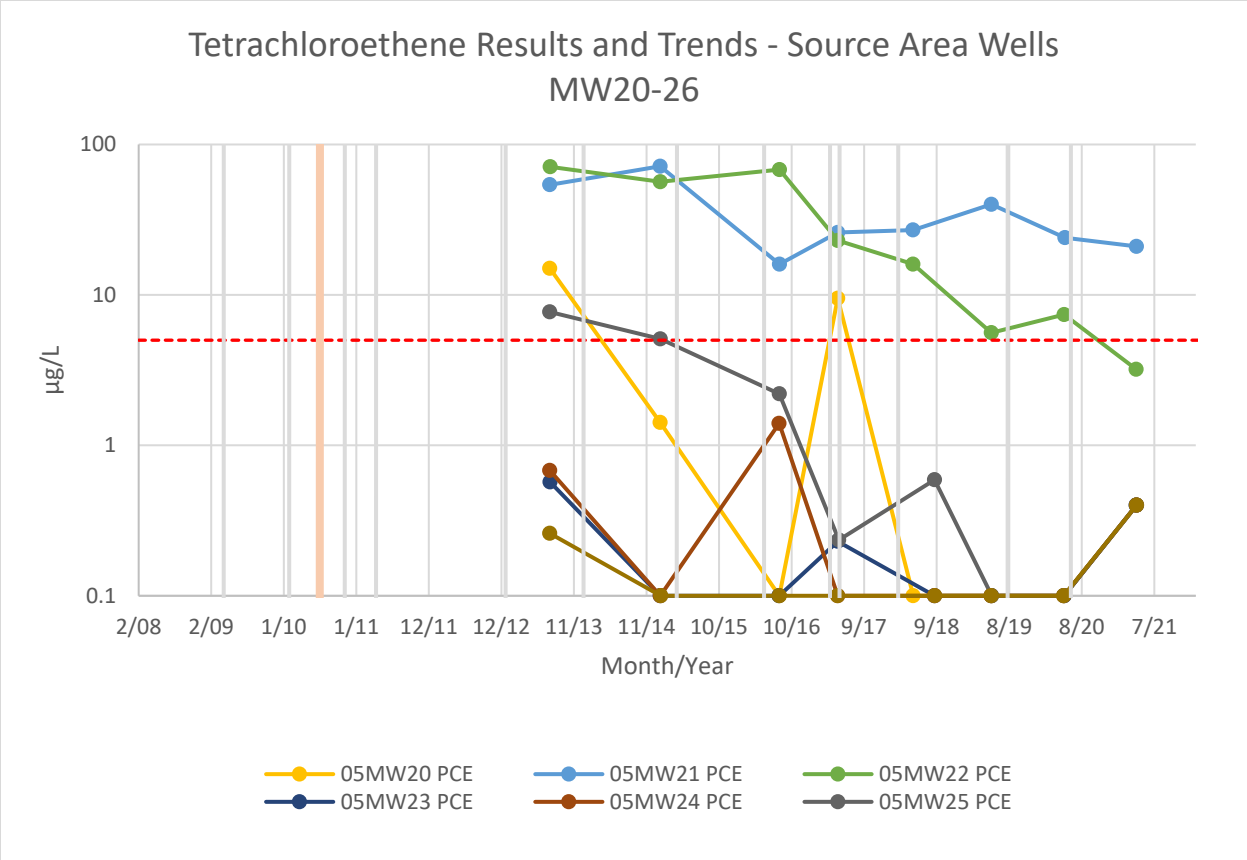

Trichloroethene Results and Trends - Upgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S TCE
05MW18S TCE
05MW18I TCE
RG TCE = 5
Bioaugmentation
Biostimulation

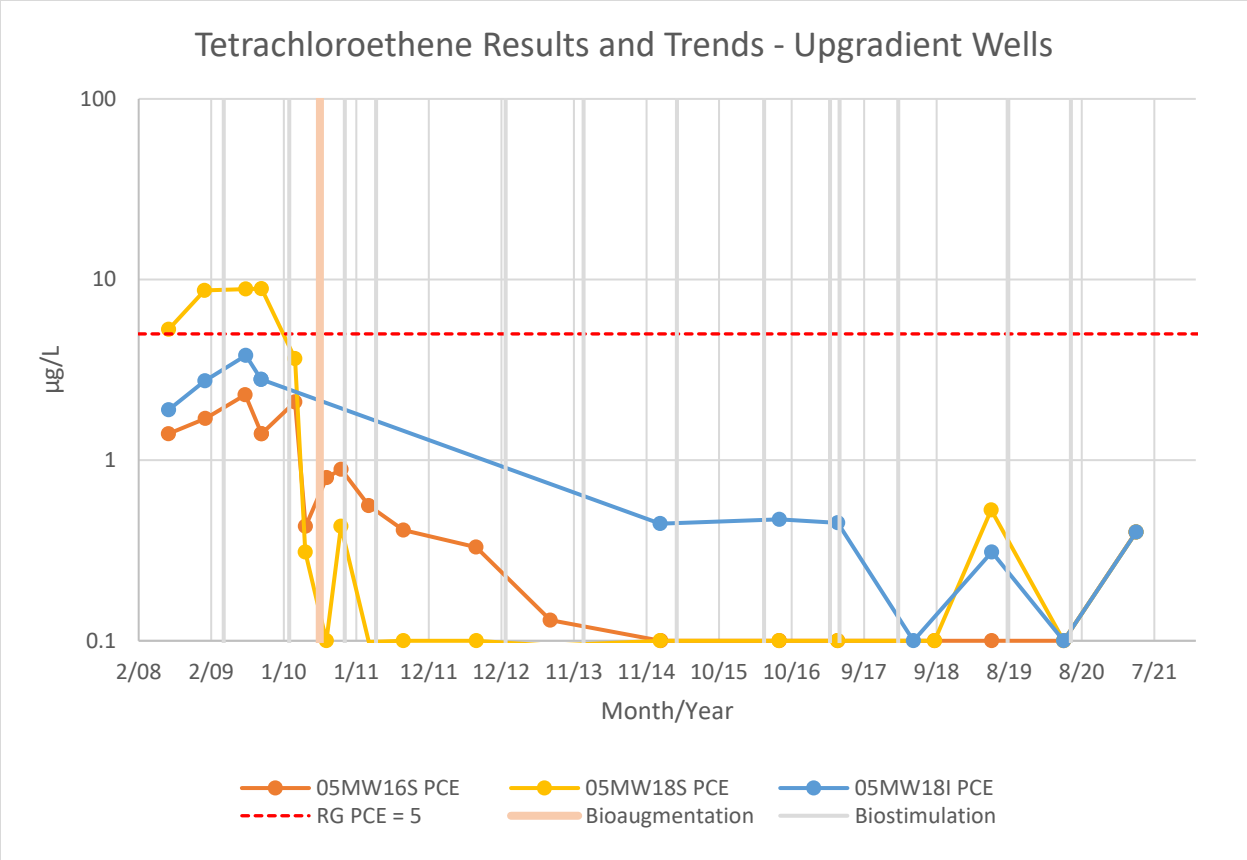

Trichloroethene Results and Trends - Downgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW10I TCE
05MW17I TCE
05MW19S TCE
05MW19I TCE
RG TCE = 5
Bioaugmentation

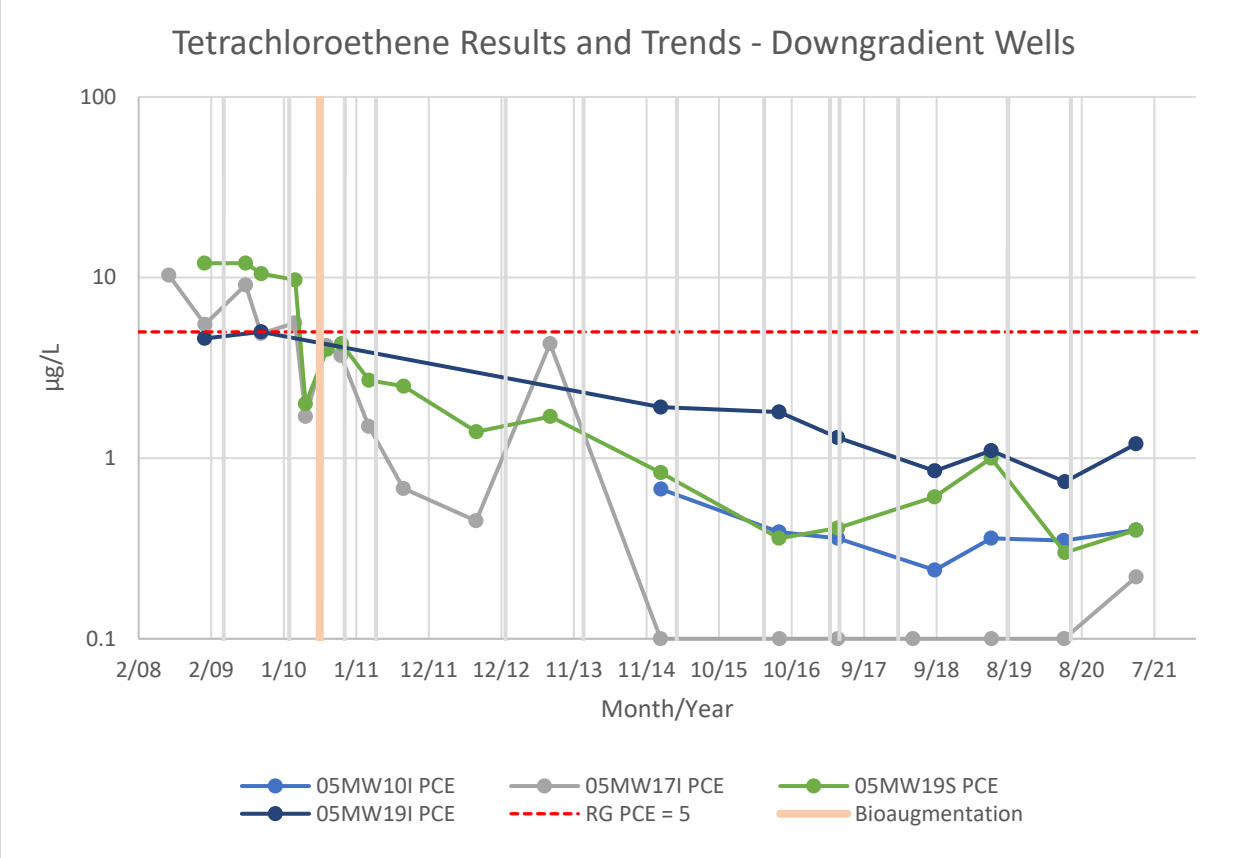
PCE

PCE concentrations have shown decreasing trends over time and PCE was detected at a concentration greater than the RG of 5 µg/L in only one well (05MW21) in 2021. The PCE concentration in well 05MW22 has decreased from 68 µg/L in 2016 to 3.2 µg/L in 2021, which is below the RG. This decreasing trend is expected because PCE is a parent compound that degrades to compounds such as TCE and 1,1-DCE.


Tetrachloroethene Results and Trends - Treatment Area MW01
Well Cluster and TW Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW01I PCE
05MW01S PCE
05MW01SI PCE
05TW01 PCE
05TW02 PCE
05TW03 PCE

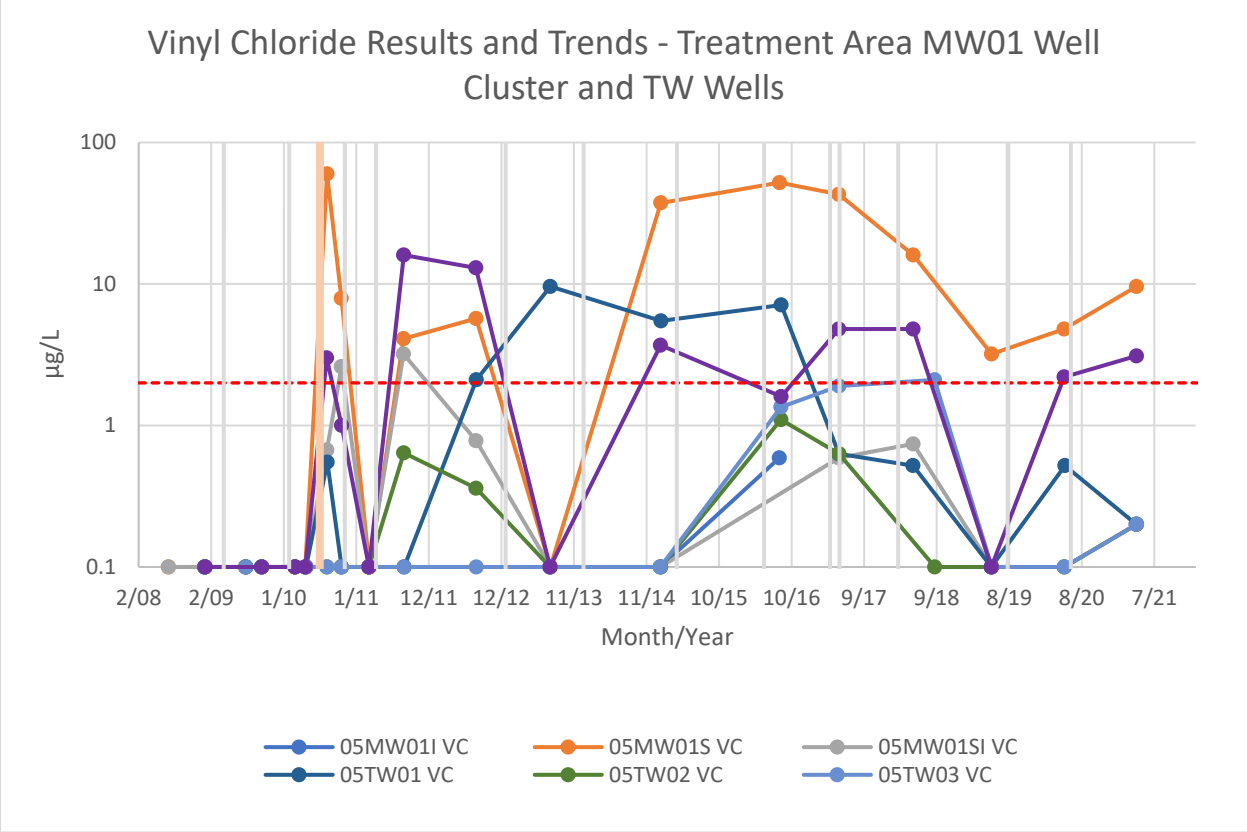

Tetrachloroethene Results and Trends - Source Area Wells
MW20-26
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 PCE
05MW21 PCE
05MW22 PCE
05MW23 PCE
05MW24 PCE
05MW25 PCE

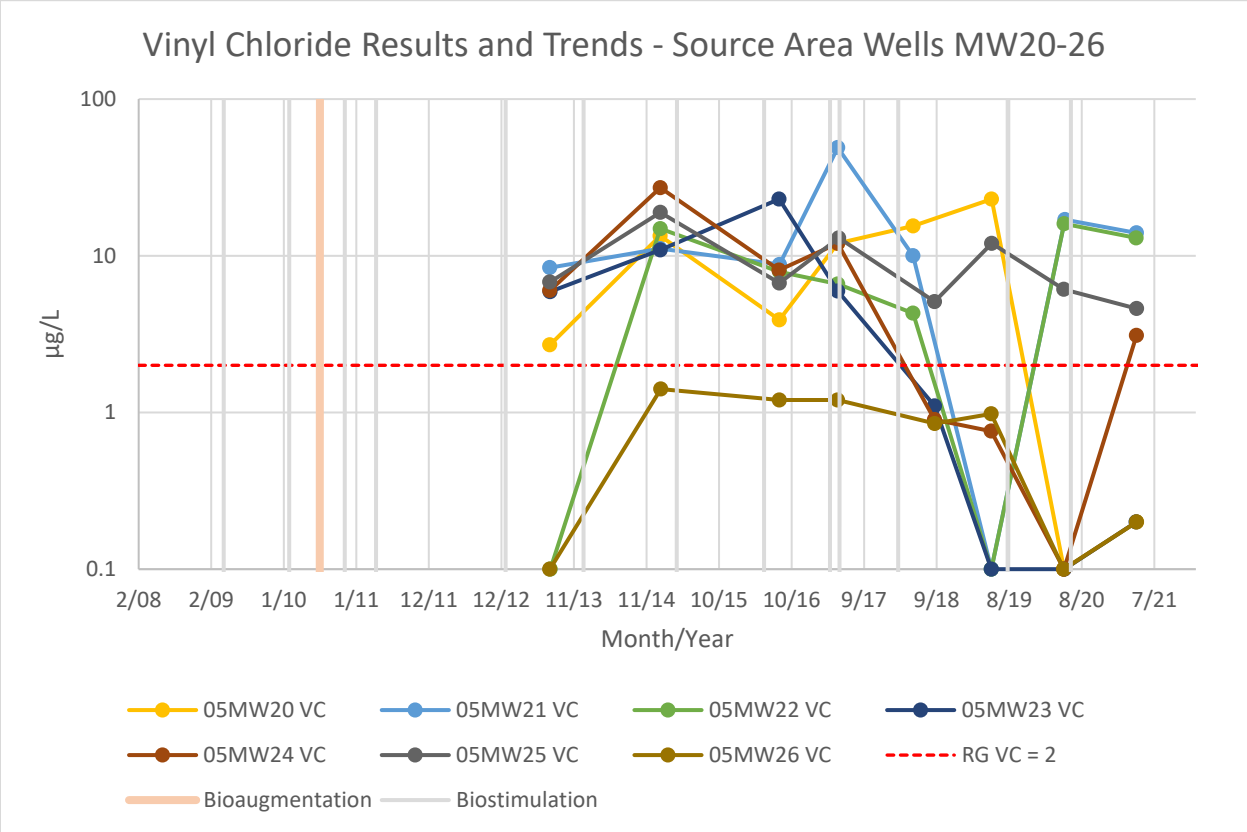

Tetrachloroethene Results and Trends - Upgradient Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S PCE
05MW18S PCE
05MW18I PCE
RG PCE = 5
Bioaugmentation
Biostimulation

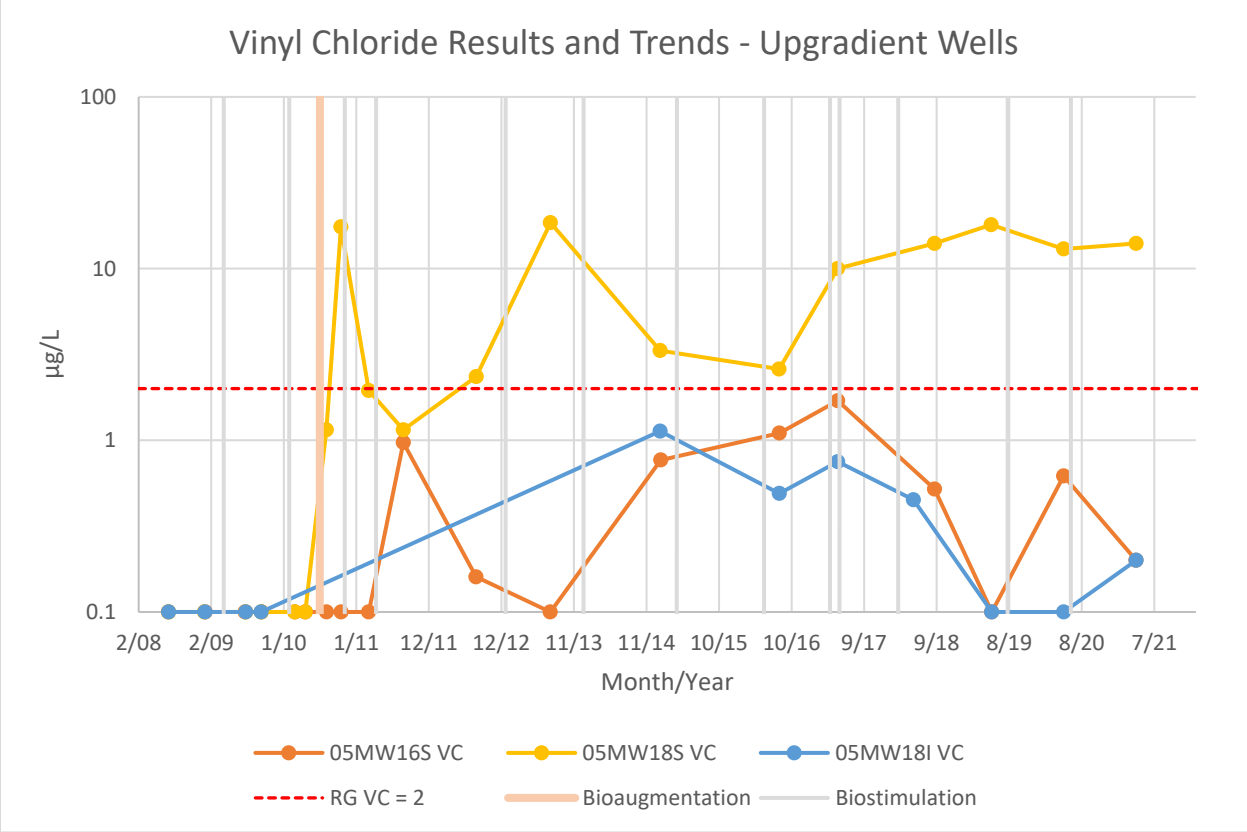


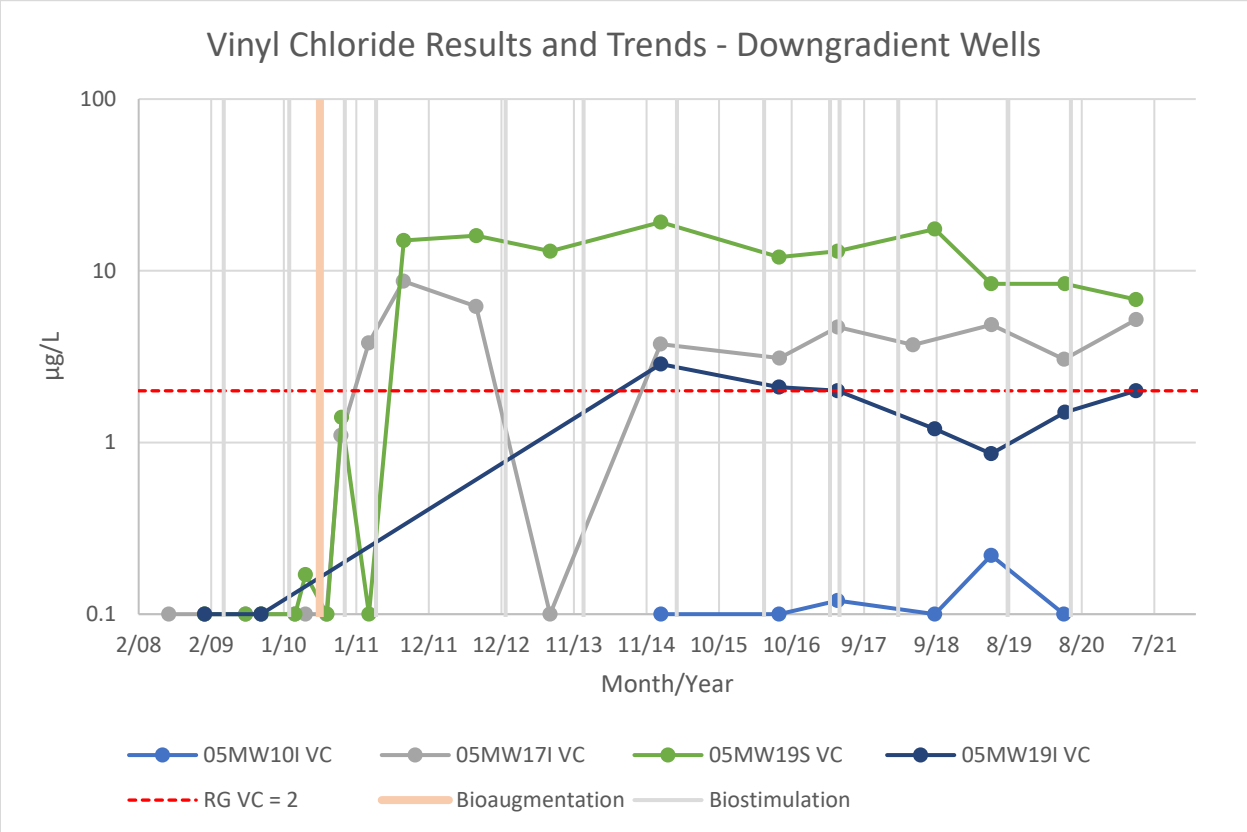
VC

VC is a biodegradation product and increases in VC are an indication that the reductive dechlorination process is ongoing. Six wells in the treatment and source areas and three downgradient wells had VC concentrations greater than the RG of 2 µg/L. VC concentrations in well 05MW20 decreased from 23 µg/L in 2019 to non-detected in 2020 and remained non-detected in 2021. The VC concentration in wells 05MW21, 05MW22, and 05TW04 exceeded the RG in 2020 and 2021 after being non-detected in 2019.


Vinyl Chloride Results and Trends - Treatment Area MW01 Well Cluster and TW Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW01I VC
05MW01S VC
05MW01SI VC
05TW01 VC
05TW02 VC
05TW03 VC

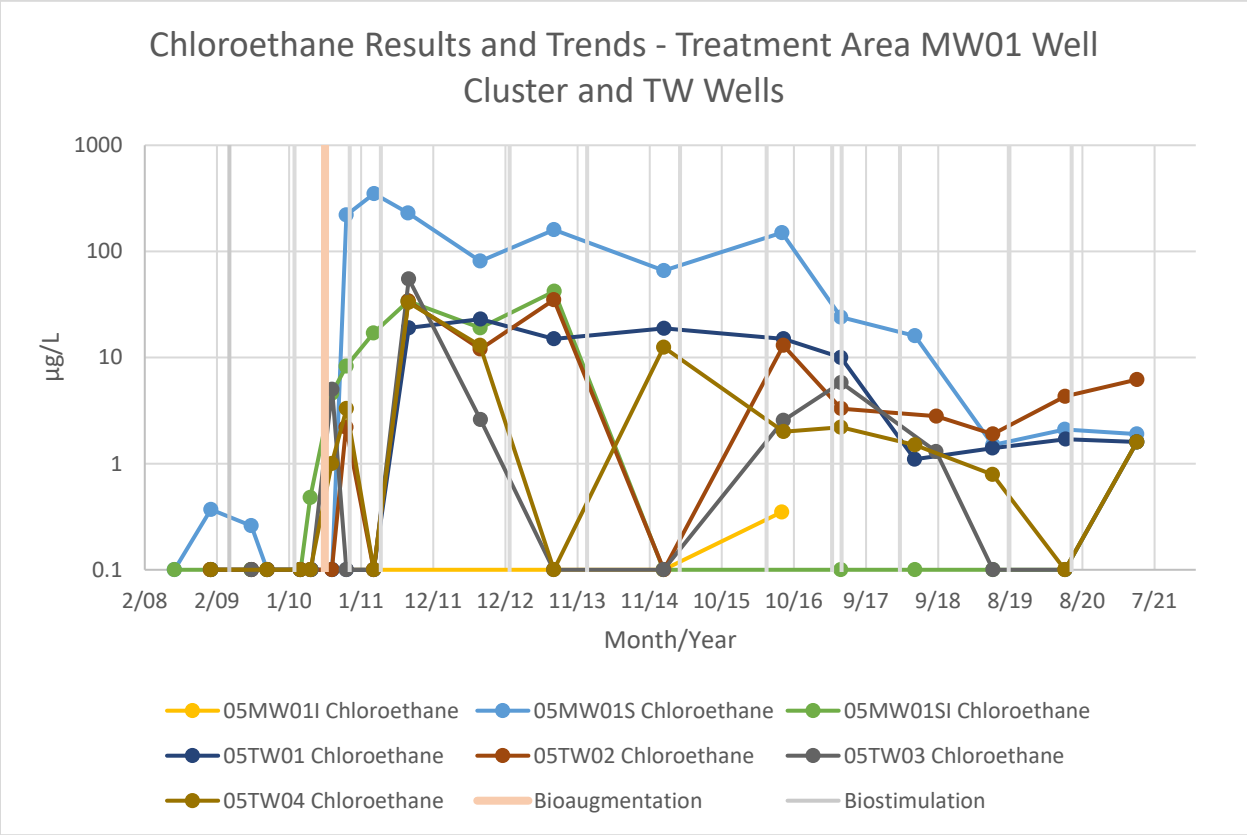

Vinyl Chloride Results and Trends - Source Area Wells MW20-26
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 VC
05MW21 VC
05MW22 VC
05MW23 VC
05MW24 VC
05MW25 VC
05MW26 VC
RG VC = 2
Bioaugmentation
Biostimulation

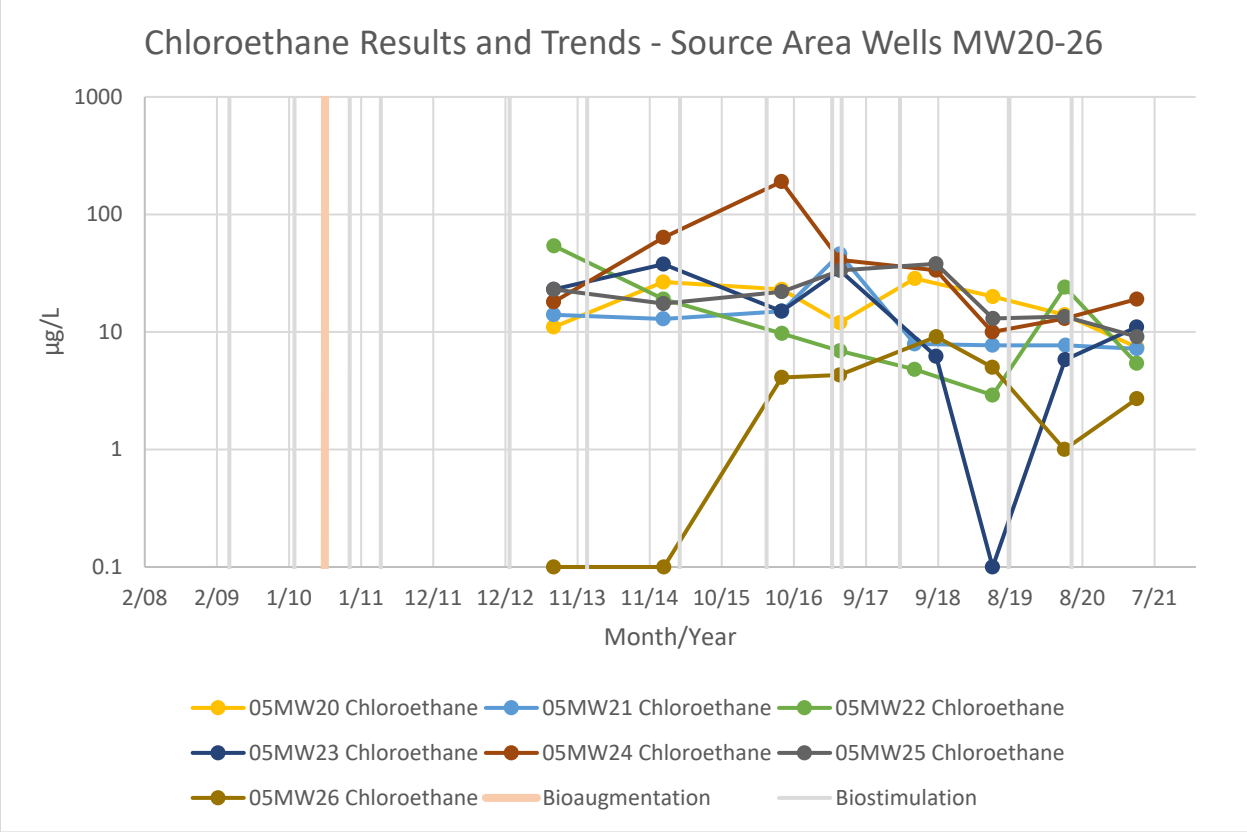

Vinyl Chloride Results and Trends - Upgradient Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S VC
05MW18S VC
05MW18I VC
RG VC = 2
Bioaugmentation
Biostimulation

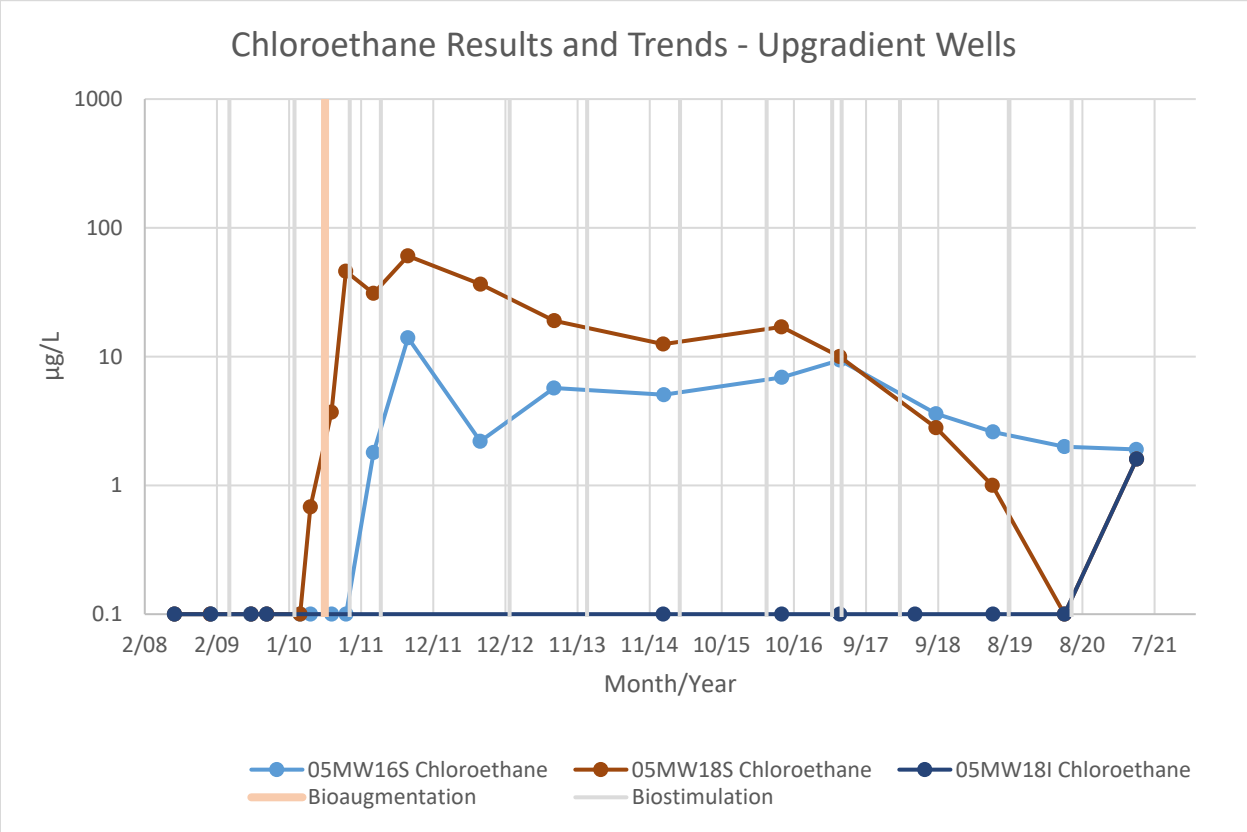

Vinyl Chloride Results and Trends - Downgradient Wells
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW10I VC
05MW17I VC
05MW19S VC
05MW19I VC
RG VC = 2
Bioaugmentation
Biostimulation

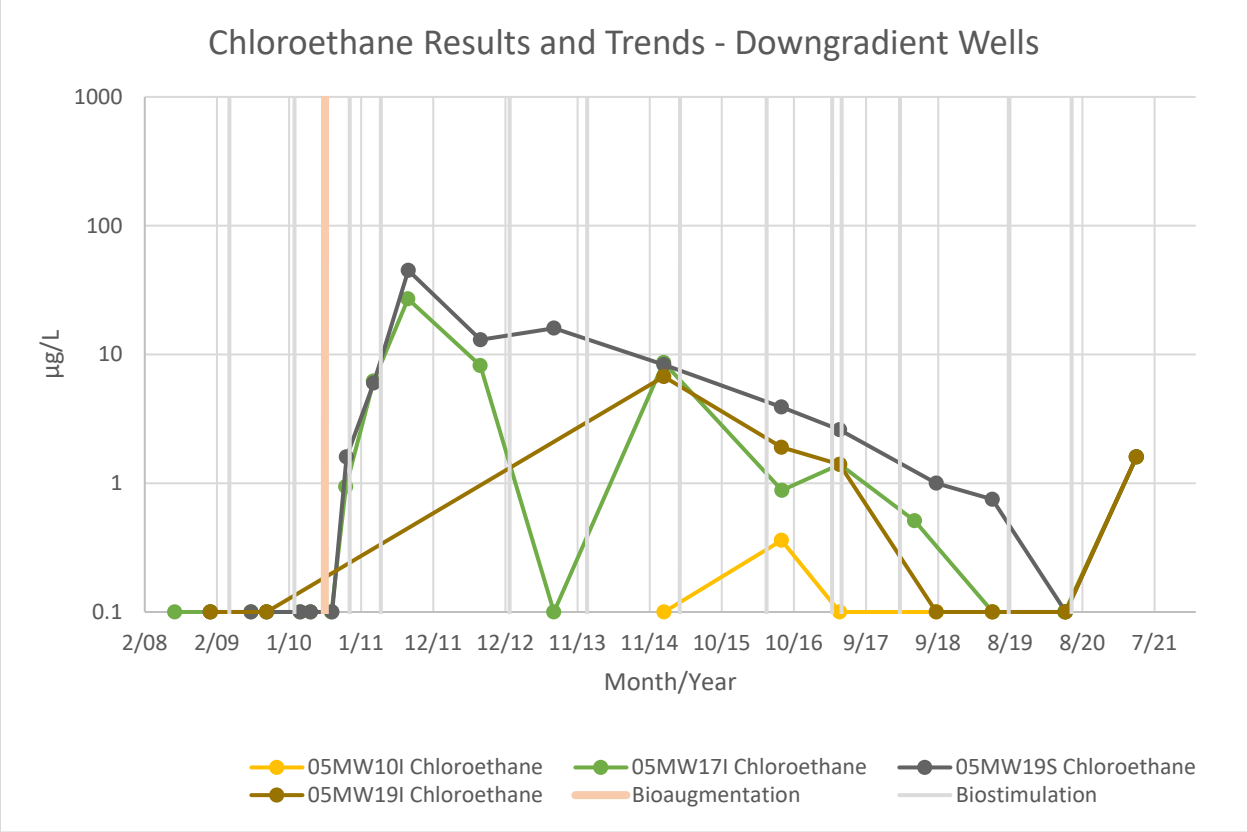
Chloroethane

In addition to evaluating trends for the COCs with established RGs, chloroethane results also provide additional evidence of degradation of the parent VOCs. Currently, no RGs exist for chloroethane. The presence of chloroethane indicates that dechlorination is ongoing. As shown in the graphs below, chloroethane has been produced at varying levels since the initial bioaugmentation during the pilot test. Results prior to the introduction of the bacteria culture into the aquifer showed that chloroethane was not present. The results from the 2021 monitoring event show a general decrease in chloroethane production in majority of the monitoring wells; however, the concentration of chloroethane increased in wells the following select wells: 05MW23, 05MW24, 05MW26, 05TW01, 05TW02, and 05TW04.




Chloroethane Results and Trends - Source Area Wells MW20-26
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 Chloroethane
05MW21 Chloroethane
05MW22 Chloroethane
05MW23 Chloroethane
05MW24 Chloroethane
05MW25 Chloroethane
05MW26 Chloroethane
Bioaugmentation
Biostimulation


Chloroethane Results and Trends - Upgradient Wells
1000
100
10
1
0.1
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S Chloroethane
05MW18S Chloroethane
05MW18I Chloroethane
Bioaugmentation
Biostimulation

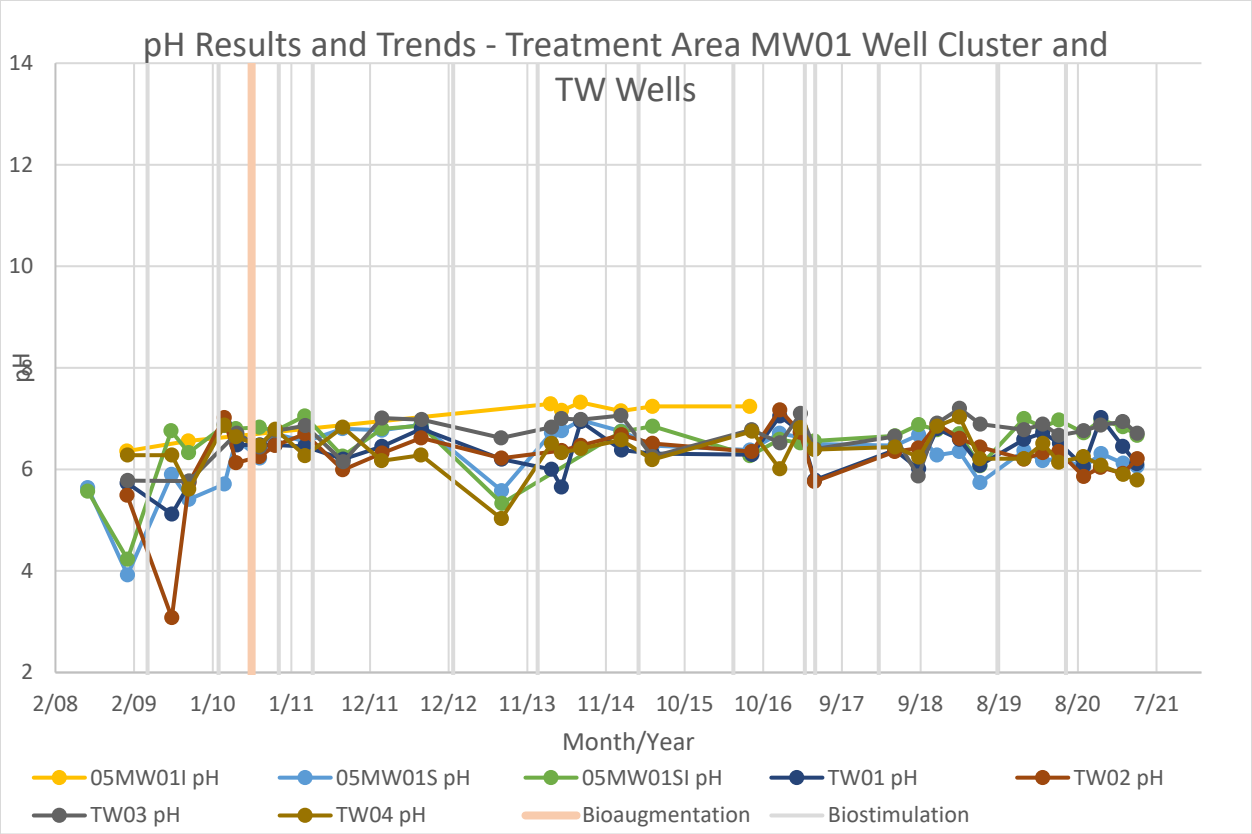


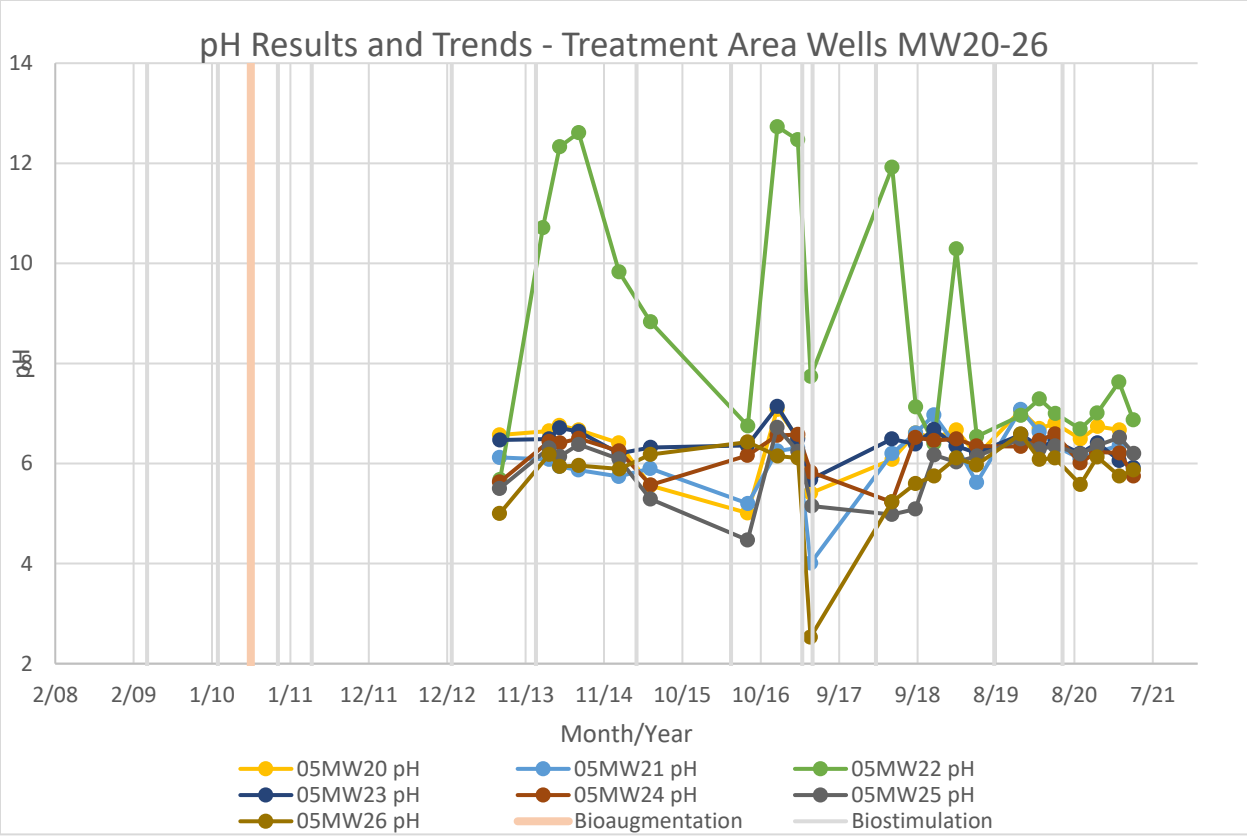
5.2.2 Process Monitoring Parameters

Process monitoring is conducted on a routine basis after injection of amendments and during annual monitoring events. Field parameters (pH, ORP, and DO) are collected during each event. Parameters requiring a fixed-based laboratory (VFAs, dissolved gases, TOC, bacterial population and genes) were collected occasionally prior to implementation of the LTM program and are included in annual sampling events. These parameters and results from the sixth LTM event are discussed in Sections 5.1.1 and 5.1.3. The figures below show trends of these parameters.

<u>pH</u>

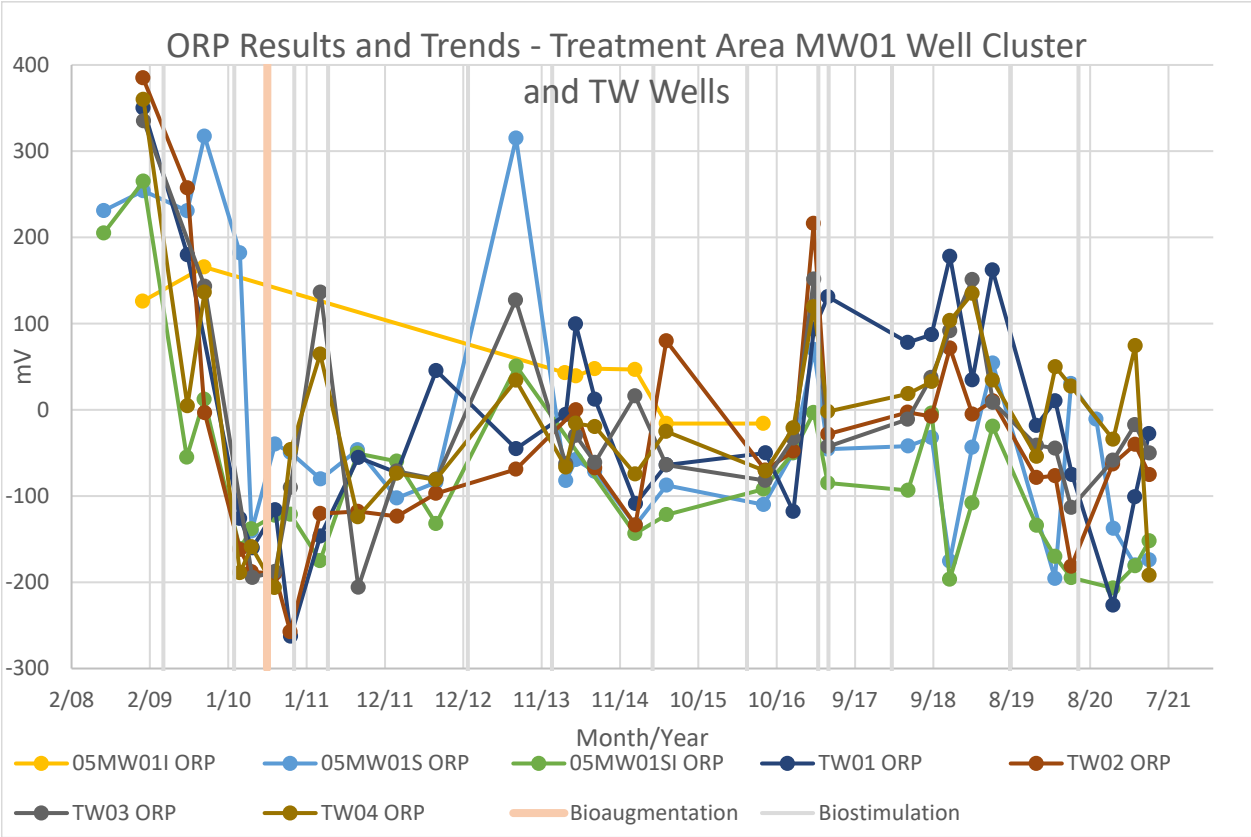
pH in the treatment and source areas generally trends upward with the introduction of alkaline buffering solution during periodic biostimulation injections and remains at levels optimal for biodegradation. The periodically high pH in well 05MW22 may be due to grout at the well screen.

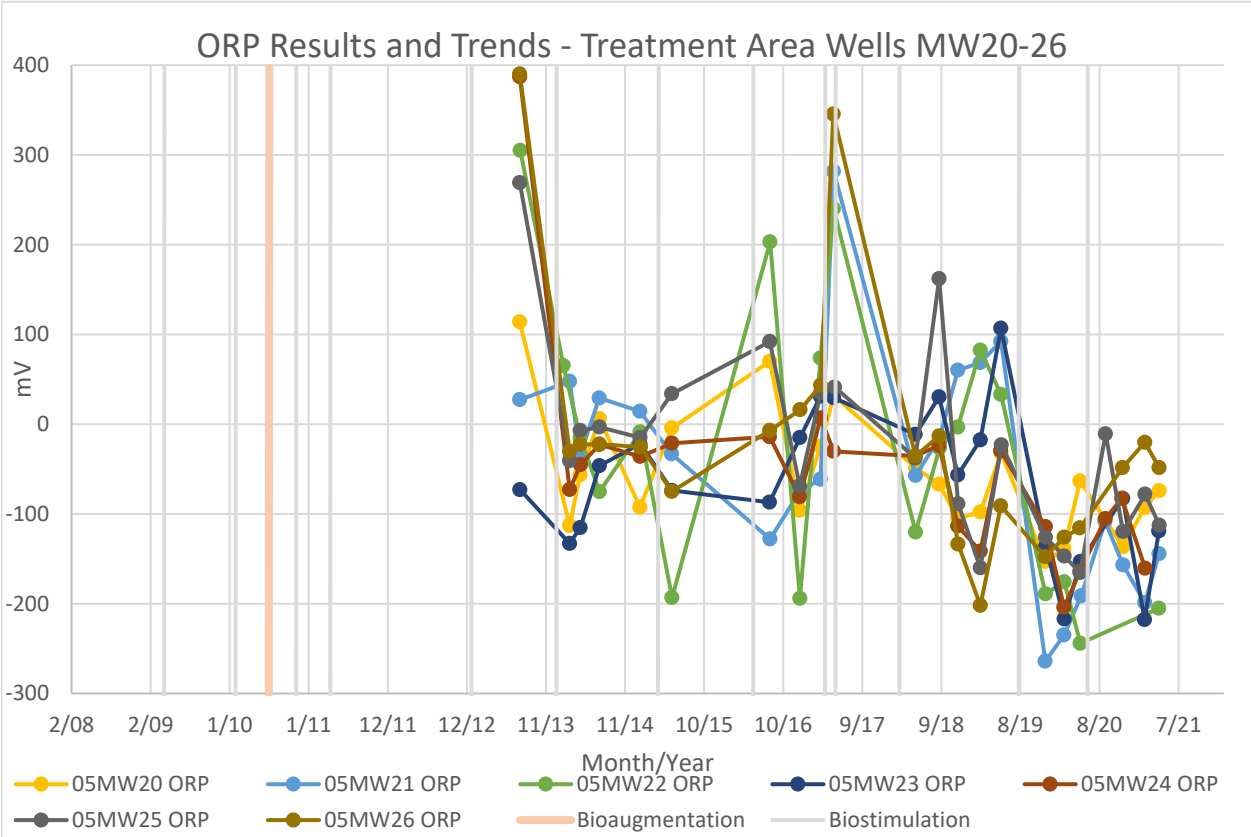

pH Results and Trends - Treatment Area MW01 Well Cluster and TW Wells
14
12
10
8
6
4
2
pH
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW01I pH
05MW01S pH
05MW01SI pH
TW01 pH
TW02 pH
TW03 pH
TW04 pH
Bioaugmentation
Biostimulation



ORP

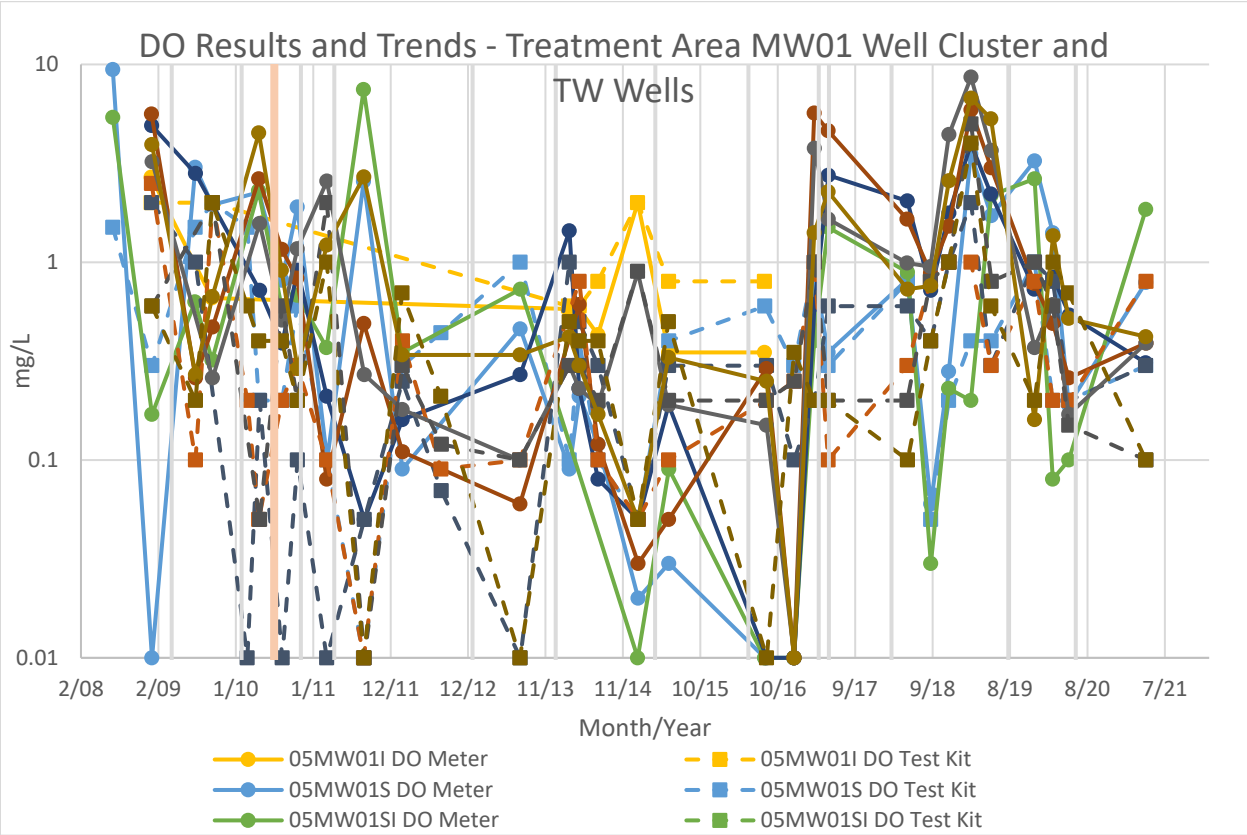
As stated in Section 5.1.1, ORP results recorded in April 2021 generally decreased from May 2020. Negative ORP values were recorded in fourteen of the monitoring wells, and seven of the wells had an ORP less than the goal of -100 mV.

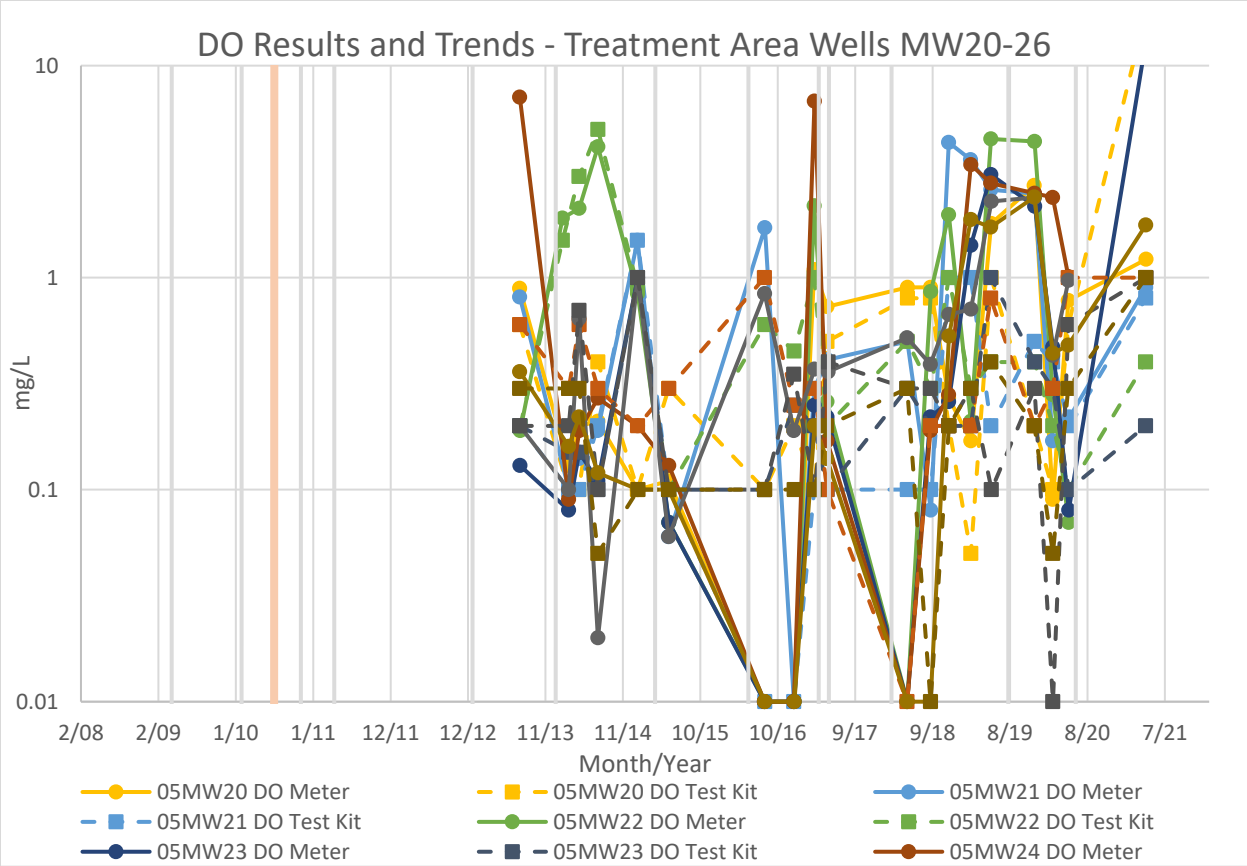

ORP Results and Trends - Treatment Area MW01 Well Cluster and TW Wells
400
300
200
100
0
-100
-200
-300
mV
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW01I ORP
05MW01S ORP
05MW01SI ORP
TW01 ORP
TW02 ORP
TW03 ORP
TW04 ORP
Bioaugmentation
Biostimulation


ORP Results and Trends - Treatment Area Wells MW20-26
400
300
200
100
0
-100
-200
-300
mV
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW20 ORP
05MW21 ORP
05MW22 ORP
05MW23 ORP
05MW24 ORP
05MW25 ORP
05MW26 ORP
Bioaugmentation
Biostimulation

DO

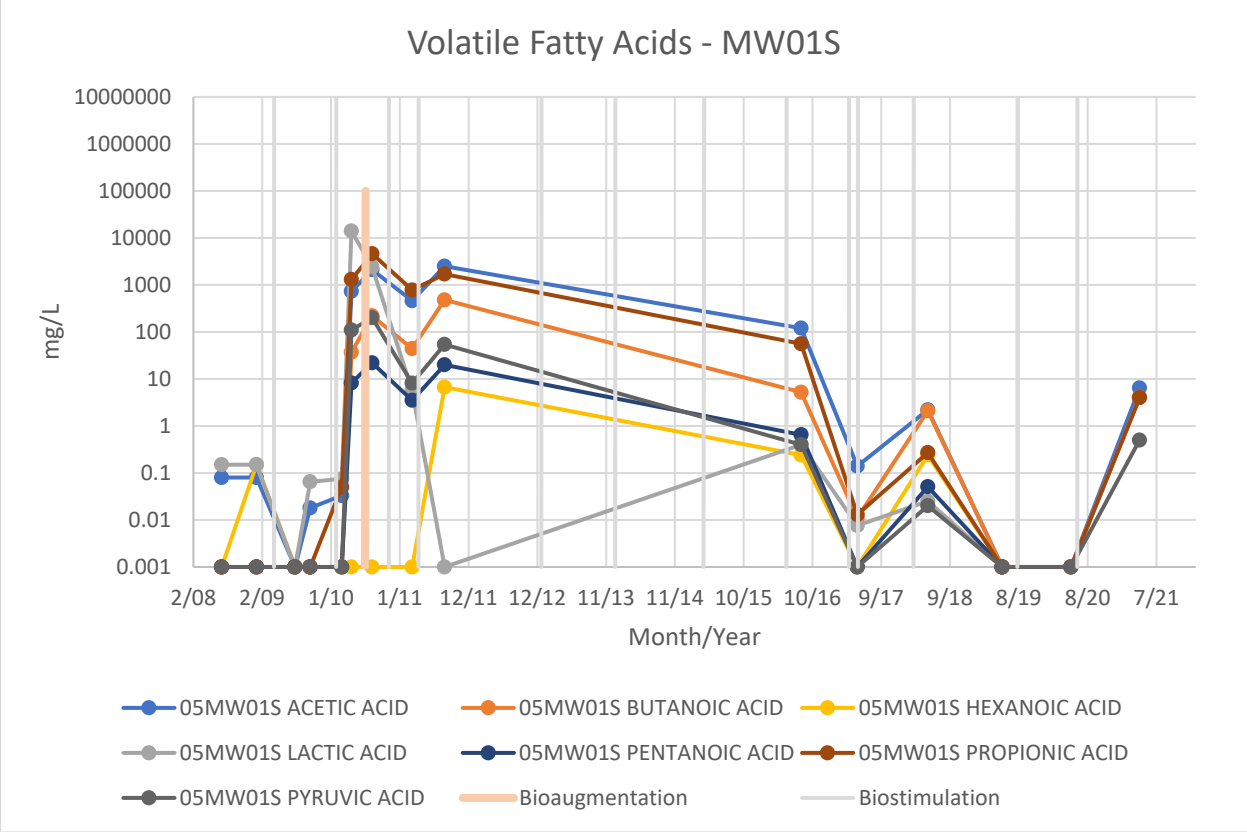
Evaluation of spikes in DO in conjunction with the evaluation of other parameters helps to determine if a biostimulation event should be considered. DO levels typically decrease to acceptable levels after these injection events. As shown in the figures below, the majority of the DO levels in the source and treatment areas are within acceptable levels (less than 1.0 ppm).

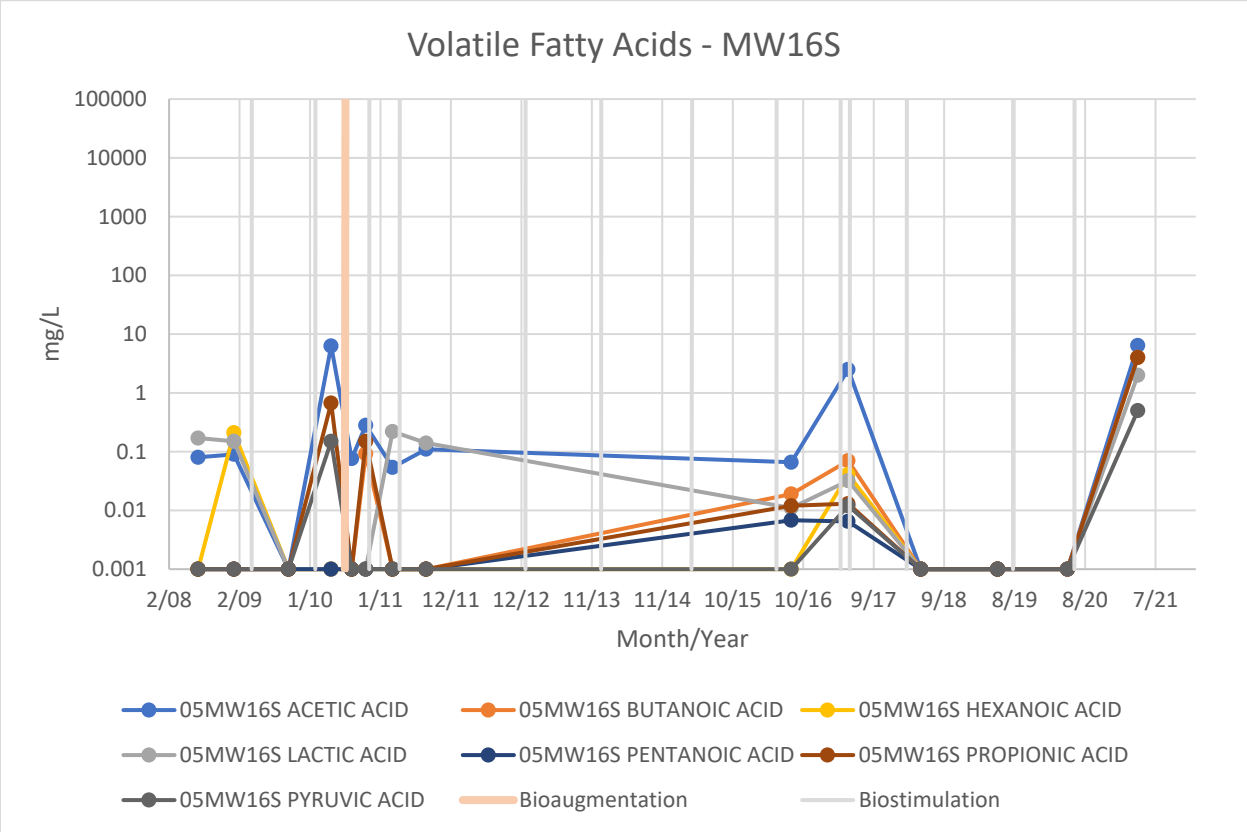




Volatile Fatty Acids

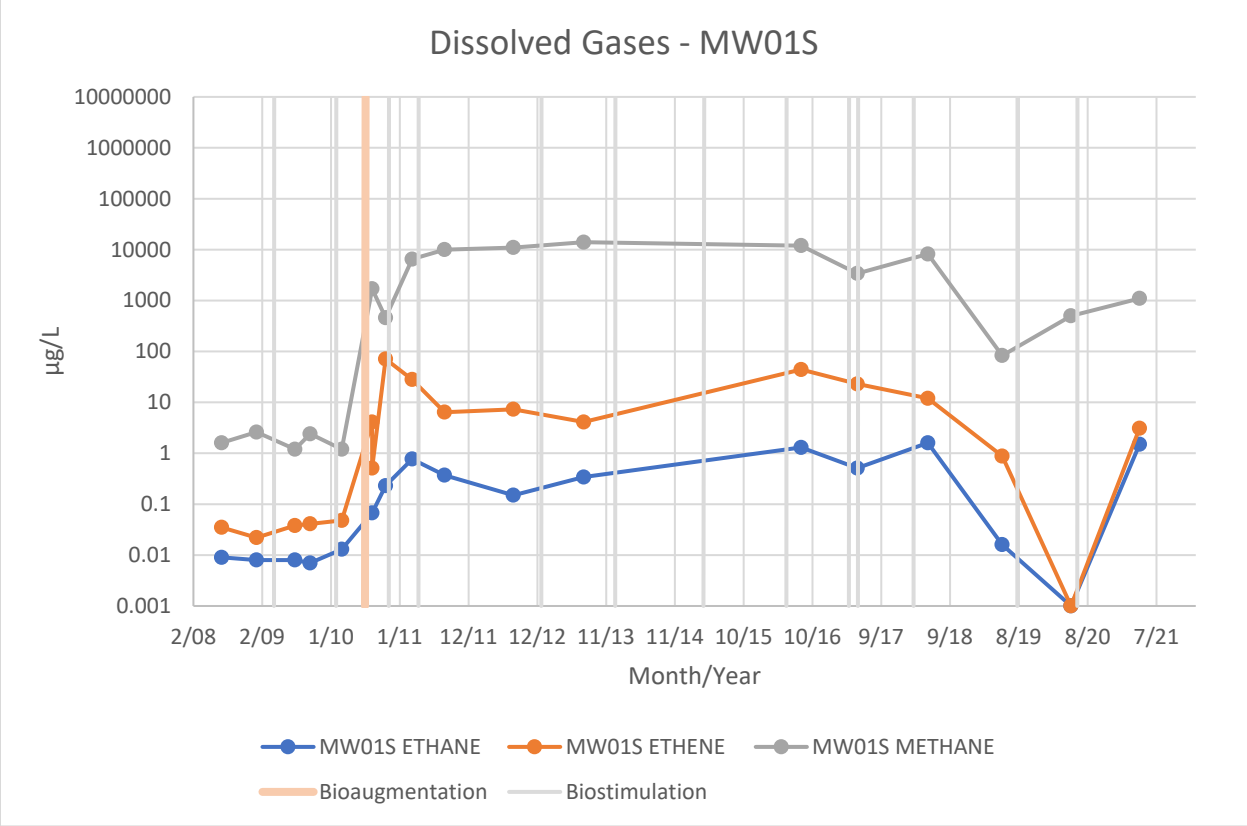
The presence of fatty acids in the treatment area indicates that bioremediation amendment is distributed in the recirculation cell and is providing a carbon source (electron donor material). As mentioned in Section 5.1.3 above, VFAs have decreased since the 2018 annual sampling event. VFAs were only observed in three of the wells in 2019, in none of the wells in 2020, and one of the wells in 2021, indicating that another injection of bioremediation amendment may be necessary to provide a carbon source. The figures below show VFAs results over time in a source area well (05MW01S) as compared to an upgradient well (05MW16S).

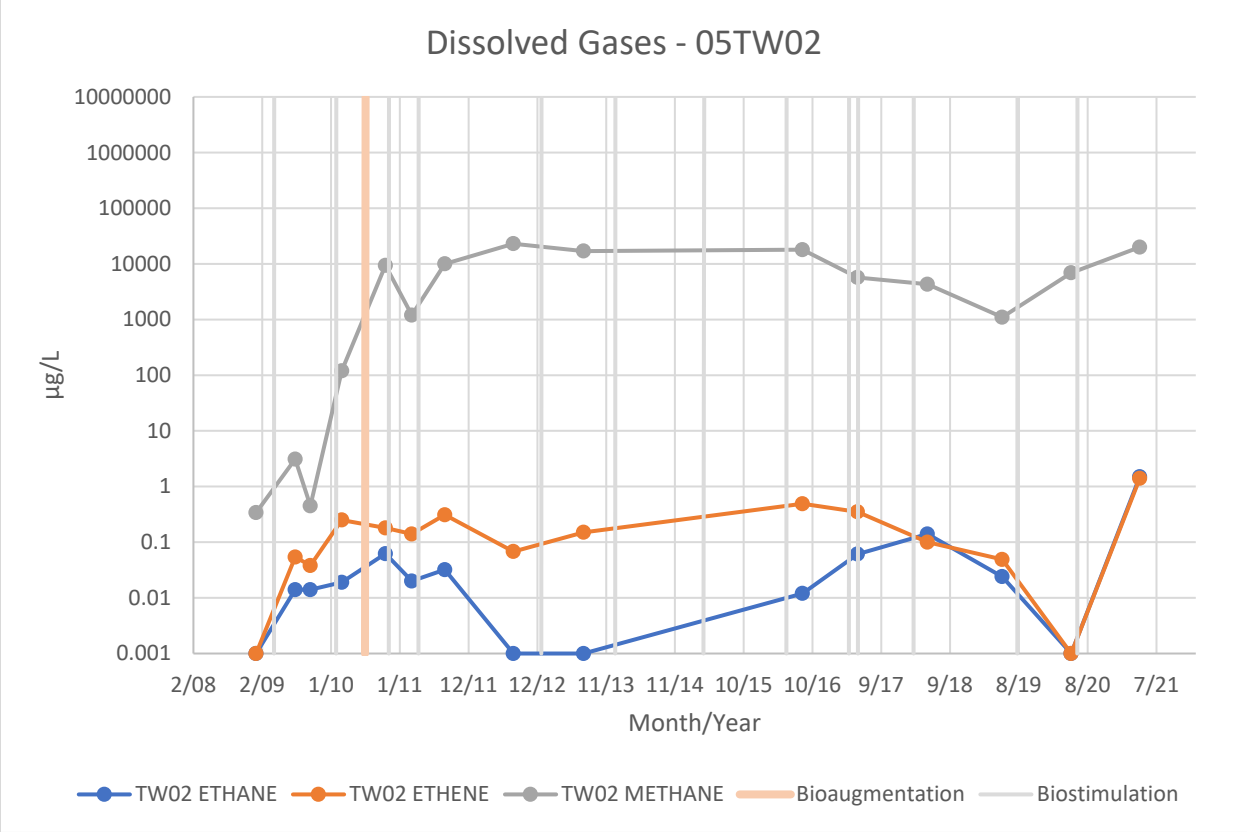

Volatile Fatty Acids - MW01S
mg/L
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW01S ACETIC ACID
05MW01S BUTANOIC ACID
05MW01S HEXANOIC ACID
05MW01S LACTIC ACID
05MW01S PENTANOIC ACID
05MW01S PROPIONIC ACID
05MW01S PYRUVIC ACID
Bioaugmentation
Biostimulation

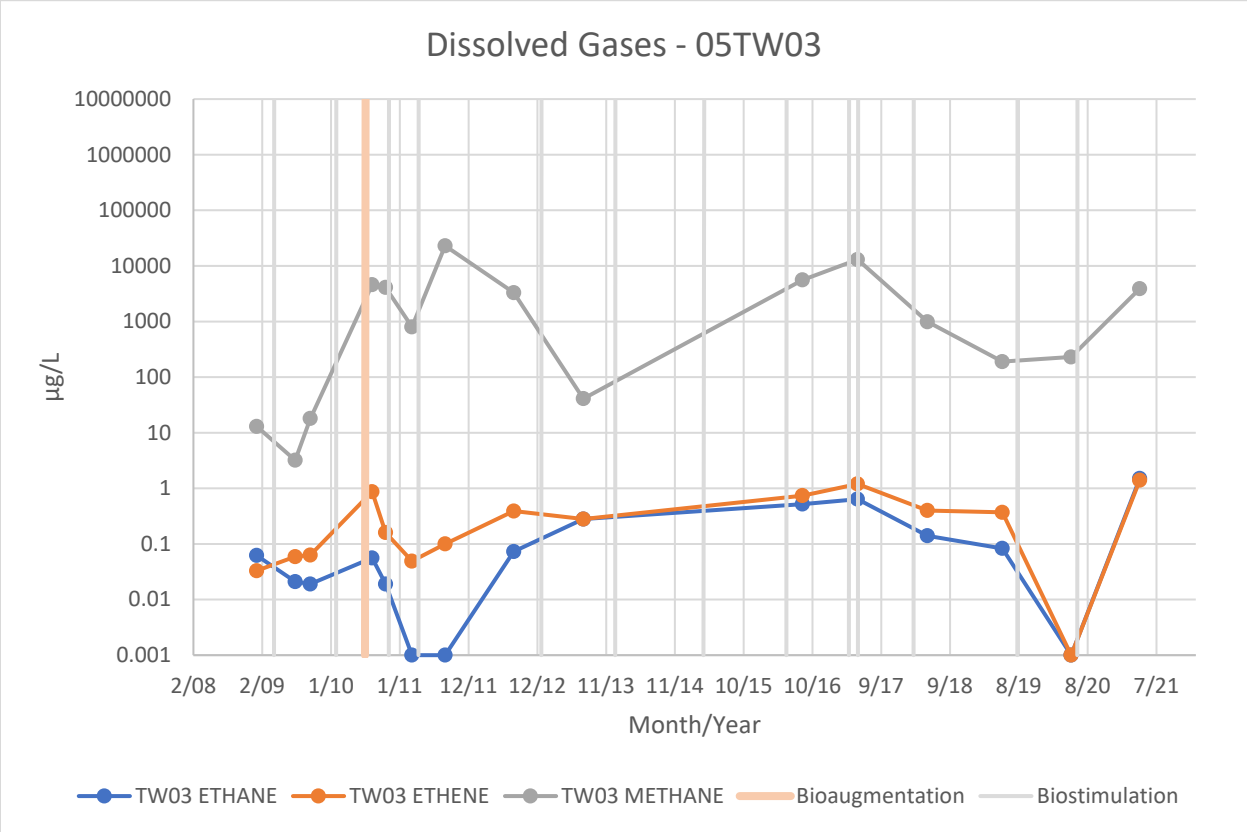

Volatile Fatty Acids - MW16S
mg/L
100000
10000
1000
100
10
1
0.1
0.01
0.001
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW16S ACETIC ACID
05MW16S BUTANOIC ACID
05MW16S HEXANOIC ACID
05MW16S LACTIC ACID
05MW16S PENTANOIC ACID
05MW16S PROPIONIC ACID
05MW16S PYRUVIC ACID
Bioaugmentation
Biostimulation

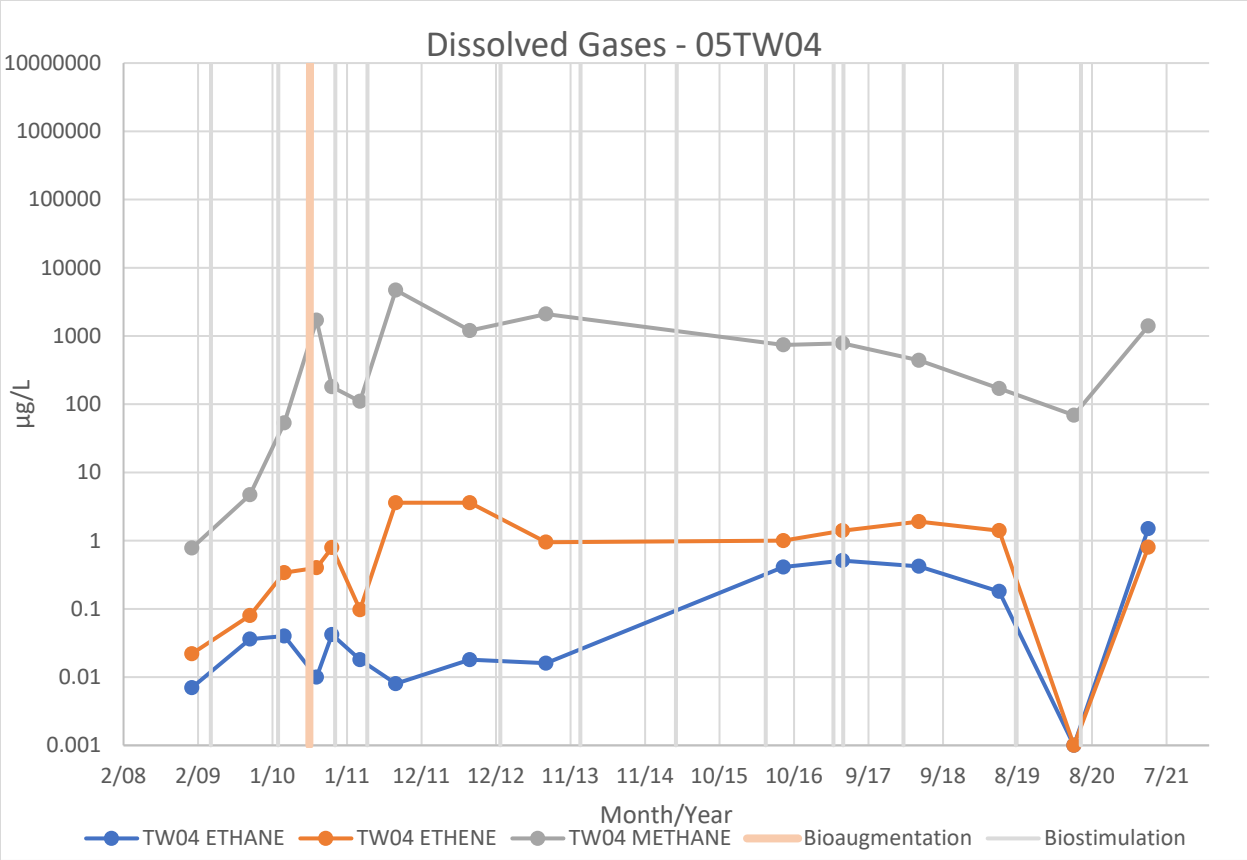
Dissolved Gases

As previously discussed, concentrations of methane and ethane indicate that biodegradation processes are ongoing, particularly within the source area; however, results show that degradation is also occurring in downgradient wells. Analysis for dissolved gases has only been conducted periodically to provide qualitative data that these processes are occurring; prior to implementation of LTM, the most recent dissolved gas analysis was done in 2013. Trends for the TW wells located within the treatment area recirculation system are shown below. Acetylene was mistakenly omitted in 2020, but was measured in 2021 and previous years. Compared to 2019, acetylene concentrations were consistent and remained non-detected. Methane concentrations generally increased from 2020 to 2021 in the treatment area but have generally remained steady since the first bioaugmentation event. Ethane and ethene had been stable prior to 2020 but neither dissolved gas was detected in the treatment area or in the upgradient and downgradient wells in 2021. The presence of ethane and ethene indicates that the final degradation step of chlorinated ethenes is occurring. If concentrations of ethane and ethene remain non-detect and VC concentrations increase, it could indicate that the reductive dechlorination process is not progressing through the final stages. Concentrations of VC and dissolved gases will be closely monitored in these wells to confirm that complete reductive dechlorination is being achieved.

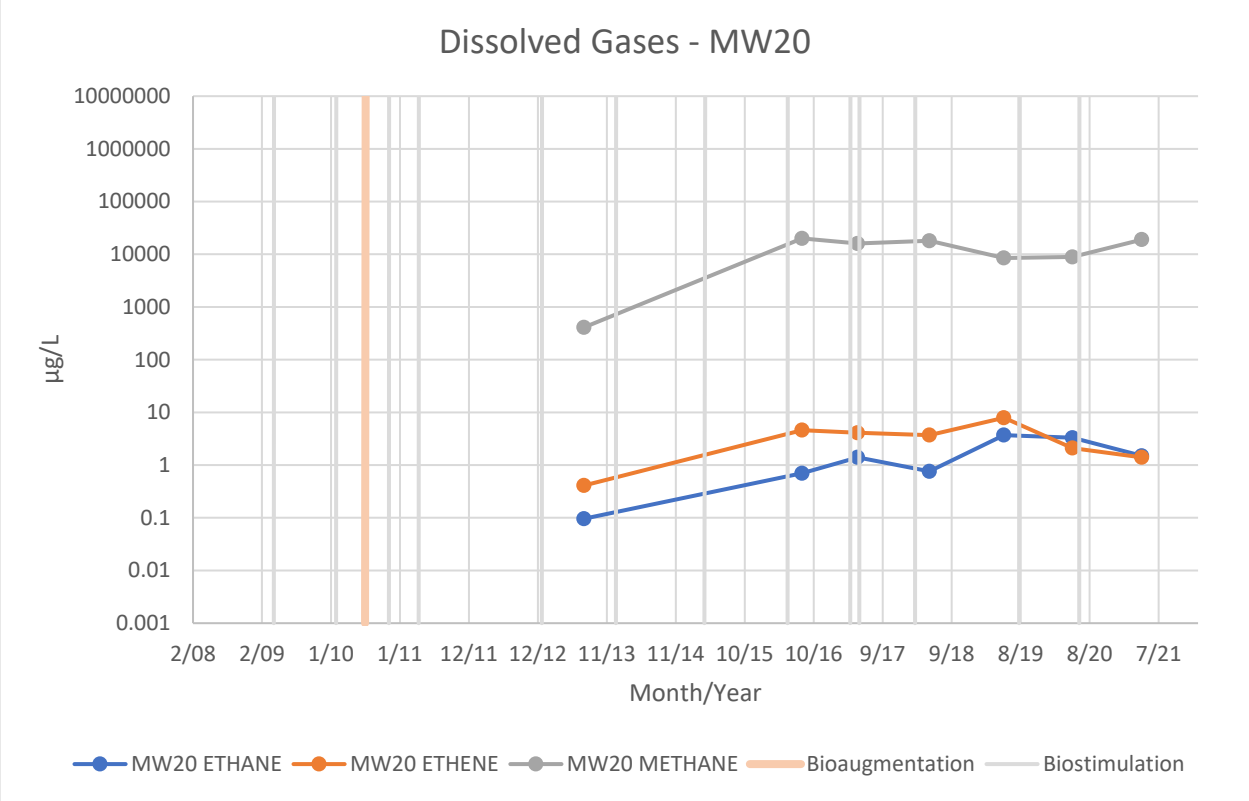

Dissolved Gases - MW01S
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
MW01S ETHANE
MW01S ETHENE
MW01S METHANE
Bioaugmentation
Biostimulation

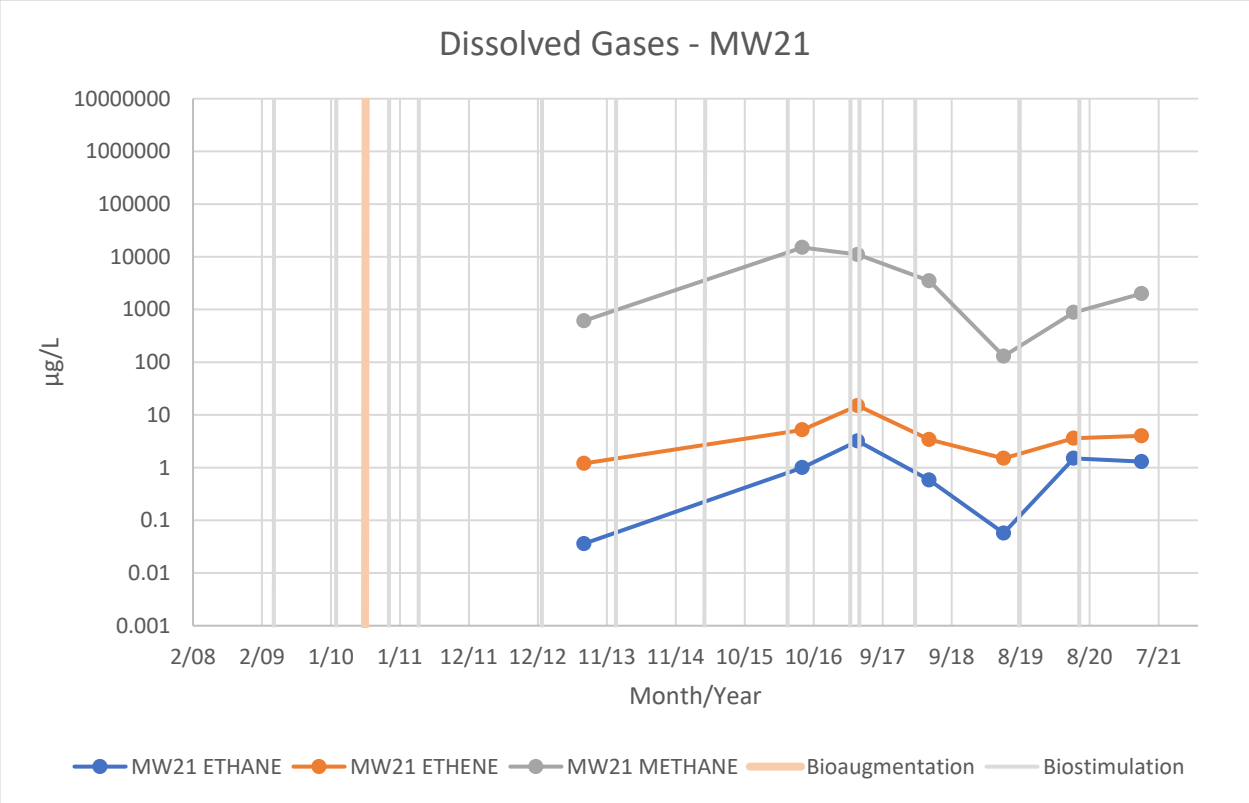

Dissolved Gases - 05TW02
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
TW02 ETHANE
TW02 ETHENE
TW02 METHANE
Bioaugmentation
Biostimulation

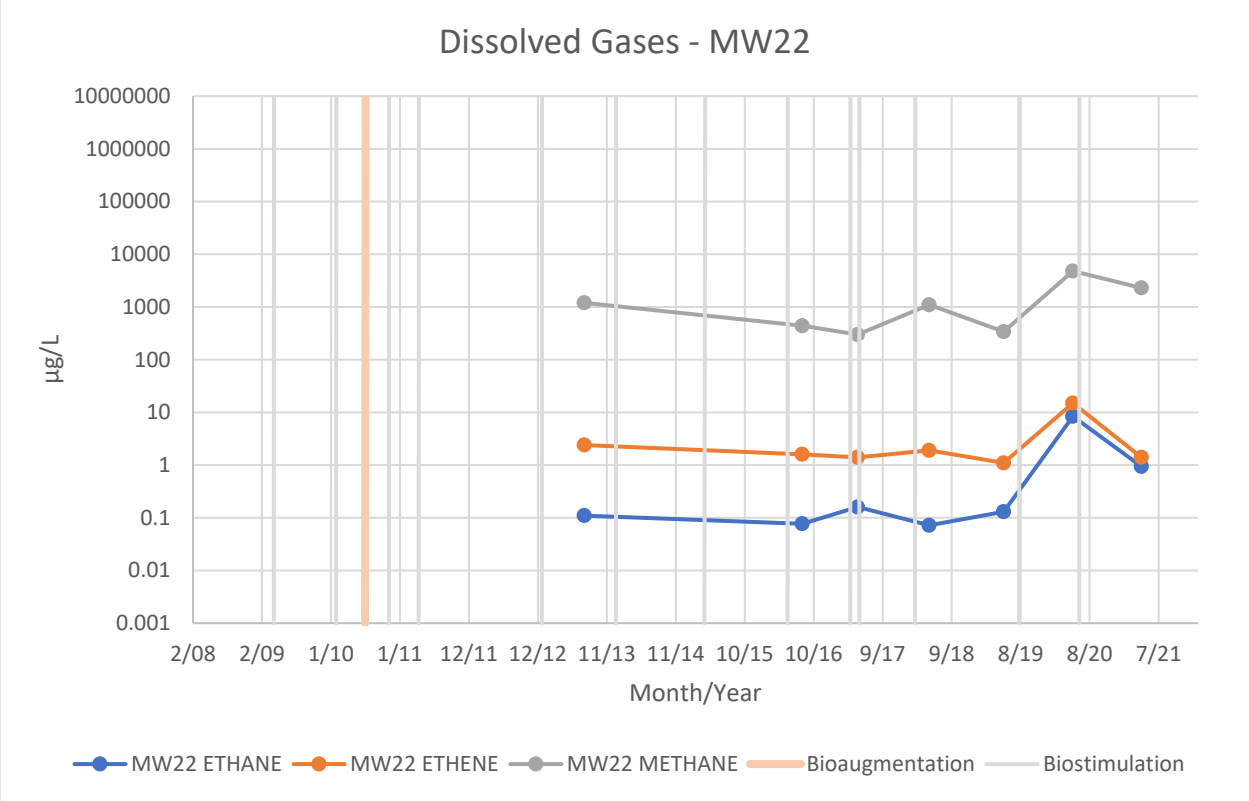

Dissolved Gases - 05TW03
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
TW03 ETHANE
TW03 ETHENE
TW03 METHANE
Bioaugmentation
Biostimulation

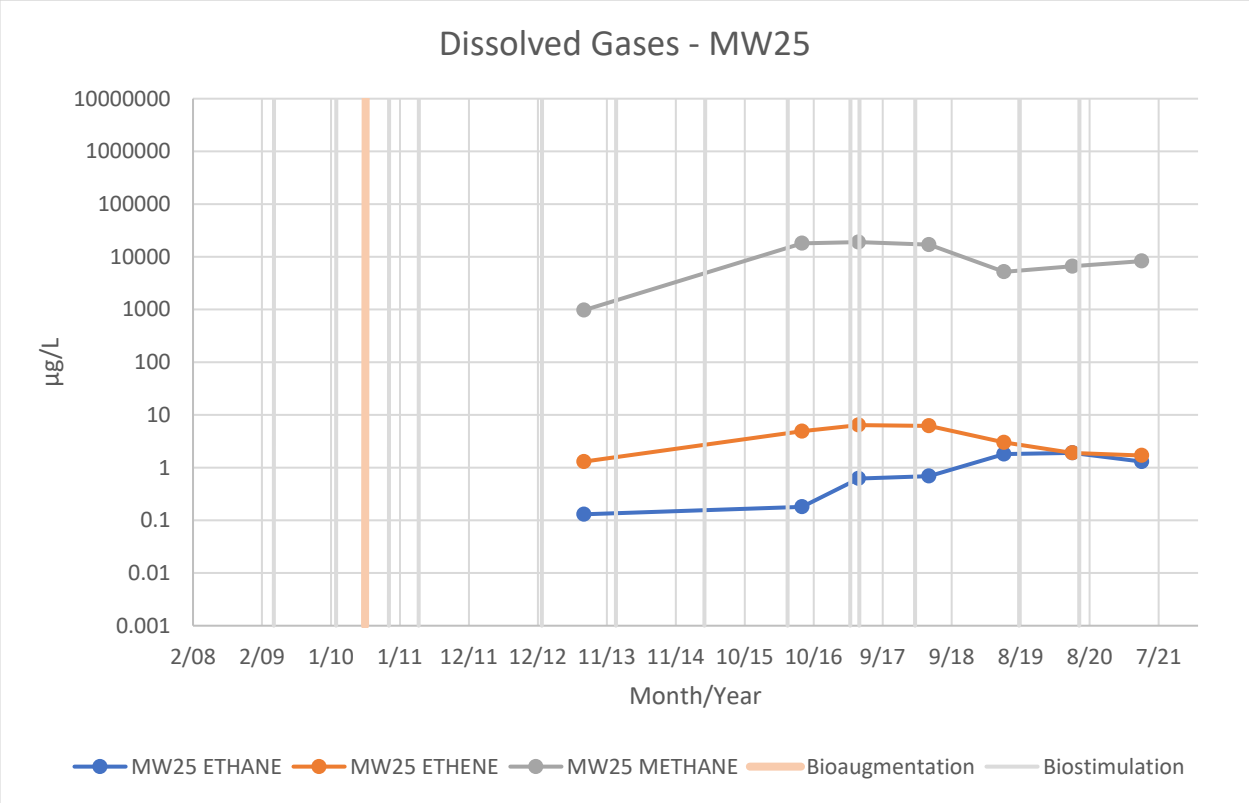


Analysis for dissolved gases at the wells installed in 2013 was conducted after the installation of these wells, and during LTM sampling events. As discussed above, most of these wells show that degradation of the parent compounds TCE and PCE is occurring. The following charts show the dissolved gases concentrations for selected wells within the source area, and generally show an increasing or stable trend for dissolved gases.


Dissolved Gases - MW20
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08 2/09 1/10 1/11 12/11 12/12 11/13 11/14 10/15 10/16 9/17 9/18 8/19 8/20 7/21
Month/Year
MW20 ETHANE
MW20 ETHENE
MW20 METHANE
Bioaugmentation
Biostimulation

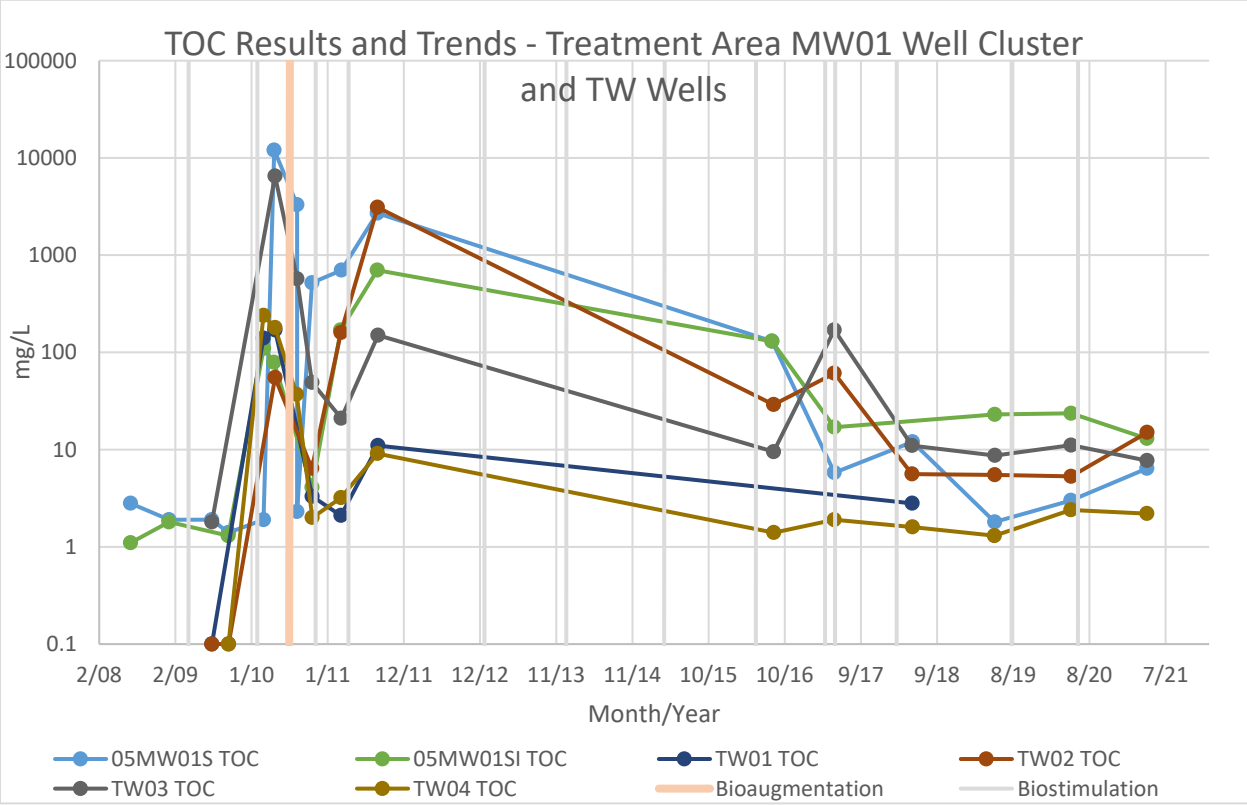

Dissolved Gases - MW21
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08 2/09 1/10 1/11 12/11 12/12 11/13 11/14 10/15 10/16 9/17 9/18 8/19 8/20 7/21
Month/Year
MW21 ETHANE
MW21 ETHENE
MW21 METHANE
Bioaugmentation
Biostimulation

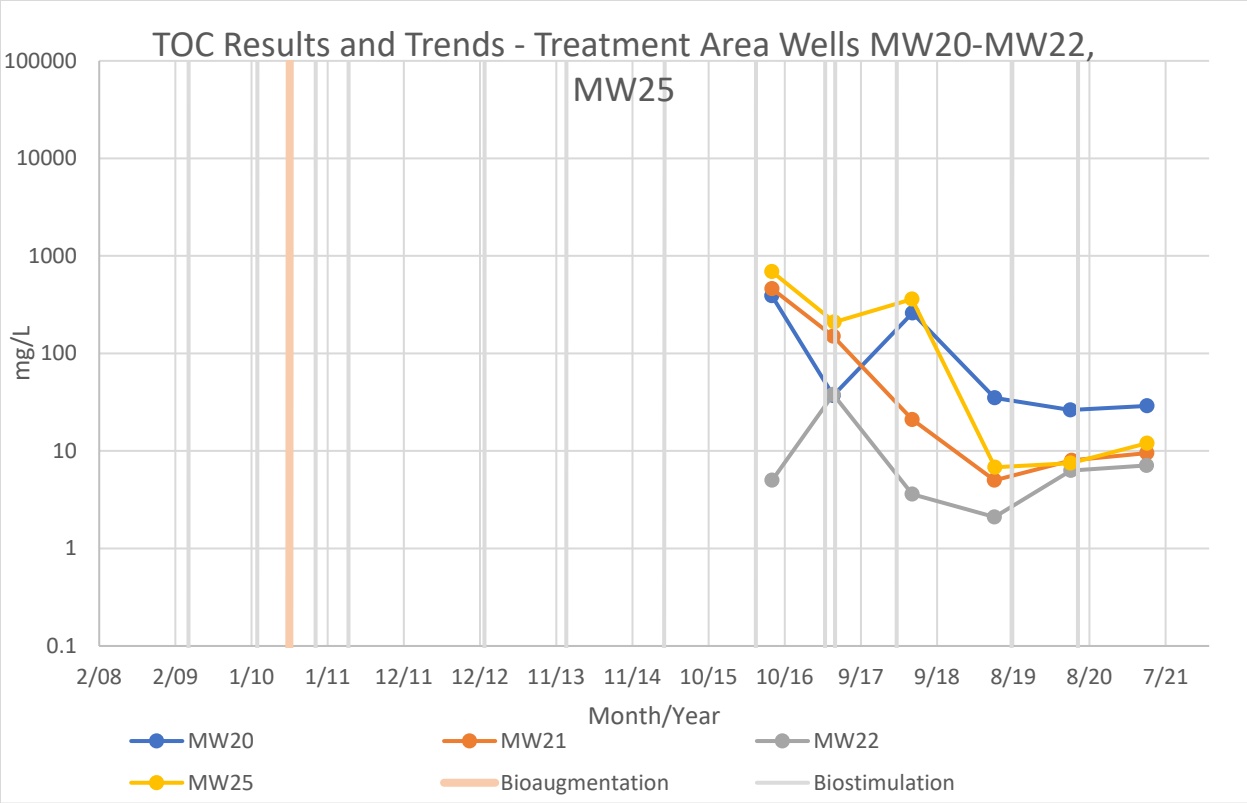

Dissolved Gases - MW22
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08 2/09 1/10 1/11 12/11 12/12 11/13 11/14 10/15 10/16 9/17 9/18 8/19 8/20 7/21
Month/Year
MW22 ETHANE
MW22 ETHENE
MW22 METHANE
Bioaugmentation
Biostimulation


Dissolved Gases - MW25
10000000
1000000
100000
10000
1000
100
10
1
0.1
0.01
0.001
µg/L
2/08 2/09 1/10 1/11 12/11 12/12 11/13 11/14 10/15 10/16 9/17 9/18 8/19 8/20 7/21
Month/Year
MW25 ETHANE
MW25 ETHENE
MW25 METHANE
Bioaugmentation
Biostimulation

TOC

Sampling for TOC prior to the 2017 LTM event had not been conducted since 2011. As discussed previously, TOC concentrations in the treatment area are indicative of a suitable environment for biodegradation. Results for TOC in wells within the treatment zone and source area ranged from 2.2 to 29 mg/L in 2021. One of these wells has TOC levels equal to the target concentration of 29 mg/L. Only five rounds of TOC data are available since 2011 for a subset of the wells, while the wells installed during the RA activities only have results from five annual sampling events. As shown below, TOC concentrations in several wells in the treatment area have decreased, while they have increased in other wells. The overall trend since 2016 shows decreasing levels of TOC in the source area and stable or slightly increasing levels of TOC in the treatment area.

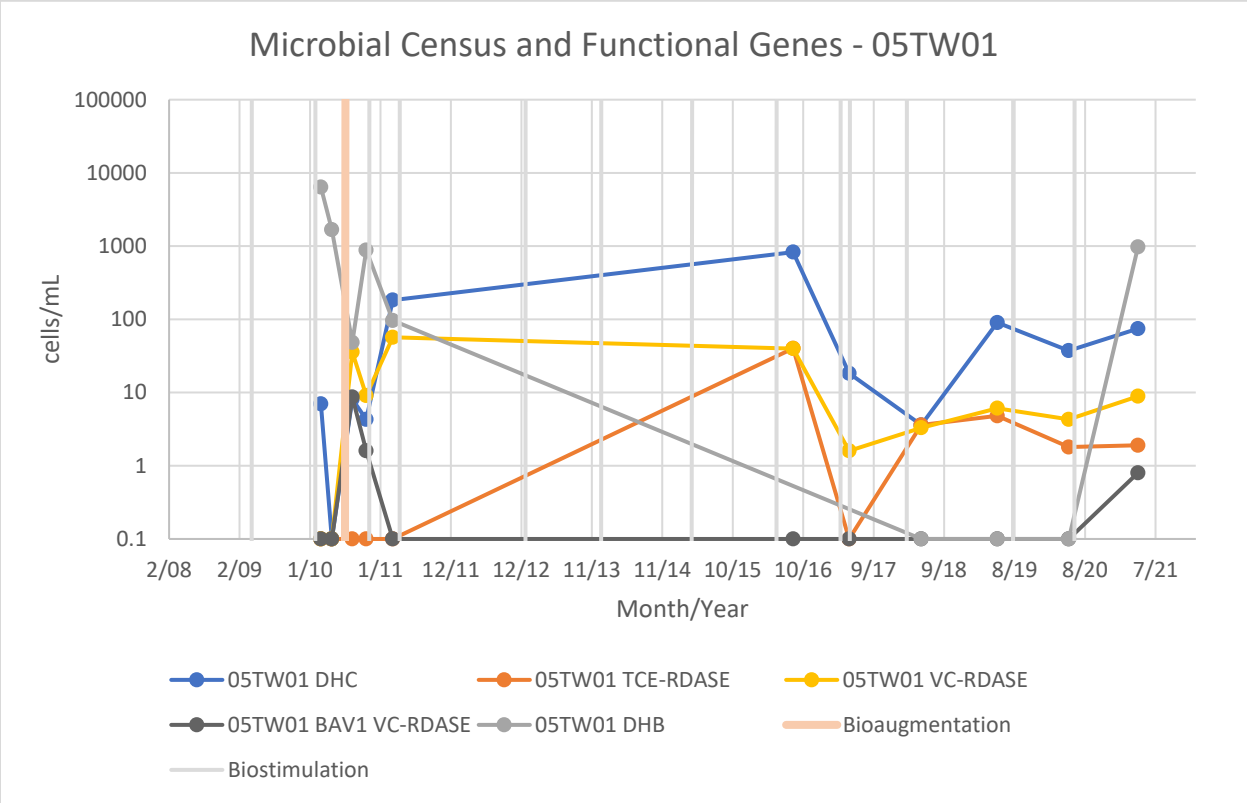


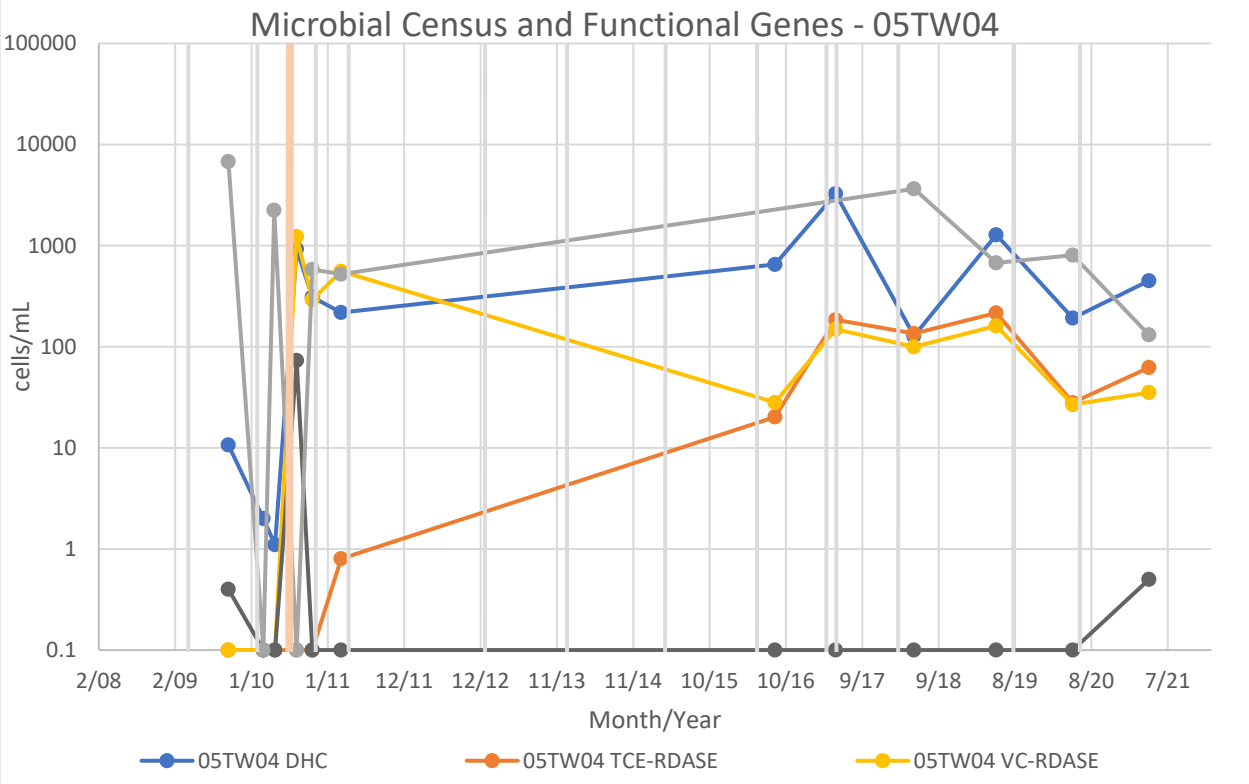


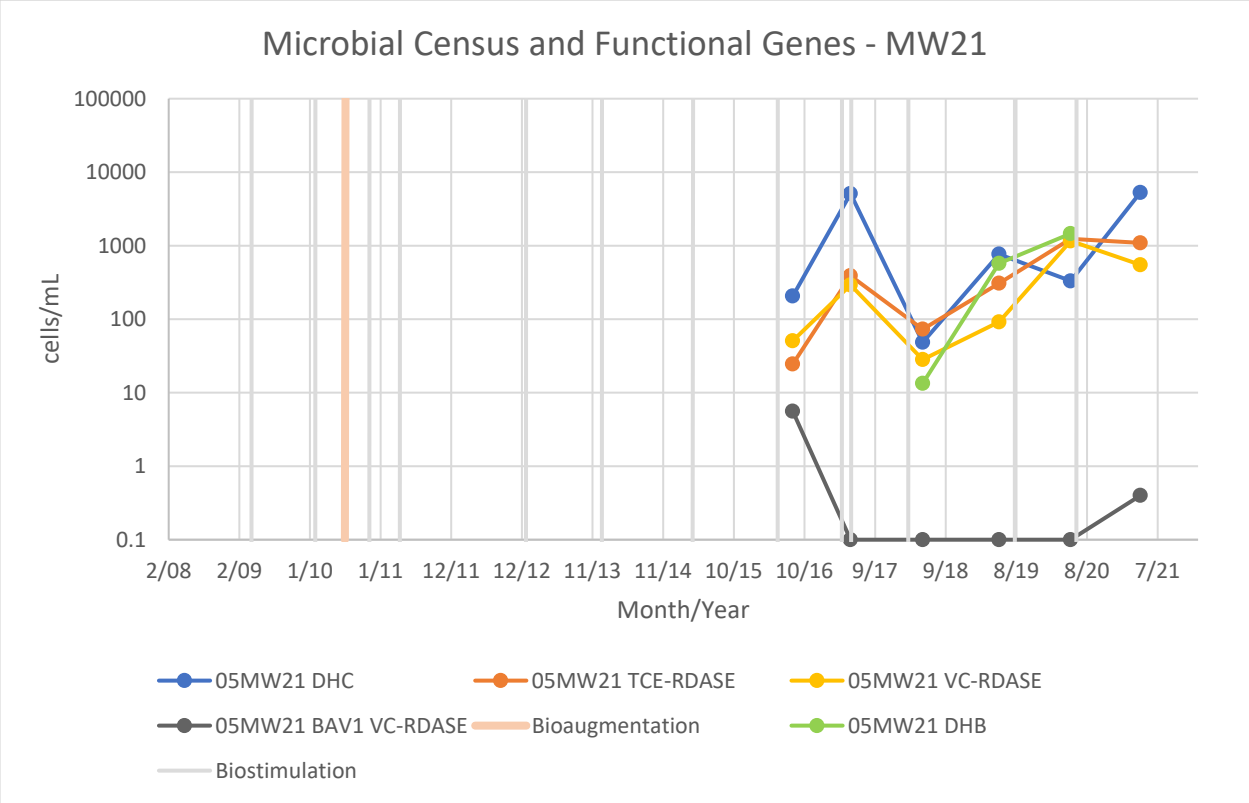
Bacterial Population

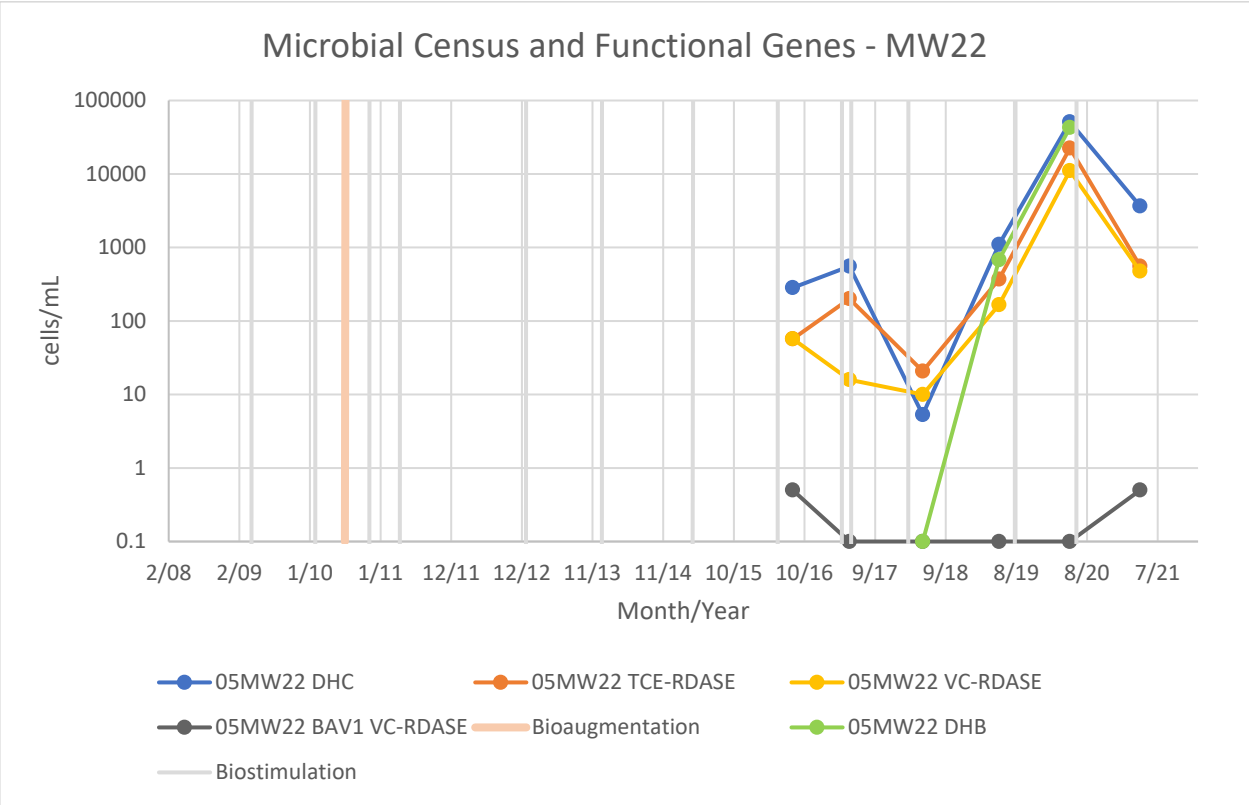
Sampling for bacterial population prior to the 2016 annual LTM event had not been conducted since 2011. In addition, some of the wells selected for bacterial population and gene analysis had not been previously sampled until the annual events. As discussed previously, DHC concentrations in the treatment area are indicative of a suitable environment for biodegradation. More detailed trend analysis for bacterial population and genes will be included in subsequent annual reports; however, comparing the last five years of data to the start of the system operation during the pilot test provides an indication of the relative conditions of the microbe population at the site. As shown on the charts below, DHC concentrations in well 05MW22 increased from 1,100 cells/mL in 2019 to 51,200 cells/mL in 2020, but decreased to 3,660 cells/mL in 2021. DHC counts increased in 05MW21 from 2020 to 2021. DHC counts in wells 05TW01 and 05TW04 increased slightly from 2020 to 2021 but have remained fairly stable since bioaugmentation and since 05MW21 was installed. Genetic analysis indicates that the concentration of TCE R-DASE which is needed to reduce TCE, increased in the treatment area wells from 2020 to 2021 but has remained fairly stable since 2017. TCE R-DASE concentrations decreased from 2020 to 2021 after a substantial increase from 2019 to 2020. VC-RDASE, which is required for reduction of VC, decreased in the source area wells from 2020 to 2021. VC-RDASE concentrations

increased slightly in the treatment area wells from 2020 to 2021 and are lower than levels following bioaugmentation. BAV1VC-RDASE levels decreased soon after bioaugmentation in wells 05TW01 and 05TW04 and soon after installation in wells 05MW21 and 05MW22. DHB is needed to complete the degradation of ethanes. DHB counts were not performed at wells 05MW21 or 05MW22 in prior annual sampling events, but were added to the sampling parameters starting with the 2018 annual event. The DHB culture at well 05TW04 is healthy and shows levels higher than those detected immediately after bioaugmentation in 2010. The DHB count at well 05TW01 showed a significant increase (976 cells/mL) in 2021 after being non-detect in 2020. DHB counts in both wells 05MW21 and 05MW22 have increased from 2018 to 2020 with a minor decrease in 2021 (05MW21: 13.4 to 1,460 to 199 cells/mL; 05MW22: 5 U to 42,900 to 5,040 cells/mL). DHB counts in these wells are higher than DHB counts observed in treatment area wells immediately after bioaugmentation.



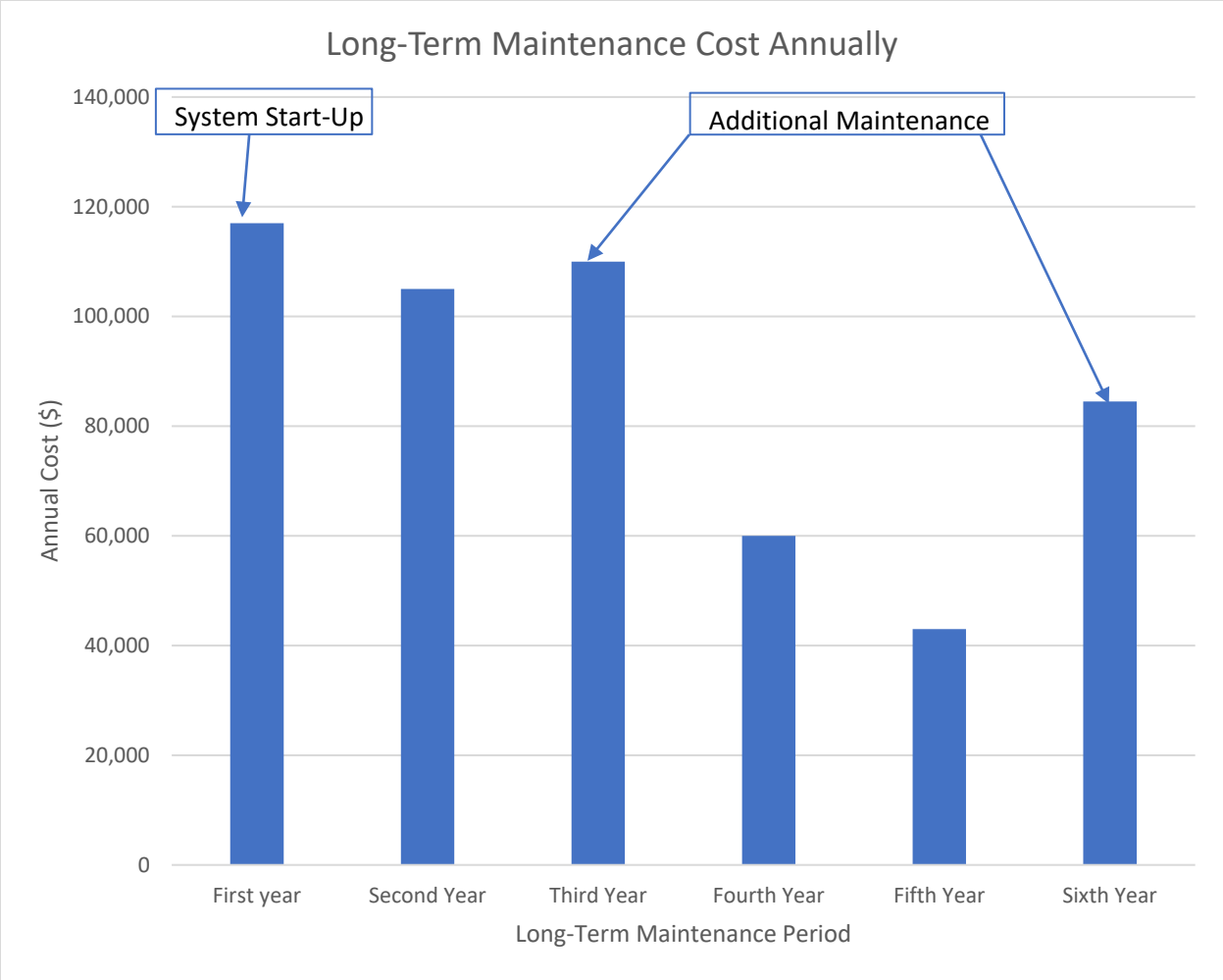

Microbial Census and Functional Genes - 05TW04
100000
10000
1000
100
10
1
0.1
cells/mL
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05TW04 DHC
05TW04 TCE-RDASE
05TW04 VC-RDASE


Microbial Census and Functional Genes - MW21
100000
10000
1000
100
10
1
0.1
cells/mL
2/08
2/09
1/10
1/11
12/11
12/12
11/13
11/14
10/15
10/16
9/17
9/18
8/19
8/20
7/21
Month/Year
05MW21 DHC
05MW21 TCE-RDASE
05MW21 VC-RDASE
05MW21 BAV1 VC-RDASE
Bioaugmentation
05MW21 DHB
Biostimulation



5.3 Trend Analysis - Cost

Costs for the sixth full year of the LTM program include: treatment system O&M including replacement of metering pumps; repair of a well pump; repairs to piping; PIM events in September 2020, November 2020, and February 2021; annual performance monitoring; and preparation of the annual report. Costs include labor, laboratory services, biostimulation amendments, replacement metering pumps, equipment rental, field supplies, and travel expenses. Sixth year costs were approximately $84,500 due to troubleshooting to optimize system operations. Fifth year costs were approximately $43,000. Fourth year costs were approximately $60,000. Approximate third year costs were $110,000. Second year costs were approximately $105,000; however, because of the change in schedule for the annual sampling from August to May, only three PIM events were conducted during the second year of operation. First year costs were approximately $117,000.



5.4 Current Extent of Site COCs Exceeding Remedial Goals

As documented, the bioremediation has decreased the extent and magnitude of the plume. The following list of figures illustrate the current (2021) lateral extent of the remedial goal exceedances for the site COCs:

- Figure 5-2: 1,1,1-Trichloroethane
- Figure 5-3: Trichloroethene
- Figure 5-4: Tetrachloroethene
- Figure 5-5: cis-1,2-Dichloroethene
- Figure 5-6: 1,1-Dichloroethene

- Figure 5-7: 1,1-Dichloroethane
- Figure 5-8: Vinyl Chloride

The degree to which the plume has contracted is illustrated in Figure 5-9, which illustrates the lateral extent of the current 2021 plume (as defined by total VOCs) versus the extent of the pre-remedial 2008 plume. To confirm current plume morphology additional wells used for the pre-remedial plume extent will be sampled during a 2022 sampling event or an event associated with the planned Site 5 Pilot System monitoring for PFAS.

5.5 Optimization and Site Closeout Progress

The selected remedy was anticipated to take 15 years to complete (Tetra Tech, 2007a). To date, six years of LTM have been completed. The projected timeframe to attain RGs has been preliminarily estimated based on COC data collected in key source area wells such as 05MW25 over the past few years of remedy implementation. In addition, typical degradation rates encountered in the literature as well as Tetra Tech experience with similar contaminants and remediation technologies were also reviewed and employed. Because TCE is the prime target contaminant at this site, it was used as a guiding parameter for remedial timeframe determination. A second compound, 1,1-DCE, which is a hydrolytic breakdown product of 1,1,1-TCA also is above the RGs in two source wells, but is likely to follow the same reductive pattern as TCE over time with continued treatment. In the absence of unknown factors, degradation rates are generally presumed to be first-order even though at the tail end of treatment, as concentrations near the MCL, zero-order degradation patterns are sometimes more prevalent. Based on this background review, field data, and research, it may be expected that RGs in groundwater at this site could be attained within a timeframe range of five to seven years. Depending on how concentrations taper off over the next 12 to 18 months, modifications and enhancements to the remediation system and protocol may be recommended and implemented to achieve these timeframes.

5.6 Land Use Controls Inspection

LUCs established for Site 5 are discussed in Section 3.1.3 of this report. The 2021 LUC Inspection Report was completed in May 2021 and indicated no changes to site use, no unauthorized groundwater use, no reuse of existing buildings or new construction within the LUC boundary, or other activities inconsistent with the LUCs (Department of the Navy, 2021). The inspection report is included as Appendix A.

5.7 In-Situ Bioremediation System Operation and Maintenance Activities

During the past year, routine O&M activities were conducted for the bioremediation system. PIM was conducted quarterly and during the annual performance monitoring event for 2021 as described above. PIM will continue on an approximately quarterly basis.

O&M activities included the operation of the system and repairs of leaks and broken piping in the bioremediation system. The metering pump was repaired and several attempts were made to clear bioaccumulation in the treatment area. The system was replumbed and flow meters were changed out. Injections were attempted in November 2020, December 2020, January 2021, and March 2021 but due to daylighting of injection material, they were paused. Additionally, troubleshooting of material daylighting during injections was performed, which included a downhole camera survey to observe bioaccumulation in the treatment area.

The investigation indicated that majority of the material within the injection points are comprised of inorganic compounds (anions and cations) with a portion being inert material (silts, clays, mud, and sand). Around 80 to 85 percent of the accumulation is the inert material. Of the ions identified iron was the most prevalent. This accumulation is likely due to the nature of the open borehole injections permitting accumulation of material. The material could not be cleared during the investigation. Injections will be resumed at the site using prior target values. Otherwise, the recommendation is to return to previous dosage to prevent additional accumulation of these materials. To increase the amount of overall Lactoil injected into the treatment area. It is recommended to complete additional injection events rather than increasing the Lactoil dosage in single events. An additional suggestion is to consider adding an oxygen scavenger, such as sodium sulfite, to a recirculated water flush prior to the Lactoil injections and during Lactoil injections to reduce some of this accumulation.

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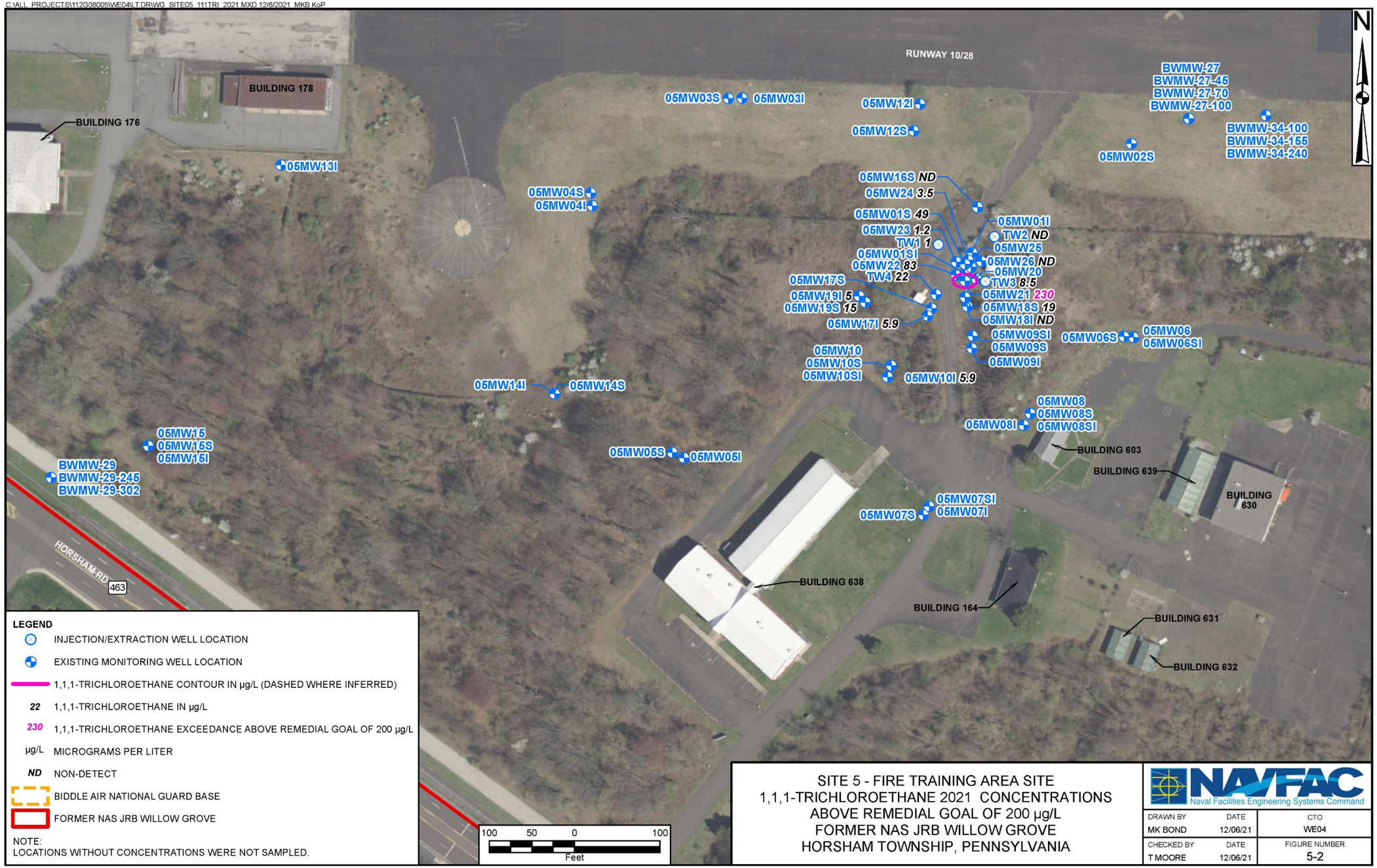

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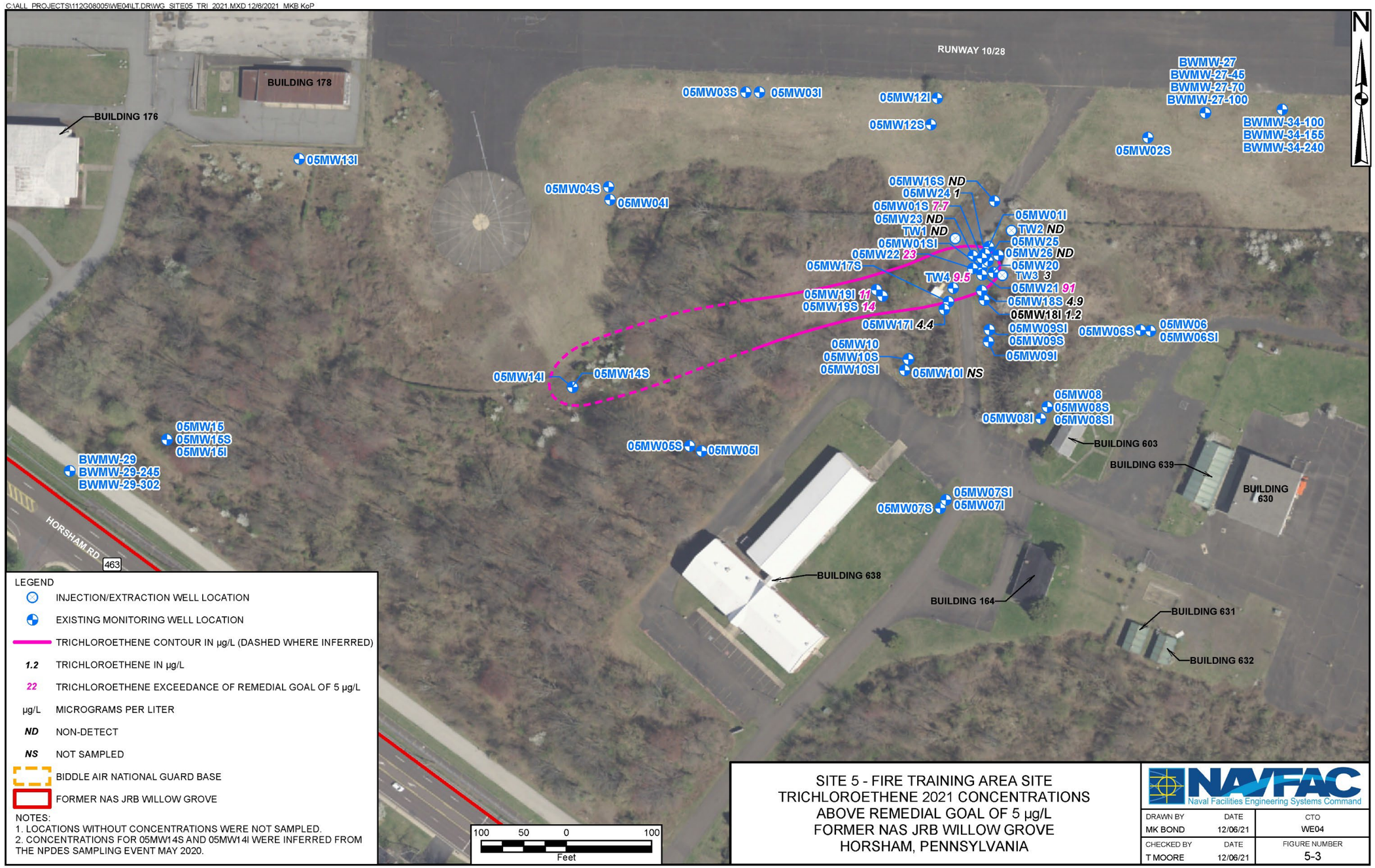

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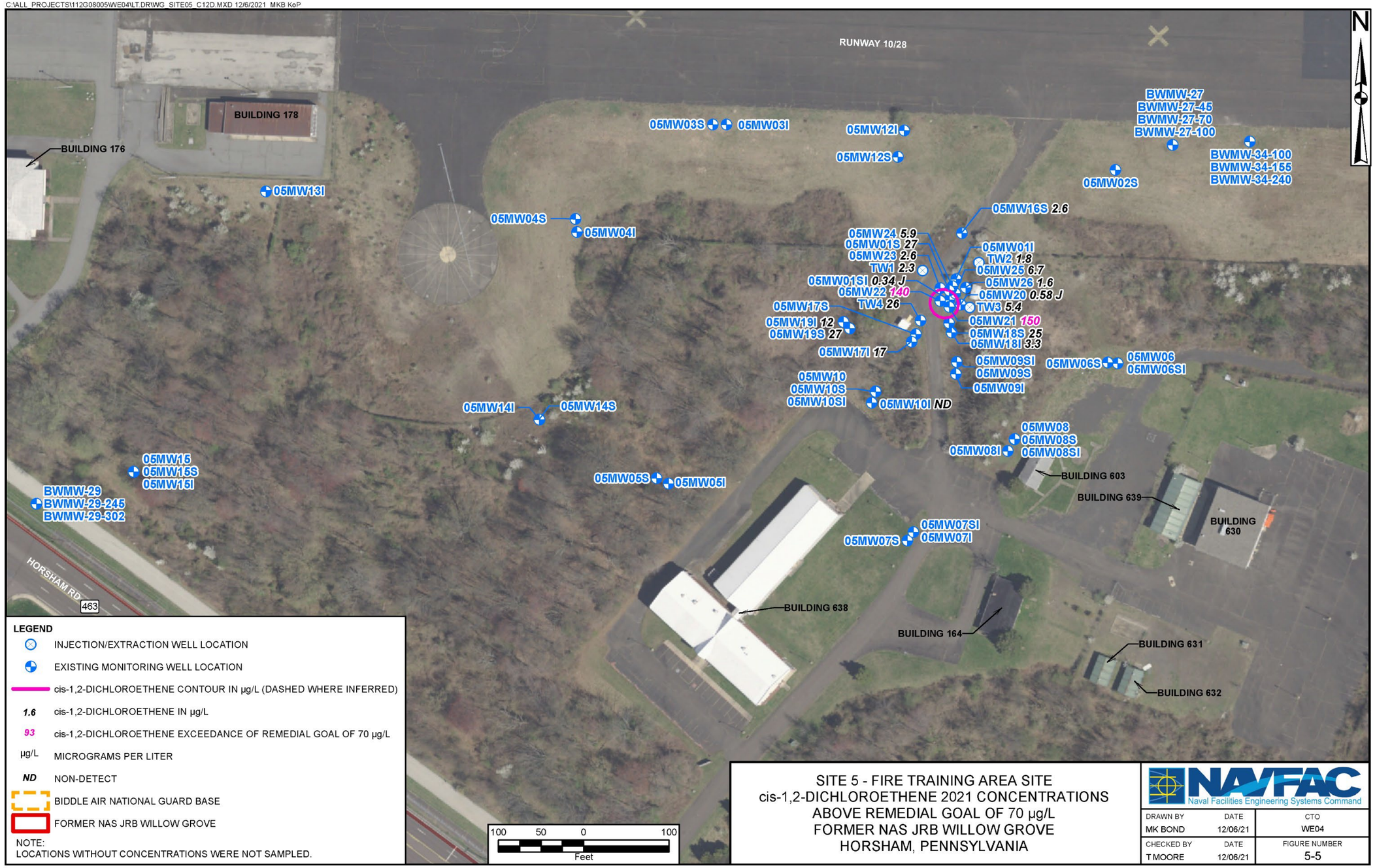

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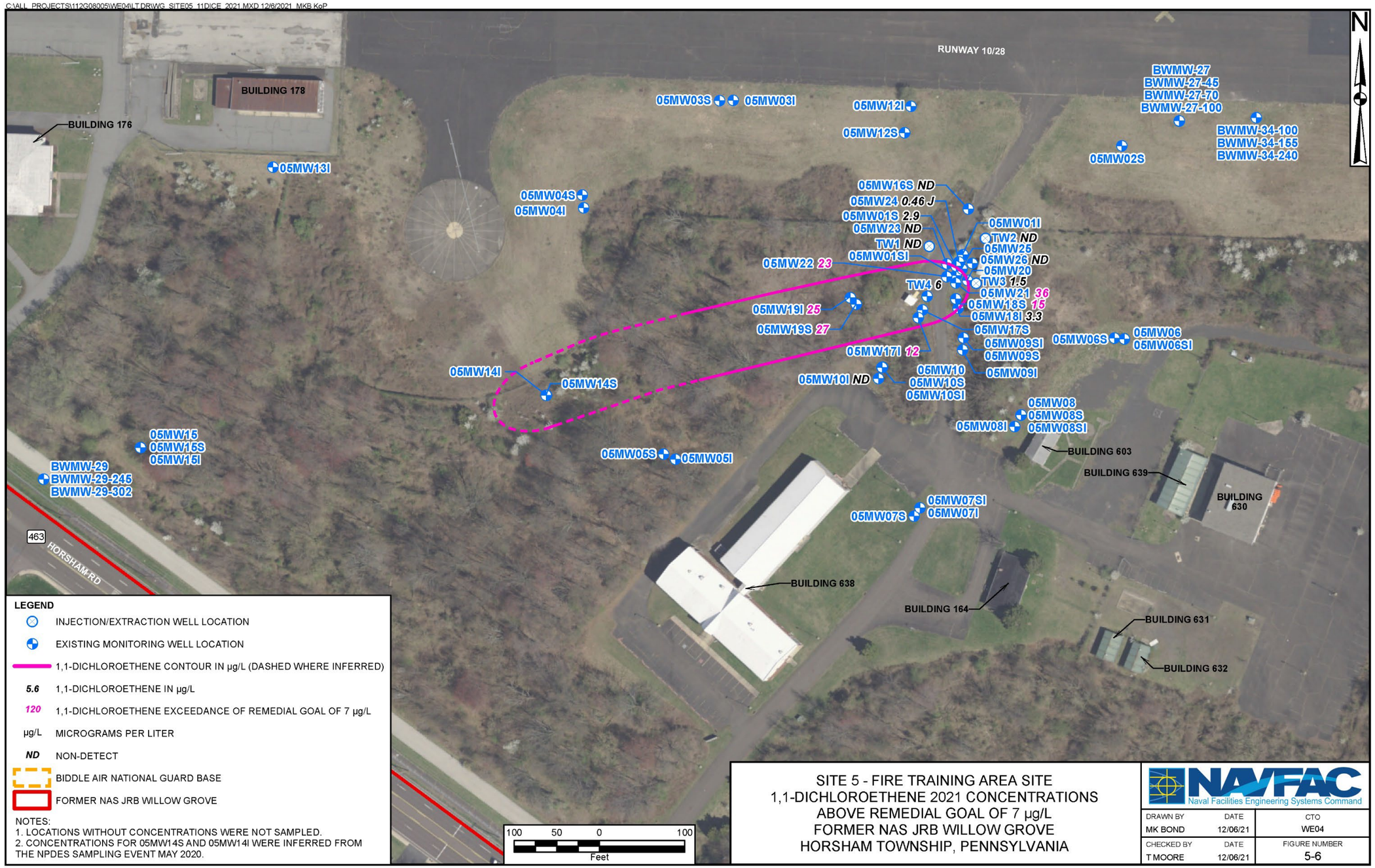

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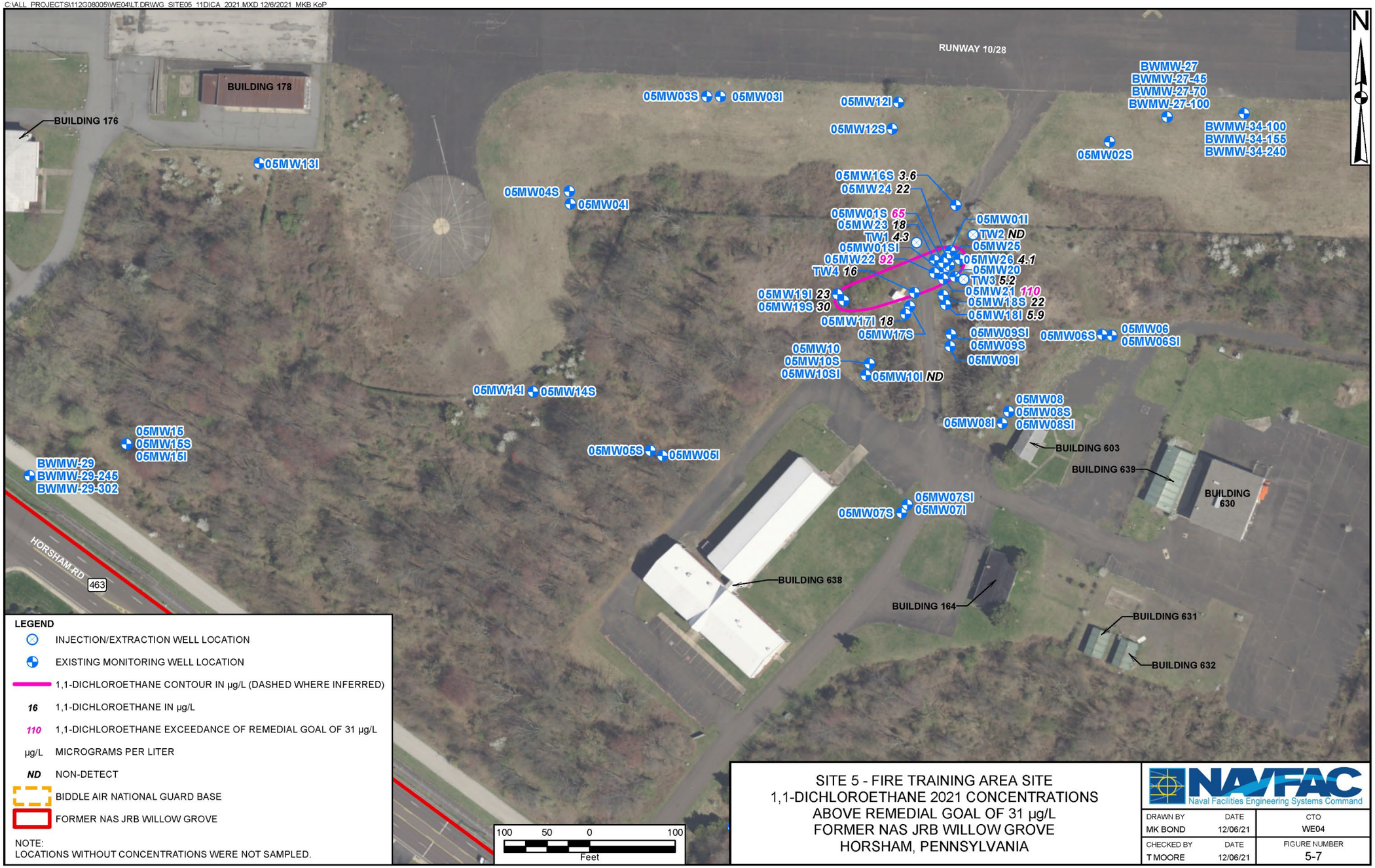

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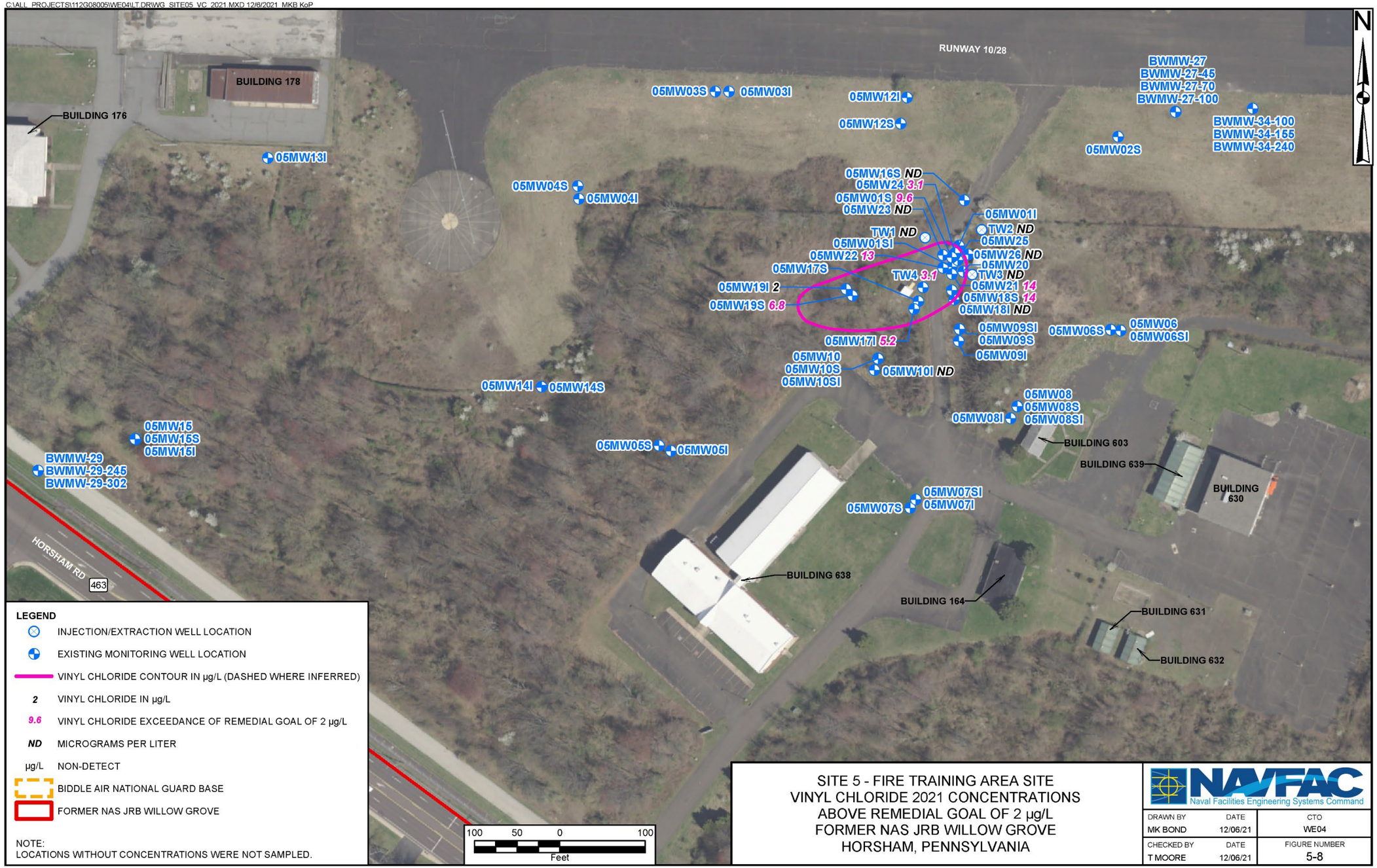

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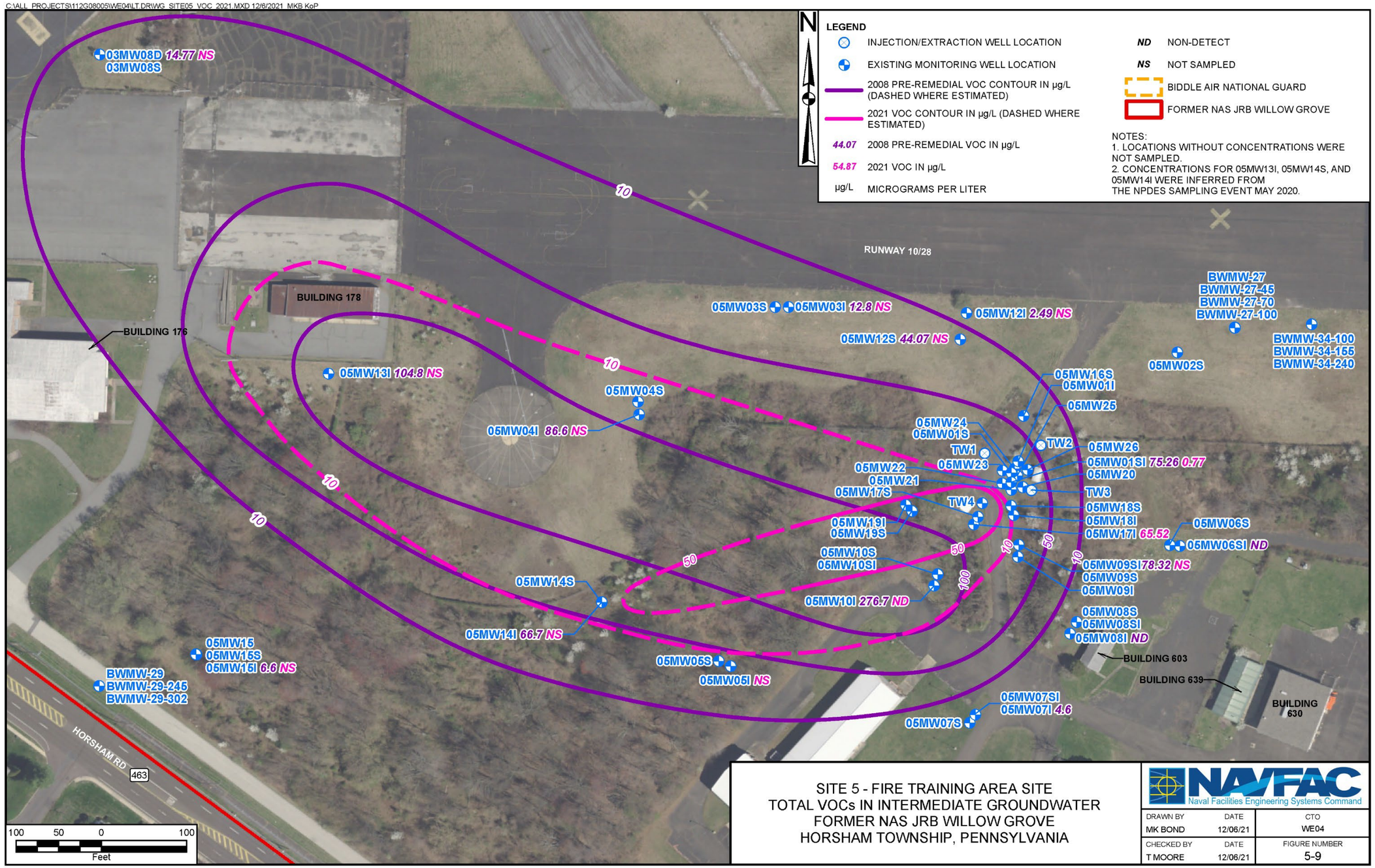

SITE 5 - FIRE TRAINING AREA SITE
TOTAL VOCs IN INTERMEDIATE GROUNDWATER
FORMER NAS JRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

NAVFAC Naval Facilities Engineering Systems Command

DRAWN BY	DATE	CTO
MK BOND	12/06/21	WE04
CHECKED BY	DATE	FIGURE NUMBER
T MOORE	12/06/21	5-9

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6.0 Conclusions and Recommendations

The following are the conclusions based on the monitoring data evaluation and O&M activities conducted at Site 5:

- A significant reduction of the parent compounds 1,1,1-TCA, TCE and PCE, as well as other VOCs, has been observed since the pilot test and first bioaugmentation and biostimulation events in 2010. Increased levels of VC, which are indicative of ongoing biodegradation, have been observed in some wells within the source and treatment areas. VC levels are now beginning to decline in some of the wells, and the presence of VC-degrading bacteria indicates that further reductions in concentrations of this compound will continue. VC concentrations in several wells downgradient of the source area have remained stable or increased over the past several sampling events, indicating that the degradation of the parent compounds is continuing or that the reductive dechlorination process is not progressing through the final stage of VC degradation. Concentrations of VC and dissolved gases (an indicator of VC degradation) will be closely monitored to confirm that complete reductive dechlorination is being achieved.

- Most of the wells included in the LTM program show downward trends of VOC concentrations. VOC concentrations at many of these wells are less than RGs, although several of the wells constructed in the center of the source area in 2013, particularly wells 05MW21 and 05MW22, show relatively higher levels of VOCs than other wells both in the source area and downgradient of the treatment area. Wells 05MW21 and 05MW22, while having the highest levels of these compounds at Site 5, have shown significant decreases in VOC concentrations over the past five years. Since 2015, the concentration of PCE has been reduced by 95 percent in well 05MW22 and by 61 percent in well 05MW21, and the concentration of TCE has been reduced by 89 percent in well 05MW22 and by 64 percent in well 05MW21.

- The process monitoring results indicate that conditions generally remain suitable for anaerobic biodegradation with regular injection of amendments (Lactoil and sodium bicarbonate). Based on PIM results, biostimulation events have resulted in maintaining the environment required to support the bacterial population. DHC and DHB levels present during the 2021 LTM event indicate that there is a suitable population of bacteria, provided anaerobic conditions are maintained. However, low or decreasing concentrations of VFAs and dissolved gases, particularly in the treatment and source area wells, indicate that increased

amounts of Lactoil and sodium bicarbonate may be needed to maintain a healthy microbial environment moving forward. The resolution to prevent this is to continue monitoring to determine if additional adjustments are needed for operation of the system and conduct troubleshooting as required to prevent any daylighting that may occur from the system in the future. Conditions will continue to be monitored in the case of additional adjustments being needed.

- The LUCs that prohibit groundwater use, and reuse of buildings or new construction without a vapor intrusion assessment are in place. The LUCs are protective and will be maintained.
- Based on this background review, field data collection, system troubleshooting, and research, it is difficult to fully determine the amount of time remaining for the system operation to reach RGs in groundwater. A more definitive and thorough analysis of timeframe will be assessed after the next more frequent injection events to determine an accurate remaining timeframe to reach RGs. The remedial action continues to operate properly and successfully.

The following actions are recommended for Site 5:

- Complete a recirculation of clean groundwater into injection wells to resolve daylighting issues with material accumulation prior to each injection event.
- Routine biostimulation events (twice a year) should continue to be conducted to increase the amounts of Lactoil and sodium bicarbonate being injected into the treatment area. A potential increase to 4 events a year may need to occur to prevent accumulation of material into the injection components.
- Results of the data evaluation indicate that no changes to the sampling strategy or monitoring well network should be made at this time. However, a larger scale event will be completed in 2022 to confirm the current plume morphology.
- Complete optimization of the system as needed based on any observations of potential increased bioaccumulation in the treatment area injection components to maintain efficiency (i.e., adding an oxygen harvester to injection solutions, retrofitting injection points).

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APPENDIX A
2021 LAND USE CONTROLS INSPECTION REPORT

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SITE 5 (GROUNDWATER) LAND USE CONTROLS

- Prohibition of groundwater use for human consumption without Navy, EPA and PADEP approval
- Require that future structures contain measures to mitigate the potential for vapor intrusion from the subsurface
- Require that existing buildings, prior to reuse, install a system to mitigate potential for vapor intrusion from the subsurface or conduct a vapor intrusion investigation that documents there is no unacceptable risk to future occupants

SITE 5 (GROUNDWATER) LUC INSPECTION CHECKLIST

Inspection Item	Y/N/NA	Summary of Inspection Performed/Comments
Has site use changed since last inspection?	N	Performed reconnaissance of Site 5 LUC area. The Air Station is closed. No changes were observed.
Is there visual evidence of unauthorized groundwater use?	N	No evidence of unauthorized groundwater use was observed.
Is there any visual evidence of reuse of the existing buildings?	N	Buildings are vacant. No evidence of reuse was observed.
If reuse of existing buildings has occurred, has a vapor intrusion mitigation system been installed or has an investigation documenting no unacceptable risk been performed?	NA	
Is there visible evidence of new building construction?	N	No new building construction was observed.
If new buildings have been constructed, do they contain vapor intrusion mitigation measures?	NA	

LAND USE CONTROLS (LUCs) INSPECTION CHECKLIST

SITE 5 – FORMER FIRE TRAINING AREA (GROUNDWATER)
FORMER NAS JRB WILLOW GROVE

SITE 5 DOCUMENTATION CHECKLIST

Inspection Item	Y/N/NA	Summary of Inspection Performed/Comments
Are there correspondence records (emails, letters) on file documenting EPA and PADEP notifications regarding LUCs? If yes, answer questions below:	N	
Are activities inconsistent with LUCs?	N	
Are corrective actions regarding activities inconsistent with LUCs?	NA	
Are there changes in procedures affecting LUCs?	N	
Are there proposed land use changes?	N	
Is there a proposed transfer or sale of the property?	N	Property transfer not anticipated within the next year.

Navy Annual Certification:

I hereby certify that a complete and thorough inspection and an evaluation of compliance with land use controls established for the site in the 2012 Record of Decision have been performed and that the items noted on this inspection form have been assessed with respect to the intent of the implemented remedial action objectives for the site.

Jennifer Good, BRAC Environmental Coordinator, by direction in my official capacity only

Navy Representative — Title

Signature — Date: 05/25/2021

Onsite Inspection Team:

Donald Whalen — Geologist/TetraTech

Lead Inspector — Title/Affiliation

Donald Whalen — 11 May 2021

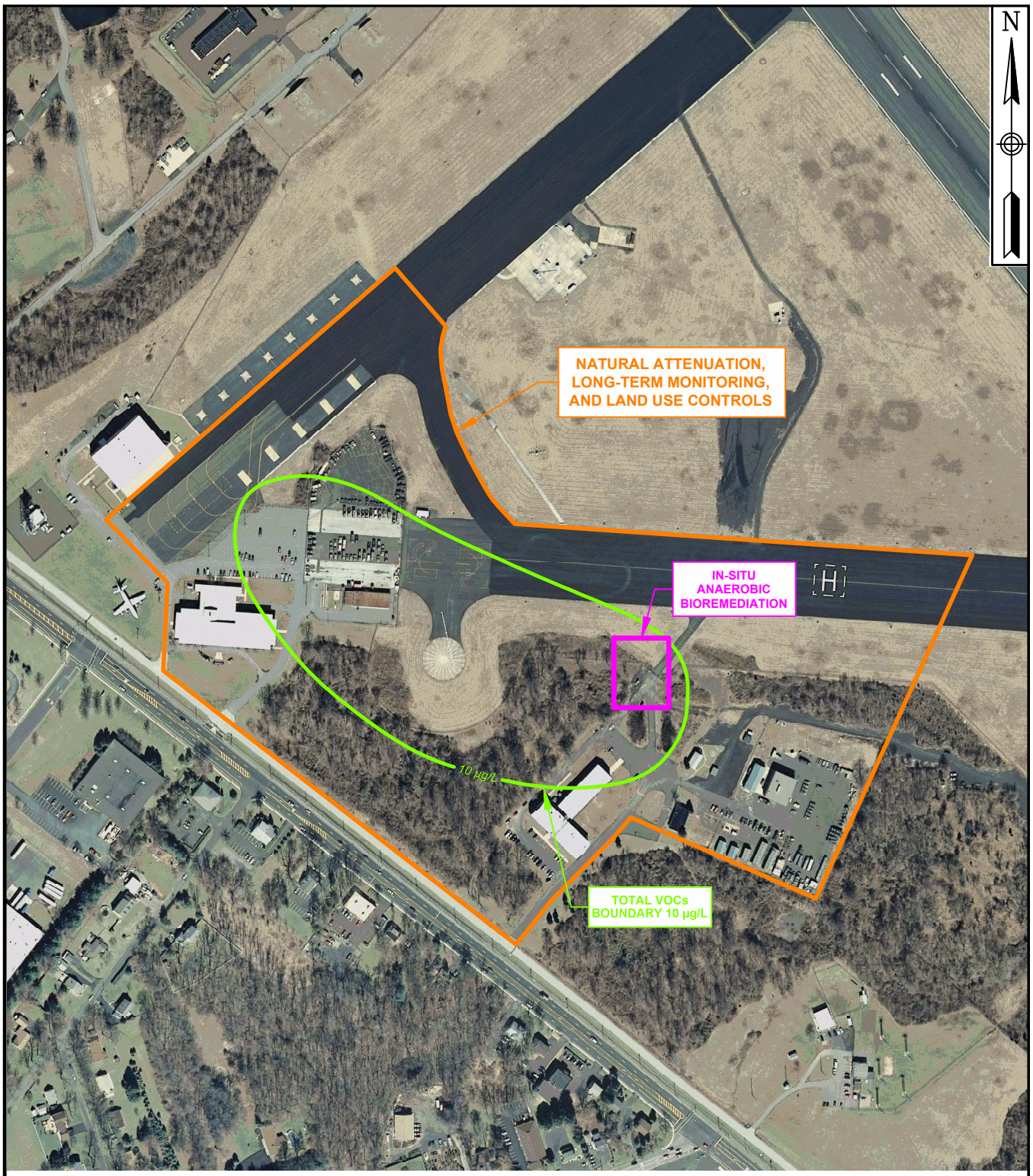
Signature — Date

Others present:

Name — Affiliation

Name — Affiliation

112G02014\1036\112G02014GM01-3.DWG 05/29/13 MKB



0 400 800

SCALE IN FEET

AERIAL BASE MAP PROVIDED BY THE PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY

LEGEND

10 µg/L TOTAL VOCs, SUMMER 2005

TETRA TECH

SITE 5 – LAND USE CONTROL AREA
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

SCALE	AS NOTED
FILE	112G02014GM01-3
REV	0
DATE	05/29/13
FIGURE NUMBER	FIGURE 2

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APPENDIX B
DATA SUMMARY

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LOCATION SAMPLE ID SAMPLE DATE DUPLICATE SAMPLE CODE	Groundwater Remedial Goals	**05MW01S** **05MW01S-20210428** **20210428** **NORMAL**	**05MW01SI** **05MW01SI-20210428** **20210428** **NORMAL**	**05MW10I** **05MW10I-20210426** **20210426** **NORMAL**	**05MW16S** **05MW16S-20210426** **20210426** **NORMAL**	**05MW17I** **05MW17I-20210427** **20210427** **ORIG**
VOLATILES (UG/L)						
1,1,1-TRICHLOROETHANE	200	49	0.4 U	0.4 U	0.4 U	7.5
1,1,2,2-TETRACHLOROETHANE	NA	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
1,1,2-TRICHLOROETHANE	5	0.29 J	0.8 U	0.8 U	0.8 U	0.3 J
1,1-DICHLOROETHANE	31	65	0.8 U	0.8 U	3.6	18
1,1-DICHLOROETHENE	7	2.9	0.8 U	0.8 U	0.8 U	12
1,2-DICHLOROETHANE	5	0.4 U	0.4 U	0.4 U	0.4 U	0.63 J
BENZENE	5	0.4 U	0.43 J	0.4 U	0.4 U	0.37 J
CHLOROETHANE	NA	1.9 J	1.6 U	1.6 U	1.9 J	1.6 UJ
CHLOROFORM	NA	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROMETHANE	NA	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
CIS-1,2-DICHLOROETHENE	70	27	0.34 J	0.4 U	2.6	17
TETRACHLOROETHENE	5	2	0.4 U	0.4 U	0.4 U	0.22 J
TRANS-1,2-DICHLOROETHENE	NA	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TRICHLOROETHENE	5	7.7	0.4 U	0.4 U	0.4 U	4.4
VINYL CHLORIDE	2	9.6	0.2 U	0.2 U	0.2 U	5.1
VOLATILE SELECTIVE ION MONITORING (UG/L)						
1,4-DIOXANE	6.4	1.4	1 U	1 U	0.59 J	1.3 J
VOLATILE GASES (UG/L)						
ACETYLENE	NA	1.5 U	1.5 U	--	1.5 U	1.5 U
ETHANE	NA	1.5 U	1.5 U	--	1.5 U	1.5 U
ETHENE	NA	3.1 J	1.4 U	--	1.4 U	0.48 J
METHANE	NA	1100	13000	--	6800	630
HALOACETIC ACIDS (UG/L)						
ACETIC ACID	NA	6400 U	6400 U	--	6400 U	6400 U
BUTANOIC ACID	NA	4000 U	4000 U	--	4000 U	4000 U
LACTIC ACID	NA	2000 U	2000 U	--	2000 U	2000 U
PROPIONIC ACID	NA	4000 U	4000 U	--	4000 U	4000 U
PYRUVIC ACID	NA	500 U	500 U	--	500 U	500 U
MICROBIOLOGICAL (CELLS/ML)						
BAV1 VC R-DASE	NA	0.5 U	--	--	--	0.4 U
DEHALOBACTER	NA	1680	--	--	--	4.2 U
DEHALOCOCCOIDES	NA	3340	--	--	--	310
TCE A REDUCTASE	NA	1060	--	--	--	29.5
VINYL CHLORIDE REDUCTASE GENE	NA	470	--	--	--	30.1
MISCELLANEOUS (MG/L)						
TOTAL ORGANIC CARBON	NA	6.4	13	--	1.4	1.4

Data Qualifiers:
J -- Value is considered estimated due to exceedance of technical quality control criteria or because result is less than the Contract Required Quantitation Limit (CRQL).
U -- Value is non-detected result as reported by laboratory.
Values highlighted in pink exceed the remedial goal

LOCATION	05MW17I	05MW18I	05MW18S	05MW19I	05MW19S
SAMPLE ID	05MW17I-20210427-D	05MW18I-20210427	05MW18S-20210427	05MW19I-20210426	05MW19S-20210426
SAMPLE DATE	20210427	20210427	20210427	20210426	20210426
DUPLICATE	05MW17I-20210427				
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL
VOLATILES (UG/L)					
1,1,1-TRICHLOROETHANE	7.9	0.4 U	19	5	15
1,1,2,2-TETRACHLOROETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
1,1,2-TRICHLOROETHANE	0.32 J	0.8 U	0.8 U	0.8 U	0.8 U
1,1-DICHLOROETHANE	18	5.9	22	23	30
1,1-DICHLOROETHENE	11	3.3	15	25	27
1,2-DICHLOROETHANE	0.58 J	0.4 U	0.4 U	0.4 U	0.4 U
BENZENE	0.37 J	0.4 U	0.58 J	0.4 U	0.4 J
CHLOROETHANE	1.6 UJ	1.6 U	1.6 U	1.6 U	1.6 U
CHLOROFORM	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROMETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
CIS-1,2-DICHLOROETHENE	17	3.3	25	12	27
TETRACHLOROETHENE	0.4 U	0.4 U	0.4 U	1.2	0.4 U
TRANS-1,2-DICHLOROETHENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TRICHLOROETHENE	4	1.2	4.9	11	14
VINYL CHLORIDE	5.2	0.2 U	14	2	6.8
VOLATILE SELECTIVE ION MONITORING (UG/L)					
1,4-DIOXANE	1.2 J	0.61 J	1.3 J	1.5	2.1
VOLATILE GASES (UG/L)					
ACETYLENE	--	1.5 U	--	--	--
ETHANE	--	1.5 U	--	--	--
ETHENE	--	1.4 U	--	--	--
METHANE	--	410	--	--	--
HALOACETIC ACIDS (UG/L)					
ACETIC ACID	--	6400 U	--	--	--
BUTANOIC ACID	--	4000 U	--	--	--
LACTIC ACID	--	2000 U	--	--	--
PROPIONIC ACID	--	4000 U	--	--	--
PYRUVIC ACID	--	500 U	--	--	--
MICROBIOLOGICAL (CELLS/ML)					
BAV1 VC R-DASE	--	--	--	--	--
DEHALOBACTER	--	--	--	--	--
DEHALOCOCCOIDES	--	--	--	--	--
TCE A REDUCTASE	--	--	--	--	--
VINYL CHLORIDE REDUCTASE GENE	--	--	--	--	--
MISCELLANEOUS (MG/L)					
TOTAL ORGANIC CARBON	--	1.2	--	--	--

LOCATION	05MW20	05MW21	05MW22	05MW23	05MW24
SAMPLE ID	05MW20-20210429	05MW21-20210428	05MW22-20210427	05MW23-20210427	05MW24-20210428
SAMPLE DATE	20210429	20210428	20210427	20210427	20210428
DUPLICATE					
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
VOLATILES (UG/L)					
1,1,1-TRICHLOROETHANE	0.4 U	230	83	1.2	3.5
1,1,2,2-TETRACHLOROETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
1,1,2-TRICHLOROETHANE	0.8 U	0.8 U	1.5	0.8 U	0.8 U
1,1-DICHLOROETHANE	2.1	110	92	18	22
1,1-DICHLOROETHENE	0.8 U	36	23	0.8 U	0.46 J
1,2-DICHLOROETHANE	0.4 U	0.4 U	0.4 U	0.36 J	0.4 U
BENZENE	0.4 U	0.39 J	0.28 J	0.29 J	0.44 J
CHLOROETHANE	7.4	7.2	5.4	11 J	19
CHLOROFORM	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROMETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
CIS-1,2-DICHLOROETHENE	0.58 J	150	140	2.6	5.9
TETRACHLOROETHENE	0.4 U	21	3.2	0.4 U	0.4 U
TRANS-1,2-DICHLOROETHENE	0.4 U	0.26 J	0.4 U	0.4 U	0.4 U
TRICHLOROETHENE	0.4 U	91	23	0.4 U	1
VINYL CHLORIDE	0.2 U	14	13	0.2 U	3.1
VOLATILE SELECTIVE ION MONITORING (UG/L)					
1,4-DIOXANE	1 U	1 U	2.6	0.81 J	1 U
VOLATILE GASES (UG/L)					
ACETYLENE	1.5 U	1.5 U	1.5 U	--	--
ETHANE	1.5 U	1.3 J	0.94 J	--	--
ETHENE	1.4 U	4 J	1.4 U	--	--
METHANE	19000	2000	2300	--	--
HALOACETIC ACIDS (UG/L)					
ACETIC ACID	6400 U	6400 U	8400 J	--	--
BUTANOIC ACID	4000 U	4000 U	4000 U	--	--
LACTIC ACID	2000 U	2000 U	2000 U	--	--
PROPIONIC ACID	4000 U	4000 U	4000 U	--	--
PYRUVIC ACID	500 U	500 U	500 U	--	--
MICROBIOLOGICAL (CELLS/ML)					
BAV1 VC R-DASE	--	0.4 U	0.5 U	--	--
DEHALOBACTER	--	199	5040	--	--
DEHALOCOCCOIDES	--	5290	3660	--	--
TCE A REDUCTASE	--	1090	557	--	--
VINYL CHLORIDE REDUCTASE GENE	--	549	475	--	--
MISCELLANEOUS (MG/L)					
TOTAL ORGANIC CARBON	29	9.5	7.1	--	--

LOCATION	05MW25	05MW25	05MW26	05TW-1	05TW-2
SAMPLE ID	05MW25-20210429	05MW25-20210429-D	05MW26-20210428	05TW01-20210427	05TW02-20210429
SAMPLE DATE	20210429	20210429	20210428	20210427	20210429
DUPLICATE		05MW25-20210429			
SAMPLE CODE	ORIG	DUP	NORMAL	NORMAL	NORMAL
VOLATILES (UG/L)					
1,1,1-TRICHLOROETHANE	0.4 UJ	3.4 J	0.4 U	1	0.4 U
1,1,2,2-TETRACHLOROETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
1,1,2-TRICHLOROETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
1,1-DICHLOROETHANE	14	17	4.1	4.3	0.8 U
1,1-DICHLOROETHENE	1.1	1.2	0.8 U	0.8 U	0.8 U
1,2-DICHLOROETHANE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
BENZENE	0.4 U	0.31 J	0.23 J	0.4 U	0.4 U
CHLOROETHANE	7.8	9.1	2.7	1.6 U	6.2
CHLOROFORM	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
CHLOROMETHANE	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
CIS-1,2-DICHLOROETHENE	6.7	6.8	1.7	2.3	1.8
TETRACHLOROETHENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TRANS-1,2-DICHLOROETHENE	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
TRICHLOROETHENE	0.4 U	0.78 J	0.4 U	0.4 U	0.4 U
VINYL CHLORIDE	4.6	4.2	0.2 U	0.2 U	0.2 U
VOLATILE SELECTIVE ION MONITORING (UG/L)					
1,4-DIOXANE	1.2 U	1.3 U	1 U	0.34 J	1.2 U
VOLATILE GASES (UG/L)					
ACETYLENE	1.5 U	--	--	1.5 U	1.5 U
ETHANE	1.3 J	--	--	1.5 U	1.5 U
ETHENE	1.7 J	--	--	1.4 U	1.4 U
METHANE	8300	--	--	13000	20000
HALOACETIC ACIDS (UG/L)					
ACETIC ACID	6400 UJ	--	--	--	6400 U
BUTANOIC ACID	4000 UJ	--	--	--	4000 U
LACTIC ACID	2000 U	--	--	--	2000 U
PROPIONIC ACID	4000 UJ	--	--	--	4000 U
PYRUVIC ACID	500 UJ	--	--	--	500 U
MICROBIOLOGICAL (CELLS/ML)					
BAV1 VC R-DASE	--	--	--	0.8 U	--
DEHALOBACTER	--	--	--	976	--
DEHALOCOCCOIDES	--	--	--	74.6	--
TCE A REDUCTASE	--	--	--	1.9	--
VINYL CHLORIDE REDUCTASE GENE	--	--	--	8.9	--
MISCELLANEOUS (MG/L)					
TOTAL ORGANIC CARBON	12 J	--	--	--	15

LOCATION	05TW-3	05TW-4
SAMPLE ID	05TW03-20210429	05TW04-20210428
SAMPLE DATE	20210429	20210428
DUPLICATE		
SAMPLE CODE	NORMAL	NORMAL
VOLATILES (UG/L)		
1,1,1-TRICHLOROETHANE	8.5	22
1,1,2,2-TETRACHLOROETHANE	0.8 U	0.8 U
1,1,2-TRICHLOROETHANE	0.8 U	0.37 J
1,1-DICHLOROETHANE	5.2	16
1,1-DICHLOROETHENE	1.5	6
1,2-DICHLOROETHANE	0.4 U	0.4 U
BENZENE	0.4 U	0.24 J
CHLOROETHANE	1.6 U	1.6 U
CHLOROFORM	0.4 U	0.4 U
CHLOROMETHANE	0.8 U	0.8 U
CIS-1,2-DICHLOROETHENE	5.4	26
TETRACHLOROETHENE	0.4 U	0.27 J
TRANS-1,2-DICHLOROETHENE	0.4 U	0.4 U
TRICHLOROETHENE	3	9.5
VINYL CHLORIDE	0.2 U	3.1
VOLATILE SELECTIVE ION MONITORING (UG/L)		
1,4-DIOXANE	1 U	1 U
VOLATILE GASES (UG/L)		
ACETYLENE	1.5 U	1.5 U
ETHANE	1.5 U	1.5 U
ETHENE	1.4 U	0.8 J
METHANE	3900	1400
HALOACETIC ACIDS (UG/L)		
ACETIC ACID	6400 U	6400 U
BUTANOIC ACID	4000 U	4000 U
LACTIC ACID	2000 U	2000 U
PROPIONIC ACID	4000 U	4000 U
PYRUVIC ACID	500 U	500 U
MICROBIOLOGICAL (CELLS/ML)		
BAV1 VC R-DASE	--	0.5 U
DEHALOBACTER	--	131
DEHALOCOCCOIDES	--	450
TCE A REDUCTASE	--	62.3
VINYL CHLORIDE REDUCTASE GENE	--	35.3
MISCELLANEOUS (MG/L)		
TOTAL ORGANIC CARBON	7.7	2.2

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APPENDIX C
LABORATORY REPORTS

(This appendix can be viewed on the main CD)

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APPENDIX D
DATA VALIDATION REPORTS

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TETRA TECH

INTERNAL CORRESPONDENCE

TO: **T. MOORE** **DATE:** **MAY 20, 2021**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **DATA VALIDATION – DECHLORINATING BACTERIA NAS JRB WILLOW GROVE SITE 5 SAMPLE DELIVERY GROUP (SDG) 121SD**

SAMPLES: 6/Aqueous/

05MW01S-20210428	05MW17I-20210427
05MW21-20210428	05MW22-20210427
05TW01-20210427	05TW04-20210428

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 121SD, consisted of six (6) aqueous environmental samples. All samples were analyzed for dechlorinating bacteria as referenced above.

The samples were collected by Tetra Tech, on April 27 and 28, 2021 and analyzed by Microbial Insights, Inc.

The data contained in this SDG were validated via EPA Stage 2A with regard to the following parameters: data completeness, holding times, laboratory method blanks, laboratory control sample recoveries and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

No issues.

Notes

No issues.

Executive Summary

Laboratory Performance: No issues.

Other Factors Affecting Data Quality: No issues.

The text of this report has been formulated to address only those areas affecting data quality.

Terri L Solomon

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05MW01S-20210428			05MW17I-20210427			05MW21-20210428			05MW22-20210427		
SDG: 121SD	LAB_ID	121SD-5			121SD-2			121SD-6			121SD-3		
FRACTION: MICRO	SAMP_DATE	4/28/2021			4/27/2021			4/28/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	CELLS/ML			CELLS/ML			CELLS/ML			CELLS/ML		
	PCT_SOLIDS												
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
BAV1 VC R-DASE		0.5	U		0.4	U		0.4	U		0.5	U	
DEHALOBACTER		1680			4.2	U		199			5040		
DEHALOCOCCOIDES		3340			310			5290			3660		
TCE A REDUCTASE		1060			29.5			1090			557		
VINYL CHLORIDE REDUCTASE GENE		470			30.1			549			475		

PROJ_NO: 08005-WE04	NSAMPLE	05TW01-20210427			05TW04-20210428		
SDG: 121SD	LAB_ID	121SD-1			121SD-4		
FRACTION: MICRO	SAMP_DATE	4/27/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	CELLS/ML			CELLS/ML		
	PCT_SOLIDS						
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
BAV1 VC R-DASE		0.8	U		0.5	U	
DEHALOBACTER		976			131		
DEHALOCOCCOIDES		74.6			450		
TCE A REDUCTASE		1.9			62.3		
VINYL CHLORIDE REDUCTASE GENE		8.9			35.3		

Appendix B

Results as Reported by the Laboratory

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **Tetra Tech, Inc.**
Project: CTO WE04 NAS JRB Willow Grove

MI Project Number: **121SD**
Date Received: 04/28/2021

Sample Information

Client Sample ID:		**05TW01-20210427**	**05MW17I-20210427**	**05MW22-20210427**	**05TW04-20210428**	**05MW01S-20210428**
Sample Date:		04/27/2021	04/27/2021	04/27/2021	04/28/2021	04/28/2021
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CB	HT/CB	HT/CB	HT/CB	HT/CB
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**7.46E+01**	**3.10E+02**	**3.66E+03**	**4.50E+02**	**3.34E+03**
tceA Reductase	TCE	**1.90E+00**	**2.95E+01**	**5.57E+02**	**6.23E+01**	**1.06E+03**
BAV1 Vinyl Chloride Reductase	BVC	<8.00E-01	<4.00E-01	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase	VCR	**8.90E+00**	**3.01E+01**	**4.75E+02**	**3.53E+01**	**4.70E+02**
Dehalobacter spp.	*DHBt*	**9.76E+02**	<4.20E+00	**5.04E+03**	**1.31E+02**	**1.68E+03**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client:	**Tetra Tech, Inc.**	**MI Project Number:**	**121SD**
Project:	CTO WE04 NAS JRB Willow Grove	Date Received:	04/28/2021

Sample Information

Client Sample ID:	**05MW21-20210428**
Sample Date:	04/28/2021
Units:	cells/mL
Analyst/Reviewer:	HT/CB

Dechlorinating Bacteria

Dehalococcoides	*DHC*	**5.29E+03**
tceA Reductase	TCE	**1.09E+03**
BAV1 Vinyl Chloride Reductase	BVC	<4.00E-01
Vinyl Chloride Reductase	VCR	**5.49E+02**
Dehalobacter spp.	*DHBt*	**1.99E+02**

Legend:

NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Appendix C

Support Documentation

REPORT TO:

Name:	Tricia Moore
Company:	Tetra Tech
Address:	234 Mall Boulevard Suite 260 King of Prussia, PA 19406
email:	tricia.moore@tetratech.com
Phone:	610.382.1171

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

Name:	
Company:	Tetra Tech
Address:	Foster Plaza VI 661 Anderson Drive Pittsburgh, PA 15220
email:	
Phone:	

microbialinsights
865-573-8188
www.microbe.com

Project Manager: Tricia Moore
Project Name: NASJRB Willow Grove Site 5
Project No.: 112G08005-WE04

Purchase Order No.
Subcontract No.
MI Quote No.

Please Check One:
- More samples to follow
- No Additional Samples

Report Type: □ Standard (default) □ Microbial Insights Level III raw data(15% surcharge) □ Microbial Insights Level IV (25% surcharge) □ Comprehensive Interpretive(15%) □ Historical Interpretive (30%)

EDD type: □ Microbial Insights Standard (default) □ All other available EDDs (5% surcharge) Specify EDD Type: _____

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																						
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other: TCE R DACE BAVIVCR-Dace	Other: And VCR Dace	Other:
12/SD 1	05TW01-20210427	4/27/2021	13:05	GW	2						X																		X		X	X	
2	05MW17I-20210427	4/27/2021	12:25	GW	1						X																		X		X	X	
3	05MW22-20210427	4/27/2021	15:30	GW	1						X																		X		X	X	

Relinquished by: Donald Wheeler 4/27/21 **Received by:** [signature] **Date** 4/28/2021

FedEx Tracking: 7735 6783 0985

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

REPORT TO:

Name:	Tricia Moore
Company:	Tetra Tech
Address:	234 Mall Boulevard Suite 260 King of Prussia, PA 19406
email:	tricia.moore@tetratech.com
Phone:	610.382.1171

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

Name:	
Company:	Tetra Tech
Address:	Foster Plaza VI 661 Anderson Drive Pittsburgh, PA 15220
email:	
Phone:	

microbialinsights
865-573-8188
www.microbe.com

Project Manager:	Tricia Moore
Project Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Purchase Order No.	
Subcontract No.	
MI Quote No.	

Please Check One:
- ☐ More samples to follow
- ■ No Additional Samples

Report Type: ☐ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (30%)

EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type: _____

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																							
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other: TCE R DACE BAVIVCR-Dace	Other: And VCR Dace	Other:
12ISD 4	05TW04-20210428	4/28/2021	12:35	GW	1						X																		X		X	X	
5	05MW01S-20210428	4/28/2021	13:05	GW	1						X																		X		X	X	
6	05MW21-20210428	4/28/2021	10:55	GW	1						X																		X		X	X	

Relinquished by: Donald Whalen 4/28/21 Received by: NJ Hessak Date 4/29/21

FedEx Tracking: 773580696719

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

Project/Client Information Sheet

MI ID set: 121SD **Date received: 04/28/2021**

Client informed of sample arrival:	Yes
COC contained all necessary info:	Yes
Verify analyses requested:	Yes

Special Information:

PROJECT NAME:	CTO WE04 NAS JRB Willow Grove
PROJECT #:	112G08005-WE04
Purchase Order #:	1180109
Subcontract #:	
Project Notes:	Per email from Sue Herbert on 4/28/21, project should include DHB and Level IV report. JA Samples 4-6 received 4/29/21 at 1015.

Send report to:

Company:	Tetra Tech NUS, Inc. - King of Prussia PA			
Address:	234 Mall Blvd Suite 260 King of Prussia, PA 19406			
Contact:	Tricia Moore			
Phone:		**Ext:**	**/Fax:**	
Email:	tricia.moore@tetratech.com			

Send report to:

Company:	Tetra Tech NUS, Inc. - King of Prussia PA			
Address:	234 Mall Blvd Suite 260 King of Prussia, PA 19406			
Contact:	Sue Herbert			
Phone:		**Ext:**	**/Fax:**	
Email:	Sue.Herbert@tetratech.com			

Send report to:

Company:	Tetra Tech - Pittsburgh PA			
Address:	661 Anderson Drive Foster Plaza 7 Suite 200 Pittsburgh, PA 15220			
Contact:	Amy Thomson			
Phone:	412-921-8182	**Ext:**	**/Fax:**	412-921-4040
Email:	amy.thomson@tetratech.com			

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

Project/Client Information Sheet

MI ID set: 121SD **Date received: 04/28/2021**

Client informed of sample arrival:	Yes
COC contained all necessary info:	Yes
Verify analyses requested:	Yes

Special Information:

PROJECT NAME:	CTO WE04 NAS JRB Willow Grove
PROJECT #:	112G08005-WE04
Purchase Order #:	1180109
Subcontract #:	
Project Notes:	Per email from Sue Herbert on 4/28/21, project should include DHB and Level IV report. JA Samples 4-6 received 4/29/21 at 1015.

Bill to:

Company:	Tetra Tech - Pittsburgh PA			
Address:	661 Anderson Drive Foster Plaza 7 Suite 200 Pittsburgh, PA 15220			
Contact:	Accounts Payable			
Phone:	412-320-2215	**Ext:**	**/Fax:**	412-321-2283

MC/VISA #: **Exp. Date:**

Quality Assurance/Quality Control Data

Samples Received **4/28/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/28/2021	05/05/2021	2 °C	100%	non-detect	non-detect
BVC	04/28/2021	05/05/2021	2 °C	103%	non-detect	non-detect
TCE	04/28/2021	05/05/2021	2 °C	103%	non-detect	non-detect
VCR	04/28/2021	05/05/2021	2 °C	107%	non-detect	non-detect
DHBt	04/28/2021	05/05/2021	2 °C	103%	non-detect	non-detect

Samples Received **4/29/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	04/29/2021	05/05/2021	0 °C	102%	non-detect	non-detect
BVC	04/29/2021	05/05/2021	0 °C	104%	non-detect	non-detect
TCE	04/29/2021	05/05/2021	0 °C	107%	non-detect	non-detect
VCR	04/29/2021	05/05/2021	0 °C	107%	non-detect	non-detect
DHBt	04/29/2021	05/05/2021	0 °C	103%	non-detect	non-detect

CCV Laboratory Control Recovery

Lab Name: Microbial Insights

CCV ID: 121SD-pos

File ID: 121SD.eds

Analysis	Batch Number	Original CT	CCV CT	CCV % Recovery	QC-limits
DHC	121SD	15.396	15.671	100.201	80 - 120%
BVC	121SD	20.012	20.683	103.244	80 - 120%
TCE	121SD	22.675	23.268	102.549	80 - 120%
VCR	121SD	18.785	20.225	107.120	80 - 120%
DHC	121SD	15.161	15.671	101.724	80 - 120%
BVC	121SD	19.946	20.683	103.563	80 - 120%
TCE	121SD	21.732	23.268	106.601	80 - 120%
VCR	121SD	18.785	20.225	107.120	80 - 120%
DHBt	121SD	17.995	18.585	103.175	80 - 120%

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **T. MOORE** **DATE:** **MAY 20, 2021**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –SELECT VOCs, 1,4-DIOXANE**
NAS JRB WILLOW GROVE SITE 5
SAMPLE DELIVERY GROUP (SDG) 280-147965-1

SAMPLES: 11/Aqueous/
Select VOCs, 1,4-Dioxane

05DUP01-20210427	05MW10I-20210426
05MW16S-20210426	05MW17I-20210427
05MW18I-20210427	05MW18S-20210427
05MW19I-20210426	05MW19S-20210426
05MW22-20210427	05MW23-20210427
05TW01-20210427	

1/Trip Blank
VOCs, 1,4-Dioxane

05TB01-20210426

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 280-147965-1, consisted of eleven (11) aqueous environmental samples and one (1) trip blank. All samples were analyzed for select volatile organic compounds (VOCs) and 1,4-Dioxane as referenced above. One (1) field duplicate pair (05MW17I-20210427 / 05DUP01-20210427) was included in this SDG.

The samples were collected by Tetra Tech, on April 26 and 27, 2021 and analyzed by Eurofins TestAmerica. All analyses were conducted in accordance with SW-846 Methods 8260B and 8260B SIM analytical and reporting protocols.

The data contained in this SDG were validated via EPA Stage 2B with regard to the following parameters: data completeness, holding times, GC/MS tuning, initial/continuing calibrations, laboratory method/field blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries, matrix spike / matrix spike duplicate recoveries, internal standard areas and recoveries and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

- The detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

- The VOC continuing calibration verification performed on instrument VMS_MS9 on 05/07/2021 @ 19:27 had a percent difference (%D) greater than the 20% but < 50% quality control limit for chloroethane. Samples 05MW17I-20210427, 05DUP01-20210427 and 05MW23-20210427 were affected. The detected and nondetected results reported for chloroethane in the affected samples were qualified as estimated, ((J) and (UJ), respectively.

Notes

Non-detected results were reported to the limit of detection (LOD).

Executive Summary

Laboratory Performance: One continuing calibration %D exceeded the 20% quality control limit.

Other Factors Affecting Data Quality: The results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled "Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS" (May 11, 2020). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated value with an unknown bias. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05DUP01-20210427			05MW10I-20210426			05MW16S-20210426			05MW17I-20210427		
SDG: 280-147965-1	LAB_ID	280-147965-10			280-147965-2			280-147965-1			280-147965-9		
FRACTION: OV	SAMP_DATE	4/27/2021			4/26/2021			4/26/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	05MW17I-20210427											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		7.9			0.4	U		0.4	U		7.5		
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		0.32	J	P	0.8	U		0.8	U		0.3	J	P
1,1-DICHLOROETHANE		18			0.8	U		3.6			18		
1,1-DICHLOROETHENE		11			0.8	U		0.8	U		12		
1,2-DICHLOROETHANE		0.58	J	P	0.4	U		0.4	U		0.63	J	P
BENZENE		0.37	J	P	0.4	U		0.4	U		0.37	J	P
CHLOROETHANE		1.6	UJ	C	1.6	U		1.9	J	P	1.6	UJ	C
CHLOROFORM		0.4	U		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		17			0.4	U		2.6			17		
TETRACHLOROETHENE		0.4	U		0.4	U		0.4	U		0.22	J	P
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.4	U		0.4	U	
TRICHLOROETHENE		4			0.4	U		0.4	U		4.4		
VINYL CHLORIDE		5.2			0.2	U		0.2	U		5.1		

PROJ_NO: 08005-WE04	NSAMPLE	05MW18I-20210427			05MW18S-20210427			05MW19I-20210426			05MW19S-20210426		
SDG: 280-147965-1	LAB_ID	280-147965-6			280-147965-7			280-147965-4			280-147965-3		
FRACTION: OV	SAMP_DATE	4/27/2021			4/27/2021			4/26/2021			4/26/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.4	U		19			5			15		
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1-DICHLOROETHANE		5.9			22			23			30		
1,1-DICHLOROETHENE		3.3			15			25			27		
1,2-DICHLOROETHANE		0.4	U		0.4	U		0.4	U		0.4	U	
BENZENE		0.4	U		0.58	J	P	0.4	U		0.4	J	P
CHLOROETHANE		1.6	U		1.6	U		1.6	U		1.6	U	
CHLOROFORM		0.4	U		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		3.3			25			12			27		
TETRACHLOROETHENE		0.4	U		0.4	U		1.2			0.4	U	
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.4	U		0.4	U	
TRICHLOROETHENE		1.2			4.9			11			14		
VINYL CHLORIDE		0.2	U		14			2			6.8		

PROJ_NO: 08005-WE04	NSAMPLE	05MW22-20210427			05MW23-20210427			05TB01-20210426			05TW01-20210427		
SDG: 280-147965-1	LAB_ID	280-147965-12			280-147965-11			280-147965-5			280-147965-8		
FRACTION: OV	SAMP_DATE	4/27/2021			4/27/2021			4/26/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		83			1.2			0.4	U		1		
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		1.5			0.8	U		0.8	U		0.8	U	
1,1-DICHLOROETHANE		92			18			0.8	U		4.3		
1,1-DICHLOROETHENE		23			0.8	U		0.8	U		0.8	U	
1,2-DICHLOROETHANE		0.4	U		0.36	J	P	0.4	U		0.4	U	
BENZENE		0.28	J	P	0.29	J	P	0.4	U		0.4	U	
CHLOROETHANE		5.4			11	J	C	1.6	U		1.6	U	
CHLOROFORM		0.4	U		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		140			2.6			0.4	U		2.3		
TETRACHLOROETHENE		3.2			0.4	U		0.4	U		0.4	U	
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.4	U		0.4	U	
TRICHLOROETHENE		23			0.4	U		0.4	U		0.4	U	
VINYL CHLORIDE		13			0.2	U		0.2	U		0.2	U	

PROJ_NO: 08005-WE04	NSAMPLE	05DUP01-20210427			05MW10I-20210426			05MW16S-20210426			05MW17I-20210427		
SDG: 280-147965-1	LAB_ID	280-147965-10			280-147965-2			280-147965-1			280-147965-9		
FRACTION: OVSIM	SAMP_DATE	4/27/2021			4/26/2021			4/26/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	05MW17I-20210427											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		1.2	J	P	1	U		0.59	J	P	1.3	J	P

PROJ_NO: 08005-WE04	NSAMPLE	05MW18I-20210427			05MW18S-20210427			05MW19I-20210426			05MW19S-20210426		
SDG: 280-147965-1	LAB_ID	280-147965-6			280-147965-7			280-147965-4			280-147965-3		
FRACTION: OVSIM	SAMP_DATE	4/27/2021			4/27/2021			4/26/2021			4/26/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		0.61	J	P	1.3	J	P	1.5			2.1		

PROJ_NO: 08005-WE04	NSAMPLE	05MW22-20210427			05MW23-20210427			05TB01-20210426			05TW01-20210427		
SDG: 280-147965-1	LAB_ID	280-147965-12			280-147965-11			280-147965-5			280-147965-8		
FRACTION: OVSIM	SAMP_DATE	4/27/2021			4/27/2021			4/26/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		2.6			0.81	J	P	1	U		0.34	J	P

Appendix B

Results as Reported by the Laboratory

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW16S-20210426
Lab Sample ID: 280-147965-1
Matrix: Water
Lab File ID: MS1_1469.D
Analysis Method: 8260B
Date Collected: 04/26/2021 14:40
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 14:55
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.9	J	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	2.6		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	3.6		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	90		85-114
1868-53-7	Dibromofluoromethane (Surr)	104		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
2037-26-5	Toluene-d8 (Surr)	97		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW10I-20210426
Lab Sample ID: 280-147965-2
Matrix: Water
Lab File ID: MS1_1470.D
Analysis Method: 8260B
Date Collected: 04/26/2021 16:50
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 15:17
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	90		85-114
1868-53-7	Dibromofluoromethane (Surr)	101		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	95		81-118
2037-26-5	Toluene-d8 (Surr)	97		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW19S-20210426
Lab Sample ID: 280-147965-3
Matrix: Water
Lab File ID: MS1_1471.D
Analysis Method: 8260B
Date Collected: 04/26/2021 14:45
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 15:38
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	J	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	27		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	30		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	27		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	15		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	14		1.0	0.40	0.16
75-01-4	Vinyl chloride	6.8		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	88		85-114
1868-53-7	Dibromofluoromethane (Surr)	103		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW19I-20210426
Lab Sample ID: 280-147965-4
Matrix: Water
Lab File ID: MS1_1472.D
Analysis Method: 8260B
Date Collected: 04/26/2021 16:35
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 16:00
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U M	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	12		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	23		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	25		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	1.2		1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	5.0		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	11		1.0	0.40	0.16
75-01-4	Vinyl chloride	2.0		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	89		85-114
1868-53-7	Dibromofluoromethane (Surr)	104		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		81-118
2037-26-5	Toluene-d8 (Surr)	94		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05TB01-20210426
Lab Sample ID: 280-147965-5
Matrix: Water
Lab File ID: MS1_1466.D
Analysis Method: 8260B
Date Collected: 04/26/2021 08:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 13:49
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	89		85-114
1868-53-7	Dibromofluoromethane (Surr)	101		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		81-118
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW18I-20210427
Lab Sample ID: 280-147965-6
Matrix: Water
Lab File ID: MS1_1473.D
Analysis Method: 8260B
Date Collected: 04/27/2021 10:50
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 16:21
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	3.3		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	5.9		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	3.3		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U M	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	1.2		1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	90		85-114
1868-53-7	Dibromofluoromethane (Surr)	104		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW18S-20210427
Lab Sample ID: 280-147965-7
Matrix: Water
Lab File ID: MS1_1474.D
Analysis Method: 8260B
Date Collected: 04/27/2021 10:20
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 16:43
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.58	J	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	25		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	22		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	15		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	19		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	4.9		1.0	0.40	0.16
75-01-4	Vinyl chloride	14		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	89		85-114
1868-53-7	Dibromofluoromethane (Surr)	107		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
2037-26-5	Toluene-d8 (Surr)	95		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05TW01-20210427
Lab Sample ID: 280-147965-8
Matrix: Water
Lab File ID: MS1_1475.D
Analysis Method: 8260B
Date Collected: 04/27/2021 13:05
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 17:04
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	2.3		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	4.3		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	1.0		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	88		85-114
1868-53-7	Dibromofluoromethane (Surr)	103		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	95		81-118
2037-26-5	Toluene-d8 (Surr)	97		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW17I-20210427
Lab Sample ID: 280-147965-9
Matrix: Water
Lab File ID: MS9_3471.d
Analysis Method: 8260B
Date Collected: 04/27/2021 12:25
Sample wt/vol: 5(mL)
Date Analyzed: 05/08/2021 01:07
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: RXI-624SilMS ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535401
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.37	J	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U Q	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	17		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	18		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.63	J	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	12		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.22	J	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	7.5		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.30	J	1.0	0.80	0.27
79-01-6	Trichloroethene	4.4		1.0	0.40	0.16
75-01-4	Vinyl chloride	5.1		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	95		85-114
1868-53-7	Dibromofluoromethane (Surr)	99		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
2037-26-5	Toluene-d8 (Surr)	100		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05DUP01-20210427
Lab Sample ID: 280-147965-10
Matrix: Water
Lab File ID: MS9_3472.d
Analysis Method: 8260B
Date Collected: 04/27/2021 16:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/08/2021 01:30
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: RXI-624SilMS ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535401
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.37	J	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U Q	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	17		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	18		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.58	J	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	11		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	7.9		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.32	J	1.0	0.80	0.27
79-01-6	Trichloroethene	4.0		1.0	0.40	0.16
75-01-4	Vinyl chloride	5.2		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		85-114
1868-53-7	Dibromofluoromethane (Surr)	100		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		81-118
2037-26-5	Toluene-d8 (Surr)	99		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW23-20210427
Lab Sample ID: 280-147965-11
Matrix: Water
Lab File ID: MS9_3473.d
Analysis Method: 8260B
Date Collected: 04/27/2021 14:15
Sample wt/vol: 5(mL)
Date Analyzed: 05/08/2021 01:53
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: RXI-624SilMS ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535401
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.29	J	1.0	0.40	0.16
75-00-3	Chloroethane	11	Q	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	2.6		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	18		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.36	J	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	1.2		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	97		85-114
1868-53-7	Dibromofluoromethane (Surr)	101		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		81-118
2037-26-5	Toluene-d8 (Surr)	100		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW22-20210427
Lab Sample ID: 280-147965-12
Matrix: Water
Lab File ID: MS1_1544.D
Analysis Method: 8260B
Date Collected: 04/27/2021 15:30
Sample wt/vol: 5(mL)
Date Analyzed: 05/09/2021 03:28
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535496
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.28	J	1.0	0.40	0.16
75-00-3	Chloroethane	5.4		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	140		1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	92		1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	23		1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	3.2		1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	83		1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	1.5		1.0	0.80	0.27
79-01-6	Trichloroethene	23		1.0	0.40	0.16
75-01-4	Vinyl chloride	13		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	92		85-114
1868-53-7	Dibromofluoromethane (Surr)	106		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		81-118
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW16S-20210426
Lab Sample ID: 280-147965-1
Matrix: Water
Lab File ID: E1083.D
Analysis Method: 8260B SIM
Date Collected: 04/26/2021 14:40
Sample wt/vol: 5(mL)
Date Analyzed: 05/01/2021 16:05
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534575
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.59	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW10I-20210426
Lab Sample ID: 280-147965-2
Matrix: Water
Lab File ID: E1111.D
Analysis Method: 8260B SIM
Date Collected: 04/26/2021 16:50
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 19:22
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW19S-20210426
Lab Sample ID: 280-147965-3
Matrix: Water
Lab File ID: E1084.D
Analysis Method: 8260B SIM
Date Collected: 04/26/2021 14:45
Sample wt/vol: 5(mL)
Date Analyzed: 05/01/2021 16:27
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534575
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	2.1		1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW19I-20210426
Lab Sample ID: 280-147965-4
Matrix: Water
Lab File ID: E1085.D
Analysis Method: 8260B SIM
Date Collected: 04/26/2021 16:35
Sample wt/vol: 5(mL)
Date Analyzed: 05/01/2021 16:50
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534575
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.5		1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05TB01-20210426
Lab Sample ID: 280-147965-5
Matrix: Water
Lab File ID: E1069.D
Analysis Method: 8260B SIM
Date Collected: 04/26/2021 08:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/01/2021 10:53
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534575
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW18I-20210427
Lab Sample ID: 280-147965-6
Matrix: Water
Lab File ID: E1104.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 10:50
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 16:46
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.61	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW18S-20210427
Lab Sample ID: 280-147965-7
Matrix: Water
Lab File ID: E1105.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 10:20
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 17:08
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.3	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05TW01-20210427
Lab Sample ID: 280-147965-8
Matrix: Water
Lab File ID: E1106.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 13:05
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 17:31
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.34	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW17I-20210427
Lab Sample ID: 280-147965-9
Matrix: Water
Lab File ID: E1107.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 12:25
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 17:53
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.3	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05DUP01-20210427
Lab Sample ID: 280-147965-10
Matrix: Water
Lab File ID: E1108.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 16:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 18:15
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.2	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW23-20210427
Lab Sample ID: 280-147965-11
Matrix: Water
Lab File ID: E1109.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 14:15
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 18:38
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.81	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID: 05MW22-20210427
Lab Sample ID: 280-147965-12
Matrix: Water
Lab File ID: E1110.D
Analysis Method: 8260B SIM
Date Collected: 04/27/2021 15:30
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 19:00
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	2.6		1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-127

Appendix C

Support Documentation

ANALYTE	ORIGINAL 05MW17I-20210427	DUPLICATE 05DUP01-20210427	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
1,1,1-TRICHLOROETHANE	7.5	7.9	1	5.19	FALSE	TRUE	TRUE	FALSE
1,1,2-TRICHLOROETHANE	0.3	0.32	1	6.45	FALSE	FALSE	FALSE	FALSE
1,1-DICHLOROETHANE	18	18	1	0.00	FALSE	TRUE	TRUE	FALSE
1,1-DICHLOROETHENE	12	11	1	8.70	FALSE	TRUE	TRUE	FALSE
1,2-DICHLOROETHANE	0.63	0.58	1	8.26	FALSE	FALSE	FALSE	FALSE
BENZENE	0.37	0.37	1	0.00	FALSE	FALSE	FALSE	FALSE
CIS-1,2-DICHLOROETHENE	17	17	1	0.00	FALSE	TRUE	TRUE	FALSE
TETRACHLOROETHENE	0.22	0.4	1	58.06	TRUE	FALSE	FALSE	FALSE
TRICHLOROETHENE	4.4	4	1	9.52	FALSE	TRUE	TRUE	FALSE
VINYL CHLORIDE	5.1	5.2	1.5	1.94	FALSE	TRUE	TRUE	FALSE
1,4-DIOXANE	1.3	1.2	1.4	8.00	FALSE	FALSE	FALSE	FALSE

Eurofins TestAmerica, Denver
4955 Yarrow Street

Arvada, CO 80002-4517
phone 303.736.0100 fax 303.431.7171

Chain of Custody Record

eurofins Environment Testing America

Regulatory Program: ☑ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact
Tetra Tech
234 Mall Blvd. Suite 260
King of Prussia, PA 19406
(xxx) xxx-xxxx Phone
(xxx) xxx-xxxx FAX
Project Name: NAS JRB Willow Grove
Site: Site 5
P O #

Project Manager: Tricia Moore
Email: tricia.moore@tetratech.com
Tel/Fax: 610-382-1171

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from Below
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Site Contact: Dan Whalen
Lab Contact:
Date: 4-27-21
Carrier: FedEx 773567806535

COC No:
____ of ____ COCs
TALS Project #:
Sampler:
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs	1,4-Dioxane	Sample Specific Notes:
05MW16S-20210426	4/26/21	1440	G	W	6	N	N	3	3	
05MW10I-20210426	4/26/21	1650	G	W	18	N	Y	9	9	Do MS/MSD
05MW19S-20210426	4/26/21	1445	G	W	6	N	N	3	3	
05MW19I-20210426	4/26/21	1635	G	W	6	N	N	3	3	
05TB01-20210426	4/26/21	0800	G	W	4	N	N	2	2	trip blank
05MW18I-20210427	4/27/21	1050	G	W	6	N	N	3	3	
05MW18S-20210427	↓	1020	G	W	6	N	N	3	3	
05TW01-20210427		1305	G	W	6	N	N	3	3	
05MW17I-20210427		1225	G	W	6	N	N	3	3	
05DUP01-20210427		1600	G	W	6	N	N	3	3	
05MW23-20210427		1415	G	W	6	N	N	3	3	
05MW22-20210427	↓	1530	G	W	6	N	N	3	3	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

2 2

280-147965 Chain of Custody

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.: 1595971
Cooler Temp. (°C): Obs'd: 14 Corr'd: 18 Therm ID No.: 11

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Dan Whalen	Tetra Tech	4/27/21 1930	[signature]	ETA Den	4/28/2021 930
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.35, dated 10/6/2020

Sample Summary

Client: White Water Associates
Job ID: 280-147965-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-147965-1	05MW16S-20210426	Water	04/26/21 14:40	04/28/21 09:30	
280-147965-2	05MW10I-20210426	Water	04/26/21 16:50	04/28/21 09:30	
280-147965-3	05MW19S-20210426	Water	04/26/21 14:45	04/28/21 09:30	
280-147965-4	05MW19I-20210426	Water	04/26/21 16:35	04/28/21 09:30	
280-147965-5	05TB01-20210426	Water	04/26/21 08:00	04/28/21 09:30	
280-147965-6	05MW18I-20210427	Water	04/27/21 10:50	04/28/21 09:30	
280-147965-7	05MW18S-20210427	Water	04/27/21 10:20	04/28/21 09:30	
280-147965-8	05TW01-20210427	Water	04/27/21 13:05	04/28/21 09:30	
280-147965-9	05MW17I-20210427	Water	04/27/21 12:25	04/28/21 09:30	
280-147965-10	05DUP01-20210427	Water	04/27/21 16:00	04/28/21 09:30	
280-147965-11	05MW23-20210427	Water	04/27/21 14:15	04/28/21 09:30	
280-147965-12	05MW22-20210427	Water	04/27/21 15:30	04/28/21 09:30	

CASE NARRATIVE

Client: White Water Associates

Project: Willow Grove Site 5 Long Term Monitoring

Report Number: 280-147965-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 4/28/2021 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.8º C.

VOLATILE ORGANIC COMPOUNDS (GC/MS)
Samples 05MW16S-20210426 (280-147965-1), 05MW10I-20210426 (280-147965-2), 05MW19S-20210426 (280-147965-3), 05MW19I-20210426 (280-147965-4), 05TB01-20210426 (280-147965-5), 05MW18I-20210427 (280-147965-6), 05MW18S-20210427 (280-147965-7), 05TW01-20210427 (280-147965-8), 05MW17I-20210427 (280-147965-9), 05DUP01-20210427 (280-147965-10), 05MW23-20210427 (280-147965-11) and 05MW22-20210427 (280-147965-12) were analyzed for volatile organic compounds (GC/MS) in accordance with 8260B. The samples were analyzed on 05/07/2021, 05/08/2021 and 05/09/2021.

The continuing calibration verification (CCV) associated with batch 280-535401 recovered above the upper control limit (20%D) for Chloroethane (23.2%D). The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: 05MW17I-20210427 (280-147965-9), 05DUP01-20210427 (280-147965-10), 05MW23-20210427 (280-147965-11) and (CCV 280-535401/2).

The CCVC associated with 280-535304 injected 12 minutes outside of the 12 hour tune time. The recoveries of all analytes were within control limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS SIM)
Samples 05MW16S-20210426 (280-147965-1), 05MW10I-20210426 (280-147965-2), 05MW19S-20210426 (280-147965-3), 05MW19I-20210426 (280-147965-4), 05TB01-20210426 (280-147965-5), 05MW18I-20210427 (280-147965-6), 05MW18S-20210427 (280-147965-7), 05TW01-20210427 (280-147965-8), 05MW17I-20210427 (280-147965-9), 05DUP01-20210427 (280-147965-10), 05MW23-20210427 (280-147965-11) and 05MW22-20210427 (280-147965-12) were analyzed for volatile organic compounds (GC-MS SIM) in accordance with SW846 8260B SIM. The samples were analyzed on 05/01/2021 and 05/03/2021.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: White Water Associates
Job ID: 280-147965-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: White Water Associates
Job ID: 280-147965-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Method 8260B

Volatile Organic Compounds (GC/MS) by Method 8260B

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TOL #	BFB #
05MW16S-20210426	280-147965-1	104	98	97	90
05MW10I-20210426	280-147965-2	101	95	97	90
05MW19S-20210426	280-147965-3	103	98	96	88
05MW19I-20210426	280-147965-4	104	96	94	89
05TB01-20210426	280-147965-5	101	96	96	89
05MW18I-20210427	280-147965-6	104	98	96	90
05MW18S-20210427	280-147965-7	107	98	95	89
05TW01-20210427	280-147965-8	103	95	97	88
05MW17I-20210427	280-147965-9	99	98	100	95
05DUP01-20210427	280-147965-10	100	100	99	96
05MW23-20210427	280-147965-11	101	100	100	97
05MW22-20210427	280-147965-12	106	100	96	92
	MB 280-535304/9	105	100	96	87
	MB 280-535401/8	99	99	101	96
	MB 280-535496/9	106	99	96	92
	LCS 280-535304/4	104	99	95	92
	LCS 280-535401/4	100	98	99	98
	LCS 280-535496/4	102	100	98	94
	LCSD 280-535304/5	101	96	96	89
	LCSD 280-535401/5	100	99	100	97
	LCSD 280-535496/5	103	101	96	93
05MW10I-20210426 MS	280-147965-2 MS	104	99	96	89
05MW10I-20210426 MSD	280-147965-2 MSD	105	99	95	90

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	80-119
DCA = 1,2-Dichloroethane-d4 (Surr)	81-118
TOL = Toluene-d8 (Surr)	89-112
BFB = 4-Bromofluorobenzene (Surr)	85-114

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1461.D

Lab ID: LCS 280-535304/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Benzene	25.0	21.7	87	79-120	
Chloroethane	25.0	19.7	79	60-138	
Chloroform	25.0	23.0	92	79-124	
Chloromethane	25.0	21.7	87	50-139	
cis-1,2-Dichloroethene	25.0	22.7	91	78-123	
1,1-Dichloroethane	25.0	20.6	83	77-125	
1,2-Dichloroethane	25.0	21.8	87	73-128	
1,1-Dichloroethene	25.0	22.0	88	71-131	
1,1,2,2-Tetrachloroethane	25.0	23.2	93	71-121	
Tetrachloroethene	25.0	24.9	100	74-129	
trans-1,2-Dichloroethene	25.0	22.5	90	75-124	
1,1,1-Trichloroethane	25.0	22.7	91	74-131	
1,1,2-Trichloroethane	25.0	23.8	95	80-119	
Trichloroethene	25.0	22.3	89	79-123	
Vinyl chloride	25.0	24.5	98	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS9_3459.d

Lab ID: LCS 280-535401/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Benzene	25.0	24.5	98	79-120	
Chloroethane	25.0	27.8	111	60-138	
Chloroform	25.0	25.1	101	79-124	
Chloromethane	25.0	27.0	108	50-139	
cis-1,2-Dichloroethene	25.0	25.2	101	78-123	
1,1-Dichloroethane	25.0	24.6	98	77-125	
1,2-Dichloroethane	25.0	24.8	99	73-128	
1,1-Dichloroethene	25.0	25.7	103	71-131	
1,1,2,2-Tetrachloroethane	25.0	23.7	95	71-121	
Tetrachloroethene	25.0	26.8	107	74-129	
trans-1,2-Dichloroethene	25.0	25.7	103	75-124	
1,1,1-Trichloroethane	25.0	25.7	103	74-131	
1,1,2-Trichloroethane	25.0	24.8	99	80-119	
Trichloroethene	25.0	25.7	103	79-123	
Vinyl chloride	25.0	25.7	103	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1527.D

Lab ID: LCS 280-535496/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Benzene	25.0	23.3	93	79-120	
Chloroethane	25.0	20.3	81	60-138	
Chloroform	25.0	23.9	96	79-124	
Chloromethane	25.0	24.0	96	50-139	
cis-1,2-Dichloroethene	25.0	23.7	95	78-123	
1,1-Dichloroethane	25.0	21.8	87	77-125	
1,2-Dichloroethane	25.0	23.8	95	73-128	
1,1-Dichloroethene	25.0	23.8	95	71-131	
1,1,2,2-Tetrachloroethane	25.0	22.4	90	71-121	
Tetrachloroethene	25.0	27.8	111	74-129	
trans-1,2-Dichloroethene	25.0	23.9	95	75-124	
1,1,1-Trichloroethane	25.0	23.9	96	74-131	
1,1,2-Trichloroethane	25.0	23.0	92	80-119	
Trichloroethene	25.0	23.6	95	79-123	
Vinyl chloride	25.0	24.6	98	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1462.D

Lab ID: LCSD 280-535304/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Benzene	25.0	22.4	90	3	20	79-120	
Chloroethane	25.0	20.2	81	2	20	60-138	
Chloroform	25.0	23.6	95	3	20	79-124	
Chloromethane	25.0	22.5	90	4	20	50-139	
cis-1,2-Dichloroethene	25.0	22.7	91	0	20	78-123	
1,1-Dichloroethane	25.0	21.3	85	3	20	77-125	
1,2-Dichloroethane	25.0	22.4	90	3	20	73-128	
1,1-Dichloroethene	25.0	22.5	90	2	20	71-131	
1,1,2,2-Tetrachloroethane	25.0	24.2	97	4	20	71-121	
Tetrachloroethene	25.0	27.0	108	8	20	74-129	
trans-1,2-Dichloroethene	25.0	23.1	92	3	20	75-124	
1,1,1-Trichloroethane	25.0	22.9	92	1	20	74-131	
1,1,2-Trichloroethane	25.0	25.3	101	6	20	80-119	
Trichloroethene	25.0	22.3	89	0	20	79-123	
Vinyl chloride	25.0	24.5	98	0	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS9_3460.d

Lab ID: LCSD 280-535401/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Benzene	25.0	25.1	100	2	20	79-120	
Chloroethane	25.0	26.3	105	6	20	60-138	
Chloroform	25.0	25.7	103	2	20	79-124	
Chloromethane	25.0	29.7	119	9	20	50-139	
cis-1,2-Dichloroethene	25.0	25.5	102	1	20	78-123	
1,1-Dichloroethane	25.0	25.0	100	2	20	77-125	
1,2-Dichloroethane	25.0	25.3	101	2	20	73-128	
1,1-Dichloroethene	25.0	26.0	104	1	20	71-131	
1,1,2,2-Tetrachloroethane	25.0	24.6	98	4	20	71-121	
Tetrachloroethene	25.0	27.3	109	2	20	74-129	
trans-1,2-Dichloroethene	25.0	26.0	104	1	20	75-124	
1,1,1-Trichloroethane	25.0	26.2	105	2	20	74-131	
1,1,2-Trichloroethane	25.0	25.4	102	3	20	80-119	
Trichloroethene	25.0	26.4	106	3	20	79-123	
Vinyl chloride	25.0	26.4	106	3	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1528.D

Lab ID: LCSD 280-535496/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Benzene	25.0	23.5	94	1	20	79-120	
Chloroethane	25.0	21.0	84	4	20	60-138	
Chloroform	25.0	24.5	98	2	20	79-124	
Chloromethane	25.0	23.5	94	2	20	50-139	
cis-1,2-Dichloroethene	25.0	24.8	99	4	20	78-123	
1,1-Dichloroethane	25.0	22.4	90	3	20	77-125	
1,2-Dichloroethane	25.0	23.5	94	1	20	73-128	
1,1-Dichloroethene	25.0	23.4	94	2	20	71-131	
1,1,2,2-Tetrachloroethane	25.0	21.4	86	5	20	71-121	
Tetrachloroethene	25.0	26.5	106	5	20	74-129	
trans-1,2-Dichloroethene	25.0	24.1	96	1	20	75-124	
1,1,1-Trichloroethane	25.0	24.6	98	3	20	74-131	
1,1,2-Trichloroethane	25.0	23.2	93	1	20	80-119	
Trichloroethene	25.0	22.6	90	5	20	79-123	
Vinyl chloride	25.0	25.5	102	4	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1487.D

Lab ID: 280-147965-2 MS Client ID: 05MW10I-20210426 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Benzene	25.0	0.40 U	22.4	90	79-120	
Chloroethane	25.0	1.6 U	19.3	77	60-138	
Chloroform	25.0	0.40 U	22.9	92	79-124	
Chloromethane	25.0	0.80 U	21.7	87	50-139	
cis-1,2-Dichloroethene	25.0	0.40 U	23.6	94	78-123	
1,1-Dichloroethane	25.0	0.80 U	20.6	82	77-125	
1,2-Dichloroethane	25.0	0.40 U	22.1	88	73-128	
1,1-Dichloroethene	25.0	0.80 U	22.0	88	71-131	
1,1,2,2-Tetrachloroethane	25.0	0.80 U	22.5	90	71-121	
Tetrachloroethene	25.0	0.40 U	27.8	111	74-129	
trans-1,2-Dichloroethene	25.0	0.40 U	23.4	93	75-124	
1,1,1-Trichloroethane	25.0	0.40 U	23.5	94	74-131	
1,1,2-Trichloroethane	25.0	0.80 U	23.8	95	80-119	
Trichloroethene	25.0	0.40 U	22.5	90	79-123	
Vinyl chloride	25.0	0.20 U	23.0	92	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1488.D

Lab ID: 280-147965-2 MSD Client ID: 05MW10I-20210426 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Benzene	25.0	22.1	89	1	20	79-120	
Chloroethane	25.0	19.9	79	3	20	60-138	
Chloroform	25.0	23.1	92	1	20	79-124	
Chloromethane	25.0	22.8	91	5	20	50-139	
cis-1,2-Dichloroethene	25.0	24.1	96	2	20	78-123	
1,1-Dichloroethane	25.0	21.3	85	3	20	77-125	
1,2-Dichloroethane	25.0	22.3	89	1	20	73-128	
1,1-Dichloroethene	25.0	22.6	90	3	20	71-131	
1,1,2,2-Tetrachloroethane	25.0	21.8	87	3	20	71-121	
Tetrachloroethene	25.0	27.6	111	0	20	74-129	
trans-1,2-Dichloroethene	25.0	23.1	92	1	20	75-124	
1,1,1-Trichloroethane	25.0	23.1	93	1	20	74-131	
1,1,2-Trichloroethane	25.0	24.2	97	2	20	80-119	
Trichloroethene	25.0	22.8	91	1	20	79-123	
Vinyl chloride	25.0	23.6	94	2	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS1_1463.D Lab Sample ID: MB 280-535304/9

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: VMS_MS1 Date Analyzed: 05/07/2021 12:32

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
05TB01-20210426	280-147965-5	MS1_1466.D	05/07/2021 13:49
05MW16S-20210426	280-147965-1	MS1_1469.D	05/07/2021 14:55
05MW10I-20210426	280-147965-2	MS1_1470.D	05/07/2021 15:17
05MW19S-20210426	280-147965-3	MS1_1471.D	05/07/2021 15:38
05MW19I-20210426	280-147965-4	MS1_1472.D	05/07/2021 16:00
05MW18I-20210427	280-147965-6	MS1_1473.D	05/07/2021 16:21
05MW18S-20210427	280-147965-7	MS1_1474.D	05/07/2021 16:43
05TW01-20210427	280-147965-8	MS1_1475.D	05/07/2021 17:04
05MW10I-20210426 MS	280-147965-2 MS	MS1_1487.D	05/07/2021 21:20
05MW10I-20210426 MSD	280-147965-2 MSD	MS1_1488.D	05/07/2021 21:42

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535304/9
Matrix: Water
Lab File ID: MS1_1463.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 12:32
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535304
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	87		85-114
1868-53-7	Dibromofluoromethane (Surr)	105		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		81-118
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS9_3462.d Lab Sample ID: MB 280-535401/8

Matrix: Water Heated Purge:(Y/N) Y

Instrument ID: VMS_MS9 Date Analyzed: 05/07/2021 21:29

GC Column: RXI-624SilMS ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
05MW17I-20210427	280-147965-9	MS9_3471.d	05/08/2021 01:07
05DUP01-20210427	280-147965-10	MS9_3472.d	05/08/2021 01:30
05MW23-20210427	280-147965-11	MS9_3473.d	05/08/2021 01:53

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535401/8
Matrix: Water
Lab File ID: MS9_3462.d
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 21:29
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: RXI-624SilMS ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535401
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U M	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	96		85-114
1868-53-7	Dibromofluoromethane (Surr)	99		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		81-118
2037-26-5	Toluene-d8 (Surr)	101		89-112

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS1_1530.D Lab Sample ID: MB 280-535496/9

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: VMS_MS1 Date Analyzed: 05/08/2021 22:18

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535496/4	MS1_1527.D	05/08/2021 21:14
	LCSD 280-535496/5	MS1_1528.D	05/08/2021 21:35
05MW22-20210427	280-147965-12	MS1_1544.D	05/09/2021 03:28

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535496/9
Matrix: Water
Lab File ID: MS1_1530.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/08/2021 22:18
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535496
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
460-00-4	4-Bromofluorobenzene (Surr)	92		85-114
1868-53-7	Dibromofluoromethane (Surr)	106		80-119
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		81-118
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS1_0134.D BFB Injection Date: 04/13/2021

Instrument ID: VMS_MS1 BFB Injection Time: 15:31

Analysis Batch No.: 532364

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	18.9	
75	30.0 - 60.0 % of mass 95	52.3	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.6	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	63.3	
175	5.0 - 9.0 % of mass 174	5.0	(8.0) 1
176	95.0 - 101.0 % of mass 174	61.3	(96.9) 1
177	5.0 - 9.0 % of mass 176	4.3	(7.0) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	ICV 280-532364/30	MS1_0143.D	04/13/2021	18:54
	STD005 280-532364/14	MS1_0144.D	04/13/2021	19:16
	STD010 280-532364/15	MS1_0145.D	04/13/2021	19:38
	STD020 280-532364/16	MS1_0146.D	04/13/2021	20:00
	STD050 280-532364/17	MS1_0147.D	04/13/2021	20:22
	STD10 280-532364/18	MS1_0148.D	04/13/2021	20:44
	ICIS 280-532364/19	MS1_0149.D	04/13/2021	21:06
	STD75 280-532364/31	MS1_0150.D	04/13/2021	21:28
	STD100 280-532364/20	MS1_0151.D	04/13/2021	21:50
	STD200 280-532364/21	MS1_0152.D	04/13/2021	22:12
	ICV 280-532364/22	MS1_0154.D	04/13/2021	22:57

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-532364/14	MS1_0144.D
Level 2	STD010 280-532364/15	MS1_0145.D
Level 3	STD020 280-532364/16	MS1_0146.D
Level 4	STD050 280-532364/17	MS1_0147.D
Level 5	STD10 280-532364/18	MS1_0148.D
Level 6	ICIS 280-532364/19	MS1_0149.D
Level 7	STD75 280-532364/31	MS1_0150.D
Level 8	STD100 280-532364/20	MS1_0151.D
Level 9	STD200 280-532364/21	MS1_0152.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Dichlorodifluoromethane	+++++ 0.2373	0.1734 0.2151	0.1848 0.2250	0.2696 0.1963	0.2792	Lin1	0.0443	0.2124							0.9910		0.9900
Chloromethane	+++++ 0.1637	0.1771 0.1557	0.1812 0.1601	0.1959 0.1459	0.1971	Ave		0.1721			0.1000	10.9		15.0			
Vinyl chloride	+++++ 0.1638	0.1761 0.1550	0.1537 0.1586	0.1893 0.1424	0.1880	Ave		0.1658				10.2		30.0			
Bromomethane	+++++ 0.1384	0.1650 0.1296	0.1858 0.1312	0.1870 0.1230	0.1731	Lin1	0.1137	0.1279							0.9950		0.9900
Chloroethane	+++++ 0.1365	0.1471 0.1246	0.1473 0.1276	0.1518 0.1188	0.1586	Ave		0.1390				10.3		15.0			
Dichlorofluoromethane	0.5130 0.3132	0.3936 0.2939	0.3923 0.2993	0.3817 0.2773	0.3835	Lin1	0.1648	0.2904							0.9960		0.9900
Trichlorofluoromethane	0.3396 0.3032	0.2948 0.2844	0.2892 0.2921	0.3361 0.2624	0.3404	Ave		0.3047				9.1		15.0			
Ethyl ether	0.1519 0.1345	0.1193 0.1328	0.1438 0.1343	0.1317 0.1328	0.1384	Ave		0.1355				6.6		15.0			
Acrolein	+++++ 0.0270	+++++ 0.0266	0.0374 0.0266	0.0281 0.0271	0.0282	Lin	0.0205	0.0269							1.0000		0.9900
1,1-Dichloroethene	+++++ 0.1501	0.1819 0.1463	0.1805 0.1453	0.1567 0.1343	0.1681	Ave		0.1579				11.0		30.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	+++++ 0.1041	0.0888 0.1064	0.1082 0.1018	0.1004 0.0940	0.1115	Ave		0.1019				7.3		15.0			
Acetone	0.0891 0.0489	0.0811 0.0477	0.0622 0.0452	0.0459 0.0487	0.0420	Lin1	0.0883	0.0473							0.9980		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Iodomethane	+++++ 0.2187	0.1080 0.2238	0.1419 0.2270	0.1491 0.2134	0.1984	Lin2	-0.118	0.2122							0.9900		0.9900
Carbon disulfide	+++++ 0.5033	0.5828 0.5055	0.6179 0.4980	0.4978 0.4542	0.5745	Ave		0.5292				10.5		15.0			
Methyl acetate	+++++ 0.1125	+++++ 0.1139	0.1268 0.1176	0.1109 0.1211	0.1064	Ave		0.1156				5.9		15.0			
3-Chloro-1-propene	+++++ 0.2388	0.3268 0.2310	0.3461 0.2184	0.2440 +++++	0.2729	Lin1	0.1600	0.2262							0.9970		0.9900
Methylene Chloride	0.3643 0.1817	0.2419 0.1771	0.2372 0.1784	0.1930 0.1715	0.2034	Lin2	0.0885	0.1787							0.9940		0.9900
t-Butyl alcohol	+++++ 0.0158	0.0130 0.0167	0.0121 0.0171	0.0145 0.0180	0.0133	Ave		0.0151				14.2		15.0			
Acrylonitrile	0.0697 0.0652	0.0677 0.0645	0.0611 0.0650	0.0659 0.0633	0.0655	Ave		0.0653				3.8		15.0			
Methyl tert-butyl ether	0.4446 0.4992	0.4538 0.4778	0.4712 0.5001	0.4815 0.4879	0.4841	Ave		0.4778				3.9		15.0			
trans-1,2-Dichloroethene	+++++ 0.1711	0.1770 0.1678	0.1923 0.1665	0.1705 0.1551	0.1826	Ave		0.1729				6.5		15.0			
Hexane	+++++ 1.0053	1.8586 1.0426	1.3483 1.0302	0.9253 0.9210	1.0070	Lin1	0.7536	0.9682							0.9960		0.9900
Vinyl acetate	0.2219 0.2635	0.2277 0.2566	0.2557 0.2472	0.2551 0.2425	0.2337	Ave		0.2449				5.9		15.0			
1,1-Dichloroethane	0.3531 0.3188	0.3599 0.3184	0.3528 0.3155	0.3162 0.2926	0.3492	Ave		0.3307			0.1000	7.1		15.0			
2-Butanone (MEK)	+++++ 0.0673	0.0796 0.0704	0.0591 0.0710	0.0633 0.0723	0.0607	Ave		0.0680				10.0		15.0			
cis-1,2-Dichloroethene	0.1944 0.1905	0.2432 0.1894	0.1906 0.1880	0.2043 0.1764	0.2073	Ave		0.1982				9.7		15.0			
2,2-Dichloropropane	0.3172 0.2691	0.3342 0.2633	0.2972 0.2611	0.2808 0.2389	0.3039	Ave		0.2851				10.7		15.0			
sec-Butyl Alcohol	+++++ 0.0117	0.0130 0.0121	0.0104 0.0126	0.0099 0.0128	0.0095	Ave		0.0115				12.0		15.0			
Bromochloromethane	+++++ 0.0878	0.0830 0.0833	0.1010 0.0861	0.0850 0.0823	0.0971	Ave		0.0882				7.9		15.0			
Tetrahydrofuran	+++++ 0.0473	+++++ 0.0468	0.0661 0.0468	0.0538 0.0477	0.0482	Ave		0.0510				13.9		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Chloroform	+++++ 0.3278	0.4074 0.3186	0.3731 0.3208	0.3222 0.3062	0.3629	Ave		0.3424				10.2		30.0			
1,1,1-Trichloroethane	+++++ 0.2883	0.3318 0.2860	0.3121 0.2817	0.2841 0.2647	0.3187	Ave		0.2959				7.6		15.0			
Cyclohexane	0.6482 0.2930	0.3873 0.2868	0.3704 0.2846	0.3095 0.2564	0.3262	Lin1	0.1864	0.2717							0.9960		0.9900
1,1-Dichloropropene	0.2357 0.2526	0.2480 0.2518	0.2697 0.2495	0.2413 0.2301	0.2691	Ave		0.2497				5.4		15.0			
Carbon tetrachloride	0.2351 0.2361	0.2351 0.2343	0.2443 0.2330	0.2248 0.2142	0.2513	Ave		0.2342				4.5		15.0			
Isobutyl alcohol	+++++ 0.0045	0.0043 0.0049	0.0045 0.0050	0.0041 0.0053	0.0037	Ave		0.0045				11.5		15.0			
Benzene	0.7946 0.7101	0.7588 0.7047	0.7580 0.7061	0.7107 0.6577	0.7517	Ave		0.7280				5.6		15.0			
1,2-Dichloroethane	0.3201 0.2493	0.2886 0.2517	0.2992 0.2513	0.2607 0.2471	0.2840	Ave		0.2725				9.7		15.0			
Trichloroethene	0.9575 0.9418	0.8922 0.9415	0.9536 0.9401	0.8930 0.8801	0.9699	Ave		0.9300				3.5		15.0			
2-Pentanone	+++++ 0.1055	0.0833 0.1097	0.0898 0.1138	0.0888 0.1154	0.0909	Ave		0.0996				12.8		15.0			
Methylcyclohexane	0.4168 0.2256	0.2395 0.2242	0.2685 0.2227	0.2210 0.2046	0.2355	Lin1	0.0862	0.2141							0.9980		0.9900
1,2-Dichloropropane	+++++ 0.1876	0.1991 0.1818	0.1980 0.1838	0.1834 0.1761	0.1968	Ave		0.1883				4.6		30.0			
1,4-Dioxane	+++++ 0.0020	+++++ 0.0021	0.0014 0.0023	0.0021 0.0023	0.0019	Lin2	-0.030	0.0022							0.9950		0.9900
Dibromomethane	0.1139 0.1184	0.1300 0.1134	0.1207 0.1179	0.1195 0.1183	0.1226	Ave		0.1194				4.1		15.0			
Bromodichloromethane	0.2657 0.2327	0.2858 0.2268	0.2488 0.2326	0.2376 0.2307	0.2469	Ave		0.2453				7.9		15.0			
2-Chloroethyl vinyl ether	+++++ 0.1100	0.0616 0.1071	0.0936 0.1091	0.1097 0.1104	0.1077	Lin2	-0.046	0.1119							0.9980		0.9900
cis-1,3-Dichloropropene	1.1863 1.4054	1.2940 1.3754	1.4535 1.3908	1.3239 1.3559	1.3962	Ave		1.3535				5.8		15.0			
4-Methyl-2-pentanone (MIBK)	0.1293 0.1318	0.1174 0.1335	0.1154 0.1361	0.1287 0.1363	0.1239	Ave		0.1280				6.0		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Toluene	0.8076 0.6954	0.7426 0.6917	0.6991 0.6971	0.6848 0.6589	0.7629	Ave		0.7156				6.5		30.0			
trans-1,3-Dichloropropene	0.2464 0.2670	0.2740 0.2651	0.2640 0.2676	0.2496 0.2686	0.2714	Ave		0.2637				3.6		15.0			
Ethyl methacrylate	1.5159 1.0053	1.2265 0.9998	1.1287 0.9973	1.0498 0.9981	1.0231	Lin2	0.2547	0.9960							1.0000		0.9900
1,1,2-Trichloroethane	0.1361 0.1441	0.1538 0.1418	0.1495 0.1446	0.1477 0.1446	0.1420	Ave		0.1449				3.5		15.0			
Tetrachloroethene	0.3765 0.5536	0.5136 0.5544	0.5256 0.5573	0.5181 0.5206	0.5723	Ave		0.5213				11.2		15.0			
1,3-Dichloropropane	1.2240 1.2879	1.0600 1.2680	1.1825 1.2904	1.2911 1.2743	1.2619	Ave		1.2378				6.1		15.0			
2-Hexanone	0.3641 0.4411	0.4003 0.4512	0.3590 0.4498	0.4423 0.4444	0.4171	Ave		0.4188				8.7		15.0			
Dibromochloromethane	0.6577 0.7630	0.6426 0.7419	0.7215 0.7659	0.7132 0.7742	0.7218	Ave		0.7224				6.4		15.0			
1,2-Dibromoethane (EDB)	0.6313 0.7500	0.6259 0.7418	0.6591 0.7618	0.6950 0.7576	0.7033	Ave		0.7029				7.7		15.0			
1-Chlorohexane	+++++ 1.0774	2.8039 1.0530	1.9025 1.0451	1.0863 0.9753	1.2259	Lin1	1.3718	1.0000							0.9980		0.9900
Chlorobenzene	2.1892 2.0970	2.1336 2.0748	2.1531 2.1131	2.0772 2.0199	2.1646	Ave		2.1136			0.3000	2.5		15.0			
1,1,1,2-Tetrachloroethane	0.3951 0.7460	0.6283 0.7365	0.6578 0.7555	0.6781 0.7431	0.6832	Lin2	-0.161	0.7381							0.9980		0.9900
Ethylbenzene	1.2430 1.1561	1.2583 1.1708	1.1816 1.1597	1.1133 1.0957	1.2468	Ave		1.1806				4.9		30.0			
m-Xylene & p-Xylene	1.4909 1.4299	1.5566 1.4339	1.5695 1.4339	1.4659 1.3461	1.5309	Ave		1.4731				4.9		15.0			
o-Xylene	1.3262 1.3858	1.4253 1.3799	1.4499 1.3845	1.4117 1.3131	1.4790	Ave		1.3950				3.9		15.0			
Styrene	+++++ 2.4652	2.4948 2.4337	2.5834 2.4374	2.3825 2.3294	2.6248	Ave		2.4689				4.0		15.0			
Bromoform	+++++ 0.4532	0.3835 0.4537	0.3532 0.4640	0.3789 0.4869	0.4251	Ave		0.4248			0.1000	11.2		15.0			
Isopropylbenzene	2.6561 2.3948	2.6015 2.4037	2.5398 2.3857	2.3150 2.2360	2.5297	Ave		2.4514				5.6		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Cyclohexanone	0.0314 0.0273	0.0246 0.0283	0.0289 0.0288	0.0291 0.0275	0.0276	Ave		0.0282				6.5		15.0			
1,1,2,2-Tetrachloroethane	+++++ 0.5764	0.5602 0.5779	0.6503 0.5843	0.5709 0.5904	0.5825	Ave		0.5866			0.3000	4.7		15.0			
Bromobenzene	+++++ 0.5334	0.4870 0.5282	0.5042 0.5377	0.4958 0.5275	0.5505	Ave		0.5205				4.3		15.0			
trans-1,4-Dichloro-2-butene	+++++ 0.1970	0.2045 0.1984	0.1989 0.1934	0.1956 0.1913	0.2069	Ave		0.1983				2.7		15.0			
1,2,3-Trichloropropane	+++++ 0.1794	0.1784 0.1832	0.1755 0.1835	0.1729 0.1889	0.1727	Ave		0.1793				3.1		15.0			
N-Propylbenzene	+++++ 0.6422	0.6027 0.6551	0.7120 0.6464	0.6070 0.6159	0.6753	Ave		0.6446				5.7		15.0			
2-Chlorotoluene	0.5846 0.5475	0.5516 0.5449	0.5600 0.5452	0.5133 0.5225	0.5713	Ave		0.5490				4.0		15.0			
1,3,5-Trimethylbenzene	2.3583 2.0793	2.4710 2.0943	2.2214 2.0793	2.0121 1.9582	2.1992	Ave		2.1637				7.7		15.0			
4-Chlorotoluene	0.5133 0.5718	0.5203 0.5788	0.5277 0.5697	0.5477 0.5475	0.5871	Ave		0.5515				4.9		15.0			
tert-Butylbenzene	1.5488 1.6698	1.6882 1.6948	1.7928 1.6705	1.5358 1.5903	1.7296	Ave		1.6578				5.1		15.0			
1,2,4-Trimethylbenzene	2.4528 2.1607	2.3211 2.1414	2.2531 2.1263	2.1505 2.0086	2.2277	Ave		2.2047				5.8		15.0			
sec-Butylbenzene	0.3756 0.4862	0.4771 0.4878	0.4893 0.4795	0.4607 0.4587	0.4901	Ave		0.4672				7.8		15.0			
1,3-Dichlorobenzene	1.0911 1.0486	1.0776 1.0599	1.1020 1.0480	1.0239 1.0232	1.0529	Ave		1.0586				2.6		15.0			
4-Isopropyltoluene	2.2147 2.1149	2.0908 2.1419	2.1475 2.1043	2.0199 1.9928	2.1706	Ave		2.1108				3.3		15.0			
1,4-Dichlorobenzene	1.0945 1.0637	1.0737 1.0768	1.1012 1.0715	1.0314 1.0530	1.0873	Ave		1.0726				2.0		15.0			
n-Butylbenzene	2.1418 2.0430	2.1785 2.0482	2.3939 2.0268	1.9162 1.9027	2.1777	Ave		2.0921				7.2		15.0			
1,2-Dichlorobenzene	0.8938 1.0021	1.0135 0.9981	0.9938 1.0085	0.9758 0.9851	1.0438	Ave		0.9905				4.1		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.1221	0.0715 0.1280	0.0759 0.1230	0.1175 0.1292	0.1135	Lin2	-0.061	0.1242							0.9940		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
1,2,4-Trichlorobenzene	0.5683 0.6223	0.5909 0.6192	0.6173 0.6175	0.5585 0.6190	0.6049	Ave		0.6020				4.0		15.0			
Hexachlorobutadiene	+++++ 0.2044	0.1649 0.2071	0.1995 0.2099	0.1832 0.2112	0.2079	Ave		0.1985				8.2		15.0			
Naphthalene	1.7539 1.9427	1.9352 1.9700	1.9284 1.9847	1.8717 1.9866	1.9962	Ave		1.9299				4.0		15.0			
1,2,3-Trichlorobenzene	0.5028 0.5580	0.5209 0.5628	0.5366 0.5669	0.5212 0.5681	0.5673	Ave		0.5450				4.6		15.0			
Dibromofluoromethane (Surr)	0.2693 0.2530	0.2706 0.2521	0.2667 0.2495	0.2639 0.2519	0.2634	Ave		0.2600				3.2		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3095 0.2973	0.3146 0.2946	0.3104 0.2953	0.3103 0.3035	0.3075	Ave		0.3048				2.4		15.0			
Toluene-d8 (Surr)	4.1567 4.3192	4.3183 4.3036	4.2407 4.3366	4.3308 4.3417	4.3087	Ave		4.2952				1.4		15.0			
4-Bromofluorobenzene (Surr)	1.1026 1.0783	1.1034 1.0937	1.0860 1.0749	1.1067 1.0870	1.0946	Ave		1.0919				1.0		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-532364/14	MS1_0144.D
Level 2	STD010 280-532364/15	MS1_0145.D
Level 3	STD020 280-532364/16	MS1_0146.D
Level 4	STD050 280-532364/17	MS1_0147.D
Level 5	STD10 280-532364/18	MS1_0148.D
Level 6	ICIS 280-532364/19	MS1_0149.D
Level 7	STD75 280-532364/31	MS1_0150.D
Level 8	STD100 280-532364/20	MS1_0151.D
Level 9	STD200 280-532364/21	MS1_0152.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Dichlorodifluoromethane	FB	Lin1	+++++ 237415	3229 334360	6906 460903	26334 846239	52593	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloromethane	FB	Ave	+++++ 163768	3298 242033	6770 328065	19128 629102	37124	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl chloride	FB	Ave	+++++ 163868	3279 240917	5742 324969	18485 613780	35410	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromomethane	FB	Lin1	+++++ 138469	3073 201510	6941 268788	18264 530226	32600	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloroethane	FB	Ave	+++++ 136586	2739 193762	5504 261500	14823 512404	29877	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dichlorofluoromethane	FB	Lin1	4886 313362	7328 456961	14658 613109	37273 1195800	72241	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichlorofluoromethane	FB	Ave	3235 303365	5489 442237	10807 598464	32819 1131463	64119	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl ether	FB	Ave	1447 134624	2222 206539	5372 275245	12859 572791	26071	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acrolein	FB	Lin	+++++ 267217	+++++ 408163	13809 538966	27053 1152940	52399	+++++ 494	+++++ 741	19.8 988	49.4 1975	98.8
1,1-Dichloroethene	FB	Ave	+++++ 150196	3386 227385	6744 297711	15302 578863	31666	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloro-1,2,2-trifluoroethane	FB	Ave	+++++ 104129	1654 165446	4043 208634	9802 405491	21010	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acetone	FB	Lin1	3396 195785	6041 296874	9294 370612	17938 840182	31637	2.00 200	4.00 300	8.00 400	20.0 800	40.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Iodomethane	FB	Lin2	+++++ 218804	2010 347928	5303 465065	14564 920123	37366	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon disulfide	FB	Ave	+++++ 503591	10851 785878	23091 1020366	48612 1958484	108208	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methyl acetate	FB	Ave	+++++ 225145	+++++ 354029	9474 482067	21661 1043921	40067	+++++ 100	+++++ 150	4.00 200	10.0 400	20.0
3-Chloro-1-propene	FB	Lin1	+++++ 238972	6085 359114	12931 447526	23832 +++++	51413	+++++ 50.0	1.00 75.0	2.00 100	5.00 +++++	10.0
Methylene Chloride	FB	Lin2	3470 181842	4504 275347	8863 365561	18849 739586	38314	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
t-Butyl alcohol	FB	Ave	+++++ 157648	2429 260347	4516 350183	14174 774095	25102	+++++ 500	10.0 750	20.0 1000	50.0 2000	100
Acrylonitrile	FB	Ave	6642 652669	12609 1003437	22820 1332152	64328 2730960	123336	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Methyl tert-butyl ether	FB	Ave	4235 499509	8449 742857	17607 1024679	47026 2103890	91183	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,2-Dichloroethene	FB	Ave	+++++ 171226	3296 260944	7185 341097	16656 668919	34402	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexane	CBNZ d5	Lin1	+++++ 205297	7245 333056	10602 434460	18749 825210	39971	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl acetate	FB	Ave	4227 527301	8480 797959	19107 1012996	49822 2091413	88034	1.00 100	2.00 150	4.00 200	10.0 400	20.0
1,1-Dichloroethane	FB	Ave	3363 319004	6702 494984	13183 646463	30878 1261819	65775	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Butanone (MEK)	FB	Ave	+++++ 269177	5931 437984	8835 582029	24733 1247601	45736	+++++ 200	4.00 300	8.00 400	20.0 800	40.0
cis-1,2-Dichloroethene	FB	Ave	1852 190639	4528 294389	7122 385071	19950 760561	39050	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2,2-Dichloropropane	FB	Ave	3021 269251	6223 409284	11105 534947	27419 1030259	57251	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butyl Alcohol	FB	Ave	+++++ 281030	5812 450687	9319 620309	23283 1327689	43020	+++++ 1200	24.0 1800	48.0 2400	120 4800	240
Bromochloromethane	FB	Ave	+++++ 87832	1545 129573	3774 176345	8303 355017	18284	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrahydrofuran	FB	Ave	+++++	+++++	4942	10502	18172	+++++	+++++	4.00	10.0	20.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			94743	145629	191816	411388		100	150	200	400	
Chloroform	FB	Ave	+++++ 328048	7585 495263	13940 657239	31466 1320058	68357	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1-Trichloroethane	FB	Ave	+++++ 288473	6178 444673	11664 577242	27742 1141332	60041	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexane	FB	Lin1	6174 293198	7212 445878	13840 583076	30226 1105588	61442	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1-Dichloropropene	FB	Ave	2245 252727	4617 391444	10077 511241	23566 992124	50685	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon tetrachloride	FB	Ave	2239 236272	4378 364260	9130 477330	21951 923587	47340	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isobutyl alcohol	FB	Ave	+++++ 111929	1983 189688	4163 258350	10085 568005	17298	+++++ 1250	25.0 1875	50.0 2500	125 5000	250
Benzene	FB	Ave	7568 710501	14128 1095642	28326 1446634	69408 2835877	141599	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloroethane	FB	Ave	3049 249416	5374 391364	11179 514932	25462 1065489	53500	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichloroethene	CBNZ d5	Ave	1958 192326	3478 300745	7498 396469	18096 788542	38496	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Pentanone	FB	Ave	+++++ 337782	4961 545563	10732 746381	27745 1592677	54789	+++++ 160	3.20 240	6.40 320	16.0 640	32.0
Methylcyclohexane	FB	Lin1	3970 225711	4459 348599	10034 456172	21582 882091	44367	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloropropane	FB	Ave	+++++ 187766	3707 282637	7398 376583	17908 759414	37076	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dioxane	FB	Lin2	+++++ 40818	+++++ 66580	1042 93301	4181 197583	7214	+++++ 1000	+++++ 1500	40.0 2000	100 4000	200
Dibromomethane	FB	Ave	1085 118493	2421 176346	4512 241512	11666 510076	23089	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromodichloromethane	FB	Ave	2531 232817	5322 352572	9296 476485	23200 994769	46511	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Chloroethyl vinyl ether	FB	Lin2	+++++ 110063	1147 166548	3496 223471	10716 475960	20295	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	2426	5044	11429	26826	55417	0.500	1.00	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			287001	439369	586551	1214890		50.0	75.0	100	200	
4-Methyl-2-pentanone (MIBK)	FB	Ave	4925 527397	8745 830175	17244 1115661	50258 2351578	93348	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Toluene	FB	Ave	7692 695793	13826 1075358	26122 1428290	66879 2841182	143701	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,3-Dichloropropene	FB	Ave	2347 267188	5101 412095	9865 548337	24377 1158242	51114	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl methacrylate	CBNZ d5	Lin2	3100 205303	4781 319380	8875 420614	21272 894268	40609	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloroethane	FB	Ave	1296 144204	2863 220482	5586 296291	14423 623525	26746	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrachloroethene	CBNZ d5	Ave	770 113044	2002 177104	4133 235052	10498 466486	22717	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichloropropane	CBNZ d5	Ave	2503 262994	4132 405040	9298 544206	26162 1141773	50088	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Hexanone	CBNZ d5	Ave	2978 360345	6242 576589	11291 758775	35848 1592730	66223	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Dibromochloromethane	CBNZ d5	Ave	1345 155812	2505 236992	5673 323010	14451 693630	28649	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	1291 153166	2440 236959	5183 321268	14083 678839	27914	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1-Chlorohexane	CBNZ d5	Lin1	+++++ 176015	8744 269104	11968 352602	17610 699110	38926	+++++ 40.0	0.800 60.0	1.60 80.0	4.00 160	8.00
Chlorobenzene	CBNZ d5	Ave	4477 428226	8317 662763	16930 891192	42090 1809785	85916	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Lin2	808 152340	2449 235254	5172 318611	13740 665785	27116	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Ethylbenzene	CBNZ d5	Ave	2542 236095	4905 374009	9291 489109	22559 981736	49486	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	3049 292001	6068 458051	12341 604730	29703 1206132	60762	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
o-Xylene	CBNZ d5	Ave	2712 282996	5556 440788	11401 583909	28605 1176560	58702	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Styrene	CBNZ d5	Ave	+++++ 503416	9725 777421	20314 1027954	48278 2087135	104181	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromoform	CBNZ d5	Ave	+++++ 92558	1495 144921	2777 195689	7677 436273	16874	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isopropylbenzene	DCBd 4	Ave	8600 760057	16346 1176968	31571 1560059	74292 3088120	157477	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexanone	CBNZ d5	Ave	2570 223358	3836 361690	9081 485284	23623 985925	43888	20.0 2000	40.0 3000	80.0 4000	200 8000	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	+++++ 182952	3520 282950	8083 382077	18320 815368	36262	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromobenzene	DCBd 4	Ave	+++++ 169290	3060 258631	6267 351609	15912 728493	34268	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	+++++ 62519	1285 97169	2473 126488	6277 264166	12878	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	+++++ 56941	1121 89720	2182 119974	5548 260821	10753	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
N-Propylbenzene	DCBd 4	Ave	+++++ 203829	3787 320773	8851 422715	19480 850608	42036	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
2-Chlorotoluene	DCBd 4	Ave	1893 173754	3466 266797	6961 356509	16471 721651	35565	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	7636 659943	15526 1025464	27613 1359719	64570 2704401	136902	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Chlorotoluene	DCBd 4	Ave	1662 181482	3269 283394	6560 372529	17577 756095	36549	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
tert-Butylbenzene	DCBd 4	Ave	5015 529955	10607 829839	22285 1092371	49286 2196349	107667	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	7942 685755	14584 1048526	28008 1390480	69011 2774073	138679	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butylbenzene	DCBd 4	Ave	1216 154319	2998 238830	6082 313541	14785 633548	30507	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	3533 332796	6771 518980	13698 685306	32857 1413169	65542	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Isopropyltoluene	DCBd 4	Ave	7171 671223	13137 1048770	26695 1376084	64820 2752286	135124	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	3544 337597	6746 527240	13689 700709	33097 1454218	67683	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
n-Butylbenzene	DCBd 4	Ave	6935 648415	13688 1002909	29758 1325409	61494 2627750	135565	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	2894 318039	6368 488714	12353 659490	31313 1360540	64978	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Lin2	+++++ 38746	449 62696	944 80429	3772 178447	7068	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
1,2,4-Trichlorobenzene	DCBd 4	Ave	1840 197510	3713 303178	7673 403794	17923 854934	37656	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexachlorobutadiene	DCBd 4	Ave	+++++ 64883	1036 101403	2480 137277	5879 291741	12942	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Naphthalene	DCBd 4	Ave	5679 616577	12159 964627	23971 1297850	60064 2743627	124268	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	1628 177104	3273 275571	6670 370723	16725 784659	35314	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dibromofluoromethane (Surr)	FB	Ave	256539 253177	251959 261291	249111 255596	257707 271499	248033	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	294797 297451	292850 305387	289960 302488	303072 327125	289637	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
Toluene-d8 (Surr)	CBNZ d5	Ave	850057 882033	841672 916486	833635 914448	877563 972537	855082	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	356995 342224	346642 357030	337488 351466	355158 375324	340705	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0

Curve Type Legend
Ave = Average ISTD
Lin = Linear ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-532364/22 Calibration Date: 04/13/2021 22:57

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_0154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.1713		40.1	50.0	-19.7	20.0
Chloromethane	Ave	0.1721	0.1529	0.1000	44.4	50.0	-11.1	20.0
Vinyl chloride	Ave	0.1658	0.1574		47.5	50.0	-5.1	20.0
Bromomethane	Lin1		0.1479		56.9	50.0	13.9	20.0
Chloroethane	Ave	0.1390	0.1307		47.0	50.0	-6.0	20.0
Dichlorofluoromethane	Lin1		0.3239		55.2	50.0	10.4	20.0
Trichlorofluoromethane	Ave	0.3047	0.2823		46.3	50.0	-7.4	20.0
Ethyl ether	Ave	0.1355	0.1329		49.0	50.0	-1.9	20.0
Acrolein	Lin		0.0141		257	494	-47.9*	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.0980		48.1	50.0	-3.8	20.0
1,1-Dichloroethene	Ave	0.1579	0.1395		44.2	50.0	-11.6	20.0
Acetone	Lin1		0.0461		193	200	-3.5	20.0
Iodomethane	Lin2		0.1903		45.4	50.0	-9.2	20.0
Carbon disulfide	Ave	0.5292	0.4797		45.3	50.0	-9.4	20.0
Methyl acetate	Ave	0.1156	0.1192		103	100	3.2	20.0
3-Chloro-1-propene	Lin1		0.2265		49.4	50.0	-1.3	20.0
Methylene Chloride	Lin2		0.1747		48.4	50.0	-3.2	20.0
t-Butyl alcohol	Ave	0.0151	0.0158		524	500	4.9	20.0
Acrylonitrile	Ave	0.0653	0.0643		492	500	-1.6	20.0
Methyl tert-butyl ether	Ave	0.4778	0.4693		49.1	50.0	-1.8	20.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1562		45.2	50.0	-9.7	20.0
Hexane	Lin1		0.9148		46.5	50.0	-7.1	20.0
Vinyl acetate	Ave	0.2449	0.1891		77.2	100	-22.8*	20.0
1,1-Dichloroethane	Ave	0.3307	0.2981	0.1000	45.1	50.0	-9.9	20.0
2-Butanone (MEK)	Ave	0.0680	0.0671		197	200	-1.3	20.0
2,2-Dichloropropane	Ave	0.2851	0.2343		41.1	50.0	-17.8	20.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1792		45.2	50.0	-9.6	20.0
sec-Butyl Alcohol	Ave	0.0115	0.0114		1190	1200	-1.2	20.0
Bromochloromethane	Ave	0.0882	0.0791		44.9	50.0	-10.3	20.0
Tetrahydrofuran	Ave	0.0510	0.0470		92.2	100	-7.8	20.0
Chloroform	Ave	0.3424	0.2989		43.7	50.0	-12.7	20.0
1,1,1-Trichloroethane	Ave	0.2959	0.2612		44.1	50.0	-11.7	20.0
Cyclohexane	Lin1		0.2660		48.3	50.0	-3.5	20.0
1,1-Dichloropropene	Ave	0.2497	0.2277		45.6	50.0	-8.8	20.0
Carbon tetrachloride	Ave	0.2342	0.2131		45.5	50.0	-9.0	20.0
Isobutyl alcohol	Ave	0.0045	0.0047		1290	1250	3.2	20.0
Benzene	Ave	0.7280	0.6620		45.5	50.0	-9.1	20.0
1,2-Dichloroethane	Ave	0.2725	0.2453		45.0	50.0	-10.0	20.0
Trichloroethene	Ave	0.9300	0.8866		47.7	50.0	-4.7	20.0
2-Pentanone	Ave	0.0996	0.1041		167	160	4.5	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-532364/22 Calibration Date: 04/13/2021 22:57

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_0154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Lin1		0.1975		45.7	50.0	-8.5	20.0
1,2-Dichloropropane	Ave	0.1883	0.1729		45.9	50.0	-8.2	20.0
1,4-Dioxane	Lin2		0.0021		950	1000	-5.0	20.0
Dibromomethane	Ave	0.1194	0.1145		48.0	50.0	-4.1	20.0
Bromodichloromethane	Ave	0.2453	0.2181		44.5	50.0	-11.1	20.0
2-Chloroethyl vinyl ether	Lin2		0.1089		49.1	50.0	-1.8	20.0
cis-1,3-Dichloropropene	Ave	1.353	1.292		47.7	50.0	-4.5	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1282		200	200	0.1	20.0
Toluene	Ave	0.7156	0.6358		44.4	50.0	-11.1	20.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2494		47.3	50.0	-5.5	20.0
Ethyl methacrylate	Lin2		0.9617		48.0	50.0	-4.0	20.0
1,1,2-Trichloroethane	Ave	0.1449	0.1395		48.1	50.0	-3.7	20.0
Tetrachloroethene	Ave	0.5213	0.4974		47.7	50.0	-4.6	20.0
1,3-Dichloropropane	Ave	1.238	1.217		49.2	50.0	-1.6	20.0
2-Hexanone	Ave	0.4188	0.4372		209	200	4.4	20.0
Dibromochloromethane	Ave	0.7224	0.7103		49.2	50.0	-1.7	20.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7095		50.5	50.0	0.9	20.0
1-Chlorohexane	Lin1		0.9939		38.4	40.0	-4.0	20.0
Chlorobenzene	Ave	2.114	1.958	0.3000	46.3	50.0	-7.4	20.0
1,1,1,2-Tetrachloroethane	Lin2		0.6881		46.8	50.0	-6.3	20.0
Ethylbenzene	Ave	1.181	1.056		44.7	50.0	-10.5	20.0
m-Xylene & p-Xylene	Ave	1.473	1.341		45.5	50.0	-8.9	20.0
o-Xylene	Ave	1.395	1.308		46.9	50.0	-6.2	20.0
Styrene	Ave	2.469	2.309		46.8	50.0	-6.5	20.0
Bromoform	Ave	0.4248	0.4299	0.1000	50.6	50.0	1.2	20.0
Isopropylbenzene	Ave	2.451	2.182		44.5	50.0	-11.0	20.0
Cyclohexanone	Ave	0.0282	0.0276		1960	2000	-2.2	20.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5607	0.3000	47.8	50.0	-4.4	20.0
Bromobenzene	Ave	0.5205	0.5024		48.3	50.0	-3.5	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1969		49.7	50.0	-0.7	20.0
1,2,3-Trichloropropane	Ave	0.1793	0.1795		50.1	50.0	0.1	20.0
N-Propylbenzene	Ave	0.6446	0.5955		46.2	50.0	-7.6	20.0
2-Chlorotoluene	Ave	0.5490	0.5021		45.7	50.0	-8.5	20.0
1,3,5-Trimethylbenzene	Ave	2.164	1.939		44.8	50.0	-10.4	20.0
4-Chlorotoluene	Ave	0.5515	0.5302		48.1	50.0	-3.9	20.0
tert-Butylbenzene	Ave	1.658	1.563		47.1	50.0	-5.7	20.0
1,2,4-Trimethylbenzene	Ave	2.205	2.031		46.1	50.0	-7.9	20.0
sec-Butylbenzene	Ave	0.4672	0.4480		47.9	50.0	-4.1	20.0
1,3-Dichlorobenzene	Ave	1.059	0.9896		46.7	50.0	-6.5	20.0
4-Isopropyltoluene	Ave	2.111	1.953		46.3	50.0	-7.5	20.0
1,4-Dichlorobenzene	Ave	1.073	1.001		46.7	50.0	-6.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-532364/22 Calibration Date: 04/13/2021 22:57

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_0154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.092	1.856		44.4	50.0	-11.3	20.0
1,2-Dichlorobenzene	Ave	0.9905	0.9617		48.5	50.0	-2.9	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1153		46.9	50.0	-6.1	20.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.5817		48.3	50.0	-3.4	20.0
Hexachlorobutadiene	Ave	0.1985	0.1917		48.3	50.0	-3.5	20.0
Naphthalene	Ave	1.930	1.941		50.3	50.0	0.6	20.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5380		49.4	50.0	-1.3	20.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2512		48.3	50.0	-3.4	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.3073		50.4	50.0	0.8	20.0
Toluene-d8 (Surr)	Ave	4.295	4.269		49.7	50.0	-0.6	20.0
4-Bromofluorobenzene (Surr)	Ave	1.092	1.104		50.6	50.0	1.1	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS1_1457-BFB.d BFB Injection Date: 05/07/2021

Instrument ID: VMS_MS1 BFB Injection Time: 09:51

Analysis Batch No.: 535304

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	17.8	
75	30.0 - 60.0 % of mass 95	53.3	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.6	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	69.8	
175	5.0 - 9.0 % of mass 174	5.0	(7.2) 1
176	95.0 - 101.0 % of mass 174	68.3	(97.8) 1
177	5.0 - 9.0 % of mass 176	4.3	(6.3) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535304/2	MS1_1457.D	05/07/2021	9:51
	CCV 280-535304/13	MS1_1459.D	05/07/2021	10:50
	LCS 280-535304/4	MS1_1461.D	05/07/2021	11:35
	LCSD 280-535304/5	MS1_1462.D	05/07/2021	11:57
	MB 280-535304/9	MS1_1463.D	05/07/2021	12:32
05TB01-20210426	280-147965-5	MS1_1466.D	05/07/2021	13:49
05MW16S-20210426	280-147965-1	MS1_1469.D	05/07/2021	14:55
05MW10I-20210426	280-147965-2	MS1_1470.D	05/07/2021	15:17
05MW19S-20210426	280-147965-3	MS1_1471.D	05/07/2021	15:38
05MW19I-20210426	280-147965-4	MS1_1472.D	05/07/2021	16:00
05MW18I-20210427	280-147965-6	MS1_1473.D	05/07/2021	16:21
05MW18S-20210427	280-147965-7	MS1_1474.D	05/07/2021	16:43
05TW01-20210427	280-147965-8	MS1_1475.D	05/07/2021	17:04
05MW10I-20210426 MS	280-147965-2 MS	MS1_1487.D	05/07/2021	21:20
05MW10I-20210426 MSD	280-147965-2 MSD	MS1_1488.D	05/07/2021	21:42
	CCVC 280-535304/40	MS1_1489.D	05/07/2021	22:03

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535304/2 Calibration Date: 05/07/2021 09:51

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1457.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.1355	0.1236		45.6	50.0	-8.8	20.0
Acrolein	Lin		0.0233		426	494	-13.7	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.1293		63.4	50.0	26.8*	20.0
1,1-Dichloroethene	Ave	0.1579	0.1631		51.6	50.0	3.3	20.0
Acetone	Lin1		0.0370		155	200	-22.7*	20.0
Iodomethane	Lin2		0.1936		46.2	50.0	-7.6	20.0
Carbon disulfide	Ave	0.5292	0.4830		45.6	50.0	-8.7	20.0
Methyl acetate	Ave	0.1156	0.0932		80.6	100	-19.4	20.0
3-Chloro-1-propene	Lin1		0.2048		44.6	50.0	-10.8	20.0
Methylene Chloride	Lin2		0.1783		49.4	50.0	-1.2	20.0
t-Butyl alcohol	Ave	0.0151	0.0127		421	500	-15.9	20.0
Acrylonitrile	Ave	0.0653	0.0535		409	500	-18.2	20.0
Methyl tert-butyl ether	Ave	0.4778	0.4566		47.8	50.0	-4.4	20.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1715		49.6	50.0	-0.8	20.0
Hexane	Lin1		0.9303		47.3	50.0	-5.5	20.0
Vinyl acetate	Ave	0.2449	0.2530		103	100	3.3	20.0
1,1-Dichloroethane	Ave	0.3307	0.2820	0.1000	42.6	50.0	-14.7	20.0
2-Butanone (MEK)	Ave	0.0680	0.0597		176	200	-12.2	20.0
2,2-Dichloropropane	Ave	0.2851	0.2590		45.4	50.0	-9.2	20.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1893		47.7	50.0	-4.5	20.0
sec-Butyl Alcohol	Ave	0.0115	0.0083		867	1200	-27.7*	20.0
Bromochloromethane	Ave	0.0882	0.0887		50.3	50.0	0.6	20.0
Tetrahydrofuran	Ave	0.0510	0.0395		77.4	100	-22.6*	20.0
Chloroform	Ave	0.3424	0.3219		47.0	50.0	-6.0	20.0
1,1,1-Trichloroethane	Ave	0.2959	0.2863		48.4	50.0	-3.2	20.0
Cyclohexane	Lin1		0.2577		46.7	50.0	-6.5	20.0
1,1-Dichloropropene	Ave	0.2497	0.2433		48.7	50.0	-2.6	20.0
Carbon tetrachloride	Ave	0.2342	0.2174		46.4	50.0	-7.2	20.0
Isobutyl alcohol	Ave	0.0045	0.0039		1070	1250	-14.4	20.0
Benzene	Ave	0.7280	0.6761		46.4	50.0	-7.1	20.0
1,2-Dichloroethane	Ave	0.2725	0.2394		43.9	50.0	-12.1	20.0
Trichloroethene	Ave	0.9300	0.8739		47.0	50.0	-6.0	20.0
2-Pentanone	Ave	0.0996	0.0940		151	160	-5.7	20.0
Methylcyclohexane	Lin1		0.1901		44.0	50.0	-12.0	20.0
1,2-Dichloropropane	Ave	0.1883	0.1586		42.1	50.0	-15.8	20.0
1,4-Dioxane	Lin2		0.0022		989	1000	-1.1	20.0
Dibromomethane	Ave	0.1194	0.1192		49.9	50.0	-0.2	20.0
Bromodichloromethane	Ave	0.2453	0.2187		44.6	50.0	-10.9	20.0
cis-1,3-Dichloropropene	Ave	1.353	1.150		42.5	50.0	-15.1	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1162		182	200	-9.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535304/2 Calibration Date: 05/07/2021 09:51

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1457.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toluene	Ave	0.7156	0.6818		47.6	50.0	-4.7	20.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2318		43.9	50.0	-12.1	20.0
Ethyl methacrylate	Lin2		0.8329		41.6	50.0	-16.9	20.0
1,1,2-Trichloroethane	Ave	0.1449	0.1498		51.7	50.0	3.4	20.0
Tetrachloroethene	Ave	0.5213	0.6146		58.9	50.0	17.9	20.0
1,3-Dichloropropane	Ave	1.238	1.153		46.6	50.0	-6.8	20.0
2-Hexanone	Ave	0.4188	0.3735		178	200	-10.8	20.0
Dibromochloromethane	Ave	0.7224	0.6837		47.3	50.0	-5.4	20.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7393		52.6	50.0	5.2	20.0
1-Chlorohexane	Lin1		0.9756		37.7	40.0	-5.9	20.0
Chlorobenzene	Ave	2.114	2.096	0.3000	49.6	50.0	-0.8	20.0
1,1,1,2-Tetrachloroethane	Lin2		0.6878		46.8	50.0	-6.4	20.0
Ethylbenzene	Ave	1.181	1.161		49.2	50.0	-1.7	20.0
m-Xylene & p-Xylene	Ave	1.473	1.415		48.0	50.0	-3.9	20.0
o-Xylene	Ave	1.395	1.388		49.8	50.0	-0.5	20.0
Styrene	Ave	2.469	2.424		49.1	50.0	-1.8	20.0
Bromoform	Ave	0.4248	0.3608	0.1000	42.5	50.0	-15.1	20.0
Isopropylbenzene	Ave	2.451	2.234		45.6	50.0	-8.9	20.0
Cyclohexanone	Ave	0.0282	0.0311		2210	2000	10.3	20.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5644	0.3000	48.1	50.0	-3.8	20.0
Bromobenzene	Ave	0.5205	0.5464		52.5	50.0	5.0	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1459		36.8	50.0	-26.4*	20.0
1,2,3-Trichloropropane	Ave	0.1793	0.1757		49.0	50.0	-2.0	20.0
N-Propylbenzene	Ave	0.6446	0.6078		47.1	50.0	-5.7	20.0
2-Chlorotoluene	Ave	0.5490	0.5280		48.1	50.0	-3.8	20.0
1,3,5-Trimethylbenzene	Ave	2.164	1.965		45.4	50.0	-9.2	20.0
4-Chlorotoluene	Ave	0.5515	0.5587		50.6	50.0	1.3	20.0
tert-Butylbenzene	Ave	1.658	1.581		47.7	50.0	-4.6	20.0
1,2,4-Trimethylbenzene	Ave	2.205	2.014		45.7	50.0	-8.7	20.0
sec-Butylbenzene	Ave	0.4672	0.4559		48.8	50.0	-2.4	20.0
1,3-Dichlorobenzene	Ave	1.059	1.046		49.4	50.0	-1.2	20.0
4-Isopropyltoluene	Ave	2.111	2.010		47.6	50.0	-4.8	20.0
1,4-Dichlorobenzene	Ave	1.073	1.080		50.3	50.0	0.7	20.0
n-Butylbenzene	Ave	2.092	1.766		42.2	50.0	-15.6	20.0
1,2-Dichlorobenzene	Ave	0.9905	1.002		50.6	50.0	1.2	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0974		39.7	50.0	-20.6*	20.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.6039		50.2	50.0	0.3	20.0
Hexachlorobutadiene	Ave	0.1985	0.2277		57.3	50.0	14.7	20.0
Naphthalene	Ave	1.930	1.759		45.6	50.0	-8.8	20.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5496		50.4	50.0	0.8	20.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2662		51.2	50.0	2.4	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535304/2 Calibration Date: 05/07/2021 09:51

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1457.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.3059		50.2	50.0	0.4	20.0
Toluene-d8 (Surr)	Ave	4.295	4.090		47.6	50.0	-4.8	20.0
4-Bromofluorobenzene (Surr)	Ave	1.092	0.9749		44.6	50.0	-10.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535304/13 Calibration Date: 05/07/2021 10:50

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1459.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2392		56.1	50.0	12.2	20.0
Chloromethane	Ave	0.1721	0.1583	0.1000	46.0	50.0	-8.0	20.0
Vinyl chloride	Ave	0.1658	0.1715		51.7	50.0	3.4	20.0
Bromomethane	Lin1		0.1209		46.4	50.0	-7.2	20.0
Chloroethane	Ave	0.1390	0.1209		43.5	50.0	-13.1	20.0
Dichlorofluoromethane	Lin1		0.3060		52.1	50.0	4.2	20.0
Trichlorofluoromethane	Ave	0.3047	0.3290		54.0	50.0	8.0	20.0
2-Chloroethyl vinyl ether	Lin2		0.0826		37.3	50.0	-25.4*	20.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2689		51.7	50.0	3.4	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.2999		49.2	50.0	-1.6	20.0
Toluene-d8 (Surr)	Ave	4.295	4.070		47.4	50.0	-5.2	20.0
4-Bromofluorobenzene (Surr)	Ave	1.092	0.9835		45.0	50.0	-9.9	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535304/40 Calibration Date: 05/07/2021 22:03

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1489.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2189		51.3	50.0	2.7	50.0
Chloromethane	Ave	0.1721	0.1527	0.1000	44.4	50.0	-11.2	50.0
Vinyl chloride	Ave	0.1658	0.1654		49.9	50.0	-0.2	50.0
Bromomethane	Lin1		0.1273		48.9	50.0	-2.2	50.0
Chloroethane	Ave	0.1390	0.1138		40.9	50.0	-18.2	50.0
Dichlorofluoromethane	Lin1		0.2954		50.3	50.0	0.6	50.0
Trichlorofluoromethane	Ave	0.3047	0.3150		51.7	50.0	3.4	50.0
Ethyl ether	Ave	0.1355	0.1160		42.8	50.0	-14.4	50.0
1,1-Dichloroethene	Ave	0.1579	0.1434		45.4	50.0	-9.2	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.1124		55.1	50.0	10.3	50.0
Acetone	Lin1		0.0416		174	200	-13.1	50.0
Iodomethane	Lin2		0.2132		50.8	50.0	1.6	50.0
Carbon disulfide	Ave	0.5292	0.4074		38.5	50.0	-23.0	50.0
Methyl acetate	Ave	0.1156	0.0953		82.4	100	-17.6	50.0
3-Chloro-1-propene	Lin1		0.1794		39.0	50.0	-22.1	50.0
Methylene Chloride	Lin2		0.1692		46.8	50.0	-6.3	50.0
t-Butyl alcohol	Ave	0.0151	0.0139		460	500	-8.0	50.0
Acrylonitrile	Ave	0.0653	0.0545		417	500	-16.5	50.0
Methyl tert-butyl ether	Ave	0.4778	0.4621		48.4	50.0	-3.3	50.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1649		47.7	50.0	-4.6	50.0
Hexane	Lin1		0.6885		34.8	50.0	-30.4	50.0
1,1-Dichloroethane	Ave	0.3307	0.2739	0.1000	41.4	50.0	-17.2	50.0
Vinyl acetate	Ave	0.2449	0.1483		60.6	100	-39.4	50.0
2-Butanone (MEK)	Ave	0.0680	0.0636		187	200	-6.5	50.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1886		47.6	50.0	-4.9	50.0
2,2-Dichloropropane	Ave	0.2851	0.2183		38.3	50.0	-23.4	50.0
sec-Butyl Alcohol	Ave	0.0115	0.0090		939	1200	-21.7	50.0
Bromochloromethane	Ave	0.0882	0.0864		49.0	50.0	-2.1	50.0
Tetrahydrofuran	Ave	0.0510	0.0526		103	100	3.1	50.0
Chloroform	Ave	0.3424	0.3334		48.7	50.0	-2.6	50.0
1,1,1-Trichloroethane	Ave	0.2959	0.2889		48.8	50.0	-2.4	50.0
Cyclohexane	Lin1		0.2362		42.8	50.0	-14.4	50.0
1,1-Dichloropropene	Ave	0.2497	0.2325		46.5	50.0	-6.9	50.0
Carbon tetrachloride	Ave	0.2342	0.2245		47.9	50.0	-4.2	50.0
Isobutyl alcohol	Ave	0.0045	0.0039		1060	1250	-14.9	50.0
Benzene	Ave	0.7280	0.6661		45.7	50.0	-8.5	50.0
1,2-Dichloroethane	Ave	0.2725	0.2513		46.1	50.0	-7.8	50.0
Trichloroethene	Ave	0.9300	0.9583		51.5	50.0	3.0	50.0
2-Pentanone	Ave	0.0996	0.0984		158	160	-1.3	50.0
Methylcyclohexane	Lin1		0.1808		41.8	50.0	-16.3	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535304/40 Calibration Date: 05/07/2021 22:03

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1489.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2-Dichloropropane	Ave	0.1883	0.1619		43.0	50.0	-14.0	50.0
1,4-Dioxane	Lin2		0.0024		1090	1000	9.0	50.0
Dibromomethane	Ave	0.1194	0.1255		52.5	50.0	5.1	50.0
Bromodichloromethane	Ave	0.2453	0.2290		46.7	50.0	-6.6	50.0
2-Chloroethyl vinyl ether	Lin2		0.0881		39.8	50.0	-20.5	50.0
cis-1,3-Dichloropropene	Ave	1.353	1.147		42.4	50.0	-15.3	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1231		192	200	-3.8	50.0
Toluene	Ave	0.7156	0.7063		49.4	50.0	-1.3	50.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2362		44.8	50.0	-10.4	50.0
Ethyl methacrylate	Lin2		0.8867		44.3	50.0	-11.5	50.0
1,1,2-Trichloroethane	Ave	0.1449	0.1555		53.6	50.0	7.3	50.0
Tetrachloroethene	Ave	0.5213	0.6066		58.2	50.0	16.4	50.0
1,3-Dichloropropane	Ave	1.238	1.220		49.3	50.0	-1.5	50.0
2-Hexanone	Ave	0.4188	0.3884		185	200	-7.3	50.0
Dibromochloromethane	Ave	0.7224	0.7277		50.4	50.0	0.7	50.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7692		54.7	50.0	9.4	50.0
1-Chlorohexane	Lin1		0.9735		37.6	40.0	-6.1	50.0
Chlorobenzene	Ave	2.114	2.177	0.3000	51.5	50.0	3.0	50.0
1,1,1,2-Tetrachloroethane	Lin2		0.7441		50.6	50.0	1.2	50.0
Ethylbenzene	Ave	1.181	1.170		49.5	50.0	-0.9	50.0
m-Xylene & p-Xylene	Ave	1.473	1.461		49.6	50.0	-0.8	50.0
o-Xylene	Ave	1.395	1.436		51.5	50.0	3.0	50.0
Styrene	Ave	2.469	2.469		50.0	50.0	-0.0	50.0
Bromoform	Ave	0.4248	0.3937	0.1000	46.3	50.0	-7.3	50.0
Isopropylbenzene	Ave	2.451	2.311		47.1	50.0	-5.7	50.0
Cyclohexanone	Ave	0.0282	0.0247		1750	2000	-12.5	50.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5369	0.3000	45.8	50.0	-8.5	50.0
Bromobenzene	Ave	0.5205	0.5745		55.2	50.0	10.4	50.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1481		37.4	50.0	-25.3	50.0
1,2,3-Trichloropropane	Ave	0.1793	0.1823		50.8	50.0	1.7	50.0
N-Propylbenzene	Ave	0.6446	0.6311		49.0	50.0	-2.1	50.0
2-Chlorotoluene	Ave	0.5490	0.5545		50.5	50.0	1.0	50.0
1,3,5-Trimethylbenzene	Ave	2.164	2.044		47.2	50.0	-5.5	50.0
4-Chlorotoluene	Ave	0.5515	0.5856		53.1	50.0	6.2	50.0
tert-Butylbenzene	Ave	1.658	1.665		50.2	50.0	0.4	50.0
1,2,4-Trimethylbenzene	Ave	2.205	2.087		47.3	50.0	-5.3	50.0
sec-Butylbenzene	Ave	0.4672	0.4686		50.1	50.0	0.3	50.0
1,3-Dichlorobenzene	Ave	1.059	1.096		51.8	50.0	3.5	50.0
4-Isopropyltoluene	Ave	2.111	2.038		48.3	50.0	-3.5	50.0
1,4-Dichlorobenzene	Ave	1.073	1.135		52.9	50.0	5.8	50.0
n-Butylbenzene	Ave	2.092	1.749		41.8	50.0	-16.4	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535304/40 Calibration Date: 05/07/2021 22:03

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1489.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2-Dichlorobenzene	Ave	0.9905	1.072		54.1	50.0	8.2	50.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1106		45.0	50.0	-10.0	50.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.6172		51.3	50.0	2.5	50.0
Hexachlorobutadiene	Ave	0.1985	0.2222		56.0	50.0	11.9	50.0
Naphthalene	Ave	1.930	1.918		49.7	50.0	-0.6	50.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5835		53.5	50.0	7.1	50.0
Acrolein	Lin				8.00	494	-100.0*	50.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2627		50.5	50.0	1.0	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.2956		48.5	50.0	-3.0	50.0
Toluene-d8 (Surr)	Ave	4.295	4.086		47.6	50.0	-4.9	50.0
4-Bromofluorobenzene (Surr)	Ave	1.092	0.9830		45.0	50.0	-10.0	50.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS1_1524.D BFB Injection Date: 05/08/2021

Instrument ID: VMS_MS1 BFB Injection Time: 20:11

Analysis Batch No.: 535496

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	18.7	
75	30.0 - 60.0 % of mass 95	55.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	7.1	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.5	
175	5.0 - 9.0 % of mass 174	5.5	(8.0) 1
176	95.0 - 101.0 % of mass 174	67.1	(98.0) 1
177	5.0 - 9.0 % of mass 176	4.2	(6.2) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535496/2	MS1_1525.D	05/08/2021	20:32
	LCS 280-535496/4	MS1_1527.D	05/08/2021	21:14
	LCSD 280-535496/5	MS1_1528.D	05/08/2021	21:35
	MB 280-535496/9	MS1_1530.D	05/08/2021	22:18
05MW22-20210427	280-147965-12	MS1_1544.D	05/09/2021	3:28
	CCVC 280-535496/34	MS1_1551.D	05/09/2021	5:56

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535496/2 Calibration Date: 05/08/2021 20:32

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1525.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2329		54.6	50.0	9.2	20.0
Chloromethane	Ave	0.1721	0.1594	0.1000	46.3	50.0	-7.4	20.0
Vinyl chloride	Ave	0.1658	0.1698		51.2	50.0	2.4	20.0
Bromomethane	Lin1		0.1343		51.6	50.0	3.2	20.0
Chloroethane	Ave	0.1390	0.1207		43.4	50.0	-13.2	20.0
Dichlorofluoromethane	Lin1		0.3126		53.3	50.0	6.5	20.0
Trichlorofluoromethane	Ave	0.3047	0.3212		52.7	50.0	5.4	20.0
Ethyl ether	Ave	0.1355	0.1183		43.6	50.0	-12.7	20.0
Acrolein	Lin		0.0249		455	494	-7.8	20.0
1,1-Dichloroethene	Ave	0.1579	0.1503		47.6	50.0	-4.8	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.1187		58.2	50.0	16.5	20.0
Acetone	Lin1		0.0340		142	200	-29.0*	20.0
Iodomethane	Lin2		0.2007		47.8	50.0	-4.3	20.0
Carbon disulfide	Ave	0.5292	0.4837		45.7	50.0	-8.6	20.0
Methyl acetate	Ave	0.1156	0.0841		72.8	100	-27.2*	20.0
3-Chloro-1-propene	Lin1		0.2123		46.2	50.0	-7.6	20.0
Methylene Chloride	Lin2		0.1779		49.3	50.0	-1.4	20.0
t-Butyl alcohol	Ave	0.0151	0.0101		336	500	-32.7*	20.0
Acrylonitrile	Ave	0.0653	0.0499		382	500	-23.6*	20.0
Methyl tert-butyl ether	Ave	0.4778	0.4387		45.9	50.0	-8.2	20.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1705		49.3	50.0	-1.4	20.0
Hexane	Lin1		0.9103		46.2	50.0	-7.5	20.0
Vinyl acetate	Ave	0.2449	0.2675		109	100	9.2	20.0
1,1-Dichloroethane	Ave	0.3307	0.2985	0.1000	45.1	50.0	-9.8	20.0
2-Butanone (MEK)	Ave	0.0680	0.0517		152	200	-23.9*	20.0
2,2-Dichloropropane	Ave	0.2851	0.2713		47.6	50.0	-4.8	20.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1933		48.8	50.0	-2.5	20.0
sec-Butyl Alcohol	Ave	0.0115	0.0067		703	1200	-41.4*	20.0
Bromochloromethane	Ave	0.0882	0.0896		50.8	50.0	1.6	20.0
Tetrahydrofuran	Ave	0.0510	0.0353		69.3	100	-30.7*	20.0
Chloroform	Ave	0.3424	0.3284		48.0	50.0	-4.1	20.0
1,1,1-Trichloroethane	Ave	0.2959	0.2932		49.5	50.0	-0.9	20.0
Cyclohexane	Lin1		0.2592		47.0	50.0	-6.0	20.0
1,1-Dichloropropene	Ave	0.2497	0.2460		49.2	50.0	-1.5	20.0
Carbon tetrachloride	Ave	0.2342	0.2188		46.7	50.0	-6.6	20.0
Isobutyl alcohol	Ave	0.0045	0.0032		874	1250	-30.0*	20.0
Benzene	Ave	0.7280	0.6916		47.5	50.0	-5.0	20.0
1,2-Dichloroethane	Ave	0.2725	0.2504		46.0	50.0	-8.1	20.0
Trichloroethene	Ave	0.9300	0.8862		47.6	50.0	-4.7	20.0
2-Pentanone	Ave	0.0996	0.0820		132	160	-17.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535496/2 Calibration Date: 05/08/2021 20:32

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1525.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Lin1		0.1973		45.7	50.0	-8.6	20.0
1,2-Dichloropropane	Ave	0.1883	0.1629		43.3	50.0	-13.5	20.0
1,4-Dioxane	Lin2		0.0018		829	1000	-17.1	20.0
Dibromomethane	Ave	0.1194	0.1187		49.7	50.0	-0.6	20.0
Bromodichloromethane	Ave	0.2453	0.2242		45.7	50.0	-8.6	20.0
2-Chloroethyl vinyl ether	Lin2		0.0855		38.6	50.0	-22.8*	20.0
cis-1,3-Dichloropropene	Ave	1.353	1.155		42.7	50.0	-14.7	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1011		158	200	-21.0*	20.0
Toluene	Ave	0.7156	0.6947		48.5	50.0	-2.9	20.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2324		44.1	50.0	-11.9	20.0
Ethyl methacrylate	Lin2		0.7697		38.4	50.0	-23.2*	20.0
1,1,2-Trichloroethane	Ave	0.1449	0.1392		48.0	50.0	-3.9	20.0
Tetrachloroethene	Ave	0.5213	0.5871		56.3	50.0	12.6	20.0
1,3-Dichloropropane	Ave	1.238	1.123		45.4	50.0	-9.2	20.0
2-Hexanone	Ave	0.4188	0.3198		153	200	-23.6*	20.0
Dibromochloromethane	Ave	0.7224	0.6358		44.0	50.0	-12.0	20.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.6937		49.3	50.0	-1.3	20.0
1-Chlorohexane	Lin1		0.9522		36.7	40.0	-8.2	20.0
Chlorobenzene	Ave	2.114	2.055	0.3000	48.6	50.0	-2.8	20.0
1,1,1,2-Tetrachloroethane	Lin2		0.6675		45.4	50.0	-9.1	20.0
Ethylbenzene	Ave	1.181	1.139		48.2	50.0	-3.5	20.0
m-Xylene & p-Xylene	Ave	1.473	1.419		48.2	50.0	-3.6	20.0
o-Xylene	Ave	1.395	1.381		49.5	50.0	-1.0	20.0
Styrene	Ave	2.469	2.392		48.4	50.0	-3.1	20.0
Bromoform	Ave	0.4248	0.3242	0.1000	38.2	50.0	-23.7*	20.0
Isopropylbenzene	Ave	2.451	2.336		47.7	50.0	-4.7	20.0
Cyclohexanone	Ave	0.0282	0.0229		1220	1500	-18.8	20.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5158	0.3000	44.0	50.0	-12.1	20.0
Bromobenzene	Ave	0.5205	0.5452		52.4	50.0	4.7	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1327		33.5	50.0	-33.1*	20.0
1,2,3-Trichloropropane	Ave	0.1793	0.1631		45.5	50.0	-9.0	20.0
N-Propylbenzene	Ave	0.6446	0.6429		49.9	50.0	-0.3	20.0
2-Chlorotoluene	Ave	0.5490	0.5431		49.5	50.0	-1.1	20.0
1,3,5-Trimethylbenzene	Ave	2.164	2.029		46.9	50.0	-6.2	20.0
4-Chlorotoluene	Ave	0.5515	0.5720		51.9	50.0	3.7	20.0
tert-Butylbenzene	Ave	1.658	1.660		50.1	50.0	0.1	20.0
1,2,4-Trimethylbenzene	Ave	2.205	2.099		47.6	50.0	-4.8	20.0
sec-Butylbenzene	Ave	0.4672	0.4571		48.9	50.0	-2.2	20.0
1,3-Dichlorobenzene	Ave	1.059	1.071		50.6	50.0	1.2	20.0
4-Isopropyltoluene	Ave	2.111	2.071		49.0	50.0	-1.9	20.0
1,4-Dichlorobenzene	Ave	1.073	1.086		50.6	50.0	1.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535496/2 Calibration Date: 05/08/2021 20:32

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1525.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.092	1.876		44.8	50.0	-10.3	20.0
1,2-Dichlorobenzene	Ave	0.9905	1.008		50.9	50.0	1.7	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0954		38.9	50.0	-22.2*	20.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.5878		48.8	50.0	-2.4	20.0
Hexachlorobutadiene	Ave	0.1985	0.2165		54.5	50.0	9.1	20.0
Naphthalene	Ave	1.930	1.651		42.8	50.0	-14.4	20.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5319		48.8	50.0	-2.4	20.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2639		50.7	50.0	1.5	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.3037		49.8	50.0	-0.3	20.0
Toluene-d8 (Surr)	Ave	4.295	4.050		47.1	50.0	-5.7	20.0
4-Bromofluorobenzene (Surr)	Ave	1.092	1.019		46.7	50.0	-6.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535496/34 Calibration Date: 05/09/2021 05:56

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1551.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2352		55.2	50.0	10.4	50.0
Chloromethane	Ave	0.1721	0.1638	0.1000	47.6	50.0	-4.8	50.0
Vinyl chloride	Ave	0.1658	0.1731		52.2	50.0	4.4	50.0
Bromomethane	Lin1		0.0967		36.9	50.0	-26.2	50.0
Chloroethane	Ave	0.1390	0.1184		42.6	50.0	-14.9	50.0
Dichlorofluoromethane	Lin1		0.3088		52.6	50.0	5.2	50.0
Trichlorofluoromethane	Ave	0.3047	0.3281		53.8	50.0	7.7	50.0
Ethyl ether	Ave	0.1355	0.1204		44.4	50.0	-11.1	50.0
Acrolein	Lin		0.0248		453	494	-8.2	50.0
1,1-Dichloroethene	Ave	0.1579	0.1620		51.3	50.0	2.6	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.1267		62.2	50.0	24.3	50.0
Acetone	Lin1		0.0391		163	200	-18.3	50.0
Iodomethane	Lin2		0.1704		40.7	50.0	-18.6	50.0
Carbon disulfide	Ave	0.5292	0.5084		48.0	50.0	-3.9	50.0
Methyl acetate	Ave	0.1156	0.0920		79.6	100	-20.4	50.0
3-Chloro-1-propene	Lin1		0.1552		33.6	50.0	-32.8	50.0
Methylene Chloride	Lin2		0.1821		50.5	50.0	0.9	50.0
t-Butyl alcohol	Ave	0.0151	0.0123		408	500	-18.5	50.0
Acrylonitrile	Ave	0.0653	0.0546		418	500	-16.5	50.0
Methyl tert-butyl ether	Ave	0.4778	0.4650		48.7	50.0	-2.7	50.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1760		50.9	50.0	1.8	50.0
Hexane	Lin1		0.9163		46.5	50.0	-6.9	50.0
Vinyl acetate	Ave	0.2449	0.2339		95.5	100	-4.5	50.0
1,1-Dichloroethane	Ave	0.3307	0.3047	0.1000	46.1	50.0	-7.9	50.0
2-Butanone (MEK)	Ave	0.0680	0.0581		171	200	-14.5	50.0
2,2-Dichloropropane	Ave	0.2851	0.2531		44.4	50.0	-11.2	50.0
cis-1,2-Dichloroethene	Ave	0.1982	0.2040		51.5	50.0	2.9	50.0
sec-Butyl Alcohol	Ave	0.0115	0.0079		829	1200	-30.9	50.0
Bromochloromethane	Ave	0.0882	0.0921		52.2	50.0	4.5	50.0
Tetrahydrofuran	Ave	0.0510	0.0374		73.4	100	-26.6	50.0
Chloroform	Ave	0.3424	0.3451		50.4	50.0	0.8	50.0
1,1,1-Trichloroethane	Ave	0.2959	0.3144		53.1	50.0	6.2	50.0
Cyclohexane	Lin1		0.2748		49.9	50.0	-0.2	50.0
1,1-Dichloropropene	Ave	0.2497	0.2662		53.3	50.0	6.6	50.0
Carbon tetrachloride	Ave	0.2342	0.2383		50.9	50.0	1.7	50.0
Isobutyl alcohol	Ave	0.0045	0.0037		1030	1250	-17.4	50.0
Benzene	Ave	0.7280	0.7170		49.2	50.0	-1.5	50.0
1,2-Dichloroethane	Ave	0.2725	0.2636		48.4	50.0	-3.2	50.0
Trichloroethene	Ave	0.9300	0.9732		52.3	50.0	4.6	50.0
2-Pentanone	Ave	0.0996	0.0927		149	160	-7.0	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535496/34 Calibration Date: 05/09/2021 05:56

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1551.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Lin1		0.2126		49.3	50.0	-1.5	50.0
1,2-Dichloropropane	Ave	0.1883	0.1691		44.9	50.0	-10.2	50.0
1,4-Dioxane	Lin2		0.0022		1000	1000	0.5	50.0
Dibromomethane	Ave	0.1194	0.1234		51.7	50.0	3.3	50.0
Bromodichloromethane	Ave	0.2453	0.2344		47.8	50.0	-4.4	50.0
2-Chloroethyl vinyl ether	Lin2		0.0891		40.2	50.0	-19.5	50.0
cis-1,3-Dichloropropene	Ave	1.353	1.232		45.5	50.0	-9.0	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1136		178	200	-11.2	50.0
Toluene	Ave	0.7156	0.7252		50.7	50.0	1.3	50.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2369		44.9	50.0	-10.2	50.0
Ethyl methacrylate	Lin2		0.8710		43.5	50.0	-13.1	50.0
1,1,2-Trichloroethane	Ave	0.1449	0.1454		50.2	50.0	0.3	50.0
Tetrachloroethene	Ave	0.5213	0.6183		59.3	50.0	18.6	50.0
1,3-Dichloropropane	Ave	1.238	1.226		49.5	50.0	-0.9	50.0
2-Hexanone	Ave	0.4188	0.3657		175	200	-12.7	50.0
Dibromochloromethane	Ave	0.7224	0.7109		49.2	50.0	-1.6	50.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7564		53.8	50.0	7.6	50.0
1-Chlorohexane	Lin1		1.059		41.0	40.0	2.5	50.0
Chlorobenzene	Ave	2.114	2.221	0.3000	52.5	50.0	5.1	50.0
1,1,1,2-Tetrachloroethane	Lin2		0.7442		50.6	50.0	1.3	50.0
Ethylbenzene	Ave	1.181	1.222		51.8	50.0	3.5	50.0
m-Xylene & p-Xylene	Ave	1.473	1.520		51.6	50.0	3.2	50.0
o-Xylene	Ave	1.395	1.443		51.7	50.0	3.4	50.0
Styrene	Ave	2.469	2.503		50.7	50.0	1.4	50.0
Bromoform	Ave	0.4248	0.3601	0.1000	42.4	50.0	-15.2	50.0
Isopropylbenzene	Ave	2.451	2.475		50.5	50.0	0.9	50.0
Cyclohexanone	Ave	0.0282	0.0263		1400	1500	-6.8	50.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5519	0.3000	47.0	50.0	-5.9	50.0
Bromobenzene	Ave	0.5205	0.5554		53.4	50.0	6.7	50.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1422		35.9	50.0	-28.3	50.0
1,2,3-Trichloropropane	Ave	0.1793	0.1843		51.4	50.0	2.8	50.0
N-Propylbenzene	Ave	0.6446	0.6585		51.1	50.0	2.2	50.0
2-Chlorotoluene	Ave	0.5490	0.5607		51.1	50.0	2.1	50.0
1,3,5-Trimethylbenzene	Ave	2.164	2.095		48.4	50.0	-3.2	50.0
4-Chlorotoluene	Ave	0.5515	0.5933		53.8	50.0	7.6	50.0
tert-Butylbenzene	Ave	1.658	1.708		51.5	50.0	3.0	50.0
1,2,4-Trimethylbenzene	Ave	2.205	2.155		48.9	50.0	-2.2	50.0
sec-Butylbenzene	Ave	0.4672	0.4842		51.8	50.0	3.6	50.0
1,3-Dichlorobenzene	Ave	1.059	1.097		51.8	50.0	3.6	50.0
4-Isopropyltoluene	Ave	2.111	2.139		50.7	50.0	1.3	50.0
1,4-Dichlorobenzene	Ave	1.073	1.108		51.6	50.0	3.3	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535496/34 Calibration Date: 05/09/2021 05:56

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1551.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.092	1.912		45.7	50.0	-8.6	50.0
1,2-Dichlorobenzene	Ave	0.9905	1.033		52.1	50.0	4.3	50.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1103		44.9	50.0	-10.2	50.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.6049		50.2	50.0	0.5	50.0
Hexachlorobutadiene	Ave	0.1985	0.2250		56.7	50.0	13.3	50.0
Naphthalene	Ave	1.930	1.826		47.3	50.0	-5.4	50.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5518		50.6	50.0	1.3	50.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2615		50.3	50.0	0.5	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.2982		48.9	50.0	-2.1	50.0
Toluene-d8 (Surr)	Ave	4.295	4.137		48.2	50.0	-3.7	50.0
4-Bromofluorobenzene (Surr)	Ave	1.092	1.015		46.5	50.0	-7.0	50.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS9_3371.d BFB Injection Date: 05/06/2021

Instrument ID: VMS_MS9 BFB Injection Time: 08:51

Analysis Batch No.: 535102

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	21.8	
75	30.0 - 60.0 % of mass 95	52.2	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	8.2	
173	Less than 2.0 % of mass 174	0.6	(0.8) 1
174	Greater than 50% of mass 95	77.8	
175	5.0 - 9.0 % of mass 174	6.9	(8.9) 1
176	95.0 - 101.0 % of mass 174	75.6	(97.2) 1
177	5.0 - 9.0 % of mass 176	6.1	(8.1) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 280-535102/13	MS9_3374.d	05/06/2021	10:13
	IC 280-535102/14	MS9_3375.d	05/06/2021	10:36
	IC 280-535102/15	MS9_3376.d	05/06/2021	10:59
	IC 280-535102/16	MS9_3377.d	05/06/2021	11:23
	IC 280-535102/17	MS9_3378.d	05/06/2021	11:46
	ICIS 280-535102/18	MS9_3379.d	05/06/2021	12:09
	IC 280-535102/19	MS9_3380.d	05/06/2021	12:32
	IC 280-535102/20	MS9_3381.d	05/06/2021	12:55
	IC 280-535102/21	MS9_3382.d	05/06/2021	13:18
	ICV 280-535102/22	MS9_3384.d	05/06/2021	13:55
	ICV 280-535102/23	MS9_3385.d	05/06/2021	14:36

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-535102/13	MS9_3374.d
Level 2	IC 280-535102/14	MS9_3375.d
Level 3	IC 280-535102/15	MS9_3376.d
Level 4	IC 280-535102/16	MS9_3377.d
Level 5	IC 280-535102/17	MS9_3378.d
Level 6	ICIS 280-535102/18	MS9_3379.d
Level 7	IC 280-535102/19	MS9_3380.d
Level 8	IC 280-535102/20	MS9_3381.d
Level 9	IC 280-535102/21	MS9_3382.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Dichlorodifluoromethane	0.2429 0.2341	0.2713 0.2314	0.2460 0.2305	0.2737 0.2274	0.2936	Lin1	0.0451	0.2308							0.9980		0.9900
Chloromethane	+++++ 0.2555	0.2972 0.2383	0.2759 0.2442	0.3482 0.2345	0.3544	Lin1	0.1737	0.2409			0.1000				0.9930		0.9900
Vinyl chloride	+++++ 0.2561	0.3286 0.2466	0.2990 0.2403	0.2693 0.2326	0.3099	Ave		0.2728				13.0		30.0			
Bromomethane	+++++ 0.0569	0.0526 0.0654	0.0687 0.0793	0.0693 0.0786	0.0573	Ave		0.0660				15.0		15.0			
Chloroethane	+++++ 0.1450	0.1915 0.1374	0.1739 0.1343	0.1611 0.1207	0.1599	Lin2	0.0579	0.1396							0.9920		0.9900
Dichlorofluoromethane	+++++ 0.3715	+++++ 0.3563	0.4736 0.3498	0.4381 0.3317	0.4379	Ave		0.3941				13.9		15.0			
Trichlorofluoromethane	+++++ 0.2777	+++++ 0.2611	0.3460 0.2567	0.3319 +++++	0.3550	Ave		0.3047				14.6		15.0			
Ethyl ether	0.2234 0.1891	0.2215 0.1801	0.2174 0.1760	0.2222 0.1760	0.2149	Ave		0.2023				10.6		15.0			
Acrolein	+++++ 0.0264	0.0395 0.0268	0.0364 0.0267	0.0316 0.0281	0.0278	Qua	0.2265	0.0253	0.0000013						1.0000		0.9900
1,1-Dichloroethene	0.1893 0.1779	0.2120 0.1726	0.1907 0.1803	0.2136 0.1887	0.2040	Ave		0.1921				7.7		30.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	0.1308 0.1400	0.1714 0.1379	0.1450 0.1459	0.1718 0.1485	0.1664	Ave		0.1509				10.1		15.0			
Acetone	0.1435 0.0774	0.1227 0.0754	0.1042 0.0716	0.0956 0.0724	0.0884	Lin1	0.1997	0.0732							0.9980		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Iodomethane	+++++ 0.2069	0.0758 0.2411	0.0878 0.2598	0.1250 +++++	0.1682	Qua	-0.159	0.1679	0.0009467						1.0000		0.9900
Carbon disulfide	0.8587 0.5489	0.7834 0.5340	0.6290 0.5475	0.6511 0.5710	0.6203	Lin2	0.1581	0.5706							0.9950		0.9900
Methyl acetate	+++++ 0.1850	0.2731 0.1798	0.2421 0.1709	0.2244 0.1711	0.2061	Lin2	0.1980	0.1837							0.9940		0.9900
3-Chloro-1-propene	0.3418 0.3195	0.4114 0.3029	0.3474 0.3001	0.3669 +++++	0.3616	Ave		0.3439				10.8		15.0			
Methylene Chloride	0.4208 0.2275	0.3466 0.2165	0.2906 0.2186	0.2796 0.2219	0.2621	Lin2	0.0996	0.2334							0.9930		0.9900
t-Butyl alcohol	0.0392 0.0317	0.0396 0.0309	0.0422 0.0291	0.0389 0.0291	0.0353	Ave		0.0351				14.4		15.0			
Acrylonitrile	0.1140 0.0934	0.1192 0.0914	0.1126 0.0868	0.1072 0.0845	0.1023	Ave		0.1013				12.6		15.0			
Methyl tert-butyl ether	0.7759 0.6600	0.7879 0.6403	0.7572 0.6246	0.7587 0.6191	0.7346	Ave		0.7065				9.8		15.0			
trans-1,2-Dichloroethene	0.2493 0.2122	0.2505 0.2061	0.2271 0.2059	0.2437 0.2118	0.2382	Ave		0.2272				8.2		15.0			
Hexane	1.3863 1.0660	1.4547 1.0407	1.1252 1.0681	1.3095 1.0835	1.2654	Ave		1.1999				13.0		15.0			
Vinyl acetate	+++++ 0.4692	0.6065 0.4433	0.5636 0.4201	0.5487 0.3973	0.5283	Lin1	0.6844	0.4181							0.9950		0.9900
1,1-Dichloroethane	0.4864 0.4019	0.4822 0.3897	0.4456 0.3883	0.4681 0.3919	0.4511	Ave		0.4339			0.1000	9.5		15.0			
2-Butanone (MEK)	0.1844 0.1185	0.1780 0.1152	0.1574 0.1089	0.1390 0.1098	0.1316	Lin1	0.2488	0.1115							0.9980		0.9900
cis-1,2-Dichloroethene	0.2942 0.2412	0.2904 0.2333	0.2595 0.2337	0.2769 0.2422	0.2684	Ave		0.2600				9.1		15.0			
2,2-Dichloropropane	0.3860 0.3218	0.4168 0.3112	0.3609 0.3135	0.3865 0.3183	0.3654	Ave		0.3534				11.0		15.0			
sec-Butyl Alcohol	0.0296 0.0243	0.0302 0.0237	0.0320 0.0225	0.0283 0.0228	0.0267	Ave		0.0267				13.2		15.0			
Bromochloromethane	0.1403 0.1151	0.1436 0.1082	0.1381 0.1064	0.1419 0.1065	0.1378	Ave		0.1264				13.3		15.0			
Tetrahydrofuran	0.1529 0.0874	0.1419 0.0866	0.1246 0.0815	0.1033 0.0835	0.0980	Lin1	0.1064	0.0839							0.9990		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Chloroform	0.4423 0.3784	0.4750 0.3640	0.4212 0.3627	0.4354 0.3681	0.4234	Ave		0.4078				10.0		30.0			
1,1,1-Trichloroethane	0.3719 0.3229	0.4049 0.3145	0.3571 0.3225	0.3849 0.3306	0.3699	Ave		0.3532				9.1		15.0			
Cyclohexane	0.4277 0.3613	0.4924 0.3568	0.3840 0.3719	0.4397 0.3869	0.4211	Ave		0.4046				11.0		15.0			
1,1-Dichloropropene	0.3281 0.3039	0.3830 0.2980	0.3280 0.3061	0.3635 0.3161	0.3493	Ave		0.3307				8.8		15.0			
Carbon tetrachloride	0.2830 0.2680	0.3199 0.2648	0.2626 0.2762	0.3092 0.2831	0.3004	Ave		0.2853				7.1		15.0			
Isobutyl alcohol	0.0148 0.0137	0.0139 0.0135	0.0167 0.0128	0.0155 0.0130	0.0142	Ave		0.0142				8.8		15.0			
Benzene	1.0750 0.8394	1.0768 0.8103	0.9685 0.8101	0.9851 0.7901	0.9519	Ave		0.9230				12.3		15.0			
1,2-Dichloroethane	+++++ 0.3216	0.4369 0.3093	0.3807 0.3016	0.3832 0.3028	0.3665	Ave		0.3503				14.0		15.0			
Trichloroethene	0.9271 0.8402	1.0552 0.8176	0.9464 0.8219	1.0050 0.8249	0.9695	Ave		0.9120				9.8		15.0			
2-Pentanone	0.2359 0.1900	0.2303 0.1860	0.2379 0.1751	0.2180 0.1746	0.2100	Ave		0.2064				12.4		15.0			
Methylcyclohexane	0.3035 0.2886	0.4277 0.2835	0.3087 0.2959	0.3481 0.3099	0.3387	Ave		0.3227				13.9		15.0			
1,2-Dichloropropane	0.2879 0.2481	0.3098 0.2390	0.2721 0.2371	0.2849 0.2403	0.2771	Ave		0.2663				9.8		30.0			
1,4-Dioxane	0.0038 0.0039	0.0040 0.0038	0.0047 0.0036	0.0047 0.0035	0.0043	Ave		0.0040				11.4		15.0			
Dibromomethane	0.1964 0.1539	0.1863 0.1478	0.1701 0.1452	0.1731 0.1450	0.1685	Ave		0.1652				11.2		15.0			
Bromodichloromethane	0.3098 0.2876	0.3356 0.2780	0.3013 0.2780	0.3164 0.2857	0.3086	Ave		0.3001				6.5		15.0			
2-Chloroethyl vinyl ether	+++++ 0.1873	0.2319 0.1756	0.2136 0.1724	0.2009 0.1719	0.1999	Ave		0.1942				11.1		15.0			
cis-1,3-Dichloropropene	1.6237 1.3840	1.6406 1.3315	1.5004 1.3035	1.5559 1.3002	1.5222	Ave		1.4624				9.2		15.0			
4-Methyl-2-pentanone (MIBK)	0.2814 0.2354	0.2902 0.2291	0.2845 0.2161	0.2696 0.2058	0.2569	Ave		0.2521				12.5		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Toluene	1.0901 0.8621	1.1227 0.8371	0.9877 0.8400	1.0133 0.8028	0.9681	Ave		0.9471				12.3		30.0			
trans-1,3-Dichloropropene	0.4012 0.3518	0.4045 0.3423	0.3643 0.3391	0.3760 0.3481	0.3733	Ave		0.3667				6.6		15.0			
Ethyl methacrylate	1.5087 1.2376	1.5917 1.1985	1.4245 1.1507	1.4252 1.1406	1.3751	Ave		1.3392				12.2		15.0			
1,1,2-Trichloroethane	0.2426 0.2083	0.2589 0.2005	0.2363 0.1959	0.2367 0.2004	0.2283	Ave		0.2231				10.1		15.0			
Tetrachloroethene	0.7116 0.6469	0.8213 0.6404	0.7000 0.6496	0.7875 0.6561	0.7558	Ave		0.7077				9.5		15.0			
1,3-Dichloropropane	1.5743 1.3406	1.6748 1.2840	1.5509 1.2472	1.5632 1.2252	1.5086	Ave		1.4410				11.6		15.0			
2-Hexanone	0.8373 0.6493	0.8678 0.6324	0.8083 0.5912	0.7521 0.5615	0.7246	Lin1	1.1371	0.5923							0.9960		0.9900
Dibromochloromethane	0.8141 0.7927	0.8568 0.7784	0.8049 0.7682	0.8330 0.7706	0.8192	Ave		0.8042				3.7		15.0			
1,2-Dibromoethane (EDB)	1.0257 0.8289	0.9916 0.7932	0.9296 0.7610	0.9461 0.7469	0.9163	Ave		0.8821				11.6		15.0			
1-Chlorohexane	2.4617 1.1199	1.9842 1.0918	1.4304 1.1180	1.4140 1.1242	1.3292	Lin2	0.5476	1.1599							0.9920		0.9900
Chlorobenzene	2.7291 2.1721	2.8029 2.0944	2.4695 2.0682	2.5430 2.0146	2.4595	Ave		2.3726			0.3000	12.4		15.0			
1,1,1,2-Tetrachloroethane	0.8926 0.8402	0.9370 0.8130	0.8726 0.8102	0.9049 0.8082	0.8979	Ave		0.8641				5.5		15.0			
Ethylbenzene	1.4708 1.2484	1.5312 1.2248	1.3420 1.2277	1.4242 1.2209	1.3935	Ave		1.3426				8.8		30.0			
m-Xylene & p-Xylene	3.5775 2.8619	3.6487 2.7520	3.0927 2.7495	3.2974 2.6292	3.2285	Ave		3.0930				12.0		15.0			
o-Xylene	1.7868 1.4900	1.8307 1.4434	1.6276 1.4445	1.6854 1.4252	1.6489	Ave		1.5981				9.6		15.0			
Styrene	2.9410 2.4875	2.9393 2.4049	2.6331 2.3930	2.7379 2.2768	2.7229	Ave		2.6151				9.2		15.0			
Bromoform	0.5098 0.5541	0.4951 0.5551	0.4940 0.5485	0.5399 0.5406	0.5386	Ave		0.5306			0.1000	4.6		15.0			
Isopropylbenzene	2.6459 2.1937	2.8598 2.1853	2.3895 2.2080	2.5563 2.1550	2.4519	Ave		2.4050				10.2		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Cyclohexanone	+++++ 0.0529	0.0743 0.0527	0.0740 0.0505	0.0659 0.0469	0.0591	Lin1	1.7796	0.0493							0.9970		0.9900
1,1,2,2-Tetrachloroethane	0.8309 0.7065	0.9042 0.6938	0.8399 0.6703	0.8231 0.7052	0.7769	Ave		0.7723			0.3000	10.6		15.0			
Bromobenzene	0.7412 0.6268	0.7824 0.6195	0.6883 0.6168	0.7157 0.6533	0.7006	Ave		0.6827				8.5		15.0			
trans-1,4-Dichloro-2-butene	0.2262 0.1905	0.2231 0.1968	0.1854 0.1924	0.1913 0.2023	0.1894	Ave		0.1997				7.5		15.0			
1,2,3-Trichloropropane	0.2763 0.2235	0.2771 0.2200	0.2611 0.2098	0.2515 0.2149	0.2465	Ave		0.2423				10.8		15.0			
N-Propylbenzene	0.7439 0.6654	0.8305 0.6625	0.6934 0.6697	0.7632 0.7024	0.7422	Ave		0.7192				7.8		15.0			
2-Chlorotoluene	0.6896 0.5990	0.7420 0.5867	0.6550 0.5900	0.6943 0.6113	0.6767	Ave		0.6494				8.5		15.0			
1,3,5-Trimethylbenzene	2.1858 1.8636	2.3003 1.8396	2.0085 1.8387	2.1136 1.8304	2.0724	Ave		2.0059				8.7		15.0			
4-Chlorotoluene	0.6917 0.6217	0.7556 0.6122	0.6824 0.6089	0.7260 0.6192	0.6968	Ave		0.6683				8.2		15.0			
tert-Butylbenzene	1.8346 1.5678	2.0076 1.5538	1.6833 1.5787	1.8275 1.6264	1.7638	Ave		1.7159				9.0		15.0			
1,2,4-Trimethylbenzene	2.3328 1.9205	2.3696 1.8776	2.0836 1.8625	2.1697 1.8565	2.1235	Ave		2.0663				9.7		15.0			
sec-Butylbenzene	0.5595 0.5016	0.5899 0.4978	0.5217 0.5088	0.5682 0.5409	0.5623	Ave		0.5390				6.1		15.0			
1,3-Dichlorobenzene	1.4107 1.1091	1.3733 1.0920	1.2424 1.0896	1.2630 1.1489	1.2251	Ave		1.2171				9.8		15.0			
4-Isopropyltoluene	2.1824 1.9682	2.3384 1.9356	2.0327 1.9552	2.1966 1.9210	2.1477	Ave		2.0753				7.1		15.0			
1,4-Dichlorobenzene	1.4153 1.1264	1.4435 1.0938	1.2749 1.0746	1.3133 1.1094	1.2549	Ave		1.2340				11.4		15.0			
n-Butylbenzene	2.0362 1.8027	2.1184 1.7797	1.8101 1.8075	1.9886 1.8423	1.9636	Ave		1.9055				6.5		15.0			
1,2-Dichlorobenzene	1.2942 1.0623	1.3274 1.0441	1.1973 1.0322	1.2262 1.0721	1.1856	Ave		1.1602				9.6		15.0			
1,2-Dibromo-3-Chloropropane	0.1285 0.1672	0.1737 0.1702	0.1768 0.1631	0.1727 0.1706	0.1720	Ave		0.1661				8.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
1,2,4-Trichlorobenzene	0.8073 0.6664	0.8313 0.6538	0.7406 0.6550	0.7669 0.6997	0.7344	Ave		0.7284				9.0		15.0			
Hexachlorobutadiene	0.3270 0.2832	0.3447 0.2761	0.3048 0.2857	0.3196 0.3157	0.3148	Ave		0.3080				7.3		15.0			
Naphthalene	2.2030 1.7765	2.2399 1.7312	2.0826 1.6672	2.0751 1.6698	1.9550	Ave		1.9334				11.8		15.0			
1,2,3-Trichlorobenzene	0.6830 0.5624	0.7295 0.5490	0.6481 0.5445	0.6624 0.5667	0.6243	Ave		0.6189				10.8		15.0			
Dibromofluoromethane (Surr)	0.2699 0.2782	0.2707 0.2764	0.2733 0.2761	0.2736 0.2857	0.2734	Ave		0.2753				1.7		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3115 0.3212	0.3134 0.3188	0.3186 0.3184	0.3176 0.3263	0.3203	Ave		0.3185				1.3		15.0			
Toluene-d8 (Surr)	3.6995 3.6450	3.7307 3.6121	3.7031 3.5721	3.6913 3.4882	3.6835	Ave		3.6473				2.1		15.0			
4-Bromofluorobenzene (Surr)	0.9584 0.9637	0.9691 0.9629	0.9575 0.9693	0.9649 1.0020	0.9597	Ave		0.9675				1.4		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-535102/13	MS9_3374.d
Level 2	IC 280-535102/14	MS9_3375.d
Level 3	IC 280-535102/15	MS9_3376.d
Level 4	IC 280-535102/16	MS9_3377.d
Level 5	IC 280-535102/17	MS9_3378.d
Level 6	ICIS 280-535102/18	MS9_3379.d
Level 7	IC 280-535102/19	MS9_3380.d
Level 8	IC 280-535102/20	MS9_3381.d
Level 9	IC 280-535102/21	MS9_3382.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Dichlorodifluoromethane	FB	Lin1	7045 682877	15640 1080503	29266 1425470	81786 2764372	173987	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloromethane	FB	Lin1	+++++ 745332	17135 1112752	32820 1510173	104058 2851607	210035	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl chloride	FB	Ave	+++++ 747104	18943 1151416	35568 1486231	80472 2828311	183654	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromomethane	FB	Ave	+++++ 166063	3033 305319	8174 490241	20703 955259	33962	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloroethane	FB	Lin2	+++++ 422893	11042 641452	20685 830639	48146 1466854	94746	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dichlorofluoromethane	FB	Ave	+++++ 1083789	+++++ 1663511	56343 2163273	130931 4032305	259475	+++++ 50.0	+++++ 75.0	2.00 100	5.00 200	10.0
Trichlorofluoromethane	FB	Ave	+++++ 810247	+++++ 1219223	41169 1587405	99194 +++++	210340	+++++ 50.0	+++++ 75.0	2.00 100	5.00 +++++	10.0
Ethyl ether	FB	Ave	6479 551599	12772 840752	25862 1088679	66417 2139297	127324	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acrolein	FB	Qua	+++++ 760746	22487 1237243	42746 1631413	93195 3368462	162545	+++++ 494	9.88 741	19.8 988	49.4 1975	98.8
1,1-Dichloroethene	FB	Ave	5490 518935	12221 806004	22686 1114884	63818 2294690	120884	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloro-1,2,2-trifluoroethane	FB	Ave	3794 408398	9883 644070	17256 902099	51338 1805108	98624	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acetone	FB	Lin1	16655 903410	28305 1408170	49606 1771541	114300 3521364	209535	2.00 200	4.00 300	8.00 400	20.0 800	40.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Iodomethane	FB	Qua	+++++ 603676	4373 1125731	10445 1606335	37364 +++++	99699	+++++ 50.0	1.00 75.0	2.00 100	5.00 +++++	10.0
Carbon disulfide	FB	Lin2	24908 1601424	45169 2493521	74839 3385750	194587 6942500	367584	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methyl acetate	FB	Lin2	+++++ 1079628	31488 1678973	57596 2113603	134137 4159898	244256	+++++ 100	2.00 150	4.00 200	10.0 400	20.0
3-Chloro-1-propene	FB	Ave	9915 932097	23719 1414493	41329 1855640	109633 +++++	214294	0.500 50.0	1.00 75.0	2.00 100	5.00 +++++	10.0
Methylene Chloride	FB	Lin2	12205 663805	19985 1010757	34568 1351610	83551 2697332	155345	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
t-Butyl alcohol	FB	Ave	11368 925779	22840 1444445	50249 1798117	116148 3535439	209235	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Acrylonitrile	FB	Ave	33073 2723719	68725 4265581	133967 5369075	320321 10276359	606190	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Methyl tert-butyl ether	FB	Ave	22507 1925454	45426 2989921	90085 3862660	226743 7526307	435315	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,2-Dichloroethene	FB	Ave	7231 619102	14442 962128	27023 1273056	72827 2574623	141126	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexane	CBNZ d5	Ave	10611 842429	22001 1321100	35352 1819739	103672 3719845	199109	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl acetate	FB	Lin1	+++++ 2737625	69933 4140151	134095 5195857	327962 9660301	626151	+++++ 100	2.00 150	4.00 200	10.0 400	20.0
1,1-Dichloroethane	FB	Ave	14108 1172465	27801 1819684	53018 2401389	139876 4765221	267337	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Butanone (MEK)	FB	Lin1	21400 1382927	41043 2151564	74909 2694446	166139 5337822	311831	2.00 200	4.00 300	8.00 400	20.0 800	40.0
cis-1,2-Dichloroethene	FB	Ave	8534 703733	16742 1089317	30877 1445485	82736 2944833	159074	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2,2-Dichloropropane	FB	Ave	11197 938825	24030 1453109	42931 1938725	115490 3869268	216555	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butyl Alcohol	FB	Ave	20631 1700190	41771 2655163	91443 3333536	203226 6666073	379541	12.0 1200	24.0 1800	48.0 2400	120 4800	240
Bromochloromethane	FB	Ave	4069 335941	8282 505422	16426 657835	42399 1294484	81642	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrahydrofuran	FB	Lin1	8869	16367	29641	61763	116185	1.00	2.00	4.00	10.0	20.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			509729	808561	1007441	2031568		100	150	200	400	
Chloroform	FB	Ave	12829 1104026	27388 1699645	50113 2242851	130123 4475688	250891	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1-Trichloroethane	FB	Ave	10788 942167	23344 1468391	42486 1994321	115014 4019681	219181	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexane	FB	Ave	12408 1054093	28388 1665905	45680 2299961	131400 4703598	249526	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1-Dichloropropene	FB	Ave	9517 886751	22080 1391251	39019 1893186	108623 3843121	207002	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon tetrachloride	FB	Ave	8209 782005	18444 1236622	31243 1708234	92407 3442470	177988	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isobutyl alcohol	FB	Ave	10718 1002595	20059 1574918	49683 1980795	115937 3957127	210197	12.5 1250	25.0 1875	50.0 2500	125 5000	250
Benzene	FB	Ave	31183 2448968	62082 3783733	115227 5009864	294378 9605590	564053	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloroethane	FB	Ave	+++++ 938271	25190 1444256	45298 1865345	114517 3681785	217190	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichloroethene	CBNZ d5	Ave	7096 663977	15960 1037852	29735 1400287	79560 2831973	152555	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Pentanone	FB	Ave	21898 1774172	42483 2778532	90585 3464057	208460 6791673	398225	1.60 160	3.20 240	6.40 320	16.0 640	32.0
Methylcyclohexane	FB	Ave	8805 841971	24660 1323879	36729 1829958	104012 3768176	200729	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloropropane	FB	Ave	8351 723971	17864 1115913	32376 1466249	85140 2921781	164187	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dioxane	FB	Ave	2184 226087	4660 354139	11271 446632	28129 843453	51422	10.0 1000	20.0 1500	40.0 2000	100 4000	200
Dibromomethane	FB	Ave	5697 449017	10743 690307	20241 897757	51726 1763434	99867	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromodichloromethane	FB	Ave	8986 838970	19350 1297899	35852 1718857	94554 3472929	182887	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Chloroethyl vinyl ether	FB	Ave	+++++ 546525	13371 820026	25418 1066332	60035 2090284	118448	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	12428	24813	47138	123175	239528	0.500	1.00	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			1093707	1690201	2220652	4463786		50.0	75.0	100	200	
4-Methyl-2-pentanone (MIBK)	FB	Ave	32656 2747136	66926 4279458	135413 5346536	322274 10006740	608956	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Toluene	FB	Ave	31622 2515197	64732 3908584	117514 5194820	302816 9760140	573661	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,3-Dichloropropene	FB	Ave	11637 1026260	23322 1598315	43344 2097282	112357 4231913	221229	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl methacrylate	CBNZ d5	Ave	11548 978068	24073 1521378	44756 1960450	112828 3915848	216384	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloroethane	FB	Ave	7036 607567	14927 936422	28115 1211627	70740 2436165	135266	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrachloroethene	CBNZ d5	Ave	5447 511262	12422 812979	21994 1106690	62341 2252312	118921	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichloropropane	CBNZ d5	Ave	12050 1059473	25330 1629879	48725 2124821	123759 4206175	237384	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Hexanone	CBNZ d5	Lin1	25635 2052623	52498 3211360	101582 4028823	238167 7711337	456097	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Dibromochloromethane	CBNZ d5	Ave	6231 626422	12959 988150	25287 1308792	65945 2645442	128907	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	7851 655036	14998 1006868	29205 1296459	74901 2563991	144185	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1-Chlorohexane	CBNZ d5	Lin2	15074 708047	24008 1108755	35951 1523762	89552 3087484	167329	0.400 40.0	0.800 60.0	1.60 80.0	4.00 160	8.00
Chlorobenzene	CBNZ d5	Ave	20889 1716564	42392 2658673	77586 3523559	201326 6916309	387015	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Ave	6832 663970	14171 1032070	27414 1380261	71638 2774493	141296	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Ethylbenzene	CBNZ d5	Ave	11258 986563	23159 1554799	42162 2091544	112752 4191578	219268	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	27383 2261655	55184 3493401	97168 4684096	261050 9026266	508022	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
o-Xylene	CBNZ d5	Ave	13677 1177491	27689 1832286	51135 2460844	133432 4892707	259462	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Styrene	CBNZ d5	Ave	22511 1965763	44455 3052804	82728 4076844	216752 7816433	428454	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromoform	CBNZ d5	Ave	3902 437864	7488 704634	15522 934441	42745 1855797	84744	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isopropylbenzene	DCBd 4	Ave	31238 2717027	66644 4215042	117125 5672485	313191 10273123	604073	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexanone	CBNZ d5	Lin1	+++++ 1672347	44963 2674479	92946 3443788	208721 6446021	372032	+++++ 2000	40.0 3000	80.0 4000	200 8000	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	9810 875002	21071 1338212	41171 1722002	100842 3361799	191391	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromobenzene	DCBd 4	Ave	8751 776337	18232 1194810	33739 1584612	87682 3114548	172606	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	2670 235979	5200 379671	9087 494229	23437 964286	46670	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	3262 276845	6457 424264	12800 538987	30818 1024485	60736	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
N-Propylbenzene	DCBd 4	Ave	8783 824150	19353 1277858	33991 1720408	93502 3348180	182865	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
2-Chlorotoluene	DCBd 4	Ave	8141 741890	17292 1131706	32105 1515627	85066 2914083	166706	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	25806 2308119	53607 3548272	98449 4723646	258960 8725639	510559	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Chlorotoluene	DCBd 4	Ave	8166 770050	17609 1180897	33448 1564303	88947 2951703	171671	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
tert-Butylbenzene	DCBd 4	Ave	21659 1941761	46785 2997008	82513 4055718	223898 7753327	434542	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	27541 2378683	55222 3621493	102132 4784822	265825 8850211	523157	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butylbenzene	DCBd 4	Ave	6605 621290	13746 960102	25571 1307164	69621 2578680	138533	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	16655 1373633	32003 2106331	60899 2799231	154743 5476907	301820	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Isopropyltoluene	DCBd 4	Ave	25766 2437740	54493 3733467	99636 5022949	269130 9157336	529114	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	16709 1395051	33638 2109738	62493 2760624	160898 5288483	309176	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
n-Butylbenzene	DCBd 4	Ave	24040 2232768	49368 3432677	88728 4643658	243640 8782230	483756	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	15280 1315736	30934 2013919	58689 2651660	150236 5110585	292091	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Ave	1517 207075	4049 328289	8667 419139	21159 813321	42367	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 535102

SDG No.:

Instrument ID: VMS_MS9 GC Column: RXI-624SilM ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 05/06/2021 10:13 Calibration End Date: 05/06/2021 13:18 Calibration ID: 53403

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
1,2,4-Trichlorobenzene	DCBd 4	Ave	9531 825371	19373 1261052	36300 1682673	93956 3335372	180925	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexachlorobutadiene	DCBd 4	Ave	3861 350773	8033 532490	14940 733906	39160 1505062	77546	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Naphthalene	DCBd 4	Ave	26009 2200274	52199 3339247	102082 4283111	254237 7960098	481659	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	8064 696549	17001 1058864	31767 1398939	81160 2701604	153795	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dibromofluoromethane (Surr)	FB	Ave	783032 811565	780485 860262	812958 853822	817587 868303	809947	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	903676 937096	903359 992390	947695 984580	949032 991800	948881	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
Toluene-d8 (Surr)	CBNZ d5	Ave	2831743 2880513	2821220 3056816	2908621 3042787	2922348 2993770	2898092	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	1131501 1193635	1129205 1238155	1173308 1245135	1182230 1194099	1182252	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0

Curve Type Legend
Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD
Qua = Quadratic ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-535102/22 Calibration Date: 05/06/2021 13:55

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3384.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.2023	0.1885		46.6	50.0	-6.8	20.0
Acrolein	Qua		0.0150		279	494	-43.5*	20.0
1,1-Dichloroethene	Ave	0.1921	0.1761		45.8	50.0	-8.3	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1509	0.1435		47.6	50.0	-4.9	20.0
Acetone	Lin1		0.0758		204	200	2.1	20.0
Iodomethane	Qua		0.2481		56.7	50.0	13.4	20.0
Carbon disulfide	Lin2		0.5440		47.4	50.0	-5.2	20.0
Methyl acetate	Lin2		0.1898		102	100	2.2	20.0
3-Chloro-1-propene	Ave	0.3439	0.3203		46.6	50.0	-6.9	20.0
Methylene Chloride	Lin2		0.2197		46.6	50.0	-6.7	20.0
t-Butyl alcohol	Ave	0.0351	0.0301		429	500	-14.2	20.0
Acrylonitrile	Ave	0.1013	0.0920		454	500	-9.2	20.0
Methyl tert-butyl ether	Ave	0.7065	0.6471		45.8	50.0	-8.4	20.0
trans-1,2-Dichloroethene	Ave	0.2272	0.2057		45.3	50.0	-9.5	20.0
Hexane	Ave	1.200	1.020		42.5	50.0	-15.0	20.0
Vinyl acetate	Lin1		0.3877		91.1	100	-8.9	20.0
1,1-Dichloroethane	Ave	0.4339	0.3833	0.1000	44.2	50.0	-11.7	20.0
2-Butanone (MEK)	Lin1		0.1155		205	200	2.5	20.0
cis-1,2-Dichloroethene	Ave	0.2600	0.2322		44.7	50.0	-10.7	20.0
2,2-Dichloropropane	Ave	0.3534	0.2976		42.1	50.0	-15.8	20.0
sec-Butyl Alcohol	Ave	0.0267	0.0219		987	1200	-17.8	20.0
Bromochloromethane	Ave	0.1264	0.1091		43.1	50.0	-13.7	20.0
Tetrahydrofuran	Lin1		0.0837		98.5	100	-1.5	20.0
Chloroform	Ave	0.4078	0.3648		44.7	50.0	-10.6	20.0
1,1,1-Trichloroethane	Ave	0.3532	0.3072		43.5	50.0	-13.0	20.0
Cyclohexane	Ave	0.4046	0.3533		43.7	50.0	-12.7	20.0
1,1-Dichloropropene	Ave	0.3307	0.2938		44.4	50.0	-11.2	20.0
Carbon tetrachloride	Ave	0.2853	0.2649		46.4	50.0	-7.1	20.0
Isobutyl alcohol	Ave	0.0142	0.0131		1150	1250	-8.2	20.0
Benzene	Ave	0.9230	0.8131		44.0	50.0	-11.9	20.0
1,2-Dichloroethane	Ave	0.3503	0.3112		44.4	50.0	-11.2	20.0
Trichloroethene	Ave	0.9120	0.8190		44.9	50.0	-10.2	20.0
2-Pentanone	Ave	0.2064	0.1841		143	160	-10.8	20.0
Methylcyclohexane	Ave	0.3227	0.2771		42.9	50.0	-14.2	20.0
1,2-Dichloropropane	Ave	0.2663	0.2389		44.9	50.0	-10.3	20.0
1,4-Dioxane	Ave	0.0040	0.0036		879	1000	-12.1	20.0
Dibromomethane	Ave	0.1652	0.1499		45.4	50.0	-9.2	20.0
Bromodichloromethane	Ave	0.3001	0.2799		46.6	50.0	-6.7	20.0
cis-1,3-Dichloropropene	Ave	1.462	1.314		44.9	50.0	-10.1	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2521	0.2273		180	200	-9.8	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-535102/22 Calibration Date: 05/06/2021 13:55

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3384.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toluene	Ave	0.9471	0.8206		43.3	50.0	-13.4	20.0
trans-1,3-Dichloropropene	Ave	0.3667	0.3431		46.8	50.0	-6.4	20.0
Ethyl methacrylate	Ave	1.339	1.218		45.5	50.0	-9.0	20.0
1,1,2-Trichloroethane	Ave	0.2231	0.2049		45.9	50.0	-8.2	20.0
Tetrachloroethene	Ave	0.7077	0.6239		44.1	50.0	-11.8	20.0
1,3-Dichloropropane	Ave	1.441	1.297		45.0	50.0	-10.0	20.0
2-Hexanone	Lin1		0.6393		214	200	7.0	20.0
Dibromochloromethane	Ave	0.8042	0.7867		48.9	50.0	-2.2	20.0
1,2-Dibromoethane (EDB)	Ave	0.8821	0.8009		45.4	50.0	-9.2	20.0
1-Chlorohexane	Lin2		1.090		37.1	40.0	-7.2	20.0
Chlorobenzene	Ave	2.373	2.091	0.3000	44.1	50.0	-11.9	20.0
1,1,1,2-Tetrachloroethane	Ave	0.8641	0.8023		46.4	50.0	-7.2	20.0
Ethylbenzene	Ave	1.343	1.187		44.2	50.0	-11.6	20.0
m-Xylene & p-Xylene	Ave	3.093	2.738		44.3	50.0	-11.5	20.0
o-Xylene	Ave	1.598	1.434		44.9	50.0	-10.2	20.0
Styrene	Ave	2.615	2.383		45.6	50.0	-8.9	20.0
Bromoform	Ave	0.5306	0.5528	0.1000	52.1	50.0	4.2	20.0
Isopropylbenzene	Ave	2.405	2.114		44.0	50.0	-12.1	20.0
Cyclohexanone	Lin1		0.0516		2060	2000	2.9	20.0
1,1,2,2-Tetrachloroethane	Ave	0.7723	0.6914	0.3000	44.8	50.0	-10.5	20.0
Bromobenzene	Ave	0.6827	0.6171		45.2	50.0	-9.6	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1997	0.1918		48.0	50.0	-4.0	20.0
1,2,3-Trichloropropane	Ave	0.2423	0.2181		45.0	50.0	-10.0	20.0
N-Propylbenzene	Ave	0.7192	0.6425		44.7	50.0	-10.7	20.0
2-Chlorotoluene	Ave	0.6494	0.5807		44.7	50.0	-10.6	20.0
1,3,5-Trimethylbenzene	Ave	2.006	1.806		45.0	50.0	-10.0	20.0
4-Chlorotoluene	Ave	0.6683	0.6070		45.4	50.0	-9.2	20.0
tert-Butylbenzene	Ave	1.716	1.525		44.4	50.0	-11.1	20.0
1,2,4-Trimethylbenzene	Ave	2.066	1.865		45.1	50.0	-9.7	20.0
sec-Butylbenzene	Ave	0.5390	0.4975		46.2	50.0	-7.7	20.0
1,3-Dichlorobenzene	Ave	1.217	1.073		44.1	50.0	-11.8	20.0
4-Isopropyltoluene	Ave	2.075	1.906		45.9	50.0	-8.2	20.0
1,4-Dichlorobenzene	Ave	1.234	1.098		44.5	50.0	-11.0	20.0
n-Butylbenzene	Ave	1.905	1.715		45.0	50.0	-10.0	20.0
1,2-Dichlorobenzene	Ave	1.160	1.035		44.6	50.0	-10.8	20.0
1,2-Dibromo-3-Chloropropane	Ave	0.1661	0.1587		47.8	50.0	-4.5	20.0
1,2,4-Trichlorobenzene	Ave	0.7284	0.6705		46.0	50.0	-7.9	20.0
Hexachlorobutadiene	Ave	0.3080	0.2941		47.7	50.0	-4.5	20.0
Naphthalene	Ave	1.933	1.756		45.4	50.0	-9.2	20.0
1,2,3-Trichlorobenzene	Ave	0.6189	0.5669		45.8	50.0	-8.4	20.0
Dibromofluoromethane (Surr)	Ave	0.2753	0.2734		49.6	50.0	-0.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-535102/22 Calibration Date: 05/06/2021 13:55

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3384.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2-Dichloroethane-d4 (Surr)	Ave	0.3185	0.3170		49.8	50.0	-0.5	20.0
Toluene-d8 (Surr)	Ave	3.647	3.655		50.1	50.0	0.2	20.0
4-Bromofluorobenzene (Surr)	Ave	0.9675	0.9655		49.9	50.0	-0.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-535102/23 Calibration Date: 05/06/2021 14:36

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3385.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2741		59.2	50.0	18.4	20.0
Chloromethane	Lin1		0.2703	0.1000	55.4	50.0	10.7	20.0
Vinyl chloride	Ave	0.2728	0.2841		52.1	50.0	4.2	20.0
Bromomethane	Ave	0.0660	0.0926		70.1	50.0	40.2*	20.0
Chloroethane	Lin2		0.1637		58.2	50.0	16.4	20.0
Dichlorofluoromethane	Ave	0.3941	0.4063		51.5	50.0	3.1	20.0
Trichlorofluoromethane	Ave	0.3047	0.3335		54.7	50.0	9.4	20.0
2-Chloroethyl vinyl ether	Ave	0.1942	0.1844		47.5	50.0	-5.0	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: MS9_3456.d BFB Injection Date: 05/07/2021

Instrument ID: VMS_MS9 BFB Injection Time: 18:55

Analysis Batch No.: 535401

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.5	
75	30.0 - 60.0 % of mass 95	50.6	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	8.3	
173	Less than 2.0 % of mass 174	0.7	(0.8) 1
174	Greater than 50% of mass 95	83.8	
175	5.0 - 9.0 % of mass 174	7.3	(8.7) 1
176	95.0 - 101.0 % of mass 174	81.5	(97.3) 1
177	5.0 - 9.0 % of mass 176	6.6	(8.2) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535401/2	MS9_3457.d	05/07/2021	19:27
	LCS 280-535401/4	MS9_3459.d	05/07/2021	20:19
	LCSD 280-535401/5	MS9_3460.d	05/07/2021	20:42
	MB 280-535401/8	MS9_3462.d	05/07/2021	21:29
05MW17I-20210427	280-147965-9	MS9_3471.d	05/08/2021	1:07
05DUP01-20210427	280-147965-10	MS9_3472.d	05/08/2021	1:30
05MW23-20210427	280-147965-11	MS9_3473.d	05/08/2021	1:53
	CCVC 280-535401/28	MS9_3478.d	05/08/2021	3:48

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535401/2 Calibration Date: 05/07/2021 19:27

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3457.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2974		32.0	25.0	28.1*	20.0
Chloromethane	Lin1		0.2650	0.1000	26.8	25.0	7.1	20.0
Vinyl chloride	Ave	0.2728	0.2963		27.2	25.0	8.6	20.0
Bromomethane	Ave	0.0660	0.0831		31.5	25.0	26.0*	20.0
Chloroethane	Lin2		0.1743		30.8	25.0	23.2*	20.0
Dichlorofluoromethane	Ave	0.3941	0.4209		26.7	25.0	6.8	20.0
Trichlorofluoromethane	Ave	0.3047	0.3654		30.0	25.0	19.9	20.0
Ethyl ether	Ave	0.2023	0.1890		23.4	25.0	-6.6	20.0
Acrolein	Qua		0.0307		286	247	15.7	20.0
1,1-Dichloroethene	Ave	0.1921	0.1843		24.0	25.0	-4.1	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1509	0.1585		26.3	25.0	5.1	20.0
Acetone	Lin1		0.0781		104	100	3.9	20.0
Iodomethane	Qua		0.1631		22.4	25.0	-10.4	20.0
Carbon disulfide	Lin2		0.5327		23.1	25.0	-7.8	20.0
Methyl acetate	Lin2		0.1819		48.4	50.0	-3.1	20.0
3-Chloro-1-propene	Ave	0.3439	0.3134		22.8	25.0	-8.9	20.0
Methylene Chloride	Lin2		0.2315		24.4	25.0	-2.5	20.0
t-Butyl alcohol	Ave	0.0351	0.0298		212	250	-15.0	20.0
Acrylonitrile	Ave	0.1013	0.0921		227	250	-9.0	20.0
Methyl tert-butyl ether	Ave	0.7065	0.6768		23.9	25.0	-4.2	20.0
trans-1,2-Dichloroethene	Ave	0.2272	0.2174		23.9	25.0	-4.3	20.0
Hexane	Ave	1.200	1.116		23.2	25.0	-7.0	20.0
1,1-Dichloroethane	Ave	0.4339	0.4027	0.1000	23.2	25.0	-7.2	20.0
Vinyl acetate	Lin1		0.5085		59.2	50.0	18.4	20.0
2-Butanone (MEK)	Lin1		0.1171		103	100	2.8	20.0
cis-1,2-Dichloroethene	Ave	0.2600	0.2476		23.8	25.0	-4.8	20.0
2,2-Dichloropropane	Ave	0.3534	0.3463		24.5	25.0	-2.0	20.0
sec-Butyl Alcohol	Ave	0.0267	0.0223		501	600	-16.5	20.0
Bromochloromethane	Ave	0.1264	0.1288		25.5	25.0	1.9	20.0
Tetrahydrofuran	Lin1		0.0894		52.0	50.0	4.1	20.0
Chloroform	Ave	0.4078	0.3920		24.0	25.0	-3.9	20.0
1,1,1-Trichloroethane	Ave	0.3532	0.3388		24.0	25.0	-4.1	20.0
Cyclohexane	Ave	0.4046	0.3720		23.0	25.0	-8.1	20.0
1,1-Dichloropropene	Ave	0.3307	0.3160		23.9	25.0	-4.4	20.0
Carbon tetrachloride	Ave	0.2853	0.2796		24.5	25.0	-2.0	20.0
Isobutyl alcohol	Ave	0.0142	0.0128		563	625	-9.9	20.0
Benzene	Ave	0.9230	0.8523		23.1	25.0	-7.7	20.0
1,2-Dichloroethane	Ave	0.3503	0.3362		24.0	25.0	-4.0	20.0
Trichloroethene	Ave	0.9120	0.8685		23.8	25.0	-4.8	20.0
2-Pentanone	Ave	0.2064	0.1846		71.5	80.0	-10.6	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535401/2 Calibration Date: 05/07/2021 19:27

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3457.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.3227	0.3002		23.3	25.0	-7.0	20.0
1,2-Dichloropropane	Ave	0.2663	0.2462		23.1	25.0	-7.5	20.0
1,4-Dioxane	Ave	0.0040	0.0039		489	500	-2.2	20.0
Dibromomethane	Ave	0.1652	0.1592		24.1	25.0	-3.6	20.0
Bromodichloromethane	Ave	0.3001	0.2853		23.8	25.0	-4.9	20.0
2-Chloroethyl vinyl ether	Ave	0.1942	0.1819		23.4	25.0	-6.3	20.0
cis-1,3-Dichloropropene	Ave	1.462	1.361		23.3	25.0	-7.0	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2521	0.2268		90.0	100	-10.0	20.0
Toluene	Ave	0.9471	0.8758		23.1	25.0	-7.5	20.0
trans-1,3-Dichloropropene	Ave	0.3667	0.3467		23.6	25.0	-5.5	20.0
Ethyl methacrylate	Ave	1.339	1.212		22.6	25.0	-9.5	20.0
1,1,2-Trichloroethane	Ave	0.2231	0.2156		24.2	25.0	-3.4	20.0
Tetrachloroethene	Ave	0.7077	0.7011		24.8	25.0	-0.9	20.0
1,3-Dichloropropane	Ave	1.441	1.361		23.6	25.0	-5.6	20.0
2-Hexanone	Lin1		0.6199		103	100	2.7	20.0
Dibromochloromethane	Ave	0.8042	0.7617		23.7	25.0	-5.3	20.0
1,2-Dibromoethane (EDB)	Ave	0.8821	0.8517		24.1	25.0	-3.4	20.0
1-Chlorohexane	Lin2		1.194		20.1	20.0	0.6	20.0
Chlorobenzene	Ave	2.373	2.244	0.3000	23.6	25.0	-5.4	20.0
1,1,1,2-Tetrachloroethane	Ave	0.8641	0.8282		24.0	25.0	-4.2	20.0
Ethylbenzene	Ave	1.343	1.271		23.7	25.0	-5.3	20.0
m-Xylene & p-Xylene	Ave	3.093	2.890		23.4	25.0	-6.6	20.0
o-Xylene	Ave	1.598	1.503		23.5	25.0	-5.9	20.0
Styrene	Ave	2.615	2.487		23.8	25.0	-4.9	20.0
Bromoform	Ave	0.5306	0.5072	0.1000	23.9	25.0	-4.4	20.0
Isopropylbenzene	Ave	2.405	2.233		23.2	25.0	-7.1	20.0
Cyclohexanone	Lin1		0.0583		1150	1000	14.7	20.0
1,1,2,2-Tetrachloroethane	Ave	0.7723	0.7143	0.3000	23.1	25.0	-7.5	20.0
Bromobenzene	Ave	0.6827	0.6530		23.9	25.0	-4.4	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1997	0.1809		22.7	25.0	-9.4	20.0
1,2,3-Trichloropropane	Ave	0.2423	0.2258		23.3	25.0	-6.8	20.0
N-Propylbenzene	Ave	0.7192	0.6876		23.9	25.0	-4.4	20.0
2-Chlorotoluene	Ave	0.6494	0.6134		23.6	25.0	-5.5	20.0
1,3,5-Trimethylbenzene	Ave	2.006	1.895		23.6	25.0	-5.5	20.0
4-Chlorotoluene	Ave	0.6683	0.6409		24.0	25.0	-4.1	20.0
tert-Butylbenzene	Ave	1.716	1.607		23.4	25.0	-6.3	20.0
1,2,4-Trimethylbenzene	Ave	2.066	1.937		23.4	25.0	-6.2	20.0
sec-Butylbenzene	Ave	0.5390	0.5263		24.4	25.0	-2.3	20.0
1,3-Dichlorobenzene	Ave	1.217	1.149		23.6	25.0	-5.6	20.0
4-Isopropyltoluene	Ave	2.075	2.026		24.4	25.0	-2.4	20.0
1,4-Dichlorobenzene	Ave	1.234	1.171		23.7	25.0	-5.1	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-535401/2 Calibration Date: 05/07/2021 19:27

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3457.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	1.905	1.842		24.2	25.0	-3.3	20.0
1,2-Dichlorobenzene	Ave	1.160	1.108		23.9	25.0	-4.5	20.0
1,2-Dibromo-3-Chloropropane	Ave	0.1661	0.1520		22.9	25.0	-8.5	20.0
1,2,4-Trichlorobenzene	Ave	0.7284	0.7239		24.8	25.0	-0.6	20.0
Hexachlorobutadiene	Ave	0.3080	0.3195		25.9	25.0	3.8	20.0
Naphthalene	Ave	1.933	1.836		23.7	25.0	-5.0	20.0
1,2,3-Trichlorobenzene	Ave	0.6189	0.6188		25.0	25.0	-0.0	20.0
Dibromofluoromethane (Surr)	Ave	0.2753	0.2758		50.1	50.0	0.2	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3185	0.3149		49.4	50.0	-1.1	20.0
Toluene-d8 (Surr)	Ave	3.647	3.611		49.5	50.0	-1.0	20.0
4-Bromofluorobenzene (Surr)	Ave	0.9675	0.9269		47.9	50.0	-4.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535401/28 Calibration Date: 05/08/2021 03:48

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3478.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2675		28.8	25.0	15.1	50.0
Chloromethane	Lin1		0.2795	0.1000	28.3	25.0	13.1	50.0
Vinyl chloride	Ave	0.2728	0.2939		26.9	25.0	7.7	50.0
Bromomethane	Ave	0.0660	0.0928		35.1	25.0	40.5	50.0
Chloroethane	Lin2		0.1622		28.6	25.0	14.5	50.0
Dichlorofluoromethane	Ave	0.3941	0.4067		25.8	25.0	3.2	50.0
Trichlorofluoromethane	Ave	0.3047	0.3415		28.0	25.0	12.1	50.0
Ethyl ether	Ave	0.2023	0.1879		23.2	25.0	-7.1	50.0
Acrolein	Qua		0.0311		290	247	17.5	50.0
1,1-Dichloroethene	Ave	0.1921	0.1820		23.7	25.0	-5.2	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1509	0.1517		25.1	25.0	0.6	50.0
Acetone	Lin1		0.0749		99.5	100	-0.5	50.0
Iodomethane	Qua		0.1438		20.1	25.0	-19.6	50.0
Carbon disulfide	Lin2		0.5286		22.9	25.0	-8.5	50.0
Methyl acetate	Lin2		0.1706		45.4	50.0	-9.3	50.0
3-Chloro-1-propene	Ave	0.3439	0.2978		21.6	25.0	-13.4	50.0
Methylene Chloride	Lin2		0.2348		24.7	25.0	-1.1	50.0
t-Butyl alcohol	Ave	0.0351	0.0273		195	250	-22.1	50.0
Acrylonitrile	Ave	0.1013	0.0881		217	250	-13.0	50.0
Methyl tert-butyl ether	Ave	0.7065	0.6658		23.6	25.0	-5.8	50.0
trans-1,2-Dichloroethene	Ave	0.2272	0.2183		24.0	25.0	-3.9	50.0
Hexane	Ave	1.200	0.9660		20.1	25.0	-19.5	50.0
Vinyl acetate	Lin1		0.4057		46.9	50.0	-6.2	50.0
1,1-Dichloroethane	Ave	0.4339	0.4011	0.1000	23.1	25.0	-7.6	50.0
2-Butanone (MEK)	Lin1		0.1091		95.6	100	-4.4	50.0
cis-1,2-Dichloroethene	Ave	0.2600	0.2477		23.8	25.0	-4.7	50.0
2,2-Dichloropropane	Ave	0.3534	0.3098		21.9	25.0	-12.3	50.0
sec-Butyl Alcohol	Ave	0.0267	0.0200		450	600	-25.0	50.0
Bromochloromethane	Ave	0.1264	0.1310		25.9	25.0	3.6	50.0
Tetrahydrofuran	Lin1		0.0819		47.6	50.0	-4.8	50.0
Chloroform	Ave	0.4078	0.3927		24.1	25.0	-3.7	50.0
1,1,1-Trichloroethane	Ave	0.3532	0.3376		23.9	25.0	-4.4	50.0
Cyclohexane	Ave	0.4046	0.3583		22.1	25.0	-11.4	50.0
1,1-Dichloropropene	Ave	0.3307	0.3108		23.5	25.0	-6.0	50.0
Carbon tetrachloride	Ave	0.2853	0.2778		24.3	25.0	-2.6	50.0
Isobutyl alcohol	Ave	0.0142	0.0117		514	625	-17.8	50.0
Benzene	Ave	0.9230	0.8532		23.1	25.0	-7.6	50.0
1,2-Dichloroethane	Ave	0.3503	0.3346		23.9	25.0	-4.5	50.0
Trichloroethene	Ave	0.9120	0.8916		24.4	25.0	-2.2	50.0
2-Pentanone	Ave	0.2064	0.1727		66.9	80.0	-16.4	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535401/28 Calibration Date: 05/08/2021 03:48

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3478.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.3227	0.2846		22.0	25.0	-11.8	50.0
1,2-Dichloropropane	Ave	0.2663	0.2466		23.2	25.0	-7.4	50.0
1,4-Dioxane	Ave	0.0040	0.0038		469	500	-6.2	50.0
Dibromomethane	Ave	0.1652	0.1589		24.0	25.0	-3.8	50.0
Bromodichloromethane	Ave	0.3001	0.2820		23.5	25.0	-6.0	50.0
2-Chloroethyl vinyl ether	Ave	0.1942	0.1745		22.5	25.0	-10.2	50.0
cis-1,3-Dichloropropene	Ave	1.462	1.314		22.5	25.0	-10.2	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2521	0.2168		86.0	100	-14.0	50.0
Toluene	Ave	0.9471	0.8887		23.5	25.0	-6.2	50.0
trans-1,3-Dichloropropene	Ave	0.3667	0.3363		22.9	25.0	-8.3	50.0
Ethyl methacrylate	Ave	1.339	1.168		21.8	25.0	-12.8	50.0
1,1,2-Trichloroethane	Ave	0.2231	0.2157		24.2	25.0	-3.3	50.0
Tetrachloroethene	Ave	0.7077	0.6862		24.2	25.0	-3.0	50.0
1,3-Dichloropropane	Ave	1.441	1.340		23.2	25.0	-7.0	50.0
2-Hexanone	Lin1		0.5744		95.1	100	-4.9	50.0
Dibromochloromethane	Ave	0.8042	0.7413		23.0	25.0	-7.8	50.0
1,2-Dibromoethane (EDB)	Ave	0.8821	0.8380		23.7	25.0	-5.0	50.0
1-Chlorohexane	Lin2		1.141		19.2	20.0	-4.0	50.0
Chlorobenzene	Ave	2.373	2.238	0.3000	23.6	25.0	-5.7	50.0
1,1,1,2-Tetrachloroethane	Ave	0.8641	0.8175		23.7	25.0	-5.4	50.0
Ethylbenzene	Ave	1.343	1.257		23.4	25.0	-6.4	50.0
m-Xylene & p-Xylene	Ave	3.093	2.861		23.1	25.0	-7.5	50.0
o-Xylene	Ave	1.598	1.500		23.5	25.0	-6.2	50.0
Styrene	Ave	2.615	2.473		23.6	25.0	-5.4	50.0
Bromoform	Ave	0.5306	0.4779	0.1000	22.5	25.0	-9.9	50.0
Isopropylbenzene	Ave	2.405	2.222		23.1	25.0	-7.6	50.0
Cyclohexanone	Lin1		0.0299		571	1000	-42.9	50.0
1,1,2,2-Tetrachloroethane	Ave	0.7723	0.6646	0.3000	21.5	25.0	-13.9	50.0
Bromobenzene	Ave	0.6827	0.6533		23.9	25.0	-4.3	50.0
trans-1,4-Dichloro-2-butene	Ave	0.1997	0.1680		21.0	25.0	-15.9	50.0
1,2,3-Trichloropropane	Ave	0.2423	0.2181		22.5	25.0	-10.0	50.0
N-Propylbenzene	Ave	0.7192	0.6763		23.5	25.0	-6.0	50.0
2-Chlorotoluene	Ave	0.6494	0.6121		23.6	25.0	-5.7	50.0
1,3,5-Trimethylbenzene	Ave	2.006	1.859		23.2	25.0	-7.3	50.0
4-Chlorotoluene	Ave	0.6683	0.6330		23.7	25.0	-5.3	50.0
tert-Butylbenzene	Ave	1.716	1.598		23.3	25.0	-6.9	50.0
1,2,4-Trimethylbenzene	Ave	2.066	1.915		23.2	25.0	-7.3	50.0
sec-Butylbenzene	Ave	0.5390	0.5157		23.9	25.0	-4.3	50.0
1,3-Dichlorobenzene	Ave	1.217	1.136		23.3	25.0	-6.7	50.0
4-Isopropyltoluene	Ave	2.075	1.964		23.7	25.0	-5.4	50.0
1,4-Dichlorobenzene	Ave	1.234	1.152		23.3	25.0	-6.6	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-535401/28 Calibration Date: 05/08/2021 03:48

Instrument ID: VMS_MS9 Calib Start Date: 05/06/2021 10:13

GC Column: RXI-624SilMS ID: 0.25(mm) Calib End Date: 05/06/2021 13:18

Lab File ID: MS9_3478.d Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	1.905	1.734		22.7	25.0	-9.0	50.0
1,2-Dichlorobenzene	Ave	1.160	1.096		23.6	25.0	-5.5	50.0
1,2-Dibromo-3-Chloropropane	Ave	0.1661	0.1384		20.8	25.0	-16.7	50.0
1,2,4-Trichlorobenzene	Ave	0.7284	0.6839		23.5	25.0	-6.1	50.0
Hexachlorobutadiene	Ave	0.3080	0.3030		24.6	25.0	-1.6	50.0
Naphthalene	Ave	1.933	1.695		21.9	25.0	-12.3	50.0
1,2,3-Trichlorobenzene	Ave	0.6189	0.5790		23.4	25.0	-6.5	50.0
Dibromofluoromethane (Surr)	Ave	0.2753	0.2773		50.3	50.0	0.8	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3185	0.3141		49.3	50.0	-1.4	50.0
Toluene-d8 (Surr)	Ave	3.647	3.606		49.5	50.0	-1.1	50.0
4-Bromofluorobenzene (Surr)	Ave	0.9675	0.9331		48.2	50.0	-3.6	50.0

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Sample No.: ICIS 280-532364/19 Date Analyzed: 04/13/2021 21:06

Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): MS1_0149.D Heated Purge: (Y/N) N

Calibration ID: 52339

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		1000623	5.84	204211	8.58	317381	10.86
UPPER LIMIT		2001246	6.34	408422	9.08	634762	11.36
LOWER LIMIT		500312	5.34	102106	8.08	158691	10.36
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-532364/22		1027467	5.84	211202	8.58	325094	10.85
CCV 280-535304/2		805377	5.84	172706	8.58	283453	10.86
CCV 280-535304/13		786254	5.84	170872	8.58	270464	10.86
LCS 280-535304/4		792919	5.84	171126	8.58	276662	10.86
LCSD 280-535304/5		776375	5.84	168343	8.58	270524	10.85
MB 280-535304/9		758595	5.84	162734	8.58	267987	10.86
280-147965-5	05TB01-20210426	743267	5.84	156999	8.58	254701	10.85
280-147965-1	05MW16S-20210426	727726	5.84	155856	8.58	257071	10.86
280-147965-2	05MW10I-20210426	758173	5.84	159159	8.58	257362	10.85
280-147965-3	05MW19S-20210426	738529	5.84	156570	8.58	256545	10.86
280-147965-4	05MW19I-20210426	757106	5.84	165307	8.58	259264	10.85
280-147965-6	05MW18I-20210427	725826	5.84	155954	8.58	252861	10.86
280-147965-7	05MW18S-20210427	714203	5.84	155785	8.58	248267	10.85
280-147965-8	05TW01-20210427	726351	5.84	153916	8.58	256742	10.86
280-147965-2 MS	05MW10I-20210426 MS	776609	5.84	168475	8.58	274981	10.85
280-147965-2 MSD	05MW10I-20210426 MSD	773776	5.84	166878	8.58	275922	10.86
CCVC 280-535304/40		798601	5.84	173598	8.58	278093	10.85
CCV 280-535496/2		732510	5.84	158600	8.58	243688	10.86
LCS 280-535496/4		713664	5.84	148802	8.58	242375	10.85
LCSD 280-535496/5		702320	5.84	152021	8.58	246575	10.85
MB 280-535496/9		666295	5.84	145311	8.58	227491	10.86
280-147965-12	05MW22-20210427	666742	5.84	143391	8.58	230716	10.86
CCVC 280-535496/34		712853	5.84	150261	8.58	238663	10.86

FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Sample No.: ICIS 280-535102/18 Date Analyzed: 05/06/2021 12:09

Instrument ID: VMS_MS9 GC Column: RXI-624SilMS ID: 0.25(mm)

Lab File ID (Standard): MS9_3379.d Heated Purge: (Y/N) Y

Calibration ID: 53403

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		2917479	5.79	790272	8.51	1238548	10.78
UPPER LIMIT		5834958	6.29	1580544	9.01	2477096	11.28
LOWER LIMIT		1458740	5.29	395136	8.01	619274	10.28
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-535102/22		2990451	5.78	807185	8.51	1242179	10.78
ICV 280-535102/23		2799768	5.79	755185	8.51	1166086	10.78
CCV 280-535401/2		2831166	5.79	770973	8.51	1212511	10.78
LCS 280-535401/4		2861241	5.79	778665	8.51	1208640	10.78
LCSD 280-535401/5		2793218	5.79	750821	8.51	1178276	10.78
MB 280-535401/8		2746202	5.79	735848	8.51	1162641	10.78
280-147965-9	05MW17I-20210427	2720770	5.79	731485	8.51	1155963	10.78
280-147965-10	05DUP01-20210427	2716462	5.79	745402	8.51	1184169	10.78
280-147965-11	05MW23-20210427	2710700	5.79	731095	8.51	1149183	10.78
CCVC 280-535401/28		2850270	5.79	786592	8.51	1229734	10.78

FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 04/13/2021 15:31

Analysis Batch Number: 532364 End Date: 04/13/2021 22:57

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-532364/1		04/13/2021 15:31	1	MS1_0134.D	DB-624 (60.25) 0.25(mm)
STD010 280-532364/23 IC		04/13/2021 15:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 15:58	1		DB-624 (60.25) 0.25(mm)
STD020 280-532364/24 IC		04/13/2021 16:20	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 16:20	1		DB-624 (60.25) 0.25(mm)
STD050 280-532364/25 IC		04/13/2021 16:42	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 16:42	1		DB-624 (60.25) 0.25(mm)
STD10 280-532364/26 IC		04/13/2021 17:04	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 17:04	1		DB-624 (60.25) 0.25(mm)
STD50 280-532364/27 IC		04/13/2021 17:26	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 17:26	1		DB-624 (60.25) 0.25(mm)
STD100 280-532364/28 IC		04/13/2021 17:48	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 17:48	1		DB-624 (60.25) 0.25(mm)
STD200 280-532364/29 IC		04/13/2021 18:10	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 18:10	1		DB-624 (60.25) 0.25(mm)
ICV 280-532364/30		04/13/2021 18:54	1	MS1_0143.D	DB-624 (60.25) 0.25(mm)
STD005 280-532364/14 IC		04/13/2021 19:16	1	MS1_0144.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 19:16	1		DB-624 (60.25) 0.25(mm)
STD010 280-532364/15 IC		04/13/2021 19:38	1	MS1_0145.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 19:38	1		DB-624 (60.25) 0.25(mm)
STD020 280-532364/16 IC		04/13/2021 20:00	1	MS1_0146.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 20:00	1		DB-624 (60.25) 0.25(mm)
STD050 280-532364/17 IC		04/13/2021 20:22	1	MS1_0147.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 20:22	1		DB-624 (60.25) 0.25(mm)
STD10 280-532364/18 IC		04/13/2021 20:44	1	MS1_0148.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 20:44	1		DB-624 (60.25) 0.25(mm)
ICIS 280-532364/19		04/13/2021 21:06	1	MS1_0149.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 21:06	1		DB-624 (60.25) 0.25(mm)
STD75 280-532364/31 IC		04/13/2021 21:28	1	MS1_0150.D	DB-624 (60.25) 0.25(mm)
STD100 280-532364/20 IC		04/13/2021 21:50	1	MS1_0151.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 21:50	1		DB-624 (60.25) 0.25(mm)
STD200 280-532364/21 IC		04/13/2021 22:12	1	MS1_0152.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 22:12	1		DB-624 (60.25) 0.25(mm)
ICV 280-532364/22		04/13/2021 22:57	1	MS1_0154.D	DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Instrument ID: VMS_MS9 Start Date: 05/06/2021 08:51

Analysis Batch Number: 535102 End Date: 05/06/2021 17:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535102/1		05/06/2021 08:51	1	MS9_3371.d	RXI-624SilMS 0.25(mm)
IC 280-535102/13		05/06/2021 10:13	1	MS9_3374.d	RXI-624SilMS 0.25(mm)
IC 280-535102/14		05/06/2021 10:36	1	MS9_3375.d	RXI-624SilMS 0.25(mm)
IC 280-535102/15		05/06/2021 10:59	1	MS9_3376.d	RXI-624SilMS 0.25(mm)
IC 280-535102/16		05/06/2021 11:23	1	MS9_3377.d	RXI-624SilMS 0.25(mm)
IC 280-535102/17		05/06/2021 11:46	1	MS9_3378.d	RXI-624SilMS 0.25(mm)
ICIS 280-535102/18		05/06/2021 12:09	1	MS9_3379.d	RXI-624SilMS 0.25(mm)
IC 280-535102/19		05/06/2021 12:32	1	MS9_3380.d	RXI-624SilMS 0.25(mm)
IC 280-535102/20		05/06/2021 12:55	1	MS9_3381.d	RXI-624SilMS 0.25(mm)
IC 280-535102/21		05/06/2021 13:18	1	MS9_3382.d	RXI-624SilMS 0.25(mm)
ICV 280-535102/22		05/06/2021 13:55	1	MS9_3384.d	RXI-624SilMS 0.25(mm)
ICV 280-535102/23		05/06/2021 14:36	1	MS9_3385.d	RXI-624SilMS 0.25(mm)
IC 280-535102/24		05/06/2021 14:59	1		RXI-624SilMS 0.25(mm)
IC 280-535102/25		05/06/2021 15:22	1		RXI-624SilMS 0.25(mm)
IC 280-535102/26		05/06/2021 15:45	1		RXI-624SilMS 0.25(mm)
IC 280-535102/27		05/06/2021 16:09	1		RXI-624SilMS 0.25(mm)
IC 280-535102/28		05/06/2021 16:32	1		RXI-624SilMS 0.25(mm)
IC 280-535102/29		05/06/2021 16:55	1		RXI-624SilMS 0.25(mm)
ICV 280-535102/30		05/06/2021 17:18	1		RXI-624SilMS 0.25(mm)

8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 05/07/2021 09:51

Analysis Batch Number: 535304 End Date: 05/07/2021 22:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 280-535304/2		05/07/2021 09:51	1	MS1_1457.D	DB-624 (60.25) 0.25(mm)
BFB 280-535304/1002		05/07/2021 09:51	1	MS1_1457-BFB.d	DB-624 (60.25) 0.25(mm)
CCV 280-535304/13		05/07/2021 10:50	1	MS1_1459.D	DB-624 (60.25) 0.25(mm)
LCS 280-535304/4		05/07/2021 11:35	1	MS1_1461.D	DB-624 (60.25) 0.25(mm)
LCSD 280-535304/5		05/07/2021 11:57	1	MS1_1462.D	DB-624 (60.25) 0.25(mm)
MB 280-535304/9		05/07/2021 12:32	1	MS1_1463.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 12:57	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 13:27	1		DB-624 (60.25) 0.25(mm)
280-147965-5	05TB01-20210426	05/07/2021 13:49	1	MS1_1466.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 14:12	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 14:34	1		DB-624 (60.25) 0.25(mm)
280-147965-1	05MW16S-20210426	05/07/2021 14:55	1	MS1_1469.D	DB-624 (60.25) 0.25(mm)
280-147965-2	05MW10I-20210426	05/07/2021 15:17	1	MS1_1470.D	DB-624 (60.25) 0.25(mm)
280-147965-3	05MW19S-20210426	05/07/2021 15:38	1	MS1_1471.D	DB-624 (60.25) 0.25(mm)
280-147965-4	05MW19I-20210426	05/07/2021 16:00	1	MS1_1472.D	DB-624 (60.25) 0.25(mm)
280-147965-6	05MW18I-20210427	05/07/2021 16:21	1	MS1_1473.D	DB-624 (60.25) 0.25(mm)
280-147965-7	05MW18S-20210427	05/07/2021 16:43	1	MS1_1474.D	DB-624 (60.25) 0.25(mm)
280-147965-8	05TW01-20210427	05/07/2021 17:04	1	MS1_1475.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 17:25	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 17:47	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 18:08	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 18:29	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 18:51	10		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 19:13	40		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 19:34	2		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 19:56	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 20:17	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 20:38	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 20:59	1		DB-624 (60.25) 0.25(mm)
280-147965-2 MS	05MW10I-20210426 MS	05/07/2021 21:20	1	MS1_1487.D	DB-624 (60.25) 0.25(mm)
280-147965-2 MSD	05MW10I-20210426 MSD	05/07/2021 21:42	1	MS1_1488.D	DB-624 (60.25) 0.25(mm)
CCVC 280-535304/40		05/07/2021 22:03	1	MS1_1489.D	DB-624 (60.25) 0.25(mm)

8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Instrument ID: VMS_MS9 Start Date: 05/07/2021 18:55

Analysis Batch Number: 535401 End Date: 05/08/2021 05:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535401/1		05/07/2021 18:55	1	MS9_3456.d	RXI-624SilMS 0.25(mm)
CCV 280-535401/2		05/07/2021 19:27	1	MS9_3457.d	RXI-624SilMS 0.25(mm)
CCV 280-535401/3		05/07/2021 19:50	1		RXI-624SilMS 0.25(mm)
LCS 280-535401/4		05/07/2021 20:19	1	MS9_3459.d	RXI-624SilMS 0.25(mm)
LCSD 280-535401/5		05/07/2021 20:42	1	MS9_3460.d	RXI-624SilMS 0.25(mm)
MB 280-535401/8		05/07/2021 21:29	1	MS9_3462.d	RXI-624SilMS 0.25(mm)
ZZZZZ		05/07/2021 22:03	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/07/2021 22:26	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/07/2021 22:49	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/07/2021 23:12	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/07/2021 23:35	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/07/2021 23:58	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 00:21	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 00:44	1		RXI-624SilMS 0.25(mm)
280-147965-9	05MW17I-20210427	05/08/2021 01:07	1	MS9_3471.d	RXI-624SilMS 0.25(mm)
280-147965-10	05DUP01-20210427	05/08/2021 01:30	1	MS9_3472.d	RXI-624SilMS 0.25(mm)
280-147965-11	05MW23-20210427	05/08/2021 01:53	1	MS9_3473.d	RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 02:16	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 02:39	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 03:02	1		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 03:25	1		RXI-624SilMS 0.25(mm)
CCVC 280-535401/28		05/08/2021 03:48	1	MS9_3478.d	RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 04:11	50		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 04:34	50		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 04:57	50		RXI-624SilMS 0.25(mm)
ZZZZZ		05/08/2021 05:20	50		RXI-624SilMS 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 05/08/2021 20:11

Analysis Batch Number: 535496 End Date: 05/09/2021 05:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535496/1		05/08/2021 20:11	1	MS1_1524.D	DB-624 (60.25) 0.25(mm)
CCV 280-535496/2		05/08/2021 20:32	1	MS1_1525.D	DB-624 (60.25) 0.25(mm)
CCV 280-535496/3		05/08/2021 20:53	1		DB-624 (60.25) 0.25(mm)
LCS 280-535496/4		05/08/2021 21:14	1	MS1_1527.D	DB-624 (60.25) 0.25(mm)
LCSD 280-535496/5		05/08/2021 21:35	1	MS1_1528.D	DB-624 (60.25) 0.25(mm)
MB 280-535496/9		05/08/2021 22:18	1	MS1_1530.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/08/2021 22:50	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/08/2021 23:11	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/08/2021 23:33	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/08/2021 23:54	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 00:15	10		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 00:37	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 00:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 01:20	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 01:41	100		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 02:03	100		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 02:24	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 02:45	5		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 03:07	4		DB-624 (60.25) 0.25(mm)
280-147965-12	05MW22-20210427	05/09/2021 03:28	1	MS1_1544.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 03:49	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 04:10	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 04:32	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 04:53	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 05:14	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/09/2021 05:35	1		DB-624 (60.25) 0.25(mm)
CCVC 280-535496/34		05/09/2021 05:56	1	MS1_1551.D	DB-624 (60.25) 0.25(mm)

8260B

8260B_SIM_DOD5

Volatile Organic Compounds (GC/MS)

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DCA #
05MW16S-20210426	280-147965-1	101
05MW10I-20210426	280-147965-2	102
05MW19S-20210426	280-147965-3	99
05MW19I-20210426	280-147965-4	98
05TB01-20210426	280-147965-5	98
05MW18I-20210427	280-147965-6	101
05MW18S-20210427	280-147965-7	97
05TW01-20210427	280-147965-8	99
05MW17I-20210427	280-147965-9	99
05DUP01-20210427	280-147965-10	100
05MW23-20210427	280-147965-11	99
05MW22-20210427	280-147965-12	98
	MB 280-534575/6	98
	MB 280-534690/6	100
	LCS 280-534575/3	97
	LCS 280-534690/3	99
	LCSD 280-534575/4	97
	LCSD 280-534690/4	99
05MW10I-20210426 MS	280-147965-2 MS	102
05MW10I-20210426 MSD	280-147965-2 MSD	100

	QC LIMITS
DCA = 1,2-Dichloroethane-d4 (Surr)	70-127

Column to be used to flag recovery values

FORM II 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1063.D

Lab ID: LCS 280-534575/3 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,4-Dioxane	50.0	52.0	104	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1091.D

Lab ID: LCS 280-534690/3 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,4-Dioxane	25.0	24.4	98	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1064.D

Lab ID: LCSD 280-534575/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,4-Dioxane	50.0	48.3	97	7	20	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1092.D

Lab ID: LCSD 280-534690/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,4-Dioxane	25.0	24.7	99	1	20	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA MATRIX SPIKE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1115.D

Lab ID: 280-147965-2 MS Client ID: 05MW10I-20210426 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
1,4-Dioxane	25.0	1.0 U	25.1	100	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1116.D

Lab ID: 280-147965-2 MSD Client ID: 05MW10I-20210426 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
1,4-Dioxane	25.0	24.4	98	3	20	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: E1066.D Lab Sample ID: MB 280-534575/6

Matrix: Water Heated Purge:(Y/N) Y

Instrument ID: VMS_E Date Analyzed: 05/01/2021 09:46

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-534575/3	E1063.D	05/01/2021 08:40
	LCSD 280-534575/4	E1064.D	05/01/2021 09:02
05TB01-20210426	280-147965-5	E1069.D	05/01/2021 10:53
05MW16S-20210426	280-147965-1	E1083.D	05/01/2021 16:05
05MW19S-20210426	280-147965-3	E1084.D	05/01/2021 16:27
05MW19I-20210426	280-147965-4	E1085.D	05/01/2021 16:50

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-534575/6
Matrix: Water
Lab File ID: E1066.D
Analysis Method: 8260B SIM
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/01/2021 09:46
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534575
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		70-127

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: E1094.D Lab Sample ID: MB 280-534690/6

Matrix: Water Heated Purge:(Y/N) Y

Instrument ID: VMS_E Date Analyzed: 05/03/2021 12:51

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-534690/3	E1091.D	05/03/2021 11:44
	LCSD 280-534690/4	E1092.D	05/03/2021 12:06
05MW18I-20210427	280-147965-6	E1104.D	05/03/2021 16:46
05MW18S-20210427	280-147965-7	E1105.D	05/03/2021 17:08
05TW01-20210427	280-147965-8	E1106.D	05/03/2021 17:31
05MW17I-20210427	280-147965-9	E1107.D	05/03/2021 17:53
05DUP01-20210427	280-147965-10	E1108.D	05/03/2021 18:15
05MW23-20210427	280-147965-11	E1109.D	05/03/2021 18:38
05MW22-20210427	280-147965-12	E1110.D	05/03/2021 19:00
05MW10I-20210426	280-147965-2	E1111.D	05/03/2021 19:22
05MW10I-20210426 MS	280-147965-2 MS	E1115.D	05/03/2021 19:44
05MW10I-20210426 MSD	280-147965-2 MSD	E1116.D	05/03/2021 20:06

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147965-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-534690/6
Matrix: Water
Lab File ID: E1094.D
Analysis Method: 8260B SIM
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/03/2021 12:51
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534690
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-127

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: E0739.D BFB Injection Date: 04/08/2021

Instrument ID: VMS_E BFB Injection Time: 12:33

Analysis Batch No.: 531869

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.6	
75	30.0 - 60.0 % of mass 95	48.4	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.4	
175	5.0 - 9.0 % of mass 174	5.1	(7.4) 1
176	95.0 - 101.0 % of mass 174	66.3	(97.0) 1
177	5.0 - 9.0 % of mass 176	4.2	(6.3) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 280-531869/2	E0740.D	04/08/2021	12:55
	IC 280-531869/3	E0741.D	04/08/2021	13:17
	IC 280-531869/4	E0742.D	04/08/2021	13:39
	IC 280-531869/5	E0743.D	04/08/2021	14:01
	ICIS 280-531869/6	E0744.D	04/08/2021	14:23
	IC 280-531869/7	E0745.D	04/08/2021	14:46
	IC 280-531869/8	E0746.D	04/08/2021	15:08
	ICV 280-531869/9	E0747.D	04/08/2021	15:30

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 531869

SDG No.:

Instrument ID: VMS_E GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 04/08/2021 12:55 Calibration End Date: 04/08/2021 15:08 Calibration ID: 52241

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-531869/2	E0740.D
Level 2	IC 280-531869/3	E0741.D
Level 3	IC 280-531869/4	E0742.D
Level 4	IC 280-531869/5	E0743.D
Level 5	ICIS 280-531869/6	E0744.D
Level 6	IC 280-531869/7	E0745.D
Level 7	IC 280-531869/8	E0746.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Vinyl chloride	+++++ 0.2017	0.2360 +++++	0.1937	0.2036	0.1958	Ave		0.2061				8.3		15.0			
2-Methyl-2-propanol	2.6831 1.6302	1.9189 1.5618	1.6307	1.5017	1.6298	Lin2	0.5426	1.5110							0.9930		0.9900
Benzene	+++++ 1.3636	+++++ 1.1610	1.5025	1.4615	1.3439	Ave		1.3665				9.7		15.0			
Trichloroethene	+++++ 0.2931	0.4861 0.2359	0.3382	0.3203	0.2889	Lin2	0.0043	0.2671							0.9920		0.9900
1,4-Dioxane	2.6749 1.5772	2.3838 1.5474	1.7744	1.6549	1.6253	Lin2	0.5936	1.5799							0.9950		0.9900
1,2-Dichloroethane-d4 (Surr)	0.2901 0.2922	0.2881 0.2883	0.2897	0.2951	0.2906	Ave		0.2906				0.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1 Analy Batch No.: 531869

SDG No.:

Instrument ID: VMS_E GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 04/08/2021 12:55 Calibration End Date: 04/08/2021 15:08 Calibration ID: 52241

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-531869/2	E0740.D
Level 2	IC 280-531869/3	E0741.D
Level 3	IC 280-531869/4	E0742.D
Level 4	IC 280-531869/5	E0743.D
Level 5	ICIS 280-531869/6	E0744.D
Level 6	IC 280-531869/7	E0745.D
Level 7	IC 280-531869/8	E0746.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Vinyl chloride	FB	Ave	+++++ 15835	386 +++++	772	1605	7752	+++++ 1.00	0.0200 +++++	0.0500	0.100	0.500
2-Methyl-2-propanol	TBAd9	Lin2	5070 319675	7823 661421	16709	30347	152404	0.503 50.3	1.01 101	2.52	5.03	25.2
Benzene	FB	Ave	+++++ 107070	+++++ 183793	5989	11520	53217	+++++ 1.00	+++++ 2.00	0.0500	0.100	0.500
Trichloroethene	FB	Lin2	+++++ 23014	795 37349	1348	2525	11441	+++++ 1.00	0.0200 2.00	0.0500	0.100	0.500
1,4-Dioxane	DXE	Lin2	455 28026	852 59314	1602	2987	14031	0.500 50.0	1.00 100	2.50	5.00	25.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	219590 229471	235624 228200	230969	232602	230130	10.0 10.0	10.0 10.0	10.0	10.0	10.0

Curve Type Legend
Ave = Average ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: ICV 280-531869/9 Calibration Date: 04/08/2021 15:30

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E0747.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.1841		0.447	0.500	-10.7	20.0
2-Methyl-2-propanol	Lin2		1.589		26.1	25.2	3.7	20.0
Benzene	Ave	1.366	1.350		0.494	0.500	-1.2	20.0
Trichloroethene	Lin2		0.2912		0.529	0.500	5.8	20.0
1,4-Dioxane	Lin2		1.588		24.9	25.2	-1.0	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2907		10.0	10.0	0.0	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: E1061.D BFB Injection Date: 05/01/2021

Instrument ID: VMS_E BFB Injection Time: 07:56

Analysis Batch No.: 534575

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.4	
75	30.0 - 60.0 % of mass 95	48.1	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	7.1	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	69.3	
175	5.0 - 9.0 % of mass 174	5.2	(7.5) 1
176	95.0 - 101.0 % of mass 174	66.8	(96.4) 1
177	5.0 - 9.0 % of mass 176	4.3	(6.4) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-534575/2	E1062.D	05/01/2021	8:18
	LCS 280-534575/3	E1063.D	05/01/2021	8:40
	LCSD 280-534575/4	E1064.D	05/01/2021	9:02
	MB 280-534575/6	E1066.D	05/01/2021	9:46
05TB01-20210426	280-147965-5	E1069.D	05/01/2021	10:53
05MW16S-20210426	280-147965-1	E1083.D	05/01/2021	16:05
05MW19S-20210426	280-147965-3	E1084.D	05/01/2021	16:27
05MW19I-20210426	280-147965-4	E1085.D	05/01/2021	16:50

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-534575/2 Calibration Date: 05/01/2021 08:18

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1062.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.2116		1.03	1.00	2.6	20.0
2-Methyl-2-propanol	Lin2		1.594		52.7	50.3	4.8	20.0
Benzene	Ave	1.366	1.392		1.02	1.00	1.8	20.0
Trichloroethene	Lin2		0.3074		1.13	1.00	13.5	20.0
1,4-Dioxane	Lin2		1.549		48.7	50.0	-2.7	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2779		9.56	10.0	-4.4	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab File ID: E1089.D BFB Injection Date: 05/03/2021

Instrument ID: VMS_E BFB Injection Time: 11:00

Analysis Batch No.: 534690

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.6	
75	30.0 - 60.0 % of mass 95	48.4	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.8	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.2	
175	5.0 - 9.0 % of mass 174	5.2	(7.6) 1
176	95.0 - 101.0 % of mass 174	65.2	(95.6) 1
177	5.0 - 9.0 % of mass 176	4.2	(6.5) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-534690/2	E1090.D	05/03/2021	11:22
	LCS 280-534690/3	E1091.D	05/03/2021	11:44
	LCSD 280-534690/4	E1092.D	05/03/2021	12:06
	MB 280-534690/6	E1094.D	05/03/2021	12:51
05MW18I-20210427	280-147965-6	E1104.D	05/03/2021	16:46
05MW18S-20210427	280-147965-7	E1105.D	05/03/2021	17:08
05TW01-20210427	280-147965-8	E1106.D	05/03/2021	17:31
05MW17I-20210427	280-147965-9	E1107.D	05/03/2021	17:53
05DUP01-20210427	280-147965-10	E1108.D	05/03/2021	18:15
05MW23-20210427	280-147965-11	E1109.D	05/03/2021	18:38
05MW22-20210427	280-147965-12	E1110.D	05/03/2021	19:00
05MW10I-20210426	280-147965-2	E1111.D	05/03/2021	19:22
05MW10I-20210426 MS	280-147965-2 MS	E1115.D	05/03/2021	19:44
05MW10I-20210426 MSD	280-147965-2 MSD	E1116.D	05/03/2021	20:06
	CCVC 280-534690/79	E1119.D	05/03/2021	20:29

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCV 280-534690/2 Calibration Date: 05/03/2021 11:22

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1090.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.1436		0.348	0.500	-30.3*	20.0
2-Methyl-2-propanol	Lin2		1.541		25.3	25.2	0.5	20.0
Benzene	Ave	1.366	1.310		0.479	0.500	-4.1	20.0
Trichloroethene	Lin2		0.2982		0.542	0.500	8.4	20.0
1,4-Dioxane	Lin2		1.595		24.9	25.0	-0.5	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2868		9.87	10.0	-1.3	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Lab Sample ID: CCVC 280-534690/79 Calibration Date: 05/03/2021 20:29

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1119.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.1259		0.305	0.500	-38.9	50.0
2-Methyl-2-propanol	Lin2		1.544		25.3	25.2	0.7	50.0
Benzene	Ave	1.366	1.278		0.468	0.500	-6.5	50.0
Trichloroethene	Lin2		0.2875		0.522	0.500	4.4	50.0
1,4-Dioxane	Lin2		1.578		24.6	25.0	-1.6	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2970		10.2	10.0	2.2	50.0

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Sample No.: ICIS 280-531869/6 Date Analyzed: 04/08/2021 14:23

Instrument ID: VMS_E GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): E0744.D Heated Purge: (Y/N) Y

Calibration ID: 52241

		FB		DXE			
		AREA #	RT #	AREA #	RT #	#	RT #
INITIAL CALIBRATION MID-POINT		792007	5.14	69065	5.61		
UPPER LIMIT		1584014	5.64	138130	6.11		
LOWER LIMIT		396004	4.64	34533	5.11		
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-531869/9		780669	5.14	71087	5.61		
CCV 280-534575/2		669195	5.14	70877	5.61		
LCS 280-534575/3		654786	5.14	66484	5.61		
LCSD 280-534575/4		687409	5.14	68890	5.61		
MB 280-534575/6		689557	5.14	74103	5.61		
280-147965-5	05TB01-20210426	702291	5.14	73180	5.61		
280-147965-1	05MW16S-20210426	704195	5.14	68196	5.61		
280-147965-3	05MW19S-20210426	710689	5.14	70715	5.61		
280-147965-4	05MW19I-20210426	706225	5.14	72673	5.61		
CCV 280-534690/2		650352	5.14	66191	5.61		
LCS 280-534690/3		655183	5.14	68332	5.61		
LCSD 280-534690/4		647311	5.14	61072	5.61		
MB 280-534690/6		651375	5.14	66326	5.61		
280-147965-6	05MW18I-20210427	641661	5.14	67692	5.61		
280-147965-7	05MW18S-20210427	667460	5.14	60152	5.61		
280-147965-8	05TW01-20210427	660239	5.14	60819	5.61		
280-147965-9	05MW17I-20210427	672943	5.14	64918	5.61		
280-147965-10	05DUP01-20210427	661972	5.14	66510	5.61		
280-147965-11	05MW23-20210427	668524	5.14	63579	5.61		
280-147965-12	05MW22-20210427	653010	5.14	63164	5.61		
280-147965-2	05MW10I-20210426	629915	5.14	61066	5.61		
280-147965-2 MS	05MW10I-20210426 MS	630384	5.14	64397	5.61		
280-147965-2 MSD	05MW10I-20210426 MSD	642183	5.14	63141	5.61		
CCVC 280-534690/79		639706	5.14	63316	5.61		

FB = Fluorobenzene
DXE = 1,4-Dioxane-d8

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B SIM

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147965-1

SDG No.:

Instrument ID: VMS_E Start Date: 05/03/2021 11:00

Analysis Batch Number: 534690 End Date: 05/03/2021 20:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-534690/1		05/03/2021 11:00	1	E1089.D	DB-624 (60.25) 0.25(mm)
CCV 280-534690/2		05/03/2021 11:22	1	E1090.D	DB-624 (60.25) 0.25(mm)
LCS 280-534690/3		05/03/2021 11:44	1	E1091.D	DB-624 (60.25) 0.25(mm)
LCSD 280-534690/4		05/03/2021 12:06	1	E1092.D	DB-624 (60.25) 0.25(mm)
MB 280-534690/6		05/03/2021 12:51	1	E1094.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 13:23	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 13:46	400		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 14:09	50		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 14:31	2		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 14:55	20		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 15:17	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 15:39	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 16:01	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/03/2021 16:24	10		DB-624 (60.25) 0.25(mm)
280-147965-6	05MW18I-20210427	05/03/2021 16:46	1	E1104.D	DB-624 (60.25) 0.25(mm)
280-147965-7	05MW18S-20210427	05/03/2021 17:08	1	E1105.D	DB-624 (60.25) 0.25(mm)
280-147965-8	05TW01-20210427	05/03/2021 17:31	1	E1106.D	DB-624 (60.25) 0.25(mm)
280-147965-9	05MW17I-20210427	05/03/2021 17:53	1	E1107.D	DB-624 (60.25) 0.25(mm)
280-147965-10	05DUP01-20210427	05/03/2021 18:15	1	E1108.D	DB-624 (60.25) 0.25(mm)
280-147965-11	05MW23-20210427	05/03/2021 18:38	1	E1109.D	DB-624 (60.25) 0.25(mm)
280-147965-12	05MW22-20210427	05/03/2021 19:00	1	E1110.D	DB-624 (60.25) 0.25(mm)
280-147965-2	05MW10I-20210426	05/03/2021 19:22	1	E1111.D	DB-624 (60.25) 0.25(mm)
280-147965-2 MS	05MW10I-20210426 MS	05/03/2021 19:44	1	E1115.D	DB-624 (60.25) 0.25(mm)
280-147965-2 MSD	05MW10I-20210426 MSD	05/03/2021 20:06	1	E1116.D	DB-624 (60.25) 0.25(mm)
CCVC 280-534690/79		05/03/2021 20:29	1	E1119.D	DB-624 (60.25) 0.25(mm)

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **T. MOORE** **DATE:** **MAY 21, 2021**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –SELECT VOCs, 1,4-DIOXANE**
NAS JRB WILLOW GROVE SITE 5
SAMPLE DELIVERY GROUP (SDG) 280-147981-1

SAMPLES: 6/Aqueous/
Select VOCs, 1,4-Dioxane

05MW01S-20210428 05MW01SI-20210428
05MW21-20210428 05MW24-20210428
05MW26-20210428 05TW04-20210428

1/Trip Blank
VOCs, 1,4-Dioxane

05TB02-20210428

1/Rinse Blank
VOCs, 1,4-Dioxane

05RB01-20210428

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 280-147981-1, consisted of six (6) aqueous environmental samples, one (1) trip blank and one (1) rinse blank. All samples were analyzed for select volatile organic compounds (VOCs) and 1,4-Dioxane as referenced above.

The samples were collected by Tetra Tech, on April 28, 2021 and analyzed by Eurofins TestAmerica. All analyses were conducted in accordance with SW-846 Methods 8260B and 8260B SIM analytical and reporting protocols.

The data contained in this SDG were validated via EPA Stage 2B with regard to the following parameters: data completeness, holding times, GC/MS tuning, initial/continuing calibrations, laboratory method/field blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries, internal standard areas and recoveries and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

- The detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

- The following compound was detected in a rinse blank at the following maximum concentration.

Compound	Concentration	Action Level LOQ > or <
1,4-Dioxane	0.3 ug/L	<

Detected results reported below the LOQ for 1,4-Dioxane were qualified as nondetected (U) and raised to the limit of detection (LOD).

Notes

Non-detected results were reported to the LOD.

Sample 05MW21-20210428 was analyzed at a 2X dilution for 1,1,1-trichloroethane.

Executive Summary

Laboratory Performance: Blank contamination was present in the rinse blank and the trip blank.

Other Factors Affecting Data Quality: The results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled "Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS" (May 11, 2020).The text of this report has been formulated to address only those areas affecting data quality.

Terri L Solomon

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Joseph A. Samchuck

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated value with an unknown bias. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05MW01S-20210428			05MW01SI-20210428			05MW21-20210428			05MW24-20210428		
SDG: 280-147981-1	LAB_ID	280-147981-2			280-147981-8			280-147981-1			280-147981-7		
FRACTION: OV	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		49			0.4	U		230			3.5		
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		0.29	J	P	0.8	U		0.8	U		0.8	U	
1,1-DICHLOROETHANE		65			0.8	U		110			22		
1,1-DICHLOROETHENE		2.9			0.8	U		36			0.46	J	P
1,2-DICHLOROETHANE		0.4	U		0.4	U		0.4	U		0.4	U	
BENZENE		0.4	U		0.43	J	P	0.39	J	P	0.44	J	P
CHLOROETHANE		1.9	J	P	1.6	U		7.2			19		
CHLOROFORM		0.4	U		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		27			0.34	J	P	150			5.9		
TETRACHLOROETHENE		2			0.4	U		21			0.4	U	
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.26	J	P	0.4	U	
TRICHLOROETHENE		7.7			0.4	U		91			1		
VINYL CHLORIDE		9.6			0.2	U		14			3.1		

PROJ_NO: 08005-WE04	NSAMPLE	05MW26-20210428			05RB01-20210428			05TB02-20210428			05TW04-20210428		
SDG: 280-147981-1	LAB_ID	280-147981-4			280-147981-6			280-147981-5			280-147981-3		
FRACTION: OV	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			RB			TB			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.4	U		0.4	U		0.4	U		22		
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		0.8	U		0.8	U		0.8	U		0.37	J	P
1,1-DICHLOROETHANE		4.1			0.8	U		0.8	U		16		
1,1-DICHLOROETHENE		0.8	U		0.8	U		0.8	U		6		
1,2-DICHLOROETHANE		0.4	U		0.4	U		0.4	U		0.4	U	
BENZENE		0.23	J	P	0.4	U		0.4	U		0.24	J	P
CHLOROETHANE		2.7			1.6	U		1.6	U		1.6	U	
CHLOROFORM		0.4	U		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		1.7			0.4	U		0.4	U		26		
TETRACHLOROETHENE		0.4	U		0.4	U		0.4	U		0.27	J	P
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.4	U		0.4	U	
TRICHLOROETHENE		0.4	U		0.4	U		0.4	U		9.5		
VINYL CHLORIDE		0.2	U		0.2	U		0.2	U		3.1		

PROJ_NO: 08005-WE04	NSAMPLE	05MW01S-20210428			05MW01SI-20210428			05MW21-20210428			05MW24-20210428		
SDG: 280-147981-1	LAB_ID	280-147981-2			280-147981-8			280-147981-1			280-147981-7		
FRACTION: OVSIM	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		1.4			1	U	B	1	U	B	1	U	

PROJ_NO: 08005-WE04	NSAMPLE	05MW26-20210428			05RB01-20210428			05TB02-20210428			05TW04-20210428		
SDG: 280-147981-1	LAB_ID	280-147981-4			280-147981-6			280-147981-5			280-147981-3		
FRACTION: OVSIM	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			RB			TB			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		1	U	B	0.3	J	P	0.27	J	P	1	U	B

Appendix B

Results as Reported by the Laboratory

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW21-20210428
Lab Sample ID: 280-147981-1
Matrix: Water
Lab File ID: R6045.D
Analysis Method: 8260B
Date Collected: 04/28/2021 10:55
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 16:01
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U M	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	110		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	36		1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U M	1.0	0.40	0.13
71-43-2	Benzene	0.39	J	1.0	0.40	0.16
75-00-3	Chloroethane	7.2		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	150		1.0	0.40	0.15
127-18-4	Tetrachloroethene	21		1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.26	J	1.0	0.40	0.15
79-01-6	Trichloroethene	91		1.0	0.40	0.16
75-01-4	Vinyl chloride	14		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		81-118
460-00-4	4-Bromofluorobenzene (Surr)	105		85-114
1868-53-7	Dibromofluoromethane (Surr)	97		80-119
2037-26-5	Toluene-d8 (Surr)	102		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW21-20210428 DL
Lab Sample ID: 280-147981-1 DL
Matrix: Water
Lab File ID: R6073.D
Analysis Method: 8260B
Date Collected: 04/28/2021 10:55
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 09:22
Soil Aliquot Vol:
Dilution Factor: 2
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535654
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	230	D	2.0	0.80	0.32

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		81-118
460-00-4	4-Bromofluorobenzene (Surr)	103		85-114
1868-53-7	Dibromofluoromethane (Surr)	98		80-119
2037-26-5	Toluene-d8 (Surr)	101		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW01S-20210428
Lab Sample ID: 280-147981-2
Matrix: Water
Lab File ID: R6046.D
Analysis Method: 8260B
Date Collected: 04/28/2021 13:05
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 16:23
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	49		1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.29	J	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	65		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	2.9		1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.9	J	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	27		1.0	0.40	0.15
127-18-4	Tetrachloroethene	2.0		1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	7.7		1.0	0.40	0.16
75-01-4	Vinyl chloride	9.6		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		81-118
460-00-4	4-Bromofluorobenzene (Surr)	104		85-114
1868-53-7	Dibromofluoromethane (Surr)	97		80-119
2037-26-5	Toluene-d8 (Surr)	102		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05TW04-20210428
Lab Sample ID: 280-147981-3
Matrix: Water
Lab File ID: R6047.D
Analysis Method: 8260B
Date Collected: 04/28/2021 12:35
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 16:47
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	22		1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.37	J	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	16		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	6.0		1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U M	1.0	0.40	0.13
71-43-2	Benzene	0.24	J	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	26		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.27	J	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	9.5		1.0	0.40	0.16
75-01-4	Vinyl chloride	3.1		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		81-118
460-00-4	4-Bromofluorobenzene (Surr)	104		85-114
1868-53-7	Dibromofluoromethane (Surr)	98		80-119
2037-26-5	Toluene-d8 (Surr)	102		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW26-20210428
Lab Sample ID: 280-147981-4
Matrix: Water
Lab File ID: R6048.D
Analysis Method: 8260B
Date Collected: 04/28/2021 11:40
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 17:10
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	4.1		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U M	1.0	0.40	0.13
71-43-2	Benzene	0.23	J	1.0	0.40	0.16
75-00-3	Chloroethane	2.7		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	1.7		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
460-00-4	4-Bromofluorobenzene (Surr)	103		85-114
1868-53-7	Dibromofluoromethane (Surr)	98		80-119
2037-26-5	Toluene-d8 (Surr)	100		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05TB02-20210428
Lab Sample ID: 280-147981-5
Matrix: Water
Lab File ID: R6034.D
Analysis Method: 8260B
Date Collected: 04/28/2021 08:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 11:47
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		81-118
460-00-4	4-Bromofluorobenzene (Surr)	102		85-114
1868-53-7	Dibromofluoromethane (Surr)	98		80-119
2037-26-5	Toluene-d8 (Surr)	102		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05RB01-20210428
Lab Sample ID: 280-147981-6
Matrix: Water
Lab File ID: R6035.D
Analysis Method: 8260B
Date Collected: 04/28/2021 15:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 12:10
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		81-118
460-00-4	4-Bromofluorobenzene (Surr)	104		85-114
1868-53-7	Dibromofluoromethane (Surr)	97		80-119
2037-26-5	Toluene-d8 (Surr)	101		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW24-20210428
Lab Sample ID: 280-147981-7
Matrix: Water
Lab File ID: R6049.D
Analysis Method: 8260B
Date Collected: 04/28/2021 14:55
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 17:33
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	3.5		1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	22		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.46	J	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U M	1.0	0.40	0.13
71-43-2	Benzene	0.44	J	1.0	0.40	0.16
75-00-3	Chloroethane	19		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	5.9		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	1.0		1.0	0.40	0.16
75-01-4	Vinyl chloride	3.1		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		81-118
460-00-4	4-Bromofluorobenzene (Surr)	103		85-114
1868-53-7	Dibromofluoromethane (Surr)	96		80-119
2037-26-5	Toluene-d8 (Surr)	102		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW01SI-20210428
Lab Sample ID: 280-147981-8
Matrix: Water
Lab File ID: R6050.D
Analysis Method: 8260B
Date Collected: 04/28/2021 15:25
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 17:56
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.43	J	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.34	J	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
460-00-4	4-Bromofluorobenzene (Surr)	103		85-114
1868-53-7	Dibromofluoromethane (Surr)	97		80-119
2037-26-5	Toluene-d8 (Surr)	103		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW21-20210428
Lab Sample ID: 280-147981-1
Matrix: Water
Lab File ID: E1208.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 10:55
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 20:51
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.3	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW01S-20210428
Lab Sample ID: 280-147981-2
Matrix: Water
Lab File ID: E1209.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 13:05
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 21:13
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.4		1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05TW04-20210428
Lab Sample ID: 280-147981-3
Matrix: Water
Lab File ID: E1210.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 12:35
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 21:35
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.64	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW26-20210428
Lab Sample ID: 280-147981-4
Matrix: Water
Lab File ID: E1211.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 11:40
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 21:57
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.84	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05TB02-20210428
Lab Sample ID: 280-147981-5
Matrix: Water
Lab File ID: E1207.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 08:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 20:29
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.27	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05RB01-20210428
Lab Sample ID: 280-147981-6
Matrix: Water
Lab File ID: E1212.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 15:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 22:19
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.30	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW24-20210428
Lab Sample ID: 280-147981-7
Matrix: Water
Lab File ID: E1213.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 14:55
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 22:41
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U M	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID: 05MW01SI-20210428
Lab Sample ID: 280-147981-8
Matrix: Water
Lab File ID: E1225.D
Analysis Method: 8260B SIM
Date Collected: 04/28/2021 15:25
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 03:07
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.65	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		70-127

Appendix C

Support Documentation

Eurofins TestAmerica, Denver
4955 Yarrow Street

Arvada, CO 80002-4517
phone 303.736.0100 fax 303.431.7171

Chain of Custody Record

eurofins Environment Testing America

Regulatory Program: ☑ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact
Tetra Tech
234 Mall Blvd. Suite 260
King of Prussia, PA 19406
(xxx) xxx-xxxx Phone
(xxx) xxx-xxxx FAX
Project Name: NAS JRB Willow Grove
Site: Site 5
P O #

Project Manager: Tricia Moore
Email: tricia.moore@tetratech.com
Tel/Fax: 610-382-1171

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from Below
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Site Contact: D. Whalen
Lab Contact:
Date: 4-28-21
Carrier: FedEx 775580566003

COC No: ____ of ____ COCs
TALS Project #:
Sampler:
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs	1,4-Dioxane	Sample Specific Notes:
05MW21-20210428	4/28/21	1055	G	W	6	N	N	3	3	
05MW015-20210428	↓	1305	G	W	6	N	N	3	3	
05TW04-20210428	↓	1235	G	W	6	N	N	3	3	
05MW26-20210428	↓	1140	G	W	6	N	N	3	3	
05TB02-20210428	↓	0800	G	W	4	N	N	2	2	trip blank
05RB01-20210428	↓	1500	G	W	6	N	N	3	3	Rinse Blank
05MW24-20210428	↓	1455	G	W	6	N	N	3	3	
05MW015I-20210428	↓	1525	G	W	6	N	N	3	3	
								2	2	

280-147981 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temp. (°C): Obs'd: 2.2 Corr'd: 2.6 Therm ID No.: 11

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Donald Whalen	Tetra Tech	4/28/21 1830	[signature]	EADEN	04/29/2021 1045
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.35, dated 10/6/2020

Sample Summary

Client: White Water Associates
Job ID: 280-147981-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-147981-1	05MW21-20210428	Water	04/28/21 10:55	04/29/21 10:45	
280-147981-2	05MW01S-20210428	Water	04/28/21 13:05	04/29/21 10:45	
280-147981-3	05TW04-20210428	Water	04/28/21 12:35	04/29/21 10:45	
280-147981-4	05MW26-20210428	Water	04/28/21 11:40	04/29/21 10:45	
280-147981-5	05TB02-20210428	Water	04/28/21 08:00	04/29/21 10:45	
280-147981-6	05RB01-20210428	Water	04/28/21 15:00	04/29/21 10:45	
280-147981-7	05MW24-20210428	Water	04/28/21 14:55	04/29/21 10:45	
280-147981-8	05MW01SI-20210428	Water	04/28/21 15:25	04/29/21 10:45	

CASE NARRATIVE

Client: White Water Associates

Project: Willow Grove Site 5 Long Term Monitoring

Report Number: 280-147981-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/29/2021 10:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

VOLATILE ORGANIC COMPOUNDS (GC/MS)

Samples 05MW21-20210428 (280-147981-1), 05MW01S-20210428 (280-147981-2), 05TW04-20210428 (280-147981-3), 05MW26-20210428 (280-147981-4), 05TB02-20210428 (280-147981-5), 05RB01-20210428 (280-147981-6), 05MW24-20210428 (280-147981-7) and 05MW01SI-20210428 (280-147981-8) were analyzed for volatile organic compounds (GC/MS) in accordance with 8260B. The samples were analyzed on 05/10/2021 and 05/11/2021.

Sample 05MW21-20210428 (280-147981-1)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 280-535527. An LCS/LCSD was analyzed to provide batch precision and accuracy.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 280-535654. An LCS/LCSD was analyzed to provide batch precision and accuracy.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS SIM)

Samples 05MW21-20210428 (280-147981-1), 05MW01S-20210428 (280-147981-2), 05TW04-20210428 (280-147981-3), 05MW26-20210428 (280-147981-4), 05TB02-20210428 (280-147981-5), 05RB01-20210428 (280-147981-6), 05MW24-20210428 (280-147981-7) and 05MW01SI-20210428 (280-147981-8) were analyzed for volatile organic compounds (GC-MS SIM) in accordance with SW846 8260B SIM. The samples were analyzed on 05/06/2021 and 05/07/2021.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: White Water Associates
Job ID: 280-147981-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: White Water Associates
Job ID: 280-147981-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Method 8260B

Volatile Organic Compounds (GC/MS) by Method 8260B

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TOL #	BFB #
05MW21-20210428	280-147981-1	97	100	102	105
05MW21-20210428 DL	280-147981-1 DL	98	97	101	103
05MW01S-20210428	280-147981-2	97	99	102	104
05TW04-20210428	280-147981-3	98	101	102	104
05MW26-20210428	280-147981-4	98	98	100	103
05TB02-20210428	280-147981-5	98	101	102	102
05RB01-20210428	280-147981-6	97	99	101	104
05MW24-20210428	280-147981-7	96	97	102	103
05MW01SI-20210428	280-147981-8	97	98	103	103
	MB 280-535527/9	97	98	102	102
	MB 280-535654/9	98	101	100	103
	LCS 280-535527/4	97	97	102	102
	LCS 280-535654/4	96	97	102	102
	LCSD 280-535527/5	96	97	102	102
	LCSD 280-535654/5	97	97	103	102

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	80-119
DCA = 1,2-Dichloroethane-d4 (Surr)	81-118
TOL = Toluene-d8 (Surr)	89-112
BFB = 4-Bromofluorobenzene (Surr)	85-114

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low Lab File ID: R6028.D

Lab ID: LCS 280-535527/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	23.6	95	74-131	
1,1,2,2-Tetrachloroethane	25.0	28.7	115	71-121	
1,1,2-Trichloroethane	25.0	26.9	107	80-119	
1,1-Dichloroethane	25.0	25.1	101	77-125	
1,1-Dichloroethene	25.0	24.8	99	71-131	
1,2-Dichloroethane	25.0	25.1	100	73-128	
Benzene	25.0	25.3	101	79-120	
Chloroethane	25.0	26.8	107	60-138	
Chloroform	25.0	24.8	99	79-124	
Chloromethane	25.0	23.3	93	50-139	
cis-1,2-Dichloroethene	25.0	25.6	102	78-123	
Tetrachloroethene	25.0	24.6	98	74-129	
trans-1,2-Dichloroethene	25.0	24.5	98	75-124	
Trichloroethene	25.0	25.4	101	79-123	
Vinyl chloride	25.0	24.8	99	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low Lab File ID: R6068.D

Lab ID: LCS 280-535654/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	22.5	90	74-131	
1,1,2,2-Tetrachloroethane	25.0	29.2	117	71-121	
1,1,2-Trichloroethane	25.0	26.4	106	80-119	
1,1-Dichloroethane	25.0	24.8	99	77-125	
1,1-Dichloroethene	25.0	23.1	93	71-131	
1,2-Dichloroethane	25.0	24.8	99	73-128	
Benzene	25.0	24.9	100	79-120	
Chloroethane	25.0	27.6	110	60-138	
Chloroform	25.0	24.4	98	79-124	
Chloromethane	25.0	23.5	94	50-139	
cis-1,2-Dichloroethene	25.0	24.8	99	78-123	
Tetrachloroethene	25.0	23.0	92	74-129	
trans-1,2-Dichloroethene	25.0	23.5	94	75-124	
Trichloroethene	25.0	24.9	99	79-123	
Vinyl chloride	25.0	26.1	104	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low Lab File ID: R6029.D

Lab ID: LCSD 280-535527/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	22.0	88	7	20	74-131	
1,1,2,2-Tetrachloroethane	25.0	28.7	115	0	20	71-121	
1,1,2-Trichloroethane	25.0	26.1	104	3	20	80-119	
1,1-Dichloroethane	25.0	24.2	97	4	20	77-125	
1,1-Dichloroethene	25.0	23.0	92	7	20	71-131	
1,2-Dichloroethane	25.0	24.4	98	3	20	73-128	
Benzene	25.0	24.5	98	3	20	79-120	
Chloroethane	25.0	25.7	103	4	20	60-138	
Chloroform	25.0	23.9	96	4	20	79-124	
Chloromethane	25.0	22.8	91	2	20	50-139	
cis-1,2-Dichloroethene	25.0	24.3	97	5	20	78-123	
Tetrachloroethene	25.0	22.4	89	10	20	74-129	
trans-1,2-Dichloroethene	25.0	23.2	93	6	20	75-124	
Trichloroethene	25.0	24.3	97	4	20	79-123	
Vinyl chloride	25.0	24.2	97	2	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low Lab File ID: R6069.D

Lab ID: LCSD 280-535654/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	22.6	90	1	20	74-131	
1,1,2,2-Tetrachloroethane	25.0	27.2	109	7	20	71-121	
1,1,2-Trichloroethane	25.0	25.5	102	3	20	80-119	
1,1-Dichloroethane	25.0	24.3	97	2	20	77-125	
1,1-Dichloroethene	25.0	23.7	95	2	20	71-131	
1,2-Dichloroethane	25.0	24.1	96	3	20	73-128	
Benzene	25.0	24.2	97	3	20	79-120	
Chloroethane	25.0	26.3	105	5	20	60-138	
Chloroform	25.0	23.7	95	3	20	79-124	
Chloromethane	25.0	22.2	89	6	20	50-139	
cis-1,2-Dichloroethene	25.0	24.1	96	3	20	78-123	
Tetrachloroethene	25.0	23.5	94	2	20	74-129	
trans-1,2-Dichloroethene	25.0	23.5	94	0	20	75-124	
Trichloroethene	25.0	24.8	99	0	20	79-123	
Vinyl chloride	25.0	24.3	97	7	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: R6031.D Lab Sample ID: MB 280-535527/9

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: VMS_R1 Date Analyzed: 05/10/2021 10:38

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535527/4	R6028.D	05/10/2021 09:29
	LCSD 280-535527/5	R6029.D	05/10/2021 09:52
05TB02-20210428	280-147981-5	R6034.D	05/10/2021 11:47
05RB01-20210428	280-147981-6	R6035.D	05/10/2021 12:10
05MW21-20210428	280-147981-1	R6045.D	05/10/2021 16:01
05MW01S-20210428	280-147981-2	R6046.D	05/10/2021 16:23
05TW04-20210428	280-147981-3	R6047.D	05/10/2021 16:47
05MW26-20210428	280-147981-4	R6048.D	05/10/2021 17:10
05MW24-20210428	280-147981-7	R6049.D	05/10/2021 17:33
05MW01SI-20210428	280-147981-8	R6050.D	05/10/2021 17:56

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535527/9
Matrix: Water
Lab File ID: R6031.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/10/2021 10:38
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535527
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		81-118
460-00-4	4-Bromofluorobenzene (Surr)	102		85-114
1868-53-7	Dibromofluoromethane (Surr)	97		80-119
2037-26-5	Toluene-d8 (Surr)	102		89-112

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: R6071.D Lab Sample ID: MB 280-535654/9

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: VMS_R1 Date Analyzed: 05/11/2021 08:36

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535654/4	R6068.D	05/11/2021 07:27
	LCSD 280-535654/5	R6069.D	05/11/2021 07:50
05MW21-20210428 DL	280-147981-1 DL	R6073.D	05/11/2021 09:22

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535654/9
Matrix: Water
Lab File ID: R6071.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 08:36
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535654
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		81-118
460-00-4	4-Bromofluorobenzene (Surr)	103		85-114
1868-53-7	Dibromofluoromethane (Surr)	98		80-119
2037-26-5	Toluene-d8 (Surr)	100		89-112

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: R5823.D BFB Injection Date: 05/06/2021

Instrument ID: VMS_R1 BFB Injection Time: 10:52

Analysis Batch No.: 535139

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	21.2	
75	30.0 - 60.0 % of mass 95	52.9	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.6	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	75.6	
175	5.0 - 9.0 % of mass 174	5.6	(7.4) 1
176	95.0 - 101.0 % of mass 174	73.1	(96.7) 1
177	5.0 - 9.0 % of mass 176	4.7	(6.5) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 280-535139/13	R5826.D	05/06/2021	12:06
	IC 280-535139/14	R5827.D	05/06/2021	12:30
	IC 280-535139/15	R5828.D	05/06/2021	12:52
	IC 280-535139/16	R5829.D	05/06/2021	13:15
	IC 280-535139/17	R5830.D	05/06/2021	13:38
	ICIS 280-535139/18	R5831.D	05/06/2021	14:01
	IC 280-535139/19	R5832.D	05/06/2021	14:24
	IC 280-535139/20	R5833.D	05/06/2021	14:47
	IC 280-535139/21	R5834.D	05/06/2021	15:11
	ICV 280-535139/22	R5836.D	05/06/2021	15:50

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-535139/13	R5826.D
Level 2	IC 280-535139/14	R5827.D
Level 3	IC 280-535139/15	R5828.D
Level 4	IC 280-535139/16	R5829.D
Level 5	IC 280-535139/17	R5830.D
Level 6	ICIS 280-535139/18	R5831.D
Level 7	IC 280-535139/19	R5832.D
Level 8	IC 280-535139/20	R5833.D
Level 9	IC 280-535139/21	R5834.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Dichlorodifluoromethane	0.1852 0.2314	0.1865 0.2287	0.1934 0.2276	0.2246 0.2248	0.2252	Ave		0.2142				9.1		15.0			
Chloromethane	+++++ 0.2584	0.3172 0.2586	0.2849 0.2544	0.2817 0.2473	0.2935	Ave		0.2745			0.1000	8.7		15.0			
Vinyl chloride	+++++ 0.2525	0.2521 0.2517	0.2569 0.2468	0.2610 0.2440	0.2716	Ave		0.2546				3.4		30.0			
Bromomethane	+++++ 0.1372	0.1437 0.1531	0.1302 0.1615	0.1384 0.1729	0.1353	Ave		0.1465				10.0		15.0			
Chloroethane	0.4729 0.1644	0.2961 0.1608	0.2134 0.1561	0.1759 0.1564	0.1818	Lin2	0.1543	0.1538							0.9940		0.9900
Dichlorofluoromethane	+++++ 0.3967	0.4733 0.3940	0.4451 0.3869	0.4321 0.3860	0.4463	Ave		0.4201				7.9		15.0			
Trichlorofluoromethane	0.3897 0.3459	0.3171 0.3293	0.3621 0.3206	0.3517 0.3141	0.3623	Ave		0.3436				7.4		15.0			
Ethyl ether	0.1674 0.1663	0.1633 0.1673	0.1669 0.1688	0.1728 0.1715	0.1720	Ave		0.1685				1.8		15.0			
Acrolein	0.0137 0.0235	0.0205 0.0241	0.0205 0.0240	0.0199 0.0268	0.0195	Lin2	-0.046	0.0234							0.9900		0.9900
1,1,2-Trichloro-1,2,2-trifluoroethane	+++++ 0.1282	0.1268 0.1410	0.1275 0.1507	0.1439 0.1534	0.1530	Ave		0.1406				8.3		15.0			
1,1-Dichloroethene	0.2454 0.1623	0.1809 0.1740	0.1754 0.1811	0.1814 0.1864	0.1924	Ave		0.1866				12.6		30.0			
Acetone	+++++ 0.0731	0.1015 0.0706	0.0859 0.0695	0.0738 0.0737	0.0702	Ave		0.0773				14.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Iodomethane	+++++ 0.2718	0.1539 0.2897	0.1687 0.2910	0.2138 0.2870	0.2646	Lin2	-0.146	0.2762							0.9920		0.9900
Carbon disulfide	+++++ 0.5070	0.5622 0.5338	0.5422 0.5554	0.5638 0.5670	0.6060	Ave		0.5547				5.2		15.0			
Methyl acetate	+++++ 0.1721	0.1864 0.1702	0.1742 0.1658	0.1638 0.1708	0.1603	Ave		0.1704				4.7		15.0			
3-Chloro-1-propene	+++++ 0.3011	0.3613 0.3104	0.3712 0.3034	0.3386 0.2570	0.3467	Ave		0.3237				11.7		15.0			
Methylene Chloride	+++++ 0.2081	0.2768 0.2138	0.2526 0.2133	0.2291 0.2151	0.2346	Ave		0.2304				10.3		15.0			
t-Butyl alcohol	0.0197 0.0268	0.0238 0.0265	0.0248 0.0262	0.0239 0.0290	0.0238	Ave		0.0249				10.5		15.0			
Acrylonitrile	0.0770 0.0889	0.0807 0.0871	0.0882 0.0855	0.0834 0.0912	0.0843	Ave		0.0852				5.1		15.0			
Methyl tert-butyl ether	0.6249 0.6668	0.6380 0.6804	0.6375 0.6702	0.6645 0.6965	0.6645	Ave		0.6604				3.5		15.0			
trans-1,2-Dichloroethene	0.3058 0.1967	0.2140 0.2032	0.2075 0.2090	0.2158 0.2141	0.2254	Ave		0.2213				14.8		15.0			
Hexane	0.6790 0.9782	0.8663 1.0481	0.9483 1.1125	1.0539 1.1212	1.1107	Ave		0.9909				14.6		15.0			
Vinyl acetate	0.4733 0.4720	0.4858 0.4743	0.4615 0.4181	0.4625 0.4312	0.4675	Ave		0.4607				4.8		15.0			
1,1-Dichloroethane	0.5562 0.3779	0.4128 0.3922	0.3861 0.3926	0.3997 0.3984	0.4244	Ave		0.4156			0.1000	13.1		15.0			
2-Butanone (MEK)	0.1314 0.1130	0.1300 0.1105	0.1156 0.1080	0.1042 0.1156	0.1055	Ave		0.1149				8.6		15.0			
cis-1,2-Dichloroethene	0.2792 0.2282	0.2404 0.2346	0.2399 0.2355	0.2408 0.2420	0.2498	Ave		0.2434				6.0		15.0			
2,2-Dichloropropane	+++++ 0.3207	0.3726 0.3321	0.3356 0.3399	0.3389 0.3443	0.3630	Ave		0.3434				4.9		15.0			
sec-Butyl Alcohol	0.0162 0.0205	0.0170 0.0197	0.0175 0.0197	0.0178 0.0217	0.0176	Ave		0.0186				9.9		15.0			
Bromochloromethane	0.1062 0.1112	0.1114 0.1152	0.1269 0.1112	0.1132 0.1132	0.1197	Ave		0.1142				5.2		15.0			
Tetrahydrofuran	0.0938 0.0771	0.0850 0.0735	0.0735 0.0719	0.0688 0.0763	0.0710	Ave		0.0768				10.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Chloroform	0.5039 0.3785	0.4118 0.3913	0.4028 0.3920	0.4061 0.3975	0.4149	Ave		0.4110				8.9		30.0			
1,1,1-Trichloroethane	0.4826 0.3260	0.3765 0.3438	0.3414 0.3563	0.3514 0.3620	0.3750	Ave		0.3683				12.4		15.0			
Cyclohexane	+++++ 0.3119	0.1404 0.3383	0.3259 0.3614	0.3499 0.3634	0.3710	Lin1	-0.150	0.3549							0.9970		0.9900
1,1-Dichloropropene	+++++ 0.2837	0.3029 0.3019	0.2971 0.3143	0.3072 0.3209	0.3347	Ave		0.3078				5.0		15.0			
Carbon tetrachloride	0.3979 0.2761	0.3017 0.2936	0.2864 0.3096	0.2904 0.3190	0.3150	Ave		0.3100				11.6		15.0			
Isobutyl alcohol	0.0078 0.0089	0.0093 0.0085	0.0085 0.0083	0.0081 0.0092	0.0077	Ave		0.0085				6.8		15.0			
Benzene	1.1847 0.8389	0.9064 0.8684	0.8774 0.8766	0.8807 0.8935	0.9397	Ave		0.9185				11.3		15.0			
1,2-Dichloroethane	0.3886 0.3296	0.3691 0.3369	0.3529 0.3320	0.3341 0.3374	0.3563	Ave		0.3485				5.7		15.0			
Trichloroethene	+++++ 0.9113	1.0344 0.9362	0.9711 0.9799	0.9764 0.9920	1.0664	Ave		0.9835				5.0		15.0			
2-Pentanone	0.1673 0.1839	0.1784 0.1793	0.1697 0.1762	0.1660 0.1891	0.1676	Ave		0.1753				4.7		15.0			
Methylcyclohexane	0.2485 0.2388	0.2435 0.2578	0.2389 0.2732	0.2514 0.2793	0.2768	Ave		0.2565				6.3		15.0			
1,2-Dichloropropane	0.2317 0.2220	0.2203 0.2273	0.2234 0.2263	0.2223 0.2314	0.2388	Ave		0.2271				2.6		30.0			
1,4-Dioxane	+++++ 0.0034	0.0030 0.0033	0.0033 0.0032	0.0033 0.0035	0.0032	Ave		0.0033				4.3		15.0			
Dibromomethane	0.1400 0.1459	0.1438 0.1481	0.1423 0.1468	0.1466 0.1513	0.1517	Ave		0.1463				2.6		15.0			
Bromodichloromethane	0.3185 0.2950	0.2835 0.3061	0.2962 0.3071	0.3027 0.3129	0.3159	Ave		0.3042				3.7		15.0			
2-Chloroethyl vinyl ether	0.1165 0.1563	0.1463 0.1570	0.1467 0.1553	0.1538 0.1604	0.1554	Ave		0.1497				8.9		15.0			
cis-1,3-Dichloropropene	1.6221 1.5511	1.4692 1.5969	1.5070 1.5838	1.5854 1.6162	1.6248	Ave		1.5729				3.4		15.0			
4-Methyl-2-pentanone (MIBK)	0.2018 0.2379	0.2153 0.2308	0.2187 0.2289	0.2151 0.2420	0.2207	Ave		0.2235				5.6		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Toluene	1.3459 0.9242	1.0102 0.9570	0.9579 0.9717	0.9768 0.9960	1.0276	Ave		1.0186				12.4		30.0			
trans-1,3-Dichloropropene	0.3202 0.3615	0.3234 0.3737	0.3384 0.3712	0.3524 0.3815	0.3642	Ave		0.3540				6.3		15.0			
Ethyl methacrylate	1.1458 1.2525	1.1123 1.2654	1.1807 1.2418	1.1679 1.3001	1.2165	Ave		1.2092				5.1		15.0			
1,1,2-Trichloroethane	0.1691 0.1985	0.1907 0.2035	0.1983 0.2024	0.1923 0.2067	0.2060	Ave		0.1964				5.9		15.0			
Tetrachloroethene	1.0302 0.6886	0.7067 0.7272	0.6720 0.7532	0.7055 0.7753	0.7839	Ave		0.7603				14.2		15.0			
1,3-Dichloropropane	1.4163 1.4919	1.3529 1.5109	1.4536 1.4948	1.4931 1.5302	1.5588	Ave		1.4781				4.2		15.0			
2-Hexanone	0.6174 0.6965	0.6380 0.6752	0.6683 0.6628	0.6444 0.7085	0.6645	Ave		0.6640				4.3		15.0			
Dibromochloromethane	0.8563 0.9592	0.8633 0.9838	0.8551 0.9868	0.9075 1.0293	0.9529	Ave		0.9327				6.9		15.0			
1,2-Dibromoethane (EDB)	0.8421 0.9268	0.8619 0.9275	0.9109 0.9142	0.8933 0.9448	0.9244	Ave		0.9051				3.7		15.0			
1-Chlorohexane	1.5727 1.1206	1.6834 1.1770	1.3942 1.2402	1.2907 1.2591	1.3465	Ave		1.3427				13.6		15.0			
Chlorobenzene	3.2712 2.5651	2.8169 2.6498	2.6540 2.6420	2.6830 2.7079	2.8018	Ave		2.7546			0.3000	7.6		15.0			
1,1,1,2-Tetrachloroethane	0.9259 0.9448	0.8548 0.9799	0.9053 0.9843	0.9248 1.0121	0.9798	Ave		0.9457				5.1		15.0			
Ethylbenzene	1.9288 1.3754	1.5086 1.4244	1.3890 1.4432	1.4335 1.4974	1.5557	Ave		1.5062				11.2		30.0			
m-Xylene & p-Xylene	2.2734 1.6911	1.8692 1.7351	1.6657 1.7564	1.7473 1.7961	1.8866	Ave		1.8246				10.1		15.0			
o-Xylene	2.3389 1.6595	1.7763 1.7237	1.6849 1.7252	1.7528 1.7880	1.8648	Ave		1.8127				11.4		15.0			
Styrene	3.3660 2.9425	2.9631 3.0454	2.8721 3.0436	2.9830 3.1680	3.1642	Ave		3.0609				4.9		15.0			
Bromoform	+++++ 0.6702	0.5270 0.6978	0.5853 0.6985	0.5970 0.7373	0.6216	Ave		0.6418			0.1000	11.0		15.0			
Isopropylbenzene	3.5361 2.5111	2.7636 2.5890	2.6262 2.6707	2.5962 2.7736	2.8409	Ave		2.7675				11.1		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Cyclohexanone	0.0381 0.0444	0.0395 0.0431	0.0428 0.0426	0.0428 0.0448	0.0446	Ave		0.0425				5.4		15.0			
1,1,2,2-Tetrachloroethane	0.6784 0.7011	0.6716 0.6938	0.6894 0.6711	0.6574 0.7053	0.6846	Ave		0.6836			0.3000	2.3		15.0			
Bromobenzene	0.7338 0.6534	0.6155 0.6652	0.6464 0.6635	0.6609 0.6886	0.6869	Ave		0.6682				4.9		15.0			
trans-1,4-Dichloro-2-butene	0.2284 0.2437	0.2190 0.2436	0.1886 0.2375	0.2166 0.2500	0.2281	Ave		0.2284				8.2		15.0			
1,2,3-Trichloropropane	0.1681 0.2293	0.2220 0.2235	0.2280 0.2226	0.2071 0.2331	0.2223	Ave		0.2173				9.1		15.0			
N-Propylbenzene	1.0285 0.7046	0.7312 0.7198	0.6929 0.7371	0.7255 0.7648	0.7684	Ave		0.7636				13.4		15.0			
2-Chlorotoluene	0.7432 0.6231	0.6547 0.6355	0.6192 0.6355	0.6291 0.6580	0.6807	Ave		0.6532				6.0		15.0			
1,3,5-Trimethylbenzene	2.9478 2.1715	2.2721 2.2114	2.1940 2.2448	2.2008 2.3047	2.4035	Ave		2.3278				10.4		15.0			
4-Chlorotoluene	0.7459 0.6590	0.6508 0.6686	0.6711 0.6710	0.6563 0.6914	0.6970	Ave		0.6790				4.3		15.0			
tert-Butylbenzene	2.4829 1.7973	1.9201 1.8503	1.8301 1.8967	1.8755 1.9496	1.9987	Ave		1.9557				10.6		15.0			
1,2,4-Trimethylbenzene	2.8584 2.2509	2.3997 2.3164	2.2195 2.3113	2.2759 2.3800	2.4520	Ave		2.3849				8.1		15.0			
sec-Butylbenzene	0.7335 0.5252	0.5200 0.5451	0.4984 0.5639	0.5346 0.5767	0.5777	Ave		0.5639				12.2		15.0			
1,3-Dichlorobenzene	1.4044 1.2408	1.1960 1.2777	1.2401 1.2719	1.2544 1.3134	1.3123	Ave		1.2790				4.7		15.0			
4-Isopropyltoluene	3.1753 2.2772	2.4248 2.3533	2.2640 2.3966	2.3006 2.4683	2.5082	Ave		2.4631				11.4		15.0			
1,4-Dichlorobenzene	1.4637 1.2691	1.2848 1.2947	1.2637 1.2927	1.2830 1.3278	1.3643	Ave		1.3160				4.8		15.0			
n-Butylbenzene	2.7506 1.9510	2.1017 2.0145	1.9554 2.0589	1.9773 2.1319	2.1601	Ave		2.1224				11.7		15.0			
1,2-Dichlorobenzene	1.2967 1.1994	1.1362 1.2204	1.1855 1.2181	1.1896 1.2692	1.2535	Ave		1.2187				4.0		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.1777	+++++ 0.1750	0.1606 0.1738	0.1538 0.1926	0.1621	Ave		0.1708				7.6		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
1,2,4-Trichlorobenzene	0.7895 0.7472	0.6776 0.7577	0.7136 0.7634	0.7136 0.7781	0.7802	Ave		0.7468				5.0		15.0			
Hexachlorobutadiene	0.1950 0.2617	0.2695 0.2693	0.2628 0.2732	0.2659 0.2819	0.2895	Ave		0.2632				10.3		15.0			
Naphthalene	2.3445 2.3097	2.1193 2.2861	2.1761 2.2986	2.1684 2.3980	2.2601	Ave		2.2623				4.0		15.0			
1,2,3-Trichlorobenzene	+++++ 0.6873	0.6249 0.6920	0.6740 0.6944	0.6566 0.7156	0.6976	Ave		0.6803				4.2		15.0			
Dibromofluoromethane (Surr)	0.2611 0.2517	0.2609 0.2562	0.2591 0.2585	0.2595 0.2557	0.2583	Ave		0.2579				1.2		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3139 0.2972	0.3093 0.3034	0.3115 0.3018	0.3132 0.3032	0.3035	Ave		0.3063				1.9		15.0			
Toluene-d8 (Surr)	4.0867 4.1043	4.1230 4.0969	4.0933 4.0961	4.1225 4.0765	4.1260	Ave		4.1028				0.4		15.0			
4-Bromofluorobenzene (Surr)	0.9361 0.9267	0.9319 0.9259	0.9415 0.9331	0.9259 0.9392	0.9353	Ave		0.9328				0.6		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-535139/13	R5826.D
Level 2	IC 280-535139/14	R5827.D
Level 3	IC 280-535139/15	R5828.D
Level 4	IC 280-535139/16	R5829.D
Level 5	IC 280-535139/17	R5830.D
Level 6	ICIS 280-535139/18	R5831.D
Level 7	IC 280-535139/19	R5832.D
Level 8	IC 280-535139/20	R5833.D
Level 9	IC 280-535139/21	R5834.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Dichlorodifluoromethane	FB	Ave	3284 432845	6458 656992	13629 898742	40702 1806006	81021	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloromethane	FB	Ave	+++++ 483348	10981 742791	20074 1004414	51038 1986863	105601	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl chloride	FB	Ave	+++++ 472308	8729 722802	18104 974391	47292 1960402	97716	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromomethane	FB	Ave	+++++ 256696	4974 439672	9176 637661	25085 1388861	48693	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloroethane	FB	Lin2	8386 307603	10249 461767	15036 616529	31881 1256597	65415	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dichlorofluoromethane	FB	Ave	+++++ 742130	16384 1131719	31362 1527854	78305 3101106	160554	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichlorofluoromethane	FB	Ave	6911 647110	10979 945791	25515 1265924	63733 2523480	130334	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl ether	FB	Ave	2968 311099	5654 480405	11762 666492	31309 1377588	61874	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acrolein	FB	Lin2	2394 434250	7021 684424	14280 937279	35666 2125123	69357	4.94 494	9.88 741	19.8 988	49.4 1975	98.8
1,1,2-Trichloro-1,2,2-trifluoroethane	FB	Ave	+++++ 239924	4388 405123	8982 594903	26068 1232197	55040	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1-Dichloroethene	FB	Ave	4352 303623	6262 499645	12363 715029	32878 1497663	69201	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acetone	FB	Ave	+++++ 547112	14052 811464	24209 1096893	53495 2368652	100978	+++++ 200	4.00 300	8.00 400	20.0 800	40.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Iodomethane	FB	Lin2	+++++ 508497	5327 832190	11886 1149052	38744 2305383	95194	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon disulfide	FB	Ave	+++++ 948437	19463 1533083	38208 2192879	102163 4554915	218021	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methyl acetate	FB	Ave	+++++ 644011	12908 977720	24545 1309542	59348 2743508	115308	+++++ 100	2.00 150	4.00 200	10.0 400	20.0
3-Chloro-1-propene	FB	Ave	+++++ 563362	12509 891589	26158 1198160	61357 2064895	124735	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methylene Chloride	FB	Ave	+++++ 389399	9582 614146	17798 842381	41519 1728166	84415	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
t-Butyl alcohol	FB	Ave	3492 501845	8253 760215	17489 1033402	43268 2329708	85779	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Acrylonitrile	FB	Ave	13664 1662774	27953 2502385	62145 3374367	151186 7329188	303424	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Methyl tert-butyl ether	FB	Ave	11082 1247518	22087 1954225	44926 2646277	120406 5595432	239065	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,2-Dichloroethene	FB	Ave	5423 367998	7409 583548	14620 825408	39096 1719658	81089	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexane	CBNZ d5	Ave	2871 439439	7116 726490	15876 1063795	45404 2178708	94632	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl acetate	FB	Ave	16789 1766255	33638 2724662	65045 3301328	167597 6928246	336349	1.00 100	2.00 150	4.00 200	10.0 400	20.0
1,1-Dichloroethane	FB	Ave	9864 706944	14290 1126442	27210 1550209	72423 3200231	152678	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Butanone (MEK)	FB	Ave	9319 845858	17999 1269161	32574 1706446	75510 3714293	151877	2.00 200	4.00 300	8.00 400	20.0 800	40.0
cis-1,2-Dichloroethene	FB	Ave	4951 426974	8322 673856	16907 929739	43625 1944063	89875	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2,2-Dichloropropane	FB	Ave	+++++ 599982	12900 953807	23652 1341985	61412 2766345	130607	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butyl Alcohol	FB	Ave	6886 918585	14104 1355008	29548 1871183	77267 4193554	151651	12.0 1200	24.0 1800	48.0 2400	120 4800	240
Bromochloromethane	FB	Ave	1883 208049	3855 330996	8943 439103	20503 909248	43074	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrahydrofuran	FB	Ave	3326	5884	10358	24945	51083	1.00	2.00	4.00	10.0	20.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			288472	422451	567603	1226106		100	150	200	400	
Chloroform	FB	Ave	8936 708073	14256 1123821	28385 1547860	73579 3193653	149277	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1-Trichloroethane	FB	Ave	8559 609986	13034 987359	24054 1407001	63679 2908476	134918	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexane	FB	Lin1	+++++ 583568	4862 971665	22965 1426993	63402 2919268	133471	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1-Dichloropropene	FB	Ave	+++++ 530734	10487 867035	20936 1241193	55667 2577732	120401	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon tetrachloride	FB	Ave	7056 516478	10445 843174	20180 1222523	52621 2563007	113326	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isobutyl alcohol	FB	Ave	3475 414140	8092 606876	15022 824063	36684 1851964	69166	12.5 1250	25.0 1875	50.0 2500	125 5000	250
Benzene	FB	Ave	21011 1569394	31377 2494325	61830 3461155	159581 7177899	338067	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloroethane	FB	Ave	6891 616639	12776 967668	24865 1310877	60537 2710542	128199	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichloroethene	CBNZ d5	Ave	+++++ 409363	8497 648934	16258 937028	42063 1927706	90856	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Pentanone	FB	Ave	9493 1101083	19766 1648369	38264 2225898	96232 4861375	192949	1.60 160	3.20 240	6.40 320	16.0 640	32.0
Methylcyclohexane	FB	Ave	4407 446724	8428 740324	16836 1078912	45547 2243416	99597	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloropropane	FB	Ave	4110 415375	7625 652867	15742 893695	40277 1859142	85904	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dioxane	FB	Ave	+++++ 125472	2061 188366	4655 252964	12041 555677	23135	+++++ 1000	20.0 1500	40.0 2000	100 4000	200
Dibromomethane	FB	Ave	2483 272949	4977 425241	10025 579783	26558 1215361	54559	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromodichloromethane	FB	Ave	5649 551867	9815 879103	20873 1212463	54857 2513326	113653	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Chloroethyl vinyl ether	FB	Ave	2067 292439	5066 450901	10334 613096	27867 1288315	55903	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	6859	12069	25229	68300	138426	0.500	1.00	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			696781	1106879	1514421	3140556		50.0	75.0	100	200	
4-Methyl-2-pentanone (MIBK)	FB	Ave	14318 1780351	29819 2652106	61644 3615384	155889 7778087	317672	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Toluene	FB	Ave	23870 1729091	34970 2748595	67503 3836639	177002 8001498	369692	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,3-Dichloropropene	FB	Ave	5678 676340	11194 1073290	23843 1465669	63851 3064699	131031	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl methacrylate	CBNZ d5	Ave	4845 562648	9137 877086	19767 1187435	50313 2526336	103644	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloroethane	FB	Ave	2999 371333	6602 584502	13971 799038	34849 1660870	74124	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrachloroethene	CBNZ d5	Ave	4356 309341	5805 504075	11251 720166	30395 1506514	66786	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichloropropane	CBNZ d5	Ave	5989 670167	11114 1047284	24335 1429320	64325 2973555	132802	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Hexanone	CBNZ d5	Ave	10443 1251583	20964 1871950	44753 2534943	111045 5506897	226471	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Dibromochloromethane	CBNZ d5	Ave	3621 430876	7092 681896	14316 943607	39096 2000103	81182	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	3561 416328	7080 642867	15250 874153	38485 1835911	78759	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1-Chlorohexane	CBNZ d5	Ave	5320 402721	11063 652700	18673 948689	44482 1957430	91773	0.400 40.0	0.800 60.0	1.60 80.0	4.00 160	8.00
Chlorobenzene	CBNZ d5	Ave	13832 1152269	23140 1836697	44433 2526330	115584 5262120	238709	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Ave	3915 424428	7022 679199	15156 941194	39839 1966669	83479	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Ethylbenzene	CBNZ d5	Ave	8156 617864	12393 987339	23254 1379985	61756 2909811	132543	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	9613 759681	15355 1202707	27887 1679492	75273 3490246	160736	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
o-Xylene	CBNZ d5	Ave	9890 745447	14592 1194757	28208 1649671	75512 3474595	158875	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Styrene	CBNZ d5	Ave	14233 1321789	24341 2110915	48084 2910328	128511 6156064	269579	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromoform	CBNZ d5	Ave	+++++ 301049	4329 483670	9799 667869	25720 1432674	52957	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isopropylbenzene	DCBd 4	Ave	25139 1907209	38432 3079736	73713 4347636	192257 9061305	409695	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexanone	CBNZ d5	Ave	6444 798042	12976 1194888	28663 1630534	73710 3486033	151881	20.0 2000	40.0 3000	80.0 4000	200 8000	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	4823 532525	9340 825293	19351 1092421	48680 2304206	98733	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromobenzene	DCBd 4	Ave	5217 496223	8559 791329	18144 1080089	48940 2249638	99062	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	1624 185082	3046 289809	5294 386682	16043 816616	32888	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	1195 174128	3087 265811	6399 362435	15335 761485	32061	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
N-Propylbenzene	DCBd 4	Ave	7312 535117	10168 856202	19447 1199945	53728 2498685	110812	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
2-Chlorotoluene	DCBd 4	Ave	5284 473248	9104 756007	17380 1034462	46588 2149648	98165	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	20957 1649254	31597 2630592	61580 3654341	162979 7529356	346611	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Chlorotoluene	DCBd 4	Ave	5303 500539	9051 795363	18835 1092346	48599 2258732	100522	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
tert-Butylbenzene	DCBd 4	Ave	17652 1365025	26702 2201023	51367 3087660	138887 6369118	288233	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	20321 1709570	33371 2755465	62298 3762526	168540 7775363	353602	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butylbenzene	DCBd 4	Ave	5215 398878	7232 648376	13989 917945	39587 1884144	83315	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	9984 942366	16632 1519869	34808 2070531	92894 4290816	189246	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Isopropyltoluene	DCBd 4	Ave	22574 1729550	33721 2799395	63546 3901437	170367 8063802	361713	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	10406 963905	17867 1540166	35469 2104406	95014 4337948	196750	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
n-Butylbenzene	DCBd 4	Ave	19555 1481818	29228 2396387	54885 3351722	146427 6964754	311505	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	9219 910922	15800 1451700	33275 1982949	88095 4146359	180770	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Ave	+++++ 134955	+++++ 208138	4509 282966	11392 629190	23371	+++++ 50.0	+++++ 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 535139

SDG No.:

Instrument ID: VMS_R1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/06/2021 12:06 Calibration End Date: 05/06/2021 15:11 Calibration ID: 53424

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
1,2,4-Trichlorobenzene	DCBd 4	Ave	5613 567506	9423 901367	20029 1242769	52846 2542189	112520	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexachlorobutadiene	DCBd 4	Ave	1386 198763	3748 320363	7376 444828	19691 920838	41745	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Naphthalene	DCBd 4	Ave	16668 1754238	29472 2719441	61078 3741972	160580 7834118	325939	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	+++++ 521976	8690 823175	18919 1130452	48624 2337873	100603	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dibromofluoromethane (Surr)	FB	Ave	463115 470894	451580 490532	456528 510323	470260 513452	464612	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	556644 556048	535370 580880	548696 595837	567522 608886	546020	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
Toluene-d8 (Surr)	CBNZ d5	Ave	1728042 1843691	1693461 1893198	1713218 1958370	1775988 1980385	1757623	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	665483 703835	647990 734297	660620 759492	685658 767073	674434	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0

Curve Type Legend
Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: ICV 280-535139/22 Calibration Date: 05/06/2021 15:50

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R5836.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2142	0.2262		52.8	50.0	5.6	20.0
Chloromethane	Ave	0.2745	0.2503	0.1000	45.6	50.0	-8.8	20.0
Vinyl chloride	Ave	0.2546	0.2449		48.1	50.0	-3.8	20.0
Bromomethane	Ave	0.1465	0.1694		57.8	50.0	15.6	20.0
Chloroethane	Lin2		0.1540		49.1	50.0	-1.8	20.0
Dichlorofluoromethane	Ave	0.4201	0.3882		46.2	50.0	-7.6	20.0
Trichlorofluoromethane	Ave	0.3436	0.3447		50.1	50.0	0.3	20.0
Ethyl ether	Ave	0.1685	0.1710		50.7	50.0	1.5	20.0
Acrolein	Lin2		0.0145		307	494	-37.8*	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1406	0.1390		49.5	50.0	-1.1	20.0
1,1-Dichloroethene	Ave	0.1866	0.1719		46.1	50.0	-7.8	20.0
Acetone	Ave	0.0773	0.0698		181	200	-9.7	20.0
Iodomethane	Lin2		0.2628		48.1	50.0	-3.8	20.0
Carbon disulfide	Ave	0.5547	0.5251		47.3	50.0	-5.3	20.0
Methyl acetate	Ave	0.1704	0.1751		103	100	2.8	20.0
3-Chloro-1-propene	Ave	0.3237	0.3132		48.4	50.0	-3.3	20.0
Methylene Chloride	Ave	0.2304	0.2105		45.7	50.0	-8.7	20.0
t-Butyl alcohol	Ave	0.0249	0.0258		516	500	3.3	20.0
Acrylonitrile	Ave	0.0852	0.0861		506	500	1.1	20.0
Methyl tert-butyl ether	Ave	0.6604	0.6648		50.3	50.0	0.7	20.0
trans-1,2-Dichloroethene	Ave	0.2213	0.1970		44.5	50.0	-11.0	20.0
Hexane	Ave	0.9909	0.9810		49.5	50.0	-1.0	20.0
Vinyl acetate	Ave	0.4607	0.3762		81.7	100	-18.3	20.0
1,1-Dichloroethane	Ave	0.4156	0.3728	0.1000	44.9	50.0	-10.3	20.0
2-Butanone (MEK)	Ave	0.1149	0.1085		189	200	-5.6	20.0
cis-1,2-Dichloroethene	Ave	0.2434	0.2279		46.8	50.0	-6.4	20.0
2,2-Dichloropropane	Ave	0.3434	0.3106		45.2	50.0	-9.6	20.0
sec-Butyl Alcohol	Ave	0.0186	0.0191		1230	1200	2.4	20.0
Bromochloromethane	Ave	0.1142	0.1074		47.0	50.0	-6.0	20.0
Tetrahydrofuran	Ave	0.0768	0.0738		96.2	100	-3.8	20.0
Chloroform	Ave	0.4110	0.3795		46.2	50.0	-7.7	20.0
1,1,1-Trichloroethane	Ave	0.3683	0.3318		45.0	50.0	-9.9	20.0
Cyclohexane	Lin1		0.3284		46.7	50.0	-6.6	20.0
1,1-Dichloropropene	Ave	0.3078	0.2864		46.5	50.0	-7.0	20.0
Carbon tetrachloride	Ave	0.3100	0.2881		46.5	50.0	-7.1	20.0
Isobutyl alcohol	Ave	0.0085	0.0078		1150	1250	-8.0	20.0
Benzene	Ave	0.9185	0.8397		45.7	50.0	-8.6	20.0
1,2-Dichloroethane	Ave	0.3485	0.3251		46.6	50.0	-6.7	20.0
Trichloroethene	Ave	0.9835	0.9323		47.4	50.0	-5.2	20.0
2-Pentanone	Ave	0.1753	0.1763		161	160	0.6	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: ICV 280-535139/22 Calibration Date: 05/06/2021 15:50

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R5836.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.2565	0.2477		48.3	50.0	-3.4	20.0
1,2-Dichloropropane	Ave	0.2271	0.2171		47.8	50.0	-4.4	20.0
1,4-Dioxane	Ave	0.0033	0.0032		973	1000	-2.7	20.0
Dibromomethane	Ave	0.1463	0.1441		49.3	50.0	-1.4	20.0
Bromodichloromethane	Ave	0.3042	0.2982		49.0	50.0	-2.0	20.0
2-Chloroethyl vinyl ether	Ave	0.1497	0.1530		51.1	50.0	2.2	20.0
cis-1,3-Dichloropropene	Ave	1.573	1.520		48.3	50.0	-3.4	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2235	0.2280		204	200	2.0	20.0
Toluene	Ave	1.019	0.9130		44.8	50.0	-10.4	20.0
trans-1,3-Dichloropropene	Ave	0.3540	0.3615		51.1	50.0	2.1	20.0
Ethyl methacrylate	Ave	1.209	1.249		51.6	50.0	3.3	20.0
1,1,2-Trichloroethane	Ave	0.1964	0.2015		51.3	50.0	2.6	20.0
Tetrachloroethene	Ave	0.7603	0.6974		45.9	50.0	-8.3	20.0
1,3-Dichloropropane	Ave	1.478	1.470		49.7	50.0	-0.5	20.0
2-Hexanone	Ave	0.6640	0.6809		205	200	2.6	20.0
Dibromochloromethane	Ave	0.9327	0.9858		52.8	50.0	5.7	20.0
1,2-Dibromoethane (EDB)	Ave	0.9051	0.9097		50.3	50.0	0.5	20.0
1-Chlorohexane	Ave	1.343	1.159		34.5	40.0	-13.7	20.0
Chlorobenzene	Ave	2.755	2.561	0.3000	46.5	50.0	-7.0	20.0
1,1,1,2-Tetrachloroethane	Ave	0.9457	0.9459		50.0	50.0	0.0	20.0
Ethylbenzene	Ave	1.506	1.351		44.9	50.0	-10.3	20.0
m-Xylene & p-Xylene	Ave	1.825	1.676		45.9	50.0	-8.1	20.0
o-Xylene	Ave	1.813	1.662		45.8	50.0	-8.3	20.0
Styrene	Ave	3.061	2.929		47.8	50.0	-4.3	20.0
Bromoform	Ave	0.6418	0.6769	0.1000	52.7	50.0	5.5	20.0
Isopropylbenzene	Ave	2.767	2.476		44.7	50.0	-10.5	20.0
Cyclohexanone	Ave	0.0425	0.0465		2190	2000	9.3	20.0
1,1,2,2-Tetrachloroethane	Ave	0.6836	0.6823	0.3000	49.9	50.0	-0.2	20.0
Bromobenzene	Ave	0.6682	0.6476		48.5	50.0	-3.1	20.0
trans-1,4-Dichloro-2-butene	Ave	0.2284	0.2410		52.8	50.0	5.5	20.0
1,2,3-Trichloropropane	Ave	0.2173	0.2225		51.2	50.0	2.4	20.0
N-Propylbenzene	Ave	0.7636	0.6972		45.7	50.0	-8.7	20.0
2-Chlorotoluene	Ave	0.6532	0.6150		47.1	50.0	-5.9	20.0
1,3,5-Trimethylbenzene	Ave	2.328	2.163		46.5	50.0	-7.1	20.0
4-Chlorotoluene	Ave	0.6790	0.6470		47.6	50.0	-4.7	20.0
tert-Butylbenzene	Ave	1.956	1.795		45.9	50.0	-8.2	20.0
1,2,4-Trimethylbenzene	Ave	2.385	2.261		47.4	50.0	-5.2	20.0
sec-Butylbenzene	Ave	0.5639	0.5354		47.5	50.0	-5.1	20.0
1,3-Dichlorobenzene	Ave	1.279	1.232		48.2	50.0	-3.7	20.0
4-Isopropyltoluene	Ave	2.463	2.263		45.9	50.0	-8.1	20.0
1,4-Dichlorobenzene	Ave	1.316	1.260		47.9	50.0	-4.3	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: ICV 280-535139/22 Calibration Date: 05/06/2021 15:50

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R5836.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.122	1.914		45.1	50.0	-9.8	20.0
1,2-Dichlorobenzene	Ave	1.219	1.192		48.9	50.0	-2.2	20.0
1,2-Dibromo-3-Chloropropane	Ave	0.1708	0.1684		49.3	50.0	-1.4	20.0
1,2,4-Trichlorobenzene	Ave	0.7468	0.7484		50.1	50.0	0.2	20.0
Hexachlorobutadiene	Ave	0.2632	0.2656		50.5	50.0	0.9	20.0
Naphthalene	Ave	2.262	2.262		50.0	50.0	-0.0	20.0
1,2,3-Trichlorobenzene	Ave	0.6803	0.6837		50.3	50.0	0.5	20.0
Dibromofluoromethane (Surr)	Ave	0.2579	0.2555		49.5	50.0	-0.9	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3063	0.3036		49.6	50.0	-0.9	20.0
Toluene-d8 (Surr)	Ave	4.103	4.108		50.1	50.0	0.1	20.0
4-Bromofluorobenzene (Surr)	Ave	0.9328	0.9325		50.0	50.0	-0.0	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: R6024.D BFB Injection Date: 05/10/2021

Instrument ID: VMS_R1 BFB Injection Time: 07:50

Analysis Batch No.: 535527

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.8	
75	30.0 - 60.0 % of mass 95	51.5	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.2	
173	Less than 2.0 % of mass 174	0.8	(1.0) 1
174	Greater than 50% of mass 95	73.7	
175	5.0 - 9.0 % of mass 174	5.6	(7.6) 1
176	95.0 - 101.0 % of mass 174	70.6	(95.8) 1
177	5.0 - 9.0 % of mass 176	4.5	(6.3) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535527/2	R6026.D	05/10/2021	8:43
	LCS 280-535527/4	R6028.D	05/10/2021	9:29
	LCSD 280-535527/5	R6029.D	05/10/2021	9:52
	MB 280-535527/9	R6031.D	05/10/2021	10:38
05TB02-20210428	280-147981-5	R6034.D	05/10/2021	11:47
05RB01-20210428	280-147981-6	R6035.D	05/10/2021	12:10
05MW21-20210428	280-147981-1	R6045.D	05/10/2021	16:01
05MW01S-20210428	280-147981-2	R6046.D	05/10/2021	16:23
05TW04-20210428	280-147981-3	R6047.D	05/10/2021	16:47
05MW26-20210428	280-147981-4	R6048.D	05/10/2021	17:10
05MW24-20210428	280-147981-7	R6049.D	05/10/2021	17:33
05MW01SI-20210428	280-147981-8	R6050.D	05/10/2021	17:56
	CCVC 280-535527/32	R6051.D	05/10/2021	18:19

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535527/2 Calibration Date: 05/10/2021 08:43

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6026.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2142	0.1609		18.8	25.0	-24.9*	20.0
Chloromethane	Ave	0.2745	0.2428	0.1000	22.1	25.0	-11.5	20.0
Vinyl chloride	Ave	0.2546	0.2406		23.6	25.0	-5.5	20.0
Bromomethane	Ave	0.1465	0.1547		26.4	25.0	5.6	20.0
Chloroethane	Lin2		0.1590		24.8	25.0	-0.7	20.0
Dichlorofluoromethane	Ave	0.4201	0.3925		23.4	25.0	-6.5	20.0
Trichlorofluoromethane	Ave	0.3436	0.3018		22.0	25.0	-12.2	20.0
Ethyl ether	Ave	0.1685	0.1756		26.1	25.0	4.2	20.0
Acrolein	Lin2		0.0407		431	247	74.5*	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1406	0.1317		23.4	25.0	-6.3	20.0
1,1-Dichloroethene	Ave	0.1866	0.1717		23.0	25.0	-8.0	20.0
Acetone	Ave	0.0773	0.0729		94.3	100	-5.7	20.0
Iodomethane	Lin2		0.1934		18.0	25.0	-27.9*	20.0
Carbon disulfide	Ave	0.5547	0.5594		25.2	25.0	0.9	20.0
Methyl acetate	Ave	0.1704	0.1711		50.2	50.0	0.4	20.0
3-Chloro-1-propene	Ave	0.3237	0.3222		24.9	25.0	-0.5	20.0
Methylene Chloride	Ave	0.2304	0.2186		23.7	25.0	-5.2	20.0
t-Butyl alcohol	Ave	0.0249	0.0236		236	250	-5.5	20.0
Acrylonitrile	Ave	0.0852	0.0929		273	250	9.0	20.0
Methyl tert-butyl ether	Ave	0.6604	0.6534		24.7	25.0	-1.1	20.0
trans-1,2-Dichloroethene	Ave	0.2213	0.2043		23.1	25.0	-7.7	20.0
Hexane	Ave	0.9909	1.092		27.5	25.0	10.2	20.0
Vinyl acetate	Ave	0.4607	0.5133		55.7	50.0	11.4	20.0
1,1-Dichloroethane	Ave	0.4156	0.3995	0.1000	24.0	25.0	-3.9	20.0
2-Butanone (MEK)	Ave	0.1149	0.1109		96.5	100	-3.5	20.0
cis-1,2-Dichloroethene	Ave	0.2434	0.2360		24.2	25.0	-3.0	20.0
2,2-Dichloropropane	Ave	0.3434	0.3236		23.6	25.0	-5.8	20.0
sec-Butyl Alcohol	Ave	0.0186	0.0186		598	600	-0.3	20.0
Bromochloromethane	Ave	0.1142	0.1093		23.9	25.0	-4.3	20.0
Tetrahydrofuran	Ave	0.0768	0.0799		52.1	50.0	4.1	20.0
Chloroform	Ave	0.4110	0.3909		23.8	25.0	-4.9	20.0
1,1,1-Trichloroethane	Ave	0.3683	0.3204		21.7	25.0	-13.0	20.0
Cyclohexane	Lin1		0.3388		24.3	25.0	-2.8	20.0
1,1-Dichloropropene	Ave	0.3078	0.3053		24.8	25.0	-0.8	20.0
Carbon tetrachloride	Ave	0.3100	0.2558		20.6	25.0	-17.5	20.0
Isobutyl alcohol	Ave	0.0085	0.0076		558	625	-10.7	20.0
Benzene	Ave	0.9185	0.8884		24.2	25.0	-3.3	20.0
1,2-Dichloroethane	Ave	0.3485	0.3356		24.1	25.0	-3.7	20.0
Trichloroethene	Ave	0.9835	0.9304		23.7	25.0	-5.4	20.0
2-Pentanone	Ave	0.1753	0.1791		81.7	80.0	2.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535527/2 Calibration Date: 05/10/2021 08:43

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6026.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.2565	0.2560		25.0	25.0	-0.2	20.0
1,2-Dichloropropane	Ave	0.2271	0.2335		25.7	25.0	2.8	20.0
1,4-Dioxane	Ave	0.0033	0.0033		504	500	0.8	20.0
Dibromomethane	Ave	0.1463	0.1475		25.2	25.0	0.9	20.0
Bromodichloromethane	Ave	0.3042	0.2942		24.2	25.0	-3.3	20.0
2-Chloroethyl vinyl ether	Ave	0.1497	0.1488		24.8	25.0	-0.6	20.0
cis-1,3-Dichloropropene	Ave	1.573	1.565		24.9	25.0	-0.5	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2235	0.2257		101	100	1.0	20.0
Toluene	Ave	1.019	0.9522		23.4	25.0	-6.5	20.0
trans-1,3-Dichloropropene	Ave	0.3540	0.3523		24.9	25.0	-0.5	20.0
Ethyl methacrylate	Ave	1.209	1.238		25.6	25.0	2.4	20.0
1,1,2-Trichloroethane	Ave	0.1964	0.2013		25.6	25.0	2.5	20.0
Tetrachloroethene	Ave	0.7603	0.6904		22.7	25.0	-9.2	20.0
1,3-Dichloropropane	Ave	1.478	1.568		26.5	25.0	6.1	20.0
2-Hexanone	Ave	0.6640	0.6756		102	100	1.8	20.0
Dibromochloromethane	Ave	0.9327	0.8667		23.2	25.0	-7.1	20.0
1,2-Dibromoethane (EDB)	Ave	0.9051	0.9260		25.6	25.0	2.3	20.0
1-Chlorohexane	Ave	1.343	1.203		17.9	20.0	-10.4	20.0
Chlorobenzene	Ave	2.755	2.651	0.3000	24.1	25.0	-3.8	20.0
1,1,1,2-Tetrachloroethane	Ave	0.9457	0.8812		23.3	25.0	-6.8	20.0
Ethylbenzene	Ave	1.506	1.424		23.6	25.0	-5.4	20.0
m-Xylene & p-Xylene	Ave	1.825	1.746		23.9	25.0	-4.3	20.0
o-Xylene	Ave	1.813	1.725		23.8	25.0	-4.8	20.0
Styrene	Ave	3.061	3.023		24.7	25.0	-1.2	20.0
Bromoform	Ave	0.6418	0.5210	0.1000	20.3	25.0	-18.8	20.0
Isopropylbenzene	Ave	2.767	2.600		23.5	25.0	-6.0	20.0
Cyclohexanone	Ave	0.0425	0.0365		859	1000	-14.1	20.0
1,1,2,2-Tetrachloroethane	Ave	0.6836	0.7430	0.3000	27.2	25.0	8.7	20.0
Bromobenzene	Ave	0.6682	0.6445		24.1	25.0	-3.6	20.0
trans-1,4-Dichloro-2-butene	Ave	0.2284	0.2277		24.9	25.0	-0.3	20.0
1,2,3-Trichloropropane	Ave	0.2173	0.2236		25.7	25.0	2.9	20.0
N-Propylbenzene	Ave	0.7636	0.7227		23.7	25.0	-5.4	20.0
2-Chlorotoluene	Ave	0.6532	0.6384		24.4	25.0	-2.3	20.0
1,3,5-Trimethylbenzene	Ave	2.328	2.226		23.9	25.0	-4.4	20.0
4-Chlorotoluene	Ave	0.6790	0.6775		24.9	25.0	-0.2	20.0
tert-Butylbenzene	Ave	1.956	1.835		23.5	25.0	-6.2	20.0
1,2,4-Trimethylbenzene	Ave	2.385	2.338		24.5	25.0	-2.0	20.0
sec-Butylbenzene	Ave	0.5639	0.5315		23.6	25.0	-5.7	20.0
1,3-Dichlorobenzene	Ave	1.279	1.251		24.4	25.0	-2.2	20.0
4-Isopropyltoluene	Ave	2.463	2.321		23.6	25.0	-5.8	20.0
1,4-Dichlorobenzene	Ave	1.316	1.286		24.4	25.0	-2.3	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535527/2 Calibration Date: 05/10/2021 08:43

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6026.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.122	2.078		24.5	25.0	-2.1	20.0
1,2-Dichlorobenzene	Ave	1.219	1.205		24.7	25.0	-1.1	20.0
1,2-Dibromo-3-Chloropropane	Ave	0.1708	0.1523		22.3	25.0	-10.9	20.0
1,2,4-Trichlorobenzene	Ave	0.7468	0.7327		24.5	25.0	-1.9	20.0
Hexachlorobutadiene	Ave	0.2632	0.2481		23.6	25.0	-5.7	20.0
Naphthalene	Ave	2.262	2.259		25.0	25.0	-0.1	20.0
1,2,3-Trichlorobenzene	Ave	0.6803	0.6737		24.8	25.0	-1.0	20.0
Dibromofluoromethane (Surr)	Ave	0.2579	0.2519		48.8	50.0	-2.3	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3063	0.3043		49.7	50.0	-0.6	20.0
Toluene-d8 (Surr)	Ave	4.103	4.128		50.3	50.0	0.6	20.0
4-Bromofluorobenzene (Surr)	Ave	0.9328	0.9350		50.1	50.0	0.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535527/32 Calibration Date: 05/10/2021 18:19

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6051.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2142	0.1640		19.1	25.0	-23.4	50.0
Chloromethane	Ave	0.2745	0.2481	0.1000	22.6	25.0	-9.6	50.0
Vinyl chloride	Ave	0.2546	0.2499		24.5	25.0	-1.8	50.0
Bromomethane	Ave	0.1465	0.0880		15.0	25.0	-39.9	50.0
Chloroethane	Lin2		0.1676		26.2	25.0	5.0	50.0
Dichlorofluoromethane	Ave	0.4201	0.3706		22.1	25.0	-11.8	50.0
Trichlorofluoromethane	Ave	0.3436	0.2784		20.3	25.0	-19.0	50.0
Ethyl ether	Ave	0.1685	0.1831		27.2	25.0	8.7	50.0
Acrolein	Lin2		0.0385		408	247	65.3*	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1406	0.1209		21.5	25.0	-14.0	50.0
1,1-Dichloroethene	Ave	0.1866	0.1660		22.2	25.0	-11.0	50.0
Acetone	Ave	0.0773	0.0771		99.8	100	-0.2	50.0
Iodomethane	Lin2		0.1430		13.5	25.0	-46.1	50.0
Carbon disulfide	Ave	0.5547	0.5453		24.6	25.0	-1.7	50.0
Methyl acetate	Ave	0.1704	0.1829		53.7	50.0	7.3	50.0
3-Chloro-1-propene	Ave	0.3237	0.3231		24.9	25.0	-0.2	50.0
Methylene Chloride	Ave	0.2304	0.2211		24.0	25.0	-4.1	50.0
t-Butyl alcohol	Ave	0.0249	0.0251		251	250	0.4	50.0
Acrylonitrile	Ave	0.0852	0.0988		290	250	16.1	50.0
Methyl tert-butyl ether	Ave	0.6604	0.6638		25.1	25.0	0.5	50.0
trans-1,2-Dichloroethene	Ave	0.2213	0.2009		22.7	25.0	-9.2	50.0
Hexane	Ave	0.9909	0.9842		24.8	25.0	-0.7	50.0
Vinyl acetate	Ave	0.4607	0.5378		58.4	50.0	16.7	50.0
1,1-Dichloroethane	Ave	0.4156	0.3996	0.1000	24.0	25.0	-3.9	50.0
2-Butanone (MEK)	Ave	0.1149	0.1200		104	100	4.5	50.0
cis-1,2-Dichloroethene	Ave	0.2434	0.2362		24.3	25.0	-3.0	50.0
2,2-Dichloropropane	Ave	0.3434	0.2736		19.9	25.0	-20.3	50.0
sec-Butyl Alcohol	Ave	0.0186	0.0198		637	600	6.2	50.0
Bromochloromethane	Ave	0.1142	0.1121		24.5	25.0	-1.8	50.0
Tetrahydrofuran	Ave	0.0768	0.0839		54.6	50.0	9.3	50.0
Chloroform	Ave	0.4110	0.3917		23.8	25.0	-4.7	50.0
1,1,1-Trichloroethane	Ave	0.3683	0.3154		21.4	25.0	-14.4	50.0
Cyclohexane	Lin1		0.3324		23.8	25.0	-4.7	50.0
1,1-Dichloropropene	Ave	0.3078	0.2969		24.1	25.0	-3.6	50.0
Carbon tetrachloride	Ave	0.3100	0.2470		19.9	25.0	-20.3	50.0
Isobutyl alcohol	Ave	0.0085	0.0083		614	625	-1.7	50.0
Benzene	Ave	0.9185	0.8950		24.4	25.0	-2.6	50.0
1,2-Dichloroethane	Ave	0.3485	0.3467		24.9	25.0	-0.5	50.0
Trichloroethene	Ave	0.9835	0.9245		23.5	25.0	-6.0	50.0
2-Pentanone	Ave	0.1753	0.1946		88.8	80.0	11.1	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535527/32 Calibration Date: 05/10/2021 18:19

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6051.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.2565	0.2470		24.1	25.0	-3.7	50.0
1,2-Dichloropropane	Ave	0.2271	0.2378		26.2	25.0	4.7	50.0
1,4-Dioxane	Ave	0.0033	0.0035		537	500	7.3	50.0
Dibromomethane	Ave	0.1463	0.1522		26.0	25.0	4.0	50.0
Bromodichloromethane	Ave	0.3042	0.2962		24.3	25.0	-2.6	50.0
2-Chloroethyl vinyl ether	Ave	0.1497	0.1513		25.3	25.0	1.0	50.0
cis-1,3-Dichloropropene	Ave	1.573	1.587		25.2	25.0	0.9	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2235	0.2450		110	100	9.6	50.0
Toluene	Ave	1.019	0.9529		23.4	25.0	-6.4	50.0
trans-1,3-Dichloropropene	Ave	0.3540	0.3505		24.8	25.0	-1.0	50.0
Ethyl methacrylate	Ave	1.209	1.321		27.3	25.0	9.3	50.0
1,1,2-Trichloroethane	Ave	0.1964	0.2046		26.0	25.0	4.2	50.0
Tetrachloroethene	Ave	0.7603	0.6539		21.5	25.0	-14.0	50.0
1,3-Dichloropropane	Ave	1.478	1.635		27.6	25.0	10.6	50.0
2-Hexanone	Ave	0.6640	0.7430		112	100	11.9	50.0
Dibromochloromethane	Ave	0.9327	0.8721		23.4	25.0	-6.5	50.0
1,2-Dibromoethane (EDB)	Ave	0.9051	0.9451		26.1	25.0	4.4	50.0
1-Chlorohexane	Ave	1.343	1.180		17.6	20.0	-12.1	50.0
Chlorobenzene	Ave	2.755	2.643	0.3000	24.0	25.0	-4.1	50.0
1,1,1,2-Tetrachloroethane	Ave	0.9457	0.8859		23.4	25.0	-6.3	50.0
Ethylbenzene	Ave	1.506	1.414		23.5	25.0	-6.1	50.0
m-Xylene & p-Xylene	Ave	1.825	1.735		23.8	25.0	-4.9	50.0
o-Xylene	Ave	1.813	1.722		23.7	25.0	-5.0	50.0
Styrene	Ave	3.061	3.039		24.8	25.0	-0.7	50.0
Bromoform	Ave	0.6418	0.5360	0.1000	20.9	25.0	-16.5	50.0
Isopropylbenzene	Ave	2.767	2.596		23.5	25.0	-6.2	50.0
Cyclohexanone	Ave	0.0425	0.0374		879	1000	-12.1	50.0
1,1,2,2-Tetrachloroethane	Ave	0.6836	0.7908	0.3000	28.9	25.0	15.7	50.0
Bromobenzene	Ave	0.6682	0.6560		24.5	25.0	-1.8	50.0
trans-1,4-Dichloro-2-butene	Ave	0.2284	0.2378		26.0	25.0	4.1	50.0
1,2,3-Trichloropropane	Ave	0.2173	0.2383		27.4	25.0	9.6	50.0
N-Propylbenzene	Ave	0.7636	0.7160		23.4	25.0	-6.2	50.0
2-Chlorotoluene	Ave	0.6532	0.6440		24.6	25.0	-1.4	50.0
1,3,5-Trimethylbenzene	Ave	2.328	2.275		24.4	25.0	-2.3	50.0
4-Chlorotoluene	Ave	0.6790	0.6815		25.1	25.0	0.4	50.0
tert-Butylbenzene	Ave	1.956	1.849		23.6	25.0	-5.4	50.0
1,2,4-Trimethylbenzene	Ave	2.385	2.358		24.7	25.0	-1.1	50.0
sec-Butylbenzene	Ave	0.5639	0.5256		23.3	25.0	-6.8	50.0
1,3-Dichlorobenzene	Ave	1.279	1.267		24.8	25.0	-0.9	50.0
4-Isopropyltoluene	Ave	2.463	2.322		23.6	25.0	-5.7	50.0
1,4-Dichlorobenzene	Ave	1.316	1.305		24.8	25.0	-0.9	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535527/32 Calibration Date: 05/10/2021 18:19

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6051.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.122	2.035		24.0	25.0	-4.1	50.0
1,2-Dichlorobenzene	Ave	1.219	1.242		25.5	25.0	1.9	50.0
1,2-Dibromo-3-Chloropropane	Ave	0.1708	0.1600		23.4	25.0	-6.3	50.0
1,2,4-Trichlorobenzene	Ave	0.7468	0.7396		24.8	25.0	-1.0	50.0
Hexachlorobutadiene	Ave	0.2632	0.2434		23.1	25.0	-7.5	50.0
Naphthalene	Ave	2.262	2.356		26.0	25.0	4.1	50.0
1,2,3-Trichlorobenzene	Ave	0.6803	0.6729		24.7	25.0	-1.1	50.0
Dibromofluoromethane (Surr)	Ave	0.2579	0.2467		47.8	50.0	-4.4	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3063	0.3002		49.0	50.0	-2.0	50.0
Toluene-d8 (Surr)	Ave	4.103	4.167		50.8	50.0	1.6	50.0
4-Bromofluorobenzene (Surr)	Ave	0.9328	0.9549		51.2	50.0	2.4	50.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: R6064.D BFB Injection Date: 05/11/2021

Instrument ID: VMS_R1 BFB Injection Time: 05:54

Analysis Batch No.: 535654

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.8	
75	30.0 - 60.0 % of mass 95	51.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.6	
173	Less than 2.0 % of mass 174	0.9	(1.2) 1
174	Greater than 50% of mass 95	73.5	
175	5.0 - 9.0 % of mass 174	5.4	(7.4) 1
176	95.0 - 101.0 % of mass 174	71.1	(96.7) 1
177	5.0 - 9.0 % of mass 176	4.6	(6.4) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535654/2	R6066.D	05/11/2021	6:41
	LCS 280-535654/4	R6068.D	05/11/2021	7:27
	LCSD 280-535654/5	R6069.D	05/11/2021	7:50
	MB 280-535654/9	R6071.D	05/11/2021	8:36
05MW21-20210428 DL	280-147981-1 DL	R6073.D	05/11/2021	9:22
	CCVC 280-535654/16	R6094.D	05/11/2021	17:28

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535654/2 Calibration Date: 05/11/2021 06:41

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6066.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2142	0.1568		18.3	25.0	-26.8*	20.0
Chloromethane	Ave	0.2745	0.2335	0.1000	21.3	25.0	-14.9	20.0
Vinyl chloride	Ave	0.2546	0.2445		24.0	25.0	-3.9	20.0
Bromomethane	Ave	0.1465	0.1257		21.5	25.0	-14.2	20.0
Chloroethane	Lin2		0.1627		25.5	25.0	1.8	20.0
Dichlorofluoromethane	Ave	0.4201	0.3494		20.8	25.0	-16.8	20.0
Trichlorofluoromethane	Ave	0.3436	0.2841		20.7	25.0	-17.3	20.0
Ethyl ether	Ave	0.1685	0.1698		25.2	25.0	0.8	20.0
Acrolein	Lin2		0.0406		430	247	74.2*	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1406	0.1155		20.6	25.0	-17.8	20.0
1,1-Dichloroethene	Ave	0.1866	0.1534		20.5	25.0	-17.8	20.0
Acetone	Ave	0.0773	0.0736		95.2	100	-4.8	20.0
Iodomethane	Lin2		0.1791		16.7	25.0	-33.1*	20.0
Carbon disulfide	Ave	0.5547	0.5196		23.4	25.0	-6.3	20.0
Methyl acetate	Ave	0.1704	0.1760		51.6	50.0	3.3	20.0
3-Chloro-1-propene	Ave	0.3237	0.3021		23.3	25.0	-6.7	20.0
Methylene Chloride	Ave	0.2304	0.2092		22.7	25.0	-9.2	20.0
t-Butyl alcohol	Ave	0.0249	0.0244		245	250	-2.1	20.0
Acrylonitrile	Ave	0.0852	0.0939		276	250	10.3	20.0
Methyl tert-butyl ether	Ave	0.6604	0.6396		24.2	25.0	-3.2	20.0
trans-1,2-Dichloroethene	Ave	0.2213	0.1903		21.5	25.0	-14.0	20.0
Hexane	Ave	0.9909	1.006		25.4	25.0	1.5	20.0
Vinyl acetate	Ave	0.4607	0.5018		54.5	50.0	8.9	20.0
1,1-Dichloroethane	Ave	0.4156	0.3760	0.1000	22.6	25.0	-9.5	20.0
2-Butanone (MEK)	Ave	0.1149	0.1135		98.8	100	-1.2	20.0
cis-1,2-Dichloroethene	Ave	0.2434	0.2247		23.1	25.0	-7.7	20.0
2,2-Dichloropropane	Ave	0.3434	0.2985		21.7	25.0	-13.1	20.0
sec-Butyl Alcohol	Ave	0.0186	0.0187		602	600	0.4	20.0
Bromochloromethane	Ave	0.1142	0.1044		22.8	25.0	-8.6	20.0
Tetrahydrofuran	Ave	0.0768	0.0784		51.1	50.0	2.1	20.0
Chloroform	Ave	0.4110	0.3730		22.7	25.0	-9.2	20.0
1,1,1-Trichloroethane	Ave	0.3683	0.2972		20.2	25.0	-19.3	20.0
Cyclohexane	Lin1		0.3038		21.8	25.0	-12.7	20.0
1,1-Dichloropropene	Ave	0.3078	0.2792		22.7	25.0	-9.3	20.0
Carbon tetrachloride	Ave	0.3100	0.2314		18.7	25.0	-25.3*	20.0
Isobutyl alcohol	Ave	0.0085	0.0082		604	625	-3.3	20.0
Benzene	Ave	0.9185	0.8518		23.2	25.0	-7.3	20.0
1,2-Dichloroethane	Ave	0.3485	0.3306		23.7	25.0	-5.1	20.0
Trichloroethene	Ave	0.9835	0.8787		22.3	25.0	-10.7	20.0
2-Pentanone	Ave	0.1753	0.1835		83.7	80.0	4.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535654/2 Calibration Date: 05/11/2021 06:41

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6066.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.2565	0.2364		23.0	25.0	-7.8	20.0
1,2-Dichloropropane	Ave	0.2271	0.2232		24.6	25.0	-1.7	20.0
1,4-Dioxane	Ave	0.0033	0.0033		508	500	1.5	20.0
Dibromomethane	Ave	0.1463	0.1465		25.0	25.0	0.2	20.0
Bromodichloromethane	Ave	0.3042	0.2851		23.4	25.0	-6.3	20.0
2-Chloroethyl vinyl ether	Ave	0.1497	0.1497		25.0	25.0	-0.0	20.0
cis-1,3-Dichloropropene	Ave	1.573	1.572		25.0	25.0	-0.0	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2235	0.2332		104	100	4.3	20.0
Toluene	Ave	1.019	0.9079		22.3	25.0	-10.9	20.0
trans-1,3-Dichloropropene	Ave	0.3540	0.3527		24.9	25.0	-0.4	20.0
Ethyl methacrylate	Ave	1.209	1.278		26.4	25.0	5.7	20.0
1,1,2-Trichloroethane	Ave	0.1964	0.2022		25.7	25.0	3.0	20.0
Tetrachloroethene	Ave	0.7603	0.6397		21.0	25.0	-15.9	20.0
1,3-Dichloropropane	Ave	1.478	1.582		26.8	25.0	7.1	20.0
2-Hexanone	Ave	0.6640	0.7036		106	100	6.0	20.0
Dibromochloromethane	Ave	0.9327	0.8620		23.1	25.0	-7.6	20.0
1,2-Dibromoethane (EDB)	Ave	0.9051	0.9272		25.6	25.0	2.4	20.0
1-Chlorohexane	Ave	1.343	1.131		16.8	20.0	-15.8	20.0
Chlorobenzene	Ave	2.755	2.570	0.3000	23.3	25.0	-6.7	20.0
1,1,1,2-Tetrachloroethane	Ave	0.9457	0.8701		23.0	25.0	-8.0	20.0
Ethylbenzene	Ave	1.506	1.360		22.6	25.0	-9.7	20.0
m-Xylene & p-Xylene	Ave	1.825	1.673		22.9	25.0	-8.3	20.0
o-Xylene	Ave	1.813	1.675		23.1	25.0	-7.6	20.0
Styrene	Ave	3.061	2.979		24.3	25.0	-2.7	20.0
Bromoform	Ave	0.6418	0.5311	0.1000	20.7	25.0	-17.2	20.0
Isopropylbenzene	Ave	2.767	2.449		22.1	25.0	-11.5	20.0
Cyclohexanone	Ave	0.0425	0.0394		926	1000	-7.4	20.0
1,1,2,2-Tetrachloroethane	Ave	0.6836	0.7655	0.3000	28.0	25.0	12.0	20.0
Bromobenzene	Ave	0.6682	0.6385		23.9	25.0	-4.5	20.0
trans-1,4-Dichloro-2-butene	Ave	0.2284	0.2443		26.7	25.0	7.0	20.0
1,2,3-Trichloropropane	Ave	0.2173	0.2316		26.6	25.0	6.6	20.0
N-Propylbenzene	Ave	0.7636	0.6784		22.2	25.0	-11.2	20.0
2-Chlorotoluene	Ave	0.6532	0.6149		23.5	25.0	-5.9	20.0
1,3,5-Trimethylbenzene	Ave	2.328	2.150		23.1	25.0	-7.6	20.0
4-Chlorotoluene	Ave	0.6790	0.6488		23.9	25.0	-4.4	20.0
tert-Butylbenzene	Ave	1.956	1.758		22.5	25.0	-10.1	20.0
1,2,4-Trimethylbenzene	Ave	2.385	2.236		23.4	25.0	-6.2	20.0
sec-Butylbenzene	Ave	0.5639	0.5097		22.6	25.0	-9.6	20.0
1,3-Dichlorobenzene	Ave	1.279	1.200		23.5	25.0	-6.2	20.0
4-Isopropyltoluene	Ave	2.463	2.210		22.4	25.0	-10.3	20.0
1,4-Dichlorobenzene	Ave	1.316	1.262		24.0	25.0	-4.1	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535654/2 Calibration Date: 05/11/2021 06:41

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6066.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.122	1.979		23.3	25.0	-6.8	20.0
1,2-Dichlorobenzene	Ave	1.219	1.190		24.4	25.0	-2.3	20.0
1,2-Dibromo-3-Chloropropane	Ave	0.1708	0.1555		22.8	25.0	-8.9	20.0
1,2,4-Trichlorobenzene	Ave	0.7468	0.7177		24.0	25.0	-3.9	20.0
Hexachlorobutadiene	Ave	0.2632	0.2452		23.3	25.0	-6.8	20.0
Naphthalene	Ave	2.262	2.256		24.9	25.0	-0.3	20.0
1,2,3-Trichlorobenzene	Ave	0.6803	0.6569		24.1	25.0	-3.4	20.0
Dibromofluoromethane (Surr)	Ave	0.2579	0.2484		48.2	50.0	-3.7	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3063	0.3023		49.3	50.0	-1.3	20.0
Toluene-d8 (Surr)	Ave	4.103	4.202		51.2	50.0	2.4	20.0
4-Bromofluorobenzene (Surr)	Ave	0.9328	0.9490		50.9	50.0	1.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535654/16 Calibration Date: 05/11/2021 17:28

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6094.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	0.2142	0.1522		17.8	25.0	-28.9	50.0
Chloromethane	Ave	0.2745	0.2372	0.1000	21.6	25.0	-13.6	50.0
Vinyl chloride	Ave	0.2546	0.2414		23.7	25.0	-5.2	50.0
Bromomethane	Ave	0.1465	0.1298		22.1	25.0	-11.4	50.0
Chloroethane	Lin2		0.1613		25.2	25.0	0.8	50.0
Dichlorofluoromethane	Ave	0.4201	0.4002		23.8	25.0	-4.7	50.0
Trichlorofluoromethane	Ave	0.3436	0.3033		22.1	25.0	-11.7	50.0
Ethyl ether	Ave	0.1685	0.1751		26.0	25.0	4.0	50.0
Acrolein	Lin2		0.0373		395	247	60.1*	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1406	0.1235		22.0	25.0	-12.1	50.0
1,1-Dichloroethene	Ave	0.1866	0.1706		22.9	25.0	-8.6	50.0
Acetone	Ave	0.0773	0.0738		95.5	100	-4.5	50.0
Iodomethane	Lin2		0.1318		12.5	25.0	-50.2*	50.0
Carbon disulfide	Ave	0.5547	0.5561		25.1	25.0	0.3	50.0
Methyl acetate	Ave	0.1704	0.1748		51.3	50.0	2.5	50.0
3-Chloro-1-propene	Ave	0.3237	0.3173		24.5	25.0	-2.0	50.0
Methylene Chloride	Ave	0.2304	0.2193		23.8	25.0	-4.8	50.0
t-Butyl alcohol	Ave	0.0249	0.0226		226	250	-9.6	50.0
Acrylonitrile	Ave	0.0852	0.0954		280	250	12.0	50.0
Methyl tert-butyl ether	Ave	0.6604	0.6318		23.9	25.0	-4.3	50.0
trans-1,2-Dichloroethene	Ave	0.2213	0.2020		22.8	25.0	-8.7	50.0
Hexane	Ave	0.9909	1.037		26.2	25.0	4.7	50.0
Vinyl acetate	Ave	0.4607	0.3881		42.1	50.0	-15.8	50.0
1,1-Dichloroethane	Ave	0.4156	0.4015	0.1000	24.2	25.0	-3.4	50.0
2-Butanone (MEK)	Ave	0.1149	0.1128		98.2	100	-1.8	50.0
cis-1,2-Dichloroethene	Ave	0.2434	0.2289		23.5	25.0	-6.0	50.0
2,2-Dichloropropane	Ave	0.3434	0.2626		19.1	25.0	-23.5	50.0
sec-Butyl Alcohol	Ave	0.0186	0.0171		550	600	-8.4	50.0
Bromochloromethane	Ave	0.1142	0.1063		23.3	25.0	-6.9	50.0
Tetrahydrofuran	Ave	0.0768	0.0796		51.9	50.0	3.7	50.0
Chloroform	Ave	0.4110	0.3856		23.5	25.0	-6.2	50.0
1,1,1-Trichloroethane	Ave	0.3683	0.3143		21.3	25.0	-14.7	50.0
Cyclohexane	Lin1		0.3447		24.7	25.0	-1.2	50.0
1,1-Dichloropropene	Ave	0.3078	0.3012		24.5	25.0	-2.1	50.0
Carbon tetrachloride	Ave	0.3100	0.2432		19.6	25.0	-21.6	50.0
Isobutyl alcohol	Ave	0.0085	0.0069		509	625	-18.5	50.0
Benzene	Ave	0.9185	0.8913		24.3	25.0	-3.0	50.0
1,2-Dichloroethane	Ave	0.3485	0.3371		24.2	25.0	-3.3	50.0
Trichloroethene	Ave	0.9835	0.9570		24.3	25.0	-2.7	50.0
2-Pentanone	Ave	0.1753	0.1830		83.5	80.0	4.4	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535654/16 Calibration Date: 05/11/2021 17:28

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6094.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Ave	0.2565	0.2595		25.3	25.0	1.2	50.0
1,2-Dichloropropane	Ave	0.2271	0.2347		25.8	25.0	3.4	50.0
1,4-Dioxane	Ave	0.0033	0.0032		483	500	-3.3	50.0
Dibromomethane	Ave	0.1463	0.1457		24.9	25.0	-0.4	50.0
Bromodichloromethane	Ave	0.3042	0.2876		23.6	25.0	-5.5	50.0
2-Chloroethyl vinyl ether	Ave	0.1497	0.1486		24.8	25.0	-0.8	50.0
cis-1,3-Dichloropropene	Ave	1.573	1.523		24.2	25.0	-3.2	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2235	0.2321		104	100	3.9	50.0
Toluene	Ave	1.019	0.9405		23.1	25.0	-7.7	50.0
trans-1,3-Dichloropropene	Ave	0.3540	0.3402		24.0	25.0	-3.9	50.0
Ethyl methacrylate	Ave	1.209	1.231		25.5	25.0	1.8	50.0
1,1,2-Trichloroethane	Ave	0.1964	0.2020		25.7	25.0	2.9	50.0
Tetrachloroethene	Ave	0.7603	0.6623		21.8	25.0	-12.9	50.0
1,3-Dichloropropane	Ave	1.478	1.582		26.8	25.0	7.0	50.0
2-Hexanone	Ave	0.6640	0.6875		104	100	3.5	50.0
Dibromochloromethane	Ave	0.9327	0.8311		22.3	25.0	-10.9	50.0
1,2-Dibromoethane (EDB)	Ave	0.9051	0.9052		25.0	25.0	0.0	50.0
1-Chlorohexane	Ave	1.343	1.185		17.7	20.0	-11.7	50.0
Chlorobenzene	Ave	2.755	2.599	0.3000	23.6	25.0	-5.7	50.0
1,1,1,2-Tetrachloroethane	Ave	0.9457	0.8547		22.6	25.0	-9.6	50.0
Ethylbenzene	Ave	1.506	1.396		23.2	25.0	-7.3	50.0
m-Xylene & p-Xylene	Ave	1.825	1.729		23.7	25.0	-5.2	50.0
o-Xylene	Ave	1.813	1.676		23.1	25.0	-7.5	50.0
Styrene	Ave	3.061	2.995		24.5	25.0	-2.2	50.0
Bromoform	Ave	0.6418	0.4830	0.1000	18.8	25.0	-24.7	50.0
Isopropylbenzene	Ave	2.767	2.603		23.5	25.0	-5.9	50.0
Cyclohexanone	Ave	0.0425	0.0353		830	1000	-17.0	50.0
1,1,2,2-Tetrachloroethane	Ave	0.6836	0.7198	0.3000	26.3	25.0	5.3	50.0
Bromobenzene	Ave	0.6682	0.6331		23.7	25.0	-5.3	50.0
trans-1,4-Dichloro-2-butene	Ave	0.2284	0.2291		25.1	25.0	0.3	50.0
1,2,3-Trichloropropane	Ave	0.2173	0.2269		26.1	25.0	4.4	50.0
N-Propylbenzene	Ave	0.7636	0.7110		23.3	25.0	-6.9	50.0
2-Chlorotoluene	Ave	0.6532	0.6259		24.0	25.0	-4.2	50.0
1,3,5-Trimethylbenzene	Ave	2.328	2.240		24.1	25.0	-3.8	50.0
4-Chlorotoluene	Ave	0.6790	0.6636		24.4	25.0	-2.3	50.0
tert-Butylbenzene	Ave	1.956	1.812		23.2	25.0	-7.3	50.0
1,2,4-Trimethylbenzene	Ave	2.385	2.311		24.2	25.0	-3.1	50.0
sec-Butylbenzene	Ave	0.5639	0.5239		23.2	25.0	-7.1	50.0
1,3-Dichlorobenzene	Ave	1.279	1.238		24.2	25.0	-3.2	50.0
4-Isopropyltoluene	Ave	2.463	2.302		23.4	25.0	-6.5	50.0
1,4-Dichlorobenzene	Ave	1.316	1.257		23.9	25.0	-4.5	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535654/16 Calibration Date: 05/11/2021 17:28

Instrument ID: VMS_R1 Calib Start Date: 05/06/2021 12:06

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 05/06/2021 15:11

Lab File ID: R6094.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.122	2.030		23.9	25.0	-4.3	50.0
1,2-Dichlorobenzene	Ave	1.219	1.199		24.6	25.0	-1.6	50.0
1,2-Dibromo-3-Chloropropane	Ave	0.1708	0.1483		21.7	25.0	-13.2	50.0
1,2,4-Trichlorobenzene	Ave	0.7468	0.7082		23.7	25.0	-5.2	50.0
Hexachlorobutadiene	Ave	0.2632	0.2383		22.6	25.0	-9.5	50.0
Naphthalene	Ave	2.262	2.236		24.7	25.0	-1.2	50.0
1,2,3-Trichlorobenzene	Ave	0.6803	0.6547		24.1	25.0	-3.8	50.0
Dibromofluoromethane (Surr)	Ave	0.2579	0.2464		47.8	50.0	-4.5	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3063	0.3070		50.1	50.0	0.2	50.0
Toluene-d8 (Surr)	Ave	4.103	4.198		51.2	50.0	2.3	50.0
4-Bromofluorobenzene (Surr)	Ave	0.9328	0.9623		51.6	50.0	3.2	50.0

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Sample No.: ICIS 280-535139/18 Date Analyzed: 05/06/2021 14:01

Instrument ID: VMS_R1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): R5831.D Heated Purge: (Y/N) N

Calibration ID: 53424

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		1870856	4.95	449213	7.47	759505	9.69
UPPER LIMIT		3741712	5.45	898426	7.97	1519010	10.19
LOWER LIMIT		935428	4.45	224607	6.97	379753	9.19
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 280-535527/2		1717969	4.95	406224	7.47	681240	9.69
LCS 280-535527/4		1702276	4.95	399533	7.47	673247	9.69
LCSD 280-535527/5		1715951	4.95	402463	7.47	668274	9.69
MB 280-535527/9		1638190	4.95	378850	7.47	622872	9.69
280-147981-5	05TB02-20210428	1681365	4.95	391092	7.47	642014	9.69
280-147981-6	05RB01-20210428	1663173	4.95	387468	7.47	627811	9.69
280-147981-1	05MW21-20210428	1606472	4.95	372783	7.47	614745	9.69
280-147981-2	05MW01S-20210428	1631601	4.95	376901	7.47	615797	9.69
280-147981-3	05TW04-20210428	1613775	4.95	372170	7.47	617050	9.69
280-147981-4	05MW26-20210428	1586817	4.95	371465	7.47	608268	9.69
280-147981-7	05MW24-20210428	1608586	4.95	369744	7.47	601586	9.69
280-147981-8	05MW01SI-20210428	1588539	4.95	362877	7.47	600634	9.69
CCVC 280-535527/32		1662924	4.95	388689	7.47	644712	9.69
CCV 280-535654/2		1694924	4.95	393431	7.47	662459	9.69
LCS 280-535654/4		1651021	4.95	384807	7.47	639293	9.69
LCSD 280-535654/5		1731720	4.95	400337	7.47	678113	9.69
MB 280-535654/9		1643871	4.95	387361	7.47	632790	9.69
280-147981-1 DL	05MW21-20210428 DL	1605172	4.95	373010	7.47	606644	9.69
CCVC 280-535654/16		1675360	4.95	393226	7.47	652551	9.69

FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Instrument ID: VMS_R1 Start Date: 05/06/2021 10:52

Analysis Batch Number: 535139 End Date: 05/06/2021 15:50

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535139/1		05/06/2021 10:52	1	R5823.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/13		05/06/2021 12:06	1	R5826.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/14		05/06/2021 12:30	1	R5827.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/15		05/06/2021 12:52	1	R5828.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/16		05/06/2021 13:15	1	R5829.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/17		05/06/2021 13:38	1	R5830.D	DB-624 (60.25) 0.25(mm)
ICIS 280-535139/18		05/06/2021 14:01	1	R5831.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/19		05/06/2021 14:24	1	R5832.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/20		05/06/2021 14:47	1	R5833.D	DB-624 (60.25) 0.25(mm)
IC 280-535139/21		05/06/2021 15:11	1	R5834.D	DB-624 (60.25) 0.25(mm)
ICV 280-535139/22		05/06/2021 15:50	1	R5836.D	DB-624 (60.25) 0.25(mm)

8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Instrument ID: VMS_R1 Start Date: 05/10/2021 07:50

Analysis Batch Number: 535527 End Date: 05/10/2021 18:19

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535527/1		05/10/2021 07:50	1	R6024.D	DB-624 (60.25) 0.25(mm)
CCV 280-535527/2		05/10/2021 08:43	1	R6026.D	DB-624 (60.25) 0.25(mm)
CCV 280-535527/3		05/10/2021 09:06	1		DB-624 (60.25) 0.25(mm)
LCS 280-535527/4		05/10/2021 09:29	1	R6028.D	DB-624 (60.25) 0.25(mm)
LCSD 280-535527/5		05/10/2021 09:52	1	R6029.D	DB-624 (60.25) 0.25(mm)
MB 280-535527/9		05/10/2021 10:38	1	R6031.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 11:01	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 11:24	1		DB-624 (60.25) 0.25(mm)
280-147981-5	05TB02-20210428	05/10/2021 11:47	1	R6034.D	DB-624 (60.25) 0.25(mm)
280-147981-6	05RB01-20210428	05/10/2021 12:10	1	R6035.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 12:33	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 12:56	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 13:19	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 13:42	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 14:05	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 14:28	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 14:51	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 15:14	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/10/2021 15:37	1		DB-624 (60.25) 0.25(mm)
280-147981-1	05MW21-20210428	05/10/2021 16:01	1	R6045.D	DB-624 (60.25) 0.25(mm)
280-147981-2	05MW01S-20210428	05/10/2021 16:23	1	R6046.D	DB-624 (60.25) 0.25(mm)
280-147981-3	05TW04-20210428	05/10/2021 16:47	1	R6047.D	DB-624 (60.25) 0.25(mm)
280-147981-4	05MW26-20210428	05/10/2021 17:10	1	R6048.D	DB-624 (60.25) 0.25(mm)
280-147981-7	05MW24-20210428	05/10/2021 17:33	1	R6049.D	DB-624 (60.25) 0.25(mm)
280-147981-8	05MW01SI-20210428	05/10/2021 17:56	1	R6050.D	DB-624 (60.25) 0.25(mm)
CCVC 280-535527/32		05/10/2021 18:19	1	R6051.D	DB-624 (60.25) 0.25(mm)

8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Instrument ID: VMS_R1 Start Date: 05/11/2021 05:54

Analysis Batch Number: 535654 End Date: 05/11/2021 17:28

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535654/1		05/11/2021 05:54	1	R6064.D	DB-624 (60.25) 0.25(mm)
CCV 280-535654/2		05/11/2021 06:41	1	R6066.D	DB-624 (60.25) 0.25(mm)
CCV 280-535654/3		05/11/2021 07:04	1		DB-624 (60.25) 0.25(mm)
LCS 280-535654/4		05/11/2021 07:27	1	R6068.D	DB-624 (60.25) 0.25(mm)
LCSD 280-535654/5		05/11/2021 07:50	1	R6069.D	DB-624 (60.25) 0.25(mm)
MB 280-535654/9		05/11/2021 08:36	1	R6071.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 08:59	1		DB-624 (60.25) 0.25(mm)
280-147981-1 DL	05MW21-20210428 DL	05/11/2021 09:22	2	R6073.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 09:46	5		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 10:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:21	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:44	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:07	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:30	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:53	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:16	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:39	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:02	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:24	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:47	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:10	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:33	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:56	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 16:19	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 16:42	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 17:05	1		DB-624 (60.25) 0.25(mm)
CCVC 280-535654/16		05/11/2021 17:28	1	R6094.D	DB-624 (60.25) 0.25(mm)

8260B

8260B_SIM_DOD5

Volatile Organic Compounds (GC/MS)

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DCA #
05MW21-20210428	280-147981-1	101
05MW01S-20210428	280-147981-2	102
05TW04-20210428	280-147981-3	101
05MW26-20210428	280-147981-4	101
05TB02-20210428	280-147981-5	103
05RB01-20210428	280-147981-6	103
05MW24-20210428	280-147981-7	101
05MW01SI-20210428	280-147981-8	102
	MB 280-535223/6	103
	LCS 280-535223/3	104
	LCSD 280-535223/4	104

	QC LIMITS
DCA = 1,2-Dichloroethane-d4 (Surr)	70-127

Column to be used to flag recovery values

FORM II 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1202.D

Lab ID: LCS 280-535223/3 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,4-Dioxane	25.2	24.0	95	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1203.D

Lab ID: LCSD 280-535223/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,4-Dioxane	25.2	23.1	92	4	20	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: E1205.D Lab Sample ID: MB 280-535223/6

Matrix: Water Heated Purge:(Y/N) Y

Instrument ID: VMS_E Date Analyzed: 05/06/2021 19:44

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535223/3	E1202.D	05/06/2021 18:38
	LCSD 280-535223/4	E1203.D	05/06/2021 19:00
05TB02-20210428	280-147981-5	E1207.D	05/06/2021 20:29
05MW21-20210428	280-147981-1	E1208.D	05/06/2021 20:51
05MW01S-20210428	280-147981-2	E1209.D	05/06/2021 21:13
05TW04-20210428	280-147981-3	E1210.D	05/06/2021 21:35
05MW26-20210428	280-147981-4	E1211.D	05/06/2021 21:57
05RB01-20210428	280-147981-6	E1212.D	05/06/2021 22:19
05MW24-20210428	280-147981-7	E1213.D	05/06/2021 22:41
05MW01SI-20210428	280-147981-8	E1225.D	05/07/2021 03:07

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-147981-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535223/6
Matrix: Water
Lab File ID: E1205.D
Analysis Method: 8260B SIM
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/06/2021 19:44
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535223
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		70-127

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: E0739.D BFB Injection Date: 04/08/2021

Instrument ID: VMS_E BFB Injection Time: 12:33

Analysis Batch No.: 531869

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.6	
75	30.0 - 60.0 % of mass 95	48.4	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.4	
175	5.0 - 9.0 % of mass 174	5.1	(7.4) 1
176	95.0 - 101.0 % of mass 174	66.3	(97.0) 1
177	5.0 - 9.0 % of mass 176	4.2	(6.3) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 280-531869/2	E0740.D	04/08/2021	12:55
	IC 280-531869/3	E0741.D	04/08/2021	13:17
	IC 280-531869/4	E0742.D	04/08/2021	13:39
	IC 280-531869/5	E0743.D	04/08/2021	14:01
	ICIS 280-531869/6	E0744.D	04/08/2021	14:23
	IC 280-531869/7	E0745.D	04/08/2021	14:46
	IC 280-531869/8	E0746.D	04/08/2021	15:08
	ICV 280-531869/9	E0747.D	04/08/2021	15:30

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 531869

SDG No.:

Instrument ID: VMS_E GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 04/08/2021 12:55 Calibration End Date: 04/08/2021 15:08 Calibration ID: 52241

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-531869/2	E0740.D
Level 2	IC 280-531869/3	E0741.D
Level 3	IC 280-531869/4	E0742.D
Level 4	IC 280-531869/5	E0743.D
Level 5	ICIS 280-531869/6	E0744.D
Level 6	IC 280-531869/7	E0745.D
Level 7	IC 280-531869/8	E0746.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Vinyl chloride	+++++ 0.2017	0.2360 +++++	0.1937	0.2036	0.1958	Ave		0.2061				8.3		15.0			
2-Methyl-2-propanol	2.6831 1.6302	1.9189 1.5618	1.6307	1.5017	1.6298	Lin2	0.5426	1.5110							0.9930		0.9900
Benzene	+++++ 1.3636	+++++ 1.1610	1.5025	1.4615	1.3439	Ave		1.3665				9.7		15.0			
Trichloroethene	+++++ 0.2931	0.4861 0.2359	0.3382	0.3203	0.2889	Lin2	0.0043	0.2671							0.9920		0.9900
1,4-Dioxane	2.6749 1.5772	2.3838 1.5474	1.7744	1.6549	1.6253	Lin2	0.5936	1.5799							0.9950		0.9900
1,2-Dichloroethane-d4 (Surr)	0.2901 0.2922	0.2881 0.2883	0.2897	0.2951	0.2906	Ave		0.2906				0.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1 Analy Batch No.: 531869

SDG No.:

Instrument ID: VMS_E GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 04/08/2021 12:55 Calibration End Date: 04/08/2021 15:08 Calibration ID: 52241

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-531869/2	E0740.D
Level 2	IC 280-531869/3	E0741.D
Level 3	IC 280-531869/4	E0742.D
Level 4	IC 280-531869/5	E0743.D
Level 5	ICIS 280-531869/6	E0744.D
Level 6	IC 280-531869/7	E0745.D
Level 7	IC 280-531869/8	E0746.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Vinyl chloride	FB	Ave	+++++ 15835	386 +++++	772	1605	7752	+++++ 1.00	0.0200 +++++	0.0500	0.100	0.500
2-Methyl-2-propanol	TBAd9	Lin2	5070 319675	7823 661421	16709	30347	152404	0.503 50.3	1.01 101	2.52	5.03	25.2
Benzene	FB	Ave	+++++ 107070	+++++ 183793	5989	11520	53217	+++++ 1.00	+++++ 2.00	0.0500	0.100	0.500
Trichloroethene	FB	Lin2	+++++ 23014	795 37349	1348	2525	11441	+++++ 1.00	0.0200 2.00	0.0500	0.100	0.500
1,4-Dioxane	DXE	Lin2	455 28026	852 59314	1602	2987	14031	0.500 50.0	1.00 100	2.50	5.00	25.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	219590 229471	235624 228200	230969	232602	230130	10.0 10.0	10.0 10.0	10.0	10.0	10.0

Curve Type Legend
Ave = Average ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: ICV 280-531869/9 Calibration Date: 04/08/2021 15:30

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E0747.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.1841		0.447	0.500	-10.7	20.0
2-Methyl-2-propanol	Lin2		1.589		26.1	25.2	3.7	20.0
Benzene	Ave	1.366	1.350		0.494	0.500	-1.2	20.0
Trichloroethene	Lin2		0.2912		0.529	0.500	5.8	20.0
1,4-Dioxane	Lin2		1.588		24.9	25.2	-1.0	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2907		10.0	10.0	0.0	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab File ID: E1200.D BFB Injection Date: 05/06/2021

Instrument ID: VMS_E BFB Injection Time: 17:54

Analysis Batch No.: 535223

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.3	
75	30.0 - 60.0 % of mass 95	48.5	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	7.0	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.4	
175	5.0 - 9.0 % of mass 174	5.2	(7.5) 1
176	95.0 - 101.0 % of mass 174	66.4	(97.0) 1
177	5.0 - 9.0 % of mass 176	4.4	(6.6) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535223/2	E1201.D	05/06/2021	18:16
	LCS 280-535223/3	E1202.D	05/06/2021	18:38
	LCSD 280-535223/4	E1203.D	05/06/2021	19:00
	MB 280-535223/6	E1205.D	05/06/2021	19:44
05TB02-20210428	280-147981-5	E1207.D	05/06/2021	20:29
05MW21-20210428	280-147981-1	E1208.D	05/06/2021	20:51
05MW01S-20210428	280-147981-2	E1209.D	05/06/2021	21:13
05TW04-20210428	280-147981-3	E1210.D	05/06/2021	21:35
05MW26-20210428	280-147981-4	E1211.D	05/06/2021	21:57
05RB01-20210428	280-147981-6	E1212.D	05/06/2021	22:19
05MW24-20210428	280-147981-7	E1213.D	05/06/2021	22:41
05MW01SI-20210428	280-147981-8	E1225.D	05/07/2021	3:07
	CCVC 280-535223/48	E1226.D	05/07/2021	3:29

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCV 280-535223/2 Calibration Date: 05/06/2021 18:16

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1201.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.0555		0.135	0.500	-73.1*	20.0
2-Methyl-2-propanol	Lin2		1.638		27.0	25.2	7.0	20.0
Benzene	Ave	1.366	1.387		0.507	0.500	1.5	20.0
Trichloroethene	Lin2		0.3094		0.563	0.500	12.6	20.0
1,4-Dioxane	Lin2		1.601		25.1	25.2	-0.2	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2971		10.2	10.0	2.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Lab Sample ID: CCVC 280-535223/48 Calibration Date: 05/07/2021 03:29

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1226.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.0534		0.129	0.500	-74.1*	50.0
2-Methyl-2-propanol	Lin2		1.643		27.0	25.2	7.3	50.0
Benzene	Ave	1.366	1.373		0.502	0.500	0.5	50.0
Trichloroethene	Lin2		0.3180		0.579	0.500	15.8	50.0
1,4-Dioxane	Lin2		1.665		26.1	25.2	3.9	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.3030		10.4	10.0	4.3	50.0

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-147981-1

SDG No.:

Sample No.: ICIS 280-531869/6 Date Analyzed: 04/08/2021 14:23

Instrument ID: VMS_E GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): E0744.D Heated Purge: (Y/N) Y

Calibration ID: 52241

		FB		DXE			
		AREA #	RT #	AREA #	RT #	#	RT #
INITIAL CALIBRATION MID-POINT		792007	5.14	69065	5.61		
UPPER LIMIT		1584014	5.64	138130	6.11		
LOWER LIMIT		396004	4.64	34533	5.11		
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-531869/9		780669	5.14	71087	5.61		
CCV 280-535223/2		601708	5.14	61020	5.61		
LCS 280-535223/3		609337	5.14	62476	5.61		
LCSD 280-535223/4		623058	5.14	61989	5.61		
MB 280-535223/6		606109	5.14	59844	5.61		
280-147981-5	05TB02-20210428	587035	5.14	55739	5.61		
280-147981-1	05MW21-20210428	623281	5.14	62509	5.61		
280-147981-2	05MW01S-20210428	605896	5.14	58471	5.61		
280-147981-3	05TW04-20210428	611150	5.14	59817	5.61		
280-147981-4	05MW26-20210428	589741	5.14	65853	5.61		
280-147981-6	05RB01-20210428	613004	5.14	62589	5.61		
280-147981-7	05MW24-20210428	591420	5.14	65842	5.61		
280-147981-8	05MW01SI-20210428	611172	5.14	61042	5.61		
CCVC 280-535223/48		609701	5.14	63112	5.61		

FB = Fluorobenzene
DXE = 1,4-Dioxane-d8

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B SIM

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **T. MOORE** **DATE:** **MAY 24, 2021**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –SELECT VOCs, 1,4-DIOXANE**
NAS JRB WILLOW GROVE SITE 5
SAMPLE DELIVERY GROUP (SDG) 280-148061-1

SAMPLES: 5/Aqueous/
Select VOCs, 1,4-Dioxane

05DUP02-20210429 05MW20-20210429
05MW25-20210429 05TW02-20210429
05TW03-20210429

1/Trip Blank
VOCs, 1,4-Dioxane

05TB03-20210429

1/Field Blank
VOCs, 1,4-Dioxane

05FB01-20210429

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 280-148061-1, consisted of five (5) aqueous environmental samples, one (1) trip blank and one (1) field blank. All samples were analyzed for select volatile organic compounds (VOCs) and 1,4-Dioxane as referenced above. One (1) field duplicate pair, 05MW25-20210429 / 05DUP02-20210429, was included in this SDG.

The samples were collected by Tetra Tech, on April 29, 2021 and analyzed by Eurofins TestAmerica. All analyses were conducted in accordance with SW-846 Methods 8260B and 8260B SIM analytical and reporting protocols.

The data contained in this SDG were validated via EPA Stage 2B with regard to the following parameters: data completeness, holding times, GC/MS tuning, initial/continuing calibrations, laboratory method/field blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries, internal standard areas and recoveries, field duplicate results and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

- The detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

- The following compound was detected in a field blank at the following maximum concentration.

Compound	Concentration	Action Level LOQ > or <
1,4-Dioxane	1.5 ug/L	>

Detected results reported below the LOQ for 1,4-Dioxane were qualified as nondetected (U) and raised to the limit of detection (LOD).

- Field duplicate imprecision (a difference greater than two times the LOQ) was noted for 1,1,1-trichloroethane for sample pair 05MW25-20210429 / 05DUP02-20210429. The detected and nondetected results reported for 1,1,1-trichloroethane for samples 05MW25-20210429 and 05DUP02-20210429 were qualified as estimated (J) and (UJ), respectively.

Notes

Non-detected results were reported to the LOD.

Executive Summary

Laboratory Performance: Field blank contamination was present in the 8260C SIM analysis.

Other Factors Affecting Data Quality: The results below the LOQ were estimated. Field duplicate imprecision was noted for sample pair 05MW25-20210429 / 05DUP02-20210429.

The data for these analyses were reviewed with reference to the Department of Defense (DOD) document entitled "Data Validation Guidelines Module 1: Data Validation Procedure for Organic Analysis by GC/MS" (May 11, 2020). The text of this report has been formulated to address only those areas affecting data quality.

Terri L. Solomon

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Joseph A. Samchuck

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated value with an unknown bias. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05DUP02-20210429			05FB01-20210429			05MW20-20210429			05MW25-20210429		
SDG: 280-148061-1	LAB_ID	280-148061-5			280-148061-6			280-148061-2			280-148061-1		
FRACTION: OV	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	05MW25-20210429											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		3.4	J	G	0.4	U		0.4	U		0.4	UJ	G
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
1,1-DICHLOROETHANE		17			0.8	U		2.1			14		
1,1-DICHLOROETHENE		1.2			0.8	U		0.8	U		1.1		
1,2-DICHLOROETHANE		0.4	U		0.4	U		0.4	U		0.4	U	
BENZENE		0.31	J	P	0.4	U		0.4	U		0.4	U	
CHLOROETHANE		9.1			1.6	U		7.4			7.8		
CHLOROFORM		0.4	U		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		6.8			0.4	U		0.58	J	P	6.7		
TETRACHLOROETHENE		0.4	U		0.4	U		0.4	U		0.4	U	
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.4	U		0.4	U	
TRICHLOROETHENE		0.78	J	P	0.4	U		0.4	U		0.4	U	
VINYL CHLORIDE		4.2			0.2	U		0.2	U		4.6		

PROJ_NO: 08005-WE04	NSAMPLE	05TB03-20210429			05TW02-20210429			05TW03-20210429		
SDG: 280-148061-1	LAB_ID	280-148061-7			280-148061-3			280-148061-4		
FRACTION: OV	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.4	U		0.4	U		8.5		
1,1,2,2-TETRACHLOROETHANE		0.8	U		0.8	U		0.8	U	
1,1,2-TRICHLOROETHANE		0.8	U		0.8	U		0.8	U	
1,1-DICHLOROETHANE		0.8	U		0.8	U		5.2		
1,1-DICHLOROETHENE		0.8	U		0.8	U		1.5		
1,2-DICHLOROETHANE		0.4	U		0.4	U		0.4	U	
BENZENE		0.4	U		0.4	U		0.4	U	
CHLOROETHANE		1.6	U		6.2			1.6	U	
CHLOROFORM		0.4	U		0.4	U		0.4	U	
CHLOROMETHANE		0.8	U		0.8	U		0.8	U	
CIS-1,2-DICHLOROETHENE		0.4	U		1.8			5.4		
TETRACHLOROETHENE		0.4	U		0.4	U		0.4	U	
TRANS-1,2-DICHLOROETHENE		0.4	U		0.4	U		0.4	U	
TRICHLOROETHENE		0.4	U		0.4	U		3		
VINYL CHLORIDE		0.2	U		0.2	U		0.2	U	

PROJ_NO: 08005-WE04	NSAMPLE	05DUP02-20210429			05FB01-20210429			05MW20-20210429			05MW25-20210429		
SDG: 280-148061-1	LAB_ID	280-148061-5			280-148061-6			280-148061-2			280-148061-1		
FRACTION: OVSIM	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	05MW25-20210429											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		1.3	U	B	1.5			1	U	B	1.2	U	B

PROJ_NO: 08005-WE04	NSAMPLE	05TB03-20210429			05TW02-20210429			05TW03-20210429		
SDG: 280-148061-1	LAB_ID	280-148061-7			280-148061-3			280-148061-4		
FRACTION: OVSIM	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,4-DIOXANE		1	J	P	1.2	U	B	1	U	B

Appendix B

Results as Reported by the Laboratory

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05MW25-20210429
Lab Sample ID: 280-148061-1
Matrix: Water
Lab File ID: MS1_1669.D
Analysis Method: 8260B
Date Collected: 04/29/2021 10:15
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 16:53
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535660
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U M	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	14		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	1.1		1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U M	1.0	0.40	0.16
75-00-3	Chloroethane	7.8		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	6.7		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	4.6		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		81-118
460-00-4	4-Bromofluorobenzene (Surr)	94		85-114
1868-53-7	Dibromofluoromethane (Surr)	104		80-119
2037-26-5	Toluene-d8 (Surr)	99		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05MW20-20210429
Lab Sample ID: 280-148061-2
Matrix: Water
Lab File ID: MS1_1670.D
Analysis Method: 8260B
Date Collected: 04/29/2021 12:25
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 17:14
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535660
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	2.1		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U M	1.0	0.40	0.16
75-00-3	Chloroethane	7.4		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.58	J	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		81-118
460-00-4	4-Bromofluorobenzene (Surr)	94		85-114
1868-53-7	Dibromofluoromethane (Surr)	105		80-119
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05TW02-20210429
Lab Sample ID: 280-148061-3
Matrix: Water
Lab File ID: MS1_1671.D
Analysis Method: 8260B
Date Collected: 04/29/2021 11:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 17:36
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535660
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U M	1.0	0.40	0.16
75-00-3	Chloroethane	6.2		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	1.8		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		81-118
460-00-4	4-Bromofluorobenzene (Surr)	94		85-114
1868-53-7	Dibromofluoromethane (Surr)	105		80-119
2037-26-5	Toluene-d8 (Surr)	97		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05TW03-20210429
Lab Sample ID: 280-148061-4
Matrix: Water
Lab File ID: MS1_1672.D
Analysis Method: 8260B
Date Collected: 04/29/2021 14:35
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 17:57
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535660
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	8.5		1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	5.2		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	1.5		1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U M	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	5.4		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	3.0		1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		81-118
460-00-4	4-Bromofluorobenzene (Surr)	96		85-114
1868-53-7	Dibromofluoromethane (Surr)	105		80-119
2037-26-5	Toluene-d8 (Surr)	98		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05DUP02-20210429
Lab Sample ID: 280-148061-5
Matrix: Water
Lab File ID: P4359.D
Analysis Method: 8260B
Date Collected: 04/29/2021 12:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 17:02
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535659
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	3.4		1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	17		1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	1.2		1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.31	J	1.0	0.40	0.16
75-00-3	Chloroethane	9.1		2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	6.8		1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.78	J	1.0	0.40	0.16
75-01-4	Vinyl chloride	4.2		1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	118		81-118
460-00-4	4-Bromofluorobenzene (Surr)	97		85-114
1868-53-7	Dibromofluoromethane (Surr)	107		80-119
2037-26-5	Toluene-d8 (Surr)	98		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05FB01-20210429
Lab Sample ID: 280-148061-6
Matrix: Water
Lab File ID: P4360.D
Analysis Method: 8260B
Date Collected: 04/29/2021 13:15
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 17:25
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535659
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	117		81-118
460-00-4	4-Bromofluorobenzene (Surr)	99		85-114
1868-53-7	Dibromofluoromethane (Surr)	106		80-119
2037-26-5	Toluene-d8 (Surr)	98		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05TB03-20210429
Lab Sample ID: 280-148061-7
Matrix: Water
Lab File ID: P4361.D
Analysis Method: 8260B
Date Collected: 04/29/2021 08:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 17:48
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535659
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	117		81-118
460-00-4	4-Bromofluorobenzene (Surr)	96		85-114
1868-53-7	Dibromofluoromethane (Surr)	109		80-119
2037-26-5	Toluene-d8 (Surr)	100		89-112

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05MW25-20210429
Lab Sample ID: 280-148061-1
Matrix: Water
Lab File ID: E1239.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 10:15
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 14:16
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.2	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05MW20-20210429
Lab Sample ID: 280-148061-2
Matrix: Water
Lab File ID: E1240.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 12:25
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 14:39
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.97	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05TW02-20210429
Lab Sample ID: 280-148061-3
Matrix: Water
Lab File ID: E1241.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 11:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 15:01
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.2	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05TW03-20210429
Lab Sample ID: 280-148061-4
Matrix: Water
Lab File ID: E1242.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 14:35
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 15:23
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	0.50	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05DUP02-20210429
Lab Sample ID: 280-148061-5
Matrix: Water
Lab File ID: E1243.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 12:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 15:45
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.3	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05FB01-20210429
Lab Sample ID: 280-148061-6
Matrix: Water
Lab File ID: E1244.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 13:15
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 16:06
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.5		1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		70-127

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID: 05TB03-20210429
Lab Sample ID: 280-148061-7
Matrix: Water
Lab File ID: E1245.D
Analysis Method: 8260B SIM
Date Collected: 04/29/2021 08:00
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 16:28
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	J	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		70-127

Appendix C

Support Documentation

ANALYTE	ORIGINAL 05MW25-20210429	DUPLICATE 05DUP02-20210429	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
1,1-DICHLOROETHANE	14	17	0.8	19.35	FALSE	TRUE	TRUE	TRUE
1,1-DICHLOROETHENE	1.1	1.2	0.8	8.70	FALSE	FALSE	FALSE	FALSE
CHLOROETHANE	7.8	9.1	1.6	15.38	FALSE	TRUE	TRUE	FALSE
CIS-1,2-DICHLOROETHENE	6.7	6.8	0.4	1.48	FALSE	TRUE	TRUE	FALSE
VINYL CHLORIDE	4.6	4.2	0.2	9.09	FALSE	TRUE	TRUE	FALSE
1,4-DIOXANE	1.2	1.3	1	8.00	FALSE	FALSE	FALSE	FALSE
1,1,1-TRICHLOROETHANE	0.4	3.4	0.4	157.89	TRUE	FALSE	TRUE	TRUE
BENZENE	0.4	0.31	0.4	25.35	FALSE	FALSE	FALSE	FALSE
TRICHLOROETHENE	0.4	0.78	0.4	64.41	TRUE	FALSE	FALSE	FALSE

Eurofins TestAmerica, Denver
4955 Yarrow Street

Arvada, CO 80002-4517
phone 303.736.0100 fax 303.431.7171

Chain of Custody Record

eurofins Environment Testing America

Regulatory Program: ☑ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact
Tetra Tech
234 Mall Blvd. Suite 260
King of Prussia, PA 19406
(xxx) xxx-xxxx Phone
(xxx) xxx-xxxx FAX
Project Name: NAS JRB Willow Grove
Site: Site 5
P O #

Project Manager: Tricia Moore
Email: tricia.moore@tetratech.com
Tel/Fax: 610-382-1171

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from Below _____
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Site Contact: D. Whalen
Lab Contact:
Date: 4-29-21
Carrier: FedEx 773593019986

COC No: _____ of _____ COCs
TALS Project #:
Sampler:
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

280-148061 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	VOCs	1,4-Dioxane	Sample Specific Notes:
05 MW25 - 20210429	4/29/21	1015	G	W	6	N	N	3	3	
05 MW20 - 20210429	↓	1225	G	W	6	N	N	3	3	
05 TW02 - 20210429	↓	1100	G	W	6	N	N	3	3	
05 TW03 - 20210429	↓	1435	G	W	6	N	N	3	3	
05 DUP02 - 20210429	↓	1210	G	W	6	N	N	3	3	
05 FB01 - 20210429	↓	1315	G	W	6	N	N	3	3	Field Blank
05 TB03 - 20210429	↓	0800	G	W	4	N	N	2	2	Trip Blank
								2	2	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:
Cooler Temp. (°C): Obs'd: 4.3 Corr'd: 4.7 Therm ID No.: 11

	Company	Date/Time		Company	Date/Time
Relinquished by: [signature]	Tetra Tech	4/29/21 1830	Received by: [signature]	ETA DEN	04/30/2021 09:35
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.35, dated 10/6/2020

Sample Summary

Client: White Water Associates
Job ID: 280-148061-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-148061-1	05MW25-20210429	Water	04/29/21 10:15	04/30/21 09:35	
280-148061-2	05MW20-20210429	Water	04/29/21 12:25	04/30/21 09:35	
280-148061-3	05TW02-20210429	Water	04/29/21 11:00	04/30/21 09:35	
280-148061-4	05TW03-20210429	Water	04/29/21 14:35	04/30/21 09:35	
280-148061-5	05DUP02-20210429	Water	04/29/21 12:00	04/30/21 09:35	
280-148061-6	05FB01-20210429	Water	04/29/21 13:15	04/30/21 09:35	
280-148061-7	05TB03-20210429	Water	04/29/21 08:00	04/30/21 09:35	

CASE NARRATIVE

Client: White Water Associates

Project: Willow Grove Site 5 Long Term Monitoring

Report Number: 280-148061-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 4/30/2021 9:35 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.7º C.

VOLATILE ORGANIC COMPOUNDS (GC/MS)
Samples 05MW25-20210429 (280-148061-1), 05MW20-20210429 (280-148061-2), 05TW02-20210429 (280-148061-3), 05TW03-20210429 (280-148061-4), 05DUP02-20210429 (280-148061-5), 05FB01-20210429 (280-148061-6) and 05TB03-20210429 (280-148061-7) were analyzed for volatile organic compounds (GC/MS) in accordance with 8260B. The samples were analyzed on 05/11/2021.

Insufficient sample volume was available to perform a matrix spike and matrix spike duplicate (MS/MSD) associated with analytical batch 280-535659. A laboratory control sample and laboratory control sample duplicate (LCS/LCSD) was analyzed for batch precision and accuracy.

Insufficient sample volume was available to perform a matrix spike and matrix spike duplicate (MS/MSD) associated with analytical batch 280-535660. A laboratory control sample and laboratory control sample duplicate (LCS/LCSD) was analyzed for batch precision and accuracy.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS SIM)
Samples 05MW25-20210429 (280-148061-1), 05MW20-20210429 (280-148061-2), 05TW02-20210429 (280-148061-3), 05TW03-20210429 (280-148061-4), 05DUP02-20210429 (280-148061-5), 05FB01-20210429 (280-148061-6) and 05TB03-20210429 (280-148061-7) were analyzed for volatile organic compounds (GC-MS SIM) in accordance with SW846 8260B SIM. The samples were analyzed on 05/07/2021.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: White Water Associates
Job ID: 280-148061-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: White Water Associates
Job ID: 280-148061-1
Project/Site: Willow Grove Site 5 Long Term Monitoring

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Method 8260B

Volatile Organic Compounds (GC/MS) by Method 8260B

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DBFM #	DCA #	TOL #	BFB #
05MW25-20210429	280-148061-1	104	105	99	94
05MW20-20210429	280-148061-2	105	104	96	94
05TW02-20210429	280-148061-3	105	104	97	94
05TW03-20210429	280-148061-4	105	102	98	96
05DUP02-20210429	280-148061-5	107	118	98	97
05FB01-20210429	280-148061-6	106	117	98	99
05TB03-20210429	280-148061-7	109	117	100	96
	MB 280-535659/9	105	117	98	96
	MB 280-535660/9	106	104	96	96
	LCS 280-535659/4	108	114	97	97
	LCS 280-535660/4	105	106	96	92
	LCSD 280-535659/5	109	117	97	96
	LCSD 280-535660/5	106	108	98	94

	QC LIMITS
DBFM = Dibromofluoromethane (Surr)	80-119
DCA = 1,2-Dichloroethane-d4 (Surr)	81-118
TOL = Toluene-d8 (Surr)	89-112
BFB = 4-Bromofluorobenzene (Surr)	85-114

Column to be used to flag recovery values

FORM II 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low Lab File ID: P4338.D

Lab ID: LCS 280-535659/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	31.3	125	74-131	
1,1,2,2-Tetrachloroethane	25.0	27.5	110	71-121	
1,1,2-Trichloroethane	25.0	25.3	101	80-119	
1,1-Dichloroethane	25.0	26.8	107	77-125	
1,1-Dichloroethene	25.0	25.0	100	71-131	
1,2-Dichloroethane	25.0	28.3	113	73-128	
Benzene	25.0	25.9	104	79-120	
Chloroethane	25.0	22.9	92	60-138	
Chloroform	25.0	28.4	113	79-124	
Chloromethane	25.0	18.9	76	50-139	
cis-1,2-Dichloroethene	25.0	25.0	100	78-123	
Tetrachloroethene	25.0	27.0	108	74-129	
trans-1,2-Dichloroethene	25.0	26.5	106	75-124	
Trichloroethene	25.0	27.7	111	79-123	
Vinyl chloride	25.0	20.5	82	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1646.D

Lab ID: LCS 280-535660/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	23.3	93	74-131	
1,1,2,2-Tetrachloroethane	25.0	22.6	90	71-121	
1,1,2-Trichloroethane	25.0	24.2	97	80-119	
1,1-Dichloroethane	25.0	20.3	81	77-125	
1,1-Dichloroethene	25.0	22.3	89	71-131	
1,2-Dichloroethane	25.0	23.1	92	73-128	
Benzene	25.0	21.8	87	79-120	
Chloroethane	25.0	17.6	71	60-138	
Chloroform	25.0	22.7	91	79-124	
Chloromethane	25.0	18.4	74	50-139	
cis-1,2-Dichloroethene	25.0	22.4	89	78-123	
Tetrachloroethene	25.0	26.3	105	74-129	
trans-1,2-Dichloroethene	25.0	22.4	90	75-124	
Trichloroethene	25.0	21.7	87	79-123	
Vinyl chloride	25.0	21.0	84	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low Lab File ID: P4350.D

Lab ID: LCSD 280-535659/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	31.2	125	0	20	74-131	
1,1,2,2-Tetrachloroethane	25.0	27.0	108	2	20	71-121	
1,1,2-Trichloroethane	25.0	25.6	102	1	20	80-119	
1,1-Dichloroethane	25.0	27.1	108	1	20	77-125	
1,1-Dichloroethene	25.0	24.5	98	2	20	71-131	
1,2-Dichloroethane	25.0	27.6	110	2	20	73-128	
Benzene	25.0	25.5	102	2	20	79-120	
Chloroethane	25.0	22.7	91	1	20	60-138	
Chloroform	25.0	28.3	113	0	20	79-124	
Chloromethane	25.0	18.0	72	5	20	50-139	
cis-1,2-Dichloroethene	25.0	25.1	100	0	20	78-123	
Tetrachloroethene	25.0	27.8	111	3	20	74-129	
trans-1,2-Dichloroethene	25.0	26.0	104	2	20	75-124	
Trichloroethene	25.0	28.3	113	2	20	79-123	
Vinyl chloride	25.0	21.1	84	3	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low Lab File ID: MS1_1647.D

Lab ID: LCSD 280-535660/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
1,1,1-Trichloroethane	25.0	22.9	92	1	20	74-131	
1,1,2,2-Tetrachloroethane	25.0	23.3	93	3	20	71-121	
1,1,2-Trichloroethane	25.0	25.1	100	3	20	80-119	
1,1-Dichloroethane	25.0	20.6	83	1	20	77-125	
1,1-Dichloroethene	25.0	22.1	88	1	20	71-131	
1,2-Dichloroethane	25.0	23.6	95	2	20	73-128	
Benzene	25.0	22.3	89	2	20	79-120	
Chloroethane	25.0	18.5	74	5	20	60-138	
Chloroform	25.0	23.1	93	2	20	79-124	
Chloromethane	25.0	17.7	71	4	20	50-139	
cis-1,2-Dichloroethene	25.0	22.7	91	1	20	78-123	
Tetrachloroethene	25.0	25.3	101	4	20	74-129	
trans-1,2-Dichloroethene	25.0	22.1	88	2	20	75-124	
Trichloroethene	25.0	22.1	88	1	20	79-123	
Vinyl chloride	25.0	21.2	85	1	20	58-137	

Column to be used to flag recovery and RPD values

FORM III 8260B

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: MS1_1649.D Lab Sample ID: MB 280-535660/9

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: VMS_MS1 Date Analyzed: 05/11/2021 09:51

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535660/4	MS1_1646.D	05/11/2021 08:47
	LCSD 280-535660/5	MS1_1647.D	05/11/2021 09:08
05MW25-20210429	280-148061-1	MS1_1669.D	05/11/2021 16:53
05MW20-20210429	280-148061-2	MS1_1670.D	05/11/2021 17:14
05TW02-20210429	280-148061-3	MS1_1671.D	05/11/2021 17:36
05TW03-20210429	280-148061-4	MS1_1672.D	05/11/2021 17:57

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535660/9
Matrix: Water
Lab File ID: MS1_1649.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 09:51
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535660
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		81-118
460-00-4	4-Bromofluorobenzene (Surr)	96		85-114
1868-53-7	Dibromofluoromethane (Surr)	106		80-119
2037-26-5	Toluene-d8 (Surr)	96		89-112

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: P4341.D Lab Sample ID: MB 280-535659/9

Matrix: Water Heated Purge:(Y/N) N

Instrument ID: VMS_P Date Analyzed: 05/11/2021 10:09

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535659/4	P4338.D	05/11/2021 09:00
	LCSD 280-535659/5	P4350.D	05/11/2021 13:36
05DUP02-20210429	280-148061-5	P4359.D	05/11/2021 17:02
05FB01-20210429	280-148061-6	P4360.D	05/11/2021 17:25
05TB03-20210429	280-148061-7	P4361.D	05/11/2021 17:48

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535659/9
Matrix: Water
Lab File ID: P4341.D
Analysis Method: 8260B
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/11/2021 10:09
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535659
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
71-55-6	1,1,1-Trichloroethane	0.40	U	1.0	0.40	0.16
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	1.0	0.80	0.21
79-00-5	1,1,2-Trichloroethane	0.80	U	1.0	0.80	0.27
75-34-3	1,1-Dichloroethane	0.80	U	1.0	0.80	0.22
75-35-4	1,1-Dichloroethene	0.80	U	1.0	0.80	0.23
107-06-2	1,2-Dichloroethane	0.40	U	1.0	0.40	0.13
71-43-2	Benzene	0.40	U	1.0	0.40	0.16
75-00-3	Chloroethane	1.6	U	2.0	1.6	0.41
67-66-3	Chloroform	0.40	U	1.0	0.40	0.16
74-87-3	Chloromethane	0.80	U	2.0	0.80	0.30
156-59-2	cis-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
127-18-4	Tetrachloroethene	0.40	U	1.0	0.40	0.20
156-60-5	trans-1,2-Dichloroethene	0.40	U	1.0	0.40	0.15
79-01-6	Trichloroethene	0.40	U	1.0	0.40	0.16
75-01-4	Vinyl chloride	0.20	U	1.5	0.20	0.10

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	117		81-118
460-00-4	4-Bromofluorobenzene (Surr)	96		85-114
1868-53-7	Dibromofluoromethane (Surr)	105		80-119
2037-26-5	Toluene-d8 (Surr)	98		89-112

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: MS1_0134.D BFB Injection Date: 04/13/2021

Instrument ID: VMS_MS1 BFB Injection Time: 15:31

Analysis Batch No.: 532364

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	18.9	
75	30.0 - 60.0 % of mass 95	52.3	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.6	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	63.3	
175	5.0 - 9.0 % of mass 174	5.0	(8.0) 1
176	95.0 - 101.0 % of mass 174	61.3	(96.9) 1
177	5.0 - 9.0 % of mass 176	4.3	(7.0) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	ICV 280-532364/30	MS1_0143.D	04/13/2021	18:54
	STD005 280-532364/14	MS1_0144.D	04/13/2021	19:16
	STD010 280-532364/15	MS1_0145.D	04/13/2021	19:38
	STD020 280-532364/16	MS1_0146.D	04/13/2021	20:00
	STD050 280-532364/17	MS1_0147.D	04/13/2021	20:22
	STD10 280-532364/18	MS1_0148.D	04/13/2021	20:44
	ICIS 280-532364/19	MS1_0149.D	04/13/2021	21:06
	STD75 280-532364/31	MS1_0150.D	04/13/2021	21:28
	STD100 280-532364/20	MS1_0151.D	04/13/2021	21:50
	STD200 280-532364/21	MS1_0152.D	04/13/2021	22:12
	ICV 280-532364/22	MS1_0154.D	04/13/2021	22:57

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-532364/14	MS1_0144.D
Level 2	STD010 280-532364/15	MS1_0145.D
Level 3	STD020 280-532364/16	MS1_0146.D
Level 4	STD050 280-532364/17	MS1_0147.D
Level 5	STD10 280-532364/18	MS1_0148.D
Level 6	ICIS 280-532364/19	MS1_0149.D
Level 7	STD75 280-532364/31	MS1_0150.D
Level 8	STD100 280-532364/20	MS1_0151.D
Level 9	STD200 280-532364/21	MS1_0152.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Dichlorodifluoromethane	+++++ 0.2373	0.1734 0.2151	0.1848 0.2250	0.2696 0.1963	0.2792	Lin1	0.0443	0.2124							0.9910		0.9900
Chloromethane	+++++ 0.1637	0.1771 0.1557	0.1812 0.1601	0.1959 0.1459	0.1971	Ave		0.1721			0.1000	10.9		15.0			
Vinyl chloride	+++++ 0.1638	0.1761 0.1550	0.1537 0.1586	0.1893 0.1424	0.1880	Ave		0.1658				10.2		30.0			
Bromomethane	+++++ 0.1384	0.1650 0.1296	0.1858 0.1312	0.1870 0.1230	0.1731	Lin1	0.1137	0.1279							0.9950		0.9900
Chloroethane	+++++ 0.1365	0.1471 0.1246	0.1473 0.1276	0.1518 0.1188	0.1586	Ave		0.1390				10.3		15.0			
Dichlorofluoromethane	0.5130 0.3132	0.3936 0.2939	0.3923 0.2993	0.3817 0.2773	0.3835	Lin1	0.1648	0.2904							0.9960		0.9900
Trichlorofluoromethane	0.3396 0.3032	0.2948 0.2844	0.2892 0.2921	0.3361 0.2624	0.3404	Ave		0.3047				9.1		15.0			
Ethyl ether	0.1519 0.1345	0.1193 0.1328	0.1438 0.1343	0.1317 0.1328	0.1384	Ave		0.1355				6.6		15.0			
Acrolein	+++++ 0.0270	+++++ 0.0266	0.0374 0.0266	0.0281 0.0271	0.0282	Lin	0.0205	0.0269							1.0000		0.9900
1,1-Dichloroethene	+++++ 0.1501	0.1819 0.1463	0.1805 0.1453	0.1567 0.1343	0.1681	Ave		0.1579				11.0		30.0			
1,1,2-Trichloro-1,2,2-trifluoroethane	+++++ 0.1041	0.0888 0.1064	0.1082 0.1018	0.1004 0.0940	0.1115	Ave		0.1019				7.3		15.0			
Acetone	0.0891 0.0489	0.0811 0.0477	0.0622 0.0452	0.0459 0.0487	0.0420	Lin1	0.0883	0.0473							0.9980		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Iodomethane	+++++ 0.2187	0.1080 0.2238	0.1419 0.2270	0.1491 0.2134	0.1984	Lin2	-0.118	0.2122							0.9900		0.9900
Carbon disulfide	+++++ 0.5033	0.5828 0.5055	0.6179 0.4980	0.4978 0.4542	0.5745	Ave		0.5292				10.5		15.0			
Methyl acetate	+++++ 0.1125	+++++ 0.1139	0.1268 0.1176	0.1109 0.1211	0.1064	Ave		0.1156				5.9		15.0			
3-Chloro-1-propene	+++++ 0.2388	0.3268 0.2310	0.3461 0.2184	0.2440 +++++	0.2729	Lin1	0.1600	0.2262							0.9970		0.9900
Methylene Chloride	0.3643 0.1817	0.2419 0.1771	0.2372 0.1784	0.1930 0.1715	0.2034	Lin2	0.0885	0.1787							0.9940		0.9900
t-Butyl alcohol	+++++ 0.0158	0.0130 0.0167	0.0121 0.0171	0.0145 0.0180	0.0133	Ave		0.0151				14.2		15.0			
Acrylonitrile	0.0697 0.0652	0.0677 0.0645	0.0611 0.0650	0.0659 0.0633	0.0655	Ave		0.0653				3.8		15.0			
Methyl tert-butyl ether	0.4446 0.4992	0.4538 0.4778	0.4712 0.5001	0.4815 0.4879	0.4841	Ave		0.4778				3.9		15.0			
trans-1,2-Dichloroethene	+++++ 0.1711	0.1770 0.1678	0.1923 0.1665	0.1705 0.1551	0.1826	Ave		0.1729				6.5		15.0			
Hexane	+++++ 1.0053	1.8586 1.0426	1.3483 1.0302	0.9253 0.9210	1.0070	Lin1	0.7536	0.9682							0.9960		0.9900
Vinyl acetate	0.2219 0.2635	0.2277 0.2566	0.2557 0.2472	0.2551 0.2425	0.2337	Ave		0.2449				5.9		15.0			
1,1-Dichloroethane	0.3531 0.3188	0.3599 0.3184	0.3528 0.3155	0.3162 0.2926	0.3492	Ave		0.3307			0.1000	7.1		15.0			
2-Butanone (MEK)	+++++ 0.0673	0.0796 0.0704	0.0591 0.0710	0.0633 0.0723	0.0607	Ave		0.0680				10.0		15.0			
cis-1,2-Dichloroethene	0.1944 0.1905	0.2432 0.1894	0.1906 0.1880	0.2043 0.1764	0.2073	Ave		0.1982				9.7		15.0			
2,2-Dichloropropane	0.3172 0.2691	0.3342 0.2633	0.2972 0.2611	0.2808 0.2389	0.3039	Ave		0.2851				10.7		15.0			
sec-Butyl Alcohol	+++++ 0.0117	0.0130 0.0121	0.0104 0.0126	0.0099 0.0128	0.0095	Ave		0.0115				12.0		15.0			
Bromochloromethane	+++++ 0.0878	0.0830 0.0833	0.1010 0.0861	0.0850 0.0823	0.0971	Ave		0.0882				7.9		15.0			
Tetrahydrofuran	+++++ 0.0473	+++++ 0.0468	0.0661 0.0468	0.0538 0.0477	0.0482	Ave		0.0510				13.9		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Chloroform	+++++ 0.3278	0.4074 0.3186	0.3731 0.3208	0.3222 0.3062	0.3629	Ave		0.3424				10.2		30.0			
1,1,1-Trichloroethane	+++++ 0.2883	0.3318 0.2860	0.3121 0.2817	0.2841 0.2647	0.3187	Ave		0.2959				7.6		15.0			
Cyclohexane	0.6482 0.2930	0.3873 0.2868	0.3704 0.2846	0.3095 0.2564	0.3262	Lin1	0.1864	0.2717							0.9960		0.9900
1,1-Dichloropropene	0.2357 0.2526	0.2480 0.2518	0.2697 0.2495	0.2413 0.2301	0.2691	Ave		0.2497				5.4		15.0			
Carbon tetrachloride	0.2351 0.2361	0.2351 0.2343	0.2443 0.2330	0.2248 0.2142	0.2513	Ave		0.2342				4.5		15.0			
Isobutyl alcohol	+++++ 0.0045	0.0043 0.0049	0.0045 0.0050	0.0041 0.0053	0.0037	Ave		0.0045				11.5		15.0			
Benzene	0.7946 0.7101	0.7588 0.7047	0.7580 0.7061	0.7107 0.6577	0.7517	Ave		0.7280				5.6		15.0			
1,2-Dichloroethane	0.3201 0.2493	0.2886 0.2517	0.2992 0.2513	0.2607 0.2471	0.2840	Ave		0.2725				9.7		15.0			
Trichloroethene	0.9575 0.9418	0.8922 0.9415	0.9536 0.9401	0.8930 0.8801	0.9699	Ave		0.9300				3.5		15.0			
2-Pentanone	+++++ 0.1055	0.0833 0.1097	0.0898 0.1138	0.0888 0.1154	0.0909	Ave		0.0996				12.8		15.0			
Methylcyclohexane	0.4168 0.2256	0.2395 0.2242	0.2685 0.2227	0.2210 0.2046	0.2355	Lin1	0.0862	0.2141							0.9980		0.9900
1,2-Dichloropropane	+++++ 0.1876	0.1991 0.1818	0.1980 0.1838	0.1834 0.1761	0.1968	Ave		0.1883				4.6		30.0			
1,4-Dioxane	+++++ 0.0020	+++++ 0.0021	0.0014 0.0023	0.0021 0.0023	0.0019	Lin2	-0.030	0.0022							0.9950		0.9900
Dibromomethane	0.1139 0.1184	0.1300 0.1134	0.1207 0.1179	0.1195 0.1183	0.1226	Ave		0.1194				4.1		15.0			
Bromodichloromethane	0.2657 0.2327	0.2858 0.2268	0.2488 0.2326	0.2376 0.2307	0.2469	Ave		0.2453				7.9		15.0			
2-Chloroethyl vinyl ether	+++++ 0.1100	0.0616 0.1071	0.0936 0.1091	0.1097 0.1104	0.1077	Lin2	-0.046	0.1119							0.9980		0.9900
cis-1,3-Dichloropropene	1.1863 1.4054	1.2940 1.3754	1.4535 1.3908	1.3239 1.3559	1.3962	Ave		1.3535				5.8		15.0			
4-Methyl-2-pentanone (MIBK)	0.1293 0.1318	0.1174 0.1335	0.1154 0.1361	0.1287 0.1363	0.1239	Ave		0.1280				6.0		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Toluene	0.8076 0.6954	0.7426 0.6917	0.6991 0.6971	0.6848 0.6589	0.7629	Ave		0.7156				6.5		30.0			
trans-1,3-Dichloropropene	0.2464 0.2670	0.2740 0.2651	0.2640 0.2676	0.2496 0.2686	0.2714	Ave		0.2637				3.6		15.0			
Ethyl methacrylate	1.5159 1.0053	1.2265 0.9998	1.1287 0.9973	1.0498 0.9981	1.0231	Lin2	0.2547	0.9960							1.0000		0.9900
1,1,2-Trichloroethane	0.1361 0.1441	0.1538 0.1418	0.1495 0.1446	0.1477 0.1446	0.1420	Ave		0.1449				3.5		15.0			
Tetrachloroethene	0.3765 0.5536	0.5136 0.5544	0.5256 0.5573	0.5181 0.5206	0.5723	Ave		0.5213				11.2		15.0			
1,3-Dichloropropane	1.2240 1.2879	1.0600 1.2680	1.1825 1.2904	1.2911 1.2743	1.2619	Ave		1.2378				6.1		15.0			
2-Hexanone	0.3641 0.4411	0.4003 0.4512	0.3590 0.4498	0.4423 0.4444	0.4171	Ave		0.4188				8.7		15.0			
Dibromochloromethane	0.6577 0.7630	0.6426 0.7419	0.7215 0.7659	0.7132 0.7742	0.7218	Ave		0.7224				6.4		15.0			
1,2-Dibromoethane (EDB)	0.6313 0.7500	0.6259 0.7418	0.6591 0.7618	0.6950 0.7576	0.7033	Ave		0.7029				7.7		15.0			
1-Chlorohexane	+++++ 1.0774	2.8039 1.0530	1.9025 1.0451	1.0863 0.9753	1.2259	Lin1	1.3718	1.0000							0.9980		0.9900
Chlorobenzene	2.1892 2.0970	2.1336 2.0748	2.1531 2.1131	2.0772 2.0199	2.1646	Ave		2.1136			0.3000	2.5		15.0			
1,1,1,2-Tetrachloroethane	0.3951 0.7460	0.6283 0.7365	0.6578 0.7555	0.6781 0.7431	0.6832	Lin2	-0.161	0.7381							0.9980		0.9900
Ethylbenzene	1.2430 1.1561	1.2583 1.1708	1.1816 1.1597	1.1133 1.0957	1.2468	Ave		1.1806				4.9		30.0			
m-Xylene & p-Xylene	1.4909 1.4299	1.5566 1.4339	1.5695 1.4339	1.4659 1.3461	1.5309	Ave		1.4731				4.9		15.0			
o-Xylene	1.3262 1.3858	1.4253 1.3799	1.4499 1.3845	1.4117 1.3131	1.4790	Ave		1.3950				3.9		15.0			
Styrene	+++++ 2.4652	2.4948 2.4337	2.5834 2.4374	2.3825 2.3294	2.6248	Ave		2.4689				4.0		15.0			
Bromoform	+++++ 0.4532	0.3835 0.4537	0.3532 0.4640	0.3789 0.4869	0.4251	Ave		0.4248			0.1000	11.2		15.0			
Isopropylbenzene	2.6561 2.3948	2.6015 2.4037	2.5398 2.3857	2.3150 2.2360	2.5297	Ave		2.4514				5.6		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Cyclohexanone	0.0314 0.0273	0.0246 0.0283	0.0289 0.0288	0.0291 0.0275	0.0276	Ave		0.0282				6.5		15.0			
1,1,2,2-Tetrachloroethane	+++++ 0.5764	0.5602 0.5779	0.6503 0.5843	0.5709 0.5904	0.5825	Ave		0.5866			0.3000	4.7		15.0			
Bromobenzene	+++++ 0.5334	0.4870 0.5282	0.5042 0.5377	0.4958 0.5275	0.5505	Ave		0.5205				4.3		15.0			
trans-1,4-Dichloro-2-butene	+++++ 0.1970	0.2045 0.1984	0.1989 0.1934	0.1956 0.1913	0.2069	Ave		0.1983				2.7		15.0			
1,2,3-Trichloropropane	+++++ 0.1794	0.1784 0.1832	0.1755 0.1835	0.1729 0.1889	0.1727	Ave		0.1793				3.1		15.0			
N-Propylbenzene	+++++ 0.6422	0.6027 0.6551	0.7120 0.6464	0.6070 0.6159	0.6753	Ave		0.6446				5.7		15.0			
2-Chlorotoluene	0.5846 0.5475	0.5516 0.5449	0.5600 0.5452	0.5133 0.5225	0.5713	Ave		0.5490				4.0		15.0			
1,3,5-Trimethylbenzene	2.3583 2.0793	2.4710 2.0943	2.2214 2.0793	2.0121 1.9582	2.1992	Ave		2.1637				7.7		15.0			
4-Chlorotoluene	0.5133 0.5718	0.5203 0.5788	0.5277 0.5697	0.5477 0.5475	0.5871	Ave		0.5515				4.9		15.0			
tert-Butylbenzene	1.5488 1.6698	1.6882 1.6948	1.7928 1.6705	1.5358 1.5903	1.7296	Ave		1.6578				5.1		15.0			
1,2,4-Trimethylbenzene	2.4528 2.1607	2.3211 2.1414	2.2531 2.1263	2.1505 2.0086	2.2277	Ave		2.2047				5.8		15.0			
sec-Butylbenzene	0.3756 0.4862	0.4771 0.4878	0.4893 0.4795	0.4607 0.4587	0.4901	Ave		0.4672				7.8		15.0			
1,3-Dichlorobenzene	1.0911 1.0486	1.0776 1.0599	1.1020 1.0480	1.0239 1.0232	1.0529	Ave		1.0586				2.6		15.0			
4-Isopropyltoluene	2.2147 2.1149	2.0908 2.1419	2.1475 2.1043	2.0199 1.9928	2.1706	Ave		2.1108				3.3		15.0			
1,4-Dichlorobenzene	1.0945 1.0637	1.0737 1.0768	1.1012 1.0715	1.0314 1.0530	1.0873	Ave		1.0726				2.0		15.0			
n-Butylbenzene	2.1418 2.0430	2.1785 2.0482	2.3939 2.0268	1.9162 1.9027	2.1777	Ave		2.0921				7.2		15.0			
1,2-Dichlorobenzene	0.8938 1.0021	1.0135 0.9981	0.9938 1.0085	0.9758 0.9851	1.0438	Ave		0.9905				4.1		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.1221	0.0715 0.1280	0.0759 0.1230	0.1175 0.1292	0.1135	Lin2	-0.061	0.1242							0.9940		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
1,2,4-Trichlorobenzene	0.5683 0.6223	0.5909 0.6192	0.6173 0.6175	0.5585 0.6190	0.6049	Ave		0.6020				4.0		15.0			
Hexachlorobutadiene	+++++ 0.2044	0.1649 0.2071	0.1995 0.2099	0.1832 0.2112	0.2079	Ave		0.1985				8.2		15.0			
Naphthalene	1.7539 1.9427	1.9352 1.9700	1.9284 1.9847	1.8717 1.9866	1.9962	Ave		1.9299				4.0		15.0			
1,2,3-Trichlorobenzene	0.5028 0.5580	0.5209 0.5628	0.5366 0.5669	0.5212 0.5681	0.5673	Ave		0.5450				4.6		15.0			
Dibromofluoromethane (Surr)	0.2693 0.2530	0.2706 0.2521	0.2667 0.2495	0.2639 0.2519	0.2634	Ave		0.2600				3.2		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3095 0.2973	0.3146 0.2946	0.3104 0.2953	0.3103 0.3035	0.3075	Ave		0.3048				2.4		15.0			
Toluene-d8 (Surr)	4.1567 4.3192	4.3183 4.3036	4.2407 4.3366	4.3308 4.3417	4.3087	Ave		4.2952				1.4		15.0			
4-Bromofluorobenzene (Surr)	1.1026 1.0783	1.1034 1.0937	1.0860 1.0749	1.1067 1.0870	1.0946	Ave		1.0919				1.0		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-532364/14	MS1_0144.D
Level 2	STD010 280-532364/15	MS1_0145.D
Level 3	STD020 280-532364/16	MS1_0146.D
Level 4	STD050 280-532364/17	MS1_0147.D
Level 5	STD10 280-532364/18	MS1_0148.D
Level 6	ICIS 280-532364/19	MS1_0149.D
Level 7	STD75 280-532364/31	MS1_0150.D
Level 8	STD100 280-532364/20	MS1_0151.D
Level 9	STD200 280-532364/21	MS1_0152.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Dichlorodifluoromethane	FB	Lin1	+++++ 237415	3229 334360	6906 460903	26334 846239	52593	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloromethane	FB	Ave	+++++ 163768	3298 242033	6770 328065	19128 629102	37124	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl chloride	FB	Ave	+++++ 163868	3279 240917	5742 324969	18485 613780	35410	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromomethane	FB	Lin1	+++++ 138469	3073 201510	6941 268788	18264 530226	32600	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloroethane	FB	Ave	+++++ 136586	2739 193762	5504 261500	14823 512404	29877	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dichlorofluoromethane	FB	Lin1	4886 313362	7328 456961	14658 613109	37273 1195800	72241	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichlorofluoromethane	FB	Ave	3235 303365	5489 442237	10807 598464	32819 1131463	64119	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl ether	FB	Ave	1447 134624	2222 206539	5372 275245	12859 572791	26071	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acrolein	FB	Lin	+++++ 267217	+++++ 408163	13809 538966	27053 1152940	52399	+++++ 494	+++++ 741	19.8 988	49.4 1975	98.8
1,1-Dichloroethene	FB	Ave	+++++ 150196	3386 227385	6744 297711	15302 578863	31666	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloro-1,2,2-trifluoroethane	FB	Ave	+++++ 104129	1654 165446	4043 208634	9802 405491	21010	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acetone	FB	Lin1	3396 195785	6041 296874	9294 370612	17938 840182	31637	2.00 200	4.00 300	8.00 400	20.0 800	40.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Iodomethane	FB	Lin2	+++++ 218804	2010 347928	5303 465065	14564 920123	37366	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon disulfide	FB	Ave	+++++ 503591	10851 785878	23091 1020366	48612 1958484	108208	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methyl acetate	FB	Ave	+++++ 225145	+++++ 354029	9474 482067	21661 1043921	40067	+++++ 100	+++++ 150	4.00 200	10.0 400	20.0
3-Chloro-1-propene	FB	Lin1	+++++ 238972	6085 359114	12931 447526	23832 +++++	51413	+++++ 50.0	1.00 75.0	2.00 100	5.00 +++++	10.0
Methylene Chloride	FB	Lin2	3470 181842	4504 275347	8863 365561	18849 739586	38314	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
t-Butyl alcohol	FB	Ave	+++++ 157648	2429 260347	4516 350183	14174 774095	25102	+++++ 500	10.0 750	20.0 1000	50.0 2000	100
Acrylonitrile	FB	Ave	6642 652669	12609 1003437	22820 1332152	64328 2730960	123336	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Methyl tert-butyl ether	FB	Ave	4235 499509	8449 742857	17607 1024679	47026 2103890	91183	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,2-Dichloroethene	FB	Ave	+++++ 171226	3296 260944	7185 341097	16656 668919	34402	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexane	CBNZ d5	Lin1	+++++ 205297	7245 333056	10602 434460	18749 825210	39971	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl acetate	FB	Ave	4227 527301	8480 797959	19107 1012996	49822 2091413	88034	1.00 100	2.00 150	4.00 200	10.0 400	20.0
1,1-Dichloroethane	FB	Ave	3363 319004	6702 494984	13183 646463	30878 1261819	65775	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Butanone (MEK)	FB	Ave	+++++ 269177	5931 437984	8835 582029	24733 1247601	45736	+++++ 200	4.00 300	8.00 400	20.0 800	40.0
cis-1,2-Dichloroethene	FB	Ave	1852 190639	4528 294389	7122 385071	19950 760561	39050	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2,2-Dichloropropane	FB	Ave	3021 269251	6223 409284	11105 534947	27419 1030259	57251	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butyl Alcohol	FB	Ave	+++++ 281030	5812 450687	9319 620309	23283 1327689	43020	+++++ 1200	24.0 1800	48.0 2400	120 4800	240
Bromochloromethane	FB	Ave	+++++ 87832	1545 129573	3774 176345	8303 355017	18284	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrahydrofuran	FB	Ave	+++++	+++++	4942	10502	18172	+++++	+++++	4.00	10.0	20.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			94743	145629	191816	411388		100	150	200	400	
Chloroform	FB	Ave	+++++ 328048	7585 495263	13940 657239	31466 1320058	68357	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1-Trichloroethane	FB	Ave	+++++ 288473	6178 444673	11664 577242	27742 1141332	60041	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexane	FB	Lin1	6174 293198	7212 445878	13840 583076	30226 1105588	61442	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1-Dichloropropene	FB	Ave	2245 252727	4617 391444	10077 511241	23566 992124	50685	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon tetrachloride	FB	Ave	2239 236272	4378 364260	9130 477330	21951 923587	47340	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isobutyl alcohol	FB	Ave	+++++ 111929	1983 189688	4163 258350	10085 568005	17298	+++++ 1250	25.0 1875	50.0 2500	125 5000	250
Benzene	FB	Ave	7568 710501	14128 1095642	28326 1446634	69408 2835877	141599	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloroethane	FB	Ave	3049 249416	5374 391364	11179 514932	25462 1065489	53500	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichloroethene	CBNZ d5	Ave	1958 192326	3478 300745	7498 396469	18096 788542	38496	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Pentanone	FB	Ave	+++++ 337782	4961 545563	10732 746381	27745 1592677	54789	+++++ 160	3.20 240	6.40 320	16.0 640	32.0
Methylcyclohexane	FB	Lin1	3970 225711	4459 348599	10034 456172	21582 882091	44367	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloropropane	FB	Ave	+++++ 187766	3707 282637	7398 376583	17908 759414	37076	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dioxane	FB	Lin2	+++++ 40818	+++++ 66580	1042 93301	4181 197583	7214	+++++ 1000	+++++ 1500	40.0 2000	100 4000	200
Dibromomethane	FB	Ave	1085 118493	2421 176346	4512 241512	11666 510076	23089	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromodichloromethane	FB	Ave	2531 232817	5322 352572	9296 476485	23200 994769	46511	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Chloroethyl vinyl ether	FB	Lin2	+++++ 110063	1147 166548	3496 223471	10716 475960	20295	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	2426	5044	11429	26826	55417	0.500	1.00	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			287001	439369	586551	1214890		50.0	75.0	100	200	
4-Methyl-2-pentanone (MIBK)	FB	Ave	4925 527397	8745 830175	17244 1115661	50258 2351578	93348	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Toluene	FB	Ave	7692 695793	13826 1075358	26122 1428290	66879 2841182	143701	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,3-Dichloropropene	FB	Ave	2347 267188	5101 412095	9865 548337	24377 1158242	51114	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl methacrylate	CBNZ d5	Lin2	3100 205303	4781 319380	8875 420614	21272 894268	40609	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloroethane	FB	Ave	1296 144204	2863 220482	5586 296291	14423 623525	26746	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrachloroethene	CBNZ d5	Ave	770 113044	2002 177104	4133 235052	10498 466486	22717	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichloropropane	CBNZ d5	Ave	2503 262994	4132 405040	9298 544206	26162 1141773	50088	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Hexanone	CBNZ d5	Ave	2978 360345	6242 576589	11291 758775	35848 1592730	66223	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Dibromochloromethane	CBNZ d5	Ave	1345 155812	2505 236992	5673 323010	14451 693630	28649	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	1291 153166	2440 236959	5183 321268	14083 678839	27914	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1-Chlorohexane	CBNZ d5	Lin1	+++++ 176015	8744 269104	11968 352602	17610 699110	38926	+++++ 40.0	0.800 60.0	1.60 80.0	4.00 160	8.00
Chlorobenzene	CBNZ d5	Ave	4477 428226	8317 662763	16930 891192	42090 1809785	85916	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Lin2	808 152340	2449 235254	5172 318611	13740 665785	27116	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Ethylbenzene	CBNZ d5	Ave	2542 236095	4905 374009	9291 489109	22559 981736	49486	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	3049 292001	6068 458051	12341 604730	29703 1206132	60762	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
o-Xylene	CBNZ d5	Ave	2712 282996	5556 440788	11401 583909	28605 1176560	58702	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Styrene	CBNZ d5	Ave	+++++ 503416	9725 777421	20314 1027954	48278 2087135	104181	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromoform	CBNZ d5	Ave	+++++ 92558	1495 144921	2777 195689	7677 436273	16874	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isopropylbenzene	DCBd 4	Ave	8600 760057	16346 1176968	31571 1560059	74292 3088120	157477	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexanone	CBNZ d5	Ave	2570 223358	3836 361690	9081 485284	23623 985925	43888	20.0 2000	40.0 3000	80.0 4000	200 8000	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	+++++ 182952	3520 282950	8083 382077	18320 815368	36262	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromobenzene	DCBd 4	Ave	+++++ 169290	3060 258631	6267 351609	15912 728493	34268	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	+++++ 62519	1285 97169	2473 126488	6277 264166	12878	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	+++++ 56941	1121 89720	2182 119974	5548 260821	10753	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
N-Propylbenzene	DCBd 4	Ave	+++++ 203829	3787 320773	8851 422715	19480 850608	42036	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
2-Chlorotoluene	DCBd 4	Ave	1893 173754	3466 266797	6961 356509	16471 721651	35565	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	7636 659943	15526 1025464	27613 1359719	64570 2704401	136902	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Chlorotoluene	DCBd 4	Ave	1662 181482	3269 283394	6560 372529	17577 756095	36549	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
tert-Butylbenzene	DCBd 4	Ave	5015 529955	10607 829839	22285 1092371	49286 2196349	107667	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	7942 685755	14584 1048526	28008 1390480	69011 2774073	138679	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butylbenzene	DCBd 4	Ave	1216 154319	2998 238830	6082 313541	14785 633548	30507	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	3533 332796	6771 518980	13698 685306	32857 1413169	65542	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Isopropyltoluene	DCBd 4	Ave	7171 671223	13137 1048770	26695 1376084	64820 2752286	135124	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	3544 337597	6746 527240	13689 700709	33097 1454218	67683	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
n-Butylbenzene	DCBd 4	Ave	6935 648415	13688 1002909	29758 1325409	61494 2627750	135565	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	2894 318039	6368 488714	12353 659490	31313 1360540	64978	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Lin2	+++++ 38746	449 62696	944 80429	3772 178447	7068	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 532364

SDG No.:

Instrument ID: VMS_MS1 GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/13/2021 19:16 Calibration End Date: 04/13/2021 22:12 Calibration ID: 52339

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
1,2,4-Trichlorobenzene	DCBd 4	Ave	1840 197510	3713 303178	7673 403794	17923 854934	37656	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexachlorobutadiene	DCBd 4	Ave	+++++ 64883	1036 101403	2480 137277	5879 291741	12942	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Naphthalene	DCBd 4	Ave	5679 616577	12159 964627	23971 1297850	60064 2743627	124268	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	1628 177104	3273 275571	6670 370723	16725 784659	35314	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dibromofluoromethane (Surr)	FB	Ave	256539 253177	251959 261291	249111 255596	257707 271499	248033	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	294797 297451	292850 305387	289960 302488	303072 327125	289637	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
Toluene-d8 (Surr)	CBNZ d5	Ave	850057 882033	841672 916486	833635 914448	877563 972537	855082	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	356995 342224	346642 357030	337488 351466	355158 375324	340705	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0

Curve Type Legend
Ave = Average ISTD
Lin = Linear ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-532364/22 Calibration Date: 04/13/2021 22:57

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_0154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.1713		40.1	50.0	-19.7	20.0
Chloromethane	Ave	0.1721	0.1529	0.1000	44.4	50.0	-11.1	20.0
Vinyl chloride	Ave	0.1658	0.1574		47.5	50.0	-5.1	20.0
Bromomethane	Lin1		0.1479		56.9	50.0	13.9	20.0
Chloroethane	Ave	0.1390	0.1307		47.0	50.0	-6.0	20.0
Dichlorofluoromethane	Lin1		0.3239		55.2	50.0	10.4	20.0
Trichlorofluoromethane	Ave	0.3047	0.2823		46.3	50.0	-7.4	20.0
Ethyl ether	Ave	0.1355	0.1329		49.0	50.0	-1.9	20.0
Acrolein	Lin		0.0141		257	494	-47.9*	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.0980		48.1	50.0	-3.8	20.0
1,1-Dichloroethene	Ave	0.1579	0.1395		44.2	50.0	-11.6	20.0
Acetone	Lin1		0.0461		193	200	-3.5	20.0
Iodomethane	Lin2		0.1903		45.4	50.0	-9.2	20.0
Carbon disulfide	Ave	0.5292	0.4797		45.3	50.0	-9.4	20.0
Methyl acetate	Ave	0.1156	0.1192		103	100	3.2	20.0
3-Chloro-1-propene	Lin1		0.2265		49.4	50.0	-1.3	20.0
Methylene Chloride	Lin2		0.1747		48.4	50.0	-3.2	20.0
t-Butyl alcohol	Ave	0.0151	0.0158		524	500	4.9	20.0
Acrylonitrile	Ave	0.0653	0.0643		492	500	-1.6	20.0
Methyl tert-butyl ether	Ave	0.4778	0.4693		49.1	50.0	-1.8	20.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1562		45.2	50.0	-9.7	20.0
Hexane	Lin1		0.9148		46.5	50.0	-7.1	20.0
Vinyl acetate	Ave	0.2449	0.1891		77.2	100	-22.8*	20.0
1,1-Dichloroethane	Ave	0.3307	0.2981	0.1000	45.1	50.0	-9.9	20.0
2-Butanone (MEK)	Ave	0.0680	0.0671		197	200	-1.3	20.0
2,2-Dichloropropane	Ave	0.2851	0.2343		41.1	50.0	-17.8	20.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1792		45.2	50.0	-9.6	20.0
sec-Butyl Alcohol	Ave	0.0115	0.0114		1190	1200	-1.2	20.0
Bromochloromethane	Ave	0.0882	0.0791		44.9	50.0	-10.3	20.0
Tetrahydrofuran	Ave	0.0510	0.0470		92.2	100	-7.8	20.0
Chloroform	Ave	0.3424	0.2989		43.7	50.0	-12.7	20.0
1,1,1-Trichloroethane	Ave	0.2959	0.2612		44.1	50.0	-11.7	20.0
Cyclohexane	Lin1		0.2660		48.3	50.0	-3.5	20.0
1,1-Dichloropropene	Ave	0.2497	0.2277		45.6	50.0	-8.8	20.0
Carbon tetrachloride	Ave	0.2342	0.2131		45.5	50.0	-9.0	20.0
Isobutyl alcohol	Ave	0.0045	0.0047		1290	1250	3.2	20.0
Benzene	Ave	0.7280	0.6620		45.5	50.0	-9.1	20.0
1,2-Dichloroethane	Ave	0.2725	0.2453		45.0	50.0	-10.0	20.0
Trichloroethene	Ave	0.9300	0.8866		47.7	50.0	-4.7	20.0
2-Pentanone	Ave	0.0996	0.1041		167	160	4.5	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-532364/22 Calibration Date: 04/13/2021 22:57

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_0154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Lin1		0.1975		45.7	50.0	-8.5	20.0
1,2-Dichloropropane	Ave	0.1883	0.1729		45.9	50.0	-8.2	20.0
1,4-Dioxane	Lin2		0.0021		950	1000	-5.0	20.0
Dibromomethane	Ave	0.1194	0.1145		48.0	50.0	-4.1	20.0
Bromodichloromethane	Ave	0.2453	0.2181		44.5	50.0	-11.1	20.0
2-Chloroethyl vinyl ether	Lin2		0.1089		49.1	50.0	-1.8	20.0
cis-1,3-Dichloropropene	Ave	1.353	1.292		47.7	50.0	-4.5	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1282		200	200	0.1	20.0
Toluene	Ave	0.7156	0.6358		44.4	50.0	-11.1	20.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2494		47.3	50.0	-5.5	20.0
Ethyl methacrylate	Lin2		0.9617		48.0	50.0	-4.0	20.0
1,1,2-Trichloroethane	Ave	0.1449	0.1395		48.1	50.0	-3.7	20.0
Tetrachloroethene	Ave	0.5213	0.4974		47.7	50.0	-4.6	20.0
1,3-Dichloropropane	Ave	1.238	1.217		49.2	50.0	-1.6	20.0
2-Hexanone	Ave	0.4188	0.4372		209	200	4.4	20.0
Dibromochloromethane	Ave	0.7224	0.7103		49.2	50.0	-1.7	20.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7095		50.5	50.0	0.9	20.0
1-Chlorohexane	Lin1		0.9939		38.4	40.0	-4.0	20.0
Chlorobenzene	Ave	2.114	1.958	0.3000	46.3	50.0	-7.4	20.0
1,1,1,2-Tetrachloroethane	Lin2		0.6881		46.8	50.0	-6.3	20.0
Ethylbenzene	Ave	1.181	1.056		44.7	50.0	-10.5	20.0
m-Xylene & p-Xylene	Ave	1.473	1.341		45.5	50.0	-8.9	20.0
o-Xylene	Ave	1.395	1.308		46.9	50.0	-6.2	20.0
Styrene	Ave	2.469	2.309		46.8	50.0	-6.5	20.0
Bromoform	Ave	0.4248	0.4299	0.1000	50.6	50.0	1.2	20.0
Isopropylbenzene	Ave	2.451	2.182		44.5	50.0	-11.0	20.0
Cyclohexanone	Ave	0.0282	0.0276		1960	2000	-2.2	20.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5607	0.3000	47.8	50.0	-4.4	20.0
Bromobenzene	Ave	0.5205	0.5024		48.3	50.0	-3.5	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1969		49.7	50.0	-0.7	20.0
1,2,3-Trichloropropane	Ave	0.1793	0.1795		50.1	50.0	0.1	20.0
N-Propylbenzene	Ave	0.6446	0.5955		46.2	50.0	-7.6	20.0
2-Chlorotoluene	Ave	0.5490	0.5021		45.7	50.0	-8.5	20.0
1,3,5-Trimethylbenzene	Ave	2.164	1.939		44.8	50.0	-10.4	20.0
4-Chlorotoluene	Ave	0.5515	0.5302		48.1	50.0	-3.9	20.0
tert-Butylbenzene	Ave	1.658	1.563		47.1	50.0	-5.7	20.0
1,2,4-Trimethylbenzene	Ave	2.205	2.031		46.1	50.0	-7.9	20.0
sec-Butylbenzene	Ave	0.4672	0.4480		47.9	50.0	-4.1	20.0
1,3-Dichlorobenzene	Ave	1.059	0.9896		46.7	50.0	-6.5	20.0
4-Isopropyltoluene	Ave	2.111	1.953		46.3	50.0	-7.5	20.0
1,4-Dichlorobenzene	Ave	1.073	1.001		46.7	50.0	-6.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-532364/22 Calibration Date: 04/13/2021 22:57

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_0154.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.092	1.856		44.4	50.0	-11.3	20.0
1,2-Dichlorobenzene	Ave	0.9905	0.9617		48.5	50.0	-2.9	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1153		46.9	50.0	-6.1	20.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.5817		48.3	50.0	-3.4	20.0
Hexachlorobutadiene	Ave	0.1985	0.1917		48.3	50.0	-3.5	20.0
Naphthalene	Ave	1.930	1.941		50.3	50.0	0.6	20.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5380		49.4	50.0	-1.3	20.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2512		48.3	50.0	-3.4	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.3073		50.4	50.0	0.8	20.0
Toluene-d8 (Surr)	Ave	4.295	4.269		49.7	50.0	-0.6	20.0
4-Bromofluorobenzene (Surr)	Ave	1.092	1.104		50.6	50.0	1.1	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: MS1_1643.D BFB Injection Date: 05/11/2021

Instrument ID: VMS_MS1 BFB Injection Time: 07:33

Analysis Batch No.: 535660

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.1	
75	30.0 - 60.0 % of mass 95	55.8	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.7	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.8	
175	5.0 - 9.0 % of mass 174	5.2	(7.6) 1
176	95.0 - 101.0 % of mass 174	66.2	(96.2) 1
177	5.0 - 9.0 % of mass 176	4.4	(6.7) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535660/2	MS1_1644.D	05/11/2021	8:02
	LCS 280-535660/4	MS1_1646.D	05/11/2021	8:47
	LCSD 280-535660/5	MS1_1647.D	05/11/2021	9:08
	MB 280-535660/9	MS1_1649.D	05/11/2021	9:51
05MW25-20210429	280-148061-1	MS1_1669.D	05/11/2021	16:53
05MW20-20210429	280-148061-2	MS1_1670.D	05/11/2021	17:14
05TW02-20210429	280-148061-3	MS1_1671.D	05/11/2021	17:36
05TW03-20210429	280-148061-4	MS1_1672.D	05/11/2021	17:57
	CCVC 280-535660/35	MS1_1673.D	05/11/2021	18:18

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535660/2 Calibration Date: 05/11/2021 08:02

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1644.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.2357		55.3	50.0	10.6	20.0
Chloromethane	Ave	0.1721	0.1623	0.1000	47.2	50.0	-5.7	20.0
Vinyl chloride	Ave	0.1658	0.1743		52.5	50.0	5.1	20.0
Bromomethane	Lin1		0.1273		48.9	50.0	-2.2	20.0
Chloroethane	Ave	0.1390	0.1161		41.8	50.0	-16.5	20.0
Dichlorofluoromethane	Lin1		0.3023		51.5	50.0	2.9	20.0
Trichlorofluoromethane	Ave	0.3047	0.3197		52.5	50.0	4.9	20.0
Ethyl ether	Ave	0.1355	0.1203		44.4	50.0	-11.2	20.0
Acrolein	Lin		0.0274		502	494	1.7	20.0
1,1-Dichloroethene	Ave	0.1579	0.1349		42.7	50.0	-14.6	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.0991		48.6	50.0	-2.8	20.0
Acetone	Lin1		0.0424		177	200	-11.3	20.0
Iodomethane	Lin2		0.1706		40.8	50.0	-18.5	20.0
Carbon disulfide	Ave	0.5292	0.4216		39.8	50.0	-20.3*	20.0
Methyl acetate	Ave	0.1156	0.0952		82.3	100	-17.7	20.0
3-Chloro-1-propene	Lin1		0.1940		42.2	50.0	-15.6	20.0
Methylene Chloride	Lin2		0.1725		47.8	50.0	-4.4	20.0
t-Butyl alcohol	Ave	0.0151	0.0131		434	500	-13.3	20.0
Acrylonitrile	Ave	0.0653	0.0567		434	500	-13.2	20.0
Methyl tert-butyl ether	Ave	0.4778	0.4776		50.0	50.0	-0.0	20.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1559		45.1	50.0	-9.8	20.0
Hexane	Lin1		0.7787		39.4	50.0	-21.1*	20.0
1,1-Dichloroethane	Ave	0.3307	0.2751	0.1000	41.6	50.0	-16.8	20.0
Vinyl acetate	Ave	0.2449	0.2927		120	100	19.5	20.0
2-Butanone (MEK)	Ave	0.0680	0.0619		182	200	-9.0	20.0
2,2-Dichloropropane	Ave	0.2851	0.2516		44.1	50.0	-11.7	20.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1775		44.8	50.0	-10.4	20.0
sec-Butyl Alcohol	Ave	0.0115	0.0086		894	1200	-25.5*	20.0
Bromochloromethane	Ave	0.0882	0.0856		48.5	50.0	-3.0	20.0
Tetrahydrofuran	Ave	0.0510	0.0417		81.8	100	-18.2	20.0
Chloroform	Ave	0.3424	0.3136		45.8	50.0	-8.4	20.0
1,1,1-Trichloroethane	Ave	0.2959	0.2714		45.9	50.0	-8.3	20.0
Cyclohexane	Lin1		0.2188		39.6	50.0	-20.8*	20.0
1,1-Dichloropropene	Ave	0.2497	0.2200		44.0	50.0	-11.9	20.0
Carbon tetrachloride	Ave	0.2342	0.2077		44.3	50.0	-11.3	20.0
Isobutyl alcohol	Ave	0.0045	0.0041		1120	1250	-10.3	20.0
Benzene	Ave	0.7280	0.6290		43.2	50.0	-13.6	20.0
1,2-Dichloroethane	Ave	0.2725	0.2661		48.8	50.0	-2.3	20.0
Trichloroethene	Ave	0.9300	0.8114		43.6	50.0	-12.8	20.0
2-Pentanone	Ave	0.0996	0.1002		161	160	0.5	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535660/2 Calibration Date: 05/11/2021 08:02

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1644.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Lin1		0.1759		40.7	50.0	-18.6	20.0
1,2-Dichloropropane	Ave	0.1883	0.1542		40.9	50.0	-18.1	20.0
1,4-Dioxane	Lin2		0.0021		979	1000	-2.1	20.0
Dibromomethane	Ave	0.1194	0.1253		52.5	50.0	4.9	20.0
Bromodichloromethane	Ave	0.2453	0.2234		45.5	50.0	-8.9	20.0
2-Chloroethyl vinyl ether	Lin2		0.1008		45.4	50.0	-9.1	20.0
cis-1,3-Dichloropropene	Ave	1.353	1.178		43.5	50.0	-13.0	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1211		189	200	-5.4	20.0
Toluene	Ave	0.7156	0.6510		45.5	50.0	-9.0	20.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2331		44.2	50.0	-11.6	20.0
Ethyl methacrylate	Lin2		0.8645		43.1	50.0	-13.7	20.0
1,1,2-Trichloroethane	Ave	0.1449	0.1408		48.6	50.0	-2.9	20.0
Tetrachloroethene	Ave	0.5213	0.5308		50.9	50.0	1.8	20.0
1,3-Dichloropropane	Ave	1.238	1.183		47.8	50.0	-4.4	20.0
2-Hexanone	Ave	0.4188	0.3906		187	200	-6.7	20.0
Dibromochloromethane	Ave	0.7224	0.6861		47.5	50.0	-5.0	20.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7375		52.5	50.0	4.9	20.0
1-Chlorohexane	Lin1		0.9143		35.2	40.0	-12.0	20.0
Chlorobenzene	Ave	2.114	1.968	0.3000	46.6	50.0	-6.9	20.0
1,1,1,2-Tetrachloroethane	Lin2		0.6751		46.0	50.0	-8.1	20.0
Ethylbenzene	Ave	1.181	1.054		44.6	50.0	-10.7	20.0
m-Xylene & p-Xylene	Ave	1.473	1.342		45.5	50.0	-8.9	20.0
o-Xylene	Ave	1.395	1.302		46.7	50.0	-6.6	20.0
Styrene	Ave	2.469	2.300		46.6	50.0	-6.8	20.0
Bromoform	Ave	0.4248	0.3644	0.1000	42.9	50.0	-14.2	20.0
Isopropylbenzene	Ave	2.451	2.100		42.8	50.0	-14.3	20.0
Cyclohexanone	Ave	0.0282	0.0334		1780	1500	18.4	20.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5489	0.3000	46.8	50.0	-6.4	20.0
Bromobenzene	Ave	0.5205	0.4974		47.8	50.0	-4.4	20.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1570		39.6	50.0	-20.8*	20.0
1,2,3-Trichloropropane	Ave	0.1793	0.1789		49.9	50.0	-0.2	20.0
N-Propylbenzene	Ave	0.6446	0.5684		44.1	50.0	-11.8	20.0
2-Chlorotoluene	Ave	0.5490	0.4960		45.2	50.0	-9.7	20.0
1,3,5-Trimethylbenzene	Ave	2.164	1.844		42.6	50.0	-14.8	20.0
4-Chlorotoluene	Ave	0.5515	0.5296		48.0	50.0	-4.0	20.0
tert-Butylbenzene	Ave	1.658	1.497		45.1	50.0	-9.7	20.0
1,2,4-Trimethylbenzene	Ave	2.205	1.922		43.6	50.0	-12.8	20.0
sec-Butylbenzene	Ave	0.4672	0.4123		44.1	50.0	-11.8	20.0
1,3-Dichlorobenzene	Ave	1.059	0.9854		46.5	50.0	-6.9	20.0
4-Isopropyltoluene	Ave	2.111	1.845		43.7	50.0	-12.6	20.0
1,4-Dichlorobenzene	Ave	1.073	1.007		47.0	50.0	-6.1	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535660/2 Calibration Date: 05/11/2021 08:02

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1644.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.092	1.699		40.6	50.0	-18.8	20.0
1,2-Dichlorobenzene	Ave	0.9905	0.9474		47.8	50.0	-4.3	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1052		42.8	50.0	-14.3	20.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.5824		48.4	50.0	-3.3	20.0
Hexachlorobutadiene	Ave	0.1985	0.1970		49.6	50.0	-0.8	20.0
Naphthalene	Ave	1.930	1.794		46.5	50.0	-7.0	20.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5392		49.5	50.0	-1.1	20.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2703		52.0	50.0	4.0	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.3310		54.3	50.0	8.6	20.0
Toluene-d8 (Surr)	Ave	4.295	4.152		48.3	50.0	-3.3	20.0
4-Bromofluorobenzene (Surr)	Ave	1.092	1.040		47.6	50.0	-4.8	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535660/35 Calibration Date: 05/11/2021 18:18

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1673.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin1		0.1991		46.7	50.0	-6.6	50.0
Chloromethane	Ave	0.1721	0.1556	0.1000	45.2	50.0	-9.6	50.0
Vinyl chloride	Ave	0.1658	0.1644		49.6	50.0	-0.9	50.0
Bromomethane	Lin1		0.1139		43.6	50.0	-12.7	50.0
Chloroethane	Ave	0.1390	0.1129		40.6	50.0	-18.8	50.0
Dichlorofluoromethane	Lin1		0.2924		49.8	50.0	-0.4	50.0
Trichlorofluoromethane	Ave	0.3047	0.3120		51.2	50.0	2.4	50.0
Ethyl ether	Ave	0.1355	0.1133		41.8	50.0	-16.4	50.0
Acrolein	Lin		0.0241		441	494	-10.7	50.0
1,1-Dichloroethene	Ave	0.1579	0.1334		42.2	50.0	-15.5	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	0.1019	0.0979		48.0	50.0	-4.0	50.0
Acetone	Lin1		0.0377		157	200	-21.3	50.0
Iodomethane	Lin2		0.1625		38.8	50.0	-22.3	50.0
Carbon disulfide	Ave	0.5292	0.4240		40.1	50.0	-19.9	50.0
Methyl acetate	Ave	0.1156	0.0916		79.3	100	-20.7	50.0
3-Chloro-1-propene	Lin1		0.1793		38.9	50.0	-22.1	50.0
Methylene Chloride	Lin2		0.1647		45.6	50.0	-8.8	50.0
t-Butyl alcohol	Ave	0.0151	0.0111		369	500	-26.1	50.0
Acrylonitrile	Ave	0.0653	0.0534		409	500	-18.2	50.0
Methyl tert-butyl ether	Ave	0.4778	0.4424		46.3	50.0	-7.4	50.0
trans-1,2-Dichloroethene	Ave	0.1729	0.1561		45.2	50.0	-9.7	50.0
Hexane	Lin1		0.7740		39.2	50.0	-21.6	50.0
1,1-Dichloroethane	Ave	0.3307	0.2747	0.1000	41.5	50.0	-17.0	50.0
Vinyl acetate	Ave	0.2449	0.2284		93.3	100	-6.7	50.0
2-Butanone (MEK)	Ave	0.0680	0.0578		170	200	-14.9	50.0
cis-1,2-Dichloroethene	Ave	0.1982	0.1811		45.7	50.0	-8.7	50.0
2,2-Dichloropropane	Ave	0.2851	0.2156		37.8	50.0	-24.4	50.0
sec-Butyl Alcohol	Ave	0.0115	0.0071		741	1200	-38.2	50.0
Bromochloromethane	Ave	0.0882	0.0864		49.0	50.0	-2.1	50.0
Tetrahydrofuran	Ave	0.0510	0.0392		76.9	100	-23.1	50.0
Chloroform	Ave	0.3424	0.3066		44.8	50.0	-10.4	50.0
1,1,1-Trichloroethane	Ave	0.2959	0.2641		44.6	50.0	-10.7	50.0
Cyclohexane	Lin1		0.2314		41.9	50.0	-16.2	50.0
1,1-Dichloropropene	Ave	0.2497	0.2244		44.9	50.0	-10.2	50.0
Carbon tetrachloride	Ave	0.2342	0.1959		41.8	50.0	-16.4	50.0
Isobutyl alcohol	Ave	0.0045	0.0032		894	1250	-28.5	50.0
Benzene	Ave	0.7280	0.6431		44.2	50.0	-11.7	50.0
1,2-Dichloroethane	Ave	0.2725	0.2566		47.1	50.0	-5.8	50.0
Trichloroethene	Ave	0.9300	0.8438		45.4	50.0	-9.3	50.0
2-Pentanone	Ave	0.0996	0.0942		151	160	-5.5	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535660/35 Calibration Date: 05/11/2021 18:18

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1673.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Methylcyclohexane	Lin1		0.1776		41.1	50.0	-17.8	50.0
1,2-Dichloropropane	Ave	0.1883	0.1537		40.8	50.0	-18.4	50.0
1,4-Dioxane	Lin2		0.0022		998	1000	-0.2	50.0
Dibromomethane	Ave	0.1194	0.1183		49.5	50.0	-1.0	50.0
Bromodichloromethane	Ave	0.2453	0.2062		42.0	50.0	-15.9	50.0
2-Chloroethyl vinyl ether	Lin2		0.0919		41.5	50.0	-17.1	50.0
cis-1,3-Dichloropropene	Ave	1.353	1.095		40.5	50.0	-19.1	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.1280	0.1138		178	200	-11.1	50.0
Toluene	Ave	0.7156	0.6431		44.9	50.0	-10.1	50.0
trans-1,3-Dichloropropene	Ave	0.2637	0.2121		40.2	50.0	-19.6	50.0
Ethyl methacrylate	Lin2		0.8010		40.0	50.0	-20.1	50.0
1,1,2-Trichloroethane	Ave	0.1449	0.1399		48.3	50.0	-3.4	50.0
Tetrachloroethene	Ave	0.5213	0.5374		51.5	50.0	3.1	50.0
1,3-Dichloropropane	Ave	1.238	1.132		45.7	50.0	-8.6	50.0
2-Hexanone	Ave	0.4188	0.3683		176	200	-12.1	50.0
Dibromochloromethane	Ave	0.7224	0.6296		43.6	50.0	-12.8	50.0
1,2-Dibromoethane (EDB)	Ave	0.7029	0.7004		49.8	50.0	-0.4	50.0
1-Chlorohexane	Lin1		0.9344		36.0	40.0	-10.0	50.0
Chlorobenzene	Ave	2.114	1.989	0.3000	47.0	50.0	-5.9	50.0
1,1,1,2-Tetrachloroethane	Lin2		0.6335		43.1	50.0	-13.7	50.0
Ethylbenzene	Ave	1.181	1.070		45.3	50.0	-9.3	50.0
m-Xylene & p-Xylene	Ave	1.473	1.330		45.1	50.0	-9.7	50.0
o-Xylene	Ave	1.395	1.315		47.1	50.0	-5.8	50.0
Styrene	Ave	2.469	2.253		45.6	50.0	-8.8	50.0
Bromoform	Ave	0.4248	0.3183	0.1000	37.5	50.0	-25.1	50.0
Isopropylbenzene	Ave	2.451	2.161		44.1	50.0	-11.9	50.0
Cyclohexanone	Ave	0.0282	0.0275		1460	1500	-2.5	50.0
1,1,2,2-Tetrachloroethane	Ave	0.5866	0.5269	0.3000	44.9	50.0	-10.2	50.0
Bromobenzene	Ave	0.5205	0.5141		49.4	50.0	-1.2	50.0
trans-1,4-Dichloro-2-butene	Ave	0.1983	0.1350		34.0	50.0	-31.9	50.0
1,2,3-Trichloropropane	Ave	0.1793	0.1724		48.1	50.0	-3.9	50.0
N-Propylbenzene	Ave	0.6446	0.5848		45.4	50.0	-9.3	50.0
2-Chlorotoluene	Ave	0.5490	0.4910		44.7	50.0	-10.6	50.0
1,3,5-Trimethylbenzene	Ave	2.164	1.877		43.4	50.0	-13.3	50.0
4-Chlorotoluene	Ave	0.5515	0.5353		48.5	50.0	-2.9	50.0
tert-Butylbenzene	Ave	1.658	1.532		46.2	50.0	-7.6	50.0
1,2,4-Trimethylbenzene	Ave	2.205	1.943		44.1	50.0	-11.9	50.0
sec-Butylbenzene	Ave	0.4672	0.4311		46.1	50.0	-7.7	50.0
1,3-Dichlorobenzene	Ave	1.059	0.9895		46.7	50.0	-6.5	50.0
4-Isopropyltoluene	Ave	2.111	1.881		44.6	50.0	-10.9	50.0
1,4-Dichlorobenzene	Ave	1.073	0.999		46.6	50.0	-6.8	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535660/35 Calibration Date: 05/11/2021 18:18

Instrument ID: VMS_MS1 Calib Start Date: 04/13/2021 19:16

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/13/2021 22:12

Lab File ID: MS1_1673.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
n-Butylbenzene	Ave	2.092	1.718		41.1	50.0	-17.9	50.0
1,2-Dichlorobenzene	Ave	0.9905	0.9472		47.8	50.0	-4.4	50.0
1,2-Dibromo-3-Chloropropane	Lin2		0.0935		38.1	50.0	-23.7	50.0
1,2,4-Trichlorobenzene	Ave	0.6020	0.5578		46.3	50.0	-7.3	50.0
Hexachlorobutadiene	Ave	0.1985	0.2009		50.6	50.0	1.2	50.0
Naphthalene	Ave	1.930	1.746		45.2	50.0	-9.6	50.0
1,2,3-Trichlorobenzene	Ave	0.5450	0.5191		47.6	50.0	-4.8	50.0
Dibromofluoromethane (Surr)	Ave	0.2600	0.2613		50.2	50.0	0.5	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3048	0.3129		51.3	50.0	2.7	50.0
Toluene-d8 (Surr)	Ave	4.295	4.130		48.1	50.0	-3.8	50.0
4-Bromofluorobenzene (Surr)	Ave	1.092	1.027		47.0	50.0	-5.9	50.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: P2865.D BFB Injection Date: 04/09/2021

Instrument ID: VMS_P BFB Injection Time: 09:01

Analysis Batch No.: 531966

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	21.0	
75	30.0 - 60.0 % of mass 95	56.9	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.8	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	67.1	
175	5.0 - 9.0 % of mass 174	4.1	(6.1) 1
176	95.0 - 101.0 % of mass 174	64.6	(96.2) 1
177	5.0 - 9.0 % of mass 176	4.2	(6.5) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD005 280-531966/17	P2868.D	04/09/2021	10:19
	STD010 280-531966/18	P2869.D	04/09/2021	10:42
	STD020 280-531966/19	P2870.D	04/09/2021	11:05
	STD050 280-531966/20	P2871.D	04/09/2021	11:28
	STD10 280-531966/21	P2872.D	04/09/2021	11:51
	ICIS 280-531966/22	P2873.D	04/09/2021	12:14
	STD75 280-531966/23	P2874.D	04/09/2021	12:37
	STD100 280-531966/24	P2875.D	04/09/2021	13:00
	STD200 280-531966/25	P2876.D	04/09/2021	13:23
	ICV 280-531966/26	P2878.D	04/09/2021	14:09

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-531966/17	P2868.D
Level 2	STD010 280-531966/18	P2869.D
Level 3	STD020 280-531966/19	P2870.D
Level 4	STD050 280-531966/20	P2871.D
Level 5	STD10 280-531966/21	P2872.D
Level 6	ICIS 280-531966/22	P2873.D
Level 7	STD75 280-531966/23	P2874.D
Level 8	STD100 280-531966/24	P2875.D
Level 9	STD200 280-531966/25	P2876.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Dichlorodifluoromethane	+++++ 0.2373	0.1197 0.2371	0.1840 0.2170	0.2763 0.2272	0.2708	Lin1	-0.036	0.2294							0.9970		0.9900
Chloromethane	+++++ 0.2276	0.2023 0.2246	0.2205 0.2154	0.2639 0.2196	0.2460	Ave		0.2275			0.1000	8.4		15.0			
Vinyl chloride	0.2237 0.2030	0.1567 0.2074	0.1973 0.1901	0.2353 0.1997	0.2247	Ave		0.2042				11.4		30.0			
Bromomethane	0.2115 0.1055	0.1612 0.1136	0.1492 0.1194	0.1445 +++++	0.1249	Lin2	0.0470	0.1187							0.9920		0.9900
Chloroethane	+++++ 0.1213	0.1320 0.1173	0.1695 0.1121	0.1565 0.1178	0.1312	Lin1	0.0675	0.1166							0.9980		0.9900
Dichlorofluoromethane	0.3221 0.3166	0.2903 0.3140	0.3424 0.3035	0.3604 0.3019	0.3458	Ave		0.3219				7.2		15.0			
Trichlorofluoromethane	0.3119 0.2951	0.2192 0.2926	0.2929 0.2727	0.3351 0.2749	0.3308	Ave		0.2917				12.0		15.0			
Ethyl ether	0.1448 0.1475	0.1518 0.1510	0.1479 0.1487	0.1521 0.1528	0.1521	Ave		0.1499				1.8		15.0			
Acrolein	0.0370 0.0393	0.0381 0.0394	0.0350 0.0395	0.0409 0.0398	0.0387	Ave		0.0386				4.5		15.0			
1,1-Dichloroethene	0.1274 0.1519	0.0875 0.1453	0.1212 0.1380	0.1405 0.1484	0.1413	Lin1	-0.029	0.1460							0.9990		0.9900
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0801 0.1074	0.0521 0.1059	0.0814 0.0989	0.1020 0.1107	0.1054	Lin1	-0.031	0.1070							0.9980		0.9900
Acetone	+++++ 0.0725	0.2279 0.0708	0.1266 0.0711	0.0937 0.0700	0.0763	Lin1	0.5529	0.0692							0.9990		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Iodomethane	0.1489 0.2065	0.1341 0.2039	0.1398 0.2000	0.1544 0.1958	0.1760	Lin1	-0.061	0.1992							0.9990		0.9900
Carbon disulfide	0.5262 0.4542	0.3598 0.4414	0.4077 0.4253	0.3950 0.4662	0.4269	Ave		0.4336				10.9		15.0			
Methyl acetate	0.6691 0.1688	0.3451 0.1606	0.2792 0.1621	0.2104 0.1607	0.1799	Lin1	0.4670	0.1597							1.0000		0.9900
3-Chloro-1-propene	0.2760 0.2407	0.2063 0.2317	0.2193 0.2239	0.2192 0.1727	0.2305	Ave		0.2245				12.3		15.0			
Methylene Chloride	0.2147 0.1849	0.2296 0.1801	0.1862 0.1795	0.1846 0.1822	0.1849	Ave		0.1919				9.2		15.0			
t-Butyl alcohol	0.0287 0.0286	0.0281 0.0290	0.0247 0.0294	0.0282 0.0284	0.0275	Ave		0.0281				4.9		15.0			
Acrylonitrile	0.0825 0.0852	0.0801 0.0834	0.0801 0.0847	0.0881 0.0834	0.0846	Ave		0.0836				3.0		15.0			
Methyl tert-butyl ether	0.5515 0.6070	0.5724 0.6007	0.5644 0.6101	0.5856 0.6093	0.5845	Ave		0.5873				3.6		15.0			
trans-1,2-Dichloroethene	0.1534 0.1740	0.1255 0.1696	0.1588 0.1642	0.1626 0.1744	0.1707	Ave		0.1614				9.4		15.0			
Hexane	0.7743 0.9557	0.4476 0.9239	0.8216 0.8601	0.9370 0.9286	0.9577	Lin1	-0.170	0.9179							0.9980		0.9900
Vinyl acetate	0.4147 0.3585	0.4197 0.3809	0.3626 0.3730	0.4220 0.3814	0.3951	Ave		0.3898				6.2		15.0			
1,1-Dichloroethane	0.3065 0.3294	0.2750 0.3143	0.3182 0.3117	0.3099 0.3243	0.3169	Ave		0.3118			0.1000	5.0		15.0			
2-Butanone (MEK)	+++++ 0.1161	0.2376 0.1109	0.2340 0.1102	0.1637 0.1084	0.1342	Lin1	0.7463	0.1088							0.9980		0.9900
cis-1,2-Dichloroethene	0.2049 0.1983	0.1917 0.1931	0.1848 0.1919	0.1928 0.1968	0.1878	Ave		0.1936				3.0		15.0			
2,2-Dichloropropane	0.2556 0.2897	0.1764 0.2830	0.2442 0.2732	0.2595 0.2889	0.2750	Ave		0.2606				13.5		15.0			
sec-Butyl Alcohol	+++++ 0.0200	0.0178 0.0205	0.0185 0.0208	0.0195 0.0207	0.0189	Ave		0.0196				5.7		15.0			
Bromochloromethane	0.0764 0.0878	0.0870 0.0834	0.0799 0.0839	0.0844 0.0826	0.0861	Ave		0.0835				4.3		15.0			
Tetrahydrofuran	0.0892 0.0704	0.0807 0.0700	0.0730 0.0703	0.0701 0.0704	0.0710	Ave		0.0739				9.0		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Chloroform	0.3379 0.3488	0.3372 0.3334	0.3225 0.3322	0.3366 0.3432	0.3360	Ave		0.3364				2.2		30.0			
1,1,1-Trichloroethane	0.2731 0.2985	0.2116 0.2947	0.2495 0.2845	0.2726 0.3032	0.2813	Ave		0.2743				10.4		15.0			
Cyclohexane	0.2484 0.2915	0.1544 0.2842	0.2618 0.2674	0.2769 0.2915	0.3024	Lin1	-0.049	0.2854							0.9980		0.9900
1,1-Dichloropropene	0.2218 0.2696	0.1725 0.2624	0.2591 0.2474	0.2494 0.2659	0.2681	Ave		0.2462				12.7		15.0			
Carbon tetrachloride	0.1901 0.2315	0.1361 0.2287	0.1848 0.2222	0.2034 0.2385	0.2096	Lin1	-0.063	0.2321							0.9990		0.9900
Isobutyl alcohol	+++++ 0.0089	0.0076 0.0089	0.0076 0.0090	0.0079 0.0087	0.0088	Ave		0.0084				7.3		15.0			
Benzene	0.6942 0.7591	0.6894 0.7347	0.7163 0.7271	0.7354 0.7413	0.7537	Ave		0.7279				3.3		15.0			
1,2-Dichloroethane	0.3667 0.2956	0.3235 0.2907	0.2981 0.2940	0.3020 0.2936	0.2924	Ave		0.3063				8.1		15.0			
Trichloroethene	0.8146 0.8556	0.6452 0.8200	0.7800 0.8034	0.7949 0.8410	0.8022	Ave		0.7952				7.6		15.0			
2-Pentanone	0.2628 0.1750	0.1914 0.1727	0.1822 0.1759	0.1799 0.1728	0.1759	Lin2	0.1297	0.1703							0.9960		0.9900
Methylcyclohexane	0.2123 0.2287	0.1065 0.2235	0.1956 0.2096	0.2181 0.2262	0.2254	Lin1	-0.041	0.2226							0.9990		0.9900
1,2-Dichloropropane	0.1797 0.1909	0.1954 0.1867	0.1750 0.1839	0.1874 0.1880	0.1883	Ave		0.1862				3.2		30.0			
1,4-Dioxane	+++++ 0.0035	0.0032 0.0034	0.0028 0.0035	0.0035 0.0034	0.0033	Ave		0.0033				6.9		15.0			
Dibromomethane	0.1149 0.1322	0.1303 0.1280	0.1217 0.1317	0.1296 0.1336	0.1261	Ave		0.1276				4.7		15.0			
Bromodichloromethane	0.2040 0.2632	0.2316 0.2586	0.2212 0.2635	0.2318 0.2698	0.2398	Ave		0.2426				9.3		15.0			
2-Chloroethyl vinyl ether	0.1315 0.1434	0.1358 0.1416	0.1347 0.1422	0.1529 0.1411	0.1509	Ave		0.1416				5.0		15.0			
cis-1,3-Dichloropropene	1.1886 1.3906	1.2019 1.3575	1.1773 1.3714	1.2010 1.4055	1.2627	Ave		1.2841				7.5		15.0			
4-Methyl-2-pentanone (MIBK)	0.2208 0.2212	0.2094 0.2195	0.2024 0.2224	0.2205 0.2157	0.2145	Ave		0.2163				3.1		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Toluene	0.7780 0.8151	0.7146 0.7807	0.7628 0.7682	0.7805 0.7944	0.7948	Ave		0.7766				3.6		30.0			
trans-1,3-Dichloropropene	0.2490 0.3001	0.2321 0.2992	0.2224 0.3092	0.2488 0.3156	0.2616	Ave		0.2709				13.1		15.0			
Ethyl methacrylate	1.1005 1.3176	1.1628 1.2888	1.1865 1.3088	1.1939 1.2944	1.2211	Ave		1.2305				6.2		15.0			
1,1,2-Trichloroethane	0.1508 0.1726	0.1690 0.1701	0.1609 0.1721	0.1689 0.1709	0.1686	Ave		0.1671				4.2		15.0			
Tetrachloroethene	0.4889 0.5759	0.3714 0.5484	0.5005 0.5284	0.5235 0.5675	0.5419	Ave		0.5163				11.9		15.0			
1,3-Dichloropropane	1.3846 1.4106	1.4122 1.3632	1.3376 1.3754	1.3805 1.3563	1.3684	Ave		1.3765				1.8		15.0			
2-Hexanone	0.6521 0.7078	0.6748 0.6926	0.6335 0.6941	0.7174 0.6770	0.6784	Ave		0.6808				3.9		15.0			
Dibromochloromethane	0.5175 0.7430	0.5504 0.7470	0.5250 0.7750	0.5993 0.7903	0.6317	Lin1	-0.278	0.7720							0.9980		0.9900
1,2-Dibromoethane (EDB)	0.7035 0.8224	0.7677 0.8006	0.7079 0.8101	0.7760 0.8055	0.7575	Ave		0.7724				5.6		15.0			
1-Chlorohexane	1.9967 1.0840	1.3245 1.0511	1.1192 1.0025	1.0736 1.0539	1.0690	Lin2	0.3596	1.0050							0.9930		0.9900
Chlorobenzene	2.1350 2.1533	2.0776 2.0804	2.0049 2.0535	2.0774 2.0593	2.0873	Ave		2.0810			0.3000	2.1		15.0			
1,1,1,2-Tetrachloroethane	0.6295 0.7360	0.5820 0.7248	0.5661 0.7339	0.6290 0.7406	0.6604	Ave		0.6669				10.4		15.0			
Ethylbenzene	1.0391 1.1920	0.9157 1.1496	1.1159 1.1324	1.1494 1.1289	1.1474	Ave		1.1078				7.5		30.0			
m-Xylene & p-Xylene	1.3157 1.4759	1.1382 1.4096	1.3019 1.3894	1.3547 1.4019	1.3468	Ave		1.3482				7.0		15.0			
o-Xylene	1.2585 1.4150	1.2072 1.3591	1.2376 1.3485	1.3329 1.3283	1.3371	Ave		1.3138				5.0		15.0			
Styrene	2.0239 2.5096	2.1557 2.4313	2.1213 2.4172	2.2333 2.3798	2.3102	Ave		2.2869				7.1		15.0			
Bromoform	+++++ 0.4712	0.3180 0.4896	0.3094 0.5092	0.3376 0.5245	0.3708	Lin1	-0.403	0.5094			0.1000				0.9970		0.9900
Isopropylbenzene	2.2531 2.4923	1.9211 2.4323	2.2184 2.3203	2.4342 2.4823	2.4732	Ave		2.3364				8.0		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Cyclohexanone	0.0336 0.0417	0.0341 0.0408	0.0349 0.0414	0.0394 0.0402	0.0393	Ave		0.0384				8.4		15.0			
1,1,2,2-Tetrachloroethane	0.7804 0.7505	0.7226 0.7662	0.7233 0.7520	0.7790 0.7625	0.7482	Ave		0.7538			0.3000	2.8		15.0			
Bromobenzene	0.5006 0.5739	0.5589 0.5614	0.5269 0.5574	0.5618 0.5819	0.5516	Ave		0.5527				4.5		15.0			
trans-1,4-Dichloro-2-butene	+++++ 0.2233	0.2650 0.2303	0.1843 0.2388	0.1950 0.2463	0.1902	Ave		0.2216				13.2		15.0			
1,2,3-Trichloropropane	+++++ 0.2361	0.2334 0.2378	0.2150 0.2343	0.2461 0.2450	0.2360	Ave		0.2355				4.0		15.0			
N-Propylbenzene	0.5463 0.6349	0.4694 0.6213	0.5682 0.5973	0.6173 0.6331	0.6278	Ave		0.5906				9.3		15.0			
2-Chlorotoluene	0.5146 0.5539	0.4448 0.5440	0.5110 0.5302	0.5691 0.5508	0.5412	Ave		0.5288				6.9		15.0			
1,3,5-Trimethylbenzene	1.7629 2.0207	1.5805 1.9728	1.7964 1.8919	1.9489 1.9630	1.9522	Ave		1.8766				7.4		15.0			
4-Chlorotoluene	0.4886 0.5851	0.5041 0.5742	0.5530 0.5612	0.5649 0.5777	0.5569	Ave		0.5518				6.0		15.0			
tert-Butylbenzene	1.5465 1.6210	1.2566 1.5836	1.4747 1.5247	1.5640 1.6277	1.5802	Ave		1.5310				7.4		15.0			
1,2,4-Trimethylbenzene	1.8277 2.0836	1.7142 2.0273	1.8538 1.9626	1.9910 2.0424	1.9874	Ave		1.9433				6.2		15.0			
sec-Butylbenzene	0.3917 0.4641	0.2990 0.4514	0.4167 0.4202	0.4308 0.4594	0.4340	Ave		0.4186				12.0		15.0			
1,3-Dichlorobenzene	1.0095 1.0223	0.8819 1.0193	0.9251 0.9881	0.9743 1.0129	1.0017	Ave		0.9817				4.9		15.0			
4-Isopropyltoluene	1.7262 1.9737	1.3313 1.9293	1.6868 1.8545	1.8610 1.9725	1.8531	Ave		1.7987				11.2		15.0			
1,4-Dichlorobenzene	1.0990 1.0460	1.0632 1.0501	1.0140 1.0211	1.0258 1.0514	1.0218	Ave		1.0436				2.6		15.0			
n-Butylbenzene	1.6414 1.8825	1.1494 1.7963	1.5273 1.7205	1.6896 1.8176	1.7575	Ave		1.6647				13.2		15.0			
1,2-Dichlorobenzene	0.9467 0.9764	0.9184 0.9700	0.9258 0.9696	0.9367 0.9717	0.9421	Ave		0.9508				2.3		15.0			
1,2-Dibromo-3-Chloropropane	+++++ 0.1484	0.1070 0.1520	0.1037 0.1567	0.1283 0.1604	0.1257	Lin2	-0.052	0.1473							0.9910		0.9900

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
1,2,4-Trichlorobenzene	0.4909 0.5529	0.5035 0.5425	0.4961 0.5329	0.5095 0.5592	0.5163	Ave		0.5226				4.8		15.0			
Hexachlorobutadiene	0.1777 0.2002	0.0958 0.1922	0.1818 0.1872	0.1806 0.2138	0.1818	Lin1	-0.054	0.2022							0.9960		0.9900
Naphthalene	1.7145 1.9607	1.6509 1.9342	1.6396 1.9211	1.8143 1.8699	1.8673	Ave		1.8192				6.7		15.0			
1,2,3-Trichlorobenzene	0.4842 0.5079	0.4769 0.4992	0.4411 0.4901	0.5007 0.4966	0.4752	Ave		0.4858				4.1		15.0			
Dibromofluoromethane (Surr)	0.2456 0.2487	0.2440 0.2511	0.2433 0.2529	0.2444 0.2531	0.2447	Ave		0.2475				1.6		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3375 0.3317	0.3331 0.3262	0.3317 0.3274	0.3323 0.3263	0.3326	Ave		0.3310				1.1		15.0			
Toluene-d8 (Surr)	4.1744 4.1840	4.1314 4.1152	4.1790 4.1359	4.0908 4.0872	4.1234	Ave		4.1357				0.9		15.0			
4-Bromofluorobenzene (Surr)	1.2017 1.1756	1.2099 1.1758	1.1853 1.1660	1.2071 1.1809	1.1737	Ave		1.1862				1.3		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-531966/17	P2868.D
Level 2	STD010 280-531966/18	P2869.D
Level 3	STD020 280-531966/19	P2870.D
Level 4	STD050 280-531966/20	P2871.D
Level 5	STD10 280-531966/21	P2872.D
Level 6	ICIS 280-531966/22	P2873.D
Level 7	STD75 280-531966/23	P2874.D
Level 8	STD100 280-531966/24	P2875.D
Level 9	STD200 280-531966/25	P2876.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Dichlorodifluoromethane	FB	Lin1	+++++ 227481	2243 348625	6869 435392	26824 904446	51783	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloromethane	FB	Ave	+++++ 218206	3791 330242	8230 432339	25617 874125	47045	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl chloride	FB	Ave	2074 194631	2936 304980	7363 381598	22837 794906	42970	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromomethane	FB	Lin2	1961 101192	3021 167078	5568 239549	14032 +++++	23880	0.500 50.0	1.00 75.0	2.00 100	5.00 +++++	10.0
Chloroethane	FB	Lin1	+++++ 116301	2474 172463	6328 225019	15191 469139	25083	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dichlorofluoromethane	FB	Ave	2987 303513	5440 461657	12781 609161	34988 1201937	66120	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichlorofluoromethane	FB	Ave	2892 282890	4107 430253	10932 547181	32526 1094465	63264	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl ether	FB	Ave	1343 141460	2844 222089	5521 298346	14767 608424	29081	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acrolein	FB	Ave	3384 372157	7050 572426	12908 782746	39165 1564433	73046	4.94 494	9.88 741	19.8 988	49.4 1975	98.8
1,1-Dichloroethene	FB	Lin1	1181 145674	1640 213580	4525 276961	13639 590902	27026	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloro-1,2,2-trifluoroethane	FB	Lin1	743 102992	976 155735	3037 198549	9897 440527	20148	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Acetone	FB	Lin1	+++++ 277982	17085 416598	18899 570448	36391 1113988	58327	+++++ 200	4.00 300	8.00 400	20.0 800	40.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Iodomethane	FB	Lin1	1381 198006	2512 299869	5218 401355	14984 779356	33660	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon disulfide	FB	Ave	4879 435477	6742 649034	15218 853587	38340 1856100	81628	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methyl acetate	FB	Lin1	12408 323718	12934 472362	20844 650735	40841 1279271	68790	1.00 100	2.00 150	4.00 200	10.0 400	20.0
3-Chloro-1-propene	FB	Ave	2559 230820	3865 340721	8185 449283	21276 687473	44082	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Methylene Chloride	FB	Ave	1991 177313	4303 264782	6949 360314	17918 725235	35363	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
t-Butyl alcohol	FB	Ave	2659 274658	5258 426369	9208 589500	27384 1128955	52679	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Acrylonitrile	FB	Ave	7653 817095	15012 1227027	29911 1699149	85529 3320271	161690	5.00 500	10.0 750	20.0 1000	50.0 2000	100
Methyl tert-butyl ether	FB	Ave	5114 581949	10727 883310	21066 1224319	56847 2425682	111761	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,2-Dichloroethene	FB	Ave	1422 166820	2352 249357	5926 329488	15785 694145	32632	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexane	CBNZ d5	Lin1	1652 209065	1926 311825	6974 401254	20787 859504	42213	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl acetate	FB	Ave	7691 687534	15731 1120215	27071 1496964	81938 3036645	151109	1.00 100	2.00 150	4.00 200	10.0 400	20.0
1,1-Dichloroethane	FB	Ave	2842 315848	5154 462119	11877 625434	30082 1290991	60597	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Butanone (MEK)	FB	Lin1	+++++ 445205	17810 652140	34945 884507	63566 1726177	102682	+++++ 200	4.00 300	8.00 400	20.0 800	40.0
cis-1,2-Dichloroethene	FB	Ave	1900 190094	3593 283916	6898 385147	18713 783533	35919	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2,2-Dichloropropane	FB	Ave	2370 277783	3306 416099	9116 548311	25187 1150205	52590	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butyl Alcohol	FB	Ave	+++++ 460621	7997 722152	16615 1003670	45390 1981495	86679	+++++ 1200	24.0 1800	48.0 2400	120 4800	240
Bromochloromethane	FB	Ave	708 84225	1630 122600	2983 168412	8197 328768	16457	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrahydrofuran	FB	Ave	1655	3024	5452	13616	27138	1.00	2.00	4.00	10.0	20.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			135090	205822	282017	560725		100	150	200	400	
Chloroform	FB	Ave	3133 334417	6319 490247	12039 666748	32676 1366201	64252	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1-Trichloroethane	FB	Ave	2532 286211	3966 433303	9314 570865	26466 1206906	53796	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexane	FB	Lin1	2303 279466	2894 417909	9773 536711	26877 1160516	57817	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1-Dichloropropene	FB	Ave	2057 258468	3233 385818	9673 496413	24212 1058539	51260	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Carbon tetrachloride	FB	Lin1	1763 221986	2550 336204	6898 445980	19746 949348	40085	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isobutyl alcohol	FB	Ave	+++++ 214463	3539 326329	7095 451543	19293 870198	41916	+++++ 1250	25.0 1875	50.0 2500	125 5000	250
Benzene	FB	Ave	6437 727810	12919 1080266	26737 1459184	71388 2951144	144130	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloroethane	FB	Ave	3400 283435	6063 427440	11127 589986	29316 1168915	55914	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichloroethene	CBNZ d5	Ave	1738 187163	2776 276747	6621 374783	17634 778451	35357	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Pentanone	FB	Lin2	7799 536960	11478 812634	21766 1129621	55887 2201079	107633	1.60 160	3.20 240	6.40 320	16.0 640	32.0
Methylcyclohexane	FB	Lin1	1969 219259	1996 328693	7301 420696	21175 900727	43108	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichloropropane	FB	Ave	1666 183052	3662 274525	6533 369101	18195 748453	36001	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dioxane	FB	Ave	+++++ 66266	1199 98781	2094 139812	6830 266973	12513	+++++ 1000	20.0 1500	40.0 2000	100 4000	200
Dibromomethane	FB	Ave	1065 126761	2442 188269	4543 264215	12584 531771	24116	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromodichloromethane	FB	Ave	1892 252305	4340 380210	8256 528779	22498 1074021	45863	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Chloroethyl vinyl ether	FB	Ave	1219 137461	2545 208246	5029 285433	14843 561902	28857	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
cis-1,3-Dichloropropene	CBNZ d5	Ave	2536	5171	9993	26643	55658	0.500	1.00	2.00	5.00	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			304200	458161	639765	1300925		50.0	75.0	100	200	
4-Methyl-2-pentanone (MIBK)	FB	Ave	8190 848512	15697 1290773	30222 1785389	85606 3434471	164093	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Toluene	FB	Ave	7214 781490	13391 1147888	28472 1541711	75770 3162498	151973	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,3-Dichloropropene	FB	Ave	2309 287722	4349 439985	8303 620482	24148 1256513	50026	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Ethyl methacrylate	CBNZ d5	Ave	2348 288222	5003 434991	10071 610572	26484 1198142	53824	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,2-Trichloroethane	FB	Ave	1398 165490	3167 250117	6006 345449	16394 680412	32242	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Tetrachloroethene	CBNZ d5	Ave	1043 125971	1598 185081	4248 246493	11613 525317	23885	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichloropropane	CBNZ d5	Ave	2954 308570	6076 460079	11354 641617	30624 1255436	60314	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Hexanone	CBNZ d5	Ave	5565 619337	11613 934984	21509 1295144	63658 2506433	119606	2.00 200	4.00 300	8.00 400	20.0 800	40.0
Dibromochloromethane	CBNZ d5	Lin1	1104 162525	2368 252104	4456 361550	13294 731477	27843	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromoethane (EDB)	CBNZ d5	Ave	1501 179906	3303 270208	6009 377911	17214 745579	33387	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1-Chlorohexane	CBNZ d5	Lin2	3408 189697	4559 283814	7600 374148	19053 780411	37694	0.400 40.0	0.800 60.0	1.60 80.0	4.00 160	8.00
Chlorobenzene	CBNZ d5	Ave	4555 471047	8939 702154	17018 957952	46085 1906082	92001	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,1,1,2-Tetrachloroethane	CBNZ d5	Ave	1343 161010	2504 244619	4805 342383	13954 685472	29109	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Ethylbenzene	CBNZ d5	Ave	2217 260755	3940 387998	9472 528247	25498 1044909	50576	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
m-Xylene & p-Xylene	CBNZ d5	Ave	2807 322860	4897 475748	11051 648174	30052 1297601	59364	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
o-Xylene	CBNZ d5	Ave	2685 309549	5194 458704	10505 629086	29569 1229471	58937	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Styrene	CBNZ d5	Ave	4318 548984	9275 820568	18006 1127626	49542 2202745	101828	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromoform	CBNZ d5	Lin1	+++++ 103070	1368 165234	2626 237526	7490 485502	16342	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Isopropylbenzene	DCBd 4	Ave	6747 801783	11432 1186939	26678 1591745	75650 3168939	154335	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Cyclohexanone	CBNZ d5	Ave	2871 364648	5871 551202	11855 771874	34958 1487160	69351	20.0 2000	40.0 3000	80.0 4000	200 8000	400
1,1,2,2-Tetrachloroethane	DCBd 4	Ave	2337 241432	4300 373897	8698 515859	24209 973383	46692	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromobenzene	DCBd 4	Ave	1499 184630	3326 273974	6337 382371	17461 742905	34422	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
trans-1,4-Dichloro-2-butene	DCBd 4	Ave	+++++ 71838	1577 112363	2216 163800	6060 314406	11866	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichloropropane	DCBd 4	Ave	+++++ 75958	1389 116035	2585 160704	7647 312802	14729	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
N-Propylbenzene	DCBd 4	Ave	1636 204237	2793 303177	6833 409727	19184 808239	39177	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
2-Chlorotoluene	DCBd 4	Ave	1541 178201	2647 265448	6145 363683	17687 703165	33770	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3,5-Trimethylbenzene	DCBd 4	Ave	5279 650068	9405 962739	21603 1297809	60570 2506039	121822	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Chlorotoluene	DCBd 4	Ave	1463 188241	3000 280213	6650 385009	17556 737513	34750	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
tert-Butylbenzene	DCBd 4	Ave	4631 521457	7478 772804	17734 1045914	48606 2077963	98610	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,4-Trimethylbenzene	DCBd 4	Ave	5473 670293	10201 989337	22294 1346321	61876 2607336	124018	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
sec-Butylbenzene	DCBd 4	Ave	1173 149292	1779 220290	5011 288245	13389 586448	27085	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,3-Dichlorobenzene	DCBd 4	Ave	3023 328884	5248 497432	11125 677832	30279 1293121	62511	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
4-Isopropyltoluene	DCBd 4	Ave	5169 634941	7922 941509	20285 1272204	57836 2518121	115640	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,4-Dichlorobenzene	DCBd 4	Ave	3291 336496	6327 512430	12194 700457	31881 1342198	63763	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
n-Butylbenzene	DCBd 4	Ave	4915 605611	6840 876586	18367 1180275	52510 2320367	109669	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dichlorobenzene	DCBd 4	Ave	2835 314118	5465 473350	11133 665134	29112 1240504	58786	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2-Dibromo-3-Chloropropane	DCBd 4	Lin2	+++++ 47732	637 74155	1247 107475	3987 204721	7841	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531966

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/09/2021 10:19 Calibration End Date: 04/09/2021 13:23 Calibration ID: 52244

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
1,2,4-Trichlorobenzene	DCBd 4	Ave	1470 177873	2996 264763	5966 365543	15834 713934	32216	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Hexachlorobutadiene	DCBd 4	Lin1	532 64397	570 93773	2186 128421	5612 272987	11347	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Naphthalene	DCBd 4	Ave	5134 630746	9824 943896	19718 1317857	56385 2387172	116524	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
1,2,3-Trichlorobenzene	DCBd 4	Ave	1450 163377	2838 243617	5304 336235	15561 633982	29652	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dibromofluoromethane (Surr)	FB	Ave	227733 238459	228657 246156	227077 253769	237250 251950	233920	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	312931 318018	312063 319795	309580 328537	322601 324773	317953	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
Toluene-d8 (Surr)	CBNZ d5	Ave	890614 915273	888766 925932	886801 964706	907477 945783	908744	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	359835 378200	359995 382535	356344 399935	375136 376888	366202	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0

Curve Type Legend
Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-531966/26 Calibration Date: 04/09/2021 14:09

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P2878.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.1499	0.1609		53.7	50.0	7.4	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Lin1		0.1025		48.2	50.0	-3.6	20.0
1,1-Dichloroethene	Lin1		0.1413		48.6	50.0	-2.8	20.0
Acetone	Lin1		0.0749		208	200	4.2	20.0
Iodomethane	Lin1		0.2039		51.5	50.0	3.0	20.0
Carbon disulfide	Ave	0.4336	0.4519		52.1	50.0	4.2	20.0
Methyl acetate	Lin1		0.1764		108	100	7.5	20.0
3-Chloro-1-propene	Ave	0.2245	0.2403		53.5	50.0	7.1	20.0
Methylene Chloride	Ave	0.1919	0.1801		46.9	50.0	-6.1	20.0
t-Butyl alcohol	Ave	0.0281	0.0308		548	500	9.7	20.0
Acrylonitrile	Ave	0.0836	0.0885		529	500	5.9	20.0
Methyl tert-butyl ether	Ave	0.5873	0.6124		52.1	50.0	4.3	20.0
trans-1,2-Dichloroethene	Ave	0.1614	0.1647		51.0	50.0	2.0	20.0
Hexane	Lin1		0.9000		49.2	50.0	-1.6	20.0
Vinyl acetate	Ave	0.3898	0.4118		106	100	5.6	20.0
1,1-Dichloroethane	Ave	0.3118	0.3038	0.1000	48.7	50.0	-2.6	20.0
2-Butanone (MEK)	Lin1		0.1157		206	200	2.9	20.0
cis-1,2-Dichloroethene	Ave	0.1936	0.1855		47.9	50.0	-4.2	20.0
2,2-Dichloropropane	Ave	0.2606	0.2752		52.8	50.0	5.6	20.0
sec-Butyl Alcohol	Ave	0.0196	0.0220		1340	1200	12.0	20.0
Bromochloromethane	Ave	0.0835	0.0848		50.8	50.0	1.6	20.0
Tetrahydrofuran	Ave	0.0739	0.0723		97.8	100	-2.2	20.0
Chloroform	Ave	0.3364	0.3295		49.0	50.0	-2.1	20.0
1,1,1-Trichloroethane	Ave	0.2743	0.2728		49.7	50.0	-0.5	20.0
Cyclohexane	Lin1		0.2678		47.1	50.0	-5.8	20.0
1,1-Dichloropropene	Ave	0.2462	0.2420		49.1	50.0	-1.7	20.0
Carbon tetrachloride	Lin1		0.2088		45.3	50.0	-9.5	20.0
Isobutyl alcohol	Ave	0.0084	0.0093		1380	1250	10.5	20.0
Benzene	Ave	0.7279	0.7158		49.2	50.0	-1.7	20.0
1,2-Dichloroethane	Ave	0.3063	0.2940		48.0	50.0	-4.0	20.0
Trichloroethene	Ave	0.7952	0.7731		48.6	50.0	-2.8	20.0
2-Pentanone	Lin2		0.1829		171	160	6.9	20.0
Methylcyclohexane	Lin1		0.2036		45.9	50.0	-8.2	20.0
1,2-Dichloropropane	Ave	0.1862	0.1815		48.7	50.0	-2.5	20.0
1,4-Dioxane	Ave	0.0033	0.0035		1070	1000	6.9	20.0
Dibromomethane	Ave	0.1276	0.1287		50.5	50.0	0.9	20.0
Bromodichloromethane	Ave	0.2426	0.2565		52.9	50.0	5.7	20.0
cis-1,3-Dichloropropene	Ave	1.284	1.316		51.2	50.0	2.5	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2163	0.2301		213	200	6.4	20.0
Toluene	Ave	0.7766	0.7491		48.2	50.0	-3.5	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-531966/26 Calibration Date: 04/09/2021 14:09

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P2878.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
trans-1,3-Dichloropropene	Ave	0.2709	0.3028		55.9	50.0	11.8	20.0
Ethyl methacrylate	Ave	1.230	1.333		54.2	50.0	8.3	20.0
1,1,2-Trichloroethane	Ave	0.1671	0.1742		52.1	50.0	4.2	20.0
Tetrachloroethene	Ave	0.5163	0.5098		49.4	50.0	-1.2	20.0
1,3-Dichloropropane	Ave	1.377	1.381		50.2	50.0	0.3	20.0
2-Hexanone	Ave	0.6808	0.7527		221	200	10.6	20.0
Dibromochloromethane	Lin1		0.7516		49.0	50.0	-1.9	20.0
1,2-Dibromoethane (EDB)	Ave	0.7724	0.8151		52.8	50.0	5.5	20.0
1-Chlorohexane	Lin2		0.9797		38.6	40.0	-3.4	20.0
Chlorobenzene	Ave	2.081	2.034	0.3000	48.9	50.0	-2.2	20.0
1,1,1,2-Tetrachloroethane	Ave	0.6669	0.7053		52.9	50.0	5.8	20.0
Ethylbenzene	Ave	1.108	1.095		49.4	50.0	-1.2	20.0
m-Xylene & p-Xylene	Ave	1.348	1.357		50.3	50.0	0.6	20.0
o-Xylene	Ave	1.314	1.317		50.1	50.0	0.2	20.0
Styrene	Ave	2.287	2.362		51.6	50.0	3.3	20.0
Bromoform	Lin1		0.4849	0.1000	48.4	50.0	-3.2	20.0
Isopropylbenzene	Ave	2.336	2.304		49.3	50.0	-1.4	20.0
Cyclohexanone	Ave	0.0384	0.0435		2270	2000	13.3	20.0
1,1,2,2-Tetrachloroethane	Ave	0.7538	0.7979	0.3000	52.9	50.0	5.8	20.0
Bromobenzene	Ave	0.5527	0.5670		51.3	50.0	2.6	20.0
trans-1,4-Dichloro-2-butene	Ave	0.2216	0.2512		56.7	50.0	13.3	20.0
1,2,3-Trichloropropane	Ave	0.2355	0.2454		52.1	50.0	4.2	20.0
N-Propylbenzene	Ave	0.5906	0.6002		50.8	50.0	1.6	20.0
2-Chlorotoluene	Ave	0.5288	0.5269		49.8	50.0	-0.4	20.0
1,3,5-Trimethylbenzene	Ave	1.877	1.909		50.9	50.0	1.7	20.0
4-Chlorotoluene	Ave	0.5518	0.5618		50.9	50.0	1.8	20.0
tert-Butylbenzene	Ave	1.531	1.514		49.5	50.0	-1.1	20.0
1,2,4-Trimethylbenzene	Ave	1.943	2.002		51.5	50.0	3.0	20.0
sec-Butylbenzene	Ave	0.4186	0.4240		50.6	50.0	1.3	20.0
1,3-Dichlorobenzene	Ave	0.9817	0.998		50.8	50.0	1.6	20.0
4-Isopropyltoluene	Ave	1.799	1.862		51.8	50.0	3.5	20.0
1,4-Dichlorobenzene	Ave	1.044	1.037		49.7	50.0	-0.6	20.0
n-Butylbenzene	Ave	1.665	1.688		50.7	50.0	1.4	20.0
1,2-Dichlorobenzene	Ave	0.9508	0.9687		50.9	50.0	1.9	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1511		51.7	50.0	3.3	20.0
1,2,4-Trichlorobenzene	Ave	0.5226	0.5516		52.8	50.0	5.5	20.0
Hexachlorobutadiene	Lin1		0.1923		47.8	50.0	-4.4	20.0
Naphthalene	Ave	1.819	2.029		55.8	50.0	11.6	20.0
1,2,3-Trichlorobenzene	Ave	0.4858	0.5049		52.0	50.0	3.9	20.0
Dibromofluoromethane (Surr)	Ave	0.2475	0.2489		50.3	50.0	0.5	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3310	0.3255		49.2	50.0	-1.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-531966/26 Calibration Date: 04/09/2021 14:09

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P2878.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toluene-d8 (Surr)	Ave	4.136	4.143		50.1	50.0	0.2	20.0
4-Bromofluorobenzene (Surr)	Ave	1.186	1.179		49.7	50.0	-0.6	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: P3856.D BFB Injection Date: 04/30/2021

Instrument ID: VMS_P BFB Injection Time: 08:59

Analysis Batch No.: 534419

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	20.4	
75	30.0 - 60.0 % of mass 95	55.7	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.4	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	59.0	
175	5.0 - 9.0 % of mass 174	4.8	(8.1) 1
176	95.0 - 101.0 % of mass 174	57.3	(97.2) 1
177	5.0 - 9.0 % of mass 176	3.9	(6.9) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	STD005 280-534419/16	P3861.D	04/30/2021	11:30
	STD010 280-534419/17	P3862.D	04/30/2021	11:53
	STD020 280-534419/18	P3863.D	04/30/2021	12:16
	STD050 280-534419/19	P3864.D	04/30/2021	12:39
	STD10 280-534419/20	P3865.D	04/30/2021	13:02
	ICIS 280-534419/21	P3866.D	04/30/2021	13:25
	STD75 280-534419/22	P3867.D	04/30/2021	13:48
	STD100 280-534419/23	P3868.D	04/30/2021	14:11
	STD200 280-534419/24	P3869.D	04/30/2021	14:34
	ICV 280-534419/25	P3873.D	04/30/2021	18:23

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 534419

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/30/2021 11:30 Calibration End Date: 04/30/2021 14:34 Calibration ID: 53071

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-534419/16	P3861.D
Level 2	STD010 280-534419/17	P3862.D
Level 3	STD020 280-534419/18	P3863.D
Level 4	STD050 280-534419/19	P3864.D
Level 5	STD10 280-534419/20	P3865.D
Level 6	ICIS 280-534419/21	P3866.D
Level 7	STD75 280-534419/22	P3867.D
Level 8	STD100 280-534419/23	P3868.D
Level 9	STD200 280-534419/24	P3869.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Dichlorodifluoromethane	+++++ 0.1828	0.1342 0.2111	0.1756 0.2014	0.2239 0.2102	0.2189	Lin2	-0.071	0.2111							0.9930		0.9900
Chloromethane	+++++ 0.1458	0.2038 0.1565	0.1500 0.1523	0.1693 0.1558	0.1620	Ave		0.1619			0.1000	11.4		15.0			
Vinyl chloride	0.2064 0.1492	0.1643 0.1676	0.1688 0.1587	0.1732 0.1688	0.1754	Ave		0.1703				9.2		30.0			
Bromomethane	+++++ 0.0832	0.1604 0.0940	0.1302 0.0948	0.1033 0.0999	0.0933	Lin1	0.0533	0.0951							0.9960		0.9900
Chloroethane	0.1109 0.0907	0.1325 0.1012	0.1030 0.0982	0.1158 0.1008	0.1055	Ave		0.1065				11.4		15.0			
Dichlorofluoromethane	0.2946 0.2893	0.3562 0.3159	0.3193 0.3076	0.3495 0.3131	0.3362	Ave		0.3202				7.2		15.0			
Trichlorofluoromethane	0.2658 0.2563	0.2574 0.2949	0.2943 0.2836	0.3096 0.2974	0.3082	Ave		0.2853				7.3		15.0			
2-Chloroethyl vinyl ether	0.1780 0.1467	0.1323 0.1452	0.1213 0.1481	0.1626 0.1493	0.1512	Ave		0.1483				10.9		15.0			
Dibromofluoromethane (Surr)	0.2425 0.2431	0.2451 0.2418	0.2434 0.2420	0.2435 0.2437	0.2379	Ave		0.2426				0.8		15.0			
1,2-Dichloroethane-d4 (Surr)	0.3380 0.3366	0.3426 0.3379	0.3400 0.3392	0.3404 0.3367	0.3390	Ave		0.3389				0.6		15.0			
Toluene-d8 (Surr)	4.3723 4.3578	4.3843 4.3899	4.3621 4.3210	4.4047 4.2960	4.3766	Ave		4.3627				0.8		15.0			
4-Bromofluorobenzene (Surr)	1.3011 1.2868	1.2623 1.2661	1.2783 1.3057	1.2967 1.2469	1.2855	Ave		1.2810				1.5		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 534419

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/30/2021 11:30 Calibration End Date: 04/30/2021 14:34 Calibration ID: 53071

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD005 280-534419/16	P3861.D
Level 2	STD010 280-534419/17	P3862.D
Level 3	STD020 280-534419/18	P3863.D
Level 4	STD050 280-534419/19	P3864.D
Level 5	STD10 280-534419/20	P3865.D
Level 6	ICIS 280-534419/21	P3866.D
Level 7	STD75 280-534419/22	P3867.D
Level 8	STD100 280-534419/23	P3868.D
Level 9	STD200 280-534419/24	P3869.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Dichlorodifluoromethane	FB	Lin2	+++++ 183099	2707 304151	6979 401466	22373 818061	43837	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloromethane	FB	Ave	+++++ 146068	4109 225470	5962 303621	16910 606447	32448	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Vinyl chloride	FB	Ave	2102 149464	3313 241426	6710 316460	17304 656808	35127	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Bromomethane	FB	Lin1	+++++ 83337	3235 135452	5176 188932	10317 388857	18679	+++++ 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Chloroethane	FB	Ave	1130 90892	2672 145789	4093 195805	11565 392313	21120	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dichlorofluoromethane	FB	Ave	3001 289856	7183 455126	12691 613189	34913 1218275	67317	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Trichlorofluoromethane	FB	Ave	2708 256815	5190 424765	11699 565356	30935 1157141	61711	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
2-Chloroethyl vinyl ether	FB	Ave	1813 146971	2668 209123	4820 295165	16245 581046	30282	0.500 50.0	1.00 75.0	2.00 100	5.00 200	10.0
Dibromofluoromethane (Surr)	FB	Ave	247031 243559	247151 232240	241935 241195	243236 237058	238167	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	344291 337269	345479 324514	337862 338169	340044 327571	339401	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
Toluene-d8 (Surr)	CBNZ d5	Ave	944902 946049	947590 916338	932891 935855	932210 912201	942137	50.0 50.0	50.0 50.0	50.0 50.0	50.0 50.0	50.0
4-Bromofluorobenzene (Surr)	DCBd 4	Ave	377341	376101	369663	371442	377610	50.0	50.0	50.0	50.0	50.0

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 534419

SDG No.:

Instrument ID: VMS_P GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 04/30/2021 11:30 Calibration End Date: 04/30/2021 14:34 Calibration ID: 53071

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
			375685	358002	374550	358924		50.0	50.0	50.0	50.0	

Curve Type Legend
Ave = Average ISTD
Lin1 = Linear 1/conc ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-534419/25 Calibration Date: 04/30/2021 18:23

Instrument ID: VMS_P Calib Start Date: 04/30/2021 11:30

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/30/2021 14:34

Lab File ID: P3873.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin2		0.1822		43.5	50.0	-13.0	20.0
Chloromethane	Ave	0.1619	0.1459	0.1000	45.0	50.0	-9.9	20.0
Vinyl chloride	Ave	0.1703	0.1509		44.3	50.0	-11.4	20.0
Bromomethane	Lin1		0.0962		50.0	50.0	0.0	20.0
Chloroethane	Ave	0.1065	0.0966		45.3	50.0	-9.3	20.0
Dichlorofluoromethane	Ave	0.3202	0.3016		47.1	50.0	-5.8	20.0
Trichlorofluoromethane	Ave	0.2853	0.2675		46.9	50.0	-6.2	20.0
2-Chloroethyl vinyl ether	Ave	0.1483	0.1475		49.7	50.0	-0.5	20.0
Dibromofluoromethane (Surr)	Ave	0.2426	0.2424		50.0	50.0	-0.0	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3389	0.3430		50.6	50.0	1.2	20.0
Toluene-d8 (Surr)	Ave	4.363	4.361		50.0	50.0	-0.0	20.0
4-Bromofluorobenzene (Surr)	Ave	1.281	1.331		52.0	50.0	3.9	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: P4335.D BFB Injection Date: 05/11/2021

Instrument ID: VMS_P BFB Injection Time: 07:48

Analysis Batch No.: 535659

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	21.2	
75	30.0 - 60.0 % of mass 95	59.4	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.5	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	61.3	
175	5.0 - 9.0 % of mass 174	5.5	(9.0) 1
176	95.0 - 101.0 % of mass 174	58.8	(95.9) 1
177	5.0 - 9.0 % of mass 176	3.9	(6.6) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535659/2	P4336.D	05/11/2021	8:14
	LCS 280-535659/4	P4338.D	05/11/2021	9:00
	MB 280-535659/9	P4341.D	05/11/2021	10:09
	LCSD 280-535659/5	P4350.D	05/11/2021	13:36
05DUP02-20210429	280-148061-5	P4359.D	05/11/2021	17:02
05FB01-20210429	280-148061-6	P4360.D	05/11/2021	17:25
05TB03-20210429	280-148061-7	P4361.D	05/11/2021	17:48
	CCVC 280-535659/49	P4366.D	05/11/2021	19:43

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535659/2 Calibration Date: 05/11/2021 08:14

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P4336.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.1499	0.1564		52.2	50.0	4.4	20.0
Acrolein	Ave	0.0386	0.0438		560	494	13.4	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Lin1		0.1053		49.5	50.0	-0.9	20.0
1,1-Dichloroethene	Lin1		0.1422		48.9	50.0	-2.2	20.0
Acetone	Lin1		0.0728		203	200	1.3	20.0
Iodomethane	Lin1		0.1540		39.0	50.0	-22.1*	20.0
Carbon disulfide	Ave	0.4336	0.4327		49.9	50.0	-0.2	20.0
Methyl acetate	Lin1		0.1627		99.0	100	-1.0	20.0
3-Chloro-1-propene	Ave	0.2245	0.2330		51.9	50.0	3.8	20.0
Methylene Chloride	Ave	0.1919	0.1775		46.3	50.0	-7.5	20.0
t-Butyl alcohol	Ave	0.0281	0.0307		546	500	9.2	20.0
Acrylonitrile	Ave	0.0836	0.0826		494	500	-1.1	20.0
Methyl tert-butyl ether	Ave	0.5873	0.6609		56.3	50.0	12.5	20.0
trans-1,2-Dichloroethene	Ave	0.1614	0.1615		50.0	50.0	0.0	20.0
Hexane	Lin1		0.9189		50.2	50.0	0.5	20.0
Vinyl acetate	Ave	0.3898	0.3945		101	100	1.2	20.0
1,1-Dichloroethane	Ave	0.3118	0.3207	0.1000	51.4	50.0	2.9	20.0
2-Butanone (MEK)	Lin1		0.1034		183	200	-8.4	20.0
cis-1,2-Dichloroethene	Ave	0.1936	0.1850		47.8	50.0	-4.4	20.0
2,2-Dichloropropane	Ave	0.2606	0.3078		59.0	50.0	18.1	20.0
sec-Butyl Alcohol	Ave	0.0196	0.0189		1160	1200	-3.6	20.0
Bromochloromethane	Ave	0.0835	0.0827		49.5	50.0	-1.0	20.0
Tetrahydrofuran	Ave	0.0739	0.0633		85.7	100	-14.3	20.0
Chloroform	Ave	0.3364	0.3698		55.0	50.0	9.9	20.0
1,1,1-Trichloroethane	Ave	0.2743	0.3282		59.8	50.0	19.6	20.0
Cyclohexane	Lin1		0.2658		46.7	50.0	-6.5	20.0
1,1-Dichloropropene	Ave	0.2462	0.2630		53.4	50.0	6.8	20.0
Carbon tetrachloride	Lin1		0.2655		57.5	50.0	14.9	20.0
Isobutyl alcohol	Ave	0.0084	0.0084		1250	1250	0.2	20.0
Benzene	Ave	0.7279	0.6979		47.9	50.0	-4.1	20.0
1,2-Dichloroethane	Ave	0.3063	0.3351		54.7	50.0	9.4	20.0
Trichloroethene	Ave	0.7952	0.8480		53.3	50.0	6.6	20.0
2-Pentanone	Lin2		0.1653		155	160	-3.4	20.0
Methylcyclohexane	Lin1		0.2135		48.1	50.0	-3.7	20.0
1,2-Dichloropropane	Ave	0.1862	0.1791		48.1	50.0	-3.8	20.0
1,4-Dioxane	Ave	0.0033	0.0032		982	1000	-1.8	20.0
Dibromomethane	Ave	0.1276	0.1327		52.0	50.0	4.0	20.0
Bromodichloromethane	Ave	0.2426	0.2877		59.3	50.0	18.6	20.0
cis-1,3-Dichloropropene	Ave	1.284	1.412		55.0	50.0	10.0	20.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2163	0.2050		190	200	-5.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535659/2 Calibration Date: 05/11/2021 08:14

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P4336.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toluene	Ave	0.7766	0.7389		47.6	50.0	-4.9	20.0
trans-1,3-Dichloropropene	Ave	0.2709	0.3143		58.0	50.0	16.0	20.0
Ethyl methacrylate	Ave	1.230	1.319		53.6	50.0	7.2	20.0
1,1,2-Trichloroethane	Ave	0.1671	0.1694		50.7	50.0	1.4	20.0
Tetrachloroethene	Ave	0.5163	0.5304		51.4	50.0	2.7	20.0
1,3-Dichloropropane	Ave	1.377	1.434		52.1	50.0	4.2	20.0
2-Hexanone	Ave	0.6808	0.6867		202	200	0.9	20.0
Dibromochloromethane	Lin1		0.8643		56.3	50.0	12.7	20.0
1,2-Dibromoethane (EDB)	Ave	0.7724	0.8176		52.9	50.0	5.9	20.0
1-Chlorohexane	Lin2		1.018		40.1	40.0	0.4	20.0
Chlorobenzene	Ave	2.081	2.042	0.3000	49.1	50.0	-1.9	20.0
1,1,1,2-Tetrachloroethane	Ave	0.6669	0.7704		57.8	50.0	15.5	20.0
Ethylbenzene	Ave	1.108	1.085		48.9	50.0	-2.1	20.0
m-Xylene & p-Xylene	Ave	1.348	1.380		51.2	50.0	2.4	20.0
o-Xylene	Ave	1.314	1.347		51.3	50.0	2.5	20.0
Styrene	Ave	2.287	2.394		52.3	50.0	4.7	20.0
Bromoform	Lin1		0.5405	0.1000	53.8	50.0	7.7	20.0
Isopropylbenzene	Ave	2.336	2.556		54.7	50.0	9.4	20.0
Cyclohexanone	Ave	0.0384	0.0582		3030	2000	51.6*	20.0
1,1,2,2-Tetrachloroethane	Ave	0.7538	0.7754	0.3000	51.4	50.0	2.9	20.0
Bromobenzene	Ave	0.5527	0.5716		51.7	50.0	3.4	20.0
trans-1,4-Dichloro-2-butene	Ave	0.2216	0.1827		41.2	50.0	-17.6	20.0
1,2,3-Trichloropropane	Ave	0.2355	0.2700		57.3	50.0	14.7	20.0
N-Propylbenzene	Ave	0.5906	0.6069		51.4	50.0	2.8	20.0
2-Chlorotoluene	Ave	0.5288	0.5212		49.3	50.0	-1.4	20.0
1,3,5-Trimethylbenzene	Ave	1.877	2.103		56.0	50.0	12.1	20.0
4-Chlorotoluene	Ave	0.5518	0.5615		50.9	50.0	1.8	20.0
tert-Butylbenzene	Ave	1.531	1.696		55.4	50.0	10.8	20.0
1,2,4-Trimethylbenzene	Ave	1.943	2.139		55.0	50.0	10.1	20.0
sec-Butylbenzene	Ave	0.4186	0.4406		52.6	50.0	5.3	20.0
1,3-Dichlorobenzene	Ave	0.9817	1.015		51.7	50.0	3.4	20.0
4-Isopropyltoluene	Ave	1.799	2.055		57.1	50.0	14.3	20.0
1,4-Dichlorobenzene	Ave	1.044	1.051		50.4	50.0	0.7	20.0
n-Butylbenzene	Ave	1.665	1.862		55.9	50.0	11.9	20.0
1,2-Dichlorobenzene	Ave	0.9508	0.9662		50.8	50.0	1.6	20.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1492		51.0	50.0	2.0	20.0
1,2,4-Trichlorobenzene	Ave	0.5226	0.5622		53.8	50.0	7.6	20.0
Hexachlorobutadiene	Lin1		0.2098		52.2	50.0	4.3	20.0
Naphthalene	Ave	1.819	1.955		53.7	50.0	7.5	20.0
1,2,3-Trichlorobenzene	Ave	0.4858	0.5060		52.1	50.0	4.2	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535659/2 Calibration Date: 05/11/2021 08:14

Instrument ID: VMS_P Calib Start Date: 04/30/2021 11:30

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/30/2021 14:34

Lab File ID: P4336.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin2		0.2660		63.3	50.0	26.7*	20.0
Chloromethane	Ave	0.1619	0.1557	0.1000	48.1	50.0	-3.8	20.0
Vinyl chloride	Ave	0.1703	0.1768		51.9	50.0	3.8	20.0
Bromomethane	Lin1		0.0894		46.5	50.0	-7.1	20.0
Chloroethane	Ave	0.1065	0.1103		51.8	50.0	3.6	20.0
Dichlorofluoromethane	Ave	0.3202	0.3477		54.3	50.0	8.6	20.0
Trichlorofluoromethane	Ave	0.2853	0.3605		63.2	50.0	26.4*	20.0
2-Chloroethyl vinyl ether	Ave	0.1483	0.1424		48.0	50.0	-4.0	20.0
Dibromofluoromethane (Surr)	Ave	0.2426	0.2661		54.9	50.0	9.7	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3389	0.3958		58.4	50.0	16.8	20.0
Toluene-d8 (Surr)	Ave	4.363	4.263		48.9	50.0	-2.3	20.0
4-Bromofluorobenzene (Surr)	Ave	1.281	1.205		47.0	50.0	-6.0	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535659/49 Calibration Date: 05/11/2021 19:43

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P4366.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ethyl ether	Ave	0.1499	0.1554		51.8	50.0	3.7	50.0
Acrolein	Ave	0.0386	0.0401		513	494	3.9	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Lin1		0.1014		47.7	50.0	-4.6	50.0
1,1-Dichloroethene	Lin1		0.1390		47.8	50.0	-4.4	50.0
Acetone	Lin1		0.0740		206	200	3.0	50.0
Iodomethane	Lin1		0.1481		37.5	50.0	-25.1	50.0
Carbon disulfide	Ave	0.4336	0.3999		46.1	50.0	-7.8	50.0
Methyl acetate	Lin1		0.1642		99.9	100	-0.1	50.0
3-Chloro-1-propene	Ave	0.2245	0.2061		45.9	50.0	-8.2	50.0
Methylene Chloride	Ave	0.1919	0.1757		45.8	50.0	-8.4	50.0
t-Butyl alcohol	Ave	0.0281	0.0305		544	500	8.7	50.0
Acrylonitrile	Ave	0.0836	0.0830		497	500	-0.7	50.0
Methyl tert-butyl ether	Ave	0.5873	0.6258		53.3	50.0	6.6	50.0
trans-1,2-Dichloroethene	Ave	0.1614	0.1580		48.9	50.0	-2.1	50.0
Hexane	Lin1		0.8002		43.8	50.0	-12.5	50.0
Vinyl acetate	Ave	0.3898	0.3304		84.8	100	-15.2	50.0
1,1-Dichloroethane	Ave	0.3118	0.3086	0.1000	49.5	50.0	-1.0	50.0
2-Butanone (MEK)	Lin1		0.1068		190	200	-5.2	50.0
cis-1,2-Dichloroethene	Ave	0.1936	0.1835		47.4	50.0	-5.2	50.0
2,2-Dichloropropane	Ave	0.2606	0.2602		49.9	50.0	-0.1	50.0
sec-Butyl Alcohol	Ave	0.0196	0.0193		1180	1200	-1.4	50.0
Bromochloromethane	Ave	0.0835	0.0831		49.8	50.0	-0.5	50.0
Tetrahydrofuran	Ave	0.0739	0.0652		88.3	100	-11.7	50.0
Chloroform	Ave	0.3364	0.3520		52.3	50.0	4.6	50.0
1,1,1-Trichloroethane	Ave	0.2743	0.3126		57.0	50.0	14.0	50.0
Cyclohexane	Lin1		0.2602		45.7	50.0	-8.5	50.0
1,1-Dichloropropene	Ave	0.2462	0.2552		51.8	50.0	3.7	50.0
Carbon tetrachloride	Lin1		0.2502		54.2	50.0	8.4	50.0
Isobutyl alcohol	Ave	0.0084	0.0086		1270	1250	1.9	50.0
Benzene	Ave	0.7279	0.7008		48.1	50.0	-3.7	50.0
1,2-Dichloroethane	Ave	0.3063	0.3332		54.4	50.0	8.8	50.0
Trichloroethene	Ave	0.7952	0.8524		53.6	50.0	7.2	50.0
2-Pentanone	Lin2		0.1680		157	160	-1.8	50.0
Methylcyclohexane	Lin1		0.1971		44.5	50.0	-11.1	50.0
1,2-Dichloropropane	Ave	0.1862	0.1696		45.6	50.0	-8.9	50.0
1,4-Dioxane	Ave	0.0033	0.0035		1070	1000	6.9	50.0
Dibromomethane	Ave	0.1276	0.1302		51.1	50.0	2.1	50.0
Bromodichloromethane	Ave	0.2426	0.2755		56.8	50.0	13.6	50.0
cis-1,3-Dichloropropene	Ave	1.284	1.325		51.6	50.0	3.2	50.0
4-Methyl-2-pentanone (MIBK)	Ave	0.2163	0.2081		192	200	-3.8	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535659/49 Calibration Date: 05/11/2021 19:43

Instrument ID: VMS_P Calib Start Date: 04/09/2021 10:19

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/09/2021 13:23

Lab File ID: P4366.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Toluene	Ave	0.7766	0.7284		46.9	50.0	-6.2	50.0
trans-1,3-Dichloropropene	Ave	0.2709	0.2979		55.0	50.0	10.0	50.0
Ethyl methacrylate	Ave	1.230	1.324		53.8	50.0	7.6	50.0
1,1,2-Trichloroethane	Ave	0.1671	0.1728		51.7	50.0	3.4	50.0
Tetrachloroethene	Ave	0.5163	0.5218		50.5	50.0	1.1	50.0
1,3-Dichloropropane	Ave	1.377	1.386		50.3	50.0	0.7	50.0
2-Hexanone	Ave	0.6808	0.6906		203	200	1.4	50.0
Dibromochloromethane	Lin1		0.8300		54.1	50.0	8.2	50.0
1,2-Dibromoethane (EDB)	Ave	0.7724	0.8179		52.9	50.0	5.9	50.0
1-Chlorohexane	Lin2		0.9913		39.1	40.0	-2.3	50.0
Chlorobenzene	Ave	2.081	1.985	0.3000	47.7	50.0	-4.6	50.0
1,1,1,2-Tetrachloroethane	Ave	0.6669	0.7581		56.8	50.0	13.7	50.0
Ethylbenzene	Ave	1.108	1.063		48.0	50.0	-4.1	50.0
m-Xylene & p-Xylene	Ave	1.348	1.341		49.7	50.0	-0.6	50.0
o-Xylene	Ave	1.314	1.333		50.7	50.0	1.5	50.0
Styrene	Ave	2.287	2.344		51.2	50.0	2.5	50.0
Bromoform	Lin1		0.5069	0.1000	50.5	50.0	1.1	50.0
Isopropylbenzene	Ave	2.336	2.480		53.1	50.0	6.1	50.0
Cyclohexanone	Ave	0.0384	0.0409		2130	2000	6.7	50.0
1,1,2,2-Tetrachloroethane	Ave	0.7538	0.7635	0.3000	50.6	50.0	1.3	50.0
Bromobenzene	Ave	0.5527	0.5578		50.5	50.0	0.9	50.0
trans-1,4-Dichloro-2-butene	Ave	0.2216	0.1713		38.6	50.0	-22.7	50.0
1,2,3-Trichloropropane	Ave	0.2355	0.2718		57.7	50.0	15.4	50.0
N-Propylbenzene	Ave	0.5906	0.5888		49.8	50.0	-0.3	50.0
2-Chlorotoluene	Ave	0.5288	0.5195		49.1	50.0	-1.8	50.0
1,3,5-Trimethylbenzene	Ave	1.877	2.072		55.2	50.0	10.4	50.0
4-Chlorotoluene	Ave	0.5518	0.5523		50.0	50.0	0.1	50.0
tert-Butylbenzene	Ave	1.531	1.665		54.4	50.0	8.8	50.0
1,2,4-Trimethylbenzene	Ave	1.943	2.128		54.7	50.0	9.5	50.0
sec-Butylbenzene	Ave	0.4186	0.4238		50.6	50.0	1.2	50.0
1,3-Dichlorobenzene	Ave	0.9817	0.999		50.9	50.0	1.8	50.0
4-Isopropyltoluene	Ave	1.799	1.991		55.3	50.0	10.7	50.0
1,4-Dichlorobenzene	Ave	1.044	1.021		48.9	50.0	-2.2	50.0
n-Butylbenzene	Ave	1.665	1.780		53.5	50.0	6.9	50.0
1,2-Dichlorobenzene	Ave	0.9508	0.9815		51.6	50.0	3.2	50.0
1,2-Dibromo-3-Chloropropane	Lin2		0.1540		52.6	50.0	5.3	50.0
1,2,4-Trichlorobenzene	Ave	0.5226	0.5604		53.6	50.0	7.2	50.0
Hexachlorobutadiene	Lin1		0.2036		50.6	50.0	1.2	50.0
Naphthalene	Ave	1.819	2.005		55.1	50.0	10.2	50.0
1,2,3-Trichlorobenzene	Ave	0.4858	0.5201		53.5	50.0	7.1	50.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535659/49 Calibration Date: 05/11/2021 19:43

Instrument ID: VMS_P Calib Start Date: 04/30/2021 11:30

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/30/2021 14:34

Lab File ID: P4366.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Lin2		0.2500		59.5	50.0	19.1	50.0
Chloromethane	Ave	0.1619	0.1492	0.1000	46.1	50.0	-7.8	50.0
Vinyl chloride	Ave	0.1703	0.1676		49.2	50.0	-1.5	50.0
Bromomethane	Lin1		0.0742		38.5	50.0	-23.1	50.0
Chloroethane	Ave	0.1065	0.1056		49.6	50.0	-0.8	50.0
Dichlorofluoromethane	Ave	0.3202	0.3413		53.3	50.0	6.6	50.0
Trichlorofluoromethane	Ave	0.2853	0.3456		60.6	50.0	21.1	50.0
2-Chloroethyl vinyl ether	Ave	0.1483	0.1303		43.9	50.0	-12.1	50.0
Dibromofluoromethane (Surr)	Ave	0.2426	0.2686		55.4	50.0	10.7	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.3389	0.3938		58.1	50.0	16.2	50.0
Toluene-d8 (Surr)	Ave	4.363	4.276		49.0	50.0	-2.0	50.0
4-Bromofluorobenzene (Surr)	Ave	1.281	1.221		47.6	50.0	-4.7	50.0

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Sample No.: ICIS 280-532364/19 Date Analyzed: 04/13/2021 21:06

Instrument ID: VMS_MS1 GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): MS1_0149.D Heated Purge: (Y/N) N

Calibration ID: 52339

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		1000623	5.84	204211	8.58	317381	10.86
UPPER LIMIT		2001246	6.34	408422	9.08	634762	11.36
LOWER LIMIT		500312	5.34	102106	8.08	158691	10.36
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-532364/22		1027467	5.84	211202	8.58	325094	10.85
CCV 280-535660/2		713361	5.84	152963	8.58	248746	10.85
LCS 280-535660/4		688574	5.84	148362	8.58	240663	10.85
LCSD 280-535660/5		686792	5.84	149766	8.58	248041	10.85
MB 280-535660/9		663047	5.84	144311	8.58	226695	10.85
280-148061-1	05MW25-20210429	622808	5.84	133237	8.58	215724	10.85
280-148061-2	05MW20-20210429	598871	5.84	131048	8.58	206266	10.85
280-148061-3	05TW02-20210429	598004	5.84	130434	8.58	206863	10.85
280-148061-4	05TW03-20210429	649842	5.84	137493	8.58	216747	10.86
CCVC 280-535660/35		705099	5.84	149494	8.58	239849	10.85

FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Sample No.: ICIS 280-531966/22 Date Analyzed: 04/09/2021 12:14

Instrument ID: VMS_P GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): P2873.D Heated Purge: (Y/N) N

Calibration ID: 52244

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		958778	4.88	218756	7.39	321698	9.61
UPPER LIMIT		1917556	5.38	437512	7.89	643396	10.11
LOWER LIMIT		479389	4.38	109378	6.89	160849	9.11
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-531966/26		983877	4.88	226861	7.39	323994	9.61

FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Sample No.: ICIS 280-534419/21 Date Analyzed: 04/30/2021 13:25

Instrument ID: VMS_P GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): P3866.D Heated Purge: (Y/N) N

Calibration ID: 53071

		FB		CBNZd5		DCBd4	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		1001841	4.88	217094	7.39	291945	9.61
UPPER LIMIT		2003682	5.38	434188	7.89	583890	10.11
LOWER LIMIT		500921	4.38	108547	6.89	145973	9.11
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 280-535659/2		859056	4.88	189333	7.39	265761	9.61
LCS 280-535659/4		873478	4.87	194078	7.39	264462	9.61
MB 280-535659/9		880497	4.88	194224	7.39	268346	9.61
LCSD 280-535659/5		856662	4.88	190390	7.39	262168	9.61
280-148061-5	05DUP02-20210429	848764	4.88	187835	7.39	259380	9.61
280-148061-6	05FB01-20210429	864419	4.88	189734	7.39	262621	9.61
280-148061-7	05TB03-20210429	866337	4.88	190952	7.39	270406	9.61
CCVC 280-535659/49		860579	4.88	191159	7.39	268699	9.61

FB = Fluorobenzene
CBNZd5 = Chlorobenzene-d5
DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_P Start Date: 04/09/2021 09:01

Analysis Batch Number: 531966 End Date: 04/09/2021 19:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-531966/1		04/09/2021 09:01	1	P2865.D	DB-624 (60.25) 0.25(mm)
CCV 280-531966/3		04/09/2021 09:33	1		DB-624 (60.25) 0.25(mm)
CCV 280-531966/4		04/09/2021 09:56	1		DB-624 (60.25) 0.25(mm)
STD005 280-531966/17 IC		04/09/2021 10:19	1	P2868.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 10:19	1		DB-624 (60.25) 0.25(mm)
STD010 280-531966/18 IC		04/09/2021 10:42	1	P2869.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 10:42	1		DB-624 (60.25) 0.25(mm)
STD020 280-531966/19 IC		04/09/2021 11:05	1	P2870.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 11:05	1		DB-624 (60.25) 0.25(mm)
STD050 280-531966/20 IC		04/09/2021 11:28	1	P2871.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 11:28	1		DB-624 (60.25) 0.25(mm)
STD10 280-531966/21 IC		04/09/2021 11:51	1	P2872.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 11:51	1		DB-624 (60.25) 0.25(mm)
ICIS 280-531966/22		04/09/2021 12:14	1	P2873.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 12:14	1		DB-624 (60.25) 0.25(mm)
STD75 280-531966/23 IC		04/09/2021 12:37	1	P2874.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 12:37	1		DB-624 (60.25) 0.25(mm)
STD100 280-531966/24 IC		04/09/2021 13:00	1	P2875.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 13:00	1		DB-624 (60.25) 0.25(mm)
STD200 280-531966/25 IC		04/09/2021 13:23	1	P2876.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 13:23	1		DB-624 (60.25) 0.25(mm)
ICV 280-531966/26		04/09/2021 14:09	1	P2878.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 14:31	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 14:54	1		DB-624 (60.25) 0.25(mm)
ICV 280-531966/27		04/09/2021 15:17	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 15:40	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 16:03	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 16:26	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 16:49	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 17:35	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 17:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 18:20	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 18:43	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 19:06	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 19:29	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/09/2021 19:52	1		DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 04/13/2021 15:31

Analysis Batch Number: 532364 End Date: 04/13/2021 22:57

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-532364/1		04/13/2021 15:31	1	MS1_0134.D	DB-624 (60.25) 0.25(mm)
STD010 280-532364/23 IC		04/13/2021 15:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 15:58	1		DB-624 (60.25) 0.25(mm)
STD020 280-532364/24 IC		04/13/2021 16:20	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 16:20	1		DB-624 (60.25) 0.25(mm)
STD050 280-532364/25 IC		04/13/2021 16:42	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 16:42	1		DB-624 (60.25) 0.25(mm)
STD10 280-532364/26 IC		04/13/2021 17:04	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 17:04	1		DB-624 (60.25) 0.25(mm)
STD50 280-532364/27 IC		04/13/2021 17:26	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 17:26	1		DB-624 (60.25) 0.25(mm)
STD100 280-532364/28 IC		04/13/2021 17:48	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 17:48	1		DB-624 (60.25) 0.25(mm)
STD200 280-532364/29 IC		04/13/2021 18:10	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 18:10	1		DB-624 (60.25) 0.25(mm)
ICV 280-532364/30		04/13/2021 18:54	1	MS1_0143.D	DB-624 (60.25) 0.25(mm)
STD005 280-532364/14 IC		04/13/2021 19:16	1	MS1_0144.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 19:16	1		DB-624 (60.25) 0.25(mm)
STD010 280-532364/15 IC		04/13/2021 19:38	1	MS1_0145.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 19:38	1		DB-624 (60.25) 0.25(mm)
STD020 280-532364/16 IC		04/13/2021 20:00	1	MS1_0146.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 20:00	1		DB-624 (60.25) 0.25(mm)
STD050 280-532364/17 IC		04/13/2021 20:22	1	MS1_0147.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 20:22	1		DB-624 (60.25) 0.25(mm)
STD10 280-532364/18 IC		04/13/2021 20:44	1	MS1_0148.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 20:44	1		DB-624 (60.25) 0.25(mm)
ICIS 280-532364/19		04/13/2021 21:06	1	MS1_0149.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 21:06	1		DB-624 (60.25) 0.25(mm)
STD75 280-532364/31 IC		04/13/2021 21:28	1	MS1_0150.D	DB-624 (60.25) 0.25(mm)
STD100 280-532364/20 IC		04/13/2021 21:50	1	MS1_0151.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 21:50	1		DB-624 (60.25) 0.25(mm)
STD200 280-532364/21 IC		04/13/2021 22:12	1	MS1_0152.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/13/2021 22:12	1		DB-624 (60.25) 0.25(mm)
ICV 280-532364/22		04/13/2021 22:57	1	MS1_0154.D	DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_P Start Date: 04/30/2021 08:59

Analysis Batch Number: 534419 End Date: 04/30/2021 18:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-534419/1		04/30/2021 08:59	1	P3856.D	DB-624 (60.25) 0.25(mm)
STD005 280-534419/16 IC		04/30/2021 11:30	1	P3861.D	DB-624 (60.25) 0.25(mm)
STD010 280-534419/17 IC		04/30/2021 11:53	1	P3862.D	DB-624 (60.25) 0.25(mm)
STD020 280-534419/18 IC		04/30/2021 12:16	1	P3863.D	DB-624 (60.25) 0.25(mm)
STD050 280-534419/19 IC		04/30/2021 12:39	1	P3864.D	DB-624 (60.25) 0.25(mm)
STD10 280-534419/20 IC		04/30/2021 13:02	1	P3865.D	DB-624 (60.25) 0.25(mm)
ICIS 280-534419/21		04/30/2021 13:25	1	P3866.D	DB-624 (60.25) 0.25(mm)
STD75 280-534419/22 IC		04/30/2021 13:48	1	P3867.D	DB-624 (60.25) 0.25(mm)
STD100 280-534419/23 IC		04/30/2021 14:11	1	P3868.D	DB-624 (60.25) 0.25(mm)
STD200 280-534419/24 IC		04/30/2021 14:34	1	P3869.D	DB-624 (60.25) 0.25(mm)
ICV 280-534419/25		04/30/2021 18:23	1	P3873.D	DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_P Start Date: 05/11/2021 07:48

Analysis Batch Number: 535659 End Date: 05/11/2021 19:43

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535659/1		05/11/2021 07:48	1	P4335.D	DB-624 (60.25) 0.25(mm)
CCV 280-535659/2		05/11/2021 08:14	1	P4336.D	DB-624 (60.25) 0.25(mm)
CCV 280-535659/3		05/11/2021 08:37	1		DB-624 (60.25) 0.25(mm)
LCS 280-535659/4		05/11/2021 09:00	1	P4338.D	DB-624 (60.25) 0.25(mm)
MB 280-535659/9		05/11/2021 10:09	1	P4341.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 10:32	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 10:55	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:18	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:41	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:04	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:27	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:50	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:13	1		DB-624 (60.25) 0.25(mm)
LCSD 280-535659/5		05/11/2021 13:36	1	P4350.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:59	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:21	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:45	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:08	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:31	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:54	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 16:16	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 16:39	1		DB-624 (60.25) 0.25(mm)
280-148061-5	05DUP02-20210429	05/11/2021 17:02	1	P4359.D	DB-624 (60.25) 0.25(mm)
280-148061-6	05FB01-20210429	05/11/2021 17:25	1	P4360.D	DB-624 (60.25) 0.25(mm)
280-148061-7	05TB03-20210429	05/11/2021 17:48	1	P4361.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 18:11	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 18:34	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 18:57	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 19:20	1		DB-624 (60.25) 0.25(mm)
CCVC 280-535659/49		05/11/2021 19:43	1	P4366.D	DB-624 (60.25) 0.25(mm)

8260B

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_MS1 Start Date: 05/11/2021 07:33

Analysis Batch Number: 535660 End Date: 05/11/2021 18:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535660/1		05/11/2021 07:33	1	MS1_1643.D	DB-624 (60.25) 0.25(mm)
CCV 280-535660/2		05/11/2021 08:02	1	MS1_1644.D	DB-624 (60.25) 0.25(mm)
CCV 280-535660/3		05/11/2021 08:24	1		DB-624 (60.25) 0.25(mm)
LCS 280-535660/4		05/11/2021 08:47	1	MS1_1646.D	DB-624 (60.25) 0.25(mm)
LCSD 280-535660/5		05/11/2021 09:08	1	MS1_1647.D	DB-624 (60.25) 0.25(mm)
MB 280-535660/9		05/11/2021 09:51	1	MS1_1649.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 10:12	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 10:34	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 10:55	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:16	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:37	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 11:58	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:19	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 12:40	2		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:02	10		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:23	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 13:44	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:05	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:26	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 14:47	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:08	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:29	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 15:50	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 16:11	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/11/2021 16:32	1		DB-624 (60.25) 0.25(mm)
280-148061-1	05MW25-20210429	05/11/2021 16:53	1	MS1_1669.D	DB-624 (60.25) 0.25(mm)
280-148061-2	05MW20-20210429	05/11/2021 17:14	1	MS1_1670.D	DB-624 (60.25) 0.25(mm)
280-148061-3	05TW02-20210429	05/11/2021 17:36	1	MS1_1671.D	DB-624 (60.25) 0.25(mm)
280-148061-4	05TW03-20210429	05/11/2021 17:57	1	MS1_1672.D	DB-624 (60.25) 0.25(mm)
CCVC 280-535660/35		05/11/2021 18:18	1	MS1_1673.D	DB-624 (60.25) 0.25(mm)

8260B_SIM_DOD5

Volatile Organic Compounds (GC/MS)

FORM II
GC/MS VOA SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): DB-624 (60. ID: 0.25(mm)

Client Sample ID	Lab Sample ID	DCA #
05MW25-20210429	280-148061-1	100
05MW20-20210429	280-148061-2	100
05TW02-20210429	280-148061-3	101
05TW03-20210429	280-148061-4	101
05DUP02-20210429	280-148061-5	101
05FB01-20210429	280-148061-6	104
05TB03-20210429	280-148061-7	105
	MB 280-535305/6	104
	LCS 280-535305/3	104
	LCSD 280-535305/4	103

	QC LIMITS
DCA = 1,2-Dichloroethane-d4 (Surr)	70-127

Column to be used to flag recovery values

FORM II 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1229.D

Lab ID: LCS 280-535305/3 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
1,4-Dioxane	12.5	11.9	95	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM III
GC/MS VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Matrix: Water Level: Low Lab File ID: E1230.D

Lab ID: LCSD 280-535305/4 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
1,4-Dioxane	12.5	14.1	113	17	20	25-141	

Column to be used to flag recovery and RPD values

FORM III 8260B SIM

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: E1232.D Lab Sample ID: MB 280-535305/6

Matrix: Water Heated Purge:(Y/N) Y

Instrument ID: VMS_E Date Analyzed: 05/07/2021 11:20

GC Column: DB-624 (60.25) ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-535305/3	E1229.D	05/07/2021 10:14
	LCSD 280-535305/4	E1230.D	05/07/2021 10:36
05MW25-20210429	280-148061-1	E1239.D	05/07/2021 14:16
05MW20-20210429	280-148061-2	E1240.D	05/07/2021 14:39
05TW02-20210429	280-148061-3	E1241.D	05/07/2021 15:01
05TW03-20210429	280-148061-4	E1242.D	05/07/2021 15:23
05DUP02-20210429	280-148061-5	E1243.D	05/07/2021 15:45
05FB01-20210429	280-148061-6	E1244.D	05/07/2021 16:06
05TB03-20210429	280-148061-7	E1245.D	05/07/2021 16:28

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 280-148061-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535305/6
Matrix: Water
Lab File ID: E1232.D
Analysis Method: 8260B SIM
Date Collected:
Sample wt/vol: 5(mL)
Date Analyzed: 05/07/2021 11:20
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: DB-624 (60.25) ID: 0.25(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535305
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
123-91-1	1,4-Dioxane	1.0	U	1.4	1.0	0.27

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		70-127

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: E0739.D BFB Injection Date: 04/08/2021

Instrument ID: VMS_E BFB Injection Time: 12:33

Analysis Batch No.: 531869

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.6	
75	30.0 - 60.0 % of mass 95	48.4	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.9	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.4	
175	5.0 - 9.0 % of mass 174	5.1	(7.4) 1
176	95.0 - 101.0 % of mass 174	66.3	(97.0) 1
177	5.0 - 9.0 % of mass 176	4.2	(6.3) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 280-531869/2	E0740.D	04/08/2021	12:55
	IC 280-531869/3	E0741.D	04/08/2021	13:17
	IC 280-531869/4	E0742.D	04/08/2021	13:39
	IC 280-531869/5	E0743.D	04/08/2021	14:01
	ICIS 280-531869/6	E0744.D	04/08/2021	14:23
	IC 280-531869/7	E0745.D	04/08/2021	14:46
	IC 280-531869/8	E0746.D	04/08/2021	15:08
	ICV 280-531869/9	E0747.D	04/08/2021	15:30

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531869

SDG No.:

Instrument ID: VMS_E GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 04/08/2021 12:55 Calibration End Date: 04/08/2021 15:08 Calibration ID: 52241

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-531869/2	E0740.D
Level 2	IC 280-531869/3	E0741.D
Level 3	IC 280-531869/4	E0742.D
Level 4	IC 280-531869/5	E0743.D
Level 5	ICIS 280-531869/6	E0744.D
Level 6	IC 280-531869/7	E0745.D
Level 7	IC 280-531869/8	E0746.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Vinyl chloride	+++++ 0.2017	0.2360 +++++	0.1937	0.2036	0.1958	Ave		0.2061				8.3		15.0			
2-Methyl-2-propanol	2.6831 1.6302	1.9189 1.5618	1.6307	1.5017	1.6298	Lin2	0.5426	1.5110							0.9930		0.9900
Benzene	+++++ 1.3636	+++++ 1.1610	1.5025	1.4615	1.3439	Ave		1.3665				9.7		15.0			
Trichloroethene	+++++ 0.2931	0.4861 0.2359	0.3382	0.3203	0.2889	Lin2	0.0043	0.2671							0.9920		0.9900
1,4-Dioxane	2.6749 1.5772	2.3838 1.5474	1.7744	1.6549	1.6253	Lin2	0.5936	1.5799							0.9950		0.9900
1,2-Dichloroethane-d4 (Surr)	0.2901 0.2922	0.2881 0.2883	0.2897	0.2951	0.2906	Ave		0.2906				0.8		15.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
GC/MS VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1 Analy Batch No.: 531869

SDG No.:

Instrument ID: VMS_E GC Column: DB-624 (60. ID: 0.25(mm) Heated Purge: (Y/N) Y

Calibration Start Date: 04/08/2021 12:55 Calibration End Date: 04/08/2021 15:08 Calibration ID: 52241

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 280-531869/2	E0740.D
Level 2	IC 280-531869/3	E0741.D
Level 3	IC 280-531869/4	E0742.D
Level 4	IC 280-531869/5	E0743.D
Level 5	ICIS 280-531869/6	E0744.D
Level 6	IC 280-531869/7	E0745.D
Level 7	IC 280-531869/8	E0746.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Vinyl chloride	FB	Ave	+++++ 15835	386 +++++	772	1605	7752	+++++ 1.00	0.0200 +++++	0.0500	0.100	0.500
2-Methyl-2-propanol	TBAd9	Lin2	5070 319675	7823 661421	16709	30347	152404	0.503 50.3	1.01 101	2.52	5.03	25.2
Benzene	FB	Ave	+++++ 107070	+++++ 183793	5989	11520	53217	+++++ 1.00	+++++ 2.00	0.0500	0.100	0.500
Trichloroethene	FB	Lin2	+++++ 23014	795 37349	1348	2525	11441	+++++ 1.00	0.0200 2.00	0.0500	0.100	0.500
1,4-Dioxane	DXE	Lin2	455 28026	852 59314	1602	2987	14031	0.500 50.0	1.00 100	2.50	5.00	25.0
1,2-Dichloroethane-d4 (Surr)	FB	Ave	219590 229471	235624 228200	230969	232602	230130	10.0 10.0	10.0 10.0	10.0	10.0	10.0

Curve Type Legend
Ave = Average ISTD
Lin2 = Linear 1/conc^2 ISTD

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: ICV 280-531869/9 Calibration Date: 04/08/2021 15:30

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E0747.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.1841		0.447	0.500	-10.7	20.0
2-Methyl-2-propanol	Lin2		1.589		26.1	25.2	3.7	20.0
Benzene	Ave	1.366	1.350		0.494	0.500	-1.2	20.0
Trichloroethene	Lin2		0.2912		0.529	0.500	5.8	20.0
1,4-Dioxane	Lin2		1.588		24.9	25.2	-1.0	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2907		10.0	10.0	0.0	20.0

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab File ID: E1227.D BFB Injection Date: 05/07/2021

Instrument ID: VMS_E BFB Injection Time: 09:29

Analysis Batch No.: 535305

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	19.7	
75	30.0 - 60.0 % of mass 95	48.7	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	7.0	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	Greater than 50% of mass 95	68.7	
175	5.0 - 9.0 % of mass 174	5.2	(7.6) 1
176	95.0 - 101.0 % of mass 174	66.4	(96.6) 1
177	5.0 - 9.0 % of mass 176	4.4	(6.7) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCV 280-535305/2	E1228.D	05/07/2021	9:51
	LCS 280-535305/3	E1229.D	05/07/2021	10:14
	LCSD 280-535305/4	E1230.D	05/07/2021	10:36
	MB 280-535305/6	E1232.D	05/07/2021	11:20
05MW25-20210429	280-148061-1	E1239.D	05/07/2021	14:16
05MW20-20210429	280-148061-2	E1240.D	05/07/2021	14:39
05TW02-20210429	280-148061-3	E1241.D	05/07/2021	15:01
05TW03-20210429	280-148061-4	E1242.D	05/07/2021	15:23
05DUP02-20210429	280-148061-5	E1243.D	05/07/2021	15:45
05FB01-20210429	280-148061-6	E1244.D	05/07/2021	16:06
05TB03-20210429	280-148061-7	E1245.D	05/07/2021	16:28
	CCVC 280-535305/29	E1256.D	05/07/2021	20:28

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCV 280-535305/2 Calibration Date: 05/07/2021 09:51

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1228.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.2701		0.655	0.500	31.0*	20.0
2-Methyl-2-propanol	Lin2		1.565		25.7	25.2	2.1	20.0
Benzene	Ave	1.366	1.477		0.541	0.500	8.1	20.0
Trichloroethene	Lin2		0.3194		0.582	0.500	16.3	20.0
1,4-Dioxane	Lin2		1.590		24.8	25.0	-0.9	20.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2955		10.2	10.0	1.7	20.0

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Lab Sample ID: CCVC 280-535305/29 Calibration Date: 05/07/2021 20:28

Instrument ID: VMS_E Calib Start Date: 04/08/2021 12:55

GC Column: DB-624 (60.25) ID: 0.25(mm) Calib End Date: 04/08/2021 15:08

Lab File ID: E1256.D Conc. Units: ug/L Heated Purge: (Y/N) Y

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Vinyl chloride	Ave	0.2061	0.2631		0.638	0.500	27.6	50.0
2-Methyl-2-propanol	Lin2		1.623		26.7	25.2	6.0	50.0
Benzene	Ave	1.366	1.892		0.692	0.500	38.5	50.0
Trichloroethene	Lin2		0.3183		0.580	0.500	16.0	50.0
1,4-Dioxane	Lin2		1.630		25.4	25.0	1.7	50.0
1,2-Dichloroethane-d4 (Surr)	Ave	0.2906	0.2995		10.3	10.0	3.1	50.0

FORM VIII
GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Sample No.: ICIS 280-531869/6 Date Analyzed: 04/08/2021 14:23

Instrument ID: VMS_E GC Column: DB-624 (60.25) ID: 0.25(mm)

Lab File ID (Standard): E0744.D Heated Purge: (Y/N) Y

Calibration ID: 52241

		FB		DXE		CBNZd5	
		AREA #	RT #	AREA #	RT #	#	RT #
INITIAL CALIBRATION MID-POINT		792007	5.14	69065	5.61		
UPPER LIMIT		1584014	5.64	138130	6.11		
LOWER LIMIT		396004	4.64	34533	5.11		
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 280-531869/9		780669	5.14	71087	5.61		
CCV 280-535305/2		616062	5.14	65529	5.61	138369	7.67
LCS 280-535305/3		624900	5.14	66624	5.61	139817	7.67
LCSD 280-535305/4		619625	5.14	61330	5.61	138743	7.67
MB 280-535305/6		617704	5.14	62697	5.61	138210	7.67
280-148061-1	05MW25-20210429	630518	5.14	65623	5.61	140684	7.67
280-148061-2	05MW20-20210429	629967	5.14	62906	5.61	141830	7.67
280-148061-3	05TW02-20210429	636638	5.14	66819	5.61	143563	7.67
280-148061-4	05TW03-20210429	631850	5.14	65732	5.61	141160	7.67
280-148061-5	05DUP02-20210429	658081	5.14	67078	5.61	146605	7.67
280-148061-6	05FB01-20210429	642868	5.14	68481	5.61	146402	7.67
280-148061-7	05TB03-20210429	643504	5.14	67113	5.61	146063	7.67
CCVC 280-535305/29		654084	5.14	68757	5.61	147758	7.67

FB = Fluorobenzene
DXE = 1,4-Dioxane-d8

Area Limit = 50%-200% of internal standard area
CBNZd5 RT Limit = ± 0 minutes of surrogate RT
Area Limit = 50%-200% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT
Column used to flag values outside QC limits

FORM VIII 8260B SIM

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_E Start Date: 04/08/2021 12:33

Analysis Batch Number: 531869 End Date: 04/08/2021 15:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-531869/1		04/08/2021 12:33	1	E0739.D	DB-624 (60.25) 0.25(mm)
IC 280-531869/2		04/08/2021 12:55	1	E0740.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/08/2021 12:55	1		DB-624 (60.25) 0.25(mm)
IC 280-531869/3		04/08/2021 13:17	1	E0741.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/08/2021 13:17	1		DB-624 (60.25) 0.25(mm)
IC 280-531869/4		04/08/2021 13:39	1	E0742.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/08/2021 13:39	1		DB-624 (60.25) 0.25(mm)
IC 280-531869/5		04/08/2021 14:01	1	E0743.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		04/08/2021 14:01	1		DB-624 (60.25) 0.25(mm)
ICIS 280-531869/6		04/08/2021 14:23	1	E0744.D	DB-624 (60.25) 0.25(mm)
IC 280-531869/7		04/08/2021 14:46	1	E0745.D	DB-624 (60.25) 0.25(mm)
IC 280-531869/8		04/08/2021 15:08	1	E0746.D	DB-624 (60.25) 0.25(mm)
ICV 280-531869/9		04/08/2021 15:30	1	E0747.D	DB-624 (60.25) 0.25(mm)

GC/MS VOA ANALYSIS RUN LOG

Lab Name: Eurofins TestAmerica, Denver Job No.: 280-148061-1

SDG No.:

Instrument ID: VMS_E Start Date: 05/07/2021 09:29

Analysis Batch Number: 535305 End Date: 05/07/2021 20:28

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 280-535305/1		05/07/2021 09:29	1	E1227.D	DB-624 (60.25) 0.25(mm)
CCV 280-535305/2		05/07/2021 09:51	1	E1228.D	DB-624 (60.25) 0.25(mm)
LCS 280-535305/3		05/07/2021 10:14	1	E1229.D	DB-624 (60.25) 0.25(mm)
LCSD 280-535305/4		05/07/2021 10:36	1	E1230.D	DB-624 (60.25) 0.25(mm)
RINSE 280-535305/5		05/07/2021 10:58	1		DB-624 (60.25) 0.25(mm)
MB 280-535305/6		05/07/2021 11:20	1	E1232.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 12:00	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 12:25	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 12:47	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 13:10	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 13:32	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 13:54	1		DB-624 (60.25) 0.25(mm)
280-148061-1	05MW25-20210429	05/07/2021 14:16	1	E1239.D	DB-624 (60.25) 0.25(mm)
280-148061-2	05MW20-20210429	05/07/2021 14:39	1	E1240.D	DB-624 (60.25) 0.25(mm)
280-148061-3	05TW02-20210429	05/07/2021 15:01	1	E1241.D	DB-624 (60.25) 0.25(mm)
280-148061-4	05TW03-20210429	05/07/2021 15:23	1	E1242.D	DB-624 (60.25) 0.25(mm)
280-148061-5	05DUP02-20210429	05/07/2021 15:45	1	E1243.D	DB-624 (60.25) 0.25(mm)
280-148061-6	05FB01-20210429	05/07/2021 16:06	1	E1244.D	DB-624 (60.25) 0.25(mm)
280-148061-7	05TB03-20210429	05/07/2021 16:28	1	E1245.D	DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 16:50	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 17:12	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 17:34	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 17:56	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 18:17	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 18:39	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 19:01	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 19:23	1		DB-624 (60.25) 0.25(mm)
ZZZZZ		05/07/2021 19:44	1		DB-624 (60.25) 0.25(mm)
CCVC 280-535305/29		05/07/2021 20:28	1	E1256.D	DB-624 (60.25) 0.25(mm)

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **T. MOORE** **DATE:** **MAY 20, 2021**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – ORGANIC VOLATILE GASES, VOLATILE FATTY ACIDS, TOTAL ORGANIC CARBON**
NAS JRB WILLOW GROVE SITE 5
SAMPLE DELIVERY GROUP (SDG) 410-37634-1

SAMPLES: 5/Aqueous/
Organic Volatile Gases

05MW16S-20210426 05MW17I-20210427
05MW18I-20210427 05MW22-20210427
05TW01-20210427

4/Aqueous
Volatile Fatty Acids, Total Organic Carbon

05MW16S-20210426 05MW17I-20210427
05MW18I-20210427 05MW22-20210427

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 410-37634-1, consisted of five (5) aqueous environmental samples. All samples were analyzed for organic volatile gases (OVG), volatile fatty acids and total organic carbon (TOC) as referenced above.

The samples were collected by Tetra Tech, on April 26 and 27, 2021 and analyzed by Eurofins TestAmerica. All analyses were conducted in accordance with SW-846 Methods 8015D VFA, 9060A and method RSK-175 analytical and reporting protocols.

The data contained in this SDG were validated via EPA Stage 2A with regard to the following parameters: data completeness, holding times, laboratory method blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries, matrix spike recoveries and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

- The detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

Notes

Non-detected results were reported to the limit of detection (LOD).

The matrix spike percent recoveries for lactic acid and pyruvic acid were above the quality control limits for sample 05MW16S-20210426. No validation actions were required as the affected sample results were nondetected.

Executive Summary

Laboratory Performance: No issues.

Other Factors Affecting Data Quality: The results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA document "National Functional Guidelines for Organic Superfund Methods Data Review" (January 2017). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05MW16S-20210426			05MW17I-20210427			05MW18I-20210427			05MW22-20210427		
SDG: 410-37634-1	LAB_ID	410-37634-1			410-37634-3			410-37634-2			410-37634-5		
FRACTION: OVG	SAMP_DATE	4/26/2021			4/27/2021			4/27/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ACETYLENE		1.5	U		1.5	U		1.5	U		1.5	U	
ETHANE		1.5	U		1.5	U		1.5	U		0.94	J	P
ETHENE		1.4	U		0.48	J	P	1.4	U		1.4	U	
METHANE		6800			630			410			2300		

PROJ_NO: 08005-WE04	NSAMPLE	05TW01-20210427		
SDG: 410-37634-1	LAB_ID	410-37634-4		
FRACTION: OVG	SAMP_DATE	4/27/2021		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
ACETYLENE		1.5	U	
ETHANE		1.5	U	
ETHENE		1.4	U	
METHANE		13000		

PROJ_NO: 08005-WE04	NSAMPLE	05MW16S-20210426			05MW17I-20210427			05MW18I-20210427			05MW22-20210427		
SDG: 410-37634-1	LAB_ID	410-37634-1			410-37634-3			410-37634-2			410-37634-5		
FRACTION: PET	SAMP_DATE	4/26/2021			4/27/2021			4/27/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ACETIC ACID		6400	U		6400	U		6400	U		8400	J	P
BUTANOIC ACID		4000	U		4000	U		4000	U		4000	U	
LACTIC ACID		2000	U		2000	U		2000	U		2000	U	
PROPIONIC ACID		4000	U		4000	U		4000	U		4000	U	
PYRUVIC ACID		500	U		500	U		500	U		500	U	

PROJ_NO: 08005-WE04	NSAMPLE	05MW16S-20210426			05MW17I-20210427			05MW18I-20210427			05MW22-20210427		
SDG: 410-37634-1	LAB_ID	410-37634-1			410-37634-3			410-37634-2			410-37634-5		
FRACTION: MISC	SAMP_DATE	4/26/2021			4/27/2021			4/27/2021			4/27/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
TOTAL ORGANIC CARBON		1.4			1.4			1.2			7.1		

Appendix B

Results as Reported by the Laboratory

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW16S-20210426 Lab Sample ID: 410-37634-1

Matrix: Water Lab File ID: 028F2801.D

Analysis Method: RSK-175 Date Collected: 04/26/2021 14:40

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 18:41

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 534977 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	6800		5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW18I-20210427 Lab Sample ID: 410-37634-2

Matrix: Water Lab File ID: 029F2901.D

Analysis Method: RSK-175 Date Collected: 04/27/2021 10:50

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 18:53

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 534977 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	410		5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW17I-20210427 Lab Sample ID: 410-37634-3

Matrix: Water Lab File ID: 030F3001.D

Analysis Method: RSK-175 Date Collected: 04/27/2021 12:25

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 19:05

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 534977 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	630		5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	0.48	J	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05TW01-20210427 Lab Sample ID: 410-37634-4

Matrix: Water Lab File ID: 031F3101.D

Analysis Method: RSK-175 Date Collected: 04/27/2021 13:05

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 19:18

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 534977 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	13000		5.0	2.0	0.63
74-84-0	Ethane	1.5	U M	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 410-37634-1
SDG No.:
Client Sample ID: 05MW22-20210427
Lab Sample ID: 410-37634-5
Matrix: Water
Lab File ID: 032F3201.D
Analysis Method: RSK-175
Date Collected: 04/27/2021 15:30
Sample wt/vol: 18(mL)
Date Analyzed: 05/05/2021 19:30
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: Rt-Alumina KCl ID: 0.53(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 534977
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-85-1	Ethene	1.4	U	5.0	1.4	0.40

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW22-20210427 Lab Sample ID: 410-37634-5

Matrix: Water Lab File ID: 032F3201.D

Analysis Method: RSK-175 Date Collected: 04/27/2021 15:30

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 19:30

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 534977 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	2300		5.0	2.0	0.63
74-84-0	Ethane	0.94	J M	5.0	1.5	0.57
74-86-2	Acetylene	1.5	U M	5.0	1.5	0.73

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW16S-20210426 Lab Sample ID: 410-37634-1

Matrix: Water Lab File ID: 11ORGC20317018.013.d

Analysis Method: 8015D VFA Date Collected: 04/26/2021 14:40

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 04:23

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U J1	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U J1	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	114		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW18I-20210427 Lab Sample ID: 410-37634-2

Matrix: Water Lab File ID: 11ORGC20317018.014.d

Analysis Method: 8015D VFA Date Collected: 04/27/2021 10:50

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 04:54

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	114		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW17I-20210427 Lab Sample ID: 410-37634-3

Matrix: Water Lab File ID: 11ORGC20317018.015.d

Analysis Method: 8015D VFA Date Collected: 04/27/2021 12:25

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 05:26

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	112		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW22-20210427 Lab Sample ID: 410-37634-5

Matrix: Water Lab File ID: 11ORGC20317018.016.d

Analysis Method: 8015D VFA Date Collected: 04/27/2021 15:30

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 05:57

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	8400	J	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	112		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW22-20210427 Lab Sample ID: 410-37634-5

Matrix: Water Lab File ID: 48ORGA21042019.019.d

Analysis Method: 8015D VFA Date Collected: 04/27/2021 15:30

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 10:57

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 40(uL) GC Column: Supelogel ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122622 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	94		68-139

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW16S-20210426
Lab Sample ID: 410-37634-1
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37634-1
SDG ID.:
Matrix: Water
Date Sampled: 04/26/2021 14:40
Reporting Basis: WET
Date Received: 04/28/2021 11:09

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	1.4	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	1.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	1.6	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	1.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	1.6	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW18I-20210427
Lab Sample ID: 410-37634-2
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37634-1
SDG ID.:
Matrix: Water
Date Sampled: 04/27/2021 10:50
Reporting Basis: WET
Date Received: 04/28/2021 11:09

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	1.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	1.1	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	1.3	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	1.1	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	1.3	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW17I-20210427
Lab Sample ID: 410-37634-3
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37634-1
SDG ID.:
Matrix: Water
Date Sampled: 04/27/2021 12:25
Reporting Basis: WET
Date Received: 04/28/2021 11:09

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	1.4	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	1.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	1.5	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	1.3	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	1.6	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW22-20210427
Lab Sample ID: 410-37634-5
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37634-1
SDG ID.:
Matrix: Water
Date Sampled: 04/27/2021 15:30
Reporting Basis: WET
Date Received: 04/28/2021 11:09

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	7.1	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	6.8	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	7.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	6.8	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	7.4	1.0	0.90	0.50	mg/L			1	9060A

Appendix C

Support Documentation

Environ[illegible] Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

410-37634 Chain of Custody

Sample # _____

Client: Tetra Tech			
Project Name/#: NASJRB Willow Grove Site 5	Site ID #:		
Project Manager: Tricia Moore	P.O. #:		
Sampler: Donald Whalen	PWSID #:		
Phone #: 610-409-2523	Quote #:		
State where samples were collected: ___ PA	For Compliance: Yes ☐ No ☐		

For Lab Use Only
SF #: _____
SCR #: _____

Preservation Codes
H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; F = Field Filtered; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	Surface	NPDES	Water	Other:	Total # of Containers	Dissolved gases (H)	Organic acids (---)	TOC (P)	Remarks
05MW16S-20210426	4/26/21	1440	✓									✓		8	✓	✓	✓	
05MW18I-20210427	4/27/21	1050	✓									✓		8	✓	✓	✓	
05MW17I-20210427	↓	1225	✓									✓		8	✓	✓	✓	
05TW01-20210427		1305	✓									✓		3	✓			
05MW22-20210427	↓	1530	✓									✓		8	✓	✓	✓	

Turnaround Time Requested (TAT) (please check): Standard ☑ Rush ☐
(Rush TAT is subject to laboratory approval and surcharges.)

Date results are needed:

Rush results requested by (please check): E-Mail ☐ Phone ☐

E-mail Address:

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☐ MA MCP ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type VI (Raw Data Only) ☐ TX TRRP-13 ☐
NJ DKQP ☐ NYSDEC Category ☐ A or ☐ B

EDD Required? Yes ☐ No ☐ If yes, format: _____

Relinquished by:	Date	Time	Received by:	Date	Time
Donald Whalen	4/27/21	1930			

Relinquished by Commercial Carrier:
UPS _____ FedEx ✓ Other _____

Temperature upon receipt 3.0 °C

Fed Ex 7735 [illegible] 6871

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: NASJRB Willow Grove Site 5

Job ID: 410-37634-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-37634-1	05MW16S-20210426	Water	04/26/21 14:40	04/28/21 11:09	
410-37634-2	05MW18I-20210427	Water	04/27/21 10:50	04/28/21 11:09	
410-37634-3	05MW17I-20210427	Water	04/27/21 12:25	04/28/21 11:09	
410-37634-4	05TW01-20210427	Water	04/27/21 13:05	04/28/21 11:09	
410-37634-5	05MW22-20210427	Water	04/27/21 15:30	04/28/21 11:09	

Job Narrative
410-37634-1

Receipt
The samples were received on 4/28/2021 11:09 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.0°C

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Tetra Tech, Inc.
Project/Site: NASJRB Willow Grove Site 5

Job ID: 410-37634-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases (GC)	RSK	TAL DEN
8015D VFA	Volatile Fatty Acids - Direct Aqueous Injection (HPLC)	SW846	ELLE
9060A	Organic Carbon, Total (TOC)	SW846	ELLE
8015 VFA	Volatile Fatty Acids - Water Prep	SW846	ELLE

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Method RSK-175 DOD

Dissolved Gases (GC) by Method RSK_175 DOD

FORM III
GC VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 005F0501.D

Lab ID: LCS 280-534977/5 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Methane	73.0	77.1	106	73-125	
Ethane	137	146	107	74-131	
Ethene	128	148	116	72-133	
Acetylene	119	134	113	70-129	M

Column to be used to flag recovery and RPD values

FORM III RSK-175

FORM III
GC VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 006F0601.D

Lab ID: LCSD 280-534977/6 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Methane	73.0	72.3	99	6	20	73-125	
Ethane	137	137	100	6	20	74-131	
Ethene	128	142	111	4	20	72-133	M
Acetylene	119	133	112	1	20	70-129	M

Column to be used to flag recovery and RPD values

FORM III RSK-175

FORM IV
GC VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Lab Sample ID: MB 280-534977/7

Matrix: Water Date Extracted:

Lab File ID:(1) 007F0701.D Lab File ID:(2) 007F0701.D

Date Analyzed:(1) 05/05/2021 11:03 Date Analyzed:(2) 05/05/2021 11:03

Instrument ID:(1) VGC_J Instrument ID:(2) VGC_J

GC Column:(1) HP-Plot Q ID: 0.53(mm) GC Column:(2) Rt-Alumina K ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 280-534977/5	05/05/2021 10:38	05/05/2021 10:38
	LCSD 280-534977/6	05/05/2021 10:50	05/05/2021 10:50
05MW16S-20210426	410-37634-1	05/05/2021 18:41	05/05/2021 18:41
05MW18I-20210427	410-37634-2	05/05/2021 18:53	05/05/2021 18:53
05MW17I-20210427	410-37634-3	05/05/2021 19:05	05/05/2021 19:05
05TW01-20210427	410-37634-4	05/05/2021 19:18	05/05/2021 19:18
05MW22-20210427	410-37634-5	05/05/2021 19:30	05/05/2021 19:30

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 280-534977/7

Matrix: Water Lab File ID: 007F0701.D

Analysis Method: RSK-175 Date Collected:

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 11:03

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 534977 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	2.0	U	5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 280-534977/5

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 10:38 Date Analyzed (2): 05/05/2021 10:38

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.54	1.62	77.1		0.9
	2		1.17	1.13	1.21	76.4		
Ethene	1		2.37	2.32	2.42	148		1.9
	2		1.71	1.66	1.76	145		
Acetylene	1		2.49	2.41	2.57	134		10.6
	2		4.01	3.93	4.09	121		
Ethane	1		2.76	2.71	2.81	146		0.8
	2		1.43	1.38	1.48	145		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 280-534977/6

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 10:50 Date Analyzed (2): 05/05/2021 10:50

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.54	1.62	72.3		0.8
	2		1.17	1.13	1.21	71.7		
Ethene	1		2.37	2.32	2.42	142		2.8
	2		1.71	1.66	1.76	138		
Acetylene	1		2.49	2.41	2.57	133		9.0
	2		4.01	3.93	4.09	121		
Ethane	1		2.75	2.71	2.81	137		0.8
	2		1.43	1.38	1.48	136		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW16S-20210426 Lab Sample ID: 410-37634-1

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 18:41 Date Analyzed (2): 05/05/2021 18:41

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.54	1.62	6800		0.3
	2		1.18	1.13	1.21	6800		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW18I-20210427 Lab Sample ID: 410-37634-2

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 18:53 Date Analyzed (2): 05/05/2021 18:53

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.54	1.62	410		1.7
	2		1.18	1.13	1.21	410		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW17I-20210427 Lab Sample ID: 410-37634-3

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 19:05 Date Analyzed (2): 05/05/2021 19:05

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.54	1.62	630		1.8
	2		1.17	1.13	1.21	640		
Ethene	1		2.38	2.32	2.42	0.48		4.7
	2		1.71	1.66	1.76	0.50		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05TW01-20210427 Lab Sample ID: 410-37634-4

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 19:18 Date Analyzed (2): 05/05/2021 19:18

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.57	1.54	1.62	13000		0.5
	2		1.17	1.13	1.21	13000		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37634-1

SDG No.:

Client Sample ID: 05MW22-20210427 Lab Sample ID: 410-37634-5

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 19:30 Date Analyzed (2): 05/05/2021 19:30

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.54	1.62	2300		1.1
	2		1.18	1.13	1.21	2300		
Ethane	1		2.77	2.71	2.81	0.94		41.9
	2		1.41	1.38	1.48	0.62		

Method 8015D VFA

Volatile Fatty Acids-Direct Aqueous Injection(HPLC) by Method 8015D

FORM II
HPLC/IC SURROGATE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Supelcosil ID: 4.6 (mm)

Client Sample ID	Lab Sample ID	FumAcd1 #
05MW16S-20210426	410-37634-1	114
05MW18I-20210427	410-37634-2	114
05MW17I-20210427	410-37634-3	112
05MW22-20210427	410-37634-5	112
05MW22-20210427	410-37634-5	94
	MB 410-120999/1-A	114
	LCS 410-120999/2-A	113
05MW16S-20210426 MS	410-37634-1 MS	114
05MW16S-20210426 MSD	410-37634-1 MSD	114

	QC LIMITS
FumAcd = Fumaric Acid	68-139

Column to be used to flag recovery values

FORM II 8015D VFA

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317018.010.d

Lab ID: LCS 410-120999/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Acetic acid	100000	103000	103	85-115	
Butyric acid	101000	101000	100	85-115	
L-Lactic Acid	50000	56700	113	85-115	
Propionic acid	100000	103000	103	82-115	M
Pyruvic Acid	12600	14400	115	85-115	

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317018.011.d

Lab ID: 410-37634-1 MS Client ID: 05MW16S-20210426 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Acetic acid	100000	6400 U	106000	106	85-115	
Butyric acid	101000	4000 U	102000	101	85-115	
L-Lactic Acid	50000	2000 U	58000	116	85-115	J1
Propionic acid	100000	4000 U	104000	103	82-115	M
Pyruvic Acid	12600	500 U	14700	116	85-115	J1

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317018.012.d

Lab ID: 410-37634-1 MSD Client ID: 05MW16S-20210426 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Acetic acid	100000	106000	106	0	30	85-115	
Butyric acid	101000	102000	102	1	30	85-115	
L-Lactic Acid	50000	58000	116	0	20	85-115	J1
Propionic acid	100000	104000	103	0	30	82-115	M
Pyruvic Acid	12600	14700	116	0	30	85-115	J1

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Lab Sample ID: MB 410-120999/1-A

Matrix: Water Date Extracted: 04/30/2021 09:06

Lab File ID:(1) 11ORGC20317018.009.d Lab File ID:(2)

Date Analyzed:(1) 05/05/2021 02:17 Date Analyzed:(2)

Instrument ID:(1) 10136 Instrument ID:(2)

GC Column:(1) Supelcosil P ID: 4.6(mm) GC Column:(2) ID:

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 410-120999/2-A	05/05/2021 02:49	
05MW16S-20210426 MS	410-37634-1 MS	05/05/2021 03:20	
05MW16S-20210426 MSD	410-37634-1 MSD	05/05/2021 03:52	
05MW16S-20210426	410-37634-1	05/05/2021 04:23	
05MW18I-20210427	410-37634-2	05/05/2021 04:54	
05MW17I-20210427	410-37634-3	05/05/2021 05:26	
05MW22-20210427	410-37634-5	05/05/2021 05:57	

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Lab Sample ID: MB 410-120999/1-A

Matrix: Water Date Extracted: 04/30/2021 09:06

Lab File ID:(1) 48ORGA21042019.013.d Lab File ID:(2)

Date Analyzed:(1) 05/05/2021 06:41 Date Analyzed:(2)

Instrument ID:(1) 6854A Instrument ID:(2)

GC Column:(1) Supelogel ID: 4.6(mm) GC Column:(2) ID:

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 410-120999/2-A	05/05/2021 07:24	
05MW22-20210427	410-37634-5	05/05/2021 10:57	

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 410-120999/1-A

Matrix: Water Lab File ID: 11ORGC20317018.009.d

Analysis Method: 8015D VFA Date Collected:

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 02:17

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	114		68-139

FORM VIII
HPLC/IC ANALYTICAL SEQUENCE

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Sample No.: CCVRT 410-122648/8 Date Analyzed: 05/05/2021 01:46

Instrument ID: 10136 GC Column: Supelcosil PAH ID: 4.6(mm)

Lab File ID (Standard): 11ORGC20317018.008. Heated Purge: (Y/N) N

Calibration ID: 18030

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				FumAcd		
				RT #		
CONTINUING CALIBRATION SURROGATE				10.02		
UPPER LIMIT				10.12		
LOWER LIMIT				9.92		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
CCVRT 410-122648/8		05/05/2021 01:46	11ORGC20317018.008.d	10.02		
MB 410-120999/1-A		05/05/2021 02:17	11ORGC20317018.009.d	10.03		
LCS 410-120999/2-A		05/05/2021 02:49	11ORGC20317018.010.d	10.03		
410-37634-1 MS	05MW16S-20210426 MS	05/05/2021 03:20	11ORGC20317018.011.d	10.03		
410-37634-1 MSD	05MW16S-20210426 MSD	05/05/2021 03:52	11ORGC20317018.012.d	10.03		
410-37634-1	05MW16S-20210426	05/05/2021 04:23	11ORGC20317018.013.d	10.04		
410-37634-2	05MW18I-20210427	05/05/2021 04:54	11ORGC20317018.014.d	10.05		
410-37634-3	05MW17I-20210427	05/05/2021 05:26	11ORGC20317018.015.d	10.05		
410-37634-5	05MW22-20210427	05/05/2021 05:57	11ORGC20317018.016.d	10.04		
CCV 410-122648/18		05/05/2021 07:00	11ORGC20317018.018.d	10.03		

FumAcd = Fumaric Acid

FumAcd RT Limit = ± 0.1 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8015D VFA

FORM VIII
HPLC/IC ANALYTICAL SEQUENCE

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37634-1

SDG No.:

Sample No.: ICRT 410-122622/7 Date Analyzed: 05/05/2021 02:26

Instrument ID: 6854A GC Column: Supelogel ID: 4.6(mm)

Lab File ID (Standard): 48ORGA21042019.007. Heated Purge: (Y/N) N

Calibration ID: 24365

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				FumAcd		
				RT #		
INITIAL CALIBRATION SURROGATE				22.96		
UPPER LIMIT				23.06		
LOWER LIMIT				22.86		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
ICRT 410-122622/7		05/05/2021 02:26	48ORGA21042019.007.d	22.96		
CCV 410-122622/12		05/05/2021 05:59	48ORGA21042019.012.d	22.95		
CCV 410-122622/22		05/05/2021 13:05	48ORGA21042019.022.d	22.96		

FumAcd = Fumaric Acid

FumAcd RT Limit = ± 0.1 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8015D VFA

GENERAL CHEMISTRY

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37634-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	LOQ	Dil
Batch ID: 121331 Date: 05/01/2021 05:07							
9060A	MB 410-121331/4	Total Organic Carbon	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 1	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 2	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 3	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 4	0.90	U	mg/L	1.0	1

FORM III-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37634-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 121331	Date: 05/01/2021 04:38										
						LCS Source: WC_TOC_QC_STD_00022					
9060A	LCS 410-121331/3	Total Organic Carbon	23.9		mg/L	25.0	96	91-113	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE DUPLICATE
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37634-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 121331	Date: 05/01/2021 05:35										
						LCSD Source: WC_TOC_QC_STD_00022					
9060A	LCSD 410-121331/5	Total Organic Carbon	24.2		mg/L	25.0	97	91-113	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job Number: 410-37634-1

SDG Number:

Matrix: Water Instrument ID: 15610

Method: 9060A DL Date: 11/29/2018 18:05

Analyte	Wavelength/ Mass	LOQ (mg/L)	DL (mg/L)
TOC Result 1		1	0.5
TOC Result 2		1	0.5
TOC Result 3		1	0.5
TOC Result 4		1	0.5
Total Organic Carbon		1	0.5

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job Number: 410-37634-1

SDG Number:

Matrix: Water Instrument ID: 15610

Method: 9060A XMDL Date: 11/21/2018 10:17

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
TOC Result 1		1	0.5
TOC Result 2		1	0.5
TOC Result 3		1	0.5
TOC Result 4		1	0.5
Total Organic Carbon		1	0.5

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Env Job No.: 410-37634-1

SDG No.:

Instrument ID: 15610 Analysis Method: 9060A

Start Date: 05/01/2021 03:40 End Date: 05/01/2021 11:23

Lab Sample Id	D/F	Type	Time	Analytes																								
				TOC	TOC1	TOC2	TOC3	TOC4																				
CCV 410-121331/1	1		03:40	X	X	X	X	X																				
CCB 410-121331/2	1		04:09	X	X	X	X	X																				
LCS 410-121331/3	1	T	04:38	X	X	X	X	X																				
MB 410-121331/4	1	T	05:07	X	X	X	X	X																				
LCSD 410-121331/5	1	T	05:35	X	X	X	X	X																				
410-37634-1	1	T	06:04	X	X	X	X	X																				
410-37634-2	1	T	06:33	X	X	X	X	X																				
410-37634-3	1	T	07:02	X	X	X	X	X																				
410-37634-5	1	T	07:31	X	X	X	X	X																				
ZZZZZZ			08:00																									
ZZZZZZ			08:29																									
ZZZZZZ			08:58																									
CCV 410-121331/13	1		09:27	X	X	X	X	X																				
CCB 410-121331/14	1		09:57	X	X	X	X	X																				
ZZZZZZ			10:25																									
CCV 410-121331/16			10:54																									
CCB 410-121331/17			11:23																									

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: Eurofins Lancaster Laboratorie Job No.: 410-37634-1

SDG No.:

Batch Number: 121331 Batch Start Date: 05/01/21 03:40 Batch Analyst: Sandone, Bethany S

Batch Method: 9060A Batch End Date: 05/01/21 11:23

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	WC_TOC_QC_STD 00022			
CCV 410-121331/1		9060A		1000 mL	1000 mL	50 mL			
LCS 410-121331/3		9060A		1000 mL	1000 mL	50 mL			
LCSD 410-121331/5		9060A		1000 mL	1000 mL	50 mL			
CCV 410-121331/13		9060A		1000 mL	1000 mL	50 mL			

Batch Notes	
Phosphoric Acid ID	1222173
Pipette/Syringe/Dispenser ID	TOC
Sodium Persulfate ID	1222184

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **T. MOORE** **DATE:** **MAY 20, 2021**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – ORGANIC VOLATILE GASES, VOLATILE FATTY ACIDS, TOTAL ORGANIC CARBON**
NAS JRB WILLOW GROVE SITE 5
SAMPLE DELIVERY GROUP (SDG) 410-37748-1

SAMPLES: 4/Aqueous/
Organic Volatile Gases, Volatile Fatty Acid, Total Organic Carbon

05MW01S-20210428	05MW01SI-20210428
05MW21-20210428	05TW04-20210428

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 410-37748-1, consisted of four (4) aqueous environmental samples. All samples were analyzed for organic volatile gases (OVG), volatile fatty acids and total organic carbon (TOC) as referenced above.

The samples were collected by Tetra Tech, on April 28, 2021 and analyzed by Eurofins TestAmerica. All analyses were conducted in accordance with SW-846 Methods 8015D VFA, 9060A and method RSK-175 analytical and reporting protocols.

The data contained in this SDG were validated via EPA Stage 2A with regard to the following parameters: data completeness, holding times, laboratory method blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

- The detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

Notes

Non-detected results were reported to the limit of detection (LOD).

Executive Summary

Laboratory Performance: No issues.

Other Factors Affecting Data Quality: The results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA document "National Functional Guidelines for Organic Superfund Methods Data Review" (January 2017). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05MW01S-20210428			05MW01SI-20210428			05MW21-20210428			05TW04-20210428		
SDG: 410-37748-1	LAB_ID	410-37748-3			410-37748-4			410-37748-1			410-37748-2		
FRACTION: OVG	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ACETYLENE		1.5	U		1.5	U		1.5	U		1.5	U	
ETHANE		1.5	U		1.5	U		1.3	J	P	1.5	U	
ETHENE		3.1	J	P	1.4	U		4	J	P	0.8	J	P
METHANE		1100			13000			2000			1400		

PROJ_NO: 08005-WE04	NSAMPLE	05MW01S-20210428			05MW01SI-20210428			05MW21-20210428			05TW04-20210428		
SDG: 410-37748-1	LAB_ID	410-37748-3			410-37748-4			410-37748-1			410-37748-2		
FRACTION: PET	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ACETIC ACID		6400	U		6400	U		6400	U		6400	U	
BUTANOIC ACID		4000	U		4000	U		4000	U		4000	U	
LACTIC ACID		2000	U		2000	U		2000	U		2000	U	
PROPIONIC ACID		4000	U		4000	U		4000	U		4000	U	
PYRUVIC ACID		500	U		500	U		500	U		500	U	

PROJ_NO: 08005-WE04	NSAMPLE	05MW01S-20210428			05MW01SI-20210428			05MW21-20210428			05TW04-20210428		
SDG: 410-37748-1	LAB_ID	410-37748-3			410-37748-4			410-37748-1			410-37748-2		
FRACTION: MISC	SAMP_DATE	4/28/2021			4/28/2021			4/28/2021			4/28/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
TOTAL ORGANIC CARBON		6.4			13			9.5			2.2		

Appendix B

Results as Reported by the Laboratory

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW21-20210428 Lab Sample ID: 410-37748-1

Matrix: Water Lab File ID: 041F4101.D

Analysis Method: RSK-175 Date Collected: 04/28/2021 10:55

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 21:21

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	2000		5.0	2.0	0.63
74-84-0	Ethane	1.3	J	5.0	1.5	0.57
74-85-1	Ethene	4.0	J	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05TW04-20210428 Lab Sample ID: 410-37748-2

Matrix: Water Lab File ID: 042F4201.D

Analysis Method: RSK-175 Date Collected: 04/28/2021 12:35

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 21:33

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	1400		5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	0.80	J	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01S-20210428 Lab Sample ID: 410-37748-3

Matrix: Water Lab File ID: 043F4301.D

Analysis Method: RSK-175 Date Collected: 04/28/2021 13:05

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 21:45

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	1100		5.0	2.0	0.63
74-84-0	Ethane	1.5	U M	5.0	1.5	0.57
74-85-1	Ethene	3.1	J M	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01SI-20210428 Lab Sample ID: 410-37748-4

Matrix: Water Lab File ID: 044F4401.D

Analysis Method: RSK-175 Date Collected: 04/28/2021 15:25

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 21:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	13000		5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW21-20210428 Lab Sample ID: 410-37748-1

Matrix: Water Lab File ID: 11ORGC20317018.033.d

Analysis Method: 8015D VFA Date Collected: 04/28/2021 10:55

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 14:50

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
107-92-6	Butyric acid	4000	U M	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	113		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW21-20210428 Lab Sample ID: 410-37748-1

Matrix: Water Lab File ID: 48ORGA21042019.060.d

Analysis Method: 8015D VFA Date Collected: 04/28/2021 10:55

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 16:07

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 40(uL) GC Column: Supelogel ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122622 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
79-09-4	Propionic acid	4000	U	10000	4000	2000

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	94		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05TW04-20210428 Lab Sample ID: 410-37748-2

Matrix: Water Lab File ID: 11ORGC20317018.034.d

Analysis Method: 8015D VFA Date Collected: 04/28/2021 12:35

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 15:22

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	117		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01S-20210428 Lab Sample ID: 410-37748-3

Matrix: Water Lab File ID: 11ORGC20317018.035.d

Analysis Method: 8015D VFA Date Collected: 04/28/2021 13:05

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 15:53

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	114		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01SI-20210428 Lab Sample ID: 410-37748-4

Matrix: Water Lab File ID: 11ORGC20317018.036.d

Analysis Method: 8015D VFA Date Collected: 04/28/2021 15:25

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 16:24

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	113		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01SI-20210428 Lab Sample ID: 410-37748-4

Matrix: Water Lab File ID: 48ORGA21042019.062.d

Analysis Method: 8015D VFA Date Collected: 04/28/2021 15:25

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 17:32

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 40(uL) GC Column: Supelogel ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122622 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	71		68-139

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW21-20210428
Lab Sample ID: 410-37748-1
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37748-1
SDG ID.:
Matrix: Water
Date Sampled: 04/28/2021 10:55
Reporting Basis: WET
Date Received: 04/29/2021 10:57

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	9.5	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	8.9	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	9.6	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	9.5	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	9.8	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05TW04-20210428
Lab Sample ID: 410-37748-2
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37748-1
SDG ID.:
Matrix: Water
Date Sampled: 04/28/2021 12:35
Reporting Basis: WET
Date Received: 04/29/2021 10:57

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	2.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	2.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	2.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	2.0	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	2.3	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW01S-20210428
Lab Sample ID: 410-37748-3
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37748-1
SDG ID.:
Matrix: Water
Date Sampled: 04/28/2021 13:05
Reporting Basis: WET
Date Received: 04/29/2021 10:57

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	6.4	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	6.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	6.4	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	6.2	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	6.6	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW01SI-20210428
Lab Sample ID: 410-37748-4
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37748-1
SDG ID.:
Matrix: Water
Date Sampled: 04/28/2021 15:25
Reporting Basis: WET
Date Received: 04/29/2021 10:57

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	13	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	13	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	14	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	13	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	14	1.0	0.90	0.50	mg/L			1	9060A

Appendix C

Support Documentation

Environ[illegible] Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

410-37748 Chain of Custody

Sample #

Client: Tetra Tech	
Project Name/#: NASJRB Willow Grove Site 5	Site ID #:
Project Manager: Tricia Moore	P.O. #:
Sampler: Donald Whalen	PWSID #:
Phone #:	Quote #:
State where samples were collected: ____ PA	For Compliance: Yes ☐ No ☐

For Lab Use Only
SF #: _____
SCR #: _____

Preservation Codes
H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; F = Field Filtered; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	Surface	NPDES	Water	Other:	Total # of Containers	Dissolved gases (H)	Organic acids (---)	TOC (P)								Remarks
05MW21-20210428	4/28/21	1055	✓						✓			✓		8	✓	✓	✓								
05TW04-20210428		1235	✓						✓			✓		8	✓	✓	✓								
05MW01S-20210428		1305	✓						✓			✓		8	✓	✓	✓								
05MW01SI-20210428	✓	1525	✓						✓			✓		8	✓	✓	✓								

Turnaround Time Requested (TAT) (please check): Standard ☑ Rush ☐
(Rush TAT is subject to laboratory approval and surcharges.)

Date results are needed:

Rush results requested by (please check): E-Mail ☐ Phone ☐

E-mail Address:

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP) ☐ MA MCP ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type VI (Raw Data Only) ☐ TX TRRP-13 ☐
NJ DKQP ☐ NYSDEC Category ☐ A or ☐ B

EDD Required? Yes ☐ No ☐ If yes, format: _____

Relinquished by:	Date	Time	Received by:	Date	Time
Donald Whalen	4/28/21	1830			
			Received by: [signature]	4/29/21	1057

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt 3.2 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 7045 0717

Fed Ex air bill no. 773580504108

DAB

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: NASJRB Willow Grove Site 5

Job ID: 410-37748-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-37748-1	05MW21-20210428	Water	04/28/21 10:55	04/29/21 10:57	
410-37748-2	05TW04-20210428	Water	04/28/21 12:35	04/29/21 10:57	
410-37748-3	05MW01S-20210428	Water	04/28/21 13:05	04/29/21 10:57	
410-37748-4	05MW01SI-20210428	Water	04/28/21 15:25	04/29/21 10:57	

Job Narrative
410-37748-1

Receipt
The samples were received on 4/29/2021 10:57 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.2°C

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Tetra Tech, Inc.
Project/Site: NASJRB Willow Grove Site 5

Job ID: 410-37748-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases (GC)	RSK	TAL DEN
8015D VFA	Volatile Fatty Acids - Direct Aqueous Injection (HPLC)	SW846	ELLE
9060A	Organic Carbon, Total (TOC)	SW846	ELLE
8015 VFA	Volatile Fatty Acids - Water Prep	SW846	ELLE

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Method RSK-175 DOD

Dissolved Gases (GC) by Method RSK_175 DOD

FORM III
GC VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 034F3401.D

Lab ID: LCS 280-535181/60 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Methane	73.0	68.0	93	73-125	
Ethane	137	126	92	74-131	
Ethene	128	123	97	72-133	
Acetylene	119	126	106	70-129	

Column to be used to flag recovery and RPD values

FORM III RSK-175

FORM III
GC VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 035F3501.D

Lab ID: LCSD 280-535181/61 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Methane	73.0	69.6	95	2	20	73-125	
Ethane	137	128	94	1	20	74-131	
Ethene	128	124	97	1	20	72-133	
Acetylene	119	127	107	1	20	70-129	M

Column to be used to flag recovery and RPD values

FORM III RSK-175

FORM IV
GC VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Lab Sample ID: MB 280-535181/62

Matrix: Water Date Extracted:

Lab File ID:(1) 036F3601.D Lab File ID:(2) 036F3601.D

Date Analyzed:(1) 05/05/2021 20:19 Date Analyzed:(2) 05/05/2021 20:19

Instrument ID:(1) VGC_J Instrument ID:(2) VGC_J

GC Column:(1) HP-Plot Q ID: 0.53(mm) GC Column:(2) Rt-Alumina K ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 280-535181/60	05/05/2021 19:55	05/05/2021 19:55
	LCSD 280-535181/61	05/05/2021 20:07	05/05/2021 20:07
05MW21-20210428	410-37748-1	05/05/2021 21:21	05/05/2021 21:21
05TW04-20210428	410-37748-2	05/05/2021 21:33	05/05/2021 21:33
05MW01S-20210428	410-37748-3	05/05/2021 21:45	05/05/2021 21:45
05MW01SI-20210428	410-37748-4	05/05/2021 21:58	05/05/2021 21:58

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 410-37748-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 280-535181/62
Matrix: Water
Lab File ID: 036F3601.D
Analysis Method: RSK-175
Date Collected:
Sample wt/vol: 18(mL)
Date Analyzed: 05/05/2021 20:19
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: HP-Plot Q ID: 0.53(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535181
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	2.0	U	5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 280-535181/60

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 19:55 Date Analyzed (2): 05/05/2021 19:55

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.59	1.55	1.63	68.0		1.0
	2		1.18	1.14	1.22	67.3		
Ethene	1		2.38	2.34	2.44	123		2.4
	2		1.73	1.68	1.78	121		
Acetylene	1		2.51	2.42	2.58	126		2.7
	2		4.03	3.95	4.11	122		
Ethane	1		2.77	2.72	2.82	126		0.3
	2		1.44	1.40	1.50	126		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 280-535181/61

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 20:07 Date Analyzed (2): 05/05/2021 20:07

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.59	1.55	1.63	69.6		1.0
	2		1.18	1.14	1.22	68.9		
Ethene	1		2.39	2.34	2.44	124		1.7
	2		1.73	1.68	1.78	122		
Acetylene	1		2.50	2.42	2.58	127		8.2
	2		4.04	3.95	4.11	117		
Ethane	1		2.77	2.72	2.82	128		0.2
	2		1.44	1.40	1.50	128		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW21-20210428 Lab Sample ID: 410-37748-1

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 21:21 Date Analyzed (2): 05/05/2021 21:21

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.55	1.63	2000		1.4
	2		1.18	1.14	1.22	2000		
Ethene	1		2.39	2.34	2.44	4.0		0.5
	2		1.71	1.68	1.78	4.0		
Ethane	1		2.77	2.72	2.82	1.3		13.1
	2		1.42	1.40	1.50	1.5		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05TW04-20210428 Lab Sample ID: 410-37748-2

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 21:33 Date Analyzed (2): 05/05/2021 21:33

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.55	1.63	1400		1.5
	2		1.17	1.14	1.22	1400		
Ethene	1		2.38	2.34	2.44	0.80		7.7
	2		1.71	1.68	1.78	0.87		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01S-20210428 Lab Sample ID: 410-37748-3

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 21:45 Date Analyzed (2): 05/05/2021 21:45

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.58	1.55	1.63	1100		1.2
	2		1.17	1.14	1.22	1100		
Ethene	1		2.38	2.34	2.44	3.1		0.8
	2		1.71	1.68	1.78	3.1		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37748-1

SDG No.:

Client Sample ID: 05MW01SI-20210428 Lab Sample ID: 410-37748-4

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 21:58 Date Analyzed (2): 05/05/2021 21:58

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.56	1.55	1.63	13000		0.6
	2		1.17	1.14	1.22	13000		

Method 8015D VFA

Volatile Fatty Acids-Direct Aqueous Injection(HPLC) by Method 8015D

FORM II
HPLC/IC SURROGATE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37748-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Supelcosil ID: 4.6 (mm)

Client Sample ID	Lab Sample ID	FumAcd1 #
05MW21-20210428	410-37748-1	113
05MW21-20210428	410-37748-1	94
05TW04-20210428	410-37748-2	117
05MW01S-20210428	410-37748-3	114
05MW01SI-20210428	410-37748-4	113
05MW01SI-20210428	410-37748-4	71
	MB 410-120999/1-A	114
	LCS 410-120999/2-A	113

	QC LIMITS
FumAcd = Fumaric Acid	68-139

Column to be used to flag recovery values

FORM II 8015D VFA

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37748-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317018.010.d

Lab ID: LCS 410-120999/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Acetic acid	100000	103000	103	85-115	
Butyric acid	101000	101000	100	85-115	
L-Lactic Acid	50000	56700	113	85-115	
Propionic acid	100000	103000	103	82-115	M
Pyruvic Acid	12600	14400	115	85-115	

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37748-1

SDG No.:

Lab Sample ID: MB 410-120999/1-A

Matrix: Water Date Extracted: 04/30/2021 09:06

Lab File ID:(1) 11ORGC20317018.009.d Lab File ID:(2)

Date Analyzed:(1) 05/05/2021 02:17 Date Analyzed:(2)

Instrument ID:(1) 10136 Instrument ID:(2)

GC Column:(1) Supelcosil P ID: 4.6(mm) GC Column:(2) ID:

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 410-120999/2-A	05/05/2021 02:49	
05MW21-20210428	410-37748-1	05/05/2021 14:50	
05TW04-20210428	410-37748-2	05/05/2021 15:22	
05MW01S-20210428	410-37748-3	05/05/2021 15:53	
05MW01SI-20210428	410-37748-4	05/05/2021 16:24	

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 410-120999/1-A

Matrix: Water Lab File ID: 11ORGC20317018.009.d

Analysis Method: 8015D VFA Date Collected:

Extraction Method: 8015 VFA Date Extracted: 04/30/2021 09:06

Sample wt/vol: 1(mL) Date Analyzed: 05/05/2021 02:17

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 122648 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	114		68-139

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37748-1

SDG No.:

Lab Sample ID: MB 410-120999/1-A

Matrix: Water Date Extracted: 04/30/2021 09:06

Lab File ID:(1) 48ORGA21042019.013.d Lab File ID:(2)

Date Analyzed:(1) 05/05/2021 06:41 Date Analyzed:(2)

Instrument ID:(1) 6854A Instrument ID:(2)

GC Column:(1) Supelogel ID: 4.6(mm) GC Column:(2) ID:

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 410-120999/2-A	05/05/2021 07:24	
05MW21-20210428	410-37748-1	05/06/2021 16:07	
05MW01SI-20210428	410-37748-4	05/06/2021 17:32	

FORM VIII
HPLC/IC ANALYTICAL SEQUENCE

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Sample No.: CCVRT 410-122648/8 Date Analyzed: 05/05/2021 01:46

Instrument ID: 10136 GC Column: Supelcosil PAH ID: 4.6(mm)

Lab File ID (Standard): 11ORGC20317018.008. Heated Purge: (Y/N) N

Calibration ID: 18030

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				FumAcd		
				RT #		
CONTINUING CALIBRATION SURROGATE				10.02		
UPPER LIMIT				10.12		
LOWER LIMIT				9.92		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
CCVRT 410-122648/8		05/05/2021 01:46	11ORGC20317018.008.d	10.02		
MB 410-120999/1-A		05/05/2021 02:17	11ORGC20317018.009.d	10.03		
LCS 410-120999/2-A		05/05/2021 02:49	11ORGC20317018.010.d	10.03		
CCV 410-122648/18		05/05/2021 07:00	11ORGC20317018.018.d	10.03		
CCV 410-122648/30		05/05/2021 13:16	11ORGC20317018.030.d	10.01		
410-37748-1	05MW21-20210428	05/05/2021 14:50	11ORGC20317018.033.d	10.02		
410-37748-2	05TW04-20210428	05/05/2021 15:22	11ORGC20317018.034.d	10.02		
410-37748-3	05MW01S-20210428	05/05/2021 15:53	11ORGC20317018.035.d	10.00		
410-37748-4	05MW01SI-20210428	05/05/2021 16:24	11ORGC20317018.036.d	10.02		
CCV 410-122648/38		05/05/2021 17:27	11ORGC20317018.038.d	10.03		

FumAcd = Fumaric Acid

FumAcd RT Limit = ± 0.1 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8015D VFA

FORM VIII
HPLC/IC ANALYTICAL SEQUENCE

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37748-1

SDG No.:

Sample No.: ICRT 410-122622/7 Date Analyzed: 05/05/2021 02:26

Instrument ID: 6854A GC Column: Supelogel ID: 4.6(mm)

Lab File ID (Standard): 48ORGA21042019.007. Heated Purge: (Y/N) N

Calibration ID: 24365

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				FumAcd		
				RT #		
INITIAL CALIBRATION SURROGATE				22.96		
UPPER LIMIT				23.06		
LOWER LIMIT				22.86		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
ICRT 410-122622/7		05/05/2021 02:26	48ORGA21042019.007.d	22.96		
CCV 410-122622/12		05/05/2021 05:59	48ORGA21042019.012.d	22.95		
CCV 410-122622/22		05/05/2021 13:05	48ORGA21042019.022.d	22.96		

FumAcd = Fumaric Acid

FumAcd RT Limit = ± 0.1 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8015D VFA

GENERAL CHEMISTRY

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37748-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	LOQ	Dil
Batch ID: 121331 Date: 05/01/2021 05:07							
9060A	MB 410-121331/4	Total Organic Carbon	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 1	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 2	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 3	0.90	U	mg/L	1.0	1
9060A	MB 410-121331/4	TOC Result 4	0.90	U	mg/L	1.0	1

FORM III-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37748-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 121331	Date: 05/01/2021 04:38										
						LCS Source: WC_TOC_QC_STD_00022					
9060A	LCS 410-121331/3	Total Organic Carbon	23.9		mg/L	25.0	96	91-113	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

7A-IN
LAB CONTROL SAMPLE DUPLICATE
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37748-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 121331	Date: 05/01/2021 05:35										
						LCSD Source: WC_TOC_QC_STD_00022					
9060A	LCSD 410-121331/5	Total Organic Carbon	24.2		mg/L	25.0	97	91-113	1	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job Number: 410-37748-1

SDG Number:

Matrix: Water Instrument ID: 15610

Method: 9060A DL Date: 11/29/2018 18:05

Analyte	Wavelength/ Mass	LOQ (mg/L)	DL (mg/L)
TOC Result 1		1	0.5
TOC Result 2		1	0.5
TOC Result 3		1	0.5
TOC Result 4		1	0.5
Total Organic Carbon		1	0.5

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job Number: 410-37748-1

SDG Number:

Matrix: Water Instrument ID: 15610

Method: 9060A XMDL Date: 11/21/2018 10:17

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
TOC Result 1		1	0.5
TOC Result 2		1	0.5
TOC Result 3		1	0.5
TOC Result 4		1	0.5
Total Organic Carbon		1	0.5

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Env Job No.: 410-37748-1

SDG No.:

Instrument ID: 15610 Analysis Method: 9060A

Start Date: 05/01/2021 03:40 End Date: 05/01/2021 11:23

Lab Sample Id	D/F	Type	Time	Analytes																								
				TOC	TOC1	TOC2	TOC3	TOC4																				
CCV 410-121331/1	1		03:40	X	X	X	X	X																				
CCB 410-121331/2	1		04:09	X	X	X	X	X																				
LCS 410-121331/3	1	T	04:38	X	X	X	X	X																				
MB 410-121331/4	1	T	05:07	X	X	X	X	X																				
LCSD 410-121331/5	1	T	05:35	X	X	X	X	X																				
ZZZZZZ			06:04																									
ZZZZZZ			06:33																									
ZZZZZZ			07:02																									
ZZZZZZ			07:31																									
410-37748-1	1	T	08:00	X	X	X	X	X																				
410-37748-2	1	T	08:29	X	X	X	X	X																				
410-37748-3	1	T	08:58	X	X	X	X	X																				
CCV 410-121331/13	1		09:27	X	X	X	X	X																				
CCB 410-121331/14	1		09:57	X	X	X	X	X																				
410-37748-4	1	T	10:25	X	X	X	X	X																				
CCV 410-121331/16	1		10:54	X	X	X	X	X																				
CCB 410-121331/17	1		11:23	X	X	X	X	X																				

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: Eurofins Lancaster Laboratorie Job No.: 410-37748-1

SDG No.:

Batch Number: 121331 Batch Start Date: 05/01/21 03:40 Batch Analyst: Sandone, Bethany S

Batch Method: 9060A Batch End Date: 05/01/21 11:23

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	WC_TOC_QC_STD 00022			
CCV 410-121331/1		9060A		1000 mL	1000 mL	50 mL			
LCS 410-121331/3		9060A		1000 mL	1000 mL	50 mL			
LCSD 410-121331/5		9060A		1000 mL	1000 mL	50 mL			
CCV 410-121331/13		9060A		1000 mL	1000 mL	50 mL			
CCV 410-121331/16		9060A		1000 mL	1000 mL	50 mL			

Batch Notes	
Phosphoric Acid ID	1222173
Pipette/Syringe/Dispenser ID	TOC
Sodium Persulfate ID	1222184

Basis	Basis Description

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TETRA TECH **INTERNAL CORRESPONDENCE**

TO:	**T. MOORE**	**DATE:**	**MAY 20, 2021**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – ORGANIC VOLATILE GASES, VOLATILE FATTY ACIDS, TOTAL ORGANIC CARBON**
NAS JRB WILLOW GROVE SITE 5
SAMPLE DELIVERY GROUP (SDG) 410-37944-1

SAMPLES: 4/Aqueous/
Organic Volatile Gases, Volatile Fatty Acid, Total Organic Carbon

05MW20-20210429	05MW25-20210429
05TW02-20210429	05TW03-20210429

Overview

The sample set for NAS JRB Willow Grove Site 5, SDG 410-37748-1, consisted of four (4) aqueous environmental samples. All samples were analyzed for organic volatile gases (OVG), volatile fatty acids and total organic carbon (TOC) as referenced above.

The samples were collected by Tetra Tech, on April 29, 2021 and analyzed by Eurofins TestAmerica. All analyses were conducted in accordance with SW-846 Methods 8015D VFA, 9060A and EPA method RSK-175 analytical and reporting protocols.

The data contained in this SDG were validated via EPA Stage 2A with regard to the following parameters: data completeness, holding times, laboratory method blanks, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate recoveries, matrix spike / matrix spike duplicate recoveries and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

- The detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

- The matrix spike and/or matrix spike duplicate percent recoveries (MS and/or MSD) for acetic acid, butanoic acid, propionic acid and pyruvic acid were below the quality control limit for sample 05MW25-20210429. The nondetected results for these compounds in the affected sample were qualified as estimated (UJ).

- The MSD percent recovery for TOC was below the quality control limit for sample 05MW25-20210429. The MS percent recovery was within quality control limits. The detected result for TOC in the affected sample was qualified as estimated (J).

Notes

Non-detected results were reported to the limit of detection (LOD).

Executive Summary

Laboratory Performance: No issues.

Other Factors Affecting Data Quality: The results below the LOQ were estimated. Several MS and/or MSD percent recoveries were outside the quality control limits.

The data for these analyses were reviewed with reference to the EPA document "National Functional Guidelines for Organic Superfund Methods Data Review" (January 2017). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator

Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's r < 0.995
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient r < 0.995
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	05MW20-20210429			05MW25-20210429			05TW02-20210429			05TW03-20210429		
SDG: 410-37944-1	LAB_ID	410-37944-2			410-37944-1			410-37944-3			410-37944-4		
FRACTION: OVG	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ACETYLENE		1.5	U		1.5	U		1.5	U		1.5	U	
ETHANE		1.5	U		1.3	J	P	1.5	U		1.5	U	
ETHENE		1.4	U		1.7	J	P	1.4	U		1.4	U	
METHANE		19000			8300			20000			3900		

PROJ_NO: 08005-WE04	NSAMPLE	05MW20-20210429			05MW25-20210429			05TW02-20210429			05TW03-20210429		
SDG: 410-37944-1	LAB_ID	410-37944-2			410-37944-1			410-37944-3			410-37944-4		
FRACTION: PET	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ACETIC ACID		6400	U		6400	UJ	D	6400	U		6400	U	
BUTANOIC ACID		4000	U		4000	UJ	D	4000	U		4000	U	
LACTIC ACID		2000	U		2000	U		2000	U		2000	U	
PROPIONIC ACID		4000	U		4000	UJ	D	4000	U		4000	U	
PYRUVIC ACID		500	U		500	UJ	D	500	U		500	U	

PROJ_NO: 08005-WE04	NSAMPLE	05MW20-20210429			05MW25-20210429			05TW02-20210429			05TW03-20210429		
SDG: 410-37944-1	LAB_ID	410-37944-2			410-37944-1			410-37944-3			410-37944-4		
FRACTION: MISC	SAMP_DATE	4/29/2021			4/29/2021			4/29/2021			4/29/2021		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
TOTAL ORGANIC CARBON		29			12	J	D	15			7.7		

Appendix B

Results as Reported by the Laboratory

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW25-20210429 Lab Sample ID: 410-37944-1

Matrix: Water Lab File ID: 045F4501.D

Analysis Method: RSK-175 Date Collected: 04/29/2021 10:15

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 22:10

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	8300		5.0	2.0	0.63
74-84-0	Ethane	1.3	J M	5.0	1.5	0.57
74-85-1	Ethene	1.7	J	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver
Job No.: 410-37944-1
SDG No.:
Client Sample ID: 05MW20-20210429
Lab Sample ID: 410-37944-2
Matrix: Water
Lab File ID: 046F4601.D
Analysis Method: RSK-175
Date Collected: 04/29/2021 12:25
Sample wt/vol: 18(mL)
Date Analyzed: 05/05/2021 22:22
Soil Aliquot Vol:
Dilution Factor: 1
Soil Extract Vol.:
GC Column: Rt-Alumina KCl ID: 0.53(mm)
% Moisture:
Level: (low/med) Low
Analysis Batch No.: 535181
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-84-0	Ethane	1.5	U	5.0	1.5	0.57

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW20-20210429 Lab Sample ID: 410-37944-2

Matrix: Water Lab File ID: 046F4601.D

Analysis Method: RSK-175 Date Collected: 04/29/2021 12:25

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 22:22

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	19000		5.0	2.0	0.63
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05TW02-20210429 Lab Sample ID: 410-37944-3

Matrix: Water Lab File ID: 047F4701.D

Analysis Method: RSK-175 Date Collected: 04/29/2021 11:00

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 22:34

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	20000		5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05TW03-20210429 Lab Sample ID: 410-37944-4

Matrix: Water Lab File ID: 048F4801.D

Analysis Method: RSK-175 Date Collected: 04/29/2021 14:35

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 22:46

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	3900		5.0	2.0	0.63
74-84-0	Ethane	1.5	U M	5.0	1.5	0.57
74-85-1	Ethene	1.4	U M	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW25-20210429 Lab Sample ID: 410-37944-1

Matrix: Water Lab File ID: 11ORGC20317019.011.d

Analysis Method: 8015D VFA Date Collected: 04/29/2021 10:15

Extraction Method: 8015 VFA Date Extracted: 05/04/2021 10:49

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 19:56

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 123343 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	112		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW25-20210429 Lab Sample ID: 410-37944-1

Matrix: Water Lab File ID: 48ORGA21042020.007.d

Analysis Method: 8015D VFA Date Collected: 04/29/2021 10:15

Extraction Method: 8015 VFA Date Extracted: 05/04/2021 10:49

Sample wt/vol: 1(mL) Date Analyzed: 05/07/2021 12:42

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 40(uL) GC Column: Supelogel ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 123735 Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	96		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW20-20210429 Lab Sample ID: 410-37944-2

Matrix: Water Lab File ID: 11ORGC20317019.012.d

Analysis Method: 8015D VFA Date Collected: 04/29/2021 12:25

Extraction Method: 8015 VFA Date Extracted: 05/04/2021 10:49

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 20:27

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 123343 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	112		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05TW02-20210429 Lab Sample ID: 410-37944-3

Matrix: Water Lab File ID: 11ORGC20317019.013.d

Analysis Method: 8015D VFA Date Collected: 04/29/2021 11:00

Extraction Method: 8015 VFA Date Extracted: 05/04/2021 10:49

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 20:58

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 123343 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	89		68-139

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05TW03-20210429 Lab Sample ID: 410-37944-4

Matrix: Water Lab File ID: 11ORGC20317019.014.d

Analysis Method: 8015D VFA Date Collected: 04/29/2021 14:35

Extraction Method: 8015 VFA Date Extracted: 05/04/2021 10:49

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 21:30

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 123343 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	114		68-139

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW25-20210429
Lab Sample ID: 410-37944-1
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37944-1
SDG ID.:
Matrix: Water
Date Sampled: 04/29/2021 10:15
Reporting Basis: WET
Date Received: 04/30/2021 11:25

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	12	1.0	0.90	0.50	mg/L		J1	1	9060A
TOC Result 1	11	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	12	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	12	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	12	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05MW20-20210429
Lab Sample ID: 410-37944-2
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37944-1
SDG ID.:
Matrix: Water
Date Sampled: 04/29/2021 12:25
Reporting Basis: WET
Date Received: 04/30/2021 11:25

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	29	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	28	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	29	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	28	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	30	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05TW02-20210429
Lab Sample ID: 410-37944-3
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37944-1
SDG ID.:
Matrix: Water
Date Sampled: 04/29/2021 11:00
Reporting Basis: WET
Date Received: 04/30/2021 11:25

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	15	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	15	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	16	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	15	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	16	1.0	0.90	0.50	mg/L			1	9060A

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 05TW03-20210429
Lab Sample ID: 410-37944-4
Lab Name: Eurofins Lancaster Laboratories Env
Job No.: 410-37944-1
SDG ID.:
Matrix: Water
Date Sampled: 04/29/2021 14:35
Reporting Basis: WET
Date Received: 04/30/2021 11:25

Analyte	Result	LOQ	LOD	DL	Units	C	Q	DIL	Method
Total Organic Carbon	7.7	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 1	7.3	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 2	8.0	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 3	7.6	1.0	0.90	0.50	mg/L			1	9060A
TOC Result 4	7.9	1.0	0.90	0.50	mg/L			1	9060A

Appendix C

Support Documentation

Envir[illegible]s Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

410-37944 Chain of Custody

Sample # _____

Client: Tetra Tech			
Project Name/#: NASJRB Willow Grove Site 5	Site ID #:		
Project Manager: Tricia Moore	P.O. #:		
Sampler: Donald Whalen	PWSID #:		
Phone #:	Quote #:		
State where samples were collected: ____ PA	For Compliance: Yes ☐ No ☐		

For Lab Use Only
SF #: _____
SCR #: _____

Preservation Codes
H = HCl; T = Thiosulfate; N = HNO_3; B = NaOH; S = H_2SO_4; P = H_3PO_4; F = Field Filtered; O = Other

Sample Identification	Collection Date	Collection Time	Grab	Composite	Matrix: Soil	Sediment	Tissue	Potable	Ground	Surface	NPDES	Water	Other:	Total # of Containers	Dissolved gases (H)	Organic acids (---)	TOC (P)	Remarks
05MW25-20210429	4/29/21	1015	✓									✓		8	✓	✓	✓	
05MW20-20210429	↓	1225	✓									✓		8	✓	✓	✓	
05TW02-20210429	↓	1100	✓									✓		8	✓	✓	✓	
05TW03-20210429	↓	1435	✓									✓		8	✓	✓	✓	

Turnaround Time Requested (TAT) (please check): Standard ☑ Rush ☐
(Rush TAT is subject to laboratory approval and surcharges.)

Date results are needed:

Rush results requested by (please check): E-Mail ☐ Phone ☐

E-mail Address:

Phone:

Data Package Options (please check if required)

Type I (Validation/non-CLP)	☐	MA MCP	☐
Type III (Reduced non-CLP)	☐	CT RCP	☐
Type VI (Raw Data Only)	☐	TX TRRP-13	☐
NJ DKQP	☐	NYSDEC Category	☐ A or ☐ B

DAO

EDD Required? Yes ☐ No ☐ If yes, format: _____

Relinquished by:	Date	Time	Received by:	Date	Time
Donald Whalen	4/29/21	1830			
			Received by: [signature]	4/30/21	1125

Relinquished by Commercial Carrier:
UPS _____ FedEx X Other _____

Temperature upon receipt 3.2 °C

Fed Ex airbill No. 773593099950

7045 0717

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: NASJRB Willow Grove Site 5

Job ID: 410-37944-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
410-37944-1	05MW25-20210429	Water	04/29/21 10:15	04/30/21 11:25	
410-37944-2	05MW20-20210429	Water	04/29/21 12:25	04/30/21 11:25	
410-37944-3	05TW02-20210429	Water	04/29/21 11:00	04/30/21 11:25	
410-37944-4	05TW03-20210429	Water	04/29/21 14:35	04/30/21 11:25	

Job Narrative
410-37944-1

Receipt
The samples were received on 4/30/2021 11:25 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.2°C

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Qualifiers

GC VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

HPLC/IC

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Tetra Tech, Inc.
Project/Site: NASJRB Willow Grove Site 5

Job ID: 410-37944-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases (GC)	RSK	TAL DEN
8015D VFA	Volatile Fatty Acids - Direct Aqueous Injection (HPLC)	SW846	ELLE
9060A	Organic Carbon, Total (TOC)	SW846	ELLE
8015 VFA	Volatile Fatty Acids - Water Prep	SW846	ELLE

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Method RSK-175 DOD

Dissolved Gases (GC) by Method RSK_175 DOD

FORM III
GC VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 034F3401.D

Lab ID: LCS 280-535181/60 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Methane	73.0	68.0	93	73-125	
Ethane	137	126	92	74-131	
Ethene	128	123	97	72-133	
Acetylene	119	126	106	70-129	

Column to be used to flag recovery and RPD values

FORM III RSK-175

FORM III
GC VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 035F3501.D

Lab ID: LCSD 280-535181/61 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Methane	73.0	69.6	95	2	20	73-125	
Ethane	137	128	94	1	20	74-131	
Ethene	128	124	97	1	20	72-133	
Acetylene	119	127	107	1	20	70-129	M

Column to be used to flag recovery and RPD values

FORM III RSK-175

FORM IV
GC VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Lab Sample ID: MB 280-535181/62

Matrix: Water Date Extracted:

Lab File ID:(1) 036F3601.D Lab File ID:(2) 036F3601.D

Date Analyzed:(1) 05/05/2021 20:19 Date Analyzed:(2) 05/05/2021 20:19

Instrument ID:(1) VGC_J Instrument ID:(2) VGC_J

GC Column:(1) HP-Plot Q ID: 0.53(mm) GC Column:(2) Rt-Alumina K ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 280-535181/60	05/05/2021 19:55	05/05/2021 19:55
	LCSD 280-535181/61	05/05/2021 20:07	05/05/2021 20:07
05MW25-20210429	410-37944-1	05/05/2021 22:10	05/05/2021 22:10
05MW20-20210429	410-37944-2	05/05/2021 22:22	05/05/2021 22:22
05TW02-20210429	410-37944-3	05/05/2021 22:34	05/05/2021 22:34
05TW03-20210429	410-37944-4	05/05/2021 22:46	05/05/2021 22:46

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 280-535181/62

Matrix: Water Lab File ID: 036F3601.D

Analysis Method: RSK-175 Date Collected:

Sample wt/vol: 18(mL) Date Analyzed: 05/05/2021 20:19

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: HP-Plot Q ID: 0.53(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 535181 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
74-82-8	Methane	2.0	U	5.0	2.0	0.63
74-84-0	Ethane	1.5	U	5.0	1.5	0.57
74-85-1	Ethene	1.4	U	5.0	1.4	0.40
74-86-2	Acetylene	1.5	U	5.0	1.5	0.73

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 280-535181/60

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 19:55 Date Analyzed (2): 05/05/2021 19:55

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.59	1.55	1.63	68.0		1.0
	2		1.18	1.14	1.22	67.3		
Ethene	1		2.38	2.34	2.44	123		2.4
	2		1.73	1.68	1.78	121		
Acetylene	1		2.51	2.42	2.58	126		2.7
	2		4.03	3.95	4.11	122		
Ethane	1		2.77	2.72	2.82	126		0.3
	2		1.44	1.40	1.50	126		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 280-535181/61

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 20:07 Date Analyzed (2): 05/05/2021 20:07

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.59	1.55	1.63	69.6		1.0
	2		1.18	1.14	1.22	68.9		
Ethene	1		2.39	2.34	2.44	124		1.7
	2		1.73	1.68	1.78	122		
Acetylene	1		2.50	2.42	2.58	127		8.2
	2		4.04	3.95	4.11	117		
Ethane	1		2.77	2.72	2.82	128		0.2
	2		1.44	1.40	1.50	128		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW25-20210429 Lab Sample ID: 410-37944-1

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 22:10 Date Analyzed (2): 05/05/2021 22:10

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.57	1.55	1.63	8300		1.6
	2		1.17	1.14	1.22	8200		
Ethene	1		2.37	2.34	2.44	1.7		7.3
	2		1.70	1.68	1.78	1.6		
Ethane	1		2.77	2.72	2.82	1.3		17.4
	2		1.40	1.40	1.50	1.1		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05MW20-20210429 Lab Sample ID: 410-37944-2

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 22:22 Date Analyzed (2): 05/05/2021 22:22

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.55	1.55	1.63	19000		0.2
	2		1.16	1.14	1.22	19000		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05TW02-20210429 Lab Sample ID: 410-37944-3

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 22:34 Date Analyzed (2): 05/05/2021 22:34

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.55	1.55	1.63	20000		1.6
	2		1.16	1.14	1.22	21000		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Denver Job No.: 410-37944-1

SDG No.:

Client Sample ID: 05TW03-20210429 Lab Sample ID: 410-37944-4

Instrument ID (1): VGC_J Instrument ID (2): VGC_J

Date Analyzed (1): 05/05/2021 22:46 Date Analyzed (2): 05/05/2021 22:46

GC Column (1): HP-Plot Q ID: 0.53(mm) GC Column (2): Rt-Alumina KC ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Methane	1		1.57	1.55	1.63	3900		0.6
	2		1.17	1.14	1.22	3900		

Method 8015D VFA

Volatile Fatty Acids-Direct Aqueous Injection(HPLC) by Method 8015D

FORM II
HPLC/IC SURROGATE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Supelcosil ID: 4.6 (mm)

Client Sample ID	Lab Sample ID	FumAcd1 #
05MW25-20210429	410-37944-1	112
05MW25-20210429	410-37944-1	96
05MW20-20210429	410-37944-2	112
05TW02-20210429	410-37944-3	89
05TW03-20210429	410-37944-4	114
	MB 410-122210/1-A	116
	LCS 410-122210/2-A	114
05MW25-20210429 MS	410-37944-1 MS	117
05MW25-20210429 MSD	410-37944-1 MSD	116

QC LIMITS
68-139

FumAcd = Fumaric Acid

Column to be used to flag recovery values

FORM II 8015D VFA

FORM III
HPLC/IC LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317019.008.d

Lab ID: LCS 410-122210/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Acetic acid	100000	103000	103	85-115	
Butyric acid	101000	101000	100	85-115	
L-Lactic Acid	50000	56500	113	85-115	
Propionic acid	100000	102000	102	82-115	M
Pyruvic Acid	12600	14000	112	85-115	

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM III
HPLC/IC MATRIX SPIKE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317019.009.d

Lab ID: 410-37944-1 MS Client ID: 05MW25-20210429 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Acetic acid	100000	6400 U	81500	81	85-115	J1
Butyric acid	101000	4000 U	76800	76	85-115	M J1
L-Lactic Acid	50000	2000 U	42400	85	85-115	
Propionic acid	100000	4000 U	78100	78	82-115	M J1
Pyruvic Acid	12600	500 U	10700	85	85-115	

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM III
HPLC/IC MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 11ORGC20317019.010.d

Lab ID: 410-37944-1 MSD Client ID: 05MW25-20210429 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Acetic acid	100000	81300	81	0	30	85-115	J1
Butyric acid	101000	76700	76	0	30	85-115	M J1
L-Lactic Acid	50000	42300	85	0	20	85-115	
Propionic acid	100000	78600	78	1	30	82-115	M J1
Pyruvic Acid	12600	10600	84	0	30	85-115	J1

Column to be used to flag recovery and RPD values

FORM III 8015D VFA

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Lab Sample ID: MB 410-122210/1-A

Matrix: Water Date Extracted: 05/04/2021 10:49

Lab File ID:(1) 11ORGC20317019.007.d Lab File ID:(2)

Date Analyzed:(1) 05/06/2021 17:50 Date Analyzed:(2)

Instrument ID:(1) 10136 Instrument ID:(2)

GC Column:(1) Supelcosil P ID: 4.6(mm) GC Column:(2) ID:

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 410-122210/2-A	05/06/2021 18:21	
05MW25-20210429 MS	410-37944-1 MS	05/06/2021 18:53	
05MW25-20210429 MSD	410-37944-1 MSD	05/06/2021 19:24	
05MW25-20210429	410-37944-1	05/06/2021 19:56	
05MW20-20210429	410-37944-2	05/06/2021 20:27	
05TW02-20210429	410-37944-3	05/06/2021 20:58	
05TW03-20210429	410-37944-4	05/06/2021 21:30	

FORM IV
HPLC/IC METHOD BLANK SUMMARY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Lab Sample ID: MB 410-122210/1-A

Matrix: Water Date Extracted: 05/04/2021 10:49

Lab File ID:(1) 48ORGA21042020.006.d Lab File ID:(2)

Date Analyzed:(1) 05/07/2021 12:00 Date Analyzed:(2)

Instrument ID:(1) 6854A Instrument ID:(2)

GC Column:(1) Supelogel ID: 4.6(mm) GC Column:(2) ID:

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
05MW25-20210429	410-37944-1	05/07/2021 12:42	
	LCS 410-122210/2-A	05/07/2021 13:25	

FORM I
HPLC/IC ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 410-122210/1-A

Matrix: Water Lab File ID: 11ORGC20317019.007.d

Analysis Method: 8015D VFA Date Collected:

Extraction Method: 8015 VFA Date Extracted: 05/04/2021 10:49

Sample wt/vol: 1(mL) Date Analyzed: 05/06/2021 17:50

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 50(uL) GC Column: Supelcosil PAH ID: 4.6(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 123343 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
64-19-7	Acetic acid	6400	U	10000	6400	3200
107-92-6	Butyric acid	4000	U	10000	4000	2000
79-33-4	L-Lactic Acid	2000	U	5000	2000	1000
79-09-4	Propionic acid	4000	U M	10000	4000	2000
127-17-3	Pyruvic Acid	500	U	1300	500	250

CAS NO.	SURROGATE	%REC	Q	LIMITS
110-17-8	Fumaric Acid	116		68-139

FORM VIII
HPLC/IC ANALYTICAL SEQUENCE

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Sample No.: CCVRT 410-123343/8 Date Analyzed: 05/06/2021 17:19

Instrument ID: 10136 GC Column: Supelcosil PAH ID: 4.6(mm)

Lab File ID (Standard): 11ORGC20317019.006. Heated Purge: (Y/N) N

Calibration ID: 18030

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				FumAcd		
				RT #		
CONTINUING CALIBRATION SURROGATE				10.10		
UPPER LIMIT				10.20		
LOWER LIMIT				10.00		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
CCVRT 410-123343/8		05/06/2021 17:19	11ORGC20317019.006.d	10.10		
MB 410-122210/1-A		05/06/2021 17:50	11ORGC20317019.007.d	10.23 *		
LCS 410-122210/2-A		05/06/2021 18:21	11ORGC20317019.008.d	10.09		
410-37944-1 MS	05MW25-20210429 MS	05/06/2021 18:53	11ORGC20317019.009.d	10.08		
410-37944-1 MSD	05MW25-20210429 MSD	05/06/2021 19:24	11ORGC20317019.010.d	10.11		
410-37944-1	05MW25-20210429	05/06/2021 19:56	11ORGC20317019.011.d	10.15		
410-37944-2	05MW20-20210429	05/06/2021 20:27	11ORGC20317019.012.d	10.12		
410-37944-3	05TW02-20210429	05/06/2021 20:58	11ORGC20317019.013.d	10.08		
410-37944-4	05TW03-20210429	05/06/2021 21:30	11ORGC20317019.014.d	10.13		
CCV 410-123343/18		05/06/2021 23:04	11ORGC20317019.017.d	10.11		

FumAcd = Fumaric Acid

FumAcd RT Limit = ± 0.1 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8015D VFA

FORM VIII
HPLC/IC ANALYTICAL SEQUENCE

Lab Name: Eurofins Lancaster Laboratories E Job No.: 410-37944-1

SDG No.:

Sample No.: CCVRT 410-123735/5 Date Analyzed: 05/07/2021 11:17

Instrument ID: 6854A GC Column: Supelogel ID: 4.6(mm)

Lab File ID (Standard): 48ORGA21042020.005. Heated Purge: (Y/N) N

Calibration ID: 24365

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, MS/MSDs AND LCSs IS GIVEN BELOW:

				FumAcd		
				RT #		
CONTINUING CALIBRATION SURROGATE				22.93		
UPPER LIMIT				23.03		
LOWER LIMIT				22.83		
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	LAB FILE ID			
CCVRT 410-123735/5		05/07/2021 11:17	48ORGA21042020.005.d	22.93		
410-37944-1	05MW25-20210429	05/07/2021 12:42	48ORGA21042020.007.d	22.93		
CCV 410-123735/11		05/07/2021 14:50	48ORGA21042020.010.d	22.93		

FumAcd = Fumaric Acid

FumAcd RT Limit = ± 0.1 minutes of surrogate RT

Column used to flag values outside QC limits

FORM VIII 8015D VFA

GENERAL CHEMISTRY

3-IN
METHOD BLANK
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job No.: 410-37944-1

SDG No.:

Method	Lab Sample ID	Analyte	Result	Qual	Units	LOQ	Dil
Batch ID: 123352 Date: 05/06/2021 06:13							
9060A	MB 410-123352/4	Total Organic Carbon	0.90	U	mg/L	1.0	1
9060A	MB 410-123352/4	TOC Result 1	0.90	U	mg/L	1.0	1
9060A	MB 410-123352/4	TOC Result 2	0.90	U	mg/L	1.0	1
9060A	MB 410-123352/4	TOC Result 3	0.90	U	mg/L	1.0	1
9060A	MB 410-123352/4	TOC Result 4	0.90	U	mg/L	1.0	1

FORM III-IN

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37944-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 123352	Date: 05/06/2021 07:11										
9060A	410-37944-1	Total Organic Carbon	12		mg/L						J1
9060A	410-37944-1 MS	Total Organic Carbon	21.3		mg/L	10.0	94	91-113			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37944-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 123352 Date: 05/06/2021 07:40											
9060A	410-37944-1 MSD	Total Organic Carbon	20.1		mg/L	10.0	83	91-113	6	20	J1

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM V-IN

7A-IN
LAB CONTROL SAMPLE
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories En Job No.: 410-37944-1

SDG No.:

Matrix: Water

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 123352	Date: 05/06/2021 05:44										
						LCS Source: WC_TOC_QC_STD_00022					
9060A	LCS 410-123352/3	Total Organic Carbon	24.0		mg/L	25.0	96	91-113			

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIIA-IN

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job Number: 410-37944-1

SDG Number:

Matrix: Water Instrument ID: 15610

Method: 9060A DL Date: 11/29/2018 18:05

Analyte	Wavelength/ Mass	LOQ (mg/L)	DL (mg/L)
TOC Result 1		1	0.5
TOC Result 2		1	0.5
TOC Result 3		1	0.5
TOC Result 4		1	0.5
Total Organic Carbon		1	0.5

9-IN
CALIBRATION BLANK DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Job Number: 410-37944-1

SDG Number:

Matrix: Water Instrument ID: 15610

Method: 9060A XMDL Date: 11/21/2018 10:17

Analyte	Wavelength/ Mass	XRL (mg/L)	XMDL (mg/L)
TOC Result 1		1	0.5
TOC Result 2		1	0.5
TOC Result 3		1	0.5
TOC Result 4		1	0.5
Total Organic Carbon		1	0.5

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: Eurofins Lancaster Laboratories Env Job No.: 410-37944-1

SDG No.:

Instrument ID: 15610 Analysis Method: 9060A

Start Date: 05/06/2021 04:46 End Date: 05/06/2021 13:58

Lab Sample Id	D/F	Type	Time	Analytes																								
				TOC	TOC1	TOC2	TOC3	TOC4																				
CCV 410-123352/1	1		04:46	X	X	X	X	X																				
CCB 410-123352/2	1		05:15	X	X	X	X	X																				
LCS 410-123352/3	1	T	05:44	X	X	X	X	X																				
MB 410-123352/4	1	T	06:13	X	X	X	X	X																				
410-37944-1	1	T	06:42	X	X	X	X	X																				
410-37944-1 MS	1	T	07:11	X	X	X	X	X																				
410-37944-1 MSD	1	T	07:40	X	X	X	X	X																				
410-37944-2	1	T	08:09	X	X	X	X	X																				
410-37944-3	1	T	08:38	X	X	X	X	X																				
410-37944-4	1	T	09:07	X	X	X	X	X																				
CCV 410-123352/11	1		09:36	X	X	X	X	X																				
CCB 410-123352/12	1		10:06	X	X	X	X	X																				
ZZZZZZ			10:35																									
ZZZZZZ			11:04																									
ZZZZZZ			11:33																									
ZZZZZZ			12:02																									
ZZZZZZ			12:31																									
ZZZZZZ			13:00																									
CCV 410-123352/19			13:29																									
CCB 410-123352/20			13:58																									

Prep Types:
T = Total/NA

FORM XIII-IN

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: Eurofins Lancaster Laboratorie Job No.: 410-37944-1

SDG No.:

Batch Number: 123352 Batch Start Date: 05/06/21 04:46 Batch Analyst: Sandone, Bethany S

Batch Method: 9060A Batch End Date: 05/06/21 13:58

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	WC_TOC_QC_STD 00022			
CCV 410-123352/1		9060A		1000 mL	1000 mL	50 mL			
LCS 410-123352/3		9060A		1000 mL	1000 mL	50 mL			
410-37944-H-1 MS	05MW25-20210429	9060A	T	25 mL	25 mL	0.5 mL			
410-37944-H-1 MSD	05MW25-20210429	9060A	T	25 mL	25 mL	0.5 mL			
CCV 410-123352/11		9060A		1000 mL	1000 mL	50 mL			

Batch Notes	
Phosphoric Acid ID	1222173
Pipette/Syringe/Dispenser ID	DI Water
Sodium Persulfate ID	1252655

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

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APPENDIX E
SAMPLE LOGS

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GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID:	05TW01-20210427	**Sampled By:**	D. Whalen
QA/QC Duplicate ID:	—	**Sample Date:**	4-27-21
MS/MSD Collected:	YES (NO)	**Sample Time:**	1305

WELL INFORMATION:

Well ID :	05TW01	**Purge Date:**	4-27-21
Well Diameter (in):	8	**Static Water Level (ft-BTOR):**	20.20
Top of Screen (ft-BTOR):		**PID Monitor Reading:**	
Bottom of Screen (ft-BTOR):		**Purge Method:**	volume purge
Total Well Depth (ft-BTOR):	75	**Sample Method:**	Grab

EQUIPMENT INFORMATION:

Water Quality Instrument:	YSI 600	**Pump Controller:**	Grundfos
Turbidity Meter:	Hach 2100Q		

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow ~~mL~~ gal / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other volume
1059	20.20	1.50	clear	6.14	.335	0.0	4.46	13.92	-160.4	—	0
1115	23.4	1.75	clear	6.29	.263	0.24	8.61	13.99	-217	—	25
1130	25.3	1.75	clear	6.29	.246	0.23	10.7	14.04	-223.6	—	50
1145	25.7	1.75	clear	6.25	.249	0.21	8.21	14.05	-230.9	—	75
1200	25.7	1.7	clear	6.28	.257	0.26	6.82	14.21	-233.8	—	100
1215	25.75	1.7	clear	6.16	.260	0.27	8.71	14.05	-228.2	—	125
1230	25.77	1.7	clear	6.14	.262	0.32	11.5	14.08	-235.1	—	150
1245	25.79	1.7	clear	6.18	.252	0.35	9.73	14.32	-220.3	—	175
1300	25.80	1.7	clear	6.11	.250	0.31	9.85	14.10	-227.8	—	200

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1059	1300	121	200	6.11	.250	0.31	9.85	14.10	-227.8	—	

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	✓
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	✓
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	
qPCR and Genes	SOP-DNA-qPCR	4C	2	670 ml	filters	✓

OBSERVATIONS / NOTES:

sulfur odor

2 qPCR filters submitted - total volume 670 ml

Coordinates:	N	E	Signature(s):
			Dakl Whalen

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: DW

Field Analyst: DW

Field Form Checked as per QA/QC Checklist (initials): AW

Sample ID No.: 05TW01-20210427

Sample Location: 05TW01

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4-27-21								
Time: 1305	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: volume purged	clear	6.11	.250	14.10	9.85	0.31	—	-22.78

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: _____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.3 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.3
☐	1 to 12 ppm	K-7512	

Analysis Time: 1318

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 125 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	125
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1325

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc

Range: 0.2 - 7 mg/L

Concentration: 3 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S):

Range: 0 - 5 mg/L

Equipment: HACH HS-C

Other: _____

Concentration: 0.7 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05TW02-20210429	**Sampled By:** DW
QA/QC Duplicate ID: —	**Sample Date:** 4-29-21
MS/MSD Collected: YES (NO)	**Sample Time:** 1100
WELL INFORMATION:	
Well ID : 05TW02	**Purge Date:** 4-29-21
Well Diameter (in): 8" open hole	**Static Water Level (ft-BTOR):** 20.53
Top of Screen (ft-BTOR): —	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): —	**Purge Method:** volume purge
Total Well Depth (ft-BTOR): 76'	**Sample Method:**
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other volume
0920	20.53	2	sl. cloudy	5.76	.446	0.09	12.8	13.66	-6.2	—	0
0933	33.50	2.5	cloudy	6.08	.448	0.10	26.2	13.74	-109.3	—	25
0945	38.6	2.5	cloudy	6.19	.464	0.14	60.8	13.83	-98.6	—	50
0955	41.7	2.5	Gray	6.21	.473	0.02	80.7	13.86	-119.9	—	75
1000	44.4	2	Gray	6.24	.497	0.0	118	13.91	-141.4	—	100
1017	45.1	1.5	Gray	6.25	.519	0.0	112	14.05	-147.4	—	125
1037	44.8	1.25	Gray	6.33	.538	0.25	94	14.11	-66.2	—	150
1057	44.38	1.25	Gray	6.21	.503	0.39	76	14.16	-75.2	—	175

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0920							76				

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	✓
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	✓
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	✓
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	✓
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

slight sulfur odor/septic odor
slight effervescence

Coordinates:	N	E	Signature(s):
			[signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Sample ID No.: 05TW02-20210429

Project No.: **112G08005-WE04**

Sample Location:

Sampled By: DW

Duplicate: ☐

Field Analyst: DW

Blank: ☐

Field Form Checked as per QA/QC Checklist (initials): DW

SAMPLING DATA:

Date: 4-29-21	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1100	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method:	Gray	6.21	.503	14.16	76	0.39	—	-75.2

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model:

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.8 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.8
☑	1 to 12 ppm	K-7512	<1

Analysis Time: 1116

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 250 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	250
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1120

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc

Range: 0.2 - 7 mg/L

Concentration: 3.5 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S):

Range: 0 - 5 mg/L

Equipment: HACH HS-C

Other:

Concentration: 0.3 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05TW03-20210429	**Sampled By:** DW
QA/QC Duplicate ID: —	**Sample Date:** 4-29-21
MS/MSD Collected: YES (NO)	**Sample Time:** 1435
WELL INFORMATION:	
Well ID : 05TW03	**Purge Date:** 4-29-21
Well Diameter (in): 8	**Static Water Level (ft-BTOR):** 20.02
Top of Screen (ft-BTOR):	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR):	**Purge Method:**
Total Well Depth (ft-BTOR):	**Sample Method:**
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1249	20.02	2	Clear	7.11	.439	0.0	9.32	13.69	13.5	—	0
1305	25.8		"	6.55	.421	0.25	8.21	13.67	7.3	—	25
1320	30.70		"	6.54	.411	0.27	7.67	13.73	2.5	—	50
1330	31.45		"	6.67	.407	0.23	6.72	13.74	-14.6	—	75
1344	32.35		"	6.73	.404	0.23	5.43	13.78	-29.7	—	100
1357	32.85		"	6.74	.403	0.24	4.19	13.77	-35.0	—	125
1407	33.35		"	6.74	.401	0.25	5.21	13.81	-40.1	—	150
1423	33.55		"	6.72	.398	0.30	7.03	13.78	-42.3	—	175
1434	33.64		"	6.71	.395	0.34	6.14	13.82	-50.2	—	200

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1249	1434										

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	✓
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	✓
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	✓
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	✓
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			[signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: ~~CS/KS~~ CS DW

Field Analyst: CS/KS

Field Form Checked as per QA/QC Checklist (initials): CS/KS

Sample ID No.: G5TW03-20210429

Sample Location: WG Site 5

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/29/21								
Time:	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	clear	6.71	.395	13.82	6.14	0.39	—	-50.2

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.1 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.1
☐	1 to 12 ppm	K-7512	

Analysis Time: 1445

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 40 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	40
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1450

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L

Concentration: 2.5 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____

Concentration: 0.1 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05TW04-20210428	**Sampled By:** DW
QA/QC Duplicate ID: —	**Sample Date:** 4-28-21
MS/MSD Collected: YES (NO)	**Sample Time:** 1235
WELL INFORMATION:	
Well ID : 05TW04	**Purge Date:**
Well Diameter (in): 8	**Static Water Level (ft-BTOR):** 20.65
Top of Screen (ft-BTOR):	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR):	**Purge Method:** Volume purge
Total Well Depth (ft-BTOR): 111	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow ~~ml~~ gal / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other volume
1024	20.65	2	clear	5.16	.219	0.18	6.80	13.76	103.3	—	0
1040	24.90	2	clear	5.39	.216	0.30	5.63	13.89	56.0	—	25
1053	25.60	2	clear	5.42	.224	0.34	4.57	13.89	6.5	—	50
1106	25.10	1.8	clear	5.58	.224	0.37	4.11	13.91	31.7	—	75
1119	24.71	1.5	clear	5.64	.226	0.41	3.77	13.91	3.9	—	100
1125	24.05	1.5	clear	5.59	.229	0.66	1.39	14.06	2.7	—	125
1141	23.90	1.5	clear	5.67	.231	0.60	1.56	14.03	-13.4	—	150
1215	23.91	1.5	clear	5.70	.229	0.86	1.42	14.52	-15.4	—	175
1233	23.95	1.5	clear	5.79	.230	0.92	1.61	14.48	-19.2	—	200

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1024	1233	129	200	5.79	.230	1.61	1.61	14.48	-19.2	—	

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	✓
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	✓
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	✓
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	✓
qPCR and Genes	SOP-DNA-qPCR	4C	1	1000ml	filter	✓

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			Daniel W. Kuhn

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	05TW04-20210428
Project No.:	112G08005-WE04	Sample Location:	05TW04
Sampled By:	D. Whalen	Duplicate:	☐
Field Analyst:	D. Whalen	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	DW		

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4-28-21								
Time: 1235	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method:	clear	5.79	.230	14.48	1.61	0.92	—	-192

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: _____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.1 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.1
☐	1 to 12 ppm	K-7512	

Analysis Time: 1245

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 70 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	70
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1248

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: 2.5 ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: 0 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW01S-20210428	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/28/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1305
WELL INFORMATION:	
Well ID : 05MW01S	**Purge Date:** 4/28/21
Well Diameter (in): 4"	**Static Water Level (ft-BTOR):** 22.99
Top of Screen (ft-BTOR): 12	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 32	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1200	22.99	200	Clear	5.59	0.240	2.98	10.7	19.48	-105.7	0.13	–
1205	24.14	200	Clear	5.59	0.247	2.54	9.24	20.50	-109.4	0.13	
1210	24.15	200	Clear	5.60	0.252	2.03	8.66	21.02	-113.7	0.13	–
1215	24.16	200	Clear	5.66	0.240	1.54	8.40	20.04	-250.1	0.13	–
1220	24.16	200	Clear	5.68	0.231	0.98	7.91	18.52	-340.2	0.13	–
1225	24.17	200	Clear	5.71	0.222	0.75	7.52	16.99	-498.4	0.13	–
1230	24.17	200	Clear	5.83	0.223	0.66	7.14	16.18	-210.0	0.13	–
1235	24.17	200	Clear	5.85	0.223	0.67	6.48	16.39	-194.6	0.13	–
1240	24.17	200	Clear	5.90	0.224	0.67	5.21	16.68	-188.2	0.13	–
1245	24.17	200	Clear	5.94	0.225	0.68	4.82	16.75	-184.5	0.13	–
1250	24.17	200	Clear	5.98	0.226	0.70	3.98	16.79	-180.2	0.13	–
1255	24.17	200	Clear	6.03	0.227	0.74	4.29	16.85	-176.0	0.13	–
1300	24.17	200	Clear	6.06	0.228	0.79	4.88	16.91	-174.1	0.13	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1200	1300	60	~3.5	6.06	0.228	0.79	4.88	16.91	-174.1	0.13	–

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	3
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	2
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	3
qPCR and Genes	SOP-DNA-qPCR	4C	1			1

OBSERVATIONS / NOTES:

No odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW015-20210428

Sample Location: Site 5 WG

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/28/21								
Time: 1305	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	Clear	6.06	0.228	16.41	4.88	0.79	0.13	-174.1

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: _____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.3 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.3
☐	1 to 12 ppm	K-7512	

Analysis Time: 1320

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 14 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	14
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1375

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L

Concentration: 1.0 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____

Concentration: 2.0 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☒

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW01SI-20210428	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/28/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1525
WELL INFORMATION:	
Well ID : 05MW01SI	**Purge Date:** 4/28/21
Well Diameter (in): 4"	**Static Water Level (ft-BTOR):** 23.90
Top of Screen (ft-BTOR): 74.5	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 84.5	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1420	23.90	250	Clear	6.12	0.398	2.11	19.8	15.99	-98.0	0.24	–
1425	23.99	250	Clear	6.19	0.403	1.83	17.6	16.07	-104.8	0.24	–
1430	24.00	250	Clear	6.23	0.408	1.57	15.4	16.50	-118.2	0.24	–
1435	24.01	250	Clear	6.28	0.409	1.49	13.9	16.65	-126.1	0.24	–
1440	24.01	250	Clear	6.32	0.411	1.38	11.6	16.74	-130.8	0.24	–
1445	24.01	250	Clear	6.40	0.416	1.59	10.4	17.25	-141.2	0.24	–
1450	24.01	250	Clear	6.42	0.426	1.65	9.12	18.81	-142.5	0.24	–
1455	24.01	250	Clear	6.48	0.430	1.70	8.41	19.40	-144.2	0.24	–
1500	24.01	250	Clear	6.55	0.435	1.74	8.11	20.35	-150.9	0.24	–
1505	24.01	250	Clear	6.59	0.436	1.75	7.25	19.98	-153.2	0.24	–
1510	24.01	250	Clear	6.63	0.438	1.81	6.91	19.29	-156.7	0.24	–
1515	24.01	250	Clear	6.65	0.441	1.83	6.14	18.89	-158.2	0.24	–
1520	24.01	250	Clear	6.67	0.442	1.85	5.48	18.88	-162.0	0.24	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (Gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1420	1520	60	~3.5	6.67	0.442	1.85	5.48	18.88	-162.0	0.24	–

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	3
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	2
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	3
qPCR and Genes	SOP-DNA-qPCR	4C	1			1

OBSERVATIONS / NOTES:

No color ; sulfur odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW01SI-20210428

Sample Location: Site 5 WG

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/28/21								
Time: 1525	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	Clear	6.67	0.442	18.48	5.48	1.85	0.24	+152.0

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 63 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	1.3
☐	1 to 12 ppm	K-7512	

Analysis Time: 1540

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 12 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	12
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1545

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L

Concentration: 1.0 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S):

Range: 0 - 5 mg/L

Equipment: HACH HS-C Other:

Concentration: 0.3 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☒

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW10I-20210426	**Sampled By:** DW
QA/QC Duplicate ID: —	**Sample Date:** 4-26-21
MS/MSD Collected: (YES) NO	**Sample Time:** 1650
WELL INFORMATION:	
Well ID : 05MW10I	**Purge Date:** 4-26-21
Well Diameter (in): 2	**Static Water Level (ft-BTOR):** 23.22
Top of Screen (ft-BTOR):	**PID Monitor Reading:** 0
Bottom of Screen (ft-BTOR):	**Purge Method:** Low Flow
Total Well Depth (ft-BTOR):	**Sample Method:**
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1555	23.22	280	clear	7.13	.278	7.27	3.24	15.38	83.8		
1600	23.24	280	clear	6.92	.287	8.01	4.26	14.78	75.5		
1605	23.23	280	clear	6.94	.289	8.37	2.44	14.74	73.5		
1610	23.23	280	clear	6.98	.290	8.11	2.12	14.84	73.1		
1615	23.22	280	clear	6.97	.290	7.50	1.56	14.76	76.6		
1620	23.23	280	clear	6.98	.290	7.14	1.99	14.79	78.4		
1625	23.22	280	clear	6.97	.290	6.70	1.34	14.83	81.2		
1630	23.22	280	clear	6.97	.289	6.30	1.07	14.85	82.9		
1635	23.22	280	clear	6.97	.289	5.90	0.93	14.77	84.7		
1640	23.22	280	clear	6.97	.289	5.64	0.80	14.77	85.7		
1645	23.22	280	clear	6.92	.288	5.43	0.68	14.85	86.9		

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal) / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1555	1645	50	3.5	6.92	.288	5.43	0.68	14.85	86.9		

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	✓
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	✓
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

DO test kit = 2 ppm

clear, no odor

Coordinates:	N	E	Signature(s):
			Daniel Whelan

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW165-20210426	**Sampled By:** KS
QA/QC Duplicate ID: —	**Sample Date:** 4-26-21
MS/MSD Collected: YES (NO)	**Sample Time:** 1440

WELL INFORMATION:

Well ID : MW165	**Purge Date:**
Well Diameter (in): 4	**Static Water Level (ft-BTOR):** 22.04
Top of Screen (ft-BTOR):	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR):	**Purge Method:** Low Flow
Total Well Depth (ft-BTOR):	**Sample Method:**

EQUIPMENT INFORMATION:

Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
13:00	22.04	300	clear	6.37	.235	3.51	2.93	15.18	-17.7		
13:05	22.11	300	clear	5.91	.242	5.75	2.14	15.81	-30.9		
13:10	22.12	300	clear	5.92	.243	6.08	1.69	16.02	-33.6		
13:15	22.15	300	clear	5.92	.243	6.08	1.66	16.02	-33.6		
13:20	22.15	300	clear	5.92	.243	6.08	1.34	16.02	-33.6		
13:25	22.15	300	clear	5.92	.243	6.08	1.31	16.02	-33.6		
13:30	22.15	300	clear	5.92	.243	6.08	0.95	16.02	-33.6		
13:35	22.12	300	clear	6.05	.245	5.03	0.74	15.97	-81.5		
13:40	22.12	300	clear	6.07	.244	4.92	0.85	16.26	-86.9		
13:45	22.12	300	clear	6.09	.243	5.04	0.65	16.68	-89.1		
13:50	22.12	300	clear	6.12	.244	4.87	0.74	16.92	-92.4		
13:55	22.12	300	clear	6.09	.241	4.77	1.34	17.03	-92.6		
14:00	22.12	300	clear	6.09	.240	4.65	0.76	17.03	-92.7		
14:05	22.12	300	clear	6.08	.234	4.34	1.35	17.12	-93.7		
14:10	22.12	300	clear	6.07	.234	4.15	1.24	17.15	-94.5		

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1300	1435	95	12	6.04	.239	3.50	1.95	17.28	-96.7	—	

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	✓
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	✓
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	✓
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	✓
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Page __ of __

Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	05MW165-20210426
Project No.:	112G08005-WE04	Sample Location:	05MW165
Sampled By:	KS/DW	Duplicate:	☐
Field Analyst:	DW	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	DW		

SAMPLING DATA:

Date: 4-26-21	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1440	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: LowFlow	clear	6.04	.239	17.28	1.95	3.50	—	-967

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model:_____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.2 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.2
☒	1 to 12 ppm	K-7512	<1

Analysis Time: 1455

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 125 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	125
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1500

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: 0.5 ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: 0.1 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☑

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW17I-20210427	**Sampled By:** CS
QA/QC Duplicate ID: 05DUP01-20210427@1600	**Sample Date:** 4/27/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1225
WELL INFORMATION:	
Well ID : 05MW17I	**Purge Date:** 4/27/21
Well Diameter (in): 2"	**Static Water Level (ft-BTOR):**
Top of Screen (ft-BTOR): 84	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 104	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or (ppt))	Other
1130	24.60	350	Clear	5.77	0.251	0.19	6.27	14.49	60.1	0.15	–
1135	24.62	350	Clear	5.88	0.252	0.17	5.40	14.52	54.2	0.15	–
1140	24.62	350	Clear	5.91	0.255	0.14	4.28	14.53	51.5	0.15	–
1145	24.62	350	Clear	6.06	0.257	0.10	3.94	14.57	44.6	0.15	–
1150	24.62	350	Clear	6.12	0.257	0.09	2.11	14.66	42.4	0.15	–
1155	24.62	350	Clear	6.17	0.257	0.08	1.45	14.70	38.2	0.15	–
1200	24.62	350	Clear	6.21	0.257	0.05	1.09	14.87	35.9	0.15	–
1205	24.62	350	Clear	6.24	0.257	0.05	1.27	14.89	33.2	0.15	–
1210	24.62	350	Clear	6.27	0.258	0.05	1.63	14.94	31.4	0.15	–
1215	24.62	350	Clear	6.30	0.258	0.05	1.04	14.98	30.5	0.15	–
1220	24.62	350	Clear	6.32	0.259	0.05	0.90	14.99	29.1	0.15	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1130	1220	50	~5	6.32	0.259	0.05	0.90	14.99	29.1	0.15	–

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	12
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	3
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	2
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	3
qPCR and Genes	SOP-DNA-qPCR	4C	1			1

OBSERVATIONS / NOTES:

No color ; no odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW17I-20210427

Sample Location: 05MW17I Site 5 GW

Duplicate: ☒

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/27/21								
Time: 1225	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	Clear	6.32	0.259	14.99	0.90	0.05	0.15	29.1

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600 XL

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.05 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.05
☐	1 to 12 ppm	K-7512	

Analysis Time: 1300

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 150 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	150
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1310

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L

Concentration: 0.5 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____

Concentration: 0. ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☒

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05-MW18S-20210427	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/27/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1020
WELL INFORMATION:	
Well ID : 05MW18S	**Purge Date:** 4/27/21
Well Diameter (in): 2"	**Static Water Level (ft-BTOR):** 21.32
Top of Screen (ft-BTOR): 68	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 78	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0925	21.32	350	Clear	5.79	0.265	1.37	9.27	14.30	38.5	0.16	–
0930	25.55	350	Clear	5.72	0.267	1.14	8.48	14.52	34.8	0.16	–
0935	25.56	350	Clear	5.98	0.269	0.88	7.12	14.90	11.9	0.16	–
0940	25.57	350	Clear	6.12	0.271	0.57	6.90	15.16	7.9	0.16	–
0945	25.57	350	Clear	6.22	0.274	0.38	6.04	15.26	-6.5	0.16	–
0950	25.57	350	Clear	6.26	0.280	0.32	5.58	15.35	-11.1	0.16	–
0955	25.57	350	Clear	6.30	0.284	0.27	5.12	15.60	-18.4	0.16	–
1000	25.57	350	Clear	6.34	0.291	0.23	5.50	15.81	-25.0	0.16	–
1005	25.57	350	Clear	6.45	0.298	0.15	5.66	15.92	-28.9	0.17	–
1010	25.57	350	Clear	6.48	0.301	0.13	5.04	16.13	-32.0	0.18	–
1015	25.57	350	Clear	6.51	0.304	0.11	5.95	16.20	-32.4	0.18	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0925	1015	50	~5	6.51	0.304	0.11	5.95	16.20	-32.4	0.18	–

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	0
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	0
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	0
qPCR and Genes	SOP-DNA-qPCR	4C	1			0

OBSERVATIONS / NOTES:

No Odor

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: OSMW18I-20210427	**Sampled By:** KS
QA/QC Duplicate ID: —	**Sample Date:** 04/27/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1050
WELL INFORMATION:	
Well ID : OSMW-18I	**Purge Date:** 04/27/21
Well Diameter (in): 2" PVC	**Static Water Level (ft-BTOR):** 23.58
Top of Screen (ft-BTOR): 88'	**PID Monitor Reading:** 0.0ppm
Bottom of Screen (ft-BTOR): 108'	**Purge Method:** Low flow
Total Well Depth (ft-BTOR): 108'	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0940	23.71	200	cloudy brown	6.26	.352	0.42	over range	13.96	8.4		
0945	23.71	200	cloudy	6.34	.335	0.42	69.6	13.42	-1.9		
0950	23.72	200	clear	6.43	.332	0.35	18.2	13.50	-3.5		
0955	23.72	200	clear	6.52	.333	0.34	7.85	13.75	-5.7		
1000	23.72	200	cloudy	6.57	.333	0.34	40.9	13.71	-6.9		
1005	23.72	200	clear	6.52	.334	0.33	9.10	13.72	-6.9		
1010	23.72	200	clear	6.60	.333	0.33	5.01	13.95	-5.9		
1015	23.72	200	clear	6.59	.333	0.34	2.56	14.01	-5.1		
1020	23.72	200	clear	6.59	.333	0.33	2.45	13.97	-4.1		
1025	23.72	200	cloudy	6.58	.334	0.33	77.7	14.24	-5.8		
1030	23.72	200	cloudy	6.58	.331	0.31	36.7	14.16	-4.7		
1035	23.72	200	clear	6.59	.333	0.33	14.0	14.15	-3.2		
1040	23.72	200	cloudy	6.63	.333	0.33	62.9	14.13	-2.8		
1045	23.72	200	clear	6.61	.332	0.33	19.8	14.42	-2.2		
1050	Sample										

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal) / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0940	1045	65	6	6.61	.332	0.33	19.8	14.42	-2.2		

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

No odor

Coordinates:	N	E	Signature(s):
			[signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Page __ of __

Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	05MW18I-20210427
Project No.:	112G08005-WE04	Sample Location:	05MW18I
Sampled By:	KS	Duplicate:	☐
Field Analyst:	KS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/27/21								
Time: 1050	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab/Low Flow	Clear	6.61	.332	14.42	19.8	0.33	N/A	-2.2

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model:_____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.3 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.3
☐	1 to 12 ppm	K-7512	

Analysis Time: 1105

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 20 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	20
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1110

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: 0 ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: 0 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☐

Correct measurement units are cited in the SAMPLING DATA block: ☐

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☐

Multiplication is correct for each *Multiplier* table: ☐

Final calculated concentration is within the appropriate *Range Used* block: ☐

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☐

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☐

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW19S-20210426	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/26/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1445
WELL INFORMATION:	
Well ID : 05MW19S	**Purge Date:** 4/26/21
Well Diameter (in): 2"	**Static Water Level (ft-BTOR):** 23.68
Top of Screen (ft-BTOR): 68	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 78	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1350	23.68	400	Cloudy	5.92	0.275	3.62	47.7	13.17	113.4	0.17	—
1355	23.69	400	Cloudy	5.94	0.276	3.12	42.6	13.09	105.2	0.17	—
1400	23.69	400	Cloudy	5.96	0.276	2.89	40.2	13.07	99.4	0.17	—
1405	23.69	400	Cloudy	6.07	0.276	2.99	38.6	13.05	94.6	0.17	—
1410	23.69	400	Cloudy	6.12	0.277	3.38	32.1	13.03	92.0	0.17	—
1415	23.69	400	Cloudy	6.17	0.277	3.67	27.0	13.00	88.1	0.17	—
1420	23.69	400	Clear	6.20	0.277	3.94	23.4	12.98	86.2	0.17	—
1425	23.69	400	Clear	6.23	0.276	4.08	19.5	12.94	85.2	0.17	—
1430	23.69	400	Clear	6.25	0.276	4.18	15.4	12.96	84.9	0.17	—
1435	23.69	400	Clear	6.27	0.276	4.29	13.9	12.99	84.3	0.17	—
1440	23.69	400	Clear	6.29	0.276	4.40	12.3	12.96	83.6	0.17	—

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1350	1440	50	~6	6.29	0.276	4.40	12.3	12.96	83.6	0.17	—

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	G
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	O
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	O
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	O
qPCR and Genes	SOP-DNA-qPCR	4C	1			O

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW19S-20210426

Sample Location: Site 5 Willow Grove

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/26/21								
Time: 1445	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	Clear	6.29	0.276	12.96	12.3	4.40	0.17	83.6

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600 XL

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.9 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	~~12~~ 0.9
☐	1 to 12 ppm	K-7512	

Analysis Time: 1500

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 120 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	120
☒	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1505

Filtered: ☐

~~**Ferrous Iron (Fe^{2+}):**~~

~~Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: ppm~~

~~Notes: Filtered: ☐~~

~~**Hydrogen Sulfide (H_2S):** Range: 0 - 5 mg/L~~

~~Equipment: HACH HS-C Other: Concentration: ppm~~

~~Notes:~~

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☒

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW19I-20210426	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/26/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1635
WELL INFORMATION:	
Well ID : 05MW19I	**Purge Date:** 4/26/21
Well Diameter (in): 2"	**Static Water Level (ft-BTOR):** 24.34
Top of Screen (ft-BTOR): 102	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 122	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1545	24.34	300	Clear	6.85	0.269	5.36	15.5	13.43	131.7	0.17	–
1550	24.35	300	Clear	6.68	0.272	4.26	15.8	13.59	124.2	0.17	–
1555	24.35	300	Clear	6.56	0.275	3.19	16.2	13.70	119.6	0.17	–
1600	24.35	300	Clear	6.45	0.277	2.41	16.5	13.85	116.3	0.17	–
1605	24.35	300	Clear	6.52	0.277	2.08	16.9	13.36	114.0	0.17	–
1610	24.35	300	Clear	6.55	0.277	1.89	15.4	13.40	113.8	0.17	–
1615	24.35	300	Clear	6.56	0.277	1.59	14.6	13.42	114.4	0.17	–
1620	24.23	300	Clear	6.56	0.277	1.45	14.0	13.43	116.4	0.17	–
1625	24.23	300	Clear	6.57	0.277	1.34	13.7	13.42	118.9	0.17	–
1630	24.23	300	Clear	6.55	0.277	1.20	13.3	13.48	120.0	0.17	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1545	1630	45	~4	6.55	0.277	1.20	13.3	13.48	120.0	0.17	–

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	0
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	0
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	0
qPCR and Genes	SOP-DNA-qPCR	4C	1			0

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW19I-20210426

Sample Location: Site 5 Willow Grove

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (% or ppt)	ORP (Eh) (+/- mV)
Date: 9/26/21								
Time: 1635								
Method: Grab	Clear	6.55	0.277	13.48	13.3	1.20	0.17	120.0

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600 XL

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 1 ppm

Range Used:	Range	Method	Concentration ppm
X	0 to 1 ppm	K-7510	1
☐	1 to 12 ppm	K-7512	

Analysis Time: 1645

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 100 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
X	50 to 500 ppm	K-9815	100
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1650

Filtered: ☐

~~**Ferrous Iron (Fe^{2+}):**~~

~~Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L~~

~~Concentration: ppm~~

~~Notes:~~

~~Filtered: ☐~~

~~**Hydrogen Sulfide (H_2S):**~~

~~Equipment: HACH HS-C Other: Range: 0 - 5 mg/L~~

~~Concentration: ppm~~

~~Notes:~~

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☑

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID:	05MW20-202104 29	**Sampled By:**	CS/KS
QA/QC Duplicate ID:	N/A	**Sample Date:**	4/29/21
MS/MSD Collected:	YES (NO)	**Sample Time:**	1225
WELL INFORMATION:			
Well ID :	05MW20	**Purge Date:**	4/29/21
Well Diameter (in):	4"	**Static Water Level (ft-BTOR):**	23.58
Top of Screen (ft-BTOR):	37	**PID Monitor Reading:**	
Bottom of Screen (ft-BTOR):	52	**Purge Method:**	Low flow
Total Well Depth (ft-BTOR):		**Sample Method:**	Low flow
EQUIPMENT INFORMATION:			
Water Quality Instrument:	YSI 600	**Pump Controller:**	Grundfos
Turbidity Meter:	Hach 2100Q		

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1125	23.58	250	Clear	6.61	0.458	2.73	10.4	19.25	42.3	0.29	—
1130	24.95	250	Clear	6.48	0.479	2.10	11.8	16.83	44.9	0.29	
1135	24.95	250	Clear	6.27	0.491	1.51	14.0	16.34	-46.1	0.29	—
1140	24.95	250	Clear	6.31	0.477	1.47	16.9	16.25	-49.2	0.28	—
1145	24.95	250	Clear	6.35	0.468	1.38	17.6	16.31	-53.1	0.27	—
1150	24.95	250	Clear	6.39	0.451	1.29	19.4	16.37	-55.2	0.26	—
1155	24.95	250	Clear	6.47	0.442	1.24	17.4	16.58	-58.9	0.25	—
1200	24.95	250	Clear	6.53	0.436	1.20	16.9	16.80	-64.2	0.25	—
1205	24.95	250	Clear	6.60	0.427	1.19	16.2	16.98	-67.1	0.24	—
1210	24.95	250	Clear	6.63	0.422	1.18	16.0	17.11	-69.5	0.24	—
1215	24.95	250	Clear	6.64	0.424	1.20	12.5	18.40	-72.1	0.24	—
1220	24.95	250	Clear	6.65	0.426	1.22	11.1	18.98	-74.1	0.24	—

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1125	1220	55	~4	6.65	0.426	1.22	11.1	18.98	-74.1	0.24	—

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	3
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	2
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	3
qPCR and Genes	SOP-DNA-qPCR	4C	1			0

OBSERVATIONS / NOTES:

Sulfur odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**
Project No.: **112G08005-WE04**
Sampled By: CS/KS
Field Analyst: CS/KS
Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW20-20210429
Sample Location: Site 5 WG
Duplicate: ☐
Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Date: 4/29/21								
Time: 1225	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	Clear	6.65	0.426	18.98	11.1	1.22	0.24	-74.1

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)
Electrode Make & Model: YSI 600
Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:
Equipment: CHEMetrics Test Kit
Concentration: 1.0 ppm
Analysis Time: 1225

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	1.0
☐	1 to 12 ppm	K-7512	

Alkalinity:
Equipment: CHEMetrics Test Kit
Concentration: 18 ppm
Analysis Time: 1230
Filtered: ☐

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	18
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Ferrous Iron (Fe^{2+}):
Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L
Concentration: 2.5 ppm
Notes:
Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L
Equipment: HACH HS-C Other: _____
Concentration: 0.1 ppm
Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑
Multiplication is correct for each *Multiplier* table: ☑
Final calculated concentration is within the appropriate *Range Used* block: ☑
Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐
Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW21-20210428	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/28/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1055
WELL INFORMATION:	
Well ID : 05MW21	**Purge Date:** 4/28/21
Well Diameter (in): 4"	**Static Water Level (ft-BTOR):** 23.71
Top of Screen (ft-BTOR): 32'	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 47'	**Purge Method:** Low Flow
Total Well Depth (ft-BTOR): 47'	**Sample Method:** Grab
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or (ppt))	Other
1000	23.71	350	Clear	5.56	0.240	1.99	20.5	14.70	-77.3	0.14	–
1005	23.90	350	Clear	5.52	0.242	1.30	18.2	15.04	-92.8	0.14	–
1010	23.92	350	Clear	5.62	0.239	1.11	15.4	15.06	-123.3	0.14	–
1015	23.93	350	Clear	5.69	0.235	1.01	14.0	15.11	-131.2	0.14	–
1020	23.94	350	Clear	5.78	0.233	0.95	12.9	15.17	-138.5	0.14	–
1025	23.94	350	Clear	5.86	0.233	0.88	10.5	15.35	-142.8	0.14	–
1030	23.95	350	Clear	5.86	0.231	0.87	10.1	15.50	-141.9	0.13	–
1035	23.95	350	Clear	5.86	0.229	0.87	9.62	15.61	-141.4	0.13	–
1040	23.95	350	Clear	5.88	0.229	0.88	8.24	15.90	-142.3	0.13	–
1045	23.95	350	Clear	5.89	0.230	0.89	5.60	15.96	-143.5	0.13	–
1050	23.95	350	Clear	5.91	0.230	0.90	4.88	15.95	-144.4	0.13	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or (ppt))	Other
1000	1050	50	~5	5.91	0.230	0.90	4.88	15.95	-144.4	0.13	–

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	3
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	2
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	3
qPCR and Genes	SOP-DNA-qPCR	4C	1			1

OBSERVATIONS / NOTES:

Sulfur Odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW21-20210428

Sample Location: Site 5 WG

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (% or ppt)	ORP (Eh) (+/- mV)
Date: 4/28/21								
Time: 1055								
Method: Grab	clear	5.91	0.230	15.95	4.88	0.90	0.13	-144.4

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.8 ppm

Range Used:	Range	Method	Concentration ppm
☑	0 to 1 ppm	K-7510	0.8
☐	1 to 12 ppm	K-7512	

Analysis Time: 1110

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: ~~0~~ 50 ppm

Range Used:	Range	Method	Concentration ppm
☑	10 to 100 ppm	K-9810	50
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1115

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L

Concentration: 0 ppm

Notes:

Filtered: ☐

Hydrogen Sulfide (H_2S):

Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____

Concentration: 2.0 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☒

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW22-20210427	**Sampled By:** CS
QA/QC Duplicate ID: N/A	**Sample Date:** 4/27/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1530
WELL INFORMATION:	
Well ID : 05MW22	**Purge Date:** 4/27/21
Well Diameter (in): 4"	**Static Water Level (ft-BTOR):** 20.90
Top of Screen (ft-BTOR): 30	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 45	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1440	20.90	300	Cloudy	6.45	0.377	1.14	33.5	15.97	-108.4	0.22	–
1445	20.95	300	Cloudy	6.49	0.377	0.74	38.4	15.99	-115.9	0.22	–
1450	20.96	300	"	6.61	0.369	0.10	40.5	16.22	-136.2	0.21	–
1455	20.97	300	"	6.70	0.370	0.07	48.2	16.43	-158.4	0.21	–
1500	20.97	300	"	6.73	0.369	0.06	49.1	16.55	-166.2	0.21	–
1505	20.95	300	"	6.77	0.369	0.00	44.4	16.71	-180.2	0.21	–
1510	20.95	300	"	6.82	0.371	0.00	33.0	16.93	-190.3	0.21	–
1515	20.95	300	"	6.84	0.371	0.00	28.2	17.14	-197.9	0.21	–
1520	20.95	300	Clear	6.86	0.371	0.00	24.1	17.21	-203.1	0.21	–
1525	20.95	300	Clear	6.87	0.371	0.00	20.4	17.27	-205.2	0.21	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (~~gal.~~ / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ~~ppt~~)	Other
1440	1525	45	~4	6.87	0.371	0.00	20.4	17.27	-205.2	0.21	–

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	3
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	2
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	3
qPCR and Genes	SOP-DNA-qPCR	4C	1			1

OBSERVATIONS / NOTES:

No color ; sulfur odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NASJRB Willow Grove Site 5**

Project No.: **112G08005-WE04**

Sampled By: CS

Field Analyst: CS

Field Form Checked as per QA/QC Checklist (initials): CS

Sample ID No.: 05MW22-20210427

Sample Location: Site 5 WG

Duplicate: ☐

Blank: ☐

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	+/- mV ~~DO~~ ORP ~~(mg/L)~~	Salinity	DO ~~ORP (Eh)~~ mg/L ~~(+/- mV)~~
Date: 4/27/21								
Time: 1530								
Method: Grab	(Visual) Clear	(S.U.) 6.87	(mS/cm) 0.371	(^{0}C) 17.27	(NTU) 20.4	-205.2	(% or ppt) 0.21	0.00

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.4 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.4
☐	1 to 12 ppm	K-7512	

Analysis Time: 1545

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 30 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	30
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1550

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: 0 ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: 2.0 ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☑

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW23-202104 27	**Sampled By:** KS
QA/QC Duplicate ID: —	**Sample Date:** 04/27/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1415

WELL INFORMATION:

Well ID : 05MW23	**Purge Date:** 04/27/21
Well Diameter (in): 4" PVC	**Static Water Level (ft-BTOR):** 22.58
Top of Screen (ft-BTOR): 36	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 51	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow

EQUIPMENT INFORMATION:

Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1215	23.18	200	clear	6.00	.202	1.51	16.6	15.82	-92.8		
1220	23.21	200	clear	5.97	.203	0.94	13.5	15.79	-115.4		
1225	23.28	200	clear	6.01	.202	0.78	12.8	15.90	-127.0		
1230	23.36	200	clear	6.07	.203	0.62	10.5	16.10	-143.5		
1235	23.25	150	clear	6.10	.204	0.70	9.82	16.26	-153.2		
1240	23.26	150	clear	6.06	.204	0.76	9.24	16.37	-151.9		
1245	23.30	150	clear	6.00	.204	0.90	9.22	16.65	-144.7		
1250	23.32	150	clear	6.00	.204	1.02	7.66	16.64	-145.2		
1255	23.35	150	clear	6.01	.205	1.20	7.24	16.85	-150.3		
1300	23.30	150	clear	5.97	.206	1.50	7.79	16.79	-148.6		
1305	23.15	150	clear	5.96	.207	1.91	6.32	16.77	-145.1		
1310	23.00	150	clear	5.95	.208	2.29	5.83	16.66	-147.4		
1315	22.86	150	clear	5.95	.207	2.74	5.78	16.55	-140.1		

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1215	1415	120	12	5.92	.220	12.79	2.65	16.94	-119.0		

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	—
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	—
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	—
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			Kevin Silver

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Page __ of __

Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	OSMW23-20210427
Project No.:	112G08005-WE04	Sample Location:	OSMW23
Sampled By:	KS	Duplicate:	☐
Field Analyst:	KS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 4/27/21	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1430	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab/Low Flow	clear	5.92	.026	16.94	2.65	12.79	N/A	-119.0

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: _____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 0.2 ppm

Range Used:	Range	Method	Concentration ppm
☒	0 to 1 ppm	K-7510	0.2
☐	1 to 12 ppm	K-7512	

Analysis Time: 1435

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 12 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	12
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1440

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: — ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: — ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☐

Correct measurement units are cited in the SAMPLING DATA block: ☐

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☐

Multiplication is correct for each *Multiplier* table: ☐

Final calculated concentration is within the appropriate *Range Used* block: ☐

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☐

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☐

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID:	05MW24-202104 28	**Sampled By:**	KS
QA/QC Duplicate ID:	—	**Sample Date:**	4/28/21
MS/MSD Collected:	YES NO	**Sample Time:**	1455

WELL INFORMATION:

Well ID :	05MW24	**Purge Date:**	4/28/21
Well Diameter (in):		**Static Water Level (ft-BTOR):**	24.09
Top of Screen (ft-BTOR):	35	**PID Monitor Reading:**	
Bottom of Screen (ft-BTOR):	50	**Purge Method:**	Low flow
Total Well Depth (ft-BTOR):		**Sample Method:**	Low flow

EQUIPMENT INFORMATION:

Water Quality Instrument:	YSI 600	**Pump Controller:**	Grundfos
Turbidity Meter:	Hach 2100Q		

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1350	24.52	250	cloudy	5.80	.270	3.75	30.5	16.60	-60.7	—	
1355	24.52	250	clear	5.67	.276	2.38	16.0	17.15	-54.1	—	
1400	24.62	250	clear	5.74	.274	1.62	10.6	18.52	-63.8	—	
1405	24.73	250	clear	5.98	.275	1.79	13.7	18.16	-70.9	—	
1410	25.60	250	clear	5.69	.253	1.06	6.86	17.63	-73.8	—	
1415	25.50	250	clear	5.84	.256	1.18	6.60	19.13	-95.0	—	
1420	25.82	250	clear	5.77	.252	1.32	7.16	18.59	-103.6	—	
1425	25.68	250	clear	5.89	.252	1.94	6.34	19.67	-118.8	—	
1430	26.28	250	clear	5.76	.242	2.46	10.8	17.11	-116.8	—	
1435	26.28	250	clear	5.67	.241	3.52	12.1	17.45	-112.7	—	
1440	26.28	250	clear	5.73	.240	4.47	11.6	17.78	-115.3	—	
1445	26.28	250	clear	5.79	.238	5.62	12.1	17.89	-115.7	—	
1450	26.28	250	clear	5.75	.237	6.91	11.8	18.43	-118.6	—	

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1350	1450	60	5	5.75	.237	6.91	11.8	18.43	-118.6	—	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	—
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	—
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	—
qPCR and Genes	SOP-DNA-qPCR	4C	1			—

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			[signature]

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Page __ of __

Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	OSMW24-20210428
Project No.:	112G08005-WE04	Sample Location:	OSMW24
Sampled By:	KS	Duplicate:	☐
Field Analyst:	KS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	AV		

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (% or ppt)	ORP (Eh) (+/- mV)
Date: 4/28/21								
Time: 1500								
Method: Grab/Low Flow	clear	5.75	.237	18.43	11.8			

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model:_____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 1 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☒	1 to 12 ppm	K-7512	1

Analysis Time: 1500

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 35 ppm

Range Used:	Range	Method	Concentration ppm
☒	10 to 100 ppm	K-9810	35
☐	50 to 500 ppm	K-9815	
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1505

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: — ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: — ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW25-202104 29	**Sampled By:** CS/KS
QA/QC Duplicate ID: 05DUP02-202104 29 @1200	**Sample Date:** 4/29/21
MS/MSD Collected: YES (NO)	**Sample Time:** 1015
WELL INFORMATION:	
Well ID : 05MW25	**Purge Date:** 4/29/21
Well Diameter (in): 4"	**Static Water Level (ft-BTOR):** 24.15
Top of Screen (ft-BTOR): 35	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 50	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or (ppt))	Other
0905	24.15	200	Cloudy	5.80	0.253	6.24	77.4	16.39	-26.3	0.15	–
0910	24.23	200	Cloudy	5.74	0.256	4.56	46.2	15.89	-48.1	0.15	–
0915	24.23	200	Clear	5.67	0.260	2.31	15.3	15.53	-60.0	0.15	–
0920	24.23	200	Clear	5.81	0.261	2.39	13.2	15.94	-70.1	0.15	–
0925	24.23	200	Clear	6.00	0.262	2.41	12.9	16.14	-79.3	0.15	–
0930	24.23	150	Clear	6.28	0.266	2.49	11.4	17.21	-92.3	0.15	–
0935	24.23	100	Clear	6.30	0.268	2.56	10.2	17.15	-94.2	0.15	
0940	24.30	400	Clear	6.34	0.253	2.76	9.86	14.96	-98.4	0.15	trace
0945	24.30	400	Clear	5.96	0.247	1.86	8.27	15.45	-92.4	0.15	–
0950	24.30	400	Clear	6.02	0.248	1.75	8.01	15.54	-99.6	0.15	–
0955	24.30	400	Clear	6.09	0.248	1.66	7.65	15.61	-104.8	0.14	–
1000	24.30	350	Clear	6.17	0.248	1.56	7.24	15.69	-109.1	0.14	–
1005	24.30	350	Clear	6.18	0.245	1.52	6.56	15.74	-110.2	0.14	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or (ppt))	Other
~~1410~~ 0905	~~1505~~ 1010	~~56~~ 65	5 ~~4~~	~~6.30~~ ~~4.98~~	~~0.479~~	~~0.52~~	~~212~~	~~21.11~~	~~-37.9~~	0.14	–

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS 0.244 1.50 6.78 16.03 -112.6

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	12
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	6
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	4
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	6
qPCR and Genes	SOP-DNA-qPCR	4C	1			0

OBSERVATIONS / NOTES:

No color ; sulfur odor

Coordinates:	N	E	Signature(s):

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

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Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	05MW25-20210429
Project No.:	112G08005-WE04	Sample Location:	Site 5 Willow Grove
Sampled By:	CS/KS	Duplicate:	☒
Field Analyst:	CS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	CS		

SAMPLING DATA:

Date: 4/29/21	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1015	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab	Clear	6.20	0.244	16.03	6.78	1.50	0.14	-112.6

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: YSI 600

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 1.0 (5) ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☒	1 to 12 ppm	K-7512	1

Analysis Time: 1025

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 100 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	100
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1030

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: 3.5 ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: _____ ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Annual Groundwater Sampling
Project Site Name:	NASJRB Willow Grove Site 5
Project No.:	112G08005-WE04

Sample ID: 05MW26-20210428	**Sampled By:** KS
QA/QC Duplicate ID: —	**Sample Date:** 4/28/21
MS/MSD Collected: YES (NO)	**Sample Time:**
WELL INFORMATION:	
Well ID : 05MW26	**Purge Date:** 4/28/21
Well Diameter (in):	**Static Water Level (ft-BTOR):** 23.77
Top of Screen (ft-BTOR): 35	**PID Monitor Reading:**
Bottom of Screen (ft-BTOR): 50	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: YSI 600	**Pump Controller:** Grundfos
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1010	23.90	200	cloudy	5.65	.241	0.80	103	16.10	25.3	—	
1015	23.90	200	cloudy	5.78	.241	0.55	108	17.30	-27.4	—	
1020	23.90	200	cloudy	5.79	.241	0.66	55.0	17.70	-50.2	—	
1025	23.90	200	cloudy	5.85	.242	0.67	35.5	18.39	-65.1	—	
1030	23.94	300	cloudy	5.86	.242	0.73	35.1	20.12	-70.8	—	
1035	24.00	300	cloudy	5.88	.243	0.86	34.5	21.83	-76.5	—	
1040	23.97	300	cloudy	5.83	.241	0.82	40.6	18.08	-78.8	—	
1045	23.97	300	cloudy	5.82	.241	0.98	26.0	20.83	-84.7	—	
1050	24.00	300	cloudy	5.78	.239	0.97	39.2	19.91	-78.4	—	
1055	24.10	300	cloudy	5.64	.237	0.96	53.6	19.54	-66.1	—	
1100	24.10	300	cloudy	5.83	.234	1.10	30.1	20.09	-88.4		
1105	24.10	300	cloudy	5.88	.236	1.20	26.9	21.07	-95.9		
1110	24.10	300	cloudy	5.83	.235	1.22	26.2	21.19	-96.2		

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1010	1135	85	6	5.87	.233	1.77	18.2	26.83	-98.5	—	

ANALYSIS, PRESERVATION AND BOTTLE REQUIRMENTS

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
VOC/1,4-Dioxane	SW-846	HCl	6	40 ml	glass vial	6
Dissloved Gases	DOD5-RSK-175	HCl	3	40 ml	glass vial	
TOC	SW-846 9060A	H3PO4	2	40 ml	amber vial	
Volatile Fatty Acids	8015D	4C	3	40 ml	glass vial	
qPCR and Genes	SOP-DNA-qPCR	4C	1			

OBSERVATIONS / NOTES:

Coordinates:	N	E	Signature(s):
			Kevin Zeller

Note: Analyte, method, and/or equipment may be deleted from form if not being performed.

TETRA TECH

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Page __ of __

Project Site Name:	NASJRB Willow Grove Site 5	Sample ID No.:	OSMW26-20210428
Project No.:	112G08005-WE04	Sample Location:	OSMW26
Sampled By:	KS	Duplicate:	☐
Field Analyst:	KS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	dw		

SAMPLING DATA:

Date: 4/28/21	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP (Eh)
Time: 1140	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(% or ppt)	(+/- mV)
Method: Grab/ Low Flow	clear	5.87	.233	26.03	18.2	1.77	—	-78.5

SAMPLE COLLECTION/ANALYSIS INFORMATION:

ORP (Eh) (+/- mv)

Electrode Make & Model: _____

Reference Electrode (circle one): Silver-Silver Chloride / Calomel / Hydrogen

Dissolved Oxygen:

Equipment: CHEMetrics Test Kit

Concentration: 1 ppm

Range Used:	Range	Method	Concentration ppm
☐	0 to 1 ppm	K-7510	
☒	1 to 12 ppm	K-7512	1

Analysis Time: 1140

Alkalinity:

Equipment: CHEMetrics Test Kit

Concentration: 55 ppm

Range Used:	Range	Method	Concentration ppm
☐	10 to 100 ppm	K-9810	
☒	50 to 500 ppm	K-9815	55
☐	100 to 1000 ppm	K-9820	

Analysis Time: 1145

Filtered: ☐

Ferrous Iron (Fe^{2+}):

Equipment: HACH IR-18C Color Disc Range: 0.2 - 7 mg/L Concentration: — ppm

Notes: Filtered: ☐

Hydrogen Sulfide (H_2S): Range: 0 - 5 mg/L

Equipment: HACH HS-C Other: _____ Concentration: — ppm

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☑

Correct measurement units are cited in the SAMPLING DATA block: ☑

Values cited in the SAMPLING DATA block are consistent with the Groundwater Sample Log Sheet: ☑

Multiplication is correct for each *Multiplier* table: ☑

Final calculated concentration is within the appropriate *Range Used* block: ☑

Alkalinity *Relationship* is determined appropriately as per manufacturer (HACH) instructions: ☑

QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑

Nitrite Interference treatment was used for Nitrate test (if Nitrite was detected): ☐

Title block on each page of form is initialized by person who performed this QA/QC Checklist: ☑