CON: 12-15
Doc #38943

April 12, 2021 Project No. 20394143

Lisa D. Sutton
Eaton Corporation
Vice President/Chief Counsel – Regulatory Matters
Eaton – Law Department
Mail Code 4N
1000 Eaton Boulevard
Cleveland, Ohio 44122 USA

RE: PHASE III ENVIRONMENTAL SITE ASSESSMENT, EATON CORPORATION, SHENANDOAH, IOWA

Dear Ms. Sutton:

Golder Associates Inc. (Golder) was retained by Eaton Corporation (Eaton) to conduct a Phase III Environmental Site Assessment (ESA) at the Eaton facility (Site) located at 1600 Airport Road, Shenandoah, Iowa (Figure 1). Based on the results of the Phase II ESA completed by Golder in November 2020, the letter response from the Iowa Department of Natural Resources (DNR) regarding the Phase II ESA dated January 6, 2021, and discussions with Eaton, the scope of work included the advancement of four boreholes and installation of four permanent groundwater monitoring wells to evaluate subsurface (soil and groundwater) conditions at the Site. This letter summarizes the field procedures and results from the assessment.

1.0 SCOPE OF WORK

The Phase III ESA field program was designed by Golder and included soil and groundwater sampling to assess subsurface conditions at the Site as described in Table 1. The scope of work was designed to evaluate the potential for subsurface impacts from historic site activities including the “Pit Area”, scrap dock and outside the current tank farm area where staining was observed. Past site activities in these areas are believed to be the source of Volatile Organic Compounds (VOCs) detected during the Phase II ESA performed for the Site (previously submitted to the Iowa DNR under separate cover). Based on the results of the Phase II ESA and ongoing discussions with Eaton and the Iowa DNR, Golder completed the following scope of work:

- Advancement of four soil borings to approximately 30 feet below ground surface (bgs) and installation of four permanent monitoring wells to collect soil and groundwater samples to further evaluate the potential for VOCs in soil and groundwater at the Site.
- Slug testing in the newly installed permanent monitoring wells to determine an approximate hydraulic conductivity for the shallow aquifer at the Site.

2.0 FIELD PROGRAM

Prior to mobilization to the Site, the Site-specific health and safety environment plan (HASEP) was reviewed and updated, and the state-required Iowa One Call (811) was submitted in order for public utility companies to mark underground utilities in the vicinity or confirm the area is clear. In addition, Golder and the subcontractors working under Golder reviewed the Site's Environment, Health, and Safety Contractor Handbook prior to initiating field work. Upon arrival at the Site, Golder reviewed the proposed boring locations and discussed private utilities with a Site representative. Golder subcontracted a private utility locate firm, Ground Penetrating Radar Systems Inc. (GPRS), to confirm the proposed borehole locations were clear of underground utilities using ground penetrating radar (GPR) and electromagnetic (EM) tracing and the field geologist followed Golder's internal procedures for authorizing ground disturbance activities.

Environmental Works, Inc. (EWI), a licensed driller in the state of Iowa, performed the drilling and installed the permanent monitoring wells for groundwater sampling. Golder provided field oversight of the drilling and monitoring well installation work completed by EWI. Golder performed all soil and groundwater sampling activities, monitoring well development, and hydraulic conductivity testing. The field program was completed February 22-26, 2021.

2.1 Direct Push Drilling and Soil Sampling

A direct push technology (DPT) drilling rig with hollow stem auger (HSA) capabilities, operated by EWI under direct supervision by Golder, was used to advance four (4) soil borings at the locations shown on Figure 2. The borings were advanced to depths based on investigation rationale and total depths as outlined on Table 1.

At all borehole locations, soil was cored continuously to the total depth using five-foot long acetate liner sleeves within the DPT tools. The recovered soil cores were logged in the field by the Golder field geologist. A field boring log detailing the location, depth and soil type for each soil sample collected was completed by the field geologist for each borehole (see Appendix A). Logging of the soil cores included soil descriptions and visual classifications in accordance with the Unified Soil Classification System (USCS) and standard industry practices. The moisture content of each soil sample was also be noted during the logging process. Soil cores were field screened for volatile organic compounds (VOCs) using a photoionization detector (PID) at 2-foot intervals. PID readings collected from the recovered soil cores ranged from 1.2 ppm to 4.8 ppm. One soil sample was collected from the depth interval with the highest PID reading (8 to 10 feet bgs in MW-4). Based on the lack of visual and olfactory evidence of impacts in the recovered soil cores, soil samples from the other borehole locations were collected from the interval just above groundwater. Pertinent data concerning the drilling, field screening, and sampling activities were recorded on the field boring logs provided as Appendix A.

After field screening, a fresh surface was created just prior to collection of the samples for laboratory analysis. The soil samples were collected using laboratory supplied coring devices (Terra Core® sampler) placed directly into appropriate laboratory containers. The sample containers were labeled and placed in a cooler with ice.

2.2 Monitoring Well Installation

Following drilling, the four boreholes were converted to permanent monitoring wells and designated MW-1 through MW-4. The monitoring wells were constructed of two-inch diameter PVC with a 0.010-inch slotted screen. The screened intervals of the monitoring wells were within a range of 20 to 34 feet bgs based on lithology

encountered during drilling. The monitoring wells were constructed using a 20/40 sand filter pack extending from the base of the borehole to at least two feet above the top of the well screen. Flowing sands prohibited the extension of the filter pack below the constructed well depth in all of the boreholes except MW-1. A bentonite seal was placed above the sand pack and then the annular space was grouted with a Portland cement to within three feet of the ground surface. The remaining annulus was filled with concrete tying into the surface completion. The surface completion consisted of a 2-foot x 2-foot x 4-inch concrete pad and steel flush-mount monitoring well cover. The well construction logs are included as Appendix B.

Permanent monitoring wells were surveyed by JEO Consulting Group Inc., an Iowa-licensed land surveyor, on February 26, 2021 to determine location and groundwater elevations relative to mean sea level. Permanent monitoring well information and groundwater elevations are presented in Table 4 and a groundwater potentiometric surface map is included as Figure 3. Survey data is included as Appendix C.

2.3 Monitoring Well Development

Following drilling and completion of the installation of the permanent monitoring wells, Golder developed each of the monitoring wells using a stainless-steel bailer and/or submersible pump. The monitoring wells were developed (surged and bailed/pumped) until the well was relatively free of sediment and a minimum of three borehole volumes have been removed. The wells continued to be purged until groundwater parameters (temperature, pH, and specific conductivity) stabilized and the turbidity was below 10 nephelometric turbidity units (NTUs). If turbidity values remained above 10 NTU after three borehole volumes had been removed, pumping continued until at least five borehole volumes were removed and three consecutive turbidity readings were within 10%. The well development forms are included as Appendix D.

2.4 Groundwater Sampling

Golder collected groundwater samples from the four newly installed permanent monitoring wells. The permanent monitoring wells were sampled following the completion of monitoring well development. Prior to purging, the depth to water and total depth were recorded to the nearest 0.01 foot using an electronic water level meter. Purging and sampling of the wells was conducted using a peristaltic pump. A flow rate of less than 0.4 liters per minute was sustained during purging and purging was completed in general accordance with EPA low flow procedures (parameter stabilization). Groundwater sample collection forms are included in Appendix E.

2.5 Sample Handling and Laboratory Analysis

All analytical samples were properly labeled as to sample location and depth (if applicable), date and time of collection, sampler's initials, analyses to be performed, preservative(s) used, and project name. This information was then logged on a chain-of-custody form.

Sample coolers were shipped to the analytical laboratory under chain-of-custody protocol for analysis. Soil and groundwater samples were analyzed for volatile organic compounds (VOCs) by EPA methods 5035 (for soil preparation) and 8260.

2.6 Hydraulic Conductivity Testing

Following installation and development of the permanent monitoring wells, hydraulic conductivity estimates were obtained using the “slug test” methodology. A slug test is a field test used to estimate the hydraulic conductivity of

formation materials adjacent to the screen section. The basic approach is to “instantaneously” change the water elevation in the well by raising or lowering the initial or static elevation and observing the stabilization of the water level to static over time.

Prior to conducting the slug tests, static water level was measured in each well. A pressure transducer was then lowered down the well to a sufficient depth to allow displacement of a slug into the water column above the transducer. Slug Testing was performed in general accordance with Golder’s internal Slug Testing Procedure and American Society for Testing and Materials (ASTM) Standard D7242 using pneumatic methods. Pneumatic slug tests use pressurized air as the slugging agent. The well is sealed, and the water column is pressurized. As the pressure increases, the water level drops, and water is forced out of the column and into the aquifer. The level drops until the pressure of the water head is equal to the increased air pressure in the well. Once equilibrium is attained, the pressure is instantaneously released, and the water level begins to return to the static conditions. Following completion of field activities, the data was analyzed using the Hvorslev Slug Test Solution. Slug testing was performed at monitoring wells MW-1, MW-2, MW-3, and MW-4 on February 26, 2021.

2.7 Decontamination and Investigation Derived Waste

Equipment decontamination was conducted in general conformance with ASTM Standard D 5088-15a. The drill rig was decontaminated upon arrival on-Site with particular attention to the working end and downhole equipment (i.e., rods, etc.). Non-dedicated downhole drilling and sampling equipment was decontaminated prior to use at each location. Decontamination consisted of washing the equipment, including rods, in a potable water and Liquinox™ solution, followed by a potable water rinse. Decontamination of Geoprobe rig equipment was performed in buckets beside the rig at each location.

Investigation Derived Waste (IDW) generated during the Phase III ESA was containerized in 55-gallon steel drums. The IDW drums were labeled and staged at the Site inside the northwest corner of the building at the request of the Site representative. Groundwater and decontamination water was collected in 5-gallon buckets during purging/decontamination and then transferred into a drum. Soil cuttings from the drilling activities were placed in a separate drum. Soil and groundwater analytical data will be used to determine an appropriate disposal method for the IDW. Personal protective equipment (PPE) and general refuse was bagged and disposed of in a general refuse dumpster at the Site.

2.8 Quality Assurance and Quality Control

All investigation procedures, including soil and groundwater sampling, collection of quality assurance and quality control (QA/QC) samples, and borehole abandonment, were conducted in general accordance with industry standard practices. Field QA/QC included one trip blank per media (provided by the laboratory) per cooler of samples submitted for analysis of VOCs.

To confirm the accuracy and reproducibility of the laboratory analytical results, the analytical laboratory implemented a QA/QC program, including laboratory replicate samples, method blanks, control standards, and matrix spike/matrix spike duplicates (MS/MSD). The laboratory QA/QC data generated during the sample analyses is included in the laboratory analytical reports (Appendix F) provided to Golder. In addition, Golder conducted an evaluation of the analytical data, including the QA/QC data (level 2 data validation), and a copy of the level 2 data validation evaluation forms are included in Appendix C. No data was rejected based on the evaluation. Detections listed in the data summary tables with a “J” qualifier are considered estimated values.

3.0 SITE GEOLOGIC AND HYDROGEOLOGIC SETTING

Based on a review of the USGS 2018 Shenandoah West, Iowa topographic quadrangle map, the Site has an elevation of approximately 970-980 feet above mean sea level and the topography is generally flat with a gentle slope to the north and west. According to the United States Department of Agriculture Web Soil Survey, surficial soils at the Site are comprised of silty clay loam, which are described as somewhat poorly drained.

Soils observed during the Phase II and III ESAs were mostly silty clays and fine sand at deeper intervals. Clay soils were encountered from ground surface to approximately 23 feet bgs on the north side of Site (MW-1) and extending down to 24-27 feet bgs on the east and southern ends of site (MW-2, MW-3 and MW-4). Poorly graded, saturated sands were encountered from 23 to 30 feet below ground surface. Saturated soil within the clay layer was encountered during drilling at depths ranging from 14 to 18.5 feet bgs.

A summary of the hydraulic conductivity results is presented in Table 5. Calculated hydraulic conductivities at the Site ranged from 2.0E-03 to 7.1E-03 centimeters per second (cm/s), which is equivalent to 1.7 to 6.1 meters per day. The well with the highest hydraulic conductivity (MW-4) is located south of the main Site building as shown on Figure 2.

4.0 ANALYTICAL RESULTS

4.1 Screening Criteria

The Iowa Department of Natural Resources (DNR) has developed statewide standards for the evaluation of soil and groundwater for certain chemicals of concern. The statewide standards for groundwater include standards for a protected groundwater source and a non-protected groundwater source. A protected groundwater source is defined by Iowa DNR as “a saturated bed, formation, or group of formations which has a hydraulic conductivity of at least 0.44 meters per day (m/d) and a total dissolved solids (TDS) concentration of less than 2,500 milligrams per liter (mg/l).” No Site-specific TDS data is available for evaluation, however, based on the hydraulic conductivity estimates discussed in Section 3.0, the standards for a protected groundwater source are likely applicable for the Site.

4.2 Soil Analytical Detections

Four soil samples were collected for analysis of VOCs and the results are shown on Table 2. The laboratory analytical reports are included in Appendix F. As discussed above, soil results were compared to the Iowa DNR statewide standards. A discussion of the analytes that were detected is provided below.

- No VOCs were detected in SS-MW-1 and SS-MW-4. Cis-1,2-dichloroethene (cis-1,2-DCE) and trichloroethene (TCE) were detected in SS-MW-2 and tetrachloroethene (PCE) was detected in SS-MW-3 (and SS-DUP-1). No other VOCs were detected and none of the detections exceeded the statewide standards for soil.

4.3 Groundwater Analytical Detections

Five groundwater samples (including one duplicate) were collected from the four permanent monitoring wells for analysis of VOCs and the results are shown on Table 3. The laboratory analytical reports are included in Appendix F. As discussed above, groundwater results were compared to the Iowa DNR statewide standards for

both Protected and Non-Protected Groundwater Sources. A discussion of the analytes that were detected is provided below.

- Four of the five groundwater samples had at least one detection of a VOC. The VOCs detected included: 1,1-Dichloroethane, cis-1,2-DCE, trans-1, 2-Dichloroethene (trans-1,2-DCE), and TCE. None of the compounds were detected above the statewide standards for a protected or a non-protected groundwater source.

5.0 SUMMARY OF FINDINGS AND CONCLUSIONS

Based on the information obtained during the Phase III ESA, Golder has prepared the following summary of findings and conclusions:

- **Soil:**
  - Three of the five soil samples (including the duplicate) had low-level detections of VOCs. None of the detections exceeded the statewide standards.
- **Groundwater:**
  - Four of the five groundwater samples (including the duplicate) had low-level detections of VOCs. None of the detections exceeded the statewide standards for a protected or a non-protected groundwater source.
  - While there were concentrations of PCE, TCE, and vinyl chloride detected above the statewide standards for a protected groundwater source during the Phase II ESA, the results of the Phase III ESA indicate the exceedances are not widespread. Detections of 1,1-DCA, cis-1,2-DCE, and trans-1,2-DCE during the Phase III ESA indicate natural degradation of PCE and TCE.

6.0 RECOMMENDATIONS

Based on the results of the Phase III ESA, Golder does not recommend any additional assessment. Monitoring wells installed as part of the Phase III ESA should be properly abandoned.

7.0 LIMITATION AND USE OF REPORT

This report was prepared for the exclusive use of Eaton. The report, which specifically includes all tables, figures, and appendices, is based on data and information collected during the Site investigation conducted by Golder and is based solely on the conditions of the property at the time of the field investigation, supplemented by historical information and data obtained by Golder as described in this report.

The assessment of environmental conditions and possible hazards at this Site has been made using the results of chemical analysis of discrete soil and groundwater samples from a limited number of locations. The Site conditions between sampling locations have been inferred based on conditions observed at sampling locations. Groundwater conditions may vary from these sample locations. Additional study, including further sampling, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a Site may be contaminated and remain undetected.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services. Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The content of this report is based on information collected during our investigation, our present understanding of the Site conditions, and our professional judgment in light of such information at the time of this report. This report provides a professional opinion and therefore no warranty is either expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

8.0 CLOSURE

Golder appreciates the opportunity to assist Eaton with this project and trusts this report is sufficient for your current needs. Should you require any additional information about this Phase III ESA Report, please feel free to contact the undersigned.

Golder Associates Inc.

Eric M. Schneider
Staff Geologist

Brett E. Forthaus, P.E.
Senior Project Engineer

Frederick M. Booth, P.G.
Principal and Program Leader

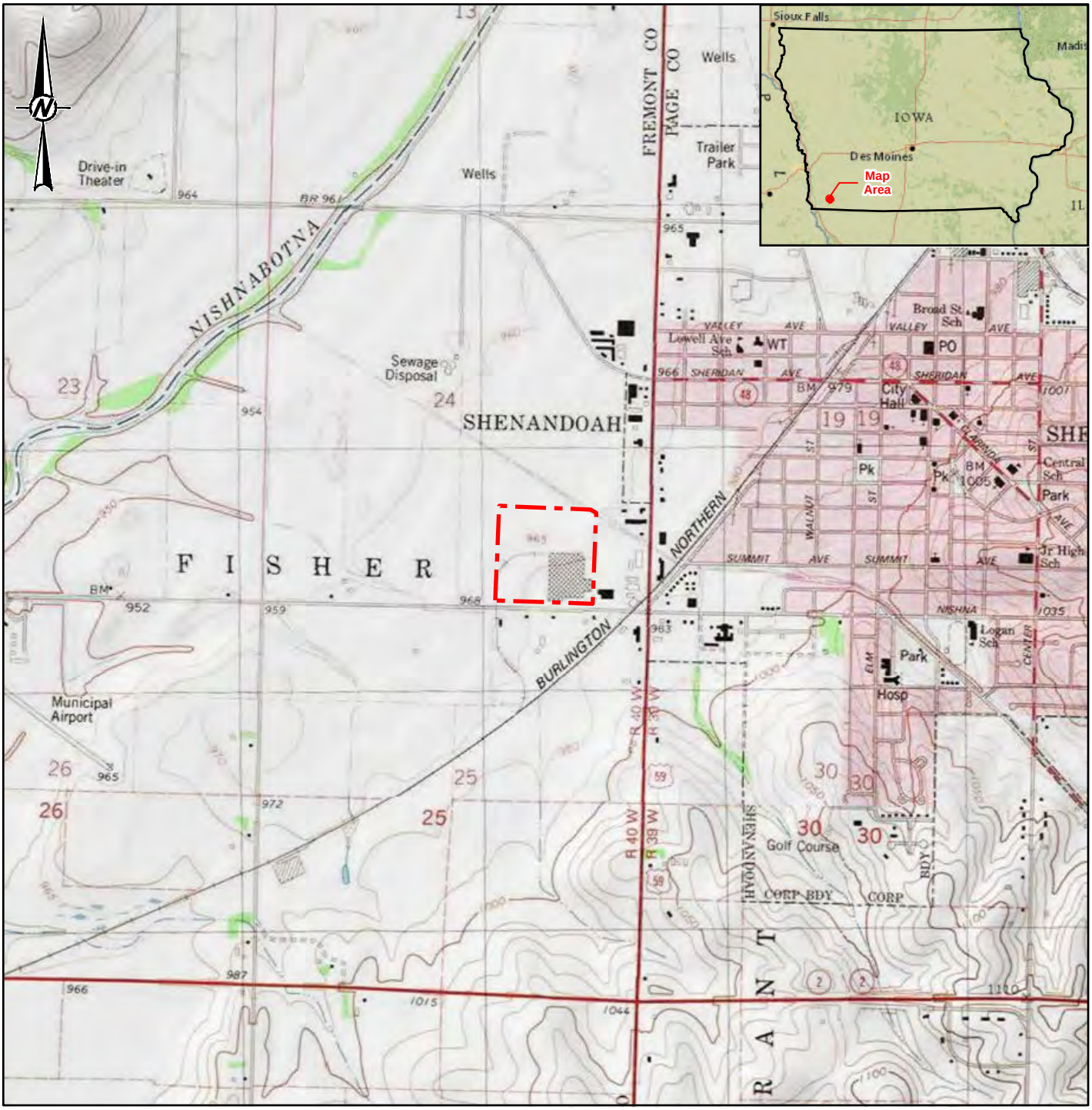
EMS/BEF/FMB

Attachments: Figure 1 – Site Location Map
Figure 2 – Sample Location Map
Figure 3 – Potentiometric Surface Map

Table 1 – Scope of Work
Table 2 – Summary of Soil Analytical Detections
Table 3 – Summary of Groundwater Analytical Detections
Table 4 – Groundwater Elevation Summary - Permanent Monitoring Wells
Table 5 – Summary of Hydraulic Conductivity Testing

Appendix A – Boring Logs
Appendix B – Permanent Monitoring Well Construction Logs
Appendix C – Permanent Monitoring Well Survey Data
Appendix D – Permanent Monitoring Well Development Forms
Appendix E – Groundwater Sample Collection Forms
Appendix F – Laboratory Analytical Data and Data Validation Reports

Figures



LEGEND

Subject Property

0 1,000 2,000 4,000 Feet

REFERENCE(S)

1. TOPOGRAPHIC BACKGROUND: ESRI BASEMAP SERVICES. USGS 1:24,000 TOPOGRAPHIC QUADRANGLES SHOWN: SHENANDOAH WEST, SHENANDOAH EAST, FARRAGUT, & BINGHAM.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE IOWA SOUTH FIPS 1402 FEET.

CLIENT
EATON CORPORATION

PROJECT
EATON CORPORATION, 1600 AIRPORT ROAD, SHENANDOAH, IOWA 51601

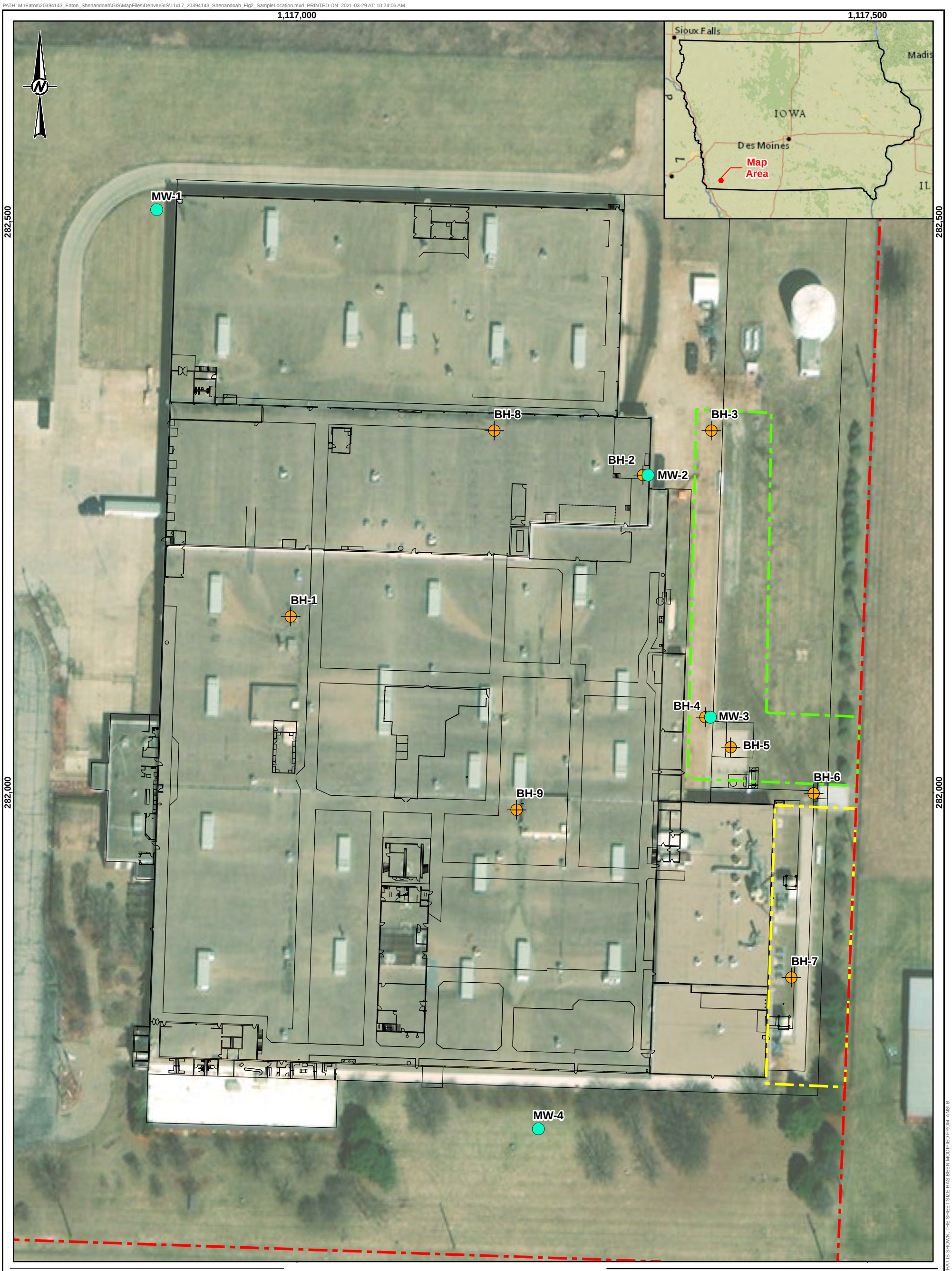
TITLE
SITE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-23
DESIGNED	RHG
PREPARED	RHG
REVIEWED	EMS
APPROVED	FMB

PROJECT NO.
20394143

FIGURE
1



LEGEND

- Subject Property
- 2010 Investigation Area
- Former UST Area
- Permanent Monitoring Well Location
- Phase II Investigation Boring Location

0 80 160

1 Inch = 80 Feet Feet

REFERENCE(S)

1. BASEMAP(S): ESRI PROVIDED BASEMAP SERVICE. VIVID. MAXAR. IMAGERY FLOWN 3/22/2019.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE IOWA SOUTH FIPS 1402 FEET

CLIENT
EATON CORPORATION

PROJECT
EATON CORPORATION, 1600 AIRPORT ROAD, SHENANDOAH, IOWA 51601

TITLE
SAMPLE LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-29
DESIGNED	EFT
PREPARED	RHG
REVIEWED	EMS
APPROVED	FMB

PROJECT NO.	CONTROL	REV.	FIGURE
20394143	-	-	2

LEGEND

- Subject Property
- 2010 Investigation Area
- Former UST Area
- Permanent Monitoring Well Location
- Phase II Investigation Boring Location
- Groundwater Elevation Contour
- Flow Direction

0 80 160

1 Inch = 80 Feet Feet

NOTE(S)

1. GROUNDWATER ELEVATIONS MEASURED ON FEBRUARY 26, 2021.
2. GROUNDWATER ELEVATION REPORTED IN FT. AMSL.

REFERENCE(S)

1. BASEMAP(S): ESRI PROVIDED BASEMAP SERVICE. VIVID. MAXAR. IMAGERY FLOWN 3/22/2019.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE IOWA SOUTH FIPS 1402 FEET

CLIENT
EATON CORPORATION

PROJECT
EATON CORPORATION, 1600 AIRPORT ROAD, SHENANDOAH, IOWA 51601

TITLE
POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2021-03-29
DESIGNED	EFT
PREPARED	RHG
REVIEWED	EMS
APPROVED	FMB

PROJECT NO.	CONTROL	REV.	FIGURE
20394143	-	-	3

Tables

Scope of Work
Eaton - Shenandoah, Iowa

Location	Rationale	Depth of boring for soil and groundwater sampling	Soil - VOCs (5035A/8260)	Groundwater - VOCs (8260)
MW-1	Exterior – Northwest corner of building, presumed downgradient from areas of highest impacts. One soil sample was collected from 10-12 ft bgs, the interval just above groundwater.	32.0 ft bgs	1	1
MW-2	Interior – near “Pit Area” and scrap dock (area with sumps, trenches, staining, chemical storage, drums). Near area with detections of VOCs during initial field investigation. One soil sample was collected from 14-16 ft bgs, the interval just above groundwater.	33.5 ft bgs	1	1
MW-3	Exterior – Outside of current tank farm area (tank farm is inside the building), there are fill ports on the exterior wall and staining was observed on the inside wall. Near area with detections of VOCs during initial field investigation. One soil sample was collected from 12-14 ft bgs, the interval just above groundwater.	34.0 ft bgs	1	1
MW-4	Exterior – Southeast corner of building, presumed upgradient from areas of highest impacts. One soil sample was collected from 8-10 ft bgs, the interval of highest potential for impacts based on PID readings.	33.5 ft bgs	1	1
QA/QC	One trip blank and one duplicate sample was submitted with all shipments of samples submitted for analysis of VOCs.	N/A	2	2
TOTAL			6	6

Notes:
VOCs - Volatile Organic Compounds
MW - Monitoring Well
ft bgs - feet below ground surface
QA/QC - Quality Assurance/Quality Control
N/A - Not Applicable
PID - Photoionization Detector

Prepared by: EMS
Checked by: BTT
Reviewed by: FMB

Table 2
Summary of Soil Analytical Detections
Eaton - Shenandoah, IA

	UNITS	Iowa Statewide Standards for Soil	SS-MW-1	SS-MW-2	SS-MW-3	SS-DUP-1 (SS-MW-3)	SS-MW-4
Sample Depth	ft bgs		10-12	14-16	12-14	12-14	8-10
Sample Date			2/23/2021	2/24/2021	2/24/2021	2/24/2021	2/22/2021
Moisture Content	%	NA	23	24	23	23	24
ANALYTE							
Volatile Organic Compounds							
cis-1,2-Dichloroethene	mg/Kg-dry	150	ND	**0.0036 J**	ND	ND	ND
Tetrachloroethene	mg/Kg-dry	1,500	ND	ND	**0.0012 J**	**0.0011 J**	ND
Trichloroethene	mg/Kg-dry	67	ND	**0.0061**	ND	ND	ND

Notes:
mg/Kg-dry - milligrams per kilogram dry weight
ft bgs - feet below ground surface
ND - not detected above method detection limit (MDL).
Bold value indicates a detection.
J - Analyte is present at an estimated concentration between the MDL and reporting limit.
Statewide Standards obtained from the Iowa Department of Natural Resources Cumulative Risk Calculator accessed here: https://programs.iowadnr.gov/riskcalc/Home/statewidestandards.

Prepared by: EMS
Checked by: BTT
Reviewed by: AMF

Table 3
Summary of Groundwater Analytical Detections
Eaton - Shenandoah, IA

	UNITS	Iowa Statewide Standards for a Protected Groundwater Source	Iowa Statewide Standards for a Non-Protected Groundwater Source	GW-MW-1	GW-MW-2	GW-MW-3	GW-MW-4	GW-DUP-1 (GW-MW-2)
Sample Date				2/26/2021	2/26/2021	2/25/2021	2/26/2021	2/26/2021
ANALYTE								
Volatile Organic Compounds								
1,1-Dichloroethane	mg/L	0.14	0.7	ND	ND	**0.0032**	ND	ND
cis-1,2-Dichloroethene	mg/L	0.07	0.35	**0.0053**	**0.0022**	**0.0038**	ND	**0.0021**
trans-1,2-Dichloroethene	mg/L	0.1	0.7	**0.00084 J**	ND	ND	ND	ND
Trichloroethene	mg/L	0.005	0.076	**0.00062 J**	ND	**0.00080 J**	ND	ND

Notes:
mg/L - milligrams per liter
ND - not detected above method detection limit (MDL)
Bold value indicates a detection.
J - Analyte is present at an estimated concentration between the MDL and report limit.
Statewide Standards obtained from the Iowa Department of Natural Resources Cumulative Risk Calculator accessed here: https://programs.iowadnr.gov/riskcalc/Home/statewidestandards.

Prepared By: EMS
Checked By: BTT
Reviewed By: AMF

Table 4
Groundwater Elevation Summary - Permanent Monitoring Wells
Eaton - Shenandoah, IA

Well Location	Northing	Easting	Ground Surface Elevation (ft. AMSL)	Top of Casing Elevation (ft. AMSL)	Screened Interval (ft. BGS)	Total Depth (ft. BTOC)	Static Water Level		
							Date	ft. BTOC	ft. AMSL
MW-1	282510.48	1116872.63	968.19	967.94	20.2-30.0	30.15	2/26/2021	10.71	957.23
MW-2	282278.04	1117303.19	968.89	968.68	23.3-33.1	32.81	2/26/2021	11.03	957.65
MW-3	282065.86	1117357.82	972.55	972.25	23.4-33.2	33.59	2/26/2021	13.09	959.16
MW-4	281705.27	1117207.06	972.71	972.37	22.9-32.7	31.97	2/26/2021	14.73	957.64

Notes:
ft. BTOC - Feet below top of casing
ft. AMSL - Feet above mean sea level
ft. BGS - Feet below ground surface
MW - Monitoring Well
Monitoring wells MW-1 through MW-4 were installed in February 2021 by Environmental Works Inc. and surveyed by JEO consulting group.
Wells surveyed in US State Plane 1983, Iowa South 1401 and NAVD88.

Prepared by: EMS
Checked by: BEF
Reviewed by: FMB

Table 5
Summary of Hydraulic Conductivity Testing
Eaton - Shenandoah, IA

Monitoring Well ID	Test Date	Screened Interval (ft. BGS)	Static Water Level (ft. BTOC)	Hydraulic Conductivity (cm/sec)
MW-1	2/26/2021	20.2-30.0	10.71	2E-03
MW-2	2/26/2021	23.3-33.1	11.03	3E-03
MW-3	2/26/2021	23.4-33.2	13.09	2E-03
MW-4	2/26/2021	22.9-32.7	14.73	7E-03

Notes
1. ft. BGS = Feet below ground surface
2. ft. BTOC = Feet below top of casing
3. cm/sec = Centimeters per second

Prepared By: EMS
Checked By: JS
Reviewed By: JCW

APPENDIX A

Boring Logs

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-1

DATE: 2/23/2021

INVESTIGATION AREA: NW side of bldg DRILLER: Paul Feld, EWI TIME: 0956-1035

TOTAL DEPTH: 32 FT BGS RIG: 7822 DT Geoprobe NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	2.0 2.5 3.3	3.2/5.0				(0.0-23.0 FT) (CL) SILTY CLAY, low plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w<PL, soft.
5	2	3.0 3.0	2.4/5.0				(5.0-14.0 FT) Same as above (SAA) except color changes to dark yellowish brown (10YR 4/2) with trace light brown (5YR 5/6) iron staining, w~PL, soft to very soft.
10	3	3.1 2.6 3.3	3.4/5.0	SS-MW-1 (10-12) collected at 10:45.	CL		(14.0-23.0 FT) SAA except medium to high plasticity fines, w>PL, very soft. (14.8 FT) Presumed water table.
15	4	3.2 2.8	3.3/5.0				

PROJECT No 20394143 LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-1

DATE: 2/23/2021

INVESTIGATION AREA: NW side of bldg DRILLER: Paul Feld, EWI TIME: 0956-1035

TOTAL DEPTH: 32 FT BGS RIG: 7822 DT Geoprobe NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	5	3.1 3.4 2.9	3.3/5.0		CL		(0.0-23.0 FT) (CL) SILTY CLAY, low plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w<PL, soft. *(Continued)*
					SC		(23.0- 25.0 FT) (SC) CLAYEY SAND, fine poorly graded sub-rounded sand, low plasticity fines; moderate yellowish brown (10YR 5/4) with trace light brown (5YR 5/6) iron staining; non-cohesive, wet, compact.
25	6	3.1 2.6	4.6/5.0		SP		(25.0-32.0 FT) (SP) SAND, fine poorly graded sub-rounded sand, some low plasticity fines; light olive gray (5Y 5/2); non-cohesive, wet, compact.
30	7		0.0/2.0				(30.0-32.0 FT) (SAA) No recovery from 30.0-32.0 feet below ground surface due to flowing sands.
35							End of boring at 32.0 feet below ground surface. For well details, see well construction log for MW-1.

PROJECT No 20394143 LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-2

DATE: 2/24/2021

INVESTIGATION AREA: Interior "Pit Area" DRILLER: Paul Feld, EWI

TIME: 1647-1715

TOTAL DEPTH: 33.5 FT BGS RIG: 7822 DT Geoprobe

NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
					Concrete		(0.0-1.0 FT) FILL - Concrete.
		1.4					(1.0-25.0 FT) (CL) SILTY CLAY, low plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w<PL, soft to firm.
	1	1.2	4.3/5.0				
5		1.5					
	2	2.3	3.4/5.0				(7.0-15.0 FT) Same As Above (SAA) except some light brown iron staining (5YR 5/6), w~PL, soft to very soft.
		3.1					
10					CL		
	3	3.2	1.8/5.0				
		2.6		SS-MW-2 (14-16) collected at 17:35.			
15		3.4					(15.0-18.0 FT) SAA except dark yellowish brown (10YR 2/2) mottling.
	4	3.0	3.1/5.0				
		2.9					(18.0-21.0 FT) SAA except w>PL. (18.0) Presumed water table.

PROJECT No 20394143 LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-2

DATE: 2/24/2021

INVESTIGATION AREA: Interior "Pit Area" DRILLER: Paul Feld, EWI

TIME: 1647-1715

TOTAL DEPTH: 33.5 FT BGS RIG: 7822 DT Geoprobe

NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	5	1.7 2.1 1.8	3.7/5.0		CL		(1.0-25.0 FT) (CL) SILTY CLAY, low plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w<PL, soft to firm. *(Continued)* (21.0-25.0 FT) SAA except color change to light olive gray (5Y 5/2), iron staining (5YR 5/6) and mottling (10YR 4/2) no longer present.
25					SC		(25.0-26.0 FT) (SC) CLAYEY SAND, fine poorly graded sub-rounded sand, low plasticity fines; light olive gray (5Y 5/2); non-cohesive, wet, compact.
					SP		(26.0-27.0 FT) (SP) SAND, fine poorly graded sub-rounded sand, some non-plastic fines; light olive gray (5Y 5/2); non-cohesive, wet, compact.
	6	2.0	3.0/5.0		SM		(27.0-28.0 FT) (SM) SILTY SAND, non-plastic fines, fine poorly graded sub-rounded sand; light olive gray (5Y 5/2); cohesive, w>PL, soft.
		1.2			SP		(28.0-33.5 FT) (SP) SAND, fine poorly graded sub-rounded sand, some non-plastic fines; light olive gray (5Y 5/2); non-cohesive, wet, compact. (30.0-33.5 FT) SAA No recovery from 30.0-33.5 feet below ground surface due to flowing sands.
30	7		0.0/3.5				
							End of boring at 33.5 feet below ground surface. For well details, see well construction log for MW-2.
35							

PROJECT No 20394143 LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-3

DATE: 2/24/2021

INVESTIGATION AREA: SE corner of bldg DRILLER: Paul Feld, EWI

TIME: 1041-1110

TOTAL DEPTH: 34 FT BGS RIG: 7822 DT Geoprobe

NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
					Concrete		(0.0-1.0 FT) FILL - Concrete.
		1.6					(1.0-20.0 FT) (CL) SILTY CLAY, low plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w<PL, firm.
	1		3.0/5.0				
		2.1					
5		2.0					(5.0-7.5 FT) Same as above (SAA) except color change to dark yellowish brown (10YR 4/2).
	2	2.0	3.6/5.0				(7.5-13.5 FT) SAA except with light brown (5YR 5/6) iron staining and light olive gray (5Y 5/2) mottling, soft.
		2.3					
10					CL		
		2.7					
	3		3.0/5.0	SS-MW-3 (12-14) collected at 11:50.			
		2.6					(13.5-15.0 FT) SAA except medium plasticity fines, w>PL, very soft.
15		3.3					(15.0-20.0 FT) SAA except some dark yellowish brown (10YR 4/2) mottling and trace medium sand.
	4	3.2	2.7/5.0				
		3.1					(18.5 FT) Presumed water table.

PROJECT No 20394143 LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-3

DATE: 2/24/2021

INVESTIGATION AREA: SE corner of bldg DRILLER: Paul Feld, EWI

TIME: 1041-1110

TOTAL DEPTH: 34 FT BGS RIG: 7822 DT Geoprobe

NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	5	3.6 2.1 2.6	3.4/5.0		CL		(20.0-27.0 FT) (CL) SILTY CLAY, medium to high plasticity fines, trace fine sand; pale yellowish brown (10YR 6/2) with light brown (5YR 5/6) iron staining and dark brown (10YR 4/2) mottling; cohesive, w>PL, very soft. (25.0-27.0 FT) SAA except color changes to light gray (N5).
25	6	2.8 1.5	3.1/5.0		SC		(27.0-28.0 FT) (SC) CLAYEY SAND, fine poorly graded sub-rounded sand, low plasticity fines; light olive gray (5Y 5/2); non-cohesive, wet, compact.
30	7		0.0/4.0		SP		(28.0-34.0) (SP) SAND, fine poorly graded sub-rounded sand, some non-plastic fines; light olive gray (5Y 5/2); non-cohesive, wet, compact. (30.0-34.0 FT) (SAA) No recovery from 30.0-34.0 feet below ground surface due to flowing sands.
35							End of boring at 34.0 feet below ground surface. For well details, see well construction log for MW-3.

PROJECT No 20394143

PROJECT Eaton Shenandoah Phase III

LOCATION Shenandoah, Iowa

LOGGED BY E. Schneider

CHECKED BY B. Forthaus

REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-4

DATE: 2/22/2021

INVESTIGATION AREA: S of main bldg | DRILLER: Paul Feld, EWI | TIME: 1150-1600

TOTAL DEPTH: 33.5 FT BGS | RIG: 7822 DT Geoprobe | NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	1	2.6 3.1 3.7	3.0/5.0	SS-MW-4 (8-10) collected at 12:55.	CL		(0.0-24.0 FT) (CL) SILTY CLAY, low to medium plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w~PL, soft to firm.
5	2	3.9 4.8	3.4/5.0				(5.0-10.0 FT) Same as above (SAA) except color change to moderate brown (5YR 4/4) and light olive gray (5Y 5/2) with light brown (5YR 5/6) iron staining, soft to very soft.
10	3	4.0 3.8 3.7	2.0/5.0				(10.0-24.0 FT) SAA except very soft.
15	4	2.6 3.3	3.1/5.0				(15.0 FT) Presume water table.

PROJECT No 20394143 | LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III | CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa | REVIEWED BY R. Booth

GOLDER

LOG OF BOREHOLE

BOREHOLE MW-4

DATE: 2/22/2021

INVESTIGATION AREA: S of main bldg | DRILLER: Paul Feld, EWI | TIME: 1150-1600

TOTAL DEPTH: 33.5 FT BGS | RIG: 7822 DT Geoprobe | NO. SAMPLES: 1

DEPTH (Feet)	RUN No.	PID (ppm)	REC	SAMPLE	USCS	GRAPHIC LOG	DESCRIPTION AND COMMENTS
	5	2.2 2.2 2.6	3.5/5.0		CL		(0.0-24.0 FT) (CL) SILTY CLAY, low to medium plasticity fines, trace fine sand; dusky yellowish brown (10YR 2/2); cohesive, w~PL, soft to firm. *(Continued)*
					SC		(24.0-25.0 FT) (SC) CLAYEY SAND, fine poorly graded sub-rounded sand, low plasticity fines; light brown (5YR 5/6); non-cohesive, wet, compact.
25	6	3.0 3.2	3.5/5.0		CL		(25.0-28.0 FT) (CL) SILTY CLAY, low plasticity fines, some fine sand; light gray (N5); cohesive, w~PL, very soft.
					SP		(28.0-33.5 FT) (SP) SAND, fine poorly graded sub rounded sand, some non-plastic to low plasticity fines; light gray (N5) with trace iron staining (5YR 5/6); non-cohesive, wet, compact. (30.0-33.5 FT) SAA No recovery from 30.0-33.5 feet below ground surface due to flowing sands.
30	7		0.0/3.5				
							End of boring at 33.5 feet below ground surface. For well details, see well construction log for MW-4.
35							

PROJECT No 20394143 | LOGGED BY E. Schneider

PROJECT Eaton Shenandoah Phase III | CHECKED BY B. Forthaus

LOCATION Shenandoah, Iowa | REVIEWED BY R. Booth

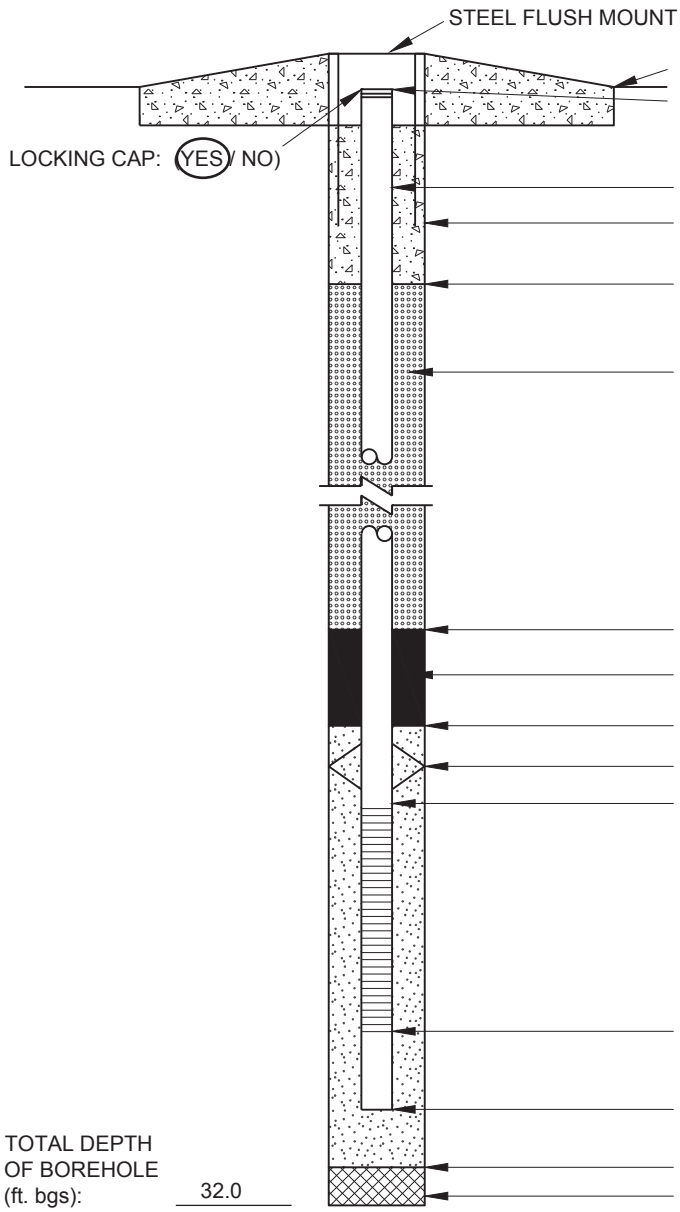
APPENDIX B

Permanent Monitoring Well Construction Logs

FLUSH-MOUNT WELL CONSTRUCTION LOG

MW-1

PROJECT NAME: Shenandoah Phase III Investigation		PROJECT NUMBER: 20394143.0003
SITE NAME: Eaton Shenandoah		LOCATION: Shenandoah, Iowa
CLIENT: Eaton Corporation		SURFACE ELEVATION: 968.2 FT MSL
GEOLOGIST: E. Schneider	NORTHING: 282510.48	EASTING: 1116872.63
DRILLER: Paul Feld	STATIC WATER LEVEL: 13.74 FT. BTOC	COMPLETION DATE: 02/23/2021
DRILLING COMPANY: Environmental Works, Inc.		DRILLING METHODS: DPT/HSA



- GROUND SURFACE ELEVATION: 968.2 FT MSL
- TOP OF CASING ELEVATION: 967.94 FT MSL
- DIAMETER OF RISER PIPE (in.): 2.0
- DIAMETER OF BOREHOLE (in.): 8.25
- CONCRETE SEAL DEPTH (ft. bgs): 3.0
- TYPE AND AMOUNT OF ANNULAR SEAL: PORTLAND "NEAT" CEMENT -4.5 BAGS
- TOP OF BENTONITE SEAL DEPTH (ft. bgs): 14.0
- TYPE AND AMOUNT OF BENTONITE SEAL: 3/8" BENTONITE CHIPS -1.5 BAGS
- TOP OF SAND PACK DEPTH (ft. bgs): 17.0
- CENTRALIZER (yes / (no)) - TYPE: N/A
- TOP OF SCREEN DEPTH (ft. bgs): 20.2
- TYPE OF SCREEN: 2" X 9.8' SCHEDULE 40 PVC
- SCREEN SLOT SIZE (in.): 0.010
- SIZE OF SAND PACK: 20/40
- AMOUNT OF SAND: 3.0 BAGS
- BOTTOM OF SCREEN DEPTH (ft. bgs): 30.0
- BOTTOM OF WELL DEPTH (ft. bgs): 30.4
- BOTTOM OF FILTER PACK (ft. bgs): 32.0
- TYPE AND AMOUNT OF BACKFILL: NONE

ADDITIONAL NOTES: FT. BGS = FEET BELOW GROUND SURFACE. FT. MSL = FEET ABOVE MEAN SEA LEVEL. IN. = INCHES.
HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) IOWA SOUTH ZONE. VERTICAL DATUM: NAVD88.
WELL SURVEYED BY JEO CONSULTING GROUP ON FEBRUARY 26, 2021. FT BTOC = FEET BELOW TOP OF CASING.
CEMENT, BENTONITE, AND SAND BAGS WEIGH 50 LBS EACH. DPT = DIRECT PUSH TECHNOLOGY. HSA = HOLLOW STEM AUGER.

CHECKED BY: B. FORTHAUS
DATE CHECKED: 3/12/2021

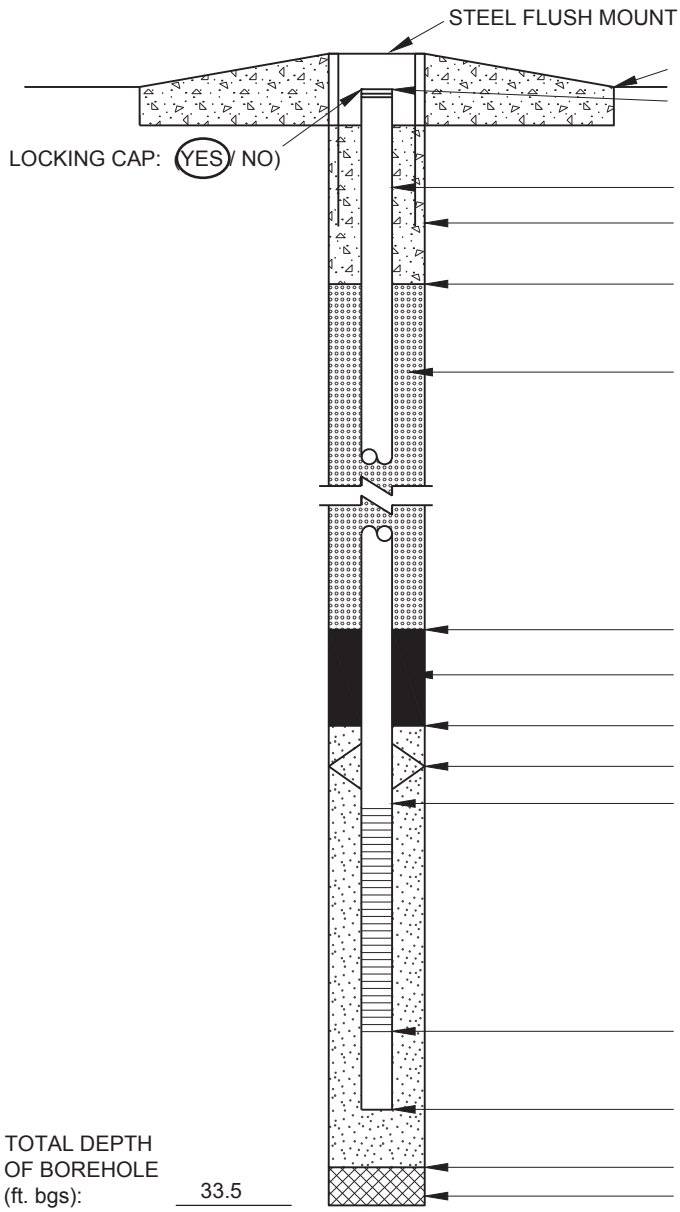
PREPARED BY: E. SCHNEIDER

GOLDER

FLUSH-MOUNT WELL CONSTRUCTION LOG

MW-2

PROJECT NAME: Shenandoah Phase III Investigation		PROJECT NUMBER: 20394143.0003
SITE NAME: Eaton Shenandoah		LOCATION: Shenandoah, Iowa
CLIENT: Eaton Corporation		SURFACE ELEVATION: 968.9 FT MSL
GEOLOGIST: E. Schneider	NORTHING: 282278.04	EASTING: 1117303.19
DRILLER: Paul Feld	STATIC WATER LEVEL: 16.18 FT BTOC	COMPLETION DATE: 02/24/2021
DRILLING COMPANY: Environmental Works, Inc.		DRILLING METHODS: DPT/HSA



GROUND SURFACE ELEVATION: 968.9 FT MSL

TOP OF CASING ELEVATION: 968.68 FT MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 8.25

CONCRETE SEAL DEPTH (ft. bgs): 3.0

TYPE AND AMOUNT OF ANNULAR SEAL: PORTLAND "NEAT" CEMENT - 5.0 BAGS

TOP OF BENTONITE SEAL DEPTH (ft. bgs): 17.0

TYPE AND AMOUNT OF BENTONITE SEAL: 3/8" BENTONITE CHIPS -1.5 BAGS

TOP OF SAND PACK DEPTH (ft. bgs): 19.0

CENTRALIZER (yes / (no)) - TYPE: N/A

TOP OF SCREEN DEPTH (ft. bgs): 23.3

TYPE OF SCREEN: 2" X 9.8' SCHEDULE 40 PVC

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: 20/40

AMOUNT OF SAND: 5.5 BAGS

BOTTOM OF SCREEN DEPTH (ft. bgs): 33.1

BOTTOM OF WELL DEPTH (ft. bgs): 33.5

BOTTOM OF FILTER PACK (ft. bgs): 33.5

TYPE AND AMOUNT OF BACKFILL: NONE

ADDITIONAL NOTES: FT. BGS = FEET BELOW GROUND SURFACE. FT. MSL = FEET ABOVE MEAN SEA LEVEL. IN. = INCHES.
HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) IOWA SOUTH ZONE. VERTICAL DATUM: NAVD88.
WELL SURVEYED BY JEO CONSULTING GROUP ON FEBRUARY 26, 2021. FT BTOC = FEET BELOW TOP OF CASING. N/A = NOT APPLICABLE.
CEMENT, BENTONITE, AND SAND BAGS WEIGH 50 LBS EACH. DPT = DIRECT PUSH TECHNOLOGY. HSA = HOLLOW STEM AUGERS.

CHECKED BY: B. FORTHAUS
DATE CHECKED: 3/12/2021

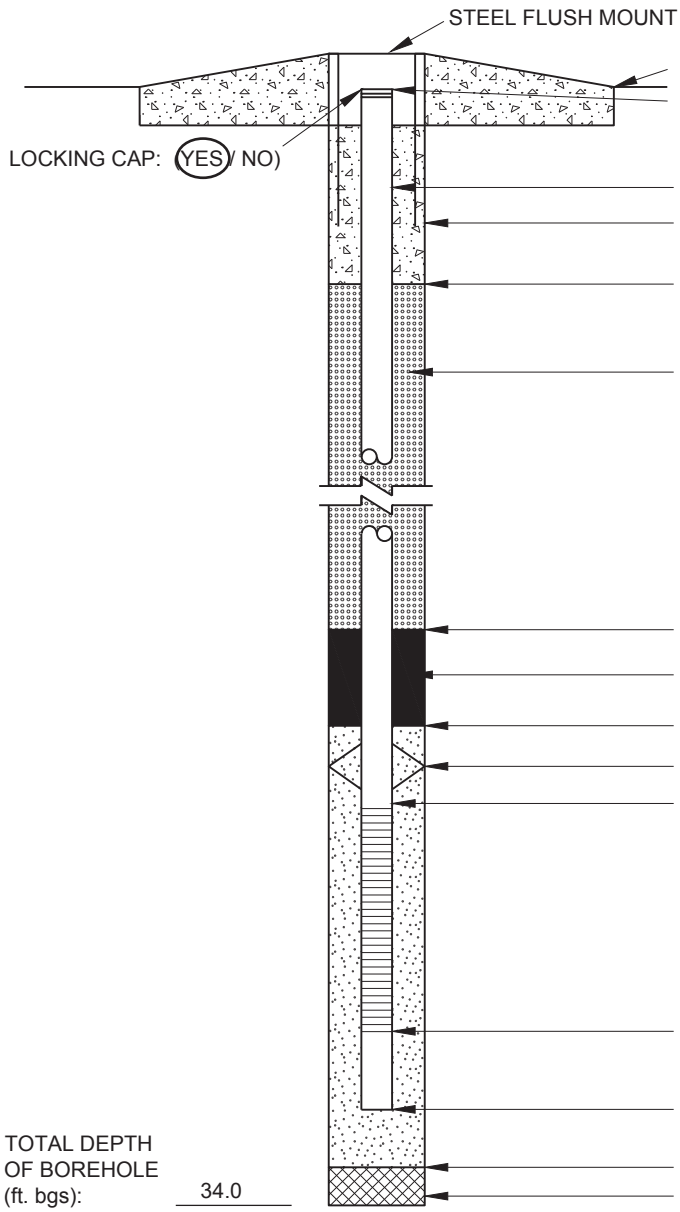
PREPARED BY: E. SCHNEIDER

GOLDER

FLUSH-MOUNT WELL CONSTRUCTION LOG

MW-3

PROJECT NAME: Shenandoah Phase III Investigation		PROJECT NUMBER: 20394143.0003
SITE NAME: Eaton Shenandoah		LOCATION: Shenandoah, Iowa
CLIENT: Eaton Corporation		SURFACE ELEVATION: 972.6 FT MSL
GEOLOGIST: E. Schneider	NORTHING: 282065.86	EASTING: 1117357.82
DRILLER: Paul Feld	STATIC WATER LEVEL: 14.04 FT BTOC	COMPLETION DATE: 02/24/2021
DRILLING COMPANY: Environmental Works, Inc.		DRILLING METHODS: DPT/HSA



GROUND SURFACE ELEVATION: 972.6 FT MSL

TOP OF CASING ELEVATION: 972.25 FT MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 8.25

CONCRETE SEAL DEPTH (ft. bgs): 3.0

TYPE AND AMOUNT OF ANNULAR SEAL: PORTLAND "NEAT" CEMENT- 5.5 BAGS

TOP OF BENTONITE SEAL DEPTH (ft. bgs): 16.0

TYPE AND AMOUNT OF BENTONITE SEAL: 3/8" BENTONITE CHIPS -1.5 BAGS

TOP OF SAND PACK DEPTH (ft. bgs): 19.0

CENTRALIZER (yes / (no)) - TYPE: N/A

TOP OF SCREEN DEPTH (ft. bgs): 23.4

TYPE OF SCREEN: 2" X 9.8' SCHEDULE 40 PVC

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: 20/40

AMOUNT OF SAND: 5.5 BAGS

BOTTOM OF SCREEN DEPTH (ft. bgs): 33.2

BOTTOM OF WELL DEPTH (ft. bgs): 33.6

BOTTOM OF FILTER PACK (ft. bgs): 34.0

TYPE AND AMOUNT OF BACKFILL: NONE

ADDITIONAL NOTES: FT. BGS = FEET BELOW GROUND SURFACE. FT. MSL = FEET ABOVE MEAN SEA LEVEL. IN. = INCHES. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) IOWA SOUTH ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY JEO CONSULTING GROUP ON FEBRUARY 26, 2021. FT BTOC = FEET BELOW TOP OF CASING. N/A = NOT APPLICABLE. CEMENT, BENTONITE, AND SAND BAGS WEIGH 50 LBS EACH. DPT = DIRECT PUSH TECHNOLOGY. HSA = HOLLOW STEM AUGERS.

CHECKED BY: B. FORTHAUS

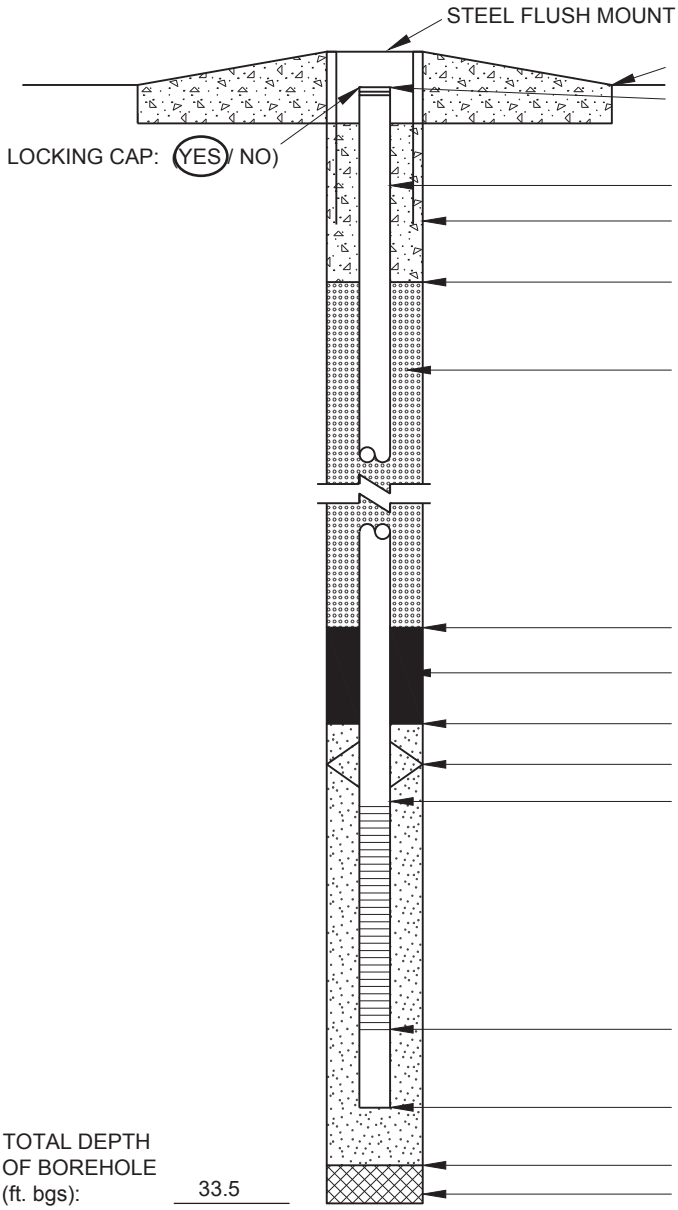
DATE CHECKED: 3/12/2021

PREPARED BY: E. SCHNEIDER

FLUSH-MOUNT WELL CONSTRUCTION LOG

MW-4

PROJECT NAME: Shenandoah Phase III Investigation		PROJECT NUMBER: 20394143.0003
SITE NAME: Eaton Shenandoah		LOCATION: Shenandoah, Iowa
CLIENT: Eaton Corporation		SURFACE ELEVATION: 972.7 FT MSL
GEOLOGIST: E. Schneider	NORTHING: 281705.27	EASTING: 1117207.06
DRILLER: Paul Feld	STATIC WATER LEVEL: 16.19 FT BTOC	COMPLETION DATE: 02/22/2021
DRILLING COMPANY: Environmental Works, Inc.		DRILLING METHODS: DPT/HSA



- GROUND SURFACE ELEVATION: 972.7 FT MSL
- TOP OF CASING ELEVATION: 972.37 FT MSL
- DIAMETER OF RISER PIPE (in.): 2.0
- DIAMETER OF BOREHOLE (in.): 8.25
- CONCRETE SEAL DEPTH (ft. bgs): 3.0
- TYPE AND AMOUNT OF ANNULAR SEAL: PORTLAND "NEAT" CEMENT 5.5 BAGS
- TOP OF BENTONITE SEAL DEPTH (ft. bgs): 15.5
- TYPE AND AMOUNT OF BENTONITE SEAL: 3/8" BENTONITE CHIPS -1.5 BAGS
- TOP OF SAND PACK DEPTH (ft. bgs): 19.0
- CENTRALIZER (yes / (no)) - TYPE: N/A
- TOP OF SCREEN DEPTH (ft. bgs): 22.9
- TYPE OF SCREEN: 2" X 9.8' SCHEDULE 40 PVC
- SCREEN SLOT SIZE (in.): 0.010
- SIZE OF SAND PACK: 20/40
- AMOUNT OF SAND: 5.0 BAGS
- BOTTOM OF SCREEN DEPTH (ft. bgs): 32.7
- BOTTOM OF WELL DEPTH (ft. bgs): 33.1
- BOTTOM OF FILTER PACK (ft. bgs): 33.5
- TYPE AND AMOUNT OF BACKFILL: NONE

ADDITIONAL NOTES: FT. BGS = FEET BELOW GROUND SURFACE. FT. MSL = FEET ABOVE MEAN SEA LEVEL. IN. = INCHES.
HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) IOWA SOUTH ZONE. VERTICAL DATUM: NAVD88.
WELL SURVEYED BY JEO CONSULTING GROUP ON FEBRUARY 26, 2021. FT BTOC = FEET BELOW TOP OF CASING. N/A = NOT APPLICABLE.
CEMENT, BENTONITE, AND SAND BAGS WEIGH 50 LBS EACH. DPT = DIRECT PUSH TECHNOLOGY. HSA = HOLLOW STEM AUGERS.

CHECKED BY: B. FORTHAUS
DATE CHECKED: 3/12/2021

PREPARED BY: E. SCHNEIDER

APPENDIX C

Permanent Monitoring Well Survey Data

ENGINEERING ■ ARCHITECTURE ■ SURVEYING ■ PLANNING

RE: Eaton Monitoring Wells – Shenandoah, Iowa

To whom it may concern,

On February 26th of 2021 we collected the horizontal and vertical location of 4 monitoring wells. The coordinates, elevations and descriptions are below.

PROPERTIES OF JOB	
SYSTEM	U.S. STATE PLANE 1983
ZONE	IOWA SOUTH 1401
DATUM	NAD1983 (CONUS) (MOL)
VERTICAL DATUM	NAVD88
GEOID	G12BUS
COORDINATES	GRID
PROJECT HIEGHT	1000

POINT #	NORTHING	EASTING	GROUND ELEVATION	TOP OF CASING ELEVATION
MW 1	282510.477	1116872.63	968.19	967.94
MW 2	282278.043	1117303.187	968.89	968.68
MW 3	282065.863	1117357.819	972.55	972.25
MW 4	281705.269	1117207.059	972.71	972.37

Sincerely,
Matthew A. Fouts, PLS (IA-23586)

JEO CONSULTING GROUP INC ■ JEO ARCHITECTURE INC
724 Simon Avenue | Carroll, Iowa 51401-2224 | p: 712.792.9711 | f: 712.792.9889
www.jeo.com

APPENDIX D

Permanent Monitoring Well Development Forms

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Eaton Shenandoah Ph III **Project No.:** 20394143

Location MW-1

1502:20

Monitored By: EMS Date 2/25/21 Time 1650

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	30.03 ~~30.37~~	feet bgs
Depth of Water (from top of PVC or ground)	10.86 ~~10.91~~	feet bgs
Radius of Casing	2.0	inches
	NA	feet
Casing Volume	NA	cubic feet
	35.02 x 3 = 105.06	gallons
	" " x 5 = 175.10	

30.03 → 17.0 = 13.03 x 2.611 = 34.02

17.0 → 10.86 = 6.14 x 0.163 = 1.00

Development / Purging Discharge Data

Purging Method: brundfos

Start Purging Date 2/25/21 Time 1500

Stop Purging Date 2/25/21 Time 1650

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
2/25/21	1525	30	16.8	6.84	0.74	904	0.48	13.2	14.40	Brown/Turbid
	1535	50	16.8	6.84	0.74	>1000	0.22	-0.1	15.86	SAA
	1555	80	16.7	6.91	0.74	215	0.17	21.9	16.01	Light Brown Opaque/Cloudy
	1605	100	16.7	6.93	0.74	195	0.21	-1.3	16.18	SAA + light fine sand
	1615	120	16.7	6.90	0.74	107	0.20	-1.4	16.11	SAA
	1625	140	16.7	6.94	0.74	89.7	0.24	-9.6	16.21	SAA
	1630	150	16.8	6.87	0.74	112	0.14	-16.0	16.15	SAA
	1635	160	16.8	6.91	0.73	108	0.20	-10.3	16.17	SAA
	1640	170	16.8	6.86	0.73	102	0.23	-17.5	16.21	SAA
	1645	175	16.7	6.78	0.72	106	0.25	-27.1	16.20	SAA
	1650	180	16.7	6.88	0.73	97.2	0.24	-30.1	16.22	SAA

~1gpm
~increase slightly
~2gpm

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Eaton Shenandoah PH II **Project No.:** 20394463

Location MW-2

Monitored By: EMS Date 2/25/21 Time 1900

Well Piezometer Data

(circle one)

35.46 Aft BTOC
13.82 Aft BTOC
Sump 2.0 Aft
13.74 x 2.611 = 35.9

Depth of Well (from top of PVC or ground)	35.24 or 33.24	feet
Depth of Water (from top of PVC or ground)	13.25 or 11.25	feet
Radius of Casing	2.0	inches
	NA	feet
Casing Volume	NA	cubic feet
	3x = 111.70 1x = 37.23	gallons

Sand @ 18.5 Aft BTOC
33.24
8.25 x .163 = 1.345

Development / Purging Discharge Data

Purging Method: Grundfos

Start Purging Date 2/25/21 Time 1800

Stop Purging Date 2/25/21 Time 1900

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
+1 2/25/21	1805	5	15.1	7.17	0.537	>1000	0.51	42.7	16.89	Dark Brown — 1 gal/min
+1	1810	15	15.6	7.00	0.541	>1000	0.26	21.0	17.01	— 2 gal/min
+1	1815	25	15.0	7.00	0.547	>1000	0.34	16.6	17.56	
+1	1820	35	15.1	6.93	0.545	>1000	0.18	8.3	17.91	
+1	1825	45	15.0	6.86	0.537	370	0.18	3.9	17.91	cleary / Light Brown
+1	1830	55	15.0	6.85	0.538	96.0	0.17	3.7	17.98	
+1	1835	65	15.0	6.78	0.537	44.8	0.17	-1.6	18.11	
+1	1840	75	15.0	6.89	0.534	27.4	0.19	-1.6	18.15	
+1	1845	85	15.0	6.91	0.535	17.4	0.25	-2.6	18.21	
	1850	95	15.0	6.77	0.529	15.0	0.34	-4.9	15.51	Slowed flow Rate / Clear — 1 gal/min
	1855	105	14.9	6.80	0.521	5.57	0.22	-5.9	15.57	clear
	1900	110	15.0	6.76	0.527	3.00	0.07	-9.5	15.54	

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: Eaton Shenandoah Phase III **Project No.:** 20394143

Location MW-3

Monitored By: BMS Date 2/25/21 Time 1220

Well Piezometer Data

QC correction to GSE = 2.4 ft

(circle one)

Depth of Well (from top of PVC or ground): 36.08 or 33.6 BGS feet BTOC 35.70

Depth of Water (from top of PVC or ground): 16.41 or 14.01 BGS feet BTOC 15.39

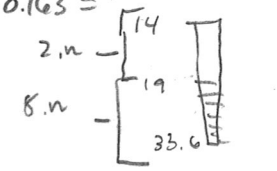
Radius of Casing: 2.0 inches; NA feet

Casing Volume: NA cubic feet; 38.919 x 3 = 116.76 gallons; x5 = 194.60

33.6 − 19.0

14.6 x 2.611 = → 38.106

4.99 x 0.163 = → 0.81337



Development / Purging Discharge Data

Purging Method: Grundfos

Start Purging Date 2/25/21 Time 1048

Stop Purging Date 2/25/21 Time 1220

	Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
+1	2/25/21	1053	10	14.3	7.39	0.600	449	1.46	121.7	23.30	Light Brown Opaque ~2gal/min
+1		1058	20	15.3	7.10	0.630	136	0.30	53.2	23.28	SAA, Except Clear
+1		1103	30	15.3	7.05	0.648	133	0.24	41.9	23.50	SAA, Light Brown Opaque
+1		1108	40	15.3	6.97	0.680	224	0.19	31.3	23.60	SAA
+1		1113	50	15.3	7.00	0.690	264	0.20	29.5	23.52	SAA
+1		1118	60	15.3	7.06	0.690	190	0.14	22.9	23.70	SAA
+1		1123	70	15.2	7.01	0.690	101	0.19	26.0	23.54	SAA
+1		1128	80	15.1	7.02	0.690	411.8	0.21	26.4	23.70	SAA
Decrease Flowrate		1133	90	15.1	7.03	0.690	26.4	0.23	14.0	24.10	No longer moving up Screened interval due to drawdown and well from development
		1147	95	15.2	7.05	0.680	11.2	0.33	20.1	23.16	
		1155	100	15.2	7.00	0.680	10.2	0.15	13.9	23.06	Clear
		1205	105	15.2	7.01	0.680	11.3	0.17	10.9	23.08	
		1210	110	15.2	6.98	0.680	9.78	0.12	7.8	23.11	
		1215	115	15.2	6.94	0.68	6.62	0.12	4.3	23.10	
		1220	120	15.2	6.91	0.69	5.68	0.12	1.6	23.07	

GOLDER

WELL DEVELOPMENT/PURGING FORM

Project Ref: 203941143 **Project No.:** Eaton Shenandoah Phase III

Location MW-44

Monitored By: EMS Date 2/23/21 Time 0900

Well Piezometer Data

(circle one)

Depth of Well (from top of PVC or ground)	33.11 ~~33.09~~	feet
Depth of Water (from top of PVC or ground)	16.18 ~~16.32~~	feet
Radius of Casing	2.0	inches
		feet
Casing Volume	NA	cubic feet
	32.124 x 3 = 96.37	gallons

15.93 → 33.11 − 16.18

16.93 x 0.163 = 2.7 + 9.912 = 12.612

12 x 0.826 = 9.912

12 x 2.611 = 31.32

4.93 x 0.163 = .804

Development / Purging Discharge Data

Purging Method: Grundfos

Start Purging Date 2/23/21 / 2/25/21 Time 1310 / 0805

Stop Purging Date 2/24/21 / 2/25/21 Time 1420 / 0900

Date	Time	Volume Discharge (gals)	Temp (°C)	pH	Spec.Cond. (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Redox Potential (+/- mV)	WL (ft BTOC)	Appearance of Water and Comments
2/23/21	1330	15	14.0	6.76	0.75	728	4.13	59.2	16.94	Opaque White
	1335	20	14.0	6.77	0.75	759	4.05	98.2	16.98	
	1340	25	13.9	6.78	0.74	652	4.37	90.5	16.99	
	1347	30	14.0	6.81	0.75	384	4.32	82.2	16.95	Cleaning
	1352	35	14.0	6.82	0.74	371	4.26	77.7	16.93	
	1357	40	14.0	6.84	0.75	446	4.51	76.9	16.95	
	1402	45	14.0	6.86	0.74	406	4.48	78.5	16.94	
	1407	50	14.0	6.87	0.74	282	4.44	79.7	16.93	
	1415	55	14.0	6.88	0.74	265	4.38	80.1	16.91	
	1420	60	14.0	6.89	0.74	266	4.36	80.2	16.93	
2/25/21	0815	20	13.7	7.34	0.73	28.1	5.38	201.0	16.86	Clear / Light to pacity
	0825	40	13.7	6.92	0.72	44.7	4.95	147.1	16.86	
	0830	50	13.7	6.92	0.71	57.9	4.97	138.6	16.87	
	0835	60	13.7	6.92	0.71	60.1	4.96	125.2	16.86	
	0840	70	13.7	6.92	0.71	18.3	5.15	129.9	16.87	
	0845	75	13.7	6.84	0.71	11.7	5.09	124.6	16.22	Clear 0.5 GPM
	0850	77.5	13.7	6.82	0.71	2.36	4.46	123.7	16.22	
	0855	80.0	13.7	6.83	0.71	2.58	4.55	133.4	16.22	
	0900	82.5	13.7	6.84	0.71	2.47	4.86	126.3	16.23	

~ 1 gal/min
~ 1 gal/min
~ 1 gal/min
~ 1 gallmin
~ 1 gallmin

2GPM

822?

Moved out of Screened interval → Flowrate Slowed to 1 GPM to Stabilize

2/23/21 → Bail 5 Gallons to remove Sediment from Base of Well. Dark Brown Water. WL to 16.56 TD to 33.18 Put down Grundfos

2/25/21 → Pump near bottom of Screened interval ~ 32 ftbgs. EMS runs for 5min@ each foot in Screened interval

APPENDIX E

Groundwater Sample Collection Forms

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Eaton Shumanlook Phase III Project No. : 20894143

WEATHER CONDITIONS

Temperature 40's Weather Clear - Wind

SAMPLE INFORMATION

Sample Location MW-1 Sample No. GW-MW-1

Sample Date 2/26/21 Time 1323 Sample By EMS

Sample Method Peristaltic Sample Type GRAB

Began Purge @ 1253 @ 300 mL/min

Water Level Before Purging: 10.93 FT BTOC

Well Volume: 35.02 Gallons

Volume Water Removed Before Sampling: 9.6 L

Water Level Before Sampling: 10.93 FT BTOC

Water Level After Sampling: 10.97 FT BTOC

Appearance of Sample: Clear - Some Small air bubbles due to Peristaltic Action

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1258	1303	1308	1313	1318	1323	
Volume Discharge	~~gals~~ L	1.5	3.0	4.5	6.0	7.5	9.0	
pH	Standard	6.76	6.77	6.77	6.72	6.71	6.70	
Spec. Cond.	mS/cm	0.580	0.577	0.573	0.572	0.572	0.571	
Turbidity	NTU	50.7	37.5	29.9	22.9	21.5	22.1	
Temperature	°C	15.7	15.7	15.7	15.8	15.6	15.6	
Dissolved Oxygen	mg/L	0.45	0.29	0.21	0.17	0.19	0.16	
Redox Potential	+/- mV	11.7	0.2	-7.1	-14.2	-20.6	-20.6	
Pump Rate	mL/min	360	300	300	300	300	300	
Water Level	FT BTOC	10.93	10.93	10.93	10.93	10.93	10.93	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	VOC' sSW8260		NO	
2				
3				
5				
6				
7				
8				

REMARKS: NO QA/QC

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE (Peristaltic Pump) Air-Lift Pump

Stainless Steel Submersible Pump Other_____

Teflon Hand Pump

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Eaton Shenandoah Project No. : 20394143

WEATHER CONDITIONS

Temperature 40's Weather NA - Well on interior of building

SAMPLE INFORMATION

Sample Location MW-2 Sample No. GW-MW-2

Sample Date 2/26/21 Time 1715 Sample By EMS

Sample Method Peristaltic Sample Type GRAB

Begin Purge @ 1630 @ 300mL/min

Water Level Before Purging: 11.03 FT BTOC

Well Volume: 37.23 Gallons

Volume Water Removed Before Sampling: 13.5 L

Water Level Before Sampling: 11.08 FT BTOC

Water Level After Sampling: 11.05 FT BTOC

Appearance of Sample: Clear - Colorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1635 1640	1645 1650	1655 1700	1705 1710	1715	
Volume Discharge	L ~~gals~~	1.5 3.0	4.5 6.0	7.5 9.0	10.5 12.0	13.5	
pH	Standard	6.76 6.71	6.71 6.73	6.77 6.77	6.79 6.79	6.80	
Spec. Cond.	mS/cm	0.580 0.61	6.61 0.62	0.61 0.601	0.601 0.601	0.600	
Turbidity	NTU	27.6 23.4	18.3 23.4	15.5 8.81	6.17 6.19	6.01	
Temperature	°C	16.0 15.8	15.8 15.6	15.4 13.5	15.4 15.4	15.4	
Dissolved Oxygen	mg/L	0.40 0.38	0.34 0.21	0.16 0.15	0.11 0.12	0.12	
Redox Potential	+/- mV	4.3 -5.3	-7.2 -15.3	-20.3 -22.5	-24.2 -25.5	-28.2	
Pump Rate	mL/min	300 300	300 300	300 300	300 300	300	
Water Level	FT BTOC	11.08 11.08	11.08 11.08	11.08 11.08	11.08 11.08	11.08	

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	VOC' sSW8260		NO	
2				
3				
5				
6				
7				
8				

REMARKS: GW-DUP-1 taken @ Sample time

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon

Peristaltic Pump / Submersible Pump / Hand Pump

Air-Lift Pump / Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Exelon Shenandoah Phase III Project No. : 20394143

WEATHER CONDITIONS

Temperature 40s Weather Clear

SAMPLE INFORMATION

Sample Location MW-3 Sample No. bw-MW-3

Sample Date 2/25/21 Time 1413 Sample By EMS

Sample Method Peristaltic Sample Type Grab

1333 Begin Purge @ 300 mL/min

Water Level Before Purging: 16.51 FT BTOC. Temporary 2.4ft riser

Well Volume: 38.919 Gallons

Volume Water Removed Before Sampling: 13.5 Liters

Water Level Before Sampling: 16.74 FT BTOC

Water Level After Sampling: 16.53 FT BTOC

Appearance of Sample: Clear. Colorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	1338	1343	1348	1353	1358	1403	1408	1413	1418
Volume Discharge	L ~~gals~~	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5
pH	Standard	6.90	6.90	6.99	7.02	7.01	7.04	7.04	7.04	7.04
Spec. Cond.	mS/cm	0.65	0.69	0.71	0.71	0.75	0.74	0.74	0.74	0.74
Turbidity	NTU	14.9	22.7	25.3	19.3	14.2	11.0	8.3	7.70	7.50
Temperature	°C	14.6	14.6	14.5	14.6	14.6	14.6	14.6	14.6	14.5
Dissolved Oxygen	mg/L	0.39	0.26	0.20	0.18	0.18	0.30	0.36	0.17	0.16
Redox Potential	+/- mV	19.8	11.8	2.8	-2.5	-9.1	-13.5	-17.7	-19.1	-22.0
Pump Rate	mL/min	300	300	300	300	300	300	300	300	300
Water Level	FT BTOC	16.71	16.71	16.71	16.75	16.75	16.75	16.75	16.74	16.74

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	VOC' sSW8260	3x 40mL Vial	NO	HCL
2				
3				
5				
6				
7				
8				

REMARKS: NA

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE / Stainless Steel / Teflon

Peristaltic Pump / Submersible Pump / Hand Pump

Air-Lift Pump / Other_____

GROUNDWATER SAMPLE COLLECTION FORM

GOLDER

Project Ref: Potter Shenandoah Phase III Project No. : 20594143

WEATHER CONDITIONS

Temperature 20's Weather Wind / overcast

SAMPLE INFORMATION

Sample Location MW-4 Sample No GW-MW-4

Sample Date 2/26/21 Time 0915 Sample By CMS

Sample Method Peristaltic Sample Type GRAB

0830 Begin purge @ 200 mL/min

Water Level Before Purging: 14.73 FT BTOC

Well Volume: 32.124 Gallons

Volume Water Removed Before Sampling: 11.5 L

Water Level Before Sampling: 14.76 FT BTOC

Water Level After Sampling: 14.74 FT BTOC

Appearance of Sample: Clear, Colorless

FIELD MEASUREMENTS

Parameter	Units	Measurement	Measurement	Measurement	Measurement	Measurement	Measurement	Sample
Time	hhmm	0835	0840	0845	0850	0855	0900	0905	0910	0915
Volume Discharge	~~gals~~ L	1	2	3	4	5.5	7.0	8.5	10.0	11.5
pH	Standard	6.90	6.91	6.90	6.86	6.82	6.80	6.78	6.78	6.78
Spec. Cond.	mS/cm	0.80	0.80	0.78	0.76	0.75	0.75	0.73	0.73	0.73
Turbidity	NTU	109	22.3	31.3	25.6	18.1	17.6	9.24	8.84	8.56
Temperature	°C	11.9	12.0	11.7	12.8	12.8	12.8	12.8	12.8	12.8
Dissolved Oxygen	mg/L	2.93	3.09	4.19	3.35	6.96	4.47	4.98	4.20	4.04
Redox Potential	+/- mV	183.6	131.2	99.9	84.7	82.9	81.6	80.7	81.6	82.4
Pump Rate	mL/min	200	200	200	300	300	300	300	300	300
Water Level	FT BTOC	14.71	14.71	14.71	14.73	14.74	14.76	14.76	14.76	14.76

LABORATORY CONTAINERS

Sub-Sample	Analysis Requested	Type and Size of Sample Container	Filtered (Yes or No)	Type of Preservative
1	VOC' sSW8260	3x40mL Glass	NO	HCL
2				
3				
5				
6				
7				
8				

REMARKS: Increased Flow Rate due to Peristaltic Pump Unable to go low as 200 mL/min

NA = Not applicable

SAMPLING METHODS:

Bailer: PVC/PE, Stainless Steel, Teflon — Peristaltic Pump, Submersible Pump, Hand Pump — Air-Lift Pump, Other_____

Temp Ph Spec Cond Turbidity

APPENDIX F

Laboratory Analytical Data and Data Validation Reports

08-Mar-2021

Anne Faeth-Boyd
Golder Associates Inc.
13515 Barrett Parkway Drive
Suite 260
Ballwin, MO 63021

Re: **Golder - Iowa Project (1661465)** Work Order: **21030066**

Dear Anne,

ALS Environmental received 6 samples on 01-Mar-2021 09:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 27.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Gary Byar

Electronically approved by: Gary Byar

Gary Byar
Project Manager

Report of Laboratory Analysis

Certificate No: IA: 403

ALS Group, USA

Date: 08-Mar-21

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Work Order: **21030066**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
21030066-01	SS-MW-4 (8-10)	Soil		2/22/2021 12:55	3/1/2021 09:00	☐
21030066-02	SS-MW-3 (12-14)	Soil		2/24/2021 11:50	3/1/2021 09:00	☐
21030066-03	SS-MW-2 (14-16)	Soil		2/24/2021 17:35	3/1/2021 09:00	☐
21030066-04	SS-MW-1 (10-12)	Soil		2/23/2021 10:45	3/1/2021 09:00	☐
21030066-05	SS-DUP-1	Soil		2/24/2021	3/1/2021 09:00	☐
21030066-06	Trip Blank	Soil		2/24/2021	3/1/2021 09:00	☐

ALS Group, USA

Date: *08-Mar-21*

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-4 (8-10)
Collection Date: 2/22/2021 12:55 PM

Work Order: 21030066
Lab ID: 21030066-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS - LOW LEVEL		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00089	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,1,2,2-Tetrachloroethane	U		0.00072	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,1,2-Trichloroethane	U		0.00075	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,1,2-Trichlorotrifluoroethane	U		0.0012	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,1-Dichloroethane	U		0.00070	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,1-Dichloroethene	U		0.0011	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,2,4-Trichlorobenzene	U		0.0012	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,2-Dibromo-3-chloropropane	U		0.0011	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,2-Dibromoethane	U		0.00040	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,2-Dichlorobenzene	U		0.00079	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,2-Dichloroethane	U		0.00063	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,2-Dichloropropane	U		0.00049	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,3-Dichlorobenzene	U		0.00069	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
1,4-Dichlorobenzene	U		0.00072	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
2-Butanone	U		0.0057	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
2-Hexanone	U		0.0020	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
4-Methyl-2-pentanone	U		0.0020	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Acetone	U		0.0052	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Benzene	U		0.00058	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Bromodichloromethane	U		0.00067	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Bromoform	U		0.00056	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Bromomethane	U		0.0028	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Carbon disulfide	U		0.00066	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Carbon tetrachloride	U		0.0011	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Chlorobenzene	U		0.00071	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Chloroethane	U		0.0021	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Chloroform	U		0.00092	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Chloromethane	U		0.0011	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
cis-1,2-Dichloroethene	U		0.00061	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
cis-1,3-Dichloropropene	U		0.00067	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Cyclohexane	U		0.0019	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Dibromochloromethane	U		0.00057	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Dichlorodifluoromethane	U		0.0028	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Ethylbenzene	U		0.00098	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Isopropylbenzene	U		0.00096	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Methyl acetate	U		0.0013	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Methyl tert-butyl ether	U		0.00069	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Methylcyclohexane	U		0.0017	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-4 (8-10)
Collection Date: 2/22/2021 12:55 PM

Work Order: 21030066
Lab ID: 21030066-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methylene chloride	U		0.0070	0.011	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Styrene	U		0.00084	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Tetrachloroethene	U		0.0010	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Toluene	U		0.00097	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
trans-1,2-Dichloroethene	U		0.00056	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
trans-1,3-Dichloropropene	U		0.00054	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Trichloroethene	U		0.00081	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Trichlorofluoromethane	U		0.00080	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Vinyl chloride	U		0.00079	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Xylenes, Total	U		0.0025	0.0056	mg/Kg-dry-dry	0.853	3/4/2021 13:54
Surr: 1,2-Dichloroethane-d4	*114*			*83-132*	*%REC*	0.853	3/4/2021 13:54
Surr: 4-Bromofluorobenzene	*102*			*83-111*	*%REC*	0.853	3/4/2021 13:54
Surr: Dibromofluoromethane	*110*			*77-125*	*%REC*	0.853	3/4/2021 13:54
Surr: Toluene-d8	*96.9*			*86-108*	*%REC*	0.853	3/4/2021 13:54
MOISTURE		Method: **SW3550C**					Analyst: **KTP**
Moisture	**24**		**0.10**	**0.10**	**% of sample**	1	3/4/2021 11:51

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-3 (12-14)
Collection Date: 2/24/2021 11:50 AM

Work Order: 21030066
Lab ID: 21030066-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS - LOW LEVEL		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00091	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,1,2,2-Tetrachloroethane	U		0.00074	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,1,2-Trichloroethane	U		0.00078	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,1,2-Trichlorotrifluoroethane	U		0.0013	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,1-Dichloroethane	U		0.00072	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,1-Dichloroethene	U		0.0011	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,2,4-Trichlorobenzene	U		0.0013	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,2-Dibromo-3-chloropropane	U		0.0011	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,2-Dibromoethane	U		0.00042	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,2-Dichlorobenzene	U		0.00081	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,2-Dichloroethane	U		0.00065	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,2-Dichloropropane	U		0.00051	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,3-Dichlorobenzene	U		0.00071	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
1,4-Dichlorobenzene	U		0.00074	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
2-Butanone	U		0.0059	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
2-Hexanone	U		0.0021	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
4-Methyl-2-pentanone	U		0.0021	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Acetone	U		0.0053	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Benzene	U		0.00060	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Bromodichloromethane	U		0.00069	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Bromoform	U		0.00058	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Bromomethane	U		0.0029	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Carbon disulfide	U		0.00068	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Carbon tetrachloride	U		0.0012	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Chlorobenzene	U		0.00073	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Chloroethane	U		0.0022	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Chloroform	U		0.00095	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Chloromethane	U		0.0012	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
cis-1,2-Dichloroethene	U		0.00062	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
cis-1,3-Dichloropropene	U		0.00069	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Cyclohexane	U		0.0020	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Dibromochloromethane	U		0.00059	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Dichlorodifluoromethane	U		0.0029	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Ethylbenzene	U		0.0010	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Isopropylbenzene	U		0.00098	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Methyl acetate	U		0.0014	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Methyl tert-butyl ether	U		0.00071	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Methylcyclohexane	U		0.0017	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-3 (12-14)
Collection Date: 2/24/2021 11:50 AM

Work Order: 21030066
Lab ID: 21030066-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methylene chloride	U		0.0072	0.012	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Styrene	U		0.00087	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Tetrachloroethene	**0.0012**	J	**0.0010**	**0.0058**	**mg/Kg-dry-dry**	0.896	3/4/2021 14:10
Toluene	U		0.0010	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
trans-1,2-Dichloroethene	U		0.00058	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
trans-1,3-Dichloropropene	U		0.00056	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Trichloroethene	U		0.00083	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Trichlorofluoromethane	U		0.00082	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Vinyl chloride	U		0.00081	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Xylenes, Total	U		0.0025	0.0058	mg/Kg-dry-dry	0.896	3/4/2021 14:10
Surr: 1,2-Dichloroethane-d4	*108*			*83-132*	*%REC*	0.896	3/4/2021 14:10
Surr: 4-Bromofluorobenzene	*107*			*83-111*	*%REC*	0.896	3/4/2021 14:10
Surr: Dibromofluoromethane	*109*			*77-125*	*%REC*	0.896	3/4/2021 14:10
Surr: Toluene-d8	*95.8*			*86-108*	*%REC*	0.896	3/4/2021 14:10
MOISTURE		Method: **SW3550C**					Analyst: **KTP**
Moisture	**23**		**0.10**	**0.10**	**% of sample**	1	3/4/2021 11:51

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-2 (14-16)
Collection Date: 2/24/2021 05:35 PM

Work Order: 21030066
Lab ID: 21030066-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS - LOW LEVEL		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00086	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,1,2,2-Tetrachloroethane	U		0.00069	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,1,2-Trichloroethane	U		0.00073	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,1,2-Trichlorotrifluoroethane	U		0.0012	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,1-Dichloroethane	U		0.00067	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,1-Dichloroethene	U		0.0011	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,2,4-Trichlorobenzene	U		0.0012	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,2-Dibromo-3-chloropropane	U		0.0011	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,2-Dibromoethane	U		0.00039	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,2-Dichlorobenzene	U		0.00076	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,2-Dichloroethane	U		0.00061	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,2-Dichloropropane	U		0.00048	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,3-Dichlorobenzene	U		0.00066	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
1,4-Dichlorobenzene	U		0.00069	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
2-Butanone	U		0.0055	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
2-Hexanone	U		0.0020	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
4-Methyl-2-pentanone	U		0.0020	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Acetone	U		0.0050	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Benzene	U		0.00056	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Bromodichloromethane	U		0.00065	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Bromoform	U		0.00054	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Bromomethane	U		0.0027	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Carbon disulfide	U		0.00064	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Carbon tetrachloride	U		0.0011	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Chlorobenzene	U		0.00068	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Chloroethane	U		0.0021	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Chloroform	U		0.00089	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Chloromethane	U		0.0011	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
cis-1,2-Dichloroethene	**0.0036**	J	**0.00059**	**0.0054**	**mg/Kg-dry-dry**	0.826	3/4/2021 14:27
cis-1,3-Dichloropropene	U		0.00065	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Cyclohexane	U		0.0018	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Dibromochloromethane	U		0.00055	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Dichlorodifluoromethane	U		0.0027	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Ethylbenzene	U		0.00094	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Isopropylbenzene	U		0.00092	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Methyl acetate	U		0.0013	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Methyl tert-butyl ether	U		0.00066	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Methylcyclohexane	U		0.0016	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-2 (14-16)
Collection Date: 2/24/2021 05:35 PM

Work Order: 21030066
Lab ID: 21030066-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methylene chloride	U		0.0067	0.011	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Styrene	U		0.00081	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Tetrachloroethene	U		0.00097	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Toluene	U		0.00093	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
trans-1,2-Dichloroethene	U		0.00054	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
trans-1,3-Dichloropropene	U		0.00052	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Trichloroethene	**0.0061**		**0.00078**	**0.0054**	**mg/Kg-dry-dry**	0.826	3/4/2021 14:27
Trichlorofluoromethane	U		0.00077	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Vinyl chloride	U		0.00076	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Xylenes, Total	U		0.0024	0.0054	mg/Kg-dry-dry	0.826	3/4/2021 14:27
Surr: 1,2-Dichloroethane-d4	*96.1*			*83-132*	*%REC*	0.826	3/4/2021 14:27
Surr: 4-Bromofluorobenzene	*103*			*83-111*	*%REC*	0.826	3/4/2021 14:27
Surr: Dibromofluoromethane	*103*			*77-125*	*%REC*	0.826	3/4/2021 14:27
Surr: Toluene-d8	*99.3*			*86-108*	*%REC*	0.826	3/4/2021 14:27
MOISTURE		Method: **SW3550C**					Analyst: **KTP**
Moisture	**24**		**0.10**	**0.10**	**% of sample**	1	3/4/2021 11:51

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-1 (10-12)
Collection Date: 2/23/2021 10:45 AM

Work Order: 21030066
Lab ID: 21030066-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS - LOW LEVEL		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00084	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,1,2,2-Tetrachloroethane	U		0.00068	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,1,2-Trichloroethane	U		0.00071	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,1,2-Trichlorotrifluoroethane	U		0.0012	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,1-Dichloroethane	U		0.00066	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,1-Dichloroethene	U		0.0010	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,2,4-Trichlorobenzene	U		0.0012	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,2-Dibromo-3-chloropropane	U		0.0011	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,2-Dibromoethane	U		0.00038	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,2-Dichlorobenzene	U		0.00074	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,2-Dichloroethane	U		0.00059	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,2-Dichloropropane	U		0.00047	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,3-Dichlorobenzene	U		0.00065	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
1,4-Dichlorobenzene	U		0.00068	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
2-Butanone	U		0.0054	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
2-Hexanone	U		0.0019	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
4-Methyl-2-pentanone	U		0.0019	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Acetone	U		0.0049	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Benzene	U		0.00055	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Bromodichloromethane	U		0.00064	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Bromoform	U		0.00053	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Bromomethane	U		0.0027	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Carbon disulfide	U		0.00063	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Carbon tetrachloride	U		0.0011	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Chlorobenzene	U		0.00067	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Chloroethane	U		0.0020	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Chloroform	U		0.00087	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Chloromethane	U		0.0011	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
cis-1,2-Dichloroethene	U		0.00057	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
cis-1,3-Dichloropropene	U		0.00064	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Cyclohexane	U		0.0018	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Dibromochloromethane	U		0.00054	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Dichlorodifluoromethane	U		0.0027	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Ethylbenzene	U		0.00092	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Isopropylbenzene	U		0.00090	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Methyl acetate	U		0.0013	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Methyl tert-butyl ether	U		0.00065	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Methylcyclohexane	U		0.0016	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-MW-1 (10-12)
Collection Date: 2/23/2021 10:45 AM

Work Order: 21030066
Lab ID: 21030066-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methylene chloride	U		0.0066	0.011	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Styrene	U		0.00080	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Tetrachloroethene	U		0.00094	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Toluene	U		0.00091	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
trans-1,2-Dichloroethene	U		0.00053	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
trans-1,3-Dichloropropene	U		0.00051	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Trichloroethene	U		0.00076	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Trichlorofluoromethane	U		0.00075	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Vinyl chloride	U		0.00074	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Xylenes, Total	U		0.0023	0.0053	mg/Kg-dry-dry	0.813	3/4/2021 14:43
Surr: 1,2-Dichloroethane-d4	*116*			*83-132*	*%REC*	0.813	3/4/2021 14:43
Surr: 4-Bromofluorobenzene	*109*			*83-111*	*%REC*	0.813	3/4/2021 14:43
Surr: Dibromofluoromethane	*110*			*77-125*	*%REC*	0.813	3/4/2021 14:43
Surr: Toluene-d8	*97.2*			*86-108*	*%REC*	0.813	3/4/2021 14:43
MOISTURE		Method: **SW3550C**					Analyst: **KTP**
Moisture	**23**		**0.10**	**0.10**	**% of sample**	1	3/4/2021 11:51

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *08-Mar-21*

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-DUP-1
Collection Date: 2/24/2021

Work Order: 21030066
Lab ID: 21030066-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS - LOW LEVEL		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00084	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,1,2,2-Tetrachloroethane	U		0.00068	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,1,2-Trichloroethane	U		0.00072	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,1,2-Trichlorotrifluoroethane	U		0.0012	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,1-Dichloroethane	U		0.00066	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,1-Dichloroethene	U		0.0010	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,2,4-Trichlorobenzene	U		0.0012	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,2-Dibromo-3-chloropropane	U		0.0011	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,2-Dibromoethane	U		0.00038	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,2-Dichlorobenzene	U		0.00075	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,2-Dichloroethane	U		0.00060	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,2-Dichloropropane	U		0.00047	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,3-Dichlorobenzene	U		0.00065	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
1,4-Dichlorobenzene	U		0.00068	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
2-Butanone	U		0.0054	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
2-Hexanone	U		0.0019	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
4-Methyl-2-pentanone	U		0.0019	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Acetone	U		0.0049	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Benzene	U		0.00056	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Bromodichloromethane	U		0.00064	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Bromoform	U		0.00053	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Bromomethane	U		0.0027	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Carbon disulfide	U		0.00063	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Carbon tetrachloride	U		0.0011	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Chlorobenzene	U		0.00067	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Chloroethane	U		0.0020	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Chloroform	U		0.00088	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Chloromethane	U		0.0011	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
cis-1,2-Dichloroethene	U		0.00058	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
cis-1,3-Dichloropropene	U		0.00064	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Cyclohexane	U		0.0018	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Dibromochloromethane	U		0.00054	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Dichlorodifluoromethane	U		0.0027	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Ethylbenzene	U		0.00093	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Isopropylbenzene	U		0.00091	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Methyl acetate	U		0.0013	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Methyl tert-butyl ether	U		0.00065	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Methylcyclohexane	U		0.0016	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: SS-DUP-1
Collection Date: 2/24/2021

Work Order: 21030066
Lab ID: 21030066-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methylene chloride	U		0.0066	0.011	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Styrene	U		0.00080	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Tetrachloroethene	**0.0011**	J	**0.00095**	**0.0053**	**mg/Kg-dry-dry**	0.821	3/4/2021 14:59
Toluene	U		0.00092	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
trans-1,2-Dichloroethene	U		0.00053	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
trans-1,3-Dichloropropene	U		0.00051	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Trichloroethene	U		0.00077	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Trichlorofluoromethane	U		0.00076	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Vinyl chloride	U		0.00075	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Xylenes, Total	U		0.0023	0.0053	mg/Kg-dry-dry	0.821	3/4/2021 14:59
Surr: 1,2-Dichloroethane-d4	*115*			*83-132*	*%REC*	0.821	3/4/2021 14:59
Surr: 4-Bromofluorobenzene	*109*			*83-111*	*%REC*	0.821	3/4/2021 14:59
Surr: Dibromofluoromethane	*114*			*77-125*	*%REC*	0.821	3/4/2021 14:59
Surr: Toluene-d8	*99.4*			*86-108*	*%REC*	0.821	3/4/2021 14:59
MOISTURE		Method: **SW3550C**					Analyst: **KTP**
Moisture	**23**		**0.10**	**0.10**	**% of sample**	1	3/4/2021 11:51

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *08-Mar-21*

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: Trip Blank
Collection Date: 2/24/2021

Work Order: 21030066
Lab ID: 21030066-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS - LOW LEVEL		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00079	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,1,2,2-Tetrachloroethane	U		0.00064	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,1,2-Trichloroethane	U		0.00067	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,1,2-Trichlorotrifluoroethane	U		0.0011	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,1-Dichloroethane	U		0.00062	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,1-Dichloroethene	U		0.00098	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,2,4-Trichlorobenzene	U		0.0011	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,2-Dibromo-3-chloropropane	U		0.00099	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,2-Dibromoethane	U		0.00036	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,2-Dichlorobenzene	U		0.00070	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,2-Dichloroethane	U		0.00056	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,2-Dichloropropane	U		0.00044	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,3-Dichlorobenzene	U		0.00061	0.0050	mg/Kg-dry	1	3/4/2021 13:22
1,4-Dichlorobenzene	U		0.00064	0.0050	mg/Kg-dry	1	3/4/2021 13:22
2-Butanone	U		0.0051	0.010	mg/Kg-dry	1	3/4/2021 13:22
2-Hexanone	U		0.0018	0.0050	mg/Kg-dry	1	3/4/2021 13:22
4-Methyl-2-pentanone	U		0.0018	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Acetone	U		0.0046	0.010	mg/Kg-dry	1	3/4/2021 13:22
Benzene	U		0.00052	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Bromodichloromethane	U		0.00060	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Bromoform	U		0.00050	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Bromomethane	U		0.0025	0.010	mg/Kg-dry	1	3/4/2021 13:22
Carbon disulfide	U		0.00059	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Carbon tetrachloride	U		0.0010	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Chlorobenzene	U		0.00063	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Chloroethane	U		0.0019	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Chloroform	U		0.00082	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Chloromethane	U		0.0010	0.010	mg/Kg-dry	1	3/4/2021 13:22
cis-1,2-Dichloroethene	U		0.00054	0.0050	mg/Kg-dry	1	3/4/2021 13:22
cis-1,3-Dichloropropene	U		0.00060	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Cyclohexane	U		0.0017	0.010	mg/Kg-dry	1	3/4/2021 13:22
Dibromochloromethane	U		0.00051	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Dichlorodifluoromethane	U		0.0025	0.010	mg/Kg-dry	1	3/4/2021 13:22
Ethylbenzene	U		0.00087	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Isopropylbenzene	U		0.00085	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Methyl acetate	U		0.0012	0.010	mg/Kg-dry	1	3/4/2021 13:22
Methyl tert-butyl ether	U		0.00061	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Methylcyclohexane	U		0.0015	0.010	mg/Kg-dry	1	3/4/2021 13:22

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: Trip Blank
Collection Date: 2/24/2021

Work Order: 21030066
Lab ID: 21030066-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methylene chloride	U		0.0062	0.010	mg/Kg-dry	1	3/4/2021 13:22
Styrene	U		0.00075	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Tetrachloroethene	U		0.00089	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Toluene	U		0.00086	0.0050	mg/Kg-dry	1	3/4/2021 13:22
trans-1,2-Dichloroethene	U		0.00050	0.0050	mg/Kg-dry	1	3/4/2021 13:22
trans-1,3-Dichloropropene	U		0.00048	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Trichloroethene	U		0.00072	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Trichlorofluoromethane	U		0.00071	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Vinyl chloride	U		0.00070	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Xylenes, Total	U		0.0022	0.0050	mg/Kg-dry	1	3/4/2021 13:22
Surr: 1,2-Dichloroethane-d4	*104*			*83-132*	*%REC*	1	3/4/2021 13:22
Surr: 4-Bromofluorobenzene	*102*			*83-111*	*%REC*	1	3/4/2021 13:22
Surr: Dibromofluoromethane	*103*			*77-125*	*%REC*	1	3/4/2021 13:22
Surr: Toluene-d8	*98.2*			*86-108*	*%REC*	1	3/4/2021 13:22

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Work Order: 21030066

Case Narrative

Batch R311026a Sample 21030066-01A MS/MSD VOC_8260_SLL The MS/MSD recovery for Acetone was above the upper control limit. The corresponding result in the parent sample was non-detect therefore no qualification is necessary. Client Sample ID: SS-MW-4 (8-10)

Batch R311123 The QC Duplicate data for Moisture is not related to this project's sample. No data requires qualification.

QC BATCH REPORT

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

MBLK Sample ID: **8V-MBLKS1-210304-R311026a** Units: **µg/Kg** Analysis Date: **3/4/2021 12:58 PM**

Client ID: Run ID: **VMS8_210304A** SeqNo: **7189881** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	0.79	5.0								
1,1,2,2-Tetrachloroethane	U	0.64	5.0								
1,1,2-Trichloroethane	U	0.67	5.0								
1,1,2-Trichlorotrifluoroethane	U	1.1	5.0								
1,1-Dichloroethane	U	0.62	5.0								
1,1-Dichloroethene	U	0.98	5.0								
1,2,4-Trichlorobenzene	U	1.1	5.0								
1,2-Dibromo-3-chloropropane	U	0.99	5.0								
1,2-Dibromoethane	U	0.36	5.0								
1,2-Dichlorobenzene	U	0.7	5.0								
1,2-Dichloroethane	U	0.56	5.0								
1,2-Dichloropropane	U	0.44	5.0								
1,3-Dichlorobenzene	U	0.61	5.0								
1,4-Dichlorobenzene	U	0.64	5.0								
2-Butanone	U	5.1	10								
2-Hexanone	U	1.8	5.0								
4-Methyl-2-pentanone	U	1.8	5.0								
Acetone	U	4.6	10								
Benzene	U	0.52	5.0								
Bromodichloromethane	U	0.6	5.0								
Bromoform	U	0.5	5.0								
Bromomethane	U	2.5	10								
Carbon disulfide	U	0.59	5.0								
Carbon tetrachloride	U	1	5.0								
Chlorobenzene	U	0.63	5.0								
Chloroethane	U	1.9	5.0								
Chloroform	U	0.82	5.0								
Chloromethane	U	1	10								
cis-1,2-Dichloroethene	U	0.54	5.0								
cis-1,3-Dichloropropene	U	0.6	5.0								
Cyclohexane	U	1.7	10								
Dibromochloromethane	U	0.51	5.0								
Dichlorodifluoromethane	U	2.5	10								
Ethylbenzene	U	0.87	5.0								
Isopropylbenzene	U	0.85	5.0								
Methyl acetate	U	1.2	10								
Methyl tert-butyl ether	U	0.61	5.0								
Methylcyclohexane	U	1.5	10								
Methylene chloride	U	6.2	10								
Styrene	U	0.75	5.0								
Tetrachloroethene	U	0.89	5.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

Toluene	U	0.86	5.0					
trans-1,2-Dichloroethene	U	0.5	5.0					
trans-1,3-Dichloropropene	U	0.48	5.0					
Trichloroethene	U	0.72	5.0					
Trichlorofluoromethane	U	0.71	5.0					
Vinyl chloride	U	0.7	5.0					
Xylenes, Total	U	2.2	5.0					
Surr: 1,2-Dichloroethane-d4	*21.02*	0	0	*20*	0	*105*	*83-132*	0
Surr: 4-Bromofluorobenzene	*20.34*	0	0	*20*	0	*102*	*83-111*	0
Surr: Dibromofluoromethane	*20.72*	0	0	*20*	0	*104*	*77-125*	0
Surr: Toluene-d8	*20.29*	0	0	*20*	0	*101*	*86-108*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030066
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

LCS	Sample ID: **8V-LCSS1-210304-R311026a**				Units: **µg/Kg**			Analysis Date: **3/4/2021 12:01 PM**			
Client ID:		Run ID: **VMS8_210304A**			SeqNo: **7189879**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	19.61	0.79	5.0	20	0	98	73-138	0			
1,1,2,2-Tetrachloroethane	19.54	0.64	5.0	20	0	97.7	71-126	0			
1,1,2-Trichloroethane	17.76	0.67	5.0	20	0	88.8	77-123	0			
1,1-Dichloroethane	18.57	0.62	5.0	20	0	92.8	63-148	0			
1,1-Dichloroethene	18.5	0.98	5.0	20	0	92.5	67-156	0			
1,2,4-Trichlorobenzene	16.68	1.1	5.0	20	0	83.4	70-132	0			
1,2-Dibromo-3-chloropropane	16.26	0.99	5.0	20	0	81.3	48-127	0			
1,2-Dibromoethane	20.19	0.36	5.0	20	0	101	71-144	0			
1,2-Dichlorobenzene	18.97	0.7	5.0	20	0	94.8	77-127	0			
1,2-Dichloroethane	18.38	0.56	5.0	20	0	91.9	77-127	0			
1,2-Dichloropropane	19.63	0.44	5.0	20	0	98.2	74-130	0			
1,3-Dichlorobenzene	18.93	0.61	5.0	20	0	94.6	75-133	0			
1,4-Dichlorobenzene	18.92	0.64	5.0	20	0	94.6	74-130	0			
2-Butanone	15.3	5.1	10	20	0	76.5	55-132	0			
2-Hexanone	18.32	1.8	5.0	20	0	91.6	55-124	0			
4-Methyl-2-pentanone	24.29	1.8	5.0	20	0	121	67-159	0			
Acetone	15.67	4.6	10	20	0	78.4	31-156	0			
Benzene	19.49	0.52	5.0	20	0	97.4	77-133	0			
Bromodichloromethane	18.66	0.6	5.0	20	0	93.3	69-133	0			
Bromoform	17.13	0.5	5.0	20	0	85.6	55-126	0			
Bromomethane	19.57	2.5	10	20	0	97.8	31-174	0			
Carbon disulfide	20.58	0.59	5.0	20	0	103	45-160	0			
Carbon tetrachloride	18.81	1	5.0	20	0	94	69-140	0			
Chlorobenzene	19.97	0.63	5.0	20	0	99.8	76-130	0			
Chloroethane	15.6	1.9	5.0	20	0	78	53-150	0			
Chloroform	18.49	0.82	5.0	20	0	92.4	72-132	0			
Chloromethane	14.48	1	10	20	0	72.4	43-150	0			
cis-1,2-Dichloroethene	19.83	0.54	5.0	20	0	99.2	74-134	0			
cis-1,3-Dichloropropene	17.72	0.6	5.0	20	0	88.6	62-134	0			
Dibromochloromethane	18.32	0.51	5.0	20	0	91.6	57-118	0			
Dichlorodifluoromethane	17.01	2.5	10	20	0	85	43-126	0			
Ethylbenzene	21.56	0.87	5.0	20	0	108	75-133	0			
Isopropylbenzene	21.14	0.85	5.0	20	0	106	74-137	0			
Methyl tert-butyl ether	18.35	0.61	5.0	20	0	91.8	62-136	0			
Methylene chloride	20.24	6.2	10	20	0	101	55-157	0			
Styrene	19.79	0.75	5.0	20	0	99	72-138	0			
Tetrachloroethene	20.69	0.89	5.0	20	0	103	70-171	0			
Toluene	20.4	0.86	5.0	20	0	102	76-130	0			
trans-1,2-Dichloroethene	19.34	0.5	5.0	20	0	96.7	65-137	0			
trans-1,3-Dichloropropene	18	0.48	5.0	20	0	90	58-126	0			
Trichloroethene	18.46	0.72	5.0	20	0	92.3	75-135	0			
Trichlorofluoromethane	17.92	0.71	5.0	20	0	89.6	62-136	0			
Vinyl chloride	18.17	0.7	5.0	20	0	90.8	57-143	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

Xylenes, Total	64.78	2.2	5.0	60	0	108	75-132	0
Surr: 1,2-Dichloroethane-d4	*19.95*	0	0	*20*	0	*99.8*	*83-132*	0
Surr: 4-Bromofluorobenzene	*20.58*	0	0	*20*	0	*103*	*83-111*	0
Surr: Dibromofluoromethane	*20.55*	0	0	*20*	0	*103*	*77-125*	0
Surr: Toluene-d8	*20.21*	0	0	*20*	0	*101*	*86-108*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030066
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

MS Sample ID: **21030066-01A MS** Units: **µg/Kg** Analysis Date: **3/4/2021 03:23 PM**
Client ID: **SS-MW-4 (8-10)** Run ID: **VMS8_210304A** SeqNo: **7189899** Prep Date: DF: **0.88**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	15.79	0.7	4.4	17.6	0	89.7	73-138	0			
1,1,2,2-Tetrachloroethane	14.47	0.56	4.4	17.6	0	82.2	71-126	0			
1,1,2-Trichloroethane	14.34	0.59	4.4	17.6	0	81.5	77-123	0			
1,1-Dichloroethane	15.12	0.55	4.4	17.6	0	85.9	63-148	0			
1,1-Dichloroethene	14.36	0.86	4.4	17.6	0	81.6	67-156	0			
1,2,4-Trichlorobenzene	13.94	0.97	4.4	17.6	0	79.2	70-132	0			
1,2-Dibromo-3-chloropropane	10.7	0.87	4.4	17.6	0	60.8	48-127	0			
1,2-Dibromoethane	16.07	0.32	4.4	17.6	0	91.3	71-144	0			
1,2-Dichlorobenzene	15.53	0.62	4.4	17.6	0	88.2	77-127	0			
1,2-Dichloroethane	15.21	0.49	4.4	17.6	0	86.4	77-127	0			
1,2-Dichloropropane	16.87	0.39	4.4	17.6	0	95.8	74-130	0			
1,3-Dichlorobenzene	15.07	0.54	4.4	17.6	0	85.6	75-133	0			
1,4-Dichlorobenzene	14.88	0.56	4.4	17.6	0	84.6	74-130	0			
2-Butanone	20.25	4.5	8.8	17.6	0	115	55-132	0			
2-Hexanone	17.24	1.6	4.4	17.6	0	98	55-124	0			
4-Methyl-2-pentanone	17.23	1.6	4.4	17.6	0	97.9	67-159	0			
Acetone	28.95	4	8.8	17.6	0	164	31-156	0			S
Benzene	15.69	0.46	4.4	17.6	0	89.2	77-133	0			
Bromodichloromethane	15.32	0.53	4.4	17.6	0	87	69-133	0			
Bromoform	13.25	0.44	4.4	17.6	0	75.3	55-126	0			
Bromomethane	14.96	2.2	8.8	17.6	0	85	31-174	0			
Carbon disulfide	16.1	0.52	4.4	17.6	0	91.4	45-160	0			
Carbon tetrachloride	13.9	0.88	4.4	17.6	0	79	69-140	0			
Chlorobenzene	15.44	0.55	4.4	17.6	0	87.7	76-130	0			
Chloroethane	12.34	1.7	4.4	17.6	0	70.1	53-150	0			
Chloroform	15	0.72	4.4	17.6	0	85.2	72-132	0			
Chloromethane	11.27	0.88	8.8	17.6	0	64	43-150	0			
cis-1,2-Dichloroethene	15.53	0.48	4.4	17.6	0	88.2	74-134	0			
cis-1,3-Dichloropropene	14.2	0.53	4.4	17.6	0	80.7	62-134	0			
Dibromochloromethane	14.93	0.45	4.4	17.6	0	84.8	57-118	0			
Dichlorodifluoromethane	12.91	2.2	8.8	17.6	0	73.4	43-126	0			
Ethylbenzene	16.55	0.77	4.4	17.6	0	94	75-133	0			
Isopropylbenzene	16.44	0.75	4.4	17.6	0	93.4	74-137	0			
Methyl tert-butyl ether	15.1	0.54	4.4	17.6	0	85.8	62-136	0			
Methylene chloride	21.08	5.5	8.8	17.6	0	120	55-157	0			
Styrene	16.21	0.66	4.4	17.6	0	92.1	72-138	0			
Tetrachloroethene	16.36	0.78	4.4	17.6	0	93	70-171	0			
Toluene	15.26	0.76	4.4	17.6	0	86.7	76-130	0			
trans-1,2-Dichloroethene	15.33	0.44	4.4	17.6	0	87.1	65-137	0			
trans-1,3-Dichloropropene	14.57	0.42	4.4	17.6	0	82.8	58-126	0			
Trichloroethene	14.48	0.63	4.4	17.6	0	82.3	75-135	0			
Trichlorofluoromethane	14.65	0.62	4.4	17.6	0	83.2	62-136	0			
Vinyl chloride	13.52	0.62	4.4	17.6	0	76.8	57-143	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

Xylenes, Total	49.59	1.9	4.4	52.8	0	93.9	75-132	0
Surr: 1,2-Dichloroethane-d4	*18.81*	0	0	*17.6*	0	*107*	*83-132*	0
Surr: 4-Bromofluorobenzene	*18.27*	0	0	*17.6*	0	*104*	*83-111*	0
Surr: Dibromofluoromethane	*18.44*	0	0	*17.6*	0	*105*	*77-125*	0
Surr: Toluene-d8	*17.09*	0	0	*17.6*	0	*97.1*	*86-108*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030066
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

MSD Sample ID: **21030066-01A MSD** Units: **µg/Kg** Analysis Date: **3/4/2021 03:39 PM**
Client ID: **SS-MW-4 (8-10)** Run ID: **VMS8_210304A** SeqNo: **7189901** Prep Date: DF: **0.873**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	16.04	0.69	4.4	17.46	0	91.8	73-138	15.79	1.57	30	
1,1,2,2-Tetrachloroethane	16.12	0.56	4.4	17.46	0	92.3	71-126	14.47	10.8	30	
1,1,2-Trichloroethane	15.5	0.58	4.4	17.46	0	88.8	77-123	14.34	7.78	30	
1,1-Dichloroethane	15.91	0.54	4.4	17.46	0	91.1	63-148	15.12	5.08	30	
1,1-Dichloroethene	15	0.86	4.4	17.46	0	85.9	67-156	14.36	4.34	30	
1,2,4-Trichlorobenzene	14.42	0.96	4.4	17.46	0	82.6	70-132	13.94	3.4	30	
1,2-Dibromo-3-chloropropane	12.5	0.86	4.4	17.46	0	71.6	48-127	10.7	15.5	30	
1,2-Dibromoethane	17.48	0.31	4.4	17.46	0	100	71-144	16.07	8.4	30	
1,2-Dichlorobenzene	16.14	0.61	4.4	17.46	0	92.5	77-127	15.53	3.85	30	
1,2-Dichloroethane	15.54	0.49	4.4	17.46	0	89	77-127	15.21	2.17	30	
1,2-Dichloropropane	17.06	0.38	4.4	17.46	0	97.7	74-130	16.87	1.11	30	
1,3-Dichlorobenzene	15.87	0.53	4.4	17.46	0	90.9	75-133	15.07	5.21	30	
1,4-Dichlorobenzene	15.09	0.56	4.4	17.46	0	86.5	74-130	14.88	1.42	30	
2-Butanone	22.94	4.5	8.7	17.46	0	131	55-132	20.25	12.5	30	
2-Hexanone	18.83	1.6	4.4	17.46	0	108	55-124	17.24	8.82	30	
4-Methyl-2-pentanone	21.08	1.6	4.4	17.46	0	121	67-159	17.23	20.1	30	
Acetone	31.59	4	8.7	17.46	0	181	31-156	28.95	8.73	30	S
Benzene	16.07	0.45	4.4	17.46	0	92	77-133	15.69	2.4	30	
Bromodichloromethane	16.28	0.52	4.4	17.46	0	93.2	69-133	15.32	6.08	30	
Bromoform	14.51	0.44	4.4	17.46	0	83.1	55-126	13.25	9.05	30	
Bromomethane	15.98	2.2	8.7	17.46	0	91.5	31-174	14.96	6.57	30	
Carbon disulfide	16.54	0.52	4.4	17.46	0	94.8	45-160	16.1	2.75	30	
Carbon tetrachloride	15.05	0.87	4.4	17.46	0	86.2	69-140	13.9	7.92	30	
Chlorobenzene	15.91	0.55	4.4	17.46	0	91.1	76-130	15.44	3	30	
Chloroethane	12.69	1.7	4.4	17.46	0	72.7	53-150	12.34	2.84	30	
Chloroform	15.32	0.72	4.4	17.46	0	87.8	72-132	15	2.09	30	
Chloromethane	11.52	0.87	8.7	17.46	0	66	43-150	11.27	2.2	30	
cis-1,2-Dichloroethene	16.14	0.47	4.4	17.46	0	92.5	74-134	15.53	3.85	30	
cis-1,3-Dichloropropene	15.4	0.52	4.4	17.46	0	88.2	62-134	14.2	8.08	30	
Dibromochloromethane	15.34	0.45	4.4	17.46	0	87.8	57-118	14.93	2.68	30	
Dichlorodifluoromethane	14.36	2.2	8.7	17.46	0	82.2	43-126	12.91	10.6	30	
Ethylbenzene	17.08	0.76	4.4	17.46	0	97.8	75-133	16.55	3.11	30	
Isopropylbenzene	16.88	0.74	4.4	17.46	0	96.7	74-137	16.44	2.62	30	
Methyl tert-butyl ether	16.15	0.53	4.4	17.46	0	92.5	62-136	15.1	6.72	30	
Methylene chloride	20.37	5.4	8.7	17.46	0	117	55-157	21.08	3.42	30	
Styrene	16.81	0.65	4.4	17.46	0	96.3	72-138	16.21	3.66	30	
Tetrachloroethene	16.59	0.78	4.4	17.46	0	95	70-171	16.36	1.38	30	
Toluene	15.8	0.75	4.4	17.46	0	90.5	76-130	15.26	3.49	30	
trans-1,2-Dichloroethene	15.5	0.44	4.4	17.46	0	88.8	65-137	15.33	1.13	30	
trans-1,3-Dichloropropene	15.07	0.42	4.4	17.46	0	86.3	58-126	14.57	3.34	30	
Trichloroethene	15.33	0.63	4.4	17.46	0	87.8	75-135	14.48	5.67	30	
Trichlorofluoromethane	15.26	0.62	4.4	17.46	0	87.4	62-136	14.65	4.07	30	
Vinyl chloride	14.13	0.61	4.4	17.46	0	80.9	57-143	13.52	4.4	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R311026a** Instrument ID **VMS8** Method: **SW8260C**

Xylenes, Total	52.16	1.9	4.4	52.38	0	99.6	75-132	49.59	5.06	30
Surr: 1,2-Dichloroethane-d4	*18.87*	0	0	*17.46*	0	*108*	*83-132*	18.81	*0.318*	*30*
Surr: 4-Bromofluorobenzene	*17.83*	0	0	*17.46*	0	*102*	*83-111*	18.27	*2.45*	*30*
Surr: Dibromofluoromethane	*18.39*	0	0	*17.46*	0	*105*	*77-125*	18.44	*0.228*	*30*
Surr: Toluene-d8	*17.33*	0	0	*17.46*	0	*99.2*	*86-108*	17.09	*1.39*	*30*

The following samples were analyzed in this batch:

21030066-01A	21030066-02A	21030066-03A
21030066-04A	21030066-05A	21030066-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030066
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311123** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R311123** Units: **% of sample** Analysis Date: **3/4/2021 11:51 AM**
Client ID: Run ID: **MOIST_210304B** SeqNo: **7189373** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.1	0.10								

LCS Sample ID: **LCS-R311123** Units: **% of sample** Analysis Date: **3/4/2021 11:51 AM**
Client ID: Run ID: **MOIST_210304B** SeqNo: **7189372** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.1	0.10	100	0	100	98-102	0			

DUP Sample ID: **21030051-01B DUP** Units: **% of sample** Analysis Date: **3/4/2021 11:51 AM**
Client ID: Run ID: **MOIST_210304B** SeqNo: **7189352** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	8.26	0.1	0.10	0	0	0	0-0	7.22	13.4	10	R

DUP Sample ID: **21021930-08A DUP** Units: **% of sample** Analysis Date: **3/4/2021 11:51 AM**
Client ID: Run ID: **MOIST_210304B** SeqNo: **7189371** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	10.93	0.1	0.10	0	0	0	0-0	10.7	2.13	10	

The following samples were analyzed in this batch:

21030066-01B	21030066-02B	21030066-03B
21030066-04B	21030066-05B	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
WorkOrder: **21030066**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group, USA

Sample Receipt Checklist

Client Name: **GOLDER-MO** Date/Time Received: **01-Mar-21 09:00**

Work Order: **21030066** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 02-Mar-21 (Date) Reviewed by: (eSignature) (Date)

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.2/4.2 C	IR3	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	3/2/2021 9:37:19 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 051640

ALS Project Manager: | ALS Work Order #: 210300066

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	20394143	Project Name	Eaton Shenandoah Ph III	A	VOC 500
Work Order		Project Number	20394143	B	Moisture
Company Name	Golder Associates Inc	Bill To Company	Golder Associates Inc	C	
Send Report To	annefaeth_boyd@golder.com	Invoice Attn		D	
Address	13515 Barrett Parkway Drive Suite 260	Address		E	
				F	
City/State/Zip	Ballwin/MO/63021	City/State/Zip		G	
Phone	314-984-8800	Phone		H	
Fax		Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	SS-MW-4 (8-10)	2/22/21	1255	So.1	5, Methanol	5	X	X									
2	SS-MW-3 (12-14)	2/24/21	1150	↓	↓	↓	↓	↓									
3	SS-MW-2 (14-16)	2/24/21	1735														
4	SS-MW-1 (10-12)	2/23/21	1045														
5	SS-DUP-1	2/24/21	—														
6	Trip Blank				1												
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: 1

Shipment Method: Fedex

Turnaround Time in Business Days (BD): ☐ 10 BD ☑ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by: Eric Schneider	Date: 2/27/21	Time: 1430	Received by:		
Relinquished by:	Date: 2/27/21	Time: 1430	Received by (Laboratory): FedEx		3/1/21 0900
Logged by (Laboratory): KR	Date: 3/1/21	Time: 1430	Checked by (Laboratory): GRB		

Notes:

Cooler ID	Cooler Temp.
IR3	3.2°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: E. Forthaus
Project Name: Eaton Shenandoah Deactivation and Phase III
Project Number: 20394143
Reviewer: A. Muehlfarth
Validation Date: 3/8/2021

Laboratory: ALS Environmental
SDG #: 21030066
Analytical Method (type and no.): VOCs (SW8260C)
Matrix: ☐ Air ■ Soil/Sed. ☐ Water ☐ Waste ☐
Sample Names SS-MW-4 (8-10), SS-MW-3 (12-14), SS-MW-2 (14-16), SS-MW-1 (10-12), SS-DUP-1, Trip Blank

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			2/22/2021 - 2/24/2021
b) Sampling team indicated?	x			EMS
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?	x			
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?		x		
h) Field Calibration within control limits?			x	
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?	X			

Note Deficiencies: Batch R311026a: MS/MSD recovery outside control limits for Acetone.
Batch R311123: QC duplicate data for Moisture for unrelated sample.

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See notes
g) Were any matrix problems noted?	x			See notes

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☐	☒	
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☒	☐	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	☒	☐	☐	
b) Were the proper compounds included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☒	☐	☐	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	SS-DUP-1 @ SS-MW-3 (12-14)
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	Max RPD: 8.7% (<20%)
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☐	☒	☐	See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, compounds included and concentrations)?	☐	☒	☐	
b) Was the %D within control limits?	☐	☐	☒	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Surrogate Spikes	YES	NO	NA	COMMENTS
a) Were surrogate recoveries within control limits?	☒	☐	☐	
b) Were surrogate recoveries not calculated due to dilutions?	☐	☒	☐	

Comments/Notes:

VOCs analyzed at a dilution in SS-MW-4 (8-10) [0.853x], SS-MW-3 (12-14) [0.896], SS-MW-2 (14-16) [0.826x], SS-MW-1 (10-12) [0.813x], and SS-DUP-1 [0.821x]. Detects were qualified.

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Comments/Notes (continued):

The laboratory performed a duplicate analysis on moisture. Sample 21030051-01B DUP RPD (13.4%) exceeded control limits (10%). Duplicate performed on unrelated sample, no qualification necessary.

MS/MSD:

21030066-01A MS/MSD: MS/MSD % recovery high for acetone. Associated with sample SS-MW-4 (8-10). Sample result is non-detect, no qualification necessary.

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
SS-MW-3 (12-14)	Tetrachloroethene	0.0012	D	Analyzed at a dilution
SS-MW-2 (14-16)	cis-1,2-Dichloroethene	0.0036	D	"
"	Trichloroethene	0.0061	D	"
SS-DUP-1	Tetrachloroethene	0.0011	D	"

Signature: Ann Muehlfarth Date: 3/8/2021

08-Mar-2021

Anne Faeth-Boyd
Golder Associates Inc.
13515 Barrett Parkway Drive
Suite 260
Ballwin, MO 63021

Re: **Golder - Iowa Project (1661465)** Work Order: **21030065**

Dear Anne,

ALS Environmental received 6 samples on 01-Mar-2021 09:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 26.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Gary Byar

Electronically approved by: Gary Byar

Gary Byar
Project Manager

Report of Laboratory Analysis

ALS Group, USA

Date: 08-Mar-21

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Work Order: **21030065**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
21030065-01	GW-MW-1	Water		2/26/2021 13:23	3/1/2021 09:00	☐
21030065-02	GW-MW-2	Water		2/26/2021 17:15	3/1/2021 09:00	☐
21030065-03	GW-MW-3	Water		2/25/2021 14:13	3/1/2021 09:00	☐
21030065-04	GW-MW-4	Water		2/26/2021 09:15	3/1/2021 09:00	☐
21030065-05	GW-DUP-1	Water		2/26/2021	3/1/2021 09:00	☐
21030065-06	Trip Blank	Water		2/26/2021	3/1/2021 09:00	☐

ALS Group, USA

Date: *08-Mar-21*

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-1
Collection Date: 2/26/2021 01:23 PM

Work Order: 21030065
Lab ID: 21030065-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 00:32
1,1,2,2-Tetrachloroethane	U		0.00040	0.0010	mg/L	1	3/5/2021 00:32
1,1,2-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 00:32
1,1,2-Trichlorotrifluoroethane	U		0.00052	0.0010	mg/L	1	3/5/2021 00:32
1,1-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 00:32
1,1-Dichloroethene	U		0.00040	0.0010	mg/L	1	3/5/2021 00:32
1,2,4-Trichlorobenzene	U		0.00045	0.0010	mg/L	1	3/5/2021 00:32
1,2-Dibromo-3-chloropropane	U		0.00043	0.0010	mg/L	1	3/5/2021 00:32
1,2-Dibromoethane	U		0.00041	0.0010	mg/L	1	3/5/2021 00:32
1,2-Dichlorobenzene	U		0.00032	0.0010	mg/L	1	3/5/2021 00:32
1,2-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 00:32
1,2-Dichloropropane	U		0.00048	0.0010	mg/L	1	3/5/2021 00:32
1,3-Dichlorobenzene	U		0.00033	0.0010	mg/L	1	3/5/2021 00:32
1,4-Dichlorobenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 00:32
2-Butanone	U		0.00052	0.0050	mg/L	1	3/5/2021 00:32
2-Hexanone	U		0.00059	0.0050	mg/L	1	3/5/2021 00:32
4-Methyl-2-pentanone	U		0.00052	0.0010	mg/L	1	3/5/2021 00:32
Acetone	U		0.0062	0.010	mg/L	1	3/5/2021 00:32
Benzene	U		0.00046	0.0010	mg/L	1	3/5/2021 00:32
Bromodichloromethane	U		0.00049	0.0010	mg/L	1	3/5/2021 00:32
Bromoform	U		0.00056	0.0010	mg/L	1	3/5/2021 00:32
Bromomethane	U		0.00090	0.0010	mg/L	1	3/5/2021 00:32
Carbon disulfide	U		0.00049	0.0010	mg/L	1	3/5/2021 00:32
Carbon tetrachloride	U		0.00040	0.0010	mg/L	1	3/5/2021 00:32
Chlorobenzene	U		0.00040	0.0010	mg/L	1	3/5/2021 00:32
Chloroethane	U		0.00068	0.0010	mg/L	1	3/5/2021 00:32
Chloroform	U		0.00046	0.0010	mg/L	1	3/5/2021 00:32
Chloromethane	U		0.00083	0.0010	mg/L	1	3/5/2021 00:32
cis-1,2-Dichloroethene	**0.0053**		**0.00042**	**0.0010**	**mg/L**	1	3/5/2021 00:32
cis-1,3-Dichloropropene	U		0.00057	0.0010	mg/L	1	3/5/2021 00:32
Cyclohexane	U		0.00063	0.0020	mg/L	1	3/5/2021 00:32
Dibromochloromethane	U		0.00040	0.0010	mg/L	1	3/5/2021 00:32
Dichlorodifluoromethane	U		0.00068	0.0010	mg/L	1	3/5/2021 00:32
Dichloromethane	U		0.00086	0.0050	mg/L	1	3/5/2021 00:32
Ethylbenzene	U		0.00034	0.0010	mg/L	1	3/5/2021 00:32
Isopropylbenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 00:32
m,p-Xylene	U		0.00081	0.0020	mg/L	1	3/5/2021 00:32
Methyl acetate	U		0.00059	0.0020	mg/L	1	3/5/2021 00:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-1
Collection Date: 2/26/2021 01:23 PM

Work Order: 21030065
Lab ID: 21030065-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methyl tert-butyl ether	U		0.00045	0.0010	mg/L	1	3/5/2021 00:32
Methylcyclohexane	U		0.00035	0.0010	mg/L	1	3/5/2021 00:32
o-Xylene	U		0.00031	0.0010	mg/L	1	3/5/2021 00:32
Styrene	U		0.00033	0.0010	mg/L	1	3/5/2021 00:32
Tetrachloroethene	U		0.00039	0.0010	mg/L	1	3/5/2021 00:32
Toluene	U		0.00045	0.0010	mg/L	1	3/5/2021 00:32
trans-1,2-Dichloroethene	**0.00084**	J	**0.00048**	**0.0010**	**mg/L**	1	3/5/2021 00:32
trans-1,3-Dichloropropene	U		0.00038	0.0010	mg/L	1	3/5/2021 00:32
Trichloroethene	**0.00062**	J	**0.00043**	**0.0010**	**mg/L**	1	3/5/2021 00:32
Trichlorofluoromethane	U		0.00052	0.0010	mg/L	1	3/5/2021 00:32
Vinyl chloride	U		0.00053	0.0010	mg/L	1	3/5/2021 00:32
Xylenes, Total	U		0.00081	0.0030	mg/L	1	3/5/2021 00:32
Surr: 1,2-Dichloroethane-d4	*105*			*75-120*	*%REC*	1	3/5/2021 00:32
Surr: 4-Bromofluorobenzene	*98.8*			*80-110*	*%REC*	1	3/5/2021 00:32
Surr: Dibromofluoromethane	*106*			*85-115*	*%REC*	1	3/5/2021 00:32
Surr: Toluene-d8	*102*			*85-110*	*%REC*	1	3/5/2021 00:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-2
Collection Date: 2/26/2021 05:15 PM

Work Order: 21030065
Lab ID: 21030065-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 00:48
1,1,2,2-Tetrachloroethane	U		0.00040	0.0010	mg/L	1	3/5/2021 00:48
1,1,2-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 00:48
1,1,2-Trichlorotrifluoroethane	U		0.00052	0.0010	mg/L	1	3/5/2021 00:48
1,1-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 00:48
1,1-Dichloroethene	U		0.00040	0.0010	mg/L	1	3/5/2021 00:48
1,2,4-Trichlorobenzene	U		0.00045	0.0010	mg/L	1	3/5/2021 00:48
1,2-Dibromo-3-chloropropane	U		0.00043	0.0010	mg/L	1	3/5/2021 00:48
1,2-Dibromoethane	U		0.00041	0.0010	mg/L	1	3/5/2021 00:48
1,2-Dichlorobenzene	U		0.00032	0.0010	mg/L	1	3/5/2021 00:48
1,2-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 00:48
1,2-Dichloropropane	U		0.00048	0.0010	mg/L	1	3/5/2021 00:48
1,3-Dichlorobenzene	U		0.00033	0.0010	mg/L	1	3/5/2021 00:48
1,4-Dichlorobenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 00:48
2-Butanone	U		0.00052	0.0050	mg/L	1	3/5/2021 00:48
2-Hexanone	U		0.00059	0.0050	mg/L	1	3/5/2021 00:48
4-Methyl-2-pentanone	U		0.00052	0.0010	mg/L	1	3/5/2021 00:48
Acetone	U		0.0062	0.010	mg/L	1	3/5/2021 00:48
Benzene	U		0.00046	0.0010	mg/L	1	3/5/2021 00:48
Bromodichloromethane	U		0.00049	0.0010	mg/L	1	3/5/2021 00:48
Bromoform	U		0.00056	0.0010	mg/L	1	3/5/2021 00:48
Bromomethane	U		0.00090	0.0010	mg/L	1	3/5/2021 00:48
Carbon disulfide	U		0.00049	0.0010	mg/L	1	3/5/2021 00:48
Carbon tetrachloride	U		0.00040	0.0010	mg/L	1	3/5/2021 00:48
Chlorobenzene	U		0.00040	0.0010	mg/L	1	3/5/2021 00:48
Chloroethane	U		0.00068	0.0010	mg/L	1	3/5/2021 00:48
Chloroform	U		0.00046	0.0010	mg/L	1	3/5/2021 00:48
Chloromethane	U		0.00083	0.0010	mg/L	1	3/5/2021 00:48
cis-1,2-Dichloroethene	**0.0022**		**0.00042**	**0.0010**	**mg/L**	1	3/5/2021 00:48
cis-1,3-Dichloropropene	U		0.00057	0.0010	mg/L	1	3/5/2021 00:48
Cyclohexane	U		0.00063	0.0020	mg/L	1	3/5/2021 00:48
Dibromochloromethane	U		0.00040	0.0010	mg/L	1	3/5/2021 00:48
Dichlorodifluoromethane	U		0.00068	0.0010	mg/L	1	3/5/2021 00:48
Dichloromethane	U		0.00086	0.0050	mg/L	1	3/5/2021 00:48
Ethylbenzene	U		0.00034	0.0010	mg/L	1	3/5/2021 00:48
Isopropylbenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 00:48
m,p-Xylene	U		0.00081	0.0020	mg/L	1	3/5/2021 00:48
Methyl acetate	U		0.00059	0.0020	mg/L	1	3/5/2021 00:48

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-2
Collection Date: 2/26/2021 05:15 PM

Work Order: 21030065
Lab ID: 21030065-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methyl tert-butyl ether	U		0.00045	0.0010	mg/L	1	3/5/2021 00:48
Methylcyclohexane	U		0.00035	0.0010	mg/L	1	3/5/2021 00:48
o-Xylene	U		0.00031	0.0010	mg/L	1	3/5/2021 00:48
Styrene	U		0.00033	0.0010	mg/L	1	3/5/2021 00:48
Tetrachloroethene	U		0.00039	0.0010	mg/L	1	3/5/2021 00:48
Toluene	U		0.00045	0.0010	mg/L	1	3/5/2021 00:48
trans-1,2-Dichloroethene	U		0.00048	0.0010	mg/L	1	3/5/2021 00:48
trans-1,3-Dichloropropene	U		0.00038	0.0010	mg/L	1	3/5/2021 00:48
Trichloroethene	U		0.00043	0.0010	mg/L	1	3/5/2021 00:48
Trichlorofluoromethane	U		0.00052	0.0010	mg/L	1	3/5/2021 00:48
Vinyl chloride	U		0.00053	0.0010	mg/L	1	3/5/2021 00:48
Xylenes, Total	U		0.00081	0.0030	mg/L	1	3/5/2021 00:48
Surr: 1,2-Dichloroethane-d4	*101*			*75-120*	*%REC*	1	3/5/2021 00:48
Surr: 4-Bromofluorobenzene	*99.6*			*80-110*	*%REC*	1	3/5/2021 00:48
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	3/5/2021 00:48
Surr: Toluene-d8	*101*			*85-110*	*%REC*	1	3/5/2021 00:48

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-3
Collection Date: 2/25/2021 02:13 PM

Work Order: 21030065
Lab ID: 21030065-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 01:05
1,1,2,2-Tetrachloroethane	U		0.00040	0.0010	mg/L	1	3/5/2021 01:05
1,1,2-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 01:05
1,1,2-Trichlorotrifluoroethane	U		0.00052	0.0010	mg/L	1	3/5/2021 01:05
1,1-Dichloroethane	**0.0032**		**0.00044**	**0.0010**	**mg/L**	1	3/5/2021 01:05
1,1-Dichloroethene	U		0.00040	0.0010	mg/L	1	3/5/2021 01:05
1,2,4-Trichlorobenzene	U		0.00045	0.0010	mg/L	1	3/5/2021 01:05
1,2-Dibromo-3-chloropropane	U		0.00043	0.0010	mg/L	1	3/5/2021 01:05
1,2-Dibromoethane	U		0.00041	0.0010	mg/L	1	3/5/2021 01:05
1,2-Dichlorobenzene	U		0.00032	0.0010	mg/L	1	3/5/2021 01:05
1,2-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 01:05
1,2-Dichloropropane	U		0.00048	0.0010	mg/L	1	3/5/2021 01:05
1,3-Dichlorobenzene	U		0.00033	0.0010	mg/L	1	3/5/2021 01:05
1,4-Dichlorobenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 01:05
2-Butanone	U		0.00052	0.0050	mg/L	1	3/5/2021 01:05
2-Hexanone	U		0.00059	0.0050	mg/L	1	3/5/2021 01:05
4-Methyl-2-pentanone	U		0.00052	0.0010	mg/L	1	3/5/2021 01:05
Acetone	U		0.0062	0.010	mg/L	1	3/5/2021 01:05
Benzene	U		0.00046	0.0010	mg/L	1	3/5/2021 01:05
Bromodichloromethane	U		0.00049	0.0010	mg/L	1	3/5/2021 01:05
Bromoform	U		0.00056	0.0010	mg/L	1	3/5/2021 01:05
Bromomethane	U		0.00090	0.0010	mg/L	1	3/5/2021 01:05
Carbon disulfide	U		0.00049	0.0010	mg/L	1	3/5/2021 01:05
Carbon tetrachloride	U		0.00040	0.0010	mg/L	1	3/5/2021 01:05
Chlorobenzene	U		0.00040	0.0010	mg/L	1	3/5/2021 01:05
Chloroethane	U		0.00068	0.0010	mg/L	1	3/5/2021 01:05
Chloroform	U		0.00046	0.0010	mg/L	1	3/5/2021 01:05
Chloromethane	U		0.00083	0.0010	mg/L	1	3/5/2021 01:05
cis-1,2-Dichloroethene	**0.0038**		**0.00042**	**0.0010**	**mg/L**	1	3/5/2021 01:05
cis-1,3-Dichloropropene	U		0.00057	0.0010	mg/L	1	3/5/2021 01:05
Cyclohexane	U		0.00063	0.0020	mg/L	1	3/5/2021 01:05
Dibromochloromethane	U		0.00040	0.0010	mg/L	1	3/5/2021 01:05
Dichlorodifluoromethane	U		0.00068	0.0010	mg/L	1	3/5/2021 01:05
Dichloromethane	U		0.00086	0.0050	mg/L	1	3/5/2021 01:05
Ethylbenzene	U		0.00034	0.0010	mg/L	1	3/5/2021 01:05
Isopropylbenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 01:05
m,p-Xylene	U		0.00081	0.0020	mg/L	1	3/5/2021 01:05
Methyl acetate	U		0.00059	0.0020	mg/L	1	3/5/2021 01:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-3
Collection Date: 2/25/2021 02:13 PM

Work Order: 21030065
Lab ID: 21030065-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methyl tert-butyl ether	U		0.00045	0.0010	mg/L	1	3/5/2021 01:05
Methylcyclohexane	U		0.00035	0.0010	mg/L	1	3/5/2021 01:05
o-Xylene	U		0.00031	0.0010	mg/L	1	3/5/2021 01:05
Styrene	U		0.00033	0.0010	mg/L	1	3/5/2021 01:05
Tetrachloroethene	U		0.00039	0.0010	mg/L	1	3/5/2021 01:05
Toluene	U		0.00045	0.0010	mg/L	1	3/5/2021 01:05
trans-1,2-Dichloroethene	U		0.00048	0.0010	mg/L	1	3/5/2021 01:05
trans-1,3-Dichloropropene	U		0.00038	0.0010	mg/L	1	3/5/2021 01:05
Trichloroethene	**0.00080**	J	**0.00043**	**0.0010**	**mg/L**	1	3/5/2021 01:05
Trichlorofluoromethane	U		0.00052	0.0010	mg/L	1	3/5/2021 01:05
Vinyl chloride	U		0.00053	0.0010	mg/L	1	3/5/2021 01:05
Xylenes, Total	U		0.00081	0.0030	mg/L	1	3/5/2021 01:05
Surr: 1,2-Dichloroethane-d4	*99.6*			*75-120*	*%REC*	1	3/5/2021 01:05
Surr: 4-Bromofluorobenzene	*100*			*80-110*	*%REC*	1	3/5/2021 01:05
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	3/5/2021 01:05
Surr: Toluene-d8	*100*			*85-110*	*%REC*	1	3/5/2021 01:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-4
Collection Date: 2/26/2021 09:15 AM

Work Order: 21030065
Lab ID: 21030065-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 01:21
1,1,2,2-Tetrachloroethane	U		0.00040	0.0010	mg/L	1	3/5/2021 01:21
1,1,2-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 01:21
1,1,2-Trichlorotrifluoroethane	U		0.00052	0.0010	mg/L	1	3/5/2021 01:21
1,1-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 01:21
1,1-Dichloroethene	U		0.00040	0.0010	mg/L	1	3/5/2021 01:21
1,2,4-Trichlorobenzene	U		0.00045	0.0010	mg/L	1	3/5/2021 01:21
1,2-Dibromo-3-chloropropane	U		0.00043	0.0010	mg/L	1	3/5/2021 01:21
1,2-Dibromoethane	U		0.00041	0.0010	mg/L	1	3/5/2021 01:21
1,2-Dichlorobenzene	U		0.00032	0.0010	mg/L	1	3/5/2021 01:21
1,2-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 01:21
1,2-Dichloropropane	U		0.00048	0.0010	mg/L	1	3/5/2021 01:21
1,3-Dichlorobenzene	U		0.00033	0.0010	mg/L	1	3/5/2021 01:21
1,4-Dichlorobenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 01:21
2-Butanone	U		0.00052	0.0050	mg/L	1	3/5/2021 01:21
2-Hexanone	U		0.00059	0.0050	mg/L	1	3/5/2021 01:21
4-Methyl-2-pentanone	U		0.00052	0.0010	mg/L	1	3/5/2021 01:21
Acetone	U		0.0062	0.010	mg/L	1	3/5/2021 01:21
Benzene	U		0.00046	0.0010	mg/L	1	3/5/2021 01:21
Bromodichloromethane	U		0.00049	0.0010	mg/L	1	3/5/2021 01:21
Bromoform	U		0.00056	0.0010	mg/L	1	3/5/2021 01:21
Bromomethane	U		0.00090	0.0010	mg/L	1	3/5/2021 01:21
Carbon disulfide	U		0.00049	0.0010	mg/L	1	3/5/2021 01:21
Carbon tetrachloride	U		0.00040	0.0010	mg/L	1	3/5/2021 01:21
Chlorobenzene	U		0.00040	0.0010	mg/L	1	3/5/2021 01:21
Chloroethane	U		0.00068	0.0010	mg/L	1	3/5/2021 01:21
Chloroform	U		0.00046	0.0010	mg/L	1	3/5/2021 01:21
Chloromethane	U		0.00083	0.0010	mg/L	1	3/5/2021 01:21
cis-1,2-Dichloroethene	U		0.00042	0.0010	mg/L	1	3/5/2021 01:21
cis-1,3-Dichloropropene	U		0.00057	0.0010	mg/L	1	3/5/2021 01:21
Cyclohexane	U		0.00063	0.0020	mg/L	1	3/5/2021 01:21
Dibromochloromethane	U		0.00040	0.0010	mg/L	1	3/5/2021 01:21
Dichlorodifluoromethane	U		0.00068	0.0010	mg/L	1	3/5/2021 01:21
Dichloromethane	U		0.00086	0.0050	mg/L	1	3/5/2021 01:21
Ethylbenzene	U		0.00034	0.0010	mg/L	1	3/5/2021 01:21
Isopropylbenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 01:21
m,p-Xylene	U		0.00081	0.0020	mg/L	1	3/5/2021 01:21
Methyl acetate	U		0.00059	0.0020	mg/L	1	3/5/2021 01:21

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-MW-4
Collection Date: 2/26/2021 09:15 AM

Work Order: 21030065
Lab ID: 21030065-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methyl tert-butyl ether	U		0.00045	0.0010	mg/L	1	3/5/2021 01:21
Methylcyclohexane	U		0.00035	0.0010	mg/L	1	3/5/2021 01:21
o-Xylene	U		0.00031	0.0010	mg/L	1	3/5/2021 01:21
Styrene	U		0.00033	0.0010	mg/L	1	3/5/2021 01:21
Tetrachloroethene	U		0.00039	0.0010	mg/L	1	3/5/2021 01:21
Toluene	U		0.00045	0.0010	mg/L	1	3/5/2021 01:21
trans-1,2-Dichloroethene	U		0.00048	0.0010	mg/L	1	3/5/2021 01:21
trans-1,3-Dichloropropene	U		0.00038	0.0010	mg/L	1	3/5/2021 01:21
Trichloroethene	U		0.00043	0.0010	mg/L	1	3/5/2021 01:21
Trichlorofluoromethane	U		0.00052	0.0010	mg/L	1	3/5/2021 01:21
Vinyl chloride	U		0.00053	0.0010	mg/L	1	3/5/2021 01:21
Xylenes, Total	U		0.00081	0.0030	mg/L	1	3/5/2021 01:21
Surr: 1,2-Dichloroethane-d4	*98.4*			*75-120*	*%REC*	1	3/5/2021 01:21
Surr: 4-Bromofluorobenzene	*97.8*			*80-110*	*%REC*	1	3/5/2021 01:21
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	3/5/2021 01:21
Surr: Toluene-d8	*102*			*85-110*	*%REC*	1	3/5/2021 01:21

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-DUP-1
Collection Date: 2/26/2021

Work Order: 21030065
Lab ID: 21030065-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 01:37
1,1,2,2-Tetrachloroethane	U		0.00040	0.0010	mg/L	1	3/5/2021 01:37
1,1,2-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 01:37
1,1,2-Trichlorotrifluoroethane	U		0.00052	0.0010	mg/L	1	3/5/2021 01:37
1,1-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 01:37
1,1-Dichloroethene	U		0.00040	0.0010	mg/L	1	3/5/2021 01:37
1,2,4-Trichlorobenzene	U		0.00045	0.0010	mg/L	1	3/5/2021 01:37
1,2-Dibromo-3-chloropropane	U		0.00043	0.0010	mg/L	1	3/5/2021 01:37
1,2-Dibromoethane	U		0.00041	0.0010	mg/L	1	3/5/2021 01:37
1,2-Dichlorobenzene	U		0.00032	0.0010	mg/L	1	3/5/2021 01:37
1,2-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 01:37
1,2-Dichloropropane	U		0.00048	0.0010	mg/L	1	3/5/2021 01:37
1,3-Dichlorobenzene	U		0.00033	0.0010	mg/L	1	3/5/2021 01:37
1,4-Dichlorobenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 01:37
2-Butanone	U		0.00052	0.0050	mg/L	1	3/5/2021 01:37
2-Hexanone	U		0.00059	0.0050	mg/L	1	3/5/2021 01:37
4-Methyl-2-pentanone	U		0.00052	0.0010	mg/L	1	3/5/2021 01:37
Acetone	U		0.0062	0.010	mg/L	1	3/5/2021 01:37
Benzene	U		0.00046	0.0010	mg/L	1	3/5/2021 01:37
Bromodichloromethane	U		0.00049	0.0010	mg/L	1	3/5/2021 01:37
Bromoform	U		0.00056	0.0010	mg/L	1	3/5/2021 01:37
Bromomethane	U		0.00090	0.0010	mg/L	1	3/5/2021 01:37
Carbon disulfide	U		0.00049	0.0010	mg/L	1	3/5/2021 01:37
Carbon tetrachloride	U		0.00040	0.0010	mg/L	1	3/5/2021 01:37
Chlorobenzene	U		0.00040	0.0010	mg/L	1	3/5/2021 01:37
Chloroethane	U		0.00068	0.0010	mg/L	1	3/5/2021 01:37
Chloroform	U		0.00046	0.0010	mg/L	1	3/5/2021 01:37
Chloromethane	U		0.00083	0.0010	mg/L	1	3/5/2021 01:37
cis-1,2-Dichloroethene	**0.0021**		**0.00042**	**0.0010**	**mg/L**	1	3/5/2021 01:37
cis-1,3-Dichloropropene	U		0.00057	0.0010	mg/L	1	3/5/2021 01:37
Cyclohexane	U		0.00063	0.0020	mg/L	1	3/5/2021 01:37
Dibromochloromethane	U		0.00040	0.0010	mg/L	1	3/5/2021 01:37
Dichlorodifluoromethane	U		0.00068	0.0010	mg/L	1	3/5/2021 01:37
Dichloromethane	U		0.00086	0.0050	mg/L	1	3/5/2021 01:37
Ethylbenzene	U		0.00034	0.0010	mg/L	1	3/5/2021 01:37
Isopropylbenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 01:37
m,p-Xylene	U		0.00081	0.0020	mg/L	1	3/5/2021 01:37
Methyl acetate	U		0.00059	0.0020	mg/L	1	3/5/2021 01:37

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: GW-DUP-1
Collection Date: 2/26/2021

Work Order: 21030065
Lab ID: 21030065-05
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methyl tert-butyl ether	U		0.00045	0.0010	mg/L	1	3/5/2021 01:37
Methylcyclohexane	U		0.00035	0.0010	mg/L	1	3/5/2021 01:37
o-Xylene	U		0.00031	0.0010	mg/L	1	3/5/2021 01:37
Styrene	U		0.00033	0.0010	mg/L	1	3/5/2021 01:37
Tetrachloroethene	U		0.00039	0.0010	mg/L	1	3/5/2021 01:37
Toluene	U		0.00045	0.0010	mg/L	1	3/5/2021 01:37
trans-1,2-Dichloroethene	U		0.00048	0.0010	mg/L	1	3/5/2021 01:37
trans-1,3-Dichloropropene	U		0.00038	0.0010	mg/L	1	3/5/2021 01:37
Trichloroethene	U		0.00043	0.0010	mg/L	1	3/5/2021 01:37
Trichlorofluoromethane	U		0.00052	0.0010	mg/L	1	3/5/2021 01:37
Vinyl chloride	U		0.00053	0.0010	mg/L	1	3/5/2021 01:37
Xylenes, Total	U		0.00081	0.0030	mg/L	1	3/5/2021 01:37
Surr: 1,2-Dichloroethane-d4	*98.3*			*75-120*	*%REC*	1	3/5/2021 01:37
Surr: 4-Bromofluorobenzene	*97.8*			*80-110*	*%REC*	1	3/5/2021 01:37
Surr: Dibromofluoromethane	*102*			*85-115*	*%REC*	1	3/5/2021 01:37
Surr: Toluene-d8	*97.5*			*85-110*	*%REC*	1	3/5/2021 01:37

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: Trip Blank
Collection Date: 2/26/2021

Work Order: 21030065
Lab ID: 21030065-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **SW8260C**					Analyst: **BG**
1,1,1-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 00:16
1,1,2,2-Tetrachloroethane	U		0.00040	0.0010	mg/L	1	3/5/2021 00:16
1,1,2-Trichloroethane	U		0.00046	0.0010	mg/L	1	3/5/2021 00:16
1,1,2-Trichlorotrifluoroethane	U		0.00052	0.0010	mg/L	1	3/5/2021 00:16
1,1-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 00:16
1,1-Dichloroethene	U		0.00040	0.0010	mg/L	1	3/5/2021 00:16
1,2,4-Trichlorobenzene	U		0.00045	0.0010	mg/L	1	3/5/2021 00:16
1,2-Dibromo-3-chloropropane	U		0.00043	0.0010	mg/L	1	3/5/2021 00:16
1,2-Dibromoethane	U		0.00041	0.0010	mg/L	1	3/5/2021 00:16
1,2-Dichlorobenzene	U		0.00032	0.0010	mg/L	1	3/5/2021 00:16
1,2-Dichloroethane	U		0.00044	0.0010	mg/L	1	3/5/2021 00:16
1,2-Dichloropropane	U		0.00048	0.0010	mg/L	1	3/5/2021 00:16
1,3-Dichlorobenzene	U		0.00033	0.0010	mg/L	1	3/5/2021 00:16
1,4-Dichlorobenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 00:16
2-Butanone	**0.019**		**0.00052**	**0.0050**	**mg/L**	1	3/5/2021 00:16
2-Hexanone	U		0.00059	0.0050	mg/L	1	3/5/2021 00:16
4-Methyl-2-pentanone	U		0.00052	0.0010	mg/L	1	3/5/2021 00:16
Acetone	**0.018**		**0.0062**	**0.010**	**mg/L**	1	3/5/2021 00:16
Benzene	U		0.00046	0.0010	mg/L	1	3/5/2021 00:16
Bromodichloromethane	U		0.00049	0.0010	mg/L	1	3/5/2021 00:16
Bromoform	U		0.00056	0.0010	mg/L	1	3/5/2021 00:16
Bromomethane	U		0.00090	0.0010	mg/L	1	3/5/2021 00:16
Carbon disulfide	U		0.00049	0.0010	mg/L	1	3/5/2021 00:16
Carbon tetrachloride	U		0.00040	0.0010	mg/L	1	3/5/2021 00:16
Chlorobenzene	U		0.00040	0.0010	mg/L	1	3/5/2021 00:16
Chloroethane	U		0.00068	0.0010	mg/L	1	3/5/2021 00:16
Chloroform	U		0.00046	0.0010	mg/L	1	3/5/2021 00:16
Chloromethane	U		0.00083	0.0010	mg/L	1	3/5/2021 00:16
cis-1,2-Dichloroethene	U		0.00042	0.0010	mg/L	1	3/5/2021 00:16
cis-1,3-Dichloropropene	U		0.00057	0.0010	mg/L	1	3/5/2021 00:16
Cyclohexane	U		0.00063	0.0020	mg/L	1	3/5/2021 00:16
Dibromochloromethane	U		0.00040	0.0010	mg/L	1	3/5/2021 00:16
Dichlorodifluoromethane	U		0.00068	0.0010	mg/L	1	3/5/2021 00:16
Dichloromethane	U		0.00086	0.0050	mg/L	1	3/5/2021 00:16
Ethylbenzene	U		0.00034	0.0010	mg/L	1	3/5/2021 00:16
Isopropylbenzene	U		0.00035	0.0010	mg/L	1	3/5/2021 00:16
m,p-Xylene	**0.0014**	J	**0.00081**	**0.0020**	**mg/L**	1	3/5/2021 00:16
Methyl acetate	U		0.00059	0.0020	mg/L	1	3/5/2021 00:16

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *08-Mar-21*

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Sample ID: Trip Blank
Collection Date: 2/26/2021

Work Order: 21030065
Lab ID: 21030065-06
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Methyl tert-butyl ether	U		0.00045	0.0010	mg/L	1	3/5/2021 00:16
Methylcyclohexane	U		0.00035	0.0010	mg/L	1	3/5/2021 00:16
o-Xylene	**0.0010**		**0.00031**	**0.0010**	**mg/L**	1	3/5/2021 00:16
Styrene	U		0.00033	0.0010	mg/L	1	3/5/2021 00:16
Tetrachloroethene	U		0.00039	0.0010	mg/L	1	3/5/2021 00:16
Toluene	U		0.00045	0.0010	mg/L	1	3/5/2021 00:16
trans-1,2-Dichloroethene	U		0.00048	0.0010	mg/L	1	3/5/2021 00:16
trans-1,3-Dichloropropene	U		0.00038	0.0010	mg/L	1	3/5/2021 00:16
Trichloroethene	U		0.00043	0.0010	mg/L	1	3/5/2021 00:16
Trichlorofluoromethane	U		0.00052	0.0010	mg/L	1	3/5/2021 00:16
Vinyl chloride	U		0.00053	0.0010	mg/L	1	3/5/2021 00:16
Xylenes, Total	**0.0024**	J	**0.00081**	**0.0030**	**mg/L**	1	3/5/2021 00:16
Surr: 1,2-Dichloroethane-d4	*103*			*75-120*	*%REC*	1	3/5/2021 00:16
Surr: 4-Bromofluorobenzene	*99.4*			*80-110*	*%REC*	1	3/5/2021 00:16
Surr: Dibromofluoromethane	*104*			*85-115*	*%REC*	1	3/5/2021 00:16
Surr: Toluene-d8	*102*			*85-110*	*%REC*	1	3/5/2021 00:16

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
Work Order: 21030065

Case Narrative

Batch R311152A The MS/MSD data for volatiles is not related to this project's sample. No data requires qualification.

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

MBLK Sample ID: **8V-MBLKW2-210304-R311152A** Units: **µg/L** Analysis Date: **3/4/2021 10:40 PM**

Client ID: Run ID: **VMS8_210304B** SeqNo: **7190811** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1,2-Trichlorotrifluoroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2,4-Trichlorobenzene	U	1.0								
1,2-Dibromo-3-chloropropane	U	1.0								
1,2-Dibromoethane	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,4-Dichlorobenzene	U	1.0								
2-Butanone	U	5.0								
2-Hexanone	U	5.0								
4-Methyl-2-pentanone	U	1.0								
Acetone	U	10								
Benzene	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	U	1.0								
Carbon disulfide	U	1.0								
Carbon tetrachloride	U	1.0								
Chlorobenzene	U	1.0								
Chloroethane	U	1.0								
Chloroform	U	1.0								
Chloromethane	U	1.0								
cis-1,2-Dichloroethene	U	1.0								
cis-1,3-Dichloropropene	U	1.0								
Cyclohexane	U	2.0								
Dibromochloromethane	U	1.0								
Dichlorodifluoromethane	U	1.0								
Dichloromethane	U	5.0								
Ethylbenzene	U	1.0								
Isopropylbenzene	U	1.0								
m,p-Xylene	U	2.0								
Methyl acetate	U	2.0								
Methyl tert-butyl ether	U	1.0								
Methylcyclohexane	U	1.0								
o-Xylene	U	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

Styrene	U	1.0					
Tetrachloroethene	U	1.0					
Toluene	U	1.0					
trans-1,2-Dichloroethene	U	1.0					
trans-1,3-Dichloropropene	U	1.0					
Trichloroethene	U	1.0					
Trichlorofluoromethane	U	1.0					
Vinyl chloride	U	1.0					
Xylenes, Total	U	3.0					
Surr: 1,2-Dichloroethane-d4	*20.13*	0	*20*	0	*101*	*75-120*	0
Surr: 4-Bromofluorobenzene	*19.63*	0	*20*	0	*98.2*	*80-110*	0
Surr: Dibromofluoromethane	*20.19*	0	*20*	0	*101*	*85-115*	0
Surr: Toluene-d8	*20.34*	0	*20*	0	*102*	*85-110*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030065
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

LCS	Sample ID: **8V-LCSW2-210304-R311152A**				Units: **µg/L**			Analysis Date: **3/4/2021 09:52 PM**		
Client ID:	Run ID: **VMS8_210304B**				SeqNo: **7190809**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	20.47	1.0	20	0	102	75-130	0			
1,1,2,2-Tetrachloroethane	22.36	1.0	20	0	112	75-130	0			
1,1,2-Trichloroethane	21.63	1.0	20	0	108	75-125	0			
1,1-Dichloroethane	20.32	1.0	20	0	102	68-142	0			
1,1-Dichloroethene	19.87	1.0	20	0	99.4	70-145	0			
1,2,4-Trichlorobenzene	22.43	1.0	20	0	112	70-135	0			
1,2-Dibromo-3-chloropropane	21.75	1.0	20	0	109	60-130	0			
1,2-Dibromoethane	22.72	1.0	20	0	114	67-155	0			
1,2-Dichlorobenzene	23.52	1.0	20	0	118	70-130	0			
1,2-Dichloroethane	22.02	1.0	20	0	110	78-125	0			
1,2-Dichloropropane	21.99	1.0	20	0	110	75-125	0			
1,3-Dichlorobenzene	22.3	1.0	20	0	112	75-130	0			
1,4-Dichlorobenzene	22.62	1.0	20	0	113	75-130	0			
2-Butanone	20.8	5.0	20	0	104	55-150	0			
2-Hexanone	22.65	5.0	20	0	113	60-135	0			
4-Methyl-2-pentanone	33.06	1.0	20	0	165	77-178	0			
Acetone	19.27	10	20	0	96.4	60-160	0			
Benzene	22.26	1.0	20	0	111	70-130	0			
Bromodichloromethane	21.7	1.0	20	0	108	75-125	0			
Bromoform	20.55	1.0	20	0	103	60-125	0			
Bromomethane	27.03	1.0	20	0	135	30-185	0			
Carbon disulfide	21.32	1.0	20	0	107	60-165	0			
Carbon tetrachloride	19.51	1.0	20	0	97.6	65-140	0			
Chlorobenzene	20.98	1.0	20	0	105	80-120	0			
Chloroethane	17.43	1.0	20	0	87.2	31-172	0			
Chloroform	20.59	1.0	20	0	103	66-135	0			
Chloromethane	15.89	1.0	20	0	79.4	46-148	0			
cis-1,2-Dichloroethene	20.45	1.0	20	0	102	75-134	0			
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	70-130	0			
Dibromochloromethane	20.45	1.0	20	0	102	60-115	0			
Dichlorodifluoromethane	20.19	1.0	20	0	101	20-120	0			
Dichloromethane	20.12	5.0	20	0	101	72-125	0			
Ethylbenzene	23.54	1.0	20	0	118	76-123	0			
Isopropylbenzene	22.86	1.0	20	0	114	80-127	0			
m,p-Xylene	48.52	2.0	40	0	121	75-130	0			
Methyl tert-butyl ether	22.39	1.0	20	0	112	68-129	0			
o-Xylene	23.61	1.0	20	0	118	76-127	0			
Styrene	21.57	1.0	20	0	108	79-117	0			
Tetrachloroethene	21.7	1.0	20	0	108	68-166	0			
Toluene	22.38	1.0	20	0	112	76-125	0			
trans-1,2-Dichloroethene	20.83	1.0	20	0	104	80-140	0			
trans-1,3-Dichloropropene	22.19	1.0	20	0	111	56-132	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

Trichloroethene	21.45	1.0	20	0	107	77-125	0
Trichlorofluoromethane	19.69	1.0	20	0	98.4	60-140	0
Vinyl chloride	21.2	1.0	20	0	106	50-136	0
Xylenes, Total	72.13	3.0	60	0	120	76-127	0
Surr: 1,2-Dichloroethane-d4	*20.08*	0	*20*	0	*100*	*75-120*	0
Surr: 4-Bromofluorobenzene	*19.54*	0	*20*	0	*97.7*	*80-110*	0
Surr: Dibromofluoromethane	*19.18*	0	*20*	0	*95.9*	*85-115*	0
Surr: Toluene-d8	*19.36*	0	*20*	0	*96.8*	*85-110*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030065
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

MS Sample ID: **21030064-02A MS** Units: **µg/L** Analysis Date: **3/5/2021 04:33 AM**
Client ID: Run ID: **VMS8_210304B** SeqNo: **7190833** Prep Date: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	10620	500	10000	0	106	75-130	0			
1,1,2,2-Tetrachloroethane	10240	500	10000	0	102	75-130	0			
1,1,2-Trichloroethane	10960	500	10000	0	110	75-125	0			
1,1-Dichloroethane	10150	500	10000	0	102	68-142	0			
1,1-Dichloroethene	10810	500	10000	0	108	70-145	0			
1,2,4-Trichlorobenzene	9340	500	10000	0	93.4	70-135	0			
1,2-Dibromo-3-chloropropane	9270	500	10000	0	92.7	60-130	0			
1,2-Dibromoethane	11380	500	10000	0	114	67-155	0			
1,2-Dichlorobenzene	10120	500	10000	0	101	70-130	0			
1,2-Dichloroethane	10920	500	10000	0	109	78-125	0			
1,2-Dichloropropane	10960	500	10000	0	110	75-125	0			
1,3-Dichlorobenzene	9915	500	10000	0	99.2	75-130	0			
1,4-Dichlorobenzene	9885	500	10000	0	98.8	75-130	0			
2-Butanone	22350	2,500	10000	9865	125	55-150	0			
2-Hexanone	10640	2,500	10000	425	102	60-135	0			
4-Methyl-2-pentanone	17320	500	10000	1300	160	77-178	0			
Acetone	28460	5,000	10000	21660	68	60-160	0			
Benzene	11240	500	10000	0	112	70-130	0			
Bromodichloromethane	10360	500	10000	0	104	75-125	0			
Bromoform	9180	500	10000	0	91.8	60-125	0			
Bromomethane	23460	500	10000	0	235	30-185	0			S
Carbon disulfide	10740	500	10000	0	107	60-165	0			
Carbon tetrachloride	9735	500	10000	0	97.4	65-140	0			
Chlorobenzene	10060	500	10000	0	101	80-120	0			
Chloroethane	14360	500	10000	0	144	31-172	0			
Chloroform	9940	500	10000	0	99.4	66-135	0			
Chloromethane	7800	500	10000	0	78	46-148	0			
cis-1,2-Dichloroethene	9925	500	10000	0	99.2	75-134	0			
cis-1,3-Dichloropropene	9440	500	10000	0	94.4	70-130	0			
Dibromochloromethane	9570	500	10000	0	95.7	60-115	0			
Dichlorodifluoromethane	11700	500	10000	0	117	20-120	0			
Dichloromethane	10240	2,500	10000	0	102	72-125	0			
Ethylbenzene	11920	500	10000	0	119	76-123	0			
Isopropylbenzene	11520	500	10000	0	115	80-127	0			
m,p-Xylene	23800	1,000	20000	0	119	75-130	0			
Methyl tert-butyl ether	11900	500	10000	1175	107	68-129	0			
o-Xylene	11450	500	10000	0	114	76-127	0			
Styrene	9960	500	10000	0	99.6	79-117	0			
Tetrachloroethene	10800	500	10000	0	108	68-166	0			
Toluene	11380	500	10000	0	114	76-125	0			
trans-1,2-Dichloroethene	10740	500	10000	0	107	80-140	0			
trans-1,3-Dichloropropene	10460	500	10000	0	105	56-132	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

Trichloroethene	10720	500	10000	0	107	77-125	0
Trichlorofluoromethane	10600	500	10000	0	106	60-140	0
Vinyl chloride	11840	500	10000	0	118	50-136	0
Xylenes, Total	35260	1,500	30000	0	118	76-127	0
Surr: 1,2-Dichloroethane-d4	*10160*	0	*10000*	0	*102*	*75-120*	0
Surr: 4-Bromofluorobenzene	*10050*	0	*10000*	0	*100*	*80-110*	0
Surr: Dibromofluoromethane	*9715*	0	*10000*	0	*97.2*	*85-115*	0
Surr: Toluene-d8	*10020*	0	*10000*	0	*100*	*85-110*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Work Order: 21030065
Project: Golder - Iowa Project (1661465)

QC BATCH REPORT

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

MSD Sample ID: **21030064-02A MSD** Units: **µg/L** Analysis Date: **3/5/2021 04:49 AM**
Client ID: Run ID: **VMS8_210304B** SeqNo: **7190834** Prep Date: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	10420	500	10000	0	104	75-130	10620	1.9	30	
1,1,2,2-Tetrachloroethane	9850	500	10000	0	98.5	75-130	10240	3.88	30	
1,1,2-Trichloroethane	10380	500	10000	0	104	75-125	10960	5.44	30	
1,1-Dichloroethane	9940	500	10000	0	99.4	68-142	10150	2.09	30	
1,1-Dichloroethene	11040	500	10000	0	110	70-145	10810	2.06	30	
1,2,4-Trichlorobenzene	9785	500	10000	0	97.8	70-135	9340	4.65	30	
1,2-Dibromo-3-chloropropane	9735	500	10000	0	97.4	60-130	9270	4.89	30	
1,2-Dibromoethane	10780	500	10000	0	108	67-155	11380	5.37	30	
1,2-Dichlorobenzene	10720	500	10000	0	107	70-130	10120	5.71	30	
1,2-Dichloroethane	10740	500	10000	0	107	78-125	10920	1.66	30	
1,2-Dichloropropane	11260	500	10000	0	113	75-125	10960	2.74	30	
1,3-Dichlorobenzene	10640	500	10000	0	106	75-130	9915	7.01	30	
1,4-Dichlorobenzene	10690	500	10000	0	107	75-130	9885	7.83	30	
2-Butanone	21910	2,500	10000	9865	120	55-150	22350	1.99	30	
2-Hexanone	10570	2,500	10000	425	101	60-135	10640	0.707	30	
4-Methyl-2-pentanone	16460	500	10000	1300	152	77-178	17320	5.12	30	
Acetone	27910	5,000	10000	21660	62.4	60-160	28460	1.97	30	
Benzene	10960	500	10000	0	110	70-130	11240	2.57	30	
Bromodichloromethane	10570	500	10000	0	106	75-125	10360	2.01	30	
Bromoform	9535	500	10000	0	95.4	60-125	9180	3.79	30	
Bromomethane	23700	500	10000	0	237	30-185	23460	1.02	30	S
Carbon disulfide	11060	500	10000	0	111	60-165	10740	2.98	30	
Carbon tetrachloride	10170	500	10000	0	102	65-140	9735	4.37	30	
Chlorobenzene	10300	500	10000	0	103	80-120	10060	2.31	30	
Chloroethane	14120	500	10000	0	141	31-172	14360	1.72	30	
Chloroform	10010	500	10000	0	100	66-135	9940	0.702	30	
Chloromethane	7655	500	10000	0	76.6	46-148	7800	1.88	30	
cis-1,2-Dichloroethene	9820	500	10000	0	98.2	75-134	9925	1.06	30	
cis-1,3-Dichloropropene	9805	500	10000	0	98	70-130	9440	3.79	30	
Dibromochloromethane	9685	500	10000	0	96.8	60-115	9570	1.19	30	
Dichlorodifluoromethane	11820	500	10000	0	118	20-120	11700	0.978	30	
Dichloromethane	9825	2,500	10000	0	98.2	72-125	10240	4.19	30	
Ethylbenzene	11620	500	10000	0	116	76-123	11920	2.59	30	
Isopropylbenzene	11180	500	10000	0	112	80-127	11520	2.95	30	
m,p-Xylene	23560	1,000	20000	0	118	75-130	23800	1.01	30	
Methyl tert-butyl ether	11820	500	10000	1175	106	68-129	11900	0.759	30	
o-Xylene	11300	500	10000	0	113	76-127	11450	1.32	30	
Styrene	10040	500	10000	0	100	79-117	9960	0.8	30	
Tetrachloroethene	10940	500	10000	0	109	68-166	10800	1.24	30	
Toluene	10960	500	10000	0	110	76-125	11380	3.72	30	
trans-1,2-Dichloroethene	10610	500	10000	0	106	80-140	10740	1.17	30	
trans-1,3-Dichloropropene	10060	500	10000	0	101	56-132	10460	3.9	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R311152A** Instrument ID **VMS8** Method: **SW8260C**

Trichloroethene	11040	500	10000	0	110	77-125	10720	2.85	30
Trichlorofluoromethane	11040	500	10000	0	110	60-140	10600	4.02	30
Vinyl chloride	11710	500	10000	0	117	50-136	11840	1.1	30
Xylenes, Total	34860	1,500	30000	0	116	76-127	35260	1.11	30
Surr: 1,2-Dichloroethane-d4	*9955*	0	*10000*	0	*99.6*	*75-120*	10160	*1.99*	*30*
Surr: 4-Bromofluorobenzene	*9725*	0	*10000*	0	*97.2*	*80-110*	10050	*3.29*	*30*
Surr: Dibromofluoromethane	*9955*	0	*10000*	0	*99.6*	*85-115*	9715	*2.44*	*30*
Surr: Toluene-d8	*9815*	0	*10000*	0	*98.2*	*85-110*	10020	*2.02*	*30*

The following samples were analyzed in this batch:

21030065-01A	21030065-02A	21030065-03A
21030065-04A	21030065-05A	21030065-06A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Golder Associates Inc.
Project: Golder - Iowa Project (1661465)
WorkOrder: **21030065**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
mg/L	Milligrams per Liter

ALS Group, USA

Sample Receipt Checklist

Client Name: **GOLDER-MO** Date/Time Received: **01-Mar-21 09:00**

Work Order: **21030065** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 01-Mar-21 (Date) Reviewed by: Gary Byar (eSignature) 02-Mar-21 (Date)

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.1/4.1 C	IR3	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	3/1/2021 2:29:48 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	_		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 45346

ALS Project Manager:

ALS Work Order #: 21030065

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	20394143	Project Name	Eaton Shenandoah Ph III	A	VOC SW 8260
Work Order		Project Number	20394143	B	
Company Name	Golder Associates Inc	Bill To Company	Golder Associates Inc	C	
Send Report To	<anne.faeth_byde@golder.com>	Invoice Attn		D	
Address	13515 Barrett Parkway Drive Suite 260	Address		E	
City/State/Zip	Ballwin/MO/63021	City/State/Zip		F	
Phone	314-984-8800	Phone		G	
Fax		Fax		H	
e-Mail Address		e-Mail Address		I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	GW-MW-1	2/26/21	1323	Water	1	3	X										
2	GW-MW-2	2/26/21	1715														
3	GW-MW-3	2/25/21	1413														
4	GW-MW-4	2/26/21	0915														
5	GW-DUP-1	2/26/21	—														
6	Trip Blank				1												
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign

Shipment Method: Fedex

Turnaround Time in Business Days (BD): ☐ 10 BD ☒ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD ☐ Other

Results Due Date:

Relinquished by: Eric Schneider Date: 2/27/21 Time: 1430 Received by:

Relinquished by: Date: 2/27/21 Time: 1430 Received by (Laboratory): FedEx

Logged by (Laboratory): KW Date: 3/1/21 Time: 1425 Checked by (Laboratory): 3/1/21 0900

Notes:

Cooler ID	Cooler Temp
1R3	3.1°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP Checklist
☐ Level III Std QC/Raw Date ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: E. Forthaus
Project Name: Eaton Shenandoah Deactivation and Phase III
Project Number: 20394143
Reviewer: A. Muehlfarth
Validation Date: 3/8/2021

Laboratory: ALS Environmental
SDG #: 21030065
Analytical Method (type and no.): VOCs (SW8260C)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names GW-MW-1, GW-MW-2, GW-MW-3, GW-MW-4, GW-DUP-1, Trip Blank

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			2/25/2021 - 2/26/2021
b) Sampling team indicated?	x			EMS
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec. Cond., Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?	X			

Note Deficiencies: MS/MSD for Batch R311152A was performed on an unrelated sample.

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?		x		
g) Were any matrix problems noted?	x			See Notes

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☐	☒	
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☒	☐	☐	See Notes

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	☒	☐	☐	
b) Were the proper compounds included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☒	☐	☐	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	GW-DUP-1 @ GW-MW-2
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	Max RPD: 4.7% (<20%)
c) Were lab duplicates analyzed (note original and duplicate samples)?	☐	☒	☐	
d) Were lab dup. precision criteria met (note RPD)?	☐	☐	☒	

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, compounds included and concentrations)?	☐	☒	☐	
b) Was the %D within control limits?	☐	☐	☒	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Surrogate Spikes	YES	NO	NA	COMMENTS
a) Were surrogate recoveries within control limits?	☒	☐	☐	
b) Were surrogate recoveries not calculated due to dilutions?	☐	☐	☒	

Comments/Notes:

Trip Blank: 2-Butanone (0.019), Acetone (0.018), m,p-Xylene (0.0014 J), o-Xylene (0.0010), Total Xylenes (0.0024 J).

Analytes non-detect in samples, no qualification necessary.

Comments/Notes (continued):

MS/MSD:

21030064-02A MS/MSD: MS/MSD % recovery high for Bromomethane. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL II - ORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Ann Muehlfarth

Date: 3/8/2021