ATTACHMENT IX
FIELD SAMPLING LOGS

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-X1

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter:	2	inches
Initial Depth to Water (DTW):	30.97	feet
Depth to Bottom (DTB):	36.71	feet
Water Column Thickness (WCT):	5.74	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.9	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	2.7	gallons
Actual Amount Purged :	1.2	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	31.00	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1136	16.7	5.85	590	49.42	BC
0.9	1139	15.6	5.99	514	53.36	BC
Dry @ 1.2 gallons						
Before Sampling	1020	15.7	5.99	458	59.93	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-3A

Project Name: Culpeper **Project/Task No.:** 310.1701.03.01

Sampler(s): Britton Cocke

Well Diameter:	2	inches
Initial Depth to Water (DTW):	14.94	feet
Depth to Bottom (DTB):	16.40	feet
Water Column Thickness (WCT):	1.46	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.2	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	0.6	gallons
Actual Amount Purged :	0.5	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	14.97	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0906	12.7	5.34	335	8.06	BC
0.2	0908	13.1	5.22	308	12.61	BC
0.4	0909	13.0	5.18	296	42.16	BC
Dry @ 0.5 gallons						
Before Sampling	0730	13.1	5.78	253	9.58	BC
After Sampling	Insufficient Volume					

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3-5/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. The well was sampled on numerous days due to low water volume.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-4

Project Name: Culpeper **Project/Task No.:** 310.1701.03.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 39.05 feet

Depth to Bottom (DTB): 45.30 feet

Water Column Thickness (WCT): 6.25 feet [DTB-DTW]

Calculation for One Well Volume (WV): 1.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 3.0 gallons

Actual Amount Purged : 1.5 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 39.08 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1215	19.0	5.39	194	3.85	BC
1.0	1217	15.5	5.55	239	220.3	BC
Well purged dry @ 1.5 gallons						
Before Sampling	1055	16.3	5.53	200	8.26	BC
After Sampling	1105	15.6	5.65	232	53.92	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature B Cocke **Date** 10/5/17

QA/QC Sign Off Matthew Anderson **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-5

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter:	2	inches
Initial Depth to Water (DTW):	11.93	feet
Depth to Bottom (DTB):	22.26	feet
Water Column Thickness (WCT):	10.33	feet [DTB-DTW]
Calculation for One Well Volume (WV):	1.7	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	5.1	gallons
Actual Amount Purged :	5.1	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	11.97	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1059	15.4	4.56	700	3.73	BC
1.7	1101	15.1	4.62	700	12.80	BC
3.4	1103	15.0	4.74	700	19.14	BC
5.1	1104	14.9	4.78	690	25.61	BC
Before Sampling	0930	15.1	5.34	690	6.77	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature B Cocke **Date** 10/5/17

QA/QC Sign Off Michael Anderson **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-6

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter:	2	inches
Initial Depth to Water (DTW):	46.92	feet
Depth to Bottom (DTB):	47.56	feet
Water Column Thickness (WCT):	0.64	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.1	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	0.3	gallons
Actual Amount Purged :	0.3	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	46.96	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1203	15.7	5.72	271	21.19	BC
0.1	1203	15.6	5.70	284	40.12	BC
0.2	1204	15.6	5.67	299	71.01	BC
0.3	1204	15.4	5.66	308	82.61	BC
After Sampling	1050	16.1	6.05	292	296.4	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. The water level before sampling was low, therefore, before sampling parameters were not taken to preserve low turbidity water for sampling metals parameters.

Signature BC **Date** 10/5/17

QA/QC Sign Off [signature] **Date** 11/2/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** MW-20

Project Name: Culpeper **Project/Task No.:** 310.1701.03.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 35.88 feet

Depth to Bottom (DTB): 51.64 feet

Water Column Thickness (WCT): 15.76 feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 7.8 gallons

Actual Amount Purged : 4.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 36.76 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1731	14.7	5.48	34	73.78	BC
2.6	1743	14.4	5.25	35	7.99	BC
Dry at 4.0 Gallons						
Before Sampling	0935	13.0	5.55	34	3.03	BC
After Sampling	0944	13.0	5.57	33	5.38	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 4.29 mg/L, ORP: -70.8 mV, Ferrous Iron: 0 mg/L, Sulfate: 1.8 mg/L

Signature B Cocke **Date** 10/5/17

QA/QC Sign Off Michael Anderson **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** CLF-S3

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 22.48 feet

Depth to Bottom (DTB): 88.50 feet

Water Column Thickness (WCT): 66.02 feet [DTB-DTW]

Calculation for One Well Volume (WV): 10.8 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 32.4 gallons

Actual Amount Purged : 32.4 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 24.79 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1448	16.7	7.41	304	5.95	BC
10.8	1508	14.5	6.78	274	3.11	BC
21.6	1528	14.5	6.71	270	2.61	BC
32.4	1538	14.5	6.62	269	2.86	BC
Before Sampling	0820	13.1	6.79	237	4.02	BC
After Sampling	0825	13.2	6.81	229	3.39	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon tanks on site. D.O.: 4.00 mg/L, ORP: -90.2 mV, Ferrous Iron: 0 mg/L, Sulfate: 1.3 mg/L.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-1B

Project Name: Culpeper **Project/Task No.:** 310.1701.03.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 7.13 feet

Depth to Bottom (DTB): 27.10 feet

Water Column Thickness (WCT): 19.97 feet [DTB-DTW]

Calculation for One Well Volume (WV): 3.3 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 9.3 gallons

Actual Amount Purged : 9.3 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 7.12 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1037	15.1	5.89	559	4.46	BC
3.3	1040	14.7	5.88	572	11.41	BC
6.6	1043	14.5	5.88	604	14.06	BC
9.9	1046	14.2	5.88	680	15.12	BC
Before Sampling	0850	13.6	5.86	660	5.39	BC
After Sampling	0903	13.8	5.91	700	14.29	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on the both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. MS/MSD samples were collected at this well.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-1C

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 16.50 feet

Depth to Bottom (DTB): 45.00 feet

Water Column Thickness (WCT): 28.50 feet [DTB-DTW]

Calculation for One Well Volume (WV): 4.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 13.8 gallons

Actual Amount Purged : 13.8 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 16.49 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1010	15.4	5.90	27	5.56	BC
4.6	1014	15.0	5.91	35	12.91	BC
9.2	1018	14.2	5.90	66	18.16	BC
13.8	1022	14.0	5.92	71	22.16	BC
Before Sampling	0830	14.0	5.87	660	6.56	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All samples were collected from one bailer; therefore, no after sampling parameters were necessary. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-1D

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 20.07 feet

Depth to Bottom (DTB): 57.13 feet

Water Column Thickness (WCT): 37.06 feet [DTB-DTW]

Calculation for One Well Volume (WV): 6.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 18.0 gallons

Actual Amount Purged : 16.5 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 20.08 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1516	15.7	6.28	720	33.15	BC
6.0	1526	14.9	6.01	626	24.09	BC
12.0	1538	15.1	5.91	548	21.16	BC
Well purged dry @ 16.5 gallons						
Before Sampling	1155	14.7	5.81	491	4.36	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/2/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-1E

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 20.12 feet

Depth to Bottom (DTB): 103.20 feet

Water Column Thickness (WCT): 83.08 feet [DTB-DTW]

Calculation for One Well Volume (WV): 13.5 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 40.5 gallons

Actual Amount Purged : 40.5 gallons

Purged with: 2" Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 22.17 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1418	14.7	6.39	540	6.53	BC
13.5	1433	15.2	6.46	583	37.76	BC
27.0	1448	15.0	6.31	548	22.80	BC
40.5	1501	14.7	6.20	524	13.66	BC
Before Sampling	1150	14.5	6.57	469	4.34	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** MW-1F

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 17.70 feet

Depth to Bottom (DTB): 200.00 feet

Water Column Thickness (WCT): 182.3 feet [DTB-DTW]

Calculation for One Well Volume (WV): 30.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 90.0 gallons

Actual Amount Purged : 90.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 17.83 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0812	10.8	7.49	408	11.45	BC
30.0	0840	11.2	7.01	449	8.61	BC
60.0	0910	13.8	6.42	532	2.94	BC
90.0	0946	13.9	6.42	680	2.75	BC
Before Sampling	0745	13.9	6.94	406	4.82	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature B Cocke **Date** 10/5/17

QA/QC Sign Off Michael Anderson **Date** 11/21/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-1G

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 9.66 feet

Depth to Bottom (DTB): 200.00 feet

Water Column Thickness (WCT): 190.34 feet [DTB-DTW]

Calculation for One Well Volume (WV): 31.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 93.0 gallons

Actual Amount Purged : 93.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 74.46 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1608	20.8	6.91	560	5.36	BC
31.0	1642	20.2	6.94	570	4.18	BC
62.0	1718	19.6	6.95	580	5.72	BC
93.0	1758	19.4	6.97	580	6.22	BC
Before Sampling	1205	14.1	6.83	560	4.85	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on the both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Britton **Date** 10/5/17

QA/QC Sign Off Michael Anderson **Date** 11/21/12

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** MW-1H

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 7.19 feet

Depth to Bottom (DTB): 210.00 feet

Water Column Thickness (WCT): 202.81 feet [DTB-DTW]

Calculation for One Well Volume (WV): 33.1 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 99.3 gallons

Actual Amount Purged : 99.3 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 5.81 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1135	17.2	6.96	506	5.35	BC
33.1	1205	15.3	6.61	540	3.10	BC
66.2	1235	14.8	6.50	599	2.04	BC
99.3	1305	15.2	6.67	590	2.32	BC
Before Sampling	0755	16.6	7.43	383	3.57	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3/17 **Well ID:** MW-1I

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 0.00 feet

Depth to Bottom (DTB): 310.00 feet

Water Column Thickness (WCT): 310.00 feet [DTB-DTW]

Calculation for One Well Volume (WV): --- gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 --- gallons

Actual Amount Purged : --- gallons

Purged with: ---

Sampled with: Disposable Bailer

Depth to Water before Sampling : 0.00 feet

	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
Before Sampling	1220	18.9	7.87	253	2.55	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was sampled on 10/3/17. The weather was sunny with temperatures in the 70s. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-2B

Project Name: Culpeper **Project/Task No.:** 310.1701.03.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 20.95 feet

Depth to Bottom (DTB): 22.50 feet

Water Column Thickness (WCT): 1.55 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.4 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 1.2 gallons

Actual Amount Purged : 1.2 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 21.03 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0953	15.7	5.37	1510	4.16	BC
0.4	0954	15.7	5.48	1540	12.91	BC
0.8	0956	15.8	5.55	1610	34.82	BC
1.2	0957	15.6	5.67	1640	69.28	BC
Before Sampling	0745	12.6	6.02	1550	9.04	BC
After Sampling	0756	14.2	6.02	1540	61.77	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-3

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 17.58 feet

Depth to Bottom (DTB): 21.18 feet

Water Column Thickness (WCT): 3.6 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 1.8 gallons

Actual Amount Purged : 1.8 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 17.61 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1423	17.0	5.13	86	6.64	BC
0.6	1425	16.0	5.08	80	30.12	BC
1.2	1426	15.3	5.03	77	131.8	BC
1.8	1427	15.1	5.05	64	174.3	BC
Before Sampling	1140	15.3	5.14	85	6.54	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** CLF-1

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 6 inches

Initial Depth to Water (DTW): 34.44 feet

Depth to Bottom (DTB): 62.30 feet

Water Column Thickness (WCT): 27.86 feet [DTB-DTW]

Calculation for One Well Volume (WV): 41.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 123.0 gallons

Actual Amount Purged : 123.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 34.50 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initials
0	1233	16.9	5.99	307	24.12	BC
41.0	1303	16.9	5.81	369	7.17	BC
82.0	1333	17.1	5.80	362	4.96	BC
123.0	1403	17.3	5.80	359	4.83	BC
Before Sampling	1115	17.1	5.73	297	6.86	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature [signature] **Date** 10/5/17

QA/QC Sign Off [signature] **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** CLF-15A

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter:	2	inches
Initial Depth to Water (DTW):	46.01	feet
Depth to Bottom (DTB):	81.46	feet
Water Column Thickness (WCT):	35.45	feet [DTB-DTW]
Calculation for One Well Volume (WV):	5.8	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	17.4	gallons
Actual Amount Purged :	7.5	gallons
Purged with:	Grundfos Pump	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	64.17	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initials
0	1619	15.5	6.36	670	4.14	BC
5.8	1631	15.5	6.61	610	2.68	BC
Well purged dry at 7.5 Gallons						
Before Sampling	0850	13.2	6.45	635	3.25	BC
After Sampling	0855	13.4	6.39	670	2.03	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 3.00 mg/L; ORP -87.7 mV; Ferrous Iron: 1.0 mg/, Sulfate: 3.6 mg/L.

Signature BBrcke **Date** 10/5/17

QA/QC Sign Off Michael Anderson **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** CLF-S1

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 82.16 feet

Depth to Bottom (DTB): 103.46 feet

Water Column Thickness (WCT): 21.3 feet [DTB-DTW]

Calculation for One Well Volume (WV): 3.5 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 10.5 gallons

Actual Amount Purged : 8.0 gallons

Purged with: Grundfos pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 93.12 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1546	16.3	7.67	630	37.88	BC
3.5	1558	15.7	7.74	521	16.26	BC
7.0	1604	15.9	7.72	516	12.82	BC
Dry at 8.0 gallons						
Before Sampling	0835	13.2	7.66	494	9.65	BC

Comments (weather conditions, color, silt, purge water management, etc): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All samples were collected from one bailer, therefore no after sampling parameters were necessary All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** MW-X2

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 8.01 feet

Depth to Bottom (DTB): 16.71 feet

Water Column Thickness (WCT): 8.70 feet [DTB-DTW]

Calculation for One Well Volume (WV): 1.4 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 4.2 gallons

Actual Amount Purged : 2.5 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 8.56 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1800	16.7	6.58	162	400.2	BC
1.4	1812	17.1	6.82	226	10.12	BC
Well purged dry at 2.5 gallons.						
Before Sampling	1010	15.6	6.40	307	6.71	BC
After Sampling	1013	16.0	6.53	323	28.73	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 1.31 mg/L, ORP: 108.3 mV, Ferrous Iron: 1.9 mg/L, Sulfate: 3.1 mg/L.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/21/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/2-3/17 **Well ID:** MW-X2D

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 61.38 feet

Depth to Bottom (DTB): 65.05 feet

Water Column Thickness (WCT): 3.67 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 1.8 gallons

Actual Amount Purged : 1.0 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 63.10 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1116	13.9	7.45	4640	2.63	BC
0.6	1118	13.6	7.61	4960	19.94	BC
Well dry @ 1.0 gallon						
Before Parameters	0940	13.5	7.29	4850	22.14	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/2/17 and sampled on 10/3/17. The weather was sunny with temperatures in the 70s on the both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Britton Cocke **Date** 10/5/17

QA/QC Sign Off Michael Anderson **Date** 11/2/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 10/3-4/17 **Well ID:** PZ-4E

Project Name: Culpeper **Project/Task No.:** 310.1701.03.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 22.81 feet

Depth to Bottom (DTB): 30.98 feet

Water Column Thickness (WCT): 10.17 feet [DTB-DTW]

Calculation for One Well Volume (WV): 1.7 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 5.1 gallons

Actual Amount Purged : 5.1 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 24.69 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1645	16.6	5.25	77	93.31	BC
1.7	1651	15.3	5.22	43	94.12	BC
3.4	1657	15.2	5.29	47	60.45	BC
5.1	1703	15.4	5.29	48	163.2	BC
Before Sampling	0910	13.5	5.39	21	4.56	BC
After Sampling	0914	13.6	5.20	45	58.66	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 10/3/17 and sampled on 10/4/17. The weather was sunny with temperatures in the 70s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 1.31 mg/L, ORP: -73.8 mV, Ferrous Iron: 1.6 mg/L, Sulfate: 0 mg/L.

Signature _____ **Date** 10/5/17

QA/QC Sign Off _____ **Date** 11/2/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 11/9-10/17 **Well ID:** PZ-4E

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Andrew Zell

Well Diameter:	2	inches
Initial Depth to Water (DTW):	26.33	feet
Depth to Bottom (DTB):	30.98	feet
Water Column Thickness (WCT):	4.65	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.8	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	2.4	gallons
Actual Amount Purged :	2.4	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	25.43	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1223	14.5	4.74	168	65.95	AZ
0.8	1225	14.0	4.46	67	609.8	AZ
1.6	1227	13.9	4.49	78	>1100	AZ
2.4	1229	13.8	4.37	75	564.3	AZ
Before Sampling	1140	14.6	5.01	234	9.49	AZ

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 11/9/17 and sampled on 11/10/17. The weather was overcast the first day and sunny on the second with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. After Sampling parameters where not recorded since all bottles were filled with one bailer.

Signature Andrew Zell **Date** 11/14/17

QA/QC Sign Off [signature] **Date** 11/15/17

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/2018 **Well ID:** CLF-1

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	6	inches
Initial Depth to Water (DTW):	37.00	feet
Depth to Bottom (DTB):	62.30	feet
Water Column Thickness (WCT):	25.30	feet [DTB-DTW]
Calculation for One Well Volume (WV):	37.2	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	111.6	gallons
Actual Amount Purged :	111.6	gallons
Purged with:	Grundfos Pump	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	37.00	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initials
0	1200	15.2	5.51	524	4.02	MA
37.2	1230	15.3	5.64	528	2.24	MA
74.4	1300	15.4	5.35	419	4.35	MA
111.6	1330	15.6	5.47	418	1.71	MA
Before Sampling	1005	14.2	5.83	362	32.21	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 4/5/18

QA/QC Sign Off _____ **Date** 4/12/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/2018 **Well ID:** CLF-15A

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	48.22	feet
Depth to Bottom (DTB):	81.46	feet
Water Column Thickness (WCT):	33.24	feet [DTB-DTW]
Calculation for One Well Volume (WV):	5.4	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	16.2	gallons
Actual Amount Purged :	6.0	gallons
Purged with:	Grundfos Pump	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	76.79	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initials
0	1520	13.7	6.98	90	31.45	MA
5.4	1532	15.6	6.19	90	5.49	MA
Well purged dry at 6.0 Gallons						
Before Sampling	0840	14.6	6.55	93	9.46	MA
After Sampling	0847	14.3	6.84	1160	103.9	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 3.05 mg/L; ORP -38.9 mV; Ferrous Iron: 1.4 mg/, Sulfate: 4.2 mg/L.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/2018 **Well ID:** CLF-S1

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 79.50 feet

Depth to Bottom (DTB): 103.46 feet

Water Column Thickness (WCT): 23.96 feet [DTB-DTW]

Calculation for One Well Volume (WV): 3.9 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 11.7 gallons

Actual Amount Purged : 11.7 gallons

Purged with: Grundfos pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 97.58 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1445	13.4	7.13	73	6.73	MA
3.9	1457	15.3	7.56	581	97.30	MA
7.8	1502	15.3	7.56	614	98.37	MA
11.7	1507	15.3	7.57	62	115.1	MA
Before Sampling	0825	14.0	7.43	536	17.65	MA

Comments (weather conditions, color, silt, purge water management, etc): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 70s on 4/4/18. All samples were collected from one bailer, therefore no after sampling parameters were necessary. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/14/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/2018 **Well ID:** CLF-S3

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	12.21	feet
Depth to Bottom (DTB):	88.50	feet
Water Column Thickness (WCT):	76.29	feet [DTB-DTW]
Calculation for One Well Volume (WV):	12.4	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	37.2	gallons
Actual Amount Purged :	37.2	gallons
Purged with:	Grundfos Pump	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	21.73	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1400	13.5	6.91	312	1.02	MA
12.4	1415	13.6	6.30	186	0.51	MA
24.8	1428	13.5	6.33	189	0.45	MA
37.2	1436	13.6	6.32	185	0.39	MA
Before Sampling	0810	13.4	6.89	279	3.74	MA
After Sampling	0816	13.4	6.89	262	1.19	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 70s on 4/4/18. All purge water was containerized and disposed of in 250-gallon tanks on site. D.O.: 1.10 mg/L, ORP: -42.6 mV, Ferrous Iron: 0 mg/L, Sulfate: 2.0 mg/L.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-1B

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	4.43	feet
Depth to Bottom (DTB):	27.10	feet
Water Column Thickness (WCT):	22.67	feet [DTB-DTW]
Calculation for One Well Volume (WV):	3.7	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	11.1	gallons
Actual Amount Purged :	11.1	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	4.41	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0936	9.2	5.56	72	28.36	MA
3.7	0940	11.7	5.39	349	77.36	MA
7.4	0945	12.0	5.29	662	57.34	MA
11.1	0949	12.1	5.30	619	31.45	MA
Before Sampling	0835	10.0	5.54	574	46.11	MA
After Sampling	0857	11.8	5.64	663	72.54	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 70s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. MS/MSD samples were collected at this well.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off B Clarke **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/2018 **Well ID:** MW-1C

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	13.73	feet
Depth to Bottom (DTB):	45.00	feet
Water Column Thickness (WCT):	31.27	feet [DTB-DTW]
Calculation for One Well Volume (WV):	5.1	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	15.3	gallons
Actual Amount Purged :	15.3	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	13.73	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0957	11.1	5.55	71	3.37	MA
5.1	1002	13.0	5.35	77	9.78	MA
10.2	1009	13.4	5.48	84	18.40	MA
15.3	1014	12.9	5.81	84	12.90	MA
Before Sampling	0905	11.5	5.55	79	5.91	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All samples were collected from one bailer; therefore, no after sampling parameters were necessary. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off BLeh **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/2018 **Well ID:** MW-1D

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	16.70	feet
Depth to Bottom (DTB):	57.13	feet
Water Column Thickness (WCT):	40.43	feet [DTB-DTW]
Calculation for One Well Volume (WV):	6.6	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	19.8	gallons
Actual Amount Purged :	19.8	gallons
Purged with:	Grundfos Pump	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	16.67	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1442	14.2	6.38	1020	375.8	MA
6.6	1447	139	6.38	660	13.37	MA
13.2	1452	14.0	6.03	660	9.93	MA
19.8	1457	13.9	5.94	670	10.69	MA
Before Sampling	1050	11.8	5.80	667	3.54	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40 on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off BLW **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/2018 **Well ID:** MW-1E

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 18.79 feet

Depth to Bottom (DTB): 103.20 feet

Water Column Thickness (WCT): 84.41 feet [DTB-DTW]

Calculation for One Well Volume (WV): 13.8 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 41.4 gallons

Actual Amount Purged : 41.4 gallons

Purged with: 2" Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 19.26 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1350	13.5	6.26	900	69.72	MA
13.8	1405	13.8	6.38	710	449.3	MA
27.6	1420	14.0	5.64	627	27.40	MA
41.4	1435	14.2	5.92	640	35.30	MA
Before Sampling	1040	12.0	6.44	421	3.76	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off B Cotton **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/2018 **Well ID:** MW-1F

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 15.92 feet

Depth to Bottom (DTB): 200.00 feet

Water Column Thickness (WCT): 184.08 feet [DTB-DTW]

Calculation for One Well Volume (WV): 30.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 90.0 gallons

Actual Amount Purged : 90.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 16.00 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0730	12.1	6.72	467	5.78	MA
30.0	0820	13.5	5.85	617	2.55	MA
60.0	0910	13.7	6.09	636	1.03	MA
90.0	1010	13.6	6.62	637	0.98	MA
Before Sampling	0740	12.4	7.05	511	1.13	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-1G

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 8.20 feet

Depth to Bottom (DTB): 200.00 feet

Water Column Thickness (WCT): 191.80 feet [DTB-DTW]

Calculation for One Well Volume (WV): 31.3 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 93.9 gallons

Actual Amount Purged : 93.9 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 185.20 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1520	13.9	6.54	690	3.11	MA
31.3	1600	17.9	7.09	690	2.04	MA
62.6	1640	16.0	6.90	690	1.29	MA
93.3	1720	15.7	6.77	690	0.33	MA
Before Sampling	1100	13.3	6.94	68	3.98	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperature in the 40s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/18 **Well ID:** MW-1H

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 5.43 feet

Depth to Bottom (DTB): 210.00 feet

Water Column Thickness (WCT): 204.57 feet [DTB-DTW]

Calculation for One Well Volume (WV): 33.3 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 99.9 gallons

Actual Amount Purged : 99.9 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 3.98 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1030	13.4	6.50	710	1.99	MA
33.3	1130	14.0	6.80	710	0.74	MA
66.6	1200	14.1	6.46	710	0.55	MA
99.9	1245	14.0	6.37	710	0.33	MA
Before Sampling	0755	10.6	7.00	547	5.08	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 4/5/18

QA/QC Sign Off _____ **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3/2018 **Well ID:** MW-1I

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	0.00	feet
Depth to Bottom (DTB):	310.00	feet
Water Column Thickness (WCT):	310.00	feet [DTB-DTW]
Calculation for One Well Volume (WV):	---	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	---	gallons
Actual Amount Purged :	---	gallons
Purged with:	---	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	0.00	feet

	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
Before Sampling	1125	11.7	7.50	324	0.25	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was sampled on 4/3/18. The weather was rainy with temperatures in the 40s. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-2B

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 18.84 feet

Depth to Bottom (DTB): 22.50 feet

Water Column Thickness (WCT): 3.66 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 1.8 gallons

Actual Amount Purged : 1.8 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 19.07 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0919	13.5	5.24	1900	4.08	MA
0.6	0921	14.0	5.38	1820	12.78	MA
1.2	0923	14.1	5.41	1850	67.41	MA
1.8	0925	14.3	5.57	1870	133.4	MA
Before Sampling	0805	13.3	5.95	350	7.29	MA
After Sampling	0816	14.0	5.76	1980	79.85	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40 on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 4/5/18

QA/QC Sign Off _____ **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-3

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	14.02	feet
Depth to Bottom (DTB):	21.18	feet
Water Column Thickness (WCT):	7.16	feet [DTB-DTW]
Calculation for One Well Volume (WV):	1.2	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	3.6	gallons
Actual Amount Purged :	3.6	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	14.36	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1355	12.0	6.07	139	10.23	MA
1.2	1357	11.9	5.11	124	54.21	MA
2.4	1359	11.8	4.78	98	99.31	MA
3.6	1402	11.9	4.64	95	235.5	MA
Before Sampling	1020	11.0	5.37	114	8.83	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/11/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-3A

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	11.99	feet
Depth to Bottom (DTB):	16.40	feet
Water Column Thickness (WCT):	4.41	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.7	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	2.1	gallons
Actual Amount Purged :	1.0	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	11.97	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0907	11.3	6.78	358	2.28	MA
0.7	0908	11.1	5.39	319	33.13	MA
Dry @ 1.0 gallons						
Before Sampling	0750	11.9	5.66	236	5.41	MA
After Sampling	Insufficient Volume					

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. The well was sampled on numerous days due to low water volume.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off Brian **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/17 **Well ID:** MW-4

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 40.83 feet

Depth to Bottom (DTB): 45.30 feet

Water Column Thickness (WCT): 4.47 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.7 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 2.1 gallons

Actual Amount Purged : 1.0 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 40.85 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1143	14.6	5.72	228	29.60	MA
0.7	1144	14.7	5.70	200	>1100	MA
Well purged dry @ 1.0 gallons						
Before Sampling	0955	13.0	5.42	266	73.99	MA
After Sampling	Insufficient Volume					

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3-4/18. The weather was cloudy with temperatures in the 40s on 4/2/18, rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 4/5/18

QA/QC Sign Off _____ **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/17 **Well ID:** MW-5

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	8.84	feet
Depth to Bottom (DTB):	22.26	feet
Water Column Thickness (WCT):	13.42	feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.2 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 6.6 gallons

Actual Amount Purged : 6.6 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 8.89 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1038	10.2	5.44	77	101.2	MA
2.2	1040	10.3	5.10	178	141.4	MA
4.4	1043	11.0	5.05	142	347.9	MA
6.6	1046	11.1	5.04	136	>1100	MA
Before Sampling	0920	10.3	5.41	169	8.62	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 4/5/18

QA/QC Sign Off _____ **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-6

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	Dry	feet
Depth to Bottom (DTB):	47.56	feet
Water Column Thickness (WCT):	0.00	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.00	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	0.00	gallons
Actual Amount Purged :	0.00	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	---	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
Well was dry						

Comments (weather conditions, color, silt, purge water management, etc.): The well was dry on 4/2/18 and on 4/3/18; therefore no purging or sampling took place for this event.

Signature Michael Anderson **Date** 4/3/18

QA/QC Sign Off [signature] **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/18 **Well ID:** MW-20

Project Name: Culpeper **Project/Task No.:** 2180019.01/02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 37.21 feet

Depth to Bottom (DTB): 51.64 feet

Water Column Thickness (WCT): 14.43 feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.4 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 7.2 gallons

Actual Amount Purged : 4.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 37.21 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1610	13.0	5.29	40	223.1	MA
2.4	1622	13.5	5.35	42	63.17	MA
Dry at 4.2 Gallons						
Before Sampling	0925	13.8	5.46	43	7.97	MA
After Sampling	0939	13.5	5.41	22	21.64	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 4.48 mg/L, ORP: -8.1 mV, Ferrous Iron: 0 mg/L, Sulfate: 2.2 mg/L

Signature _____ **Date** 4/5/18

QA/QC Sign Off _____ **Date** 4/10/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-X1

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	33.07	feet
Depth to Bottom (DTB):	36.71	feet
Water Column Thickness (WCT):	3.64	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.6	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	1.8	gallons
Actual Amount Purged :	1.0	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	31.00	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1111	14.5	5.80	680	10.58	MA
0.6	1114	14.6	5.84	620	60.21	MA
Dry @ 1.0 gallons						
Before Sampling	0945	14.8	5.96	586	41.69	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/3/18

QA/QC Sign Off [signature] **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/18 **Well ID:** MW-X2

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	4.22	feet
Depth to Bottom (DTB):	16.71	feet
Water Column Thickness (WCT):	12.49	feet [DTB-DTW]
Calculation for One Well Volume (WV):	2.0	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	6.0	gallons
Actual Amount Purged :	6.0	gallons
Purged with:	Grundfos Pump	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	4.06	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1638	10.0	5.95	491	300.0	MA
2.0	1650	9.1	6.25	490	7.11	MA
4.0	1653	9.0	6.24	490	7.11	MA
6.0	1655	9.0	6.21	490	8.64	MA
Before Sampling	0955	11.4	6.41	462	7.14	MA
After Sampling	1002	10.1	6.45	494	21.48	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 3.66 mg/L, ORP: -32.0 mV, Ferrous Iron: 2.3 mg/L, Sulfate: 4.0 mg/L.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off Blake **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/2-3/18 **Well ID:** MW-X2D

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter:	2	inches
Initial Depth to Water (DTW):	61.22	feet
Depth to Bottom (DTB):	65.05	feet
Water Column Thickness (WCT):	3.83	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.6	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	1.8	gallons
Actual Amount Purged :	1.0	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	62.76	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1056	12.9	5.82	5870	2.92	MA
0.6	1100	13.0	6.97	5970	10.70	MA
Well dry @ 1.0 gallon						
Before Parameters	0925	12.7	6.50	3040	7.48	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/2/18 and sampled on 4/3/18. The weather was cloudy with temperatures in the 40s on 4/2/18 and rainy with temperatures in the 40s on 4/3/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 4/3-4/18 **Well ID:** PZ-4E

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Michael Anderson

Well Diameter: 2 inches

Initial Depth to Water (DTW): 25.68 feet

Depth to Bottom (DTB): 30.98 feet

Water Column Thickness (WCT): 5.30 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.9 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 2.7 gallons

Actual Amount Purged : 2.7 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 25.63 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1542	14.0	5.32	80	89.32	MA
0.9	1548	14.3	5.06	77	452.7	MA
1.8	1552	14.4	5.04	78	234.3	MA
2.7	1555	15.0	5.05	82	486.4	MA
Before Sampling	0900	14.4	5.29	126	41.23	MA
After Sampling	0907	14.1	5.22	79	103.6	MA

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 0.88 mg/L, ORP: -16.2 mV, Ferrous Iron: 2.1 mg/L, Sulfate: 0 mg/L.

Signature Michael Anderson **Date** 4/5/18

QA/QC Sign Off [signature] **Date** 4/16/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/2018 **Well ID:** CLF-1

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 6 inches

Initial Depth to Water (DTW): 36.54 feet

Depth to Bottom (DTB): 62.30 feet

Water Column Thickness (WCT): 25.76 feet [DTB-DTW]

Calculation for One Well Volume (WV): 37.9 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 113.7 gallons

Actual Amount Purged : 113.7 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 36.59 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initials
0	1222	16.4	5.76	581	16.20	BC
37.9	1252	16.5	5.78	456	2.09	BC
75.8	1322	16.5	5.84	413	5.04	BC
113.7	1352	16.6	5.89	398	3.92	BC
Before Sampling	1030	15.9	5.65	486	5.10	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80's on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/12/18

QA/QC Sign Off _____ **Date** 11/9/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/2018 **Well ID:** CLF-15A

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 51.20 feet

Depth to Bottom (DTB): 81.46 feet

Water Column Thickness (WCT): 30.26 feet [DTB-DTW]

Calculation for One Well Volume (WV): 5.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 15.0 gallons

Actual Amount Purged : 11.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 51.29 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initials
0	1544	15.9	6.91	598	9.91	BC
5.0	1550	15.7	6.77	631	5.08	BC
10.0	1556	15.7	6.74	644	2.01	BC
Well purged dry at 11.0 Gallons						
Before Sampling	0755	15.7	6.61	680	4.21	BC
After Sampling	0759	15.8	6.74	649	45.77	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/26/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 2.91 mg/L; ORP -88.4 mV; Ferrous Iron: 1.7 mg/, Sulfate: 2.9 mg/L.

Signature _____ **Date** 10/14/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/2018 **Well ID:** CLF-S1

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 90.11 feet

Depth to Bottom (DTB): 103.46 feet

Water Column Thickness (WCT): 13.35 feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.2 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 6.6 gallons

Actual Amount Purged : 6.0 gallons

Purged with: Grundfos pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 94.18 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1516	16.0	7.51	735	29.70	BC
2.2	1522	15.7	7.64	622	22.01	BC
4.4	1532	15.6	7.71	600	11.11	BC
Well purged dry @ 6.0 gallons						
Before Sampling	0745	16.1	7.61	610	12.81	BC
After Sampling	0749	15.7	7.58	618	18.16	BC

Comments (weather conditions, color, silt, purge water management, etc): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/27/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 4.28 mg/L, ORP: -77.6 mV, Ferrous Iron: 0 mg/L, Sulfate: 5.1 mg/L.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/9/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/2018 **Well ID:** CLF-S3

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 17.52 feet

Depth to Bottom (DTB): 88.50 feet

Water Column Thickness (WCT): 70.98 feet [DTB-DTW]

Calculation for One Well Volume (WV): 11.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 34.8 gallons

Actual Amount Purged : 34.8 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 17.70 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1412	16.1	7.08	261	6.89	BC
11.6	1430	14.3	6.69	284	3.19	BC
23.2	1440	14.4	6.65	289	3.01	BC
34.8	1451	14.4	6.65	294	3.90	BC
Before Sampling	0945	15.4	6.61	275	5.81	BC
After Sampling	0950	15.1	6.58	269	6.91	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/26/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon tanks on site. D.O.: 3.81 mg/L, ORP: -95.8 mV, Ferrous Iron: 0 mg/L, Sulfate: 1.9 mg/L.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-1B

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 3.66 feet

Depth to Bottom (DTB): 27.10 feet

Water Column Thickness (WCT): 23.44 feet [DTB-DTW]

Calculation for One Well Volume (WV): 3.8 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 11.4 gallons

Actual Amount Purged : 11.4 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 3.72 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0958	14.9	5.91	612	2.18	BC
3.8	1002	14.7	5.95	655	8.21	BC
7.6	1007	14.6	5.99	6.81	14.08	BC
11.4	1012	14.6	6.06	719	21.12	BC
Before Sampling	0900	14.2	5.98	590	3.90	BC
After Sampling	0920	14.3	6.09	635	24.19	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. MS/MSD samples were collected at this well.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/2018 **Well ID:** MW-1C

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 12.94 feet

Depth to Bottom (DTB): 45.00 feet

Water Column Thickness (WCT): 32.06 feet [DTB-DTW]

Calculation for One Well Volume (WV): 5.2 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 15.6 gallons

Actual Amount Purged : 15.6 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 12.95 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1024	14.9	5.78	83	8.16	BC
5.2	1029	14.5	5.81	77	12.94	BC
10.4	1034	14.3	5.81	70	21.16	BC
15.6	1038	14.2	5.80	61	28.04	BC
Before Sampling	0925	14.8	5.79	65	5.11	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All samples were collected from one bailer; therefore, no after sampling parameters were necessary. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/2/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/2018 **Well ID:** MW-1D

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 15.25 feet

Depth to Bottom (DTB): 57.13 feet

Water Column Thickness (WCT): 41.88 feet [DTB-DTW]

Calculation for One Well Volume (WV): 6.8 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 20.4 gallons

Actual Amount Purged : 20.4 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 15.32 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1528	16.1	5.84	722	58	BC
6.8	1535	15.5	5.81	709	22.16	BC
13.6	1541	15.4	5.78	681	18.09	BC
20.4	1548	15.3	5.56	612	11.14	BC
Before Sampling	1115	15.5	5.41	629	15.08	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80's on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/2/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/2018 **Well ID:** MW-1E

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 16.53 feet

Depth to Bottom (DTB): 103.20 feet

Water Column Thickness (WCT): 86.67 feet [DTB-DTW]

Calculation for One Well Volume (WV): 15.8 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 47.4 gallons

Actual Amount Purged : 47.4 gallons

Purged with: 2" Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 16.55 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1418	15.0	6.33	612	10.08	BC
14.1	1438	14.6	6.21	555	21.16	BC
28.2	1458	14.4	6.14	511	29.91	BC
42.3	1518	14.1	6.08	481	22.44	BC
Before Sampling	1105	14.9	6.18	592	12.81	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/3/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/2018 **Well ID:** MW-1F

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 13.74 feet

Depth to Bottom (DTB): 200.00 feet

Water Column Thickness (WCT): 186.26 feet [DTB-DTW]

Calculation for One Well Volume (WV): 30.4 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 91.2 gallons

Actual Amount Purged : 91.2 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 13.81 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0736	11.9	7.12	612	8.19	BC
30.4	0816	11.0	7.08	641	14.08	BC
60.8	0856	11.6	6.95	660	8.77	BC
91.2	0936	11.9	6.91	672	5.04	BC
Before Sampling	0900	11.7	6.77	651	6.81	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/26/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/12/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-1G

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 6.21 feet

Depth to Bottom (DTB): 200.00 feet

Water Column Thickness (WCT): 193.79 feet [DTB-DTW]

Calculation for One Well Volume (WV): 31.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 94.8 gallons

Actual Amount Purged : 94.8 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 182.94 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1608	17.9	6.94	551	3.19	BC
31.6	1648	17.3	6.88	526	5.08	BC
63.2	1728	17.1	6.81	511	6.40	BC
94.8	1808	17.1	6.69	495	4.18	BC
Before Sampling	1125	16.9	6.71	516	4.01	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70's on 9/25/18 and sunny with temperature in the 80's on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/18 **Well ID:** MW-1H

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 5.11 feet

Depth to Bottom (DTB): 210.00 feet

Water Column Thickness (WCT): 204.89 feet [DTB-DTW]

Calculation for One Well Volume (WV): 33.4 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 100.2 gallons

Actual Amount Purged : 100.2 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 5.20 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1050	16.8	6.49	618	4.29	BC
33.4	1130	15.4	6.53	571	4.08	BC
66.8	1210	15.1	6.44	551	3.16	BC
100.2	1250	14.8	6.38	529	4.33	BC
Before Sampling	0850	15.8	6.30	588	3.66	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/26/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26/2018 **Well ID:** MW-11

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 0.00 feet

Depth to Bottom (DTB): 310.00 feet

Water Column Thickness (WCT): 310.00 feet [DTB-DTW]

Calculation for One Well Volume (WV): --- gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 --- gallons

Actual Amount Purged : --- gallons

Purged with: ---

Sampled with: Disposable Bailer

Depth to Water before Sampling : 0.00 feet

	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
Before Sampling	1135	17.9	7.42	196	1.58	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was sampled on 9/26/18. The weather was sunny with temperatures in the 80s. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-2B

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 18.80 feet

Depth to Bottom (DTB): 22.50 feet

Water Column Thickness (WCT): 3.70 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 1.8 gallons

Actual Amount Purged : 1.8 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 18.89 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0938	15.9	5.61	1120	22.60	BC
0.6	0940	14.1	5.55	1160	52	BC
1.2	0942	14.3	5.51	1210	59	BC
1.8	0944	14.4	5.49	1220	45.15	BC
Before Sampling	0825	14.0	5.44	1100	18.70	BC
After Sampling	0835	14.2	5.40	1180	49.11	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80's on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/4/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-3

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 12.78 feet

Depth to Bottom (DTB): 21.18 feet

Water Column Thickness (WCT): 13.44 feet [DTB-DTW]

Calculation for One Well Volume (WV): 12.2 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 6.6 gallons

Actual Amount Purged : 6.6 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 12.86 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1422	16.5	5.35	89	12.19	BC
2.2	1426	16.1	5.22	83	31.24	BC
4.4	1430	15.8	5.04	66	78	BC
6.6	1433	15.7	4.91	45	152	BC
Before Sampling	1100	15.3	5.10	69	8.16	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/2/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-3A

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 7.09 feet

Depth to Bottom (DTB): 16.40 feet

Water Column Thickness (WCT): 9.31 feet [DTB-DTW]

Calculation for One Well Volume (WV): 1.5 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 4.5 gallons

Actual Amount Purged : 3.5 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 7.12 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	0915	12.4	5.81	402	5.16	BC
1.5	0919	12.1	5.74	362	13.18	BC
3.0	0923	11.8	5.66	312	56	BC
Dry @ 3.5 gallons						
Before Sampling	0755	13.1	5.69	390	3.29	BC
After Sampling	0810	12.7	5.60	375	10.16	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/14/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/17 **Well ID:** MW-4

Project Name: Culpeper **Project/Task No.:** 2180019.01

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 40.21 feet

Depth to Bottom (DTB): 45.30 feet

Water Column Thickness (WCT): 5.09 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.8 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 2.4 gallons

Actual Amount Purged : 1.2 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 40.33 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1205	16.6	5.66	180	5.88	BC
0.8	1207	15.7	5.61	195	19.20	BC
Well purged dry @ 1.5 gallons						
Before Sampling	1020	15.4	5.70	168	6.91	BC
After Sampling	1029	15.2	5.62	201	84	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-5

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 6.15 feet

Depth to Bottom (DTB): 22.26 feet

Water Column Thickness (WCT): 16.11 feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 7.8 gallons

Actual Amount Purged : 7.8 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 6.19 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1052	15.0	4.98	333	8.19	BC
2.6	1055	14.8	4.95	310	15.16	BC
5.2	1058	14.8	4.89	288	34.18	BC
7.8	1101	14.6	4.85	269	62	BC
Before Sampling	0945	14.5	4.78	295	6.12	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/10/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-6

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter:	2	inches
Initial Depth to Water (DTW):	Dry	feet
Depth to Bottom (DTB):	47.56	feet
Water Column Thickness (WCT):	0.00	feet [DTB-DTW]
Calculation for One Well Volume (WV):	0.00	gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3	0.00	gallons
Actual Amount Purged :	0.00	gallons
Purged with:	Disposable Bailer	
Sampled with:	Disposable Bailer	
Depth to Water before Sampling :	---	feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
Well was dry						

Comments (weather conditions, color, silt, purge water management, etc.): The well was dry on 9/25/18 and on 9/26/18; therefore no purging or sampling took place for this event.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/2/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/18 **Well ID:** MW-20

Project Name: Culpeper **Project/Task No.:** 2180019.01/02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 37.10 feet

Depth to Bottom (DTB): 51.64 feet

Water Column Thickness (WCT): 14.54 feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.3 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 6.9 gallons

Actual Amount Purged : 6.0 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 37.31 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1649	14.9	5.71	61	66	BC
2.3	1655	14.4	5.55	55	33.41	BC
4.6	1701	14.2	5.49	52	14.09	BC
Dry at 6.0 Gallons						
Before Sampling	0715	14.8	5.51	58	11.18	BC
After Sampling	0724	14.6	5.66	51	23.70	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/26/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 4.50 mg/L, ORP: -65.2 mV, Ferrous Iron: 0 mg/L, Sulfate: 1.1 mg/L

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/3/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-X1

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 30.84 feet

Depth to Bottom (DTB): 36.71 feet

Water Column Thickness (WCT): 5.87 feet [DTB-DTW]

Calculation for One Well Volume (WV): 1.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 3.0 gallons

Actual Amount Purged : 1.5 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 30.91 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1128	15.3	6.11	610	49.50	BC
1.0	1131	15.0	5.94	630	62	BC
Dry @ 1.5 gallons						
Before Sampling	1010	14.8	6.03	590	38.72	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/10/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/18 **Well ID:** MW-X2

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 4.58 feet

Depth to Bottom (DTB): 16.71 feet

Water Column Thickness (WCT): 12.14 feet [DTB-DTW]

Calculation for One Well Volume (WV): 2.0 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 6.0 gallons

Actual Amount Purged : 5.5 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 4.70 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1729	16.9	6.31	180	298	BC
2.0	1735	16.8	6.48	199	33.81	BC
4.0	1741	16.9	6.58	218	12.19	BC
Well purged dry @ 5.5 gallons						
Before Sampling	0910	16.7	6.41	198	10.19	BC
After Sampling	0915	16.7	6.51	216	31.16	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 4/3/18 and sampled on 4/4/18. The weather was rainy with temperatures in the 40s on 4/3/18 and rainy with temperatures in the 60s on 4/4/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 3.29 mg/L, ORP: 111.2 mV, Ferrous Iron: 2.4 mg/L, Sulfate: 3.9 mg/L.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/25-26/18 **Well ID:** MW-X2D

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 61.16 feet

Depth to Bottom (DTB): 65.05 feet

Water Column Thickness (WCT): 3.89 feet [DTB-DTW]

Calculation for One Well Volume (WV): 0.6 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 1.8 gallons

Actual Amount Purged : 1.5 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water before Sampling : 61.89 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1114	14.1	7.33	4960	3.08	BC
0.6	1116	14.0	7.39	5060	18.12	BC
1.2	1118	14.1	7.44	5110	26.14	BC
Well dry @ 1.5 gallon						
Before Parameters	0955	14.2	7.33	5500	5.19	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/25/18 and sampled on 9/26/18. The weather was rainy with temperatures in the 70s on 9/25/18 and sunny with temperatures in the 80s on 9/26/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

JOYCE ENGINEERING

GROUNDWATER MONITORING WELL SAMPLING LOG

Date of Event: 9/26-27/18 **Well ID:** PZ-4E

Project Name: Culpeper **Project/Task No.:** 2180019.02

Sampler(s): Britton Cocke

Well Diameter: 2 inches

Initial Depth to Water (DTW): 23.00 feet

Depth to Bottom (DTB): 30.98 feet

Water Column Thickness (WCT): 7.98 feet [DTB-DTW]

Calculation for One Well Volume (WV): 1.3 gallons

WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well

For Three Well Volumes: WV X 3 3.9 gallons

Actual Amount Purged : 3.9 gallons

Purged with: Grundfos Pump

Sampled with: Disposable Bailer

Depth to Water before Sampling : 23.18 feet

Gallons Purged	Time	Temp(°C)	pH	Cond.(uS)	Turb.(ntu)	Initial
0	1608	16.4	5.11	61	111	BC
1.3	1614	15.7	5.20	50	71	BC
2.6	1620	15.4	5.21	49	54	BC
3.9	1624	15.4	5.20	49	97	BC
Before Sampling	0805	15.8	5.22	58	53	BC
After Sampling	0810	15.7	5.17	49	118	BC

Comments (weather conditions, color, silt, purge water management, etc.): The well was purged on 9/26/18 and sampled on 9/27/18. The weather was sunny with temperatures in the 80s on 9/26/18 and overcast with temperatures in the 70s on 9/27/18. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 1.73 mg/L, ORP: -86.2 mV, Ferrous Iron: 1.0 mg/L, Sulfate: 0.8 mg/L.

Signature _____ **Date** 10/16/18

QA/QC Sign Off _____ **Date** 11/7/18

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/2019

Well ID: MW-1B

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 3.90 (feet)

Depth to Bottom: 27.10 (feet)

Water Column Thickness: 23.20 (feet)

Calculation for One Well Volume (WV): 3.8 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 11.4 gallons

Actual Amount Purged: 11.7 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 4.03 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1046	9.2	5.91	743	9.74
3.9	1049	10.1	5.94	736	34.32
7.8	1052	11.9	5.92	723	31.15
11.7	1055	12.0	5.90	716	33.47
Before Sampling	0755	8.1	5.79	735	7.11
After Sampling	0803	10.0	5.83	740	10.12

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. The water column thickness was incorrectly recorded in the field note increasing the purge volume by 0.1 gallons per well volume.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper Date: 4/1-2/2019

Well ID: MW-1C Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 13.50 (feet)

Depth to Bottom: 45.00 (feet)

Water Column Thickness: 31.50 (feet)

Calculation for One Well Volume (WV): 5.1 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 15.3 gallons

Actual Amount Purged: 15.3 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 14.25 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1101	11.3	6.14	713	30.93
5.1	1104	12.3	6.06	753	10.20
10.2	1109	13.1	5.30	877	10.72
15.3	1114	12.9	5.93	898	12.83
Before Sampling	0835	11.0	6.10	700	10.48

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper Date: 4/1-2/2019

Well ID: MW-1D Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 14.60 (feet)

Depth to Bottom: 57.13 (feet)

Water Column Thickness: 42.53 (feet)

Calculation for One Well Volume (WV): 6.9 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 20.7 gallons

Actual Amount Purged: 20.7 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 14.75 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1428	13.7	6.29	604	37.22
6.9	1437	13.8	5.88	512	18.51
13.8	1441	13.9	6.20	536	17.86
20.7	1445	14.1	6.14	537	17.78
Before Sampling	1025	10.1	6.12	509	7.69

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper Date: 4/1-2/2019

Well ID: MW-1E Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 14.70 (feet)

Depth to Bottom: 103.20 (feet)

Water Column Thickness: 88.50 (feet)

Calculation for One Well Volume (WV): 14.4 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 43.2 gallons

Actual Amount Purged: 43.2 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 14.15 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1036	12.7	6.61	891	15.45
14.4	1057	13.5	6.39	688	231
28.8	1116	14.1	6.48	684	18.93
43.2	1124	14.0	6.39	680	11.70
Before Sampling	1030	10.9	6.46	659	1.00

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: [signature] Date: 4/4/19

QA/QC Signature: [signature] Date: 4/19/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/2-3/2019

Well ID: MW-1F

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 11.75 (feet)

Depth to Bottom: 200.00 (feet)

Water Column Thickness: 188.25 (feet)

Calculation for One Well Volume (WV): 30.7 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 92.1 gallons

Actual Amount Purged: 92.1 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 11.70 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	0710	4.5	7.49	569	18.53
30.7	0750	8.7	7.09	578	9.11
61.4	0830	12.1	6.51	610	0.89
92.1	0910	12.4	6.47	630	0.00
Before Sampling	0725	4.2	7.11	70.2	4.20

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/2019

Well ID: MW-1G

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 4.10 (feet)

Depth to Bottom: 200.00 (feet)

Water Column Thickness: 195.90 (feet)

Calculation for One Well Volume (WV): 31.9 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 95.7 gallons

Actual Amount Purged: 95.7 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 163.60 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1455	14.0	6.92	716	13.68
31.9	1535	16.1	7.00	714	22.16
63.8	1615	13.9	7.46	707	24.57
95.7	1655	14.2	7.59	701	20.16
Before Sampling	1040	12.6	7.23	751	5.53

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/2/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/2-3/2019

Well ID: MW-1H

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 0.00 (feet)

Depth to Bottom: 210.00 (feet)

Water Column Thickness: 210.00 (feet)

Calculation for One Well Volume (WV): 34.2 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 102.6 gallons

Actual Amount Purged: 102.6 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 0.00 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	0935	3.0	6.75	700	2.00
34.2	1015	4.4	6.88	740	0.78
68.4	1055	10.1	6.92	750	0.00
102.6	1135	10.3	6.95	750	0.00
Before Sampling	0735	2.8	6.78	710	0.00

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/3/2019

Well ID: MW-1I

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 0.00 (feet)

Depth to Bottom: 310.00 (feet)

Water Column Thickness: 310.00 (feet)

Calculation for One Well Volume (WV): — gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 — gallons

Actual Amount Purged: — gallons

Purged with: —

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 0.00 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
Before Sampling	0740	2.7	7.46	101	2.11

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was sampled on 4/3/19. The weather was sunny with temperatures in the 40s. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2-19

Well ID: MW-2B

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 17.30 (feet)

Depth to Bottom: 22.50 (feet)

Water Column Thickness: 5.20 (feet)

Calculation for One Well Volume (WV): 0.8 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 2.4 gallons

Actual Amount Purged: 2.4 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 17.48 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1016	12.9	5.94	1949	5.46
0.8	1018	13.4	6.00	1952	0.47
1.6	1020	13.3	6.02	1935	6.30
2.4	1021	13.3	6.11	1908	20.54
Before Sampling	0740	10.3	6.05	2000	4.19
After Sampling	0745	12.0	6.11	2010	28.30

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/19

Well ID: MW-3A

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 5.75 (feet)

Depth to Bottom: 16.40 (feet)

Water Column Thickness: 10.65 (feet)

Calculation for One Well Volume (WV): 1.7 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 5.1 gallons

Actual Amount Purged: 5.1 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 6.11 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1000	8.9	6.69	254	15.50
1.7	1002	8.5	5.63	49.9	45.49
3.4	1003	8.6	5.37	39.7	44.90
5.1	1004	8.4	5.25	41.2	48.81
Before Sampling	0720	6.0	7.01	69.1	12.30
After Sampling	0730	6.2	7.11	60.2	25.17

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/2019

Well ID: MW-3

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 11.81 (feet)

Depth to Bottom: 21.18 (feet)

Water Column Thickness: 9.37 (feet)

Calculation for One Well Volume (WV): 1.5 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 4.5 gallons

Actual Amount Purged: 4.5 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 11.79 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1430	11.1	5.25	162	19.22
1.5	1432	10.4	5.09	138	28.32
3.0	1434	10.9	4.97	133	86
4.5	1436	11.0	4.98	131	93
Before Sampling	1020	9.9	5.76	142	3.98

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/2019

Well ID: MW-4

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 33.50 (feet)

Depth to Bottom: 45.30 (feet)

Water Column Thickness: 11.80 (feet)

Calculation for One Well Volume (WV): 1.9 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 5.7 gallons

Actual Amount Purged: 2.0 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 37.89 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1225	15.2	5.51	224	0.41
1.9	1228	14.4	5.61	161	126
Well purged dry @ 2.0 gallons					
Before Sampling	0950	13.0	5.55	250	4.24
After Sampling	1002	14.0	5.64	251	66

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site.

Signature: _____ Date: 4/2/19

QA/QC Signature: _____ Date: 4/19/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/2019

Well ID: MW-5

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 8.48 (feet)

Depth to Bottom: 22.26 (feet)

Water Column Thickness: 13.78 (feet)

Calculation for One Well Volume (WV): 2.2 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 6.6 gallons

Actual Amount Purged: 6.0 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 9.30 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1132	10.5	5.79	166	14.20
2.2	1134	10.4	5.75	148	24.76
4.4	1136	11.0	5.72	134	39.18
Dry @ 6.0 gallons					
Before Sampling	0900	8.7	5.95	149	5.68

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/2/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/1-2/2019

Well ID: CLF-1

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 30.96 (feet)

Depth to Bottom: 62.30 (feet)

Water Column Thickness: 31.34 (feet)

Calculation for One Well Volume (WV): 46.0 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 138.0 gallons

Actual Amount Purged: 138.0 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 30.99 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1235	15.3	5.96	626	0.00
46.0	1305	16.0	5.94	382	16.99
92.0	1335	15.8	5.91	386	4.39
138	1405	15.5	6.05	384	2.54
Before Sampling	1005	13.2	5.91	340	14.90

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/2-3/2019

Well ID: CLF-S1

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 79.30 (feet)

Depth to Bottom: 103.46 (feet)

Water Column Thickness: 24.16 (feet)

Calculation for One Well Volume (WV): 3.9 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 11.7 gallons

Actual Amount Purged: 11.7 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 80.44 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1426	13.0	7.11	620	7.11
3.9	1429	14.2	7.30	622	49.23
7.8	1432	14.3	7.50	630	102
11.7	1436	14.5	7.55	636	210
Before Sampling	0830	14.2	7.01	630	10.12

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from on bailer; therefore, no after parameters were necessary.

Signature: [signature] Date: 4/4/19

QA/QC Signature: [signature] Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/2-3/2019

Well ID: CLF-S3

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 17.00 (feet)

Depth to Bottom: 88.50 (feet)

Water Column Thickness: 71.50 (feet)

Calculation for One Well Volume (WV): 11.7 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 35.1 gallons

Actual Amount Purged: 35.1 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 16.89 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1336	13.4	6.68	278	35.02
11.7	1352	13.8	6.71	185	0.00
23.4	1402	13.9	6.70	180	0.00
35.1	1412	14.0	6.70	178	0.00
Before Sampling	0820	13.1	6.72	270	0.00
After Sampling	0825	13.3	6.75	275	19.23

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 0.85 mg/L, ORP: 160.1 mV, Ferrous Iron: 0.0 mg/L, Sulfate: 3.2 mg/L.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/2-3/2019

Well ID: CLF-15A

Sampler(s): Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 40.30 (feet)

Depth to Bottom: 81.46 (feet)

Water Column Thickness: 41.16 (feet)

Calculation for One Well Volume (WV): 6.7 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 20.1 gallons

Actual Amount Purged: 12.0 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 40.32 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1145	12.3	7.01	926	10.41
6.7	1202	15.9	6.39	880	2.00
Well purged dry at 12.0 gallons					
Before Sampling	0840	12.0	6.93	920	5.13
After Sampling	0845	12.2	6.96	925	10.11

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 0.10 mg/L; ORP 68.3 mV; Ferrous Iron: 2.0 mg/L, Sulfate: 3.4 mg/L.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282

www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper **Date:** 4/2-3/2019

Well ID: MW-20 **Sampler(s):** Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 36.11 (feet)

Depth to Bottom: 51.64 (feet)

Water Column Thickness: 15.53 (feet)

Calculation for One Well Volume (WV): 2.5 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 7.5 gallons

Actual Amount Purged: 7.5 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 36.22 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1450	12.9	5.32	29	200
2.5	1456	13.1	5.39	32	39.25
5.0	1502	13.3	5.40	36	20.44
7.5	1505	13.4	5.42	36	56
Before Sampling	0755	12.4	5.30	32	4.55
After Sampling	0800	12.8	5.37	30	10.70

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 2.68 mg/L, ORP: -109.7 mV, Ferrous Iron: 0.0 mg/L, Sulfate: 0 mg/L

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/25/19

Well ID: PZ-4E

Sampler(s): Andrew Zell

Well Diameter: 2 (inches)

Initial Depth to Water: 19.60 (feet)

Depth to Bottom: 30.98 (feet)

Water Column Thickness: 11.38 (feet)

Calculation for One Well Volume (WV): 1.8 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 5.4 gallons

Actual Amount Purged: 5.4 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 19.65 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1046	15.4	5.06	75	10.53
1.8	1049	14.1	5.12	67	802
3.6	1052	13.7	5.15	65	877
5.4	1055	13.6	5.18	56	926
Before Sampling	1250	15.8	5.43	81	102
After Sampling	0855	13.2	6.36	69.3	19.43

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged and sampled on 4/25/19. The weather was partly cloudy with temperatures in the 60s. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature: _____ Date: 5/1/19

QA/QC Signature: _____ Date: 5/9/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/25/2019

Well ID: MW-1H

Sampler(s): Andrew Zell

Well Diameter: 2 (inches)

Initial Depth to Water: 0.00 (feet)

Depth to Bottom: 210.00 (feet)

Water Column Thickness: 210.00 (feet)

Calculation for One Well Volume (WV): -- gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 -- gallons

Actual Amount Purged: -- gallons

Purged with: --

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 0.00 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
Before Sampling	1110	16.5	6.50	739	2.57

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was sampled on 4/25/19. The weather was partly cloudy with temperatures in the 60s. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature: _____ Date: 5/1/19

QA/QC Signature: _____ Date: 5/9/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper **Date:** 4/1-2/2019

Well ID: MW-6 **Sampler(s):** Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 43.60 (feet)

Depth to Bottom: 47.56 (feet)

Water Column Thickness: 3.96 (feet)

Calculation for One Well Volume (WV): 0.6 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 1.8 gallons

Actual Amount Purged: 1.8 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 43.45 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1214	14.9	6.08	368	19.06
0.6	1216	14.9	5.88	418	43.69
1.2	1217	15.0	5.91	423	67
1.8	1218	15.2	6.00	430	100
Before Sampling	0940	13.0	5.94	616	26.54

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper **Date:** 4/1-2/2019

Well ID: MW-X1 **Sampler(s):** Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 25.30 (feet)

Depth to Bottom: 36.71 (feet)

Water Column Thickness: 11.41 (feet)

Calculation for One Well Volume (WV): 1.9 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 5.7 gallons

Actual Amount Purged: 5.7 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 25.45 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1156	14.1	5.67	624	27.81
1.9	1158	14.3	5.86	535	215
3.8	1201	14.0	5.98	712	118
5.7	1204	14.5	5.94	583	89
Before Sampling	0920	14.3	5.73	670	25.31

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper **Date:** 4/2-3/2019

Well ID: MW-X2 **Sampler(s):** Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 4.00 (feet)

Depth to Bottom: 16.71 (feet)

Water Column Thickness: 12.71 (feet)

Calculation for One Well Volume (WV): 2.1 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 6.3 gallons

Actual Amount Purged: 6.3 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 3.96 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1525	9.0	5.83	410	296
2.1	1531	9.5	5.85	404	38.21
4.2	1537	9.6	5.87	403	9.00
6.3	1540	9.6	5.88	400	6.43
Before Sampling	0900	8.3	5.89	415	20.30
After Sampling	0905	8.5	5.94	417	29.44

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 2.86 mg/L, ORP: -19.8 mV, Ferrous Iron: 3.5 mg/L, Sulfate: 5.1 mg/L.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper **Date:** 4/1-2/2019

Well ID: MW-X2D **Sampler(s):** Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 59.60 (feet)

Depth to Bottom: 65.05 (feet)

Water Column Thickness: 5.45 (feet)

Calculation for One Well Volume (WV): 0.9 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 2.7 gallons

Actual Amount Purged: 1.2 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 60.00 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1144	13.0	6.74	5510	19.10
0.9	1147	12.9	7.01	5670	11.63
Well dry @ 1.2 gallons					
Before Sampling	0915	11.7	7.24	5445	31.51

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/1/19 and sampled on 4/2/19. The weather was overcast with temperatures in the 40s on both days. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after sampling parameters were necessary.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper **Date:** 4/2-3/2019

Well ID: PZ-4E **Sampler(s):** Michael Anderson

Well Diameter: 2 (inches)

Initial Depth to Water: 19.65 (feet)

Depth to Bottom: 30.98 (feet)

Water Column Thickness: 11.33 (feet)

Calculation for One Well Volume (WV): 1.8 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 5.4 gallons

Actual Amount Purged: 5.4 gallons

Purged with: Grundfos®

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 19.69 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1311	13.4	6.30	75.4	33.97
1.8	1317	13.8	5.46	70.9	31.13
3.6	1323	14.0	5.45	69.2	87
5.4	1326	14.0	5.45	69.7	72
Before Sampling	0850	13.1	6.29	78.1	8.00
After Sampling	0855	13.2	6.36	69.3	19.43

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged on 4/2/19 and sampled on 4/3/19. The weather had temperatures in the 40s on both days, overcast the first and sunny the second. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. D.O.: 0.10 mg/L, ORP: 152.3 mV, Ferrous Iron: 2.0 mg/L, Sulfate: 1.8 mg/L.

Signature: _____ Date: 4/4/19

QA/QC Signature: _____ Date: 4/19/19

1604 Ownby Lane | Richmond, VA 23220 | p (804) 355-4520 | f (804) 355-4282
www.labellapc.com

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/25/19

Well ID: PZ-4E

Sampler(s): Andrew Zell

Well Diameter: 2 (inches)

Initial Depth to Water: 19.60 (feet)

Depth to Bottom: 30.98 (feet)

Water Column Thickness: 11.38 (feet)

Calculation for One Well Volume (WV): 1.8 gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 5.4 gallons

Actual Amount Purged: 5.4 gallons

Purged with: Disposable Bailer

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 19.65 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
0	1046	15.4	5.06	75	10.53
1.8	1049	14.1	5.12	67	802
3.6	1052	13.7	5.15	65	877
5.4	1055	13.6	5.18	56	926
Before Sampling	1250	15.8	5.43	81	102
After Sampling	0855	13.2	6.36	69.3	19.43

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was purged and sampled on 4/25/19. The weather was partly cloudy with temperatures in the 60s. All purge water was containerized and disposed of in 250-gallon plastic tanks on site. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature: _____ Date: 5/1/19

QA/QC Signature: _____ Date: 5/9/19

LaBella
Powered by partnership.

FIELD INFORMATION FORM - PURGE VOLUMES

Site Name: Culpeper

Date: 4/25/2019

Well ID: MW-1H

Sampler(s): Andrew Zell

Well Diameter: 2 (inches)

Initial Depth to Water: 0.00 (feet)

Depth to Bottom: 210.00 (feet)

Water Column Thickness: 210.00 (feet)

Calculation for One Well Volume (WV): -- gallons

(WV = WCT X 0.163 for 2" well; WV = WCT X 0.653 for 4" well)

For Three Well Volumes: WV X 3 -- gallons

Actual Amount Purged: -- gallons

Purged with: --

Sampled with: Disposable Bailer

Depth to Water Before Sampling: 0.00 feet

Gallons Purged	Time	Temp. (°C)	pH (s.u.)	Cond. (µ.s.)	Turb. (ntu)
Before Sampling	1110	16.5	6.50	739	2.57

Comments (weather conditions, color, silt, type of sample, purge water management, etc.):

The well was sampled on 4/25/19. The weather was partly cloudy with temperatures in the 60s. All samples were collected from one bailer; therefore, no after parameters were necessary.

Signature: _____ Date: 5/1/19

QA/QC Signature: _____ Date: 5/9/19

GOLDER FIELD SAMPLING LOG

Date: 10/14/19, 10/15/19
Weather: sun 60s, fair sun, 60

Project Name: Culpeper Landfill
Project No./Task No.: 19115362
Event: 2 SA 19 - compliance
Sampler(s): N. Chich
Well ID: MW-1C
Field Calibration Completed: 10/14/19 0950, 0940 10/15/19
Well Diameter: 2 inches
Initial Depth to Water: 14.81 feet
Depth to Bottom: 46.02 [soft] feet
Water Column Thickness: 31.21 feet

Equipment Used:
- ☐ WL Indicator
- ☐ Turbidity Meter
- ☐ Air Tank
- ☒ Disposable Bailer
- ☒ YSI Pro DSS S/N 17M102880
- ☐ Peristaltic Pump
- ☐ Compressor
- ☐ Non-dedicated BP
- ☐ In Situ Troll 9500
- ☐ MP-10 Controller Box
- ☐ MP-15 Controller Box
- ☐ Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10/14/19	1136	5.31	669	107.06	2.23	15.5	83.7	—
10/14/19	1153	4.67	699	94.80	1.95	14.9	113.5	5.09
10/14/19	1209	5.01	726	13.90	2.56	14.7	125.4	10.18
10/14/19	1223	5.19	734	7.07	2.94	14.8	126.9	15.27
10/15/19	1258	—	SAMPLE					
10/15/19	1305	6.43	835	4.75	1.89	17.2	123.7	—

Calculated Well Vol. (Gallons): 5.09
Total Calculated Purge Volume (Gallons): (31.21)(0.163) = 5.09 gal
Purge Water Management: On-site Containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 1258 / 10-15-19
Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):
- ☒ VSWMR Table 3.1 Column A VOCs
- ☐ VSWMR Table 3.1 Column A Metals
- ☐ VSWMR Table 3.1 Column B
- ☒ Other: Cobalt, dichlorodifluoromethane

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/15/19 Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10-15-19, 10-16-19
Weather: sun, 70s, rain, 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: MW-1D
Field Calibration Completed: 0750 on 10/15/19, 0800 10/16/19
Well Diameter: 2.0 inches
Initial Depth to Water: 19.08 (10-15-19) feet
Depth to Bottom: 57.10 feet
Water Column Thickness: 38.02 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer for sampling
- [ ] Non-dedicated BP
- [x] Other grundfos pump for purg

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1146	5.49	563	14.6	4.78	13.9	114.3	0
10-15-19	1156	5.44	595	5.0	2.96	14.0	71.0	~6.25
10-15-19	1205	5.44	581	2.2	2.21	13.7	93.4	~12.5
10-15-19	1214	5.44	603	1.9	2.02	13.8	99.9	~18.75
10-16-19	0935		sampled					
10-16-19	0943	5.79	505	5.0	4.92	14.1	66.7	~19

Calculated Well Vol. (Gallons): (38.02)(0.163) = ~6.197 Total Calculated Purge Volume (Gallons): ~19

Purge Water Management: onsite polytank

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample, initial purge ~~start~~ light
purge start 10-15-19: 1146

Sample Date/Time: 10/16/19 @ 0935 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other cobalt

Other Observations / Equipment Operation Problems: ~175Hz, ~0.75gal/min for grundfos

Sampler Signature: Moira Taylor Date: 10/16/19 Page 1 of 1

QA/QC Signature: Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10-15-19, 10/16/19
Weather: sun, 70s, rain, 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: MW-1E
Field Calibration Completed: 0750 on 10-15-19, 0800 10/16/19
Well Diameter: 2.0 inches
Initial Depth to Water: 18.15 (10/15/19) feet
Depth to Bottom: 104.85 feet
Water Column Thickness: 86.7 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI ProPSS 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer - sampling
- [ ] Non-dedicated BP
- [X] Other grundfos pump - purging

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1239	5.84	849	279.3	3.65	13.4	-12.2	0
10-15-19	1250	6.06	692	108.1	3.93	13.8	-39.4	~14.25
10-15-19	1300	5.95	644	63.2	4.91	14.0	-21.6	~28.5
10-15-19	1311	5.87	635	47.1	3.09	14.2	-3.6	~42.75
10/16/19	0955	sampled						
10/16/19	1003	~~5.43~~ 6.06 MT	606	11.0	5.43	13.9	37.9	~42.75

Calculated Well Vol. (Gallons): (14.13)3 = ~42.75
Total Calculated Purge Volume (Gallons): ~42.75
Purge Water Management: ~~onsite pollutank~~ MT onsite leachate containment
Purge Observations (product observed, color, odor, turbidity, sheen): light brown initial purge, clear grab sample
purge start 10/15/19: 12 39
Sample Date/Time: 10/16/19 @ 0955
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [X] VSWMR Table 3.1 Column B detects
- [X] Other cobalt

Other Observations / Equipment Operation Problems: ~220 Hz, ~0.75-1 gpm

Sampler Signature: Moira Taylor Date: 10/16/19 Page 1 of 1
QA/QC Signature: Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10-15-19, 10-16-19, 10-17
Weather: sun, 70s, rain, 50s, sun

Project Name: Laurel Valley LF (closed) Project No./Task No.: ~~19113562~~ MT 19115362
Event: 2SA19 GW Sampler(s): M. Taylor
Well ID: MW-1F Field Calibration Completed: 0750 on 10/15/19, 0800 on 10-16-1
Well Diameter: 2.0 inches Initial Depth to Water: 15.61 ~~10-16-19~~ feet 0940 on 10-17-19
Depth to Bottom: 200.00 feet Water Column Thickness: 184.39 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI ProDSS 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer - sampling
- [ ] Non-dedicated BP
- [X] Other grundfos pump - purgin

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1422	7.89	5.93	10.9	5.61	15.1	-17.0	0
10-15-19	1434	——	—— generator stops working ——				——	~10.5
10-16-19	0910	——	resume purge ——					
10-16-19	0929	6.37	620	2.4	5.49	14.3	22.8	~30
10-16-19	0950	5.68	590	1.1	4.23	14.1	40.9	~60.25
10-16-19	1018	5.94	601	0.5	3.87	14.0	18.7	~90.25
10-17-19	1042	——	sampled ——					
10-17-19	1052	6.70	505	8.0	6.92	13.8	101.8	~90.25

Calculated Well Vol. (Gallons): 30.05 (x3 = 90.16) Total Calculated Purge Volume (Gallons): ~90.16
Purge Water Management: onsite leachate containment
Purge Observations (product observed, color, odor, turbidity, sheen): initial purge dark brown/black, clear ~~purge~~ MT grab
purge start 10-15-19 @ ~~time~~ 1422
Sample Date/Time: 10-17-19 @ 1042 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other Cobalt, dichlorofluoromethane

Other Observations / Equipment Operation Problems: DTB taken from 4/2-4/3/19 purge log (La Bella), pause purge at 1434 - gen. dies, ~275 Hz for grundfos pump

Sampler Signature: Moira Taylor Date: 10-17-19 Page 1 of 1
QA/QC Signature: Date: 10-18-19

GOLDER FIELD SAMPLING LOG

Date: 10/16/19, 10/17/19
Weather: rain, 50s, sun, 60s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: MW-1G
Field Calibration Completed: 0800 10/16/19, 0940 10/17/19
Well Diameter: 2.0 inches
Initial Depth to Water: 57.87 10/16/19 feet
Depth to Bottom: 200.00 * feet
Water Column Thickness: 192.13 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 15S103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer - Sampling
- [ ] Non-dedicated BP
- [x] Other grundfos pump - purging

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-16-19	1030	6.29	636	159.9	3.84	13.8	49.5	0
10-16-19	1102	6.54	601	131.2	3.50	13.7	37.5	~31.5
10-16-19	1125	6.46	642	2.8	4.21	13.8	59.1	~63
10-16-19	1150	—	—	well dry	—	—	—	~85
10-17-19	1025	—	—	sampled	—	—	—	—
10-17-19	1032	7.20	611	11.2	5.73	13.7	88.7	~85

Calculated Well Vol. (Gallons): 31.32 (x3 = 93.95) Total Calculated Purge Volume (Gallons): 93.95
Purge Water Management: onsite leachate containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear purge, clear grab sample

Sample Date/Time: 10/17/19 @ 1025
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detect
- [x] Other Cobalt

Other Observations / Equipment Operation Problems: * DEPTH TO BOTTOM: taken from 4/2-4/3/19 La Bella purge log
~320-350 H_2 → too fast, went dry

Sampler Signature: Moira Taylor Date: 10/17/19 Page 1 of 1
QA/QC Signature: Date: 10-18-19

GOLDER

FIELD SAMPLING LOG

Date: 10/16/19, 10/17/19
Weather: rain, 50s, sun, 60s

Project Name: Laurel Valley LF
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: MW-1H
Field Calibration Completed: 0800 10-16-19, 0940 10/17/19
Well Diameter: 2.0 inches
Initial Depth to Water: 3.69 10-16-19 feet
Depth to Bottom: 210.00 * feet
Water Column Thickness: 206.31 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 15J103602, 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer - sampling
- [ ] Non-dedicated BP
- [x] Other grundfos pump - purging

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/16/19	1227	5.54	668	9.4	2.42	13.9	33.5	0
10/16/19	1310	—	generator dies	—	—	—	—	20
10/17/19	1000	—	resume purging	—	—	—	—	—
10/17/19	1008	5.82	834	6.02	4.04	14.3	182.6	33.63
10/17/19	1035	6.26	668	3.99	4.05	14.2	148.6	68.
10/17/19	1055	6.48	663	3.40	3.97	14.6	104.3	~101.
10/17/19	1100	—	SAMPLE	—	—	—	—	—

Calculated Well Vol. (Gallons): 33.63 (x3 = 100.9) Total Calculated Purge Volume (Gallons): 100.9

Purge Water Management: onsite leachate containment

Purge Observations (product observed, color, odor, turbidity, sheen): purge water clear, clear grab

Sample Date/Time: 10/17/19 / 1100 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detect
- [x] Other: Cobalt

Other Observations / Equipment Operation Problems:

* Depth to bottom used from 4/2-3/19 La Bella purge log

Sampler Signature: [signature] Date: 10/17/19 Page 1 of 1

QA/QC Signature: M Taylor Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10/17/19
Weather: Overcast, 50s

Project Name: Laurel Valley LF
Project No./Task No.: 19115762
Event: 2SA19 GW
Sampler(s): N. Chien
Well ID: MW-1I
Field Calibration Completed: 0940 on 10/17/19
Well Diameter: 2.0 inches
Initial Depth to Water: 0 feet
Depth to Bottom: ~~>200~~ 310.00 feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 17M10X81
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/17/19	1019	7.02	290.4	4.42	9.09	14.2	176.9	0
10/17/19	1022	—	—	SAMPLED	—	—	—	—

Calculated Well Vol. (Gallons): — Total Calculated Purge Volume (Gallons): —

Purge Water Management: ~~N/A~~ Onsite

Purge Observations (product observed, color, odor, turbidity, sheen): Clear grab sample

Water level = 0' prior to sampling

Sample Date/Time: 10-17-19 / 1022

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Cobalt

Other Observations / Equipment Operation Problems: artisan well

Depth to bottom taken from 4/2/19 La Bella purge log

Sampler Signature: [signature] Date: 10/17/19

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10/15/19, 10-16-1
Weather: Sunny 60s°F, rain, s

Project Name: CulpeperLF
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): N.Chien / M.Taylor
Well ID: MW-3
Field Calibration Completed: 0750 on 10/15/19, 0800 on 10/1
Well Diameter: 2.0 inches
Initial Depth to Water: 16.58 10/15/19 feet
Depth to Bottom: 21.78 feet
Water Column Thickness: 5.20 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS S/N 17M103887, 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/15/19	1205	7.54	112.4	239.56	5.61	15.5	190.9	—
10/15/19	1210	6.19	91.3	56.94	5.28	14.8	173.6	0.84
10/15/19	1214	—	DRY	—	—	—	—	~1.2
10/16/19	1135 ~~1130~~	—	Sampled	—	—	—	—	—

Calculated Well Vol. (Gallons): (5.2)(0.163) = 0.84 Total Calculated Purge Volume (Gallons): 2.52
Purge Water Management: onsite leachate containment
Purge Observations (product observed, color, odor, turbidity, sheen): Clear grab sample

Sample Date/Time: 10/16/19 @ 1135 Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detect
- [x] Other cobalt

Other Observations / Equipment Operation Problems:

Sampler Signature: Moira Jayes Date: 10/16/19 Page 1 of 1
QA/QC Signature: Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10/14/19, 15 min 10/16/19
Weather: Sunny 60s °F, rain, 5

Project Name: Culpeper LF
Project No./Task No.: ~~19116~~ NC 19115362
Event: 25A19
Sampler(s): N. Chien IS
Well ID: MW-5
Field Calibration Completed: ~~0950~~ 0750 NC on 10/14/19, 0800 10/1
Well Diameter: 2.0 inches
Initial Depth to Water: 10.59 feet
Depth to Bottom: 22.43 [soft] feet
Water Column Thickness: 11.84 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS S/N 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/15/19	1556	5.84	743	11.14	3.10	16.1	138.1	0
10/15/19	1600	5.91	568	52.08	5.09	16.1	116.9	1.92
10/15/19	1606	5.86	559	66.07	5.24	15.7	132.7	3.84
10/15/19	1610	—	Well dry at		4.9 gallons		—	—
10/16/19	1325	—	SAMPLED		—	—	—	—
10/16/19	1328	4.65	603	15.04	3.18	15.6	173.8	~

Calculated Well Vol. (Gallons): (11.84)(0.163) = 1.92 Total Calculated Purge Volume (Gallons): 5.76
Purge Water Management: onsite poly tank
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10-16-19 / 1325
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Cobalt

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10-16-19 Page 1 of 1

QA/QC Signature: [signature] Date: 10-18-19

GOLDER

FIELD SAMPLING LOG

Date: 10/14/19, 10/15/19

Weather: Sunny 60s °F, sun, cc

Project Name: Culpeper LF

Project No./Task No.: 19115362

Event: 25A19

Sampler(s): N. Chien

Well ID: MW-6

Field Calibration Completed: 0950 on 10/14/19, 0740 10/15/19

Well Diameter: 2.0 inches

Initial Depth to Water: 39.12 feet

Depth to Bottom: [soft] 49.64 feet

Water Column Thickness: 10.52 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI DSS S/N 17M10288I
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/14/19 ~~1328~~ NC	1328	5.52	340.2	18.97	3.54	15.8	77.2	—
10/14/19	1341	5.09	328.7	29.86	4.84	15.3	26.6	1.71
10/14/19	1347	4.94	333.0	75.00	4.76	14.9	17.6	3.42
10/14/19	1355	4.74	310.8	46.24	3.20	15.0	38.3	5.13
10/15/19	1425	—	—	SAMPLE	—	—	—	—
10/15/19	1432	5.99	371.5	26.72	2.75	15.6	34.4	—

Calculated Well Vol. (Gallons): (10.52)(0.163) = 1.71 Total Calculated Purge Volume (Gallons): 5.13

Purge Water Management: on-site containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10/15/19 | 1425 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Cobalt

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/15/19 Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10/14/19, 10/15/19

Weather: Sunny ~60°F, sun, c

Project Name: Culpeper LF

Project No./Task No.: 19115362

Event: 2SA19 GW

Sampler(s): N Chien

Well ID: MW-X-1

Field Calibration Completed: 0950 on 10/14/19, 0740 10/15/19

Well Diameter: 2.0 inches

Initial Depth to Water: 27.29 feet

Depth to Bottom: Hard, 37.27 feet

Water Column Thickness: 9.98 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS S/N 17M101581
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other —

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/14/19	1038	5.47	744	14.95	1.90	16.6	4.9	—
10/14/19	1045	5.50	310.2	25.26	4.36	15.2	-19.2	1.63
10/14/19	1052	5.53	641	18.49	2.57	14.9	12.6	3.26
10/14/19	1058	4.96	632	15.94	2.70	14.9	17.0	4.88
10/15/19	1410	—	—	SAMPLE	—	—	—	—
10/15/19	1415	6.32	696	19.85	2.71	15.5	26.2	—

Calculated Well Vol. (Gallons): 1.63 (1), 4.88 (3) Total Calculated Purge Volume (Gallons): (9.98)(0.163) = 1.63 = 4.88 for 3 wells vol.

Purge Water Management: on-site containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

purge start: 1038

Sample Date/Time: 1410 / 10/15/19

Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [ ] Other Cobalt

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/15/19 Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10/17/19
Weather: Sunny 50s °F

Project Name: Laurel Valley LF
Project No./Task No.: 19115362
Event: 2SA19
Sampler(s): N. Chien
Well ID: CLF-1
Field Calibration Completed: 0940 on 10/17/19
Well Diameter: 5.0 ~~2.0~~ NC inches
Initial Depth to Water: 27.00 feet
Depth to Bottom: 62.51 feet
Water Column Thickness: 35.51 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] ~~Disposable Bailer sampling~~ NC
- [ ] Non-dedicated BP
- [x] Other grundfos pump - bailing sampl

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/17/19	1152	6.66	411.5	88.14	3.07	15.9	-9.0	0
10/17/19	1211	7.54	320.8	4.68	2.98	16.8	49.7	~~23.2~~ NC 36.22
10/17/19	1235	7.72	342.9	4.67	2.08	16.7	29.9	72.44
10/17/19	1303	7.74	366.9	4.00	3.09	17.2	12.2	409
10/17/19	1309			SAMPLED				

Calculated Well Vol. (Gallons): (35.51) (1.020) = 36.22 ~~(0.699) = 24.8~~ NC
Total Calculated Purge Volume (Gallons): 108.66
Purge Water Management: containerize and move to knock-out tank
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10-17-19 / 1309
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Cobalt

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/17/19
Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10-15-19, 10/16/19
Weather: Sun, 70s, rain, 50s

Project Name: Laurel Valley LF
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: MW-X2
Field Calibration Completed: 0750 on 10-15-19, 0800 10/16/19
Well Diameter: 2.0 inches
Initial Depth to Water: 7.51 feet
Depth to Bottom: 17.13 feet
Water Column Thickness: 9.62 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI ProDSS 15J103602, 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1637	7.62	405.2	6.42	3.17	16.2	75.3	0
10-15-19	1643	6.17	507	16.8	3.29	16.6	47.6	~1.5
10-15-19	1648	5.98	512	21.4	3.38	16.5	6.3	~3.25
10-15-19	1653	5.90	523	19.7	3.44	16.4	-12.9	~4.75
10-16-19	1400	—	—	SAMPLED			—	—
10-16-19	1405	5.56	586	17.65	2.28	16.1	94.0	—

Calculated Well Vol. (Gallons): 1.56 (x3 = 4.70) Total Calculated Purge Volume (Gallons): 4.70
Purge Water Management: onsite leachate containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample
purge start 10/15/19 1637
Sample Date/Time: 10-16-19 1400
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [X] VSWMR Table 3.1 Column B detects
- [X] Other mercury, nitrate/nitrite, alkalinity, chloride, dissolved methane, sulfate, sulfide

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10-15-19 Page 1 of 1
QA/QC Signature: [signature] Date: 10-18-19

GOLDER

FIELD SAMPLING LOG

Date: 10/16/19, 10/17/19
Weather: rain, 50s, sun, 60s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: CLF-15A
Field Calibration Completed: 0800 10/16/19, 0940 @ 10/17/19
Well Diameter: 2.0 inches
Initial Depth to Water: 42.90 feet
Depth to Bottom: 81.60 feet
Water Column Thickness: 38.7 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/16/19	1508	5.50	757	87.7	3.75	13.6	66.3	0
10/16/19	1545	5.93	804	92.8	4.07	13.5	78.9	~6.5
10/16/19	1617	6.13	702	71.3	3.39	13.5	61.2	~12.75
10/16/19	1618	—	well dry	—	—	—	—	—
10/17/19	1430	—	SAMPLE	—	—	—	—	—
10/17/19	1515	7.67	914	69.44	6.34	14.8	58.7	—

Calculated Well Vol. (Gallons): 6.31
Total Calculated Purge Volume (Gallons): 18.92
Purge Water Management: onsite leachate containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear-to-opaque grab sample

Sample Date/Time: 10-17-19 / 1430
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column B detect
- [ ] VSWMR Table 3.1 Column A Metals
- [x] Other mercury, nitrate/nitrite, alkalinity, chloride, dissolved methane, sulfate, sul

Other Observations / Equipment Operation Problems: Well recharged slowly during sampling
pause ~~sampling~~ purging @ 1620 - equipment issue

Sampler Signature: [signature] Date: 10/17/19
QA/QC Signature: [signature] Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10/15/19, 10/16/19
Weather: Sunny 70s°F, rain, 50

Project Name: Culpeper LF
Project No./Task No.: 19115362
Event: 25A19 GW
Sampler(s): N. Chien / M. Taylor
Well ID: PZ-4E
Field Calibration Completed: 0750 on 10/15/19, 0800 on 10/16/19
Well Diameter: 2.0 inches
Initial Depth to Water: 22.78' feet
Depth to Bottom: 31.14 feet
Water Column Thickness: 8.36 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI PRO S/N 17M10288, 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/15/19	1630	6.47	71.3	23.51	3.77	14.3	130.0	0
10/15/19	1634	5.98	50.9	121.54	4.99	14.2	153.7	1.36
10/15/19	1638	5.79	58.7	215.71	5.17	14.2	162.0	2.72
10/15/19	1644	5.34	61.1	161.37	3.07	13.9	197.8	4.09
10/16/19	1445	—	sampled	—	—	—	—	—
10/16/19	1457	6.29	62.2	27.7	5.68	14.1	161.2	~4.09

Calculated Well Vol. (Gallons): (8.36)(0.163) = 1.36
Total Calculated Purge Volume (Gallons): 4.09
Purge Water Management: on-site containment
Purge Observations (product observed, color, odor, turbidity, sheen): Clear grab sample w/ some small suspended particles

Sample Date/Time: 10/16/19 @ 1445
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B Detects
- [x] Other: Mercury, Nitrate/nitrite, Alkalinity, Chloride, Dissolved methane, sulfate, sulfide

Other Observations / Equipment Operation Problems:

Sampler Signature: Moira Taylor
Date: 10/16/19
Page 1 of 1

QA/QC Signature:
Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10/17/19
Weather: sun, 60s

Project Name: Laurel Valley LF
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor
Well ID: CLF-53
Field Calibration Completed: 0940 10/17/19
Well Diameter: 2.0 inches
Initial Depth to Water: 23.89 feet
Depth to Bottom: 88.96 feet
Water Column Thickness: 65.07 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 15J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/17/19	1258	7.84	305.3	68.1	5.54	13.0	81.9	0
10/17/19	1326	7.65	265.8	10.2	6.01	13.2	93.4	~10.75
10/17/19	1355	7.82	170.8	4.8	6.11	13.1	92.8	~21
10/17/19	1418	7.53	161.2	1.9	4.29	13.2	97.6	~32
10/17/19	1425		SAMPLED					
10/17/19	1431	6.86	163.6	4.2	6.12	13.3	110.9	~32

Calculated Well Vol. (Gallons): (65.07)(0.163) = 10.60 Total Calculated Purge Volume (Gallons): 31.82
Purge Water Management: onsite leachate containment system
Purge Observations (product observed, color, odor, turbidity, sheen): clear purge, clear grab

Sample Date/Time: 10/17/19 @ 1425
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Mercury, Nitrate/nitrite, alkalinity, chloride, dissolved meth sulfate, sulfide

Other Observations / Equipment Operation Problems:

Sampler Signature: M Taylor Date: 10/17/19 Page 1 of 1
QA/QC Signature: Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10-15-19

Weather: Sun, 70s

Project Name: Laurel Valley

Project No./Task No.: 19115362

Event: 2SA19 GW

Sampler(s): M. Taylor

Well ID: MW-X2D

Field Calibration Completed: 0750 10/15/19

Well Diameter: 2.0 inches

Initial Depth to Water: 58.17 feet

Depth to Bottom: 67.05 feet

Water Column Thickness: 8.88 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 15S103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1602	6.92	4961	9.0	10.33	14.3	76.0	0
10-15-19	1610	7.26	4983	126.2	9.35	14.3	81.3	1.5
10-15-19	1620	7.39	4890	112.3	9.73	14.3	94.7	3.0
10-15-19	1623	—	well dry @ ~3.25 gal.					
10/16/19	1337	—	SAMPLED					
10/16/19	1346	6.97	4878	110.7	8.89	13.8	110.8	

Calculated Well Vol. (Gallons): 1.44 (x3 = 4.34) Total Calculated Purge Volume (Gallons): 4.34

Purge Water Management: onsite leachate containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10-15-19 / 1337

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B defects
- [x] Other mercury

Other Observations / Equipment Operation Problems:

Sampler Signature: M Taylor Date: 10/16/19

Page 1 of 1

QA/QC Signature: Date: 10/16/19

GOLDER

FIELD SAMPLING LOG

Date: P/16/19, 10/17/19

Weather: Raining ~50°F, sun, 60s

Project Name: Culpeper LF

Project No./Task No.: 19116 NC 19115362

Event: 2SA19 GW

Sampler(s): N. Chien, M. Taylor

Well ID: CLF-S1

Field Calibration Completed: 0800 on 10-16-19, 0940 10/17/19

Well Diameter: 2.0 inches

Initial Depth to Water: 59.65 feet

Depth to Bottom: 103.69 feet

Water Column Thickness: 50.04 feet

Equipment Used:
- [x] WL Indicator S/N 17M102881
- [x] YSI PSS S/N 18J103602
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/16/19	1035	6.84	51.8	54.50	5.04	14.3	186.7	0
10/16/19	1110	6.66	182.9	134.68	6.94	13.8	134.2	~8
10/16/19	1203	7.01	296	155.57	6.09	13.6	101.7	~16
10/16/19	1240	7.13	510	62.57	7.47	13.3	188.1	~25
10/17/19	1200		sampled					
10/17/19	1207	7.54	484.1	37.8	8.02	13.4	109.8	~25

Calculated Well Vol. (Gallons): (50.04)(0.163) = 8.16 Total Calculated Purge Volume (Gallons): 24.47

Purge Water Management: onsite containment for leachate

Purge Observations (product observed, color, odor, turbidity, sheen): clear purge, clear grab sample

Sample Date/Time: 10/17/19 @ 1200

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Mercury

Other Observations / Equipment Operation Problems:

Sampler Signature: Moira Jazen Date: 10/17/19 Page 1 of 1

QA/QC Signature: Date: 10/18/19

GOLDER FIELD SAMPLING LOG

Date: 10-15-19, 10/16/19
Weather: sun, 60s, rain, 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor / N. Chien
Well ID: MW-20
Field Calibration Completed: 0750 on 10-15-19, 0800 10/16/19
Well Diameter: 2.0 inches
Initial Depth to Water: 34.09 feet
Depth to Bottom: 55.83 feet
Water Column Thickness: 21.74 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 15310360 2, 19M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1030	8.10	58.9	48.8	9.64	12.8	118.9	0
10-15-19	1047	5.63	42.4	30.0	9.59	12.7	192.7	3.5
10-15-19	1050	well dry at 3.75 gal						
10/16/19	0935			SAMPLED				
10/16/19	0945	4.95	74.6	4.46	8.07	13.1	186.9	

Calculated Well Vol. (Gallons): (21.74')(0.163 gal/ft) = ~3.5 gal
Total Calculated Purge Volume (Gallons): ~~3.75~~ 3.5
Purge Water Management: onsite polytank
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

purge start: 1030 ~~tank~~ MT on 10-15-19

Sample Date/Time: 10/16/19 / 0935
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [x] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other: nitrate/nitrite, alkalinity, chloride, dissolved methane, sulfate, sulfide, mercury, cobalt, arsenic

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/16/19 Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10/14/19
Weather: Sunny 60s °F

Project Name: Culpeper LF
Project No./Task No.: 19115362
Event: 2SA19
Sampler(s): N. Chien
Well ID: MW-18
Field Calibration Completed: 0950 on 10/14/19, 0750 on 10/15/19
Well Diameter: 2.0 inches
Initial Depth to Water: 6.94 feet
Depth to Bottom: 27.16 [soft] feet
Water Column Thickness: 20.62 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/14/19	1230	4.97	630	15.64	2.45	14.7	110.4	—
10/14/19	1235	4.86	634	8.04	5.41	14.6	93.9	3.4
10/14/19	1244	4.79	630	11.92	4.02	14.1	94.0	6.8
10/14/19	1256	4.87	607	13.97	4.24	14.5	86.5	10.2
10/15/19	1315	—	—	SAMPLED	—	—	—	—
10/15/19	1338	5.96	709	12.63	3.27	16.1	84.8	—

Calculated Well Vol. (Gallons): 3.4
Total Calculated Purge Volume (Gallons): (20.62)(0.163) = 3.4
Purge Water Management: on-site containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 1315 / 10/15/19
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B Detects
- [x] Other Cobalt, Arsenic, Sulfide, Mercury, Tin

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/15/19 Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10-14-19
Weather: sun, 70s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): M. Taylor / N. Chien
Well ID: MW-28
Field Calibration Completed: 0950 on 10/14/19
Well Diameter: 2.0 inches
Initial Depth to Water: 19.99 feet
Depth to Bottom: 25.78 (hard) feet
Water Column Thickness: 5.79 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS S/N 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/14/19	1537	7.35	1765	27.00	2.40	17.7	128.9	0
10/14/19	1540	6.60	1683	21.50	2.96	16.1	98.2	0.94
10/14/19	1542	6.14	1640	86.77	4.80	15.6	87.3	1.88
10/14/19	1545	5.63	1638	78.76	3.32	15.7	85.22	2.82
10/15/19	1230	—				SAMPLED		
10/15/19	1244	6.52	880	34.19	5.77	16.6	121.7	—

Calculated Well Vol. (Gallons): (5.79)(0.163) = 0.94 Total Calculated Purge Volume (Gallons): 2.82
Purge Water Management: on-site containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10/15/19 / 1230 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other Cobalt, Arsenic, Sulfide, Mercury, Tin

Other Observations / Equipment Operation Problems:

Sampler Signature: Moira Taylor Date: 10-15-19 Page 1 of 1
QA/QC Signature: Date: 10-18-19

GOLDER

FIELD SAMPLING LOG

Date: 10/15/19, 10/16/19, 10-17-19
Weather: Sunny 60s °F, rain 50s, sun, 60s

Project Name: Culpeper LF
Project No./Task No.: 19115362
Event: 2SA19 GW
Sampler(s): N. Chien / M. Taylor
Well ID: MW-3A
Field Calibration Completed: 0750 on 10/15/19, 0800 10/16/19, 0940 10/17/19
Well Diameter: 2.0 inches
Initial Depth to Water: 13.22 (10/15/19) feet
Depth to Bottom: 16.49 feet
Water Column Thickness: 3.27 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS S/N 17M103881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/15/19	1146	7.89	449.3	81.32	2.54	17.1	141.1	—
10/15/19	1148	—	DRY	—	—	—	—	~0.2
10/16/19	1330	—	sample	—	—	—	—	—
10/16/19	1334	—	well	dry	—	—	—	—
10/16/19	1543	—	resume	sampling	—	—	—	—
10/16/19	1548	—	well	dry	—	—	—	—
10/17/19	1110	—	resume	sampling	—	—	—	—
10/17/19	1113	—	well	dry*	—	—	—	—

Calculated Well Vol. (Gallons): (3.27)(0.163) = 0.53 Total Calculated Purge Volume (Gallons): ~1.6

Purge Water Management: onsite leachate containment

Purge Observations (product observed, color, odor, turbidity, sheen): purge water light tan, sample was clear to light tan grab

Sample Date/Time: 10/16/19 1330 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [x] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B dekats
- [ ] Other

Other Observations / Equipment Operation Problems: * well went dry after finished full sample kit, could not take post-sample water quality reading

Sampler Signature: M. Taylor Date: 10-17-19 Page 1 of 1

QA/QC Signature: [signature] Date: 10-18-19

GOLDER

FIELD SAMPLING LOG

Date: 10/14/19

Weather: Sunny 60s °F

Project Name: Culpeper LF

Project No./Task No.: ~~19116362~~ NC 19115362

Event: 2SA19

Sampler(s): N.Chien

Well ID: MW-4

Field Calibration Completed: 0950 on 10/14/19

Well Diameter: 2.0 inches

Initial Depth to Water: 34.78 feet

Depth to Bottom: 45.89 (hard) feet

Water Column Thickness: 11.11 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS S/N 17M102888
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/14/19	1416	5.68	204.0	162.17	3.03	15.7	112.2	—
10/14/19	1422	6.32	204.6	74.30	1.48	15.3	102.9	1.81
10/14/19	1428	6.64	221.8	108.02	5.23	15.1	79.2	3.62
10/14/19	1434	6.76	231.5	70.57	5.70	15.3	80.7	5.43
10/15/19	1455	—	SAMPLED					
10/15/19	1505	6.00	227.4	33.52	3.55	15.2	91.5	—

Calculated Well Vol. (Gallons): (11.11)(0.163) = 1.81 Total Calculated Purge Volume (Gallons): 5.43

Purge Water Management: on-site containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grabsample

Sample Date/Time: 10-15-19 / 1455 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [x] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B petects
- [x] Other sulfide, mercury, tin

Other Observations / Equipment Operation Problems:

Sampler Signature: Date: 10-15-19 Page 1 of 1

QA/QC Signature: Date: ~~10-17-19~~ MT 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10-15-19, 10/16/19

Weather: sun, 60s, rain, 50s

Project Name: Laurel Valley

Project No./Task No.: 19115362

Event: 2SA19 GW

Sampler(s): M. Taylor / N. Chien

Well ID: MW-20

Field Calibration Completed: 0750 on 10-15-19, 0800 10/16/19

Well Diameter: 2.0 inches

Initial Depth to Water: 34.09 feet

Depth to Bottom: 55.83 feet

Water Column Thickness: 21.74 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 15S103602, 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-15-19	1030	8.10	58.9	48.8	9.64	12.8	118.9	0
10-15-19	1047	5.63	42.4	30.0	9.59	12.7	192.7	3.5
10-15-19	1050	well dry at 3.75 gal						
10/16/19	0935	SAMPLED						
10/16/19	0945	4.95	74.6	4.46	8.07	13.1	186.9	—

Calculated Well Vol. (Gallons): (21.74')(0.163 gal/ft) = ~3.5 gal

Total Calculated Purge Volume (Gallons): ~~3.75 MT~~ 3.5

Purge Water Management: onsite polytank

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

purge start: 1030 ~~to~~ MT on 10-15-19

Sample Date/Time: 10/16/19 / 0935

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [x] VSWMR Table 3.1 Column A Metals
- [x] VSWMR Table 3.1 Column B detects
- [x] Other nitrate/nitrite, alkalinity, chloride, dissolved methane, sulfate, sulfide, mercury, cobalt, arsenic

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 10/16/19 Page 1 of 1

QA/QC Signature: [signature] Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 10/15/19

Weather: Sunny 70°F

Project Name: Culpeper LF

Project No./Task No.: 19115362

Event: 2SA19

Sampler(s): N. Chien

Well ID: Field Blank

Field Calibration Completed: —

Well Diameter: — inches

Initial Depth to Water: — feet

Depth to Bottom: — feet

Water Column Thickness: — feet

Equipment Used: ☐ WL Indicator ☐ YSI_____ ☐ In Situ Troll 9500 ☐ Turbidity Meter ☐ Peristaltic Pump ☐ MP-10 Controller Box ☐ Air Tank ☐ Compressor ☐ MP-15 Controller Box ☐ Disposable Bailer ☐ Non-dedicated BP ☐ Other_____

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/15/19	1443	—	SAMPLED		—			

Calculated Well Vol. (Gallons): — Total Calculated Purge Volume (Gallons): —

Purge Water Management: —

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample taken near MW-4

Sample Date/Time: 1443 / 10/15/19 Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):

☒ VSWMR Table 3.1 Column A VOCs ☐ VSWMR Table 3.1 Column A Metals

☒ VSWMR Table 3.1 Column B Detects Cobalt, Arsenic, Sulfide, Mercury, Tin

☒ Other

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/15/19 Page 1 of 1

QA/QC Signature: M Jaylen Date: 10/18/19

GOLDER

FIELD SAMPLING LOG

Date: 11/21/2019
Weather: Sunny 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: Resample
Sampler(s): J. England
Well ID: MW-1B
Field Calibration Completed: 11/21/19 @ 1020
Well Diameter: 2.0 inches
Initial Depth to Water: ~~4.80~~ 4.79 feet 4.75 on 11/22/19
Depth to Bottom: 27.08 feet
Water Column Thickness: 22.29 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro Plus 17H02888 & 19H101420
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] ~~Disposable Bailer~~
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
11/21/19	1225	5.74	597	23.1	2.70	14.3	235.1	3.63
↓	1231	5.75	594	20.6	1.94	14.1	225.8	7.25
↓	1238	5.75	586	21.8	1.99	14.2	218.1	11.00
11/22/19	1029	5.35	489.6	5.80	2.52	13.8	202.7	~~4.75~~
11/22/19	1030	SAMPLED						

Calculated Well Vol. (Gallons): 3.63
Total Calculated Purge Volume (Gallons): 11.00
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample taken with disposal bailer 11/22/19

Sample Date/Time: 11/22/19 @ 1030
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Total Cd

Other Observations / Equipment Operation Problems: DTB = 27.08 - DTW = 4.79 = 22.29 X 0.163 = 3.63 X 3 = 10.90

Sampler Signature: John England Date: 11/22/19 Page 1 of 1

QA/QC Signature: Date: 11/22/19

MICROPURGE SAMPLING LOG

GOLDER

Date: 11/21/19
Weather: Sunny 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: Resample
Sampler(s): J. England
Well ID: P2-46
Field Calibration Completed: 11/21/19 @ 1020
Well Diameter: 2.0 inches
Initial Depth to Water: 23.29 feet 23.17 on 11/22/19
Depth to Bottom: 31.13 feet
Water Column Thickness: 7.84 feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI ProDss 17M102880 & 19K101429
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ —
- [ ] MP-10 Controller Box
- [ ] MP-15 Controller Box
- [ ] —

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	~~DTW (feet)~~	~~Flow Rate~~ Gallons ~~(mL/min)~~
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	~~<0.3 feet~~	~~<500~~
11/21/19								
1150	5.19	61.4	90.1	3.00	14.1	189.8	—	1.30
1155	5.18	57.7	110.9	2.99	13.9	204.9	—	2.60
1200	5.21	59.2	113.0	3.10	13.9	210.8	—	3.90
11/22/19 1043	5.32	53.5	78.4	2.24	14.2	273.3	—	—
1045	—	—	—	SAMPLE	—	—	—	—

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): 3.90
Purge Water Management: on site containment
Purge Observations (color, odor, turbidity, sheen): Clear grab sample

Sample Time: 11/22/19 @ 1045
Field Filtered (0.45um): [ ] Yes [ ] No
Sample Parameters/Analyte(s):
- [ ] CCR Appendix III
- [ ] CCR Appendix IV
- [ ] WWTP VPDES (D.Cr, D.Mn, SO4, TDS, TOC)
- [ ] Sludge VSWMR (D.CRVI, Cu, Fe, Mn, Ni, Ag, Na, Sn, Va, Zn, CN-, H2S, ALK, TOC, Hard)
- [ ] Stage I&II, and III VSWMR (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Ni, Se, Ag, Tl, Va, Zn)
- [x] Other: Total Hg

Other Observations / Equipment Operation Problems: DTB = 31.13 - DTW = 23.29 = 7.84 X 0.163 = 1.28
1.28 X 3 = 3.83 Gal

Sampler Signature: [signature] Date: 11/22/19
QA/QC Signature: [signature] Date: 11/22/19

GOLDER

MICROPURGE SAMPLING LOG

Date: 11/22/19
Weather: Rain 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: Resample
Sampler(s): J.England/M.Antal
Well ID: Field Blank
Field Calibration Completed: —
Well Diameter: — inches
Initial Depth to Water: — feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- ☐ WL Indicator
- ☐ Turbidity Meter
- ☐ Air Tank
- ☐ Dedicated Bladder Pump
- ☐ YSI —
- ☐ Peristaltic Pump
- ☐ Compressor
- ☐ Non-dedicated BP
- ☐ In-Situ —
- ☐ MP-10 Controller Box
- ☐ MP-15 Controller Box
- ☐ —

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1145	SAMPLED	—	—	—	—	—	—	—

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): —
Purge Water Management: —
Purge Observations (color, odor, turbidity, sheen): Clear grab Sample taken Near PZ-4E

Sample Time: 1145
Field Filtered (0.45um): ☐ Yes ☐ No

Sample Parameters/Analyte(s):
- ☐ CCR Appendix III
- ☐ CCR Appendix IV
- ☐ WWTP VPDES (D.Cr, D.Mn, SO4, TDS, TOC)
- ☐ Sludge VSWMR (D.CRVI, Cu, Fe, Mn, Ni, Ag, Na, Sn, Va, Zn, CN-, H2S, ALK, TOC, Hard)
- ☐ Stage I&II, and III VSWMR (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Ni, Se, Ag, Tl, Va, Zn)
- ☒ Other: Total Cd, Hg

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 11/22/19
QA/QC Signature: Date: 11/22/19

GOLDER

FIELD SAMPLING LOG

Date: 11/21/2019
Weather: Sunny 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: Resample
Sampler(s): J. England
Well ID: MW-1B
Field Calibration Completed: 11/21/19 @ 1020
Well Diameter: 2.0 inches
Initial Depth to Water: ~~4.80~~ 4.79 feet 4.75 on 11/22/19
Depth to Bottom: 27.08 feet
Water Column Thickness: 22.29 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro Plus 17H02888 & 19H101420
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] ~~Disposable Bailer~~
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
11/21/19	1225	5.74	597	23.1	2.70	14.3	235.1	3.63
↓	1231	5.75	594	20.6	1.94	14.1	225.8	7.25
↓	1238	5.75	586	21.8	1.99	14.2	218.1	11.00
11/22/19	1029	5.35	489.6	5.80	2.52	13.8	202.7	~~4.75~~
11/22/19	1030	SAMPLED						

Calculated Well Vol. (Gallons): 3.63
Total Calculated Purge Volume (Gallons): 11.00
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample taken with disposal bailer 11/22/19

Sample Date/Time: 11/22/19 @ 1030
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Total Cd

Other Observations / Equipment Operation Problems: DTB = 27.08 - DTW = 4.79 = 22.29 X 0.163 = 3.63 X 3 = 10.90

Sampler Signature: John England Date: 11/22/19 Page 1 of 1

QA/QC Signature: Date: 11/22/19

MICROPURGE SAMPLING LOG

GOLDER

Date: 11/21/19
Weather: Sunny 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: Resample
Sampler(s): J. England
Well ID: P2-46
Field Calibration Completed: 11/21/19 @ 1020
Well Diameter: 2.0 inches
Initial Depth to Water: 23.29 feet 23.17 on 11/22/19
Depth to Bottom: 31.13 feet
Water Column Thickness: 7.84 feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI ProDss 17M102880 & 19K101429
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ —
- [ ] MP-10 Controller Box
- [ ] MP-15 Controller Box
- [ ] —

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	~~DTW (feet)~~	~~Flow Rate~~ Gallons ~~(mL/min)~~
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	~~<0.3 feet~~	~~<500~~
11/21/19								
1150	5.19	61.4	90.1	3.00	14.1	189.8	—	1.30
1155	5.18	57.7	110.9	2.99	13.9	204.9	—	2.60
1200	5.21	59.2	113.0	3.10	13.9	210.8	—	3.90
11/22/19 1043	5.32	53.5	78.4	2.24	14.2	273.3	—	—
1045	—	—	—	SAMPLE	—	—	—	—

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): 3.90
Purge Water Management: on site containment
Purge Observations (color, odor, turbidity, sheen): Clear grab sample

Sample Time: 11/22/19 @ 1045
Field Filtered (0.45um): [ ] Yes [ ] No
Sample Parameters/Analyte(s):
- [ ] CCR Appendix III
- [ ] CCR Appendix IV
- [ ] WWTP VPDES (D.Cr, D.Mn, SO4, TDS, TOC)
- [ ] Sludge VSWMR (D.CRVI, Cu, Fe, Mn, Ni, Ag, Na, Sn, Va, Zn, CN-, H2S, ALK, TOC, Hard)
- [ ] Stage I&II, and III VSWMR (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Ni, Se, Ag, Tl, Va, Zn)
- [x] Other: Total Hg

Other Observations / Equipment Operation Problems: DTB = 31.13 - DTW = 23.29 = 7.84 X 0.163 = 1.28
1.28 X 3 = 3.83 Gal

Sampler Signature: [signature] Date: 11/22/19
QA/QC Signature: [signature] Date: 11/22/19

GOLDER

MICROPURGE SAMPLING LOG

Date: 11/22/19
Weather: Rain 50s

Project Name: Laurel Valley
Project No./Task No.: 19115362
Event: Resample
Sampler(s): J.England/M.Antal
Well ID: Field Blank
Field Calibration Completed: —
Well Diameter: — inches
Initial Depth to Water: — feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- ☐ WL Indicator
- ☐ Turbidity Meter
- ☐ Air Tank
- ☐ Dedicated Bladder Pump
- ☐ YSI —
- ☐ Peristaltic Pump
- ☐ Compressor
- ☐ Non-dedicated BP
- ☐ In-Situ —
- ☐ MP-10 Controller Box
- ☐ MP-15 Controller Box
- ☐ —

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1145	SAMPLED	—	—	—	—	—	—	—

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): —
Purge Water Management: —
Purge Observations (color, odor, turbidity, sheen): Clear grab Sample taken Near PZ-4E

Sample Time: 1145
Field Filtered (0.45um): ☐ Yes ☐ No

Sample Parameters/Analyte(s):
- ☐ CCR Appendix III
- ☐ CCR Appendix IV
- ☐ WWTP VPDES (D.Cr, D.Mn, SO4, TDS, TOC)
- ☐ Sludge VSWMR (D.CRVI, Cu, Fe, Mn, Ni, Ag, Na, Sn, Va, Zn, CN-, H2S, ALK, TOC, Hard)
- ☐ Stage I&II, and III VSWMR (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Ni, Se, Ag, Tl, Va, Zn)
- ☒ Other: Total Cd, Hg

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 11/22/19
QA/QC Signature: Date: 11/22/19

GOLDER

FIELD SAMPLING LOG

Date: 5-18-2020
Weather: overcast, 50s

Project Name: Laurel Valley LF
Project No./Task No.: 19115362
Event: 1SA20 Resample
Sampler(s): M. Taylor
Well ID: MW-20
Field Calibration Completed: 1105 on 5-18-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 32.31 feet
Depth to Bottom: 54.64 feet
Water Column Thickness: 22.33 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 17M102880
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
5-18-2020	1200	7.93	170.2	3.8	7.61	13.8	233.4	0
5-18-2020	1217	6.65	49.1	17.1	7.73	13.3	201.4	3.63
5-18-2020	1221	—	dry	—	—	—	—	~3.8
5-18-2020	1244	4.94	40.9	5.4	8.61	13.5	246.8	—
5-18-2020	1245	—	sampled	—	—	—	—	—
5-18-2020	1248	4.65	39.6	4.9	7.82	13.3	258.2	—

Calculated Well Vol. (Gallons): (22.33')(0.163 gal/ft) = 3.63 gallons
Total Calculated Purge Volume (Gallons): 10.92
Purge Water Management: onsite containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear purge water, clear grab sample

Sample Date/Time: 5-18-2020 / 1245
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: gamma-Chlordane (8081)

Other Observations / Equipment Operation Problems:
WL @ 1244 5-18-2020: 47.80'

Sampler Signature: M. Taylor
Date: 5-18-2020
Page 1 of 1

QA/QC Signature:
Date: 05-19-2020

GOLDER FIELD SAMPLING LOG

Date: 10/19/2020 / 10-20-2020
Weather: sun, 70s / sun, 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.100/~~200~~ MT
Event: 2SA20 Comp./~~EAP~~ MT GW
Sampler(s): M. Taylor
Well ID: MW-1B
Field Calibration Completed: 1100 10/19/2020, 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 4.33 feet
Depth to Bottom: 27.11 feet
Water Column Thickness: 22.78 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1238	5.54	612	11.94	2.79	13.6	115.8	0
10-19-2020	1245	5.78	641	12.85	3.85	12.7	100.3	~3.75
10-19-2020	1253	5.59	635	9.12	3.26	12.4	108.8	47.5
10-19-2020	1301	5.58	629	7.34	3.14	12.5	113.4	~~10.75~~ MT ~11.25
10-20-2020	1049	5.84	286.9	6.80	6.75	14.7	141.2	—
10-20-2020	1050	—	SAMPLED	—	—	—	—	—
10-20-2020	~~to~~ MT 1105	6.38	585	9.60	8.64	14.7	107.7	—

Calculated Well Vol. (Gallons): (22.78)(0.163) = 3.71 Total Calculated Purge Volume (Gallons): 11.13
Purge Water Management: onsite containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample
DTW 10-20-2020 @ 1046 : 4.60 feet

Sample Date/Time: 10-20-2020 @ 1050
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [X] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other ~~See Sample Menu date October 8, 2020~~ MT diethyl phthalate, endosulfan sulfate, gamma chlordan, Isobutyl alcohol

Other Observations / Equipment Operation Problems: dichlorodifluoromethane, naphthalene, sulfide, mercury, tin, bis(2-ethylhexyl)phthalate, 2,4,5-trichlorophenoxyacetic acid, 4-aminobiphenyl, dibenz(a,h)anthracene, di-n-butyl phthalate, Indeno(1,2,3-cd)pyrene

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10/19/2020 / 10-20-2020
Weather: sun, 70s / sun, 70s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.100
Event: 2SH20 Comp. GW
Sampler(s): M. Taylor
Well ID: MW-28
Field Calibration Completed: 1100 10-19-2020 / 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 18.89 feet
Depth to Bottom: 25.28 feet
Water Column Thickness: 6.39 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI ProDSS (17M102881)
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1409	6.24	1856	12.84	3.68	15.0	31.2	0
10-19-2020	1414	6.08	1736	14.28	2.51	14.7	30.6	~1.25
10-19-2020	1417	6.16	1756	49.31	4.44	14.3	27.3	~2.5
10-19-2020	1421	6.13	1757	111.02	3.49	13.8	32.4	~3.75
10-20-2020	1143	6.18	1694	3.36	3.61	14.2	36.0	—
10-20-2020	1145	—	sampled	—	—	—	—	—
10-20-2020	1158	6.04	1610	16.02	3.03	15.0	39.9	—

Calculated Well Vol. (Gallons): (6.39)(0.163) = 1.04 Total Calculated Purge Volume (Gallons): 3.12

Purge Water Management: Onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

DTW 10-20-2020 @ 1140 = 19.20 feet

Sample Date/Time: 10-20-2020 / 1145 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [X] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other See MW-18 purge log for Compliance analytes

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10/19/2020 / 10-20-2020
Weather: sun, 70s / sun, 70s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.100
Event: 2SA20 Comp. GW
Sampler(s): M. Taylor
Well ID: MW-3A
Field Calibration Completed: 1100 10/19/2020 / 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 8.88 feet
Depth to Bottom: 16.49 feet
Water Column Thickness: 7.61 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1438	7.18	218.4	36.42	8.16	15.3	21.3	0
10-19-2020	1442	6.16	190.6	31.00	8.21	14.8	117.0	~1.25
10-19-2020	1436	—	dry, let recharge	—	—	—	—	~2
10-20-2020	1240	6.26	286.0	32.48	8.76	16.7	50.0	—
10-20-2020	1245	—	SAMPLED	—	—	—	—	—
10-20-2020	1259	5.77	168.2	6.21	7.51	15.7	172.1	—

Calculated Well Vol. (Gallons): (7.61)(0.163) = 1.24 Total Calculated Purge Volume (Gallons): total purge ~2

Purge Water Management: Onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

DTW 10-20-2020 at 1236: 8.96'

Sample Date/Time: 10-20-2020 / 1245 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] VSWMR Table 3.1 Column A VOCs
- [x] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other see MW-1B purge log for compliance analytes

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10-19-2020 / 10-20-2020
Weather: sun, 70s , sun, 70s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.100
Event: 2SA20 Comp. GW
Sampler(s): M. Taylor
Well ID: MW-4
Field Calibration Completed: 1100 10-19-2020 / 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 38.02 feet
Depth to Bottom: 44.70 feet
Water Column Thickness: 6.68 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 19M1028881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1632	5.98	301.7	6.67	5.36	12.8	34.7	0
10-19-2020	1639	6.10	301.4	69.81	6.61	12.7	39.4	~1.25
10-19-2020	1645	5.84	317.4	344.98	5.42	12.7	47.9	~2.5
10-19-2020	1648	—	dry, left recharge	—	—	—	—	~2.75
10-20-2020	1348	5.71	209.3	70.28	2.20	14.9	56.8	—
10-20-2020	1400	—	Sampled	—	—	—	—	—
10-20-2020	1422	5.64	230.1	55.24	2.65	14.5	98.2	—

Calculated Well Vol. (Gallons): (6.68)(0.163) = 1.088 Total Calculated Purge Volume (Gallons): ~3.0

Purge Water Management: onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): gray, turbid grab sample. micaceous

DTW 1357 10-20-2020: 38.41'

Sample Date/Time: 10-20-2020 / 1400 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [X] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other see MW-1B purge log for compliance analytes

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER FIELD SAMPLING LOG

Date: 10-20-2020 / 10-21-2020
Weather: sun, 60s, sun, 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.100/200
Event: 2SA20 Comp./ CAP GW
Sampler(s): M. Taylor
Well ID: MW-20
Field Calibration Completed: 0745 10-20-2020 / 0800 10-21-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 34.97' feet
Depth to Bottom: 54.64 feet
Water Column Thickness: 19.67 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-20-2020	0918	6.60	152.7	3.24	9.18	11.4	193.5	0
10-20-2020	0930	6.15	69.1	12.28	8.50	11.3	176.9	~3.25
10-20-2020	0933	dry, let recharge						~3.5
10-21-2020	0852	5.82	138.8	4.10	8.74	11.0	208.2	—
10-21-2020	0855	sampled						
10-21-2020	0907	5.12	75.5	9.81	8.77	11.2	231.1	—

Calculated Well Vol. (Gallons): (19.67)(0.163) ~3.2 Total Calculated Purge Volume (Gallons): 4.0
Purge Water Management: onsite containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample
DTW 10-21-2020 0850: 35.03'

Sample Date/Time: 10-21-2020 / 0855
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] VSWMR Table 3.1 Column A VOCs
- [X] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other nitrate/nitrite, alkalinity, chloride, methane, sulfate, sulfide, see MW-1B purge log for compliance analytes

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-21-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10/19/2020 / 10-20-2020
Weather: sun, 70s / sun, 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA20 CAP GW
Sampler(s): M. Taylor
Well ID: MW-1C
Field Calibration Completed: 1100 10/19/2020, 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 13.85 feet
Depth to Bottom: 45.15 feet
Water Column Thickness: 31.30 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1315	6.34	740	7.06	7.23	13.5	85.1	0
10-19-2020	1327	6.11	835	19.22	5.99	12.7	100.8	~5.25
10-19-2020	1337	6.36	881	16.45	7.86	12.7	91.2	~10.5
10-19-2020	1347	5.86	879	11.43	3.93	14.0	96.5	~15.75
10-20-2020	1118	5.77	787	4.68	2.79	15.1	112.0	~
10-20-2020	1120		Sampled					
10-20-2020	1122	5.77	786	3.85	2.67	14.7	113.5	~

Calculated Well Vol. (Gallons): (31.30)(0.163) = 5.10 Total Calculated Purge Volume (Gallons): 15.3
Purge Water Management: onsite containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample
DTW 10-20-2020 @ 1117 : 13.92 feet

Sample Date/Time: 10/20/2020 @1120 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other cobalt, 1,1-dichloroethane, trichloroethene, vinyl chloride

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER FIELD SAMPLING LOG

Date: 10/19/2020, 10-20-2020
Weather: Sunny 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.209
Event: 2SA2020 GW - CAP
Sampler(s): J. England
Well ID: MW-1D
Field Calibration Completed: 10/19/2020 @ 1100, 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 15.82 feet
Depth to Bottom: 57.10 feet
Water Column Thickness: 41.28 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI S/N: 19E104764
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Grundfos Pump Controller Box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/19/2020	1640	6.26	889	114.05	1.09	13.8	48.1	1
↓	1648	5.98	617	36.76	1.15	14.1	66.8	7
↓	1656	5.97	622	25.89	1.21	14.2	99.3	14
↓	1704	6.00	624	17.01	1.09	14.1	104.7	21
10/20/2020	1015	6.09	564	13.52	5.29	15.8	99.1	21.5
↓	1020							22.0
↓	1025	5.85	586	8.64	1.59	14.6	113.8	22.5

Calculated Well Vol. (Gallons): 6.73
Total Calculated Purge Volume (Gallons): 22.5
Purge Water Management: On Site Containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge time: 1639
Clear grab Sample
Sample Date/Time: 10/20/2020 @ 1020
Field Filtered (0.45um): ☐ Yes ☐ No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Cobalt, 1,1 dichloroethane, Trichloroethene, Vinyl chloride

Other Observations / Equipment Operation Problems:
57.10 - 15.82 = 41.28 x 0.163 = 6.73

Sampler Signature: John England Date: 10/20/2020 Page 1 of 1
QA/QC Signature: M Gayle Date: 10-23-2020

GOLDER

FIELD SAMPLING LOG

Date: 10/19/2020, 10-20-2020
Weather: Sunny 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA 2020 GW - CAP
Sampler(s): J. England
Well ID: MW-1E
Field Calibration Completed: 10/19/2020 @ 1100, 0745 10-20-20
Well Diameter: 2.0 inches
Initial Depth to Water: 18.32 feet
Depth to Bottom: 104.85 feet
Water Column Thickness: 86.53 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 19E104484
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Grundfos Pump, control box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/19/2020	1537	6.39	796	109.60	0.99	14.7	22.4	1
↓	1550	6.40	712	138.24	1.02	14.6	26.6	14.10
	1605	6.33	685	74.27	1.31	14.6	44.2	28.50
	1627	6.26	682	97.63	1.11	15.0	50.8	42.50
10/20/2020	1000	6.50	650	10.73	4.38	16.4	31.2	43.00
↓	1005	— SAMPLED						43.50
	1010	6.22	643	10.01	1.41	14.5	72.4	44.00

Calculated Well Vol. (Gallons): 14.10
Total Calculated Purge Volume (Gallons): 44.0
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge time 1535
104.85 - 18.32 = 86.53 × 0.163 = 14.10
Sample Date/Time: 10/20/2020 @ 1005
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Cobalt, 1-1 dichloroethane, Tichloroethane, Vinyl Chloride

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 10/20/2020 Page 1 of 1
QA/QC Signature: M. Joseph Date: 10-23-2020

GOLDER FIELD SAMPLING LOG

Date: 10/20/2020, 10-21-2020
Weather: Sunny 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA2020 GW-CAP
Sampler(s): J. England
Well ID: MW-1P
Field Calibration Completed: 10/20/2020 @ 0745, 0800 10-21-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 16.78 feet
Depth to Bottom: 215.30 feet
Water Column Thickness: 198.52 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI 19E104904 Pro DSS
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Geotech Pump, controller box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10/20/2020	1045	6.54	557	3.60	3.99	14.2	45.5	1
↓	1100	6.30	608	1.59	1.80	14.4	35.9	33
↓	1123	6.33	605	0.93	1.42	14.6	25.7	66
↓	1150	6.33	605	4.03	1.67	16.1	28.9	99
10/21/2020	0825	6.42	551	10.47	2.84	12.9	133.4	99.5
↓	0830	- SAMPLED -						100.0
↓	0835	6.60	526	12.60	4.00	13.1	135.8	100.5

Calculated Well Vol. (Gallons): 32.36
Total Calculated Purge Volume (Gallons): 100.5
Purge Water Management: On Site Containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge time 1044
Clear grab Sample
Sample Date/Time: 10/21/2020 @ 0830
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Cobalt, 1,1-dichloroethene, Trichloroethene, Vinyl chloride

Other Observations / Equipment Operation Problems:
215.30 - 16.78 = 198.52 x 0.163 = 32.36

Sampler Signature: John England Date: 10/21/2020 Page 1 of 1
QA/QC Signature: M. Joyce Date: 10-23-2020

GOLDER FIELD SAMPLING LOG

Date: 10/19/2020, 10-20-20
Weather: Sunny 60s

Project Name: Culpeper - Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA2020 CAP GW
Sampler(s): J. England
Well ID: MW-16
Field Calibration Completed: 10/19/2020 @ 1100, 0745 10-20-20
Well Diameter: 2.0 inches
Initial Depth to Water: 6.81 feet
Depth to Bottom: 203.70 feet
Water Column Thickness: 196.89 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 19E104104
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Grundfos Pump, control box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/19/2020	1440	6.84	696	11.60	1.76	16.4	19.6	1
	1507	7.18	691	8.46	7.38	18.3	1.5	32
	1518	— purged dry —						47
10/20/2020	0925	6.84	651	7.40	4.89	15.7	70.1	48.0
	0930	— SAMPLED —						48.5
	0935	6.74	690	7.60	1.21	14.7	26.0	49.0

Calculated Well Vol. (Gallons): ~ 32.01
Total Calculated Purge Volume (Gallons): ~49.0 Gal
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge time 1439
203.70 - 6.81 = 196.89 × 0.163 = 32.01 clear grab sample
Sample Date/Time: 10/20/2020 @ 0930
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Cobalt, 1,1-dichloroethane, Trichloroethene, Vinyl chloride

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 10/20/2021 Page 1 of 1
QA/QC Signature: M. Taylor Date: 10-23-2020

GOLDER FIELD SAMPLING LOG

Date: 10/19/2020, 10/20/2020
Weather: Sunny 60s

Project Name: Culpeper - Laurel Valley LF
Project No./Task No.: 20145729-200
Event: 2SA2020 CAP GW
Sampler(s): J. England
Well ID: MW-1H
Field Calibration Completed: 10/19/2020 @ 1109, 0745 10-20-20
Well Diameter: 2.0 inches
Initial Depth to Water: 2.51 feet
Depth to Bottom: 210.23 feet
Water Column Thickness: 207.72 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDss 19E104904
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Grundfos Pump, controller box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/19/2020	1231	6.63	732	2.10	2.64	16.3	54.7	~~34~~ 1
↓	1254	6.51	722	0.62	1.60	15.6	22.7	~~68~~ 34
↓	1312	6.74	718	1.36	0.92	15.5	11.4	~~102~~ 68
↓	1335	6.68	715	0.54	0.79	15.3	7.5	102
10/20/2020	0850	6.62	627	8.77	4.01	13.5	209.0	103
↓	0855	— SAMPLED —						
↓	0900	6.48	660	9.08	2.30	12.5	101.4	104

Calculated Well Vol. (Gallons): 34.0 Gal
Total Calculated Purge Volume (Gallons): ~ 104
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge start: 1230
210.23 - 2.51 = 207.72 × 0.163 = 33.86 Gal clear grab sample
Sample Date/Time: 10/20/2020 @ 0855
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Cobalt, 1,1-dichloroethane, Trichloroethene, Vinyl chloride

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 10/20/2020 Page 1 of 1
QA/QC Signature: M. Foyle Date: 10-23-2020

GOLDER

FIELD SAMPLING LOG

Date: 10/19/2020
Weather: Sunny 60s

Project Name: Culpeper - Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA 2020 CAP GW
Sampler(s): J England
Well ID: MW-1I
Field Calibration Completed: 10/19/2020 @ 1100
Well Diameter: 2.0 inches
Initial Depth to Water: 0.0 feet
Depth to Bottom: 314.49 feet
Water Column Thickness: 314.49 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 19E104904
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/19/2020	1140	6.99	285.1	0.75	8.50	15.5	180.5	0.25
↓	1145	SAMPLED						0.50
↓	1150	7.28	282.1	1.02	8.42	15.6	169.3	0.75

Calculated Well Vol. (Gallons): N/A Total Calculated Purge Volume (Gallons): ~1.0
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): Clear grab Sample

Sample Date/Time: 10/19/2020 @ 1145
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Cobalt, 1-1-dichloroethane, Trichloroethane, Vinyl chloride

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 10/19/2020 Page 1 of 1
QA/QC Signature: M. Jayh Date: 10-23-2020

GOLDER

FIELD SAMPLING LOG

Date: 10/19/2020 - 10/20/2020

Weather: sun, 70s, sun, 60s

Project Name: Laurel Valley LF

Project No./Task No.: 20145729.200

Event: 2SA20 CAP GW

Sampler(s): M Taylor

Well ID: MW-3

Field Calibration Completed: 1100 10-19-2020 / 0745 10-20-2020

Well Diameter: 2.0 inches

Initial Depth to Water: 13.10 feet

Depth to Bottom: 21.68 feet

Water Column Thickness: 8.58 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10-19-2020	1504	5.68	120.5	38.42	6.38	13.8	138.9	0
10-19-2020	1510	5.37	115.9	20.06	6.26	13.4	158.3	~1.5
10-19-2020	1514	5.06	114.8	25.65	6.19	13.1	173.6	~3
10-19-2020	1519	5.24	64.0	30.08	9.43	14.0	183.3	~4.5
10-20-2020	~~1017~~ 1315 MI	5.25	112.3	3.72	4.62	15.8	221.1	-
10-20-2020	~~1028~~ MT 1320	SAMPLED						
10-20-2020	~~1021~~ 1322 MT	5.17	112.5	4.86	4.17	14.2	239.4	-

Calculated Well Vol. (Gallons): (8.58)(0.163) = 1.39 Total Calculated Purge Volume (Gallons): 4.17

Purge Water Management: onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

1313 DTW on 10-20-2020: 13.17 feet

Sample Date/Time: 10/20/2020 / 1320 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other cobalt, 1-1-dichloroethane, trichloroethene, vinyl chloride

Other Observations / Equipment Operation Problems:

pre-sample WQ: 1315, post-sample WQ: 1322 WQ= water quality

Sampler Signature: M Taylor Date: 10/20/2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER FIELD SAMPLING LOG

Date: 10/19/2020, 10/20/2020
Weather: Sun, 60s, Sun, 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA20 CAP GW
Sampler(s): M. Taylor
Well ID: MW-5
Field Calibration Completed: 1100 10-19-2020, 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 8.59 10-19-2020 feet
Depth to Bottom: 22.46 feet
Water Column Thickness: 13.87 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1158	7.08	181.8	11.15	7.62	14.3	194.9	0
10-19-2020	1203	6.36	136.3	49.44	7.25	14.1	109.9	~2.5
10-19-2020	1208	5.26	119.0	94.22	5.67	13.8	88.6	~5
10-19-2020	1212	5.29	129.9	95.50	7.39	13.2	117.8	~7.5
10-20-2020	1018	6.59	126.3	10.26	8.80	14.5	181.5	—
10-20-2020	1020	—	—	Sampled	—	—	—	—
10-20-2020	1022	5.94	131.2	12.95	8.95	14.6	142.4	—

Calculated Well Vol. (Gallons): (13.87)(0.163) = 2.26 Total Calculated Purge Volume (Gallons): 6.78

Purge Water Management: Onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab with small, brown floating particles

1016 DTW 10-20-2020: 8.77'

Sample Date/Time: 10/20/2020 @ 1020 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other Cobalt, 1,1-dichloroethane, trichloroethene, vinyl chloride

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10-19-2020 / 10-20-2020
Weather: sun, 70s / sun, 70s

Project Name: Laurel Valley LF
Project No./Task No.: ~~20447mt~~ 20145729.200
Event: 2SA20 CAP GW
Sampler(s): M. Taylor
Well ID: MW-6
Field Calibration Completed: 1100 10-19-2020 / 0745 10-20-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 43.37 feet
Depth to Bottom: 48.27 feet
Water Column Thickness: 4.90 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-19-2020	1550	5.71	362.4	18.63	4.73	13.2	94.8	0
10-19-2020	1600	5.63	395.0	19.26	4.61	12.9	53.8	~1
10-19-2020	1606	5.93	407.3	39.02	4.42	12.8	36.0	~2
10-19-2020	1612	5.93	402.1	29.14	4.05	13.2	28.4	~3
10-20-2020	1339	5.69	342.0	16.29	5.94	14.8	100.5	-
10-20-2020	1340		SAMPLED					
10-20-2020	1343	5.60	358.1	10.07	4.93	14.5	81.7	-

Calculated Well Vol. (Gallons): (4.9)(0.163)=0.79 Total Calculated Purge Volume (Gallons): ~2.37
Purge Water Management: Onsite containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample; small, floating, cohesive tan particles
DTW 10-20-2020 @ 1335 : 43.43'
Sample Date/Time: 10-20-2020 / 1340
Field Filtered (0.45um): [ ] Yes [X] No
Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other 1,1-dichloroethane, naphthalene, Cobalt

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1
QA/QC Signature: John England Date: 10/21/2020

GOLDER FIELD SAMPLING LOG

Date: 10/20/2020, 10-21-202
Weather: Sunny 60s, sun. 70s

Project Name: B4E Laurel Valley LF Project No./Task No.: 20145729.200
Event: ~~MP2-4E~~ 2SA2020 GW-CAP Sampler(s): J. England
Well ID: MP2-4E Field Calibration Completed: 6745 10-20-2020, 0800 10-21-2020
Well Diameter: 2.0 inches Initial Depth to Water: 22.29 feet
Depth to Bottom: 31.20 feet Water Column Thickness: 8.91 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI ProDSS 19E104904, 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10/20/2020	1700	5.71	81.2	6.11	2.91	15.1	51.2	1
↓	1704	5.73	85.2	6.69	2.50	14.7	70.1	1.5
	1707	5.34	68.0	57.30	2.43	14.1	57.30	3.0
↓	1715	5.53	71.5	169.66	2.90	14.3	103.8	4.5
10-21-2020	1138	5.56	196.3	18.77	3.39	13.9	94.6	–
10-21-2020	1140	—	Sampled	—	—	—	—	—
10-21-2020	1151	5.40	119.8	31.44	3.07	13.6	100.5	–

Calculated Well Vol. (Gallons): 1.45 Total Calculated Purge Volume (Gallons): ~5.0
Purge Water Management: Onsite containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10-21-2020 / 1140 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other nitrate/nitrite, alkalinity, chloride, methane, sulfate, sulfide

Other Observations / Equipment Operation Problems: Fe^{2+}: 2.5 mg/L

Sampler Signature: M. Jaylor Date: 10-21-2020 Page 1 of 1
QA/QC Signature: John England Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10-20-2020 / 10-21-2020
Weather: Sun, 70s / Sun, 70s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA20 CAP GW
Sampler(s): M. Taylor
Well ID: MW-X1
Field Calibration Completed: 0745 10-20-2020 / 0800 10-21-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 27.43' feet
Depth to Bottom: 37.29 feet
Water Column Thickness: 9.86 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 19M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-20-2020	1548	6.17	706	5.42	2.84	14.0	-7.7	0
10-20-2020	1555	6.13	679	22.09	3.42	13.5	-17.8	~1.75
10-20-2020	1602	5.98	665	75.81	2.98	13.1	-16.8	~3.5
10-20-2020	1612	6.01	623	73.14	4.03	14.0	-12.1	~5.25
10-21-2020	0952	5.70	617	31.49	3.44	13.9	-9.3	-
10-21-2020	0955	SAMPLED						
10-21-2020	1000	5.74	634	29.85	2.63	13.5	-9.1	-

Calculated Well Vol. (Gallons): 1.607
Total Calculated Purge Volume (Gallons): 4.82
Purge Water Management: Onsite Containment
Purge Observations (product observed, color, odor, turbidity, sheen): slightly cloudy, micaceous grab sample
DTW 10-21-2020 0950: 27.50'
Sample Date/Time: 10-21-2020 / 0955
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other 1,1-dichloroethane, naphthalene, cobalt

Other Observations / Equipment Operation Problems: ~~Fe^{2+}~~ : mg/L MT

Sampler Signature: M. Taylor
Date: 10-21-2020
Page 1 of 1

QA/QC Signature: John England
Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10-20-2020 / 10-21-2020

Weather: sun, 70s / overcast, 70s

Project Name: Laurel Valley LF

Project No./Task No.: 20145729.200

Event: 2SA20 CAP GW

Sampler(s): M. Taylor

Well ID: MW-X2

Field Calibration Completed: 0745 10-20-2020 / 0800 10-21-2020

Well Diameter: 2.0 inches

Initial Depth to Water: 4.83 feet

Depth to Bottom: 16.94 feet

Water Column Thickness: 12.11 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10-20-2020	1511	8.44	509	4.31	8.97	14.4	51.4	0
10-20-2020	1517	8.33	290.8	20.04	7.27	14.3	-20.8	~2
10-20-2020	1525	7.72	237.5	22.19	5.51	14.5	-14.8	~4
10-20-2020	1530	7.43	249.0	69.65	6.54	14.4	-27.8	~6
10-21-2020	1043	6.57	591	18.15	5.16	13.9	84.2	—
10-21-2020	1045	—	sampled	—	—	—	—	—
10-21-2020	1055	6.45	293.4	9.81	4.82	14.4	89.3	—

Calculated Well Vol. (Gallons): 1.97

Total Calculated Purge Volume (Gallons): 5.91

Purge Water Management: onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

DTW on 10-21-2020 @ ~~5.11~~ 1040 hrs: 5.11 feet

Sample Date/Time: 10-21-2020 / 1045

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other nitrate/nitrite, alkalinity, chloride, methane, sulfate, sulfide

Other Observations / Equipment Operation Problems: Fe^{2+}: 0.0 mg/L

Sampler Signature: M. Taylor

Date: 10-21-2020

Page 1 of 1

QA/QC Signature: John England

Date: 10/22/2020

GOLDER

FIELD SAMPLING LOG

Date: 10-20-2020 / 10-21-2020

Weather: sun, 70s / sun, 60s

Project Name: Laurel Valley LF

Project No./Task No.: 20145729200

Event: 2SA20 CAP GW

Sampler(s): M. Taylor

Well ID: MW-X20

Field Calibration Completed: 0745 10-20-2020 / 0800 10-21-2020

Well Diameter: 2.0 inches

Initial Depth to Water: 61.94 feet

Depth to Bottom: 66.28 feet

Water Column Thickness: 4.34 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI ProDSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-20-2020	1448	6.54	2392	5.91	9.25	14.7	-20.3	0
10-20-2020	1505	7.34	2412	14.57	8.47	13.0	27.9	~0.75
10-20-2020	1507	——— dry, let recharge ———						~1
10-21-2020	1018	7.04	2282	94.70	8.24	12.9	-31.6	~
10-21-2020	1020	——— SAMPLED ———						———
10-21-2020	1028	6.80	2138	125.06	7.89	12.6	-49.7	~

Calculated Well Vol. (Gallons): ~0.70

Total Calculated Purge Volume (Gallons): ~1

Purge Water Management: onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): cloudy grab sample

DTW @ 1015 on 10-21-2020: 63.24'

Sample Date/Time: 10/21/2020 / 1020

Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other 1,1-dichloroethane, trichloroethene, mercury

Other Observations / Equipment Operation Problems: ~~Fe2+~~ MT

Sampler Signature: M. Taylor

Date: ~~10-20-~~ MT 10-21-2020

QA/QC Signature: John England

Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10/20/2020, 10-21-2020
Weather: Sunny 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.209
Event: 2SA2020 GW - CAP
Sampler(s): J. England
Well ID: CLF-1
Field Calibration Completed: 10/20/2020 @ 0745, 0800 10-21-2020
Well Diameter: 6.0 inches
Initial Depth to Water: 31.06 feet
Depth to Bottom: 62.55 feet
Water Column Thickness: 31.49 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI AE104904 ProDSS
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Grundfos Pump, controller box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm) ^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10/20/2020	1250	5.88	388.6	7.25	1.08	17.1	9.2	1
↓	1310	5.95	345.6	6.32	0.92	16.6	9.7	47
↓	1340	5.79	365.7	0.90	0.91	17.4	18.3	93
↓	1425	5.82	373.9	0.95	1.73	18.3	21.0	140
10/21/2020	0905	5.87	358.6	9.18	3.35	15.9	25.4	140.5
↓	0910	– SAMPLED –						141.1
↓	0915	5.79	345.1	7.45	1.48	15.9	31.2	142.0

Calculated Well Vol. (Gallons): 47
Total Calculated Purge Volume (Gallons): ~142.0
Purge Water Management: on site containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge time: 1249
Clear grab Sample
Sample Date/Time: 10/21/2020 @ 0910
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other 1,1 dichloroethane, Naphthalene, Cobalt

Other Observations / Equipment Operation Problems:
62.55 - 31.06 = 31.49 X 1.469 = 46.26

Sampler Signature: John England
Date: 10/21/2020
Page 1 of 1

QA/QC Signature: M. Jaylo
Date: 10-23-2020

GOLDER

FIELD SAMPLING LOG

10-20-2020,
Date: 10/21/2020
Weather: Sunny 60s

Project Name: Laurel Valley
Project No./Task No.: 20145729 200
Event: 2SA2020GW CAP
Sampler(s): J. England
Well ID: CLF-51
Field Calibration Completed: 10/20/2020 0745, 0800 10-21-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 78.30 feet
Depth to Bottom: 105.79 feet
Water Column Thickness: 27.49 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI 19E104904 Pro DSS
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10/20/2020	1625	7.27	515	33.60	3.98	14.7	86.1	1
↓	1645	7.52	512	51.79	3.14	14.6	57.5	4.5
↓	1650	— Purged Dry —						5.0
10/21/2020	1005	7.61	396.7	20.42	7.49	14.6	89.8	5.5
↓	1010	— SAMPLED —						6.0
↓	1015	7.60	408.6	19.89	7.48	14.1	93.1	6.5

Calculated Well Vol. (Gallons): 4.48
Total Calculated Purge Volume (Gallons): 6.5
Purge Water Management: On Site Containment
Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample
105.79 - 78.30 = 27.49 x 0.163 = 4.48
Sample Date/Time: 10/21/2020 @ 1010
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other 1,1 dichloroethane, trichloroethene, Mercury

Other Observations / Equipment Operation Problems:

Sampler Signature: John England
Date: 10/21/2020
Page 1 of 1

QA/QC Signature: M. Jaffe
Date: 10-23-2020

GOLDER

FIELD SAMPLING LOG

Date: 10/20/2020 - 10/21/2020
Weather: Sunny 60s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.200
Event: 2SA2020 GW
Sampler(s): J. England
Well ID: CLF-53
Field Calibration Completed: 10/20/2020 @ 0745, 0800 10-21-20
Well Diameter: 2.0 inches
Initial Depth to Water: 19.28 feet
Depth to Bottom: 89.00 feet
Water Column Thickness: 69.72 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI 19E104904 Pro DSS
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Disposable Bailer
- [ ] Non-dedicated BP
- [x] Other Grundfos pump and controller box

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10/20/2020	1509	6.50	198.6	7.37	2.12	15.1	7.0	1
↓	1518	6.67	165.4	2.40	2.00	14.4	19.3	12
↓	1530	6.61	168.3	2.26	1.87	14.4	37.0	24
↓	1538	6.64	172.0	2.62	1.72	14.3	40.7	36
10/21/2020	0940	6.75	153.7	7.75	2.76	14.7	68.4	37
↓	0945	— SAMPLED —						37.5
↓	0950	6.85	249.8	7.99	3.72	14.8	71.7	38.0

Calculated Well Vol. (Gallons): 11.36
Total Calculated Purge Volume (Gallons): ~38.0
Purge Water Management: On Site Containment
Purge Observations (product observed, color, odor, turbidity, sheen): purge time 1509
Clear grab Sample
Sample Date/Time: 10/21/2020 @ 0945
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other Mercury, 1,1 Dichloroethane, trichlorethene

Other Observations / Equipment Operation Problems:
89.00 - 19.28 = 69.72 x 0.163 = 11.36

Sampler Signature: John England
Date: 10/21/2020
Page 1 of 1

QA/QC Signature: M. Taylor
Date: 10-23-2020

GOLDER

FIELD SAMPLING LOG

Date: 10-20-2020 / 10-21-2020

Weather: sun, 70s / slightly cloudy, 70s

Project Name: Laurel Valley LF

Project No./Task No.: 20145729-200

Event: 2SA20 CAP GW

Sampler(s): M. Taylor

Well ID: CLF-1SA

Field Calibration Completed: 0745 10-20-2020 / 0800 10-21-2020

Well Diameter: 2.0 inches

Initial Depth to Water: 50.13 feet

Depth to Bottom: 83.25 feet

Water Column Thickness: 33.12 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 17M102881
- [ ] In Situ Troll 9500
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [X] Disposable Bailer
- [ ] Non-dedicated BP
- [ ] Other

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	Gallons
10-20-2020	1640	6.82	830	22.41	4.60	12.6	4.5	0
10-20-2020	1704	6.39	892	23.61	3.13	13.2	5.2	~5.5
10-20-2020	1722	—	dry, left recharge	—	—	—	—	~8.75
10-21-2020	1113	6.81	1068	9.87	4.20	12.9	-24.7	—
10-21-2020	1115	—	sampled	—	—	—	—	—
10-21-2020	1126	6.24	1007	12.19	2.16	13.2	10.6	—

Calculated Well Vol. (Gallons): ~5.40

Total Calculated Purge Volume (Gallons): ~8.75

Purge Water Management: Onsite containment

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample

Sample Date/Time: 10-21-2020 / 1115

Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other nitrate, nitrite, alkalinity, chloride, methane, sulfate, sulfide

Other Observations / Equipment Operation Problems: Fe^{2r}: 3.0 mg/L

Sampler Signature: M. Taylor

Date: 10-21-2020

Page 1 of 1

QA/QC Signature: John England

Date: 10/21/2020

GOLDER

FIELD SAMPLING LOG

Date: 10-20-2020
Weather: Sun, 70s

Project Name: Laurel Valley LF
Project No./Task No.: 20145729.100
Event: 2SA20 Comp. GW
Sampler(s): M. Taylor
Well ID: Field Blank
Field Calibration Completed: —
Well Diameter: — inches
Initial Depth to Water: — feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- ☐ WL Indicator
- ☐ YSI —
- ☐ In Situ Troll 9500
- ☐ Turbidity Meter
- ☐ Peristaltic Pump
- ☐ MP-10 Controller Box
- ☐ Air Tank
- ☐ Compressor
- ☐ MP-15 Controller Box
- ☐ Disposable Bailer
- ☐ Non-dedicated BP
- ☐ Other —

Date	Time	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	Gallons
10-20-2020	1210	—	sampled	—	—	—	—	—

Calculated Well Vol. (Gallons): — Total Calculated Purge Volume (Gallons): —

Purge Water Management: —

Purge Observations (product observed, color, odor, turbidity, sheen): clear grab sample collected near MW-2B using lab-supplied D.I. water

Sample Date/Time: 10-20-2020 / 1210

Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):
- ☒ VSWMR Table 3.1 Column A VOCs
- ☒ VSWMR Table 3.1 Column A Metals
- ☐ VSWMR Table 3.1 Column B
- ☒ Other see MW-1B purge log for compliance analytes

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 10-20-2020 Page 1 of 1

QA/QC Signature: John England Date: 10/21/2020