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ARCADIS Design & Consultancy for natural and built assets

CD Scanned
PM Copy

Mr. Tim Hornosky
State Remediation Section
SC Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201-1708

Arcadis U.S., Inc.
1450 Greene Street
Suite 220
Augusta
Georgia 30901-5201
Tel 706 828 4421
Fax 706 828 4722
www.arcadis.com

ENVIRONMENT

Subject:
Results of 72-Hour AFVR
Brenntag Southeast, Charleston, South Carolina

Date:
December 22, 2020

Contact:
Edward Hirshenson

Phone
706.828.4421

Email:
Edward.hirshenson@arcadis.com

Our ref:
30049825

Dear Tim Hornosky:

Brenntag Southeast, Inc. has authorized ARCADIS U.S., Inc. to forward the 72-hour Aggressive Fluid Vapor Recovery (AFVR) results from monitor well MW-14 for Area #2. The South Carolina Department of Health and Environmental Control (SCDHEC) has accepted recommendation to conduct a long term AFVR event at monitor well MW-14. The AFVR event was conducted on September 14 – 17, 2020. Below are results of the AFVR event.

Prior to starting the AFVR, pressure vacuum gauges were installed in monitor wells MW-9 and MW-12 (William M. Bird & Co., Inc.). The vacuum gauges were threaded to the polyvinyl chloride (PVC) caps and placed on the PVC casing within the manhole vaults. Readings were recorded approximately one hour prior to AFVR test. Readings were recorded every hour until the 72-hour test was completed. All vacuum readings from both wells were recorded at zero.

A one-inch PVC stinger was placed inside monitor well MW-14 to capture fluids and vapours. The vacuum reading from the Vac truck was at 25 in Hg (inches of mercury). All fluids were pumped into a tanker and vapours vacuumed through a carbon vessel. During the test, parameters (PID, temperature, relative humidity, and flow) were recorded hourly and are presented in Attachment A. At the end of the 72-hour test, fluids captured during the test was manifested, transported, and disposed to a licensed facility and is included in Attachment B. At total of 3,727 gallons of fluids was pumped and of that approximately 15.3 gallons of mass and 95.6 pounds of vapours were recovered.

(62)

Groundwater samples were collected for volatile organic compounds (VOCs) using EPA Method SW-846 8260B, approximately 19 hours into the test and a second water sample collected at the end of the 72-hour test. A disposable bailer was used to collect samples when stinger was removed to transfer fluids from the vac truck to totes. Results of the two groundwater samples collected are presented below:

Results after 19 hours are as follows:

1. 1,2 Dichlorobenzene at 483 ug/L;
2. Cis 1,2-dichloroethene at 1,680 ug/L;
3. Trichloroethene at 345 ug/L;
4. Ethylbenzene at 2,220 ug/L;
5. Toluene at 25,0000 ug/L; and
6. Xylenes at 20,000 ug/L.

Results after 72 hours are as follows:

1. 1,2-Dichlorobenzene at 485 ug/L;
2. Cis 1,2-Dichloroethene at 1,110 ug/L;
3. Trichloroethene at 363 ug/L;
4. Ethylbenzene at 2,780 ug/L;
5. Toluene at 25,600 ug/L; and
6. Xylenes at 25,300 ug/L.

The main constituents in groundwater from both groundwater samples were ethylbenzene, toluene, and xylenes which made up approximately 95% of the contaminants. Total hydrocarbon concentrations from the 19-hour and 72-hour sampling event were reported at 47,220 ug/L and 53,680 ug/L, respectively. Total chlorinated solvent concentrations were reported at 2,508 ug/L and 1,958 ug/L.

On September 23, 2020, six days after the 72-hour AFVR event, a groundwater sample was collected from monitor well MW-14 for VOCs using EPA Method SW-846 8260B. Low flow sampling was conducted and field parameters (pH, specific conductance, dissolved oxygen, redox potential, and temperature) were collected every five minutes. Laboratory results indicated the following:

1. 1,2-Dichlorobenzene at 398 J ug/L;
2. Cis 1,2-Dichloroethene at 2,380 ug/L;
3. Trichloroethene at 589 ug/L;
4. Benzene at 264 J ug/L;
5. Ethylbenzene at 4,110 ug/L;
6. Toluene at 43,900 ug/L; and
7. Xylenes at 38,800 ug/L.

Total hydrocarbon and chlorinated solvent concentration reported six days after the AFVR event were reported at 87,074 ug/L and 3,367ug/L, respectively. Laboratory analytical reports are included in Attachment C.

By comparing the groundwater samples collected six days after the AFVR test to concentrations reported on 6/28/2016 (chlorinated solvents at 15,800 ug/L and hydrocarbons at 221,500 ug/L), chlorinated solvents are reduced by about 78% and hydrocarbons are reduced by 60%. Graphs for chlorinated

solvents and hydrocarbons are depicted in Attachment D. Graph for BTEX show a slight increasing trend but stabilizing and for chlorinated compound graph indicate a decreasing trend. Both graphs indicate in the last eleven sampling events, the trend has been decreasing. Note that concentrations of chlorinated solvents and hydrocarbons are still elevated in groundwater that may indicate mass bound in silts and clays.

Please call me at (706) 828-4421 if you have any questions.

Sincerely,

Arcadis U.S., Inc.

Charles Lawson, PG
Project Geologist

Edward Hirshenson
Senior Scientist

Copies:
Mr. Shawn Wiram/North America/Brenntag

ATTACHMENT A

72-Hour AFVR Field Test Results

AFVR Data Sheet - Emissions Data & Calculation

Client: Arcadis Brenntag	Site: Brenntag; 4200 Azalea Drive, North Charleston, SC (MW-14)	9/14 thru 9/17/2020	Job# 1432
Technician: Jose Perez	Meters: MiniRae 2000-10.6 eV PID, TESTO 445-Vane, %RH, Temp	Response Factor: 1	Stack Dia(in): 4

Time (h:m)	Delta Time (min)	Pre-Carbon PPM	Post-Carbon PPM	Velocity (fpm)	Temp (^{0} F)	RH (%)	Flow (cfm)	Specific Humidity (lbW / lbDA)	Water Vapor (vol %)	Qstd (dscfm)	Dry Conc (PPMv)	Response Factor	Corrected Conc (PPMv)	Mass Conc (mg/m^3)	Mass Conc (lb/ft^3)	Mass Removed (lb)
1300	60	42.6	0	3668	138	4.3	320	0.100	0.138	243	49	1	49	263	0.000016	0.24
1400	60	48.1	0	3744	186	4.3	327	0.100	0.138	230	56	1	56	297	0.000019	0.26
1500	60	50.2	0	3825	210	3.8	334	0.100	0.138	227	58	1	58	310	0.000019	0.26
1600	60	177.9	0	3785	220	3.6	330	0.100	0.138	221	206	1	206	1098	0.000069	0.91
1700	60	185.1	0	4125	195	4.6	360	0.100	0.138	250	215	1	215	1142	0.000071	1.07
1800	60	216.9	0	3810	195	4.8	332	0.100	0.138	231	252	1	252	1338	0.000084	1.16
1900	60	219.2	0	3952	190	4.7	345	0.100	0.138	241	254	1	254	1352	0.000084	1.22
2000	60	198.3	0	4019	180	4.8	351	0.100	0.138	249	230	1	230	1223	0.000076	1.14
2100	60	202.5	0	4201	178	4.9	366	0.100	0.138	261	235	1	235	1249	0.000078	1.22
2200	60	198.5	0	4246	178	4.7	370	0.100	0.138	264	230	1	230	1225	0.000076	1.21
2300	60	199.3	0	4020	178	4.9	351	0.100	0.138	250	231	1	231	1230	0.000077	1.15
2400	60	199.8	0	4130	175	4.9	360	0.100	0.138	258	232	1	232	1233	0.000077	1.19
0100	60	202.7	0	3901	175	4.8	340	0.100	0.138	244	235	1	235	1251	0.000078	1.14
0200	60	198.5	0	4098	177	4.7	357	0.100	0.138	255	230	1	230	1225	0.000076	1.17
0300	60	202.3	0	3969	177	4.8	346	0.100	0.138	247	235	1	235	1248	0.000078	1.16
0400	60	200.5	0	4038	178	4.6	352	0.100	0.138	251	233	1	233	1237	0.000077	1.16
0500	60	201.0	0	4005	178	4.7	349	0.100	0.138	249	233	1	233	1240	0.000077	1.16
0600	60	289.4	0	3845	178	3.8	335	0.100	0.138	239	336	1	336	1786	0.000111	1.60
0700	60	104.6	0	3191	83	6.2	278	0.100	0.138	233	121	1	121	645	0.000040	0.56
0800	60	235.8	0	3343	98	4.7	292	0.100	0.138	238	274	1	274	1455	0.000091	1.30
0900	60	318.9	0	3581	138	4.5	312	0.100	0.138	238	370	1	370	1968	0.000123	1.75
1000	60	328.6	0	3450	186	4.3	301	0.100	0.138	212	381	1	381	2027	0.000127	1.61
1100	60	333.0	0	3313	195	4.0	289	0.100	0.138	201	386	1	386	2055	0.000128	1.55
1200	60	306.9	0	3561	196	4.1	311	0.100	0.138	215	356	1	356	1894	0.000118	1.53
1300	60	303.9	0	3572	196	4.1	312	0.100	0.138	216	353	1	353	1875	0.000117	1.52
1400	60	294.6	0	3506	198	3.8	306	0.100	0.138	211	342	1	342	1818	0.000113	1.44
1500	60	299.7	0	3577	195	4.0	312	0.100	0.138	217	348	1	348	1849	0.000115	1.50
1600	60	308.6	0	3668	197	3.9	320	0.100	0.138	222	358	1	358	1904	0.000119	1.58
1700	60	326.8	0	3896	198	3.3	340	0.100	0.138	235	379	1	379	2016	0.000126	1.78
1800	60	303.3	0	3698	195	3.5	323	0.100	0.138	224	352	1	352	1871	0.000117	1.57
1900	60	327.3	0	3876	195	3.8	338	0.100	0.138	235	380	1	380	2019	0.000126	1.78
2000	60	325.6	0	3891	195	3.5	339	0.100	0.138	236	378	1	378	2009	0.000125	1.77
2100	60	328.6	0	3796	195	3.9	331	0.100	0.138	230	381	1	381	2027	0.000127	1.75
2200	60	327.9	0	3898	196	4.0	340	0.100	0.138	236	380	1	380	2023	0.000126	1.79
2300	60	318.6	0	3699	196	4.1	323	0.100	0.138	224	370	1	370	1966	0.000123	1.65
2400	60	328.5	0	3794	197	3.7	331	0.100	0.138	229	381	1	381	2027	0.000127	1.74
0100	60	330.5	0	3895	197	3.9	340	0.100	0.138	235	383	1	383	2039	0.000127	1.80
0200	60	319.8	0	3879	197	4.0	338	0.100	0.138	234	371	1	371	1973	0.000123	1.73
0300	60	328.8	0	3883	197	3.9	339	0.100	0.138	235	381	1	381	2029	0.000127	1.78
0400	60	299.8	0	3895	197	3.8	340	0.100	0.138	235	348	1	348	1850	0.000115	1.63
0500	60	300.2	0	3899	197	3.9	340	0.100	0.138	236	348	1	348	1852	0.000116	1.63
0600	60	298.7	0	3897	197	4.0	340	0.100	0.138	235	347	1	347	1843	0.000115	1.63
0700	60	386.5	0	3683	176	4.1	321	0.100	0.138	230	448	1	448	2385	0.000149	2.05
0800	60	278.4	0	3638	180	4.4	317	0.100	0.138	226	323	1	323	1718	0.000107	1.45
0900	60	282.9	0	3673	185	4.9	320	0.100	0.138	226	328	1	328	1745	0.000109	1.48

AFVR Data Sheet - Emissions Data & Calculation

Client: Arcadis Brenntag	Site: Brenntag; 4200 Azalea Drive, North Charleston, SC (MW-14)	9/14 thru 9/17/2020	Job# 1432
Technician: Jose Perez	Meters: MiniRae 2000-10.6 eV PID, TESTO 445-Vane, %RH, Temp	Response Factor: 1	Stack Dia(in): 4

Time (h:m)	Delta Time (min)	Pre-Carbon PPM	Post-Carbon PPM	Velocity (fpm)	Temp (^{0} F)	RH (%)	Flow (cfm)	Specific Humidity (lbW / lbDA)	Water Vapor (vol %)	Qstd (dscfm)	Dry Conc (PPMv)	Response Factor	Corrected Conc (PPMv)	Mass Conc (mg/m^3)	Mass Conc (lb/ft^3)	Mass Removed (lb)
1300	60	42.6	0	3668	138	4.3	320	0.100	0.138	243	49	1	49	263	0.000016	0.24
1000	60	277.2	0	3693	185	5.4	322	0.100	0.138	227	322	1	322	1710	0.000107	1.46
1100	60	284.9	0	3759	180	5.3	328	0.100	0.138	233	331	1	331	1758	0.000110	1.54
1200	60	301.1	0	3632	185	4.6	317	0.100	0.138	224	349	1	349	1858	0.000116	1.56
1300	60	206.2	0	3643	180	6.3	318	0.100	0.138	226	239	1	239	1272	0.000079	1.08
1400	60	234.1	0	3744	175	6.1	327	0.100	0.138	234	272	1	272	1444	0.000090	1.27
1500	60	202.9	0	3734	170	5.9	326	0.100	0.138	235	235	1	235	1252	0.000078	1.10
1600	60	228.6	0	3617	168	7.1	315	0.100	0.138	229	265	1	265	1410	0.000088	1.21
1700	60	218.7	0	3677	170	6.8	321	0.100	0.138	232	254	1	254	1349	0.000084	1.17
1800	60	212.6	0	3780	170	8.9	330	0.100	0.138	238	247	1	247	1312	0.000082	1.17
1900	60	213.9	0	3775	170	7.6	329	0.100	0.138	238	248	1	248	1320	0.000082	1.18
2000	60	219.8	0	3645	170	8.5	318	0.100	0.138	230	255	1	255	1356	0.000085	1.17
2100	60	221.1	0	3777	170	8.1	329	0.100	0.138	238	257	1	257	1364	0.000085	1.22
2200	60	225.2	0	3698	170	7.9	323	0.100	0.138	233	261	1	261	1389	0.000087	1.21
2300	60	226.1	0	3701	170	8.0	323	0.100	0.138	233	262	1	262	1395	0.000087	1.22
2400	60	221.6	0	3689	170	8.2	322	0.100	0.138	232	257	1	257	1367	0.000085	1.19
0100	60	219.5	0	3649	170	7.1	318	0.100	0.138	230	255	1	255	1354	0.000085	1.17
0200	60	228.1	0	3769	170	6.9	329	0.100	0.138	237	265	1	265	1407	0.000088	1.25
0300	60	225.2	0	3685	170	7.6	321	0.100	0.138	232	261	1	261	1389	0.000087	1.21
0400	60	227.9	0	3782	170	7.9	330	0.100	0.138	238	264	1	264	1406	0.000088	1.26
0500	60	225.4	0	3759	170	7.8	328	0.100	0.138	237	262	1	262	1391	0.000087	1.23
0600	60	228.2	0	3748	170	8.0	327	0.100	0.138	236	265	1	265	1408	0.000088	1.25
0700	60	233.9	0	3769	170	4.9	329	0.100	0.138	237	271	1	271	1443	0.000090	1.28
0800	60	237.2	0	3871	175	5.3	338	0.100	0.138	242	275	1	275	1463	0.000091	1.33
0900	60	188.6	0	3729	183	5.4	325	0.100	0.138	230	219	1	219	1164	0.000073	1.00
1000	60	313.1	0	3719	190	5.4	324	0.100	0.138	227	363	1	363	1932	0.000121	1.64
1100	60	251.2	0	3871	190	5.7	338	0.100	0.138	236	291	1	291	1550	0.000097	1.37
1200	60	257.4	0	3886	190	5.6	339	0.100	0.138	237	299	1	299	1588	0.000099	1.41

Total emissions, pounds	95.65
Total emissions, gallons (6.25 lb/gal)	15.30

PPMmea = Measured VOC concentration from OVA/TVA (PPMv)

Velocity = Measured velocity (fpm)

Temp = Measured temperature (^{0}F)

RH = Measured relative humidity (%)

Flow = Actual Flow Volume (cfm)

Specific Humidity = data from psychrometric chart at measured Temp and RH (lb water/lb dry air) (lbW / lbDA)

Water Vapor = % water vapor on a volume basis = (Specific Humidity / 18 lb-mole H2O) / [(1 / 28.84 lb-mole dry air) + (Specific Humidity / 18 lb-mole H2O)]

Qstd = Flow volume on a dry basis at a standard temperature of 68^0 F = (1-Water Vapor) (Flow) [528 0R / (Temp +460)]

Dry Conc = PPMv VOC on a dry basis = [PPMmea / (1-Water Vapor)]

Response Factor of OVA/TVA meter; 1 if response factor is unknown

Corrected Conc = Dry Conc PPMv VOC corrected by Response Factor = (Dry Conc) (Response Factor)

Mass Conc (mg/m^3) = Mass concentration VOC as gasoline dry basis at standard temperature = (Corrected Conc) (128 mg/mg-mole / 24.07 m3/mg-mole)

Mass Conc (lb/ft^3) = [Mass Conc (mg/m3)] [(6.243 * 10^{-8})(lb/ft3)/(mg/m3)]

Mass Removed (lb) = [Mass Conc (lb/ft3)] [Qstd (dscfm)] [Time Interval (min)]

Aggressive Fluid and Vapor Recovery at Monitor Well MW-14
Brenntag, Charleston, SC

Date	Time		PID (ppm)		Total	Estimated Mass	Total Fluids
	Start	End	Start	End	Emissions (lbs)	Removed (gal)	Removed (gal)
6/6/2018	9:00	14:00	216	423	10.11	1.62	525
4/2/2019	8:30	15:30	53	36	1.29	0.21	525
6/25/2019	10:40	17:00	203	15000	575	92	600
8/27/2019	8:00	16:00	568	418	10.46	1.67	600
11/19/2019	8:00	16:00	264	515	15.85	2.54	600
9/14/2020	12:00	---	49	---	---	---	---
9/17/2020	---	12:00	---	299	95.65	15.3	3727
Totals					708.36	113.34	6577

Note: 9/14 thru 9/17 conducted a 72-hour test.

Notes: PID=Potoizonation Detector
lbs=pounds
gal=gallons
ppm=parts per million

ATTACHMENT B

Manifest

Please print or type.

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: SCD003370525
2. Page 1 of: 1
3. Emergency Response Phone: 800-255-3924 MIS0007951
4. Manifest Tracking Number: 013311473 FLE

GENERATOR

5. Generator's Name and Mailing Address
Breantag Mid-South
4200 Azalea Drive
N. Charleston, SC 29405
Generator's Phone: 843-744-7421

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: A&D Environmental Services (SC), LLC
U.S. EPA ID Number: SCD987598331

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address: DART, A Clean Earth Company
4132 Pompano Road
Charlotte, NC 28216
Facility's Phone: 704-395-9559
U.S. EPA ID Number: NCD121700777

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. NA3082, Hazardous Waste Liquid, N.O.S. (Tetrachloroethylene, Ethylbenzene), 9, PGIII ERG#171	1	TT	3727	G	D039
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
9b.1) Approval Number: 203330491
Emergency Response Number
800-255-3924
Job Number: PO#
Contract Number MIS0007951

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Johnnie Patterson | Signature | Month: 09 | Day: 18 | Year: 20

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Scott Melin | Signature | Month: 9 | Day: 22 | Year: 20

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

ATTACHMENT C

Laboratory Analytical Reports

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

ARCADIS Geraghty & Miller

Brenntag; Charleston, SC

SC000204.0011.00001

SGS Job Number: FA78882

Sampling Dates: 09/15/20 - 09/17/20

Report to:

ARCADIS Geraghty & Miller

jbeckner@arcadis-us.com

ATTN: Jeff Beckner

Total number of pages in report: 12

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Allison Losada 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

Test results relate only to samples analyzed.

Sections: 1 2 3 4

Table of Contents

Sample Summary

ARCADIS Geraghty & Miller

Job No: FA78882

Brenntag; Charleston, SC
Project No: SC000204.0011.00001

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA78882-1	09/15/20	07:15	CL	09/18/20	AQ	Ground Water	MW-14
FA78882-2	09/17/20	12:00	CL	09/18/20	AQ	Ground Water	MW-14

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA78882
Account: ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC
Collected: 09/15/20 thru 09/17/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA78882-1	**MW-14**					
1,2-Dichlorobenzene		483 J	500	160	ug/l	SW846 8260D
cis-1,2-Dichloroethylene		1680	500	140	ug/l	SW846 8260D
Ethylbenzene		2220	500	180	ug/l	SW846 8260D
Toluene		25000	500	150	ug/l	SW846 8260D
Trichloroethylene		345 J	500	170	ug/l	SW846 8260D
Xylene (total)		20000	1500	360	ug/l	SW846 8260D
FA78882-2	**MW-14**					
1,2-Dichlorobenzene		485 J	500	160	ug/l	SW846 8260D
cis-1,2-Dichloroethylene		1110	500	140	ug/l	SW846 8260D
Ethylbenzene		2780	500	180	ug/l	SW846 8260D
Toluene		25600	500	150	ug/l	SW846 8260D
Trichloroethylene		363 J	500	170	ug/l	SW846 8260D
Xylene (total)		25300	1500	360	ug/l	SW846 8260D

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	FA78882-1	**Date Sampled:**	09/15/20
Matrix:	AQ - Ground Water	**Date Received:**	09/18/20
Method:	SW846 8260D	**Percent Solids:**	n/a
Project:	Brenntag; Charleston, SC		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y52982.D	500	09/29/20 14:39	CV	n/a	n/a	VY2194
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL 4.2 List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [a]	ND	13000	5000	ug/l	
71-43-2	Benzene	ND	500	160	ug/l	
75-27-4	Bromodichloromethane	ND	500	120	ug/l	
75-25-2	Bromoform	ND	500	200	ug/l	
78-93-3	2-Butanone (MEK) [a]	ND	2500	1000	ug/l	
75-15-0	Carbon Disulfide	ND	1000	270	ug/l	
56-23-5	Carbon Tetrachloride	ND	500	180	ug/l	
108-90-7	Chlorobenzene	ND	500	100	ug/l	
75-00-3	Chloroethane	ND	1000	330	ug/l	
67-66-3	Chloroform	ND	500	150	ug/l	
110-82-7	Cyclohexane	ND	500	200	ug/l	
124-48-1	Dibromochloromethane	ND	500	140	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2500	520	ug/l	
106-93-4	1,2-Dibromoethane	ND	1000	140	ug/l	
75-71-8	Dichlorodifluoromethane [b]	ND	1000	250	ug/l	
95-50-1	1,2-Dichlorobenzene	483	500	160	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	500	110	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	500	130	ug/l	
75-34-3	1,1-Dichloroethane	ND	500	170	ug/l	
107-06-2	1,2-Dichloroethane	ND	500	160	ug/l	
75-35-4	1,1-Dichloroethylene	ND	500	160	ug/l	
156-59-2	cis-1,2-Dichloroethylene	1680	500	140	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	500	110	ug/l	
78-87-5	1,2-Dichloropropane	ND	500	210	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	500	150	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	500	110	ug/l	
100-41-4	Ethylbenzene	2220	500	180	ug/l	
76-13-1	Freon 113 [c]	ND	500	240	ug/l	
591-78-6	2-Hexanone	ND	5000	1000	ug/l	
98-82-8	Isopropylbenzene	ND	500	110	ug/l	
79-20-9	Methyl Acetate [a]	ND	10000	2500	ug/l	
74-83-9	Methyl Bromide	ND	1000	290	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	FA78882-1	**Date Sampled:**	09/15/20
Matrix:	AQ - Ground Water	**Date Received:**	09/18/20
Method:	SW846 8260D	**Percent Solids:**	n/a
Project:	Brenntag; Charleston, SC		

VOA TCL 4.2 List

CAS No.	Compound	Result	RL	MDL	Units	Q
74-87-3	Methyl Chloride	ND	1000	250	ug/l	
108-87-2	Methylcyclohexane	ND	500	220	ug/l	
75-09-2	Methylene Chloride	ND	2500	1000	ug/l	
108-10-1	4-Methyl-2-pentanone (MIB [a]	ND	2500	500	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	500	110	ug/l	
100-42-5	Styrene	ND	500	110	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane [a]	ND	500	150	ug/l	
127-18-4	Tetrachloroethylene	ND	500	110	ug/l	
108-88-3	Toluene	25000	500	150	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1000	250	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	500	120	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	500	230	ug/l	
79-01-6	Trichloroethylene	345	500	170	ug/l	J
75-69-4	Trichlorofluoromethane	ND	1000	250	ug/l	
75-01-4	Vinyl Chloride	ND	500	200	ug/l	
1330-20-7	Xylene (total)	20000	1500	360	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		83-118%
17060-07-0	1,2-Dichloroethane-D4	109%		79-125%
2037-26-5	Toluene-D8	96%		85-112%
460-00-4	4-Bromofluorobenzene	101%		83-118%

(a) Associated CCV outside of control limits low.
(b) Associated CCV outside of control limits high, sample was ND.
(c) Associated ICV and BS outside control limits low.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	FA78882-2	**Date Sampled:**	09/17/20
Matrix:	AQ - Ground Water	**Date Received:**	09/18/20
Method:	SW846 8260D	**Percent Solids:**	n/a
Project:	Brenntag; Charleston, SC		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y52983.D	500	09/29/20 15:07	CV	n/a	n/a	VY2194
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL 4.2 List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [a]	ND	13000	5000	ug/l	
71-43-2	Benzene	ND	500	160	ug/l	
75-27-4	Bromodichloromethane	ND	500	120	ug/l	
75-25-2	Bromoform	ND	500	200	ug/l	
78-93-3	2-Butanone (MEK) [a]	ND	2500	1000	ug/l	
75-15-0	Carbon Disulfide	ND	1000	270	ug/l	
56-23-5	Carbon Tetrachloride	ND	500	180	ug/l	
108-90-7	Chlorobenzene	ND	500	100	ug/l	
75-00-3	Chloroethane	ND	1000	330	ug/l	
67-66-3	Chloroform	ND	500	150	ug/l	
110-82-7	Cyclohexane	ND	500	200	ug/l	
124-48-1	Dibromochloromethane	ND	500	140	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2500	520	ug/l	
106-93-4	1,2-Dibromoethane	ND	1000	140	ug/l	
75-71-8	Dichlorodifluoromethane [b]	ND	1000	250	ug/l	
95-50-1	1,2-Dichlorobenzene	485	500	160	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	500	110	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	500	130	ug/l	
75-34-3	1,1-Dichloroethane	ND	500	170	ug/l	
107-06-2	1,2-Dichloroethane	ND	500	160	ug/l	
75-35-4	1,1-Dichloroethylene	ND	500	160	ug/l	
156-59-2	cis-1,2-Dichloroethylene	1110	500	140	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	500	110	ug/l	
78-87-5	1,2-Dichloropropane	ND	500	210	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	500	150	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	500	110	ug/l	
100-41-4	Ethylbenzene	2780	500	180	ug/l	
76-13-1	Freon 113 [c]	ND	500	240	ug/l	
591-78-6	2-Hexanone	ND	5000	1000	ug/l	
98-82-8	Isopropylbenzene	ND	500	110	ug/l	
79-20-9	Methyl Acetate [a]	ND	10000	2500	ug/l	
74-83-9	Methyl Bromide	ND	1000	290	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	FA78882-2	**Date Sampled:**	09/17/20
Matrix:	AQ - Ground Water	**Date Received:**	09/18/20
Method:	SW846 8260D	**Percent Solids:**	n/a
Project:	Brenntag; Charleston, SC		

VOA TCL 4.2 List

CAS No.	Compound	Result	RL	MDL	Units	Q
74-87-3	Methyl Chloride	ND	1000	250	ug/l	
108-87-2	Methylcyclohexane	ND	500	220	ug/l	
75-09-2	Methylene Chloride	ND	2500	1000	ug/l	
108-10-1	4-Methyl-2-pentanone (MIB [a]	ND	2500	500	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	500	110	ug/l	
100-42-5	Styrene	ND	500	110	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane [a]	ND	500	150	ug/l	
127-18-4	Tetrachloroethylene	ND	500	110	ug/l	
108-88-3	Toluene	25600	500	150	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1000	250	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	500	120	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	500	230	ug/l	
79-01-6	Trichloroethylene	363	500	170	ug/l	J
75-69-4	Trichlorofluoromethane	ND	1000	250	ug/l	
75-01-4	Vinyl Chloride	ND	500	200	ug/l	
1330-20-7	Xylene (total)	25300	1500	360	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		83-118%
17060-07-0	1,2-Dichloroethane-D4	110%		79-125%
2037-26-5	Toluene-D8	96%		85-112%
460-00-4	4-Bromofluorobenzene	101%		83-118%

(a) Associated CCV outside of control limits low.
(b) Associated CCV outside of control limits high, sample was ND.
(c) Associated ICV and BS outside control limits low.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

ARCADIS

ID#: FA78882

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page ___ of ___

Lab Work Order #

Send Results to:

Contact & Company Name: CHARLES LAWSON ARCADIS
Telephone: 706-828-4424
Address: 1450 Greene St Ste 200
Fax:
City: AUGUSTA State: GA Zip: 30909
E-mail Address: Charles.Lawson@Arcadis.com
Project Name/Location (City, State): BRENNTAG - CHARLESTON S.C.
Project #: 30049825
Sampler's Printed Name: C. LAWSON
Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Preservative	Filtered (✓)	# of Containers	Container Information	PARAMETER ANALYSIS & METHOD: 8260 VOC 40 mL GLASS VIAL HCL 4°C	REMARKS
1 MW-14	9/15/2020	7:15		X	W	B		3	1	3	STRONG ODOR OF HYDROCARBONS
2 MW-14	9/17/2020	12:00		X	W			3		3	STRONG ODOR HYDROCARBONS

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil
W - Water
T - Tissue
SE - Sediment
SL - Sludge
A - Air
NL - NAPL/Oil
SW - Sample Wipe
Other: _____

INITIAL ASSESSMENT DO
LABEL VERIFICATION JK

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: SGS	Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact	Printed Name: Charles LAWSON	Printed Name: FX	Printed Name: FX	Printed Name: 09/18/20 9:45
☒ Cooler packed with ice (✓)		Signature: CB Lawson	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: ARCADIS	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: 4.6 °C IR #1	Date/Time: 9/17/2020 1450	Date/Time:	Date/Time:	Date/Time:

20730826 CofC AR Form 08.27.2015

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by Arcadis

FA78882: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA78882 **Client:** ARCADIS **Project:** BRENTAG- CHARLESTON

Date / Time Received: 9/18/2020 9:45:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 138666016863

Therm ID: IR 1; **Therm CF:** -0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (4.8);

Cooler Temps (Corrected) °C: Cooler 1: (4.6);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☑		☐	☐
2. Trip Blank listed on COC	☐		☑	☐

	W	or	S	N/A
3. Type Of TB Received	☑		☐	☐

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Broken / Leaking			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☑	☐
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments SAMPLE #1 RECEIVED 1 VIAL BROKEN

SM001
Rev. Date 05/24/17

Technician: JENNAK Date: 9/18/2020 9:45:00 AM Reviewer: _____ Date: _____

FA78882: Chain of Custody
Page 2 of 2

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

ARCADIS Geraghty & Miller

Brenntag; Charleston, SC

SC000204.0011.00001

SGS Job Number: FA79100

Sampling Date: 09/23/20

Report to:

ARCADIS Geraghty & Miller
1450 Greene St Suite 220
Augusta, GA 30901
charles.lawson@arcadis.com; Edward.Hirshenson@arcadis.com

ATTN: Charles Lawson

Total number of pages in report: 17

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Allison Losada 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

Test results relate only to samples analyzed.

Sections: 1 2 3 4 5

Table of Contents

SGS North America Inc.

Sample Summary

ARCADIS Geraghty & Miller

Job No: FA79100

Brenntag; Charleston, SC
Project No: SC000204.0011.00001

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA79100-1	09/23/20	09:25	CL	09/24/20	AQ	Ground Water	MW-14

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the MDL

Summary of Hits

Job Number: FA79100
Account: ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC
Collected: 09/23/20

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA79100-1	**MW-14**					
Benzene		264 J	500	160	ug/l	SW846 8260D
1,2-Dichlorobenzene		398 J	500	160	ug/l	SW846 8260D
cis-1,2-Dichloroethylene		2380	500	140	ug/l	SW846 8260D
Ethylbenzene		4110	500	180	ug/l	SW846 8260D
Toluene		43900	500	150	ug/l	SW846 8260D
Trichloroethylene		589	500	170	ug/l	SW846 8260D
Xylene (total)		38800	1500	360	ug/l	SW846 8260D

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	FA79100-1	**Date Sampled:**	09/23/20
Matrix:	AQ - Ground Water	**Date Received:**	09/24/20
Method:	SW846 8260D	**Percent Solids:**	n/a
Project:	Brenntag; Charleston, SC		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0143889.D	500	10/02/20 18:08	SO	n/a	n/a	VC5774
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL 4.2 List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone [a]	ND	13000	5000	ug/l	
71-43-2	Benzene	264	500	160	ug/l	J
75-27-4	Bromodichloromethane	ND	500	120	ug/l	
75-25-2	Bromoform	ND	500	200	ug/l	
78-93-3	2-Butanone (MEK) [a]	ND	2500	1000	ug/l	
75-15-0	Carbon Disulfide	ND	1000	270	ug/l	
56-23-5	Carbon Tetrachloride	ND	500	180	ug/l	
108-90-7	Chlorobenzene	ND	500	100	ug/l	
75-00-3	Chloroethane	ND	1000	330	ug/l	
67-66-3	Chloroform	ND	500	150	ug/l	
110-82-7	Cyclohexane	ND	500	200	ug/l	
124-48-1	Dibromochloromethane	ND	500	140	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2500	520	ug/l	
106-93-4	1,2-Dibromoethane	ND	1000	140	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1000	250	ug/l	
95-50-1	1,2-Dichlorobenzene	398	500	160	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	500	110	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	500	130	ug/l	
75-34-3	1,1-Dichloroethane	ND	500	170	ug/l	
107-06-2	1,2-Dichloroethane	ND	500	160	ug/l	
75-35-4	1,1-Dichloroethylene	ND	500	160	ug/l	
156-59-2	cis-1,2-Dichloroethylene	2380	500	140	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	500	110	ug/l	
78-87-5	1,2-Dichloropropane	ND	500	210	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	500	150	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	500	110	ug/l	
100-41-4	Ethylbenzene	4110	500	180	ug/l	
76-13-1	Freon 113	ND	500	240	ug/l	
591-78-6	2-Hexanone	ND	5000	1000	ug/l	
98-82-8	Isopropylbenzene	ND	500	110	ug/l	
79-20-9	Methyl Acetate [a]	ND	10000	2500	ug/l	
74-83-9	Methyl Bromide [a]	ND	1000	290	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	FA79100-1	**Date Sampled:**	09/23/20
Matrix:	AQ - Ground Water	**Date Received:**	09/24/20
Method:	SW846 8260D	**Percent Solids:**	n/a
Project:	Brenntag; Charleston, SC		

VOA TCL 4.2 List

CAS No.	Compound	Result	RL	MDL	Units	Q
74-87-3	Methyl Chloride	ND	1000	250	ug/l	
108-87-2	Methylcyclohexane	ND	500	220	ug/l	
75-09-2	Methylene Chloride	ND	2500	1000	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	2500	500	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	500	110	ug/l	
100-42-5	Styrene	ND	500	110	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	500	150	ug/l	
127-18-4	Tetrachloroethylene	ND	500	110	ug/l	
108-88-3	Toluene	43900	500	150	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1000	250	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	500	120	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	500	230	ug/l	
79-01-6	Trichloroethylene	589	500	170	ug/l	
75-69-4	Trichlorofluoromethane	ND	1000	250	ug/l	
75-01-4	Vinyl Chloride	ND	500	200	ug/l	
1330-20-7	Xylene (total)	38800	1500	360	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		83-118%
17060-07-0	1,2-Dichloroethane-D4	103%		79-125%
2037-26-5	Toluene-D8	105%		85-112%
460-00-4	4-Bromofluorobenzene	102%		83-118%

(a) Associated CCV outside of control limits low.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page ___ of ___

Lab Work Order # FA79100

Send Results to:

Contact & Company Name: CHARLES LAWSON ARCADIS
Telephone: 706-829-4421
Address: Ste 220 1450 Greene St
Fax:
City: AUGUSTA State: GA Zip: 30909
E-mail Address: Charles.Lawson@Arcadis.com
Project Name/Location (City, State): Brenntag Charleston, SC
Project #: 30049825 T=5
Sampler's Printed Name: C. LAWSON
Sampler's Signature: C. Lawson

Preservative	B							
Filtered (✓)								
# of Containers	3							
Container Information	1							

PARAMETER ANALYSIS & METHOD

8260 VOC 40 mL VIAL HCL

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil, W - Water, T - Tissue, SE - Sediment, SL - Sludge, A - Air, NL - NAPL/Oil, SW - Sample Wipe, Other: _____

	Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix		REMARKS
(1)	MW-14	9/23/2020	9:25		X	W	3	STRONG HYDROCARBON ODORS
								5-DAY TURNAROUND TIME

INITIAL ASSESSMENT KSA
LABEL VERIFICATION JK

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: SGS	Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact	Printed Name: Charles Lawson	Printed Name: KK	Printed Name: KK	Printed Name: KYRA SAN AGUSTIN
☑ Cooler packed with ice (✓)		Signature: CL	Signature:	Signature:	Signature:
Specify Turnaround Requirements: 5-DAY	Sample Receipt: 12 #1	Firm: ARCADIS	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: -0.4	Date/Time: 9/23/2020 1130	Date/Time:	Date/Time:	Date/Time: 9/24/20 9:40

20730826 CofC AR Form 08.27.2015

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by Arcadis

1.4

FA79100: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA79100 **Client:** ARCADIS **Project:** 30049325

Date / Time Received: 9/24/2020 9:40:00 AM **Delivery Method:** FX **Airbill #'s:** 9231 5379 7703

Therm ID: IR 1; **Therm CF:** -0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (1.6);

Cooler Temps (Corrected) °C: Cooler 1: (1.4);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☑	☐
2. Trip Blank listed on COC	☐		☑	☐

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☑	☐
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 9/24/2020 9:40:00 AM Reviewer: _____ Date: _____

FA79100: Chain of Custody
Page 2 of 2

MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA79100
Account: ARCGMSCA ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VC5774-MB	C0143870.D	1	10/02/20	SO	n/a	n/a	VC5774

The QC reported here applies to the following samples: **Method:** SW846 8260D

FA79100-1

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
110-82-7	Cyclohexane	ND	1.0	0.39	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.22	ug/l	
79-20-9	Methyl Acetate	ND	20	5.0	ug/l	
74-83-9	Methyl Bromide	0.99	2.0	0.59	ug/l	J
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
108-87-2	Methylcyclohexane	ND	1.0	0.44	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.0	ug/l	

Method Blank Summary

Job Number: FA79100
Account: ARCGMSCA ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VC5774-MB	C0143870.D	1	10/02/20	SO	n/a	n/a	VC5774

The QC reported here applies to the following samples: **Method:** SW846 8260D

FA79100-1

CAS No.	Compound	Result	RL	MDL	Units	Q
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.23	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.72	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	95%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	79-125%
2037-26-5	Toluene-D8	107%	85-112%
460-00-4	4-Bromofluorobenzene	101%	83-118%

Blank Spike Summary

Job Number: FA79100
Account: ARCGMSCA ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VC5774-BS	C0143867.D	1	10/02/20	SO	n/a	n/a	VC5774

The QC reported here applies to the following samples: **Method:** SW846 8260D

FA79100-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	93.2	75	50-147
71-43-2	Benzene	25	22.5	90	81-122
75-27-4	Bromodichloromethane	25	21.8	87	79-123
75-25-2	Bromoform	25	23.0	92	66-123
78-93-3	2-Butanone (MEK)	125	88.8	71	56-143
75-15-0	Carbon Disulfide	25	19.4	78	66-148
56-23-5	Carbon Tetrachloride	25	22.1	88	76-136
108-90-7	Chlorobenzene	25	24.9	100	82-124
75-00-3	Chloroethane	25	23.3	93	62-144
67-66-3	Chloroform	25	22.0	88	80-124
110-82-7	Cyclohexane	25	22.7	91	73-138
124-48-1	Dibromochloromethane	25	25.0	100	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	23.9	96	64-123
106-93-4	1,2-Dibromoethane	25	24.0	96	75-120
75-71-8	Dichlorodifluoromethane	25	18.2	73	42-167
95-50-1	1,2-Dichlorobenzene	25	26.3	105	82-124
541-73-1	1,3-Dichlorobenzene	25	27.3	109	84-125
106-46-7	1,4-Dichlorobenzene	25	26.4	106	78-120
75-34-3	1,1-Dichloroethane	25	21.4	86	81-122
107-06-2	1,2-Dichloroethane	25	22.2	89	75-125
75-35-4	1,1-Dichloroethylene	25	23.3	93	78-137
156-59-2	cis-1,2-Dichloroethylene	25	22.0	88	78-120
156-60-5	trans-1,2-Dichloroethylene	25	22.2	89	76-127
78-87-5	1,2-Dichloropropane	25	22.1	88	76-124
10061-01-5	cis-1,3-Dichloropropene	25	21.8	87	75-118
10061-02-6	trans-1,3-Dichloropropene	25	23.6	94	80-120
100-41-4	Ethylbenzene	25	25.1	100	81-121
76-13-1	Freon 113	25	19.6	78	72-134
591-78-6	2-Hexanone	125	103	82	61-129
98-82-8	Isopropylbenzene	25	25.7	103	83-132
79-20-9	Methyl Acetate	125	94.2	75	65-126
74-83-9	Methyl Bromide	25	18.1	72	59-143
74-87-3	Methyl Chloride	25	20.8	83	50-159
108-87-2	Methylcyclohexane	25	23.2	93	76-129
75-09-2	Methylene Chloride	25	19.7	79	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	105	84	66-122

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA79100
Account: ARCGMSCA ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VC5774-BS	C0143867.D	1	10/02/20	SO	n/a	n/a	VC5774

The QC reported here applies to the following samples: **Method:** SW846 8260D

FA79100-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
1634-04-4	Methyl Tert Butyl Ether	25	21.8	87	72-117
100-42-5	Styrene	25	24.7	99	78-119
79-34-5	1,1,2,2-Tetrachloroethane	25	25.8	103	72-120
127-18-4	Tetrachloroethylene	25	24.2	97	76-135
108-88-3	Toluene	25	24.7	99	80-120
120-82-1	1,2,4-Trichlorobenzene	25	25.3	101	73-129
71-55-6	1,1,1-Trichloroethane	25	21.7	87	75-130
79-00-5	1,1,2-Trichloroethane	25	24.5	98	76-119
79-01-6	Trichloroethylene	25	21.7	87	81-126
75-69-4	Trichlorofluoromethane	25	23.4	94	71-156
75-01-4	Vinyl Chloride	25	21.3	85	69-159
1330-20-7	Xylene (total)	75	78.0	104	80-126

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	97%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%
2037-26-5	Toluene-D8	109%	85-112%
460-00-4	4-Bromofluorobenzene	103%	83-118%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA79100
Account: ARCGMSCA ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA79122-2MS	C0143878.D	200	10/02/20	SO	n/a	n/a	VC5774
FA79122-2MSD	C0143879.D	200	10/02/20	SO	n/a	n/a	VC5774
FA79122-2	C0143877.D	200	10/02/20	SO	n/a	n/a	VC5774

The QC reported here applies to the following samples: **Method:** SW846 8260D

FA79100-1

CAS No.	Compound	FA79122-2 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		25000	17700	71	25000	17800	71	1	50-147/21
71-43-2	Benzene	5110		5000	9420	86	5000	8550	69*	10	81-122/14
75-27-4	Bromodichloromethane	ND		5000	4240	85	5000	3850	77*	10	79-123/19
75-25-2	Bromoform	ND		5000	4130	83	5000	4190	84	1	66-123/21
78-93-3	2-Butanone (MEK)	ND		25000	16800	67	25000	17600	70	5	56-143/18
75-15-0	Carbon Disulfide	ND		5000	3740	75	5000	3350	67	11	66-148/23
56-23-5	Carbon Tetrachloride	ND		5000	4330	87	5000	3950	79	9	76-136/23
108-90-7	Chlorobenzene	ND		5000	4850	97	5000	4400	88	10	82-124/14
75-00-3	Chloroethane	ND		5000	4440	89	5000	4120	82	7	62-144/20
67-66-3	Chloroform	ND		5000	4120	82	5000	3780	76*	9	80-124/15
110-82-7	Cyclohexane	400		5000	4900	90	5000	4340	79	12	73-138/18
124-48-1	Dibromochloromethane	ND		5000	4700	94	5000	4520	90	4	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		5000	4180	84	5000	4730	95	12	64-123/18
106-93-4	1,2-Dibromoethane	ND		5000	4720	94	5000	4560	91	3	75-120/13
75-71-8	Dichlorodifluoromethane	ND		5000	3440	69	5000	3120	62	10	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		5000	4950	99	5000	4790	96	3	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		5000	5020	100	5000	4950	99	1	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		5000	4930	99	5000	4630	93	6	78-120/15
75-34-3	1,1-Dichloroethane	ND		5000	4140	83	5000	3700	74*	11	81-122/15
107-06-2	1,2-Dichloroethane	ND		5000	4280	86	5000	3890	78	10	75-125/14
75-35-4	1,1-Dichloroethylene	ND		5000	4300	86	5000	3870	77*	11	78-137/18
156-59-2	cis-1,2-Dichloroethylene	ND		5000	4000	80	5000	3810	76*	5	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		5000	4210	84	5000	3820	76	10	76-127/17
78-87-5	1,2-Dichloropropane	ND		5000	4290	86	5000	3940	79	9	76-124/14
10061-01-5	cis-1,3-Dichloropropene	ND		5000	4150	83	5000	3860	77	7	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		5000	4450	89	5000	4270	85	4	80-120/22
100-41-4	Ethylbenzene	3400		5000	8390	100	5000	7750	87	8	81-121/14
76-13-1	Freon 113	ND		5000	3450	69*	5000	3280	66*	5	72-134/20
591-78-6	2-Hexanone	ND		25000	19000	76	25000	19800	79	4	61-129/18
98-82-8	Isopropylbenzene	128	J	5000	5030	98	5000	4680	91	7	83-132/15
79-20-9	Methyl Acetate	ND		25000	17200	69	25000	17900	72	4	65-126/18
74-83-9	Methyl Bromide	ND		5000	2880	58*	5000	2850	57*	1	59-143/19
74-87-3	Methyl Chloride	ND		5000	3630	73	5000	3490	70	4	50-159/19
108-87-2	Methylcyclohexane	184	J	5000	4760	92	5000	4430	85	7	76-129/17
75-09-2	Methylene Chloride	ND		5000	3840	77	5000	3380	68*	13	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		25000	20000	80	25000	19800	79	1	66-122/16

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA79100
Account: ARCGMSCA ARCADIS Geraghty & Miller
Project: Brenntag; Charleston, SC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA79122-2MS	C0143878.D	200	10/02/20	SO	n/a	n/a	VC5774
FA79122-2MSD	C0143879.D	200	10/02/20	SO	n/a	n/a	VC5774
FA79122-2	C0143877.D	200	10/02/20	SO	n/a	n/a	VC5774

The QC reported here applies to the following samples: **Method:** SW846 8260D

FA79100-1

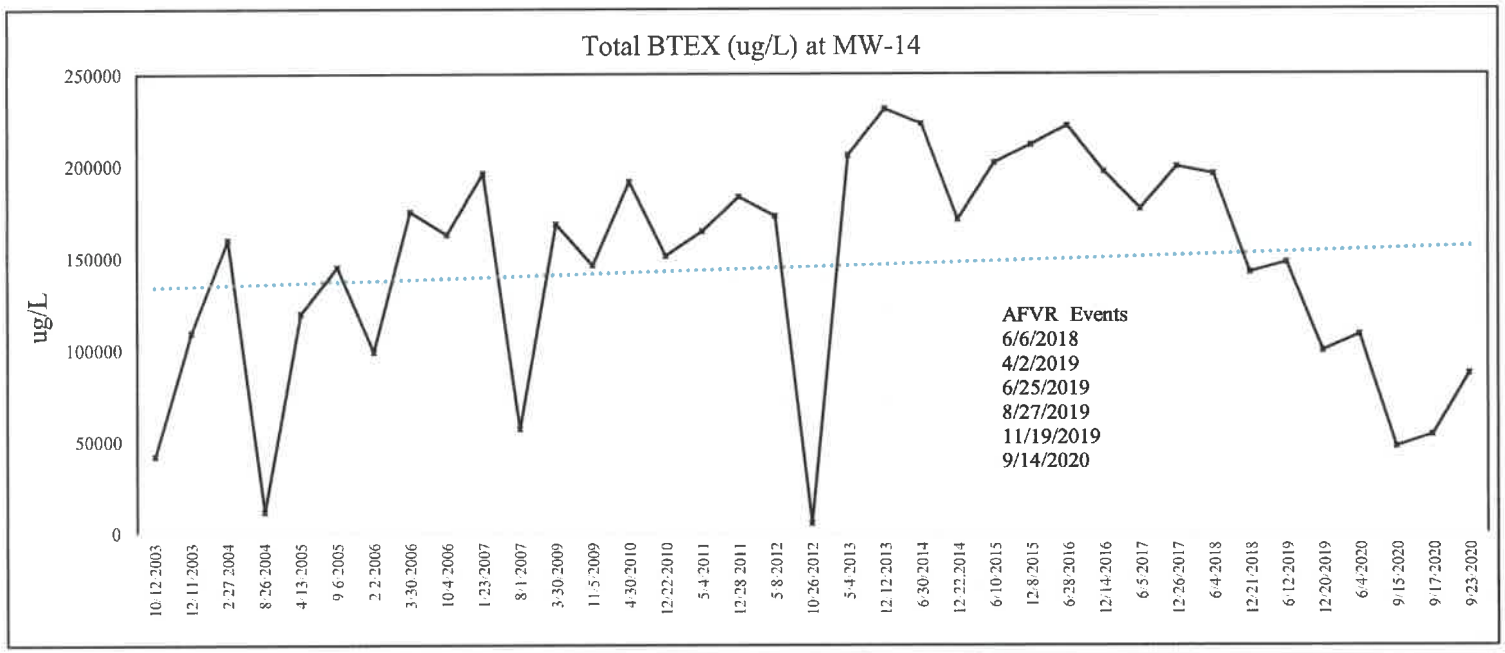
CAS No.	Compound	FA79122-2 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
1634-04-4	Methyl Tert Butyl Ether	595		5000	4750	83	5000	4590	80	3	72-117/14
100-42-5	Styrene	ND		5000	4670	93	5000	4420	88	6	78-119/23
79-34-5	1,1,2,2-Tetrachloroethane	ND		5000	4610	92	5000	4690	94	2	72-120/14
127-18-4	Tetrachloroethylene	ND		5000	4700	94	5000	4440	89	6	76-135/16
108-88-3	Toluene	3390		5000	8290	98	5000	7660	85	8	80-120/14
120-82-1	1,2,4-Trichlorobenzene	ND		5000	4620	92	5000	4700	94	2	73-129/20
71-55-6	1,1,1-Trichloroethane	ND		5000	4350	87	5000	3710	74*	16	75-130/16
79-00-5	1,1,2-Trichloroethane	ND		5000	4750	95	5000	4390	88	8	76-119/14
79-01-6	Trichloroethylene	ND		5000	4220	84	5000	3810	76*	10	81-126/15
75-69-4	Trichlorofluoromethane	ND		5000	4790	96	5000	4110	82	15	71-156/21
75-01-4	Vinyl Chloride	ND		5000	4030	81	5000	3590	72	12	69-159/18
1330-20-7	Xylene (total)	18400		15000	34100	105	15000	31200	85	9	80-126/15

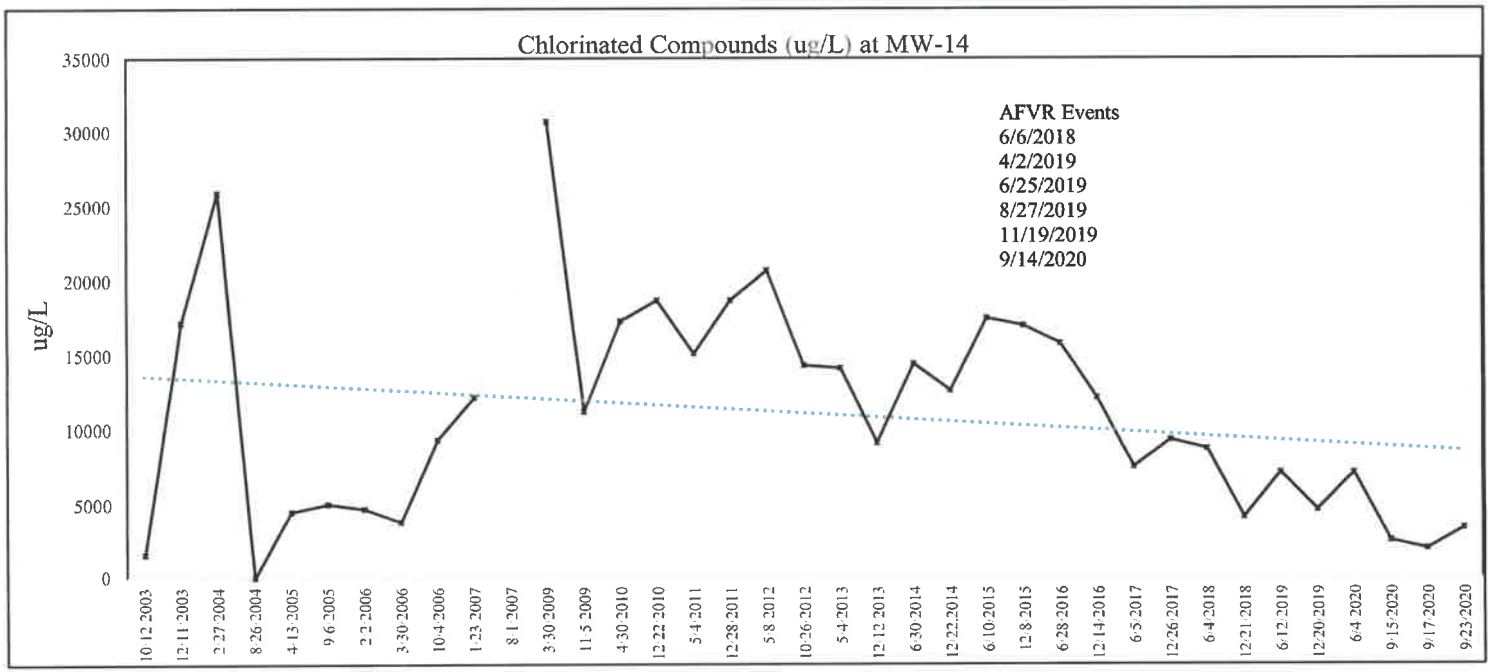
CAS No.	Surrogate Recoveries	MS	MSD	FA79122-2	Limits
1868-53-7	Dibromofluoromethane	97%	97%	95%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	102%	103%	79-125%
2037-26-5	Toluene-D8	108%	107%	108%	85-112%
460-00-4	4-Bromofluorobenzene	100%	101%	101%	83-118%

* = Outside of Control Limits.

ATTACHMENT D

Graphs


Total BTEX (ug/L) at MW-14
ug/L
250000
200000
150000
100000
50000
0
AFVR Events
6/6/2018
4/2/2019
6/25/2019
8/27/2019
11/19/2019
9/14/2020
10 12 2003
12 11 2003
2 27 2004
8 26 2004
4 13 2005
9 6 2005
2 2 2006
3 30 2006
10 4 2006
1 23 2007
8 1 2007
3 30 2009
11 5 2009
4 30 2010
12 22 2010
5 4 2011
12 28 2011
5 8 2012
10 26 2012
5 4 2013
12 12 2013
6 30 2014
12 22 2014
6 10 2015
12 8 2015
6 28 2016
12 14 2016
6 5 2017
12 26 2017
6 4 2018
12 21 2018
6 12 2019
12 20 2019
6 4 2020
9 15 2020
9 17 2020
9 23 2020


Chlorinated Compounds (ug/L) at MW-14
ug/L
35000
30000
25000
20000
15000
10000
5000
0
AFVR Events
6/6/2018
4/2/2019
6/25/2019
8/27/2019
11/19/2019
9/14/2020
10 12 2003
12 11 2003
2 27 2004
8 26 2004
4 13 2005
9 6 2005
2 2 2006
3 30 2006
10 4 2006
1 23 2007
8 1 2007
3 30 2009
11 5 2009
4 30 2010
12 22 2010
5 4 2011
12 28 2011
5 8 2012
10 26 2012
5 4 2013
12 12 2013
6 30 2014
12 22 2014
6 10 2015
12 8 2015
6 28 2016
12 14 2016
6 5 2017
12 26 2017
6 4 2018
12 21 2018
6 12 2019
12 20 2019
6 4 2020
9 15 2020
9 17 2020
9 23 2020