NORTHROP GRUMMAN

ISTR Operations Monthly Progress Report

Reporting Period: November 2021*

Operable Unit 3 VOC Source Area Remedy
Former Grumman Settling Ponds, Bethpage, NY
NYSDEC Site No. 130003A
January 6, 2021

* Covers period of 10/22 through 11/30 (see note on page 3)

In-Situ Thermal Remediation (ISTR) Operations Monthly Progress Report

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Prepared per Section 8.2 of the OU3 Remedial Action Work Plan (RAWP) and DER-10, Section 5.7(b):

1. Remedy Progress / Performance Monitoring
2. Ambient Air
3. Significant Activities
4. Schedule / Proposed Modifications
5. Data Tables

Remedy Progress / Performance Monitoring November 2021*

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ISTR Operations Summary

- TVOCs air emissions are depicted in slide 6.
- Site-wide vapor emissions will be reported in the next SGCS and GWCS OM&M reports and compared to the emissions limits specified in the 8/12/21 Proposed Modifications to the OU3 SGCS.
- No exceedances of NYSDEC Community Air Monitoring Plan (CAMP) PID action levels**
- No exceedances of NYS SPDES permit equivalency limits

** November reporting period covers 10/22 through 11/30. After 10/21, following completion of the "crossover" piping construction (per NYSDEC 9/21 approval), existing OU3 SGCS process equipment began extracting vapors from the ISTR wellfield. October operations following "crossover" (10/22 through 10/31) are included in this November 2021 report.*

*** See slide 10 for additional information*

Reporting Period: November 2021

System Startup	8/26/2020
Days of Operation Since Startup	462
Estimated cumulative TVOC Mass Removed through crossover to OU3 SGCS (10/18/21), lbs	1,366
TVOC Mass Recovery Rate at end of reporting period, lb/day	0.09

Remedy Progress / Performance Monitoring November 2021

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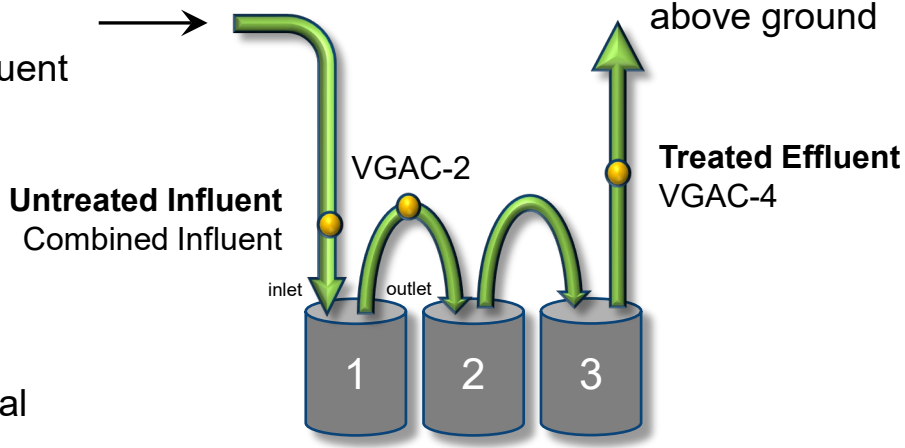
Vapor Treatment System following Crossover

From extraction system:
- SGCS Header
- ISTR Wellfield Influent



- Vapor Treatment System Sampling Locations, 5 total

Remedy Progress / Performance Monitoring November 2021

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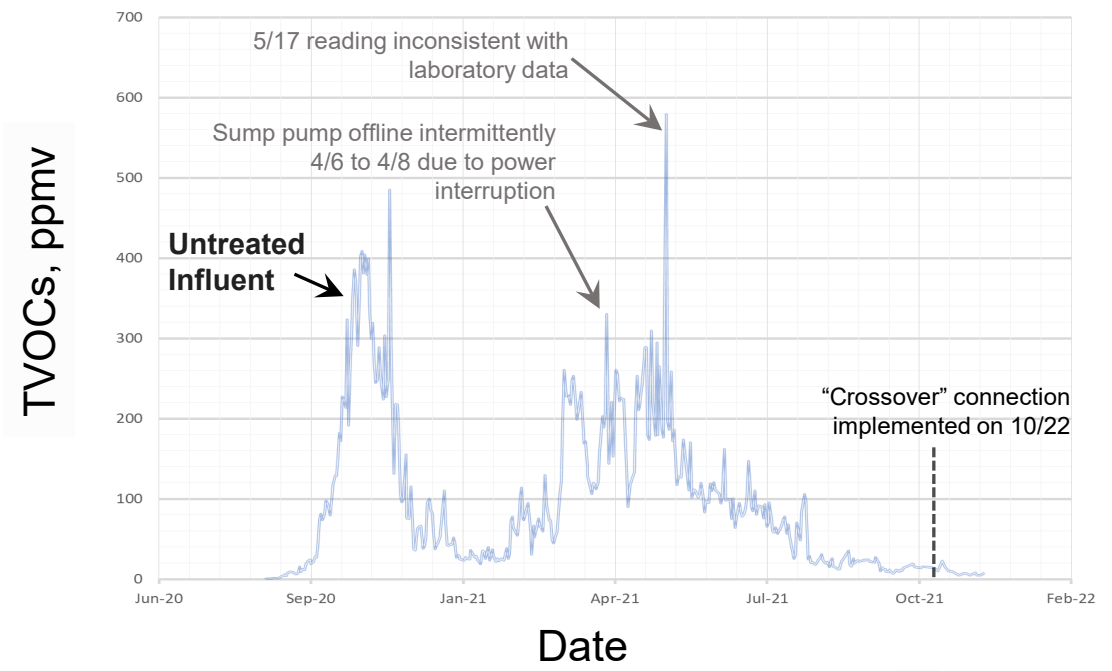
Vapor Treatment System (PID)



TVOC concentrations (PID) on November 29:

- Influent* = 7.3 ppmv
- Effluent** = 0.5 ppmv

Maximum TVOC concentrations (PID) during November reporting period:

- Influent* = 23 ppmv (11/15)
- Effluent** = 1.3 ppmv (11/15)

** Influent concentration for wellfield vapor stream only*

*** Effluent concentration measured at sampling location VGAC-4 (see slide 4 for sampling location).*

Remedy Progress / Performance Monitoring November 2021

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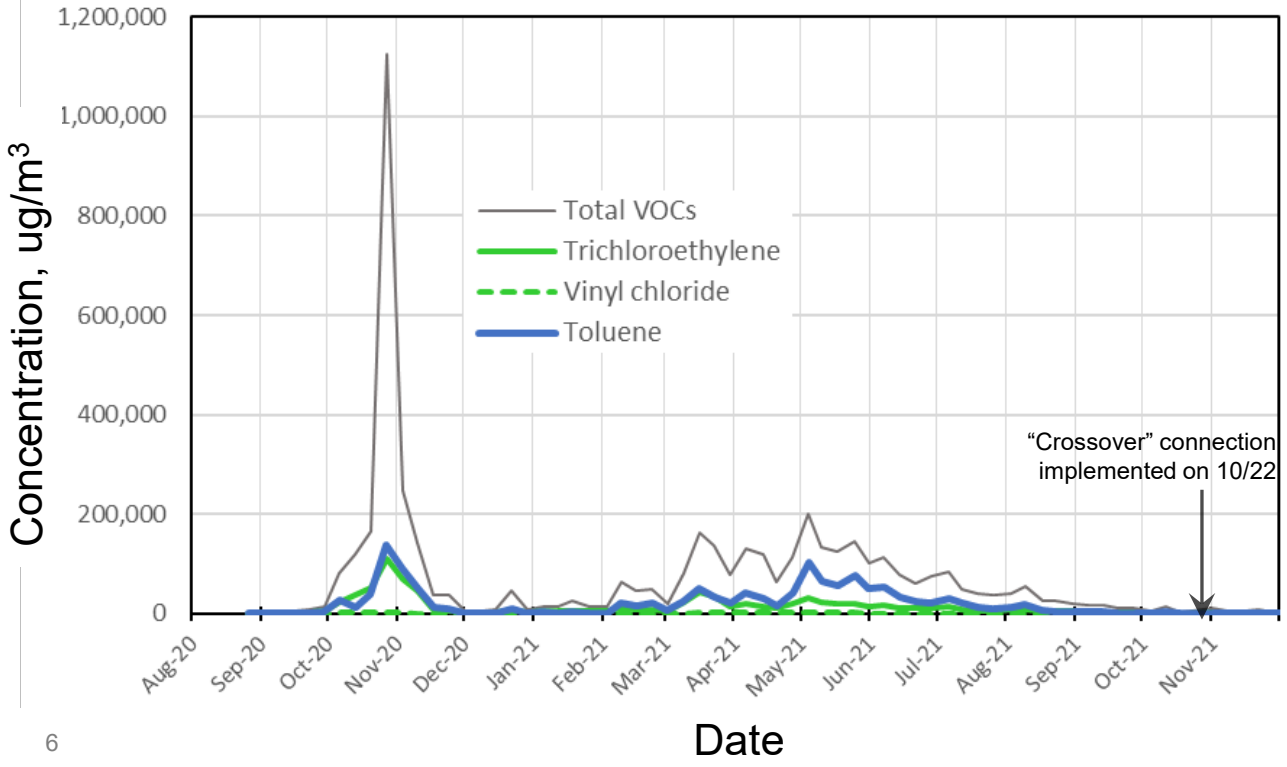
Vapor Treatment System Influent*



Influent concentrations (Summa) on 11/29:

- TVOCs = 2,964 ug/m^3
- TCE = 838 ug/m^3
- Vinyl chloride = 62 ug/m^3

* *Influent sample collected from the "Wellfield Influent" sampling location starting 11/1/21*

Remedy Progress / Performance Monitoring November 2021

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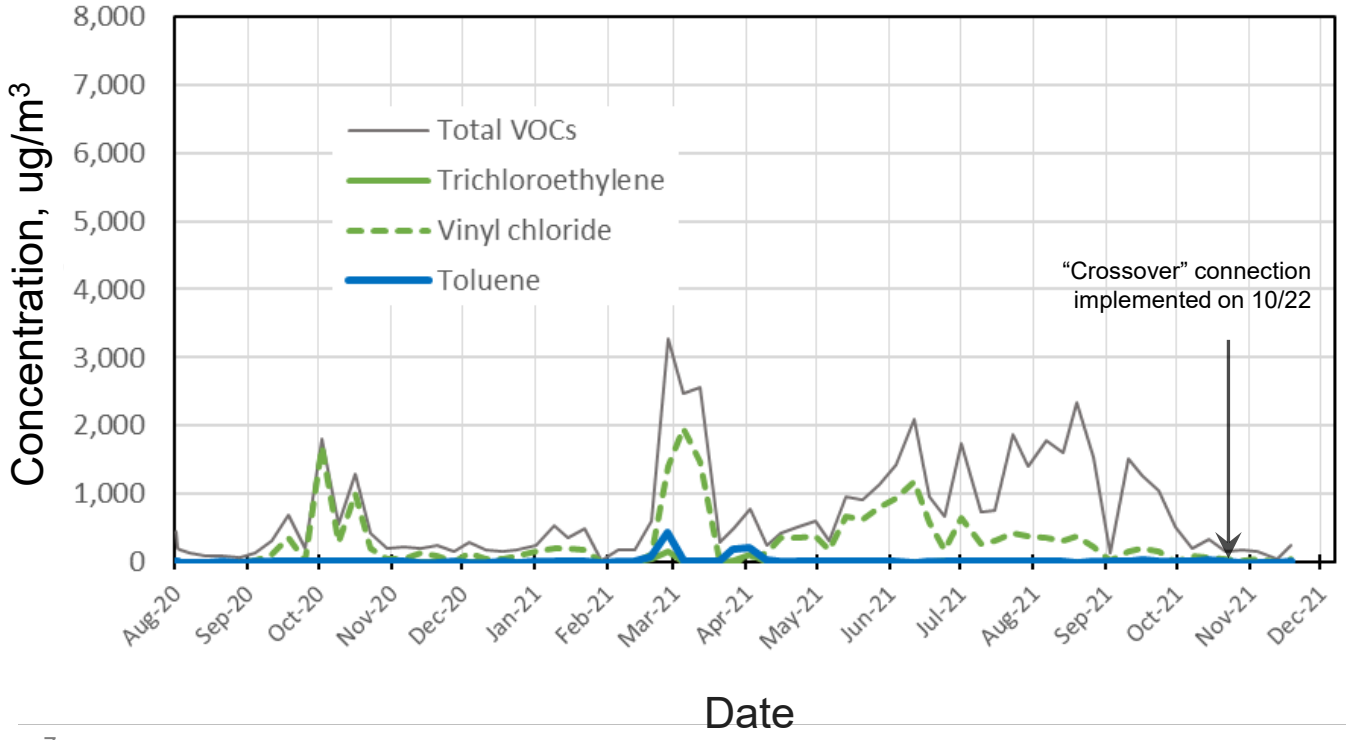
Vapor Treatment System Effluent*



Effluent concentrations (Summa) on 11/29:

- TVOCs = 163 ug/m^3
- TCE = <1 ug/m^3
- Vinyl chloride = 37 ug/m^3

** Effluent sample collected from the "VGAC-4" sampling location starting 11/1/21*

Remedy Progress / Performance Monitoring
November 2021

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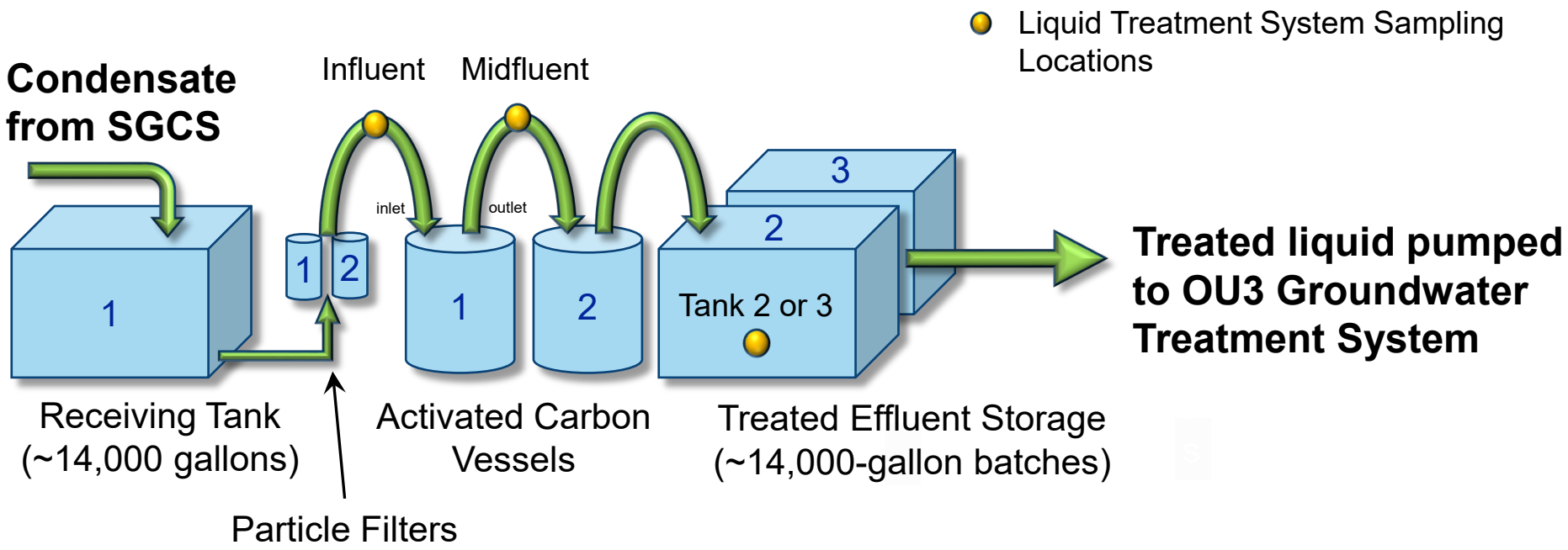
Liquid Treatment System



Remedy Progress / Performance Monitoring November 2021

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Cumulative Liquid Produced

- 11,984 gallons treated effluent discharged to OU3 groundwater treatment system during reporting period, for a cumulative total of 268,704 gallons. Pre-discharge effluent characterization results provided in Table 2.
- 301,671 total gallons extracted through end of reporting period, including 14,989 gallons previously transported offsite for treatment and disposal, and approximately 17,978 gallons stored onsite pending characterization prior to disposal through the OU3 system.

Ambient Air PID Monitoring
November 2021

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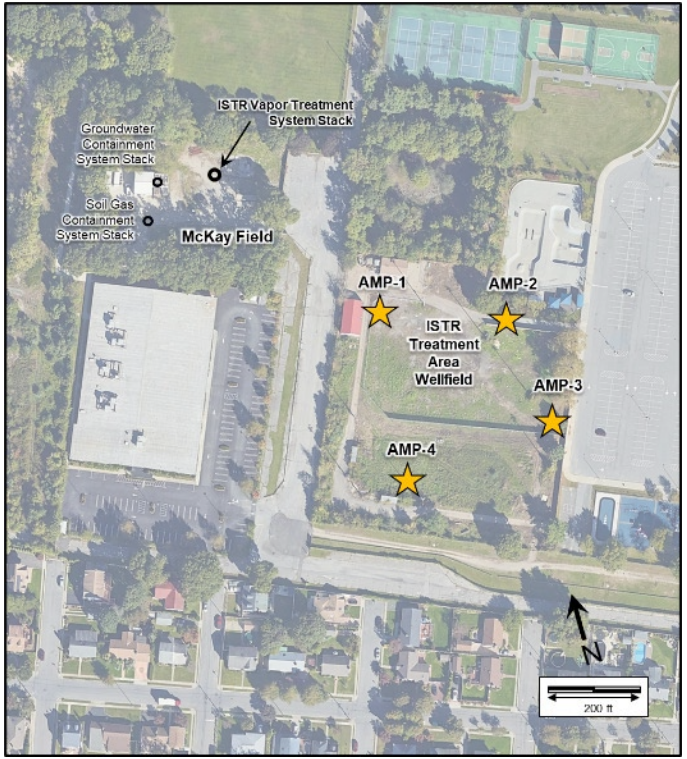
PID levels comply with Community Air Monitoring Plan (CAMP) criteria in the RAWP:

- PID readings recorded continuously at locations AMP-1 through 4 through 11/10*
- Results emailed daily to the State and Town of Oyster Bay (Monday through Saturday)
- PID monitoring results did not exceed NYSDEC's CAMP action level (5 ppm TVOCs for a 15-minute average)

* Monitoring discontinued following DEC approval on 11/10 to discontinue PID monitoring at the four CAMP monitoring stations.



Significant Activities
November 2021

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Major equipment repairs and significant downtime:

- None.

Other significant activities:

- PID monitoring discontinued at CAMP stations following NYSDEC approval on 11/10/21.
- Continued to purge water from VEWs.
- Continued LNAPL gauging and removal in VEWs through 11/15.

Planned Significant Activities During Next Two Months

- Maintain vapor extraction and treatment system operation, monitoring, and maintenance at the modified OU3 SGCS in preparation for system shutdown.
- Evaluate rebound (if any) following mid-November discontinuation of LNAPL gauging and removal in 8 VEWs.
- Continue purging water from shallow VEWs.

Schedule

Activity	RAWP Schedule	Current Status
Remedial System Operation	Q3/20 – Q1/21	Q3/20 – Q1/22
Post-Treatment Confirmation Sampling	Q1/21	Complete
Remedy Cool-down	Q1/21-Q2-21	Q1/21 – Q2/22
Equipment Removal & Site Restoration	Q2/21	Q1/22

ISTR vapor extraction and treatment continues to operate in the modified OU3 SGCS.

Pending RAWP Modifications

None


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HSW

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

Compound (ug/m^3)	Sample ID:	OU3 SGCS INFLUENT	VGAC-2	VGAC-4
	Lab Sample ID:	JD34123-1	JD34123-3	JD34123-4
	Date Sampled:	10/25/2021	10/25/2021	10/25/2021
1,1,1-Trichloroethane		**3.8**	< 0.71	< 0.71
1,1-Dichloroethane		**4.0**	< 0.19	< 0.19
1,1-Dichloroethylene		< 0.27	< 0.27	< 0.27
1,2,4-Trimethylbenzene		< 0.64	< 0.64	< 0.64
1,2-Dibromoethane		< 0.55	< 0.55	< 0.55
1,3,5-Trimethylbenzene		< 0.64	< 0.64	< 0.64
1,3-Butadiene		< 0.40	< 0.40	< 0.40
1,4-Dioxane*		< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		< 0.41	< 0.41	< 0.41
2-Hexanone		< 0.61	< 0.61	< 0.61
4-Ethyltoluene		< 0.59	< 0.59	< 0.59
Acetone*		**5.2**	**48.7**	**29.5**
Benzene		< 0.15	**1.3** J	**7.0**
Bromoform		< 1.6	< 1.6	< 1.6
Carbon disulfide		< 0.29	< 0.29	< 0.29
Carbon tetrachloride		< 0.59	< 0.59	< 0.59
Chloroethane		< 0.50	**1.2** J	< 0.50
Chloroform		**63.5**	< 0.39	< 0.39
Chloromethane*		< 0.13	**3.5**	**3.3**
cis-1,2-Dichloroethylene		**127**	**4.8**	< 0.19
Cyclohexane		< 0.30	< 0.30	< 0.30
Dichlorodifluoromethane		**2.4** J	**3.2** J	**3.2** J
Ethanol		**88.4**	**35.6**	**301**
Ethyl acetate		**12**	**7.9**	**5.0**
Ethylbenzene		< 0.26	**8.7**	**4.3**
Freon 113				
Heptane		< 0.29	< 0.29	< 0.29
Hexane		< 0.15	< 0.15	< 0.15
Isopropyl alcohol*		**4.2**	**16**	**5.7**
m,p-Xylene		< 0.61	**38**	**15**
m-Dichlorobenzene		< 0.46	< 0.46	< 0.46
Methyl ethyl ketone		< 0.50	**4.4**	**3.8**
Methyl isobutyl ketone		< 0.57	**36**	**32**
Methylene chloride*		< 0.20	**2.2** J	< 0.20
o-Dichlorobenzene		< 0.52	< 0.52	< 0.52
o-Xylene		< 0.30	**11**	**4.1**
Propylene*		< 0.11	**30.6**	**72.5**
Styrene		< 0.32	< 0.32	< 0.32
Tertiary butyl alcohol		**1.4** J	< 0.17	**2.7**
Tetrachloroethylene		**8.1**	< 0.81	< 0.81
Tetrahydrofuran		< 0.59	< 0.59	< 0.59
Toluene		< 0.22	**4.9**	**5.3**
trans-1,2-Dichloroethylene		**3.2**	< 0.11	**1.4** J
Trichloroethylene		**335**	**5.3**	< 0.41
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62
Vinyl acetate		< 0.49	< 0.49	< 0.49
Vinyl chloride*		< 0.23	**70.6**	**6.4**
Xylenes (total)		< 0.30	**49.5**	**19**
TVOCs		**658**	**334.4**	**502**
TVOCs less poor adsorbers*		**649**	**163**	**385**

Footnotes:

ug/mg^3 micrograms per cubic meter
* Compound is poorly adsorbed by activated carbon.
< Compound was not detected at or above the indicated value.
J Detected concentration is less than the quantitation limit.
TVOCs Total volatile organic compounds
Detections are highlighted.

Note:
Wellfield Influent sample JD34123-2 and Combined Influent sample JD34123-5 received by lab with vacuum out of range (+0.4 psi pressure); analyses therefore canceled by HSW.

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Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

HSW

Compound (ug/m^3)	Sample ID:	WELLFIELD INFLUENT		OU3 SGCS INFLUENT		COMBINED INFLUENT		VGAC-2		VGAC-4	
	Lab Sample ID:	JD34484-5		JD34484-1		JD34484-2		JD34484-3		JD34484-4	
	Date Sampled:	11/1/2021		11/1/2021		11/1/2021		11/1/2021		11/1/2021	
1,1,1-Trichloroethane		< 3.6		2.3		< 1.5		< 0.71		< 0.71	
1,1-Dichloroethane		24		2.9	J	13		1.9	J	< 0.19	
1,1-Dichloroethylene		9.9		< 0.27		4.4		< 0.27		< 0.27	
1,2,4-Trimethylbenzene		115		< 0.64		52.1		< 0.64		< 0.64	
1,2-Dibromoethane		< 2.8		< 0.55		< 1.1		< 0.55		< 0.55	
1,3,5-Trimethylbenzene		56.5		< 0.64		26		< 0.64		< 0.64	
1,3-Butadiene		< 2.0		< 0.40		< 0.82		< 0.40		< 0.40	
1,4-Dioxane*		< 3.6		< 0.76		< 1.5		< 0.76		< 0.76	
2,2,4-Trimethylpentane		23		< 0.41		11		< 0.41		< 0.41	
2-Hexanone		91.2		< 0.61		38		< 0.61		< 0.61	
4-Ethyltoluene		19	J	< 0.59		9.3		< 0.59		< 0.59	
Acetone*		1,740		4.0		931		32.3		14	
Benzene		32		< 0.15		3.5	J	< 0.15		1.8	J
Bromoform		< 7.8		< 1.6		< 3.1		< 1.6		< 1.6	
Carbon disulfide		49.8		< 0.29		21		17		< 0.29	
Carbon tetrachloride		< 3.0		< 0.59		< 1.2		< 0.59		< 0.59	
Chloroethane		< 2.6		< 0.50		< 1.0		2.1		3.2	
Chloroform		< 2.0		42		31		1.9	J	< 0.39	
Chloromethane*		4.5	J	< 0.13		2.5	J	< 0.13		< 0.13	
cis-1,2-Dichloroethylene		1,280		86.0		634		17		< 0.19	
Cyclohexane		7.2	J	< 0.30		< 0.62		< 0.30		< 0.30	
Dichlorodifluoromethane		2.5	J	2.3	J	< 0.64		2.8	J	2.9	J
Ethanol		128		6.0		59.7		46.5		24.7	
Ethyl acetate		7.6	J	3.6		12		6.5		10	
Ethylbenzene		226		< 0.26		101		2.3	J	< 0.26	
Freon 113											
Heptane		41.8		< 0.29		16		< 0.29		< 0.29	
Hexane		14		< 0.15		< 0.30		< 0.15		< 0.15	
Isopropyl alcohol*		46.5		< 0.64		22		3.2		2.1	
m,p-Xylene		712		< 0.61		325		9.1		4.3	
m-Dichlorobenzene		< 2.3		< 0.46		< 0.90		< 0.46		< 0.46	
Methyl ethyl ketone		519		< 0.50		225		< 0.50		< 0.50	
Methyl isobutyl ketone		30		< 0.57		14		11		4.5	
Methylene chloride*		< 1.0		< 0.20		< 0.42		< 0.20		< 0.20	
o-Dichlorobenzene		< 2.6		< 0.52		< 1.0		< 0.52		< 0.52	
o-Xylene		204		< 0.30		93.4		2.9	J	1.3	J
Propylene*		85.5		< 0.11		36.8		48.4		52.6	
Styrene		< 1.6		< 0.32		3.3	J	< 0.32		< 0.32	
Tertiary butyl alcohol		28		< 0.17		12		< 0.17		< 0.17	
Tetrachloroethylene		26		4.9		13		< 0.81		< 0.81	
Tetrahydrofuran		6.5	J	< 0.59		2.9	J	< 0.59		< 0.59	
Toluene		1,710		< 0.22		773		< 0.22		1.9	J
trans-1,2-Dichloroethylene		37		2.0	J	17		< 0.11		< 0.11	
Trichloroethylene		2,240		231		1,190		1.0		0.91	
Trichlorofluoromethane		< 3.1		< 0.62		< 1.2		< 0.62		< 0.62	
Vinyl acetate		60.9		< 0.49		26		< 0.49		< 0.49	
Vinyl chloride*		138		< 0.23		60.1		88.4		81.8	
Xylenes (total)		916		< 0.30		418		12		5.6	
TVOCs		9,720		387		4,780		294.3		206.0	
TVOCs less poor adsorbers*		7,710		383		3,730		120.0		55.5	

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are highlighted.

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Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

HSW

Compound (ug/m^3)	Sample ID:	WELLFIELD INFLUENT	OU3 SGCS INFLUENT	COMBINED INFLUENT	VGAC-2	VGAC-4
	Lab Sample ID:	JD34942-2	JD34942-1	JD34942-3	JD34942-4	JD34942-5
	Date Sampled:	11/8/2021	11/8/2021	11/8/2021	11/8/2021	11/8/2021
1,1,1-Trichloroethane		2.9	2.7	3.4	< 0.71	< 0.71
1,1-Dichloroethane		19	3.0 J	12	10	< 0.19
1,1-Dichloroethylene		7.5	< 0.27	4.4	5.2	< 0.27
1,2,4-Trimethylbenzene		22	< 0.64	70.3	< 0.64	< 0.64
1,2-Dibromoethane		< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
1,3,5-Trimethylbenzene		14	< 0.64	35	< 0.64	< 0.64
1,3-Butadiene		< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		21	< 0.41	9.8	< 0.41	< 0.41
2-Hexanone		73.6	< 0.61	65.4	< 0.61	< 0.61
4-Ethyltoluene		16	< 0.59	39	< 0.59	< 0.59
Acetone*		974	4.0	665	163	57.5
Benzene		18	< 0.15	3.5	1.3 J	2.7
Bromoform		< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Carbon disulfide		33.6	< 0.29	17	28	< 0.29
Carbon tetrachloride		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Chloroethane		2.0 J	< 0.50	1.1 J	1.6 J	2.0 J
Chloroform		5.4	50.3	34	11	< 0.39
Chloromethane*		3.3	< 0.13	2.5	2.7	< 0.13
cis-1,2-Dichloroethylene		662	99.5	507	95.9	5.6
Cyclohexane		< 0.30	< 0.30	4.1	< 0.30	< 0.30
Dichlorodifluoromethane		1.9 J	2.0 J	2.3 J	2.0 J	2.6 J
Ethanol		121	6.8	57.1	86.5	60.7
Ethyl acetate		< 0.54	< 0.54	< 0.54	1.9 J	4.7
Ethylbenzene		93.4	< 0.26	103	2.6 J	< 0.26
Freon 113		< 0.52	< 0.52	0.77 J	< 0.52	< 0.52
Heptane		34	< 0.29	19	< 0.29	< 0.29
Hexane		25	< 0.15	< 0.15	< 0.15	< 0.15
Isopropyl alcohol*		53.6	< 0.64	26.8	19	14
m,p-Xylene		271	< 0.61	322	11	4.8
m-Dichlorobenzene		< 0.46	< 0.46	< 0.46	< 0.46	< 0.46
Methyl ethyl ketone		348	< 0.50	205	8.8	11
Methyl isobutyl ketone		29	< 0.57	19	13	6.1
Methylene chloride*		3.5	< 0.20	2.9	3.2	3.8
o-Dichlorobenzene		< 0.52	< 0.52	< 0.52	< 0.52	< 0.52
o-Xylene		76.9	< 0.30	99.0	3.6	< 0.30
Propylene*		60.3	< 0.11	28.5	31.4	41.4
Styrene		3.8	< 0.32	6.0	< 0.32	< 0.32
Tertiary butyl alcohol		32.4	< 0.17	17	2.1 J	2.4
Tetrachloroethylene		14	21	16	< 0.81	< 0.81
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Toluene		739	< 0.22	716	6.0	26
trans-1,2-Dichloroethylene		28	2.0 J	16	3.8	< 0.11
Trichloroethylene		1,210	266	1130	9.1	8.6
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62	2.5	< 0.62
Vinyl acetate		< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Vinyl chloride*		83.3	< 0.23	39.9	56.7	74.9
Xylenes (total)		347	< 0.30	422	15	4.8
TVOCs		5,100	457	4,300	582.3	328.8
TVOCs less poor adsorbers*		3,920	453	3,530	306.3	137.2

Footnotes:

ug/mg^3 micrograms per cubic meter
* Compound is poorly adsorbed by activated carbon.
< Compound was not detected at or above the indicated value.
J Detected concentration is less than the quantitation limit.
TVOCs Total volatile organic compounds
Detections are highlighted.

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Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

HSW

Compound (ug/m^3)	Sample ID:	WELLFIELD INFLUENT	OU3 SGCS INFLUENT	COMBINED INFLUENT	VGAC-2	DUPLICATE (VGAC-2)	VGAC-4
	Lab Sample ID:	JD35322-2	JD35322-1	JD35322-5	JD35322-3	JD35322-6	JD35322-4
	Date Sampled:	11/15/2021	11/15/2021	11/15/2021	11/15/2021	11/15/2021	11/15/2021
1,1,1-Trichloroethane		2.6	2.7	2.5	< 0.71	< 0.71	< 0.71
1,1-Dichloroethane		17	3.1 J	10	9.7	7.3	< 0.19
1,1-Dichloroethylene		6.7	< 0.27	4.0	4.4	3.5	< 0.27
1,2,4-Trimethylbenzene		58.5	< 0.64	7.4	< 0.64	< 0.64	< 0.64
1,2-Dibromoethane		< 0.55	< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
1,3,5-Trimethylbenzene		34	< 0.64	4.9	< 0.64	< 0.64	< 0.64
1,3-Butadiene		< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		19	< 0.41	8.4	< 0.41	< 0.41	< 0.41
2-Hexanone		99.4	< 0.61	18	< 0.61	< 0.61	< 0.61
4-Ethyltoluene		38	< 0.59	5.4	< 0.59	< 0.59	< 0.59
Acetone*		801	5.2	475	69.6	54.9	19
Benzene		6.7	< 0.15	2.7	< 0.15	< 0.15	1.9 J
Bromoform		< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Carbon disulfide		30	< 0.29	16	17	13	2.3 J
Carbon tetrachloride		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Chloroethane		1.6 J	< 0.50	< 0.50	1.1 J	< 0.50	< 0.50
Chloroform		4.9	54.2	28	13	8.3	< 0.39
Chloromethane*		2.7	< 0.13	2.1	2.5	2.3	2.3
cis-1,2-Dichloroethylene		702	91.6	448	115	75.3	2.0
Cyclohexane		< 0.30	< 0.30	3.2	< 0.30	< 0.30	< 0.30
Dichlorodifluoromethane		2.0 J	2.1 J	2.0 J	2.1 J	2.1 J	2.3 J
Ethanol		63.7	17	33.0	45.2	36.2	38.8
Ethyl acetate		< 0.54	3.6	10	5.4	< 0.54	3.5
Ethylbenzene		131	< 0.26	33	< 0.26	< 0.26	< 0.26
Freon 113		< 0.52	< 0.52	< 0.52	< 0.52	< 0.52	< 0.52
Heptane		34	< 0.29	13	< 0.29	< 0.29	< 0.29
Hexane		< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Isopropyl alcohol*		28.3	< 0.64	< 0.64	2.3	1.9 J	9.8
m,p-Xylene		383	< 0.61	96.4	2.9 J	< 0.61	< 0.61
m-Dichlorobenzene		< 0.46	< 0.46	< 0.46	< 0.46	< 0.46	< 0.46
Methyl ethyl ketone		282	< 0.50	125	< 0.50	< 0.50	1.5 J
Methyl isobutyl ketone		30	< 0.57	8.2	< 0.57	< 0.57	< 0.57
Methylene chloride*		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
o-Dichlorobenzene		< 0.52	< 0.52	< 0.52	< 0.52	< 0.52	< 0.52
o-Xylene		115	< 0.30	27	< 0.30	< 0.30	< 0.30
Propylene*		49.5	0.88 J	27.7	31.1	27.1	32.0
Styrene		< 0.32	< 0.32	< 0.32	< 0.32	< 0.32	< 0.32
Tertiary butyl alcohol		20	< 0.17	9.1	< 0.17	< 0.17	< 0.17
Tetrachloroethylene		18	5.8	8.1	< 0.81	< 0.81	< 0.81
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Toluene		893	3.5	433	3.2	4.5	3.6
trans-1,2-Dichloroethylene		27	2.2 J	14	4.0	2.9 J	< 0.11
Trichloroethylene		1400	264	849	11	5.4	< 0.41
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62	< 0.62	< 0.62	< 0.62
Vinyl acetate		< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Vinyl chloride*		73.4	< 0.23	38.6	49.3	41.4	42.4
Xylenes (total)		500	< 0.30	123	2.9 J	< 0.30	< 0.30
TVOCs		5,380	455.88	2,762	389	286.1	161.4
TVOCs less poor adsorbers*		4,430	449.8	2,220	234	158.5	55.9

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are highlighted.

RE US ENGINEERS

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

HSW

Compound (ug/m^3)	Sample ID:	WELLFIELD INFLUENT	OU3 SGCS INFLUENT	COMBINED INFLUENT	VGAC-2	VGAC-4
	Lab Sample ID:	JD35733-2	JD35733-1	JD35733-3	JD35733-4	JD35733-5
	Date Sampled:	11/22/2021	11/22/2021	11/22/2021	11/22/2021	11/22/2021
1,1,1-Trichloroethane		**2.9**	**3.3**	< 0.71	< 0.71	< 0.71
1,1-Dichloroethane		**19**	**3.5**	< 0.19	**19**	< 0.19
1,1-Dichloroethylene		**9.1**	< 0.27	< 0.27	**7.9**	< 0.27
1,2,4-Trimethylbenzene		**72.3**	< 0.64	< 0.64	< 0.64	< 0.64
1,2-Dibromoethane		< 0.55	< 0.55	< 0.55	< 0.55	< 0.55
1,3,5-Trimethylbenzene		**42**	< 0.64	< 0.64	< 0.64	< 0.64
1,3-Butadiene		< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
1,4-Dioxane*		< 0.76	< 0.76	< 0.76	< 0.76	< 0.76
2,2,4-Trimethylpentane		**27**	< 0.41	< 0.41	< 0.41	< 0.41
2-Hexanone		**132**	< 0.61	< 0.61	< 0.61	< 0.61
4-Ethyltoluene		**46**	< 0.59	< 0.59	< 0.59	< 0.59
Acetone*		**1120**	**5.5**	**37.1**	**159**	**24.0**
Benzene		**8.3**	< 0.15	< 0.15	< 0.15	< 0.15
Bromoform		< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Carbon disulfide		**66.6**	< 0.29	< 0.29	**22**	**6.5**
Carbon tetrachloride		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Chloroethane		**2.2**	< 0.50	< 0.50	< 0.50	< 0.50
Chloroform		**6.3**	**58.6**	< 0.39	**36**	< 0.39
Chloromethane*		**3.7**	< 0.13	**1.1** J	**2.7**	**2.7**
cis-1,2-Dichloroethylene		**749**	**94.0**	**11**	**303**	**1.9**
Cyclohexane		< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Dichlorodifluoromethane		**2.0** J	**2.2** J	< 0.33	**2.5** J	**2.0** J
Ethanol		**81.6**	< 1.6	**11**	**46.0**	**52.4**
Ethyl acetate		< 0.54	< 0.54	**14**	**5.0**	**4.0**
Ethylbenzene		**162**	< 0.26	< 0.26	< 0.26	< 0.26
Freon 113		< 0.52	< 0.52	< 0.52	< 0.52	< 0.52
Heptane		**48.8**	< 0.29	< 0.29	< 0.29	< 0.29
Hexane		< 0.15	< 0.15	< 0.15	< 0.15	< 0.15
Isopropyl alcohol*		< 0.64	< 0.64	< 0.64	**11**	**31.5**
m,p-Xylene		**452**	< 0.61	**4.3**	< 0.61	< 0.61
m-Dichlorobenzene		< 0.46	< 0.46	< 0.46	< 0.46	< 0.46
Methyl ethyl ketone		**392**	< 0.50	**5.3**	**3.8**	< 0.50
Methyl isobutyl ketone		**41.4**	< 0.57	< 0.57	< 0.57	< 0.57
Methylene chloride*		< 0.20	< 0.20	< 0.20	**3.1**	< 0.20
o-Dichlorobenzene		< 0.52	< 0.52	< 0.52	< 0.52	< 0.52
o-Xylene		**146**	< 0.30	< 0.30	< 0.30	< 0.30
Propylene*		**82.6**	< 0.11	**1.9** J	**41.1**	**31.4**
Styrene		< 0.32	< 0.32	< 0.32	< 0.32	< 0.32
Tertiary butyl alcohol		**24**	**1.3** J	**4.9**	**1.5** J	< 0.17
Tetrachloroethylene		**24**	**8.1**	< 0.81	< 0.81	**1.1**
Tetrahydrofuran		< 0.59	< 0.59	< 0.59	< 0.59	< 0.59
Toluene		**1140**	**1.6** J	**14**	< 0.22	< 0.22
trans-1,2-Dichloroethylene		**32**	**2.3** J	< 0.11	**11**	< 0.11
Trichloroethylene		**1750**	**289**	**24**	**33**	< 0.41
Trichlorofluoromethane		< 0.62	< 0.62	< 0.62	< 0.62	**2.3**
Vinyl acetate		< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Vinyl chloride*		**75.7**	< 0.23	< 0.23	**26.3**	**16**
Xylenes (total)		**595**	< 0.30	**4.3**	< 0.30	< 0.30
TVOCs		**6,760**	**469**	**128.6**	**734**	**175.8**
TVOCs less poor adsorbers*		**5,480**	**464**	**88.5**	**491**	**70.2**

Footnotes:

ug/mg^3 micrograms per cubic meter
* Compound is poorly adsorbed by activated carbon.
< Compound was not detected at or above the indicated value.
J Detected concentration is less than the quantitation limit.
TVOCs Total volatile organic compounds
Detections are highlighted.

RE US ENGINEERS

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

HSW

Compound (ug/m^3)	Sample ID:	WELLFIELD INFLUENT		OU3 SGCS INFLUENT		COMBINED INFLUENT		VGAC-2		VGAC-4	
	Lab Sample ID:	JD35897-2		JD35897-1		JD35897-3		JD35897-4		JD35897-5	
	Date Sampled:	11/29/2021		11/29/2021		11/29/2021		11/29/2021		11/29/2021	
1,1,1-Trichloroethane		< 0.71		**2.3**		**2.7**		< 0.71		< 0.71	
1,1-Dichloroethane		**11**		**3.5**		**8.1**		**7.7**		< 0.19	
1,1-Dichloroethylene		**5.6**		< 0.27		**3.1**		**3.6**		< 0.27	
1,2,4-Trimethylbenzene		**2.2**	J	< 0.64		**3.8**	J	**4.9**		< 0.64	
1,2-Dibromoethane		< 0.55		< 0.55		< 0.55		< 0.55		< 0.55	
1,3,5-Trimethylbenzene		< 0.64		< 0.64		**2.9**	J	< 0.64		< 0.64	
1,3-Butadiene		< 0.40		< 0.40		< 0.40		< 0.40		< 0.40	
1,4-Dioxane*		< 0.76		< 0.76		< 0.76		< 0.76		< 0.76	
2,2,4-Trimethylpentane		**9.8**		< 0.41		**6.1**		< 0.41		< 0.41	
2-Hexanone		**9.8**		< 0.61		**11**		< 0.61		< 0.61	
4-Ethyltoluene		< 0.59		< 0.59		< 0.59		< 0.59		< 0.59	
Acetone*		**615**		**19**		**477**		**138**		**18**	
Benzene		**10**		**18**		**2.2**	J	< 0.15		< 0.15	
Bromoform		< 1.6		< 1.6		< 1.6		< 1.6		< 1.6	
Carbon disulfide		**36.1**		< 0.29		**20**		**17**		**9.7**	
Carbon tetrachloride		< 0.59		< 0.59		< 0.59		< 0.59		< 0.59	
Chloroethane		**1.3**	J	< 0.50		< 0.50		< 0.50		< 0.50	
Chloroform		**2.9**	J	**39**		**27**		**16**		< 0.39	
Chloromethane*		**2.9**		< 0.13		**1.8**		**1.8**		< 0.13	
cis-1,2-Dichloroethylene		**476**		**78.1**		**325**		**175**		< 0.19	
Cyclohexane		**2.2**	J	< 0.30		< 0.30		< 0.30		< 0.30	
Dichlorodifluoromethane		**2.1**	J	**2.1**	J	**2.1**	J	**2.0**	J	**2.3**	J
Ethanol		**48.8**		**15**		**28.3**		**41.6**		**38.3**	
Ethyl acetate		**6.8**		**2.7**	J	**4.7**		**4.7**		**5.0**	
Ethylbenzene		**22**		< 0.26		**27**		< 0.26		< 0.26	
Freon 113		< 0.52		< 0.52		< 0.52		< 0.52		< 0.52	
Heptane		**13**		< 0.29		**8.6**		< 0.29		< 0.29	
Hexane		**3.5**		< 0.15		**1.6**	J	< 0.15		< 0.15	
Isopropyl alcohol*		**21**		**2.2**		**15**		**7.1**		**20**	
m,p-Xylene		**54.3**		< 0.61		**71.7**		**5.6**		< 0.61	
m-Dichlorobenzene		< 0.46		< 0.46		< 0.46		< 0.46		< 0.46	
Methyl ethyl ketone		**166**		**1.6**	J	**104**		**7.7**		**1.3**	J
Methyl isobutyl ketone		**6.6**		< 0.57		**4.9**		< 0.57		< 0.57	
Methylene chloride*		**3.4**		< 0.20		< 0.20		< 0.20		**3.3**	
o-Dichlorobenzene		< 0.52		< 0.52		< 0.52		< 0.52		< 0.52	
o-Xylene		**15**		< 0.30		**22**		**1.7**	J	< 0.30	
Propylene*		**42.1**		**0.76**	J	**24.7**		**24.6**		**26.5**	
Styrene		< 0.32		< 0.32		< 0.32		< 0.32		< 0.32	
Tertiary butyl alcohol		**15**		**2.0**	J	**8.5**		**6.1**		**1.3**	J
Tetrachloroethylene		**6.1**		< 0.81		**5.4**		**3.3**		< 0.81	
Tetrahydrofuran		**1.4**	J	< 0.59		< 0.59		< 0.59		< 0.59	
Toluene		**437**		< 0.22		**337**		**2.5**	J	< 0.22	
trans-1,2-Dichloroethylene		**15**		**1.9**	J	**10**		**5.9**		< 0.11	
Trichloroethylene		**838**		**155**		**683**		**9.1**		< 0.41	
Trichlorofluoromethane		< 0.62		< 0.62		< 0.62		< 0.62		< 0.62	
Vinyl acetate		< 0.49		< 0.49		**8.8**		< 0.49		< 0.49	
Vinyl chloride*		**61.9**		< 0.23		**33.0**		**33.5**		**36.8**	
Xylenes (total)		**69.5**		< 0.30		**93.8**		**7.4**		< 0.30	
TVOCs		**2,964**		**343**		**2,291**		**520**		**162.5**	
TVOCs less poor adsorbers*		**2,218**		**321**		**1,740**		**315**		**57.9**	

Footnotes:

ug/mg^3 micrograms per cubic meter

* Compound is poorly adsorbed by activated carbon.

< Compound was not detected at or above the indicated value.

J Detected concentration is less than the quantitation limit.

TVOCs Total volatile organic compounds

Detections are highlighted.

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Table 2. Liquid Treatment System Sampling Results

HSW

Analyte	TOGS 111 Effluent Limitations (GA)	SPDES Permit Equivalent Daily Maximum Discharge Limitations	Sample ID:	FRAC2-A4272-20211025
			Lab Sample ID:	JD34126-1 / 1A
			Date Sampled:	10/25/2021
Volatile Organic Compounds (none detected)				
Semivolatile Organic Compounds (none detected)				
Polychlorinated Biphenyls (none detected)				
Metals (none detected)				
General Chemistry (mg/L):				
Nitrogen, Nitrate	10	10		**1.1**
Nitrogen, Nitrate + Nitrite	10			**1.1**

Footnotes:

mg/L	milligrams per liter
TOGS 111	Technical and Operational Guidance Series 1.1.1., Groundwater Effluent Limitations, Class GA, New York State.
	Detections are highlighted.