NORTHROP GRUMMAN

ISTR Operations Monthly Progress Report

Reporting Period: **January 2021**

Operable Unit 3 VOC Source Area Remedy
Former Grumman Settling Ponds, Bethpage, NY
NYSDEC Site No. 130003A
February 26, 2021

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

NORTHROP GRUMMAN

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. Pending RAWP Modifications
6. Data Tables

Remedy Progress / Performance Monitoring
January 2021

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ISTR Operations Summary

- Air emissions comply with effluent concentration limits specified in the RAWP
- No exceedances of NYSDEC Community Air Monitoring Plan (CAMP) PID action levels
- No validated ambient air monitoring results above target screening levels
- Liquid discharges comply with criteria specified in the RAWP

Reporting Period: January 2021

System Startup	8/26/2020
Days of Operation Since Startup	158
Estimated cumulative TVOC Mass Removed, lbs	750

Remedy Progress / Performance Monitoring
January 2021

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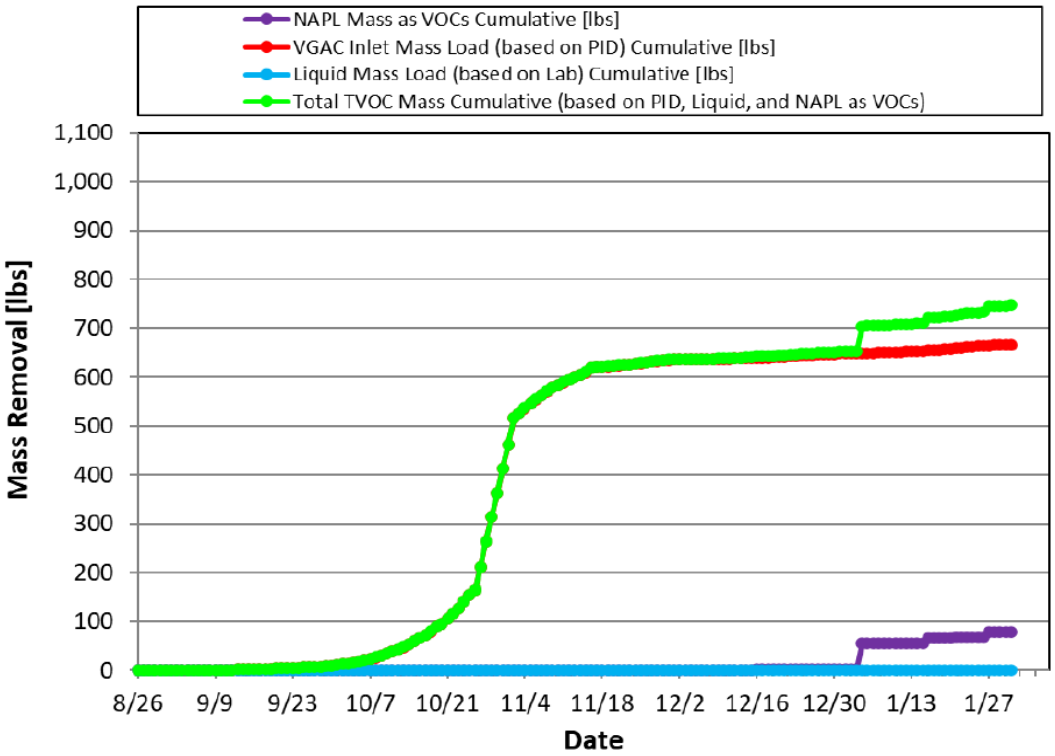
Cumulative TVOC Mass Removed



Estimated 750 lbs of total volatile organic compounds (TVOCs) removed through 1/31

Cumulative TVOC mass is the sum of the following:

- Photoionization detector (PID) TVOC vapor mass
- Liquid TVOC mass
- Condensed non-aqueous phase liquid (NAPL) TVOC mass (estimated NAPL accumulated through 1/31 is included)

Remedy Progress / Performance Monitoring January 2021

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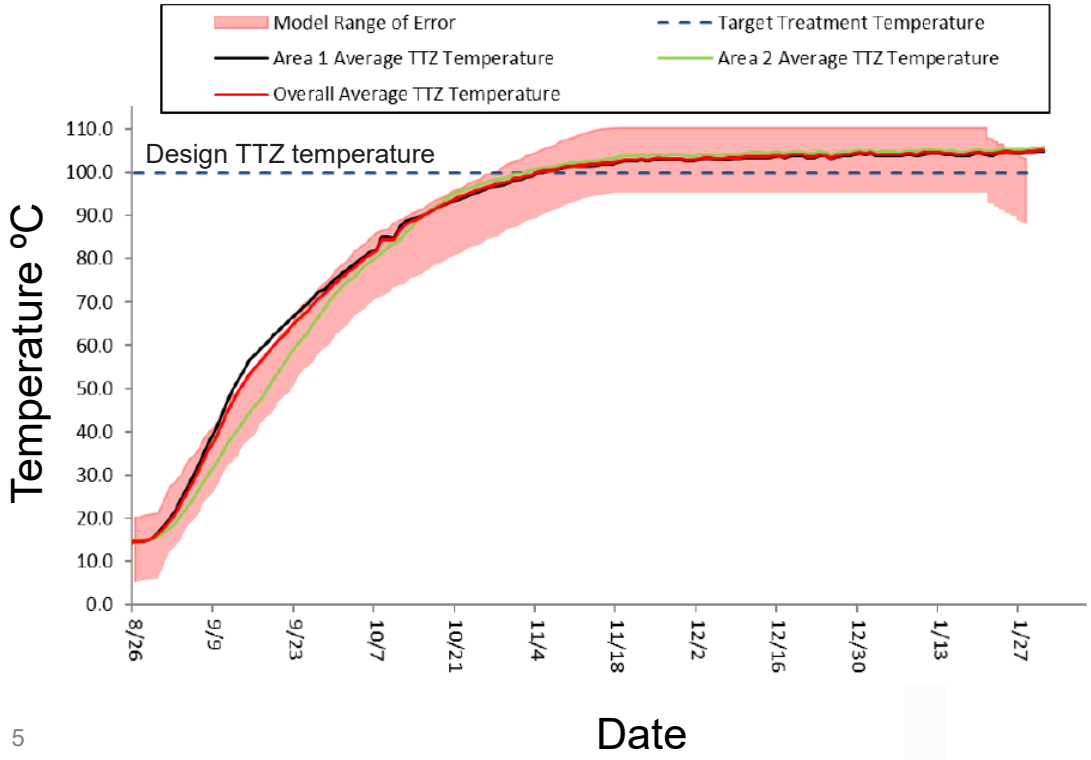
Cumulative Temperature Progression

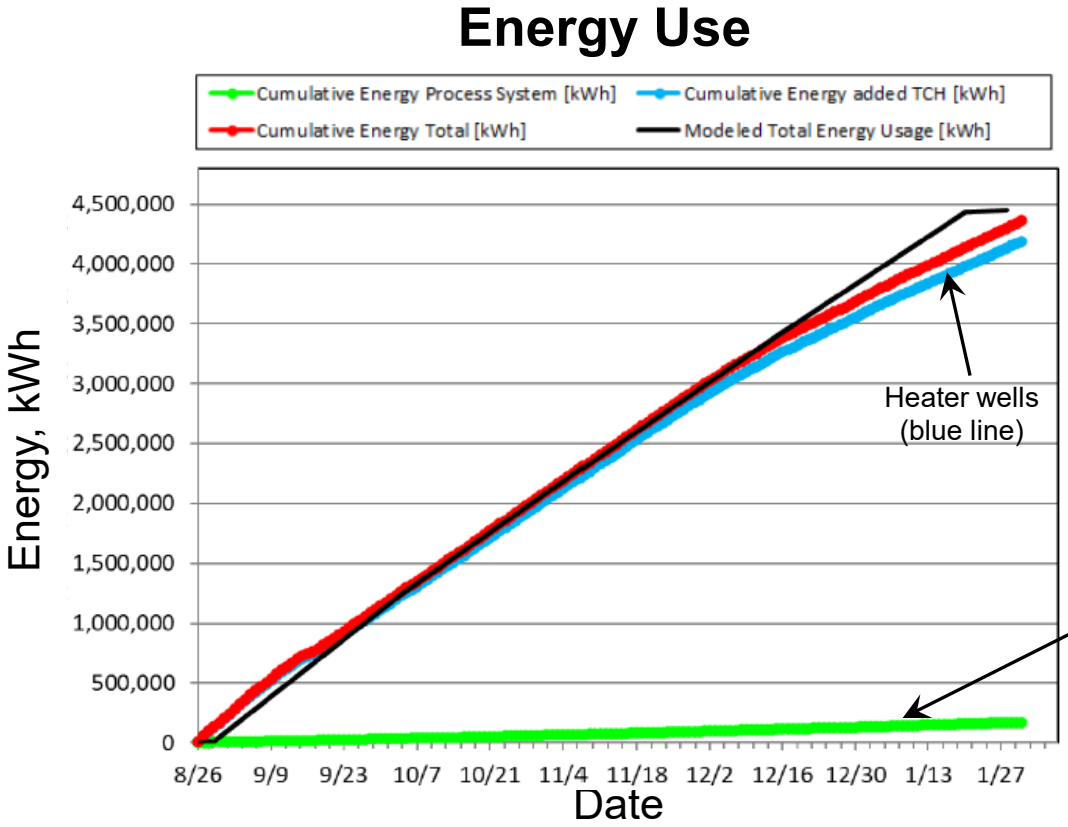


Target treatment zone (TTZ) design temperature is 100ºC

Days of treatment at 100°C through January 31:

- Area 1 = 88 days
- Area 2 = 90 days

Remedy Progress / Performance Monitoring
January 2021



Remedy Progress / Performance Monitoring
January 2021

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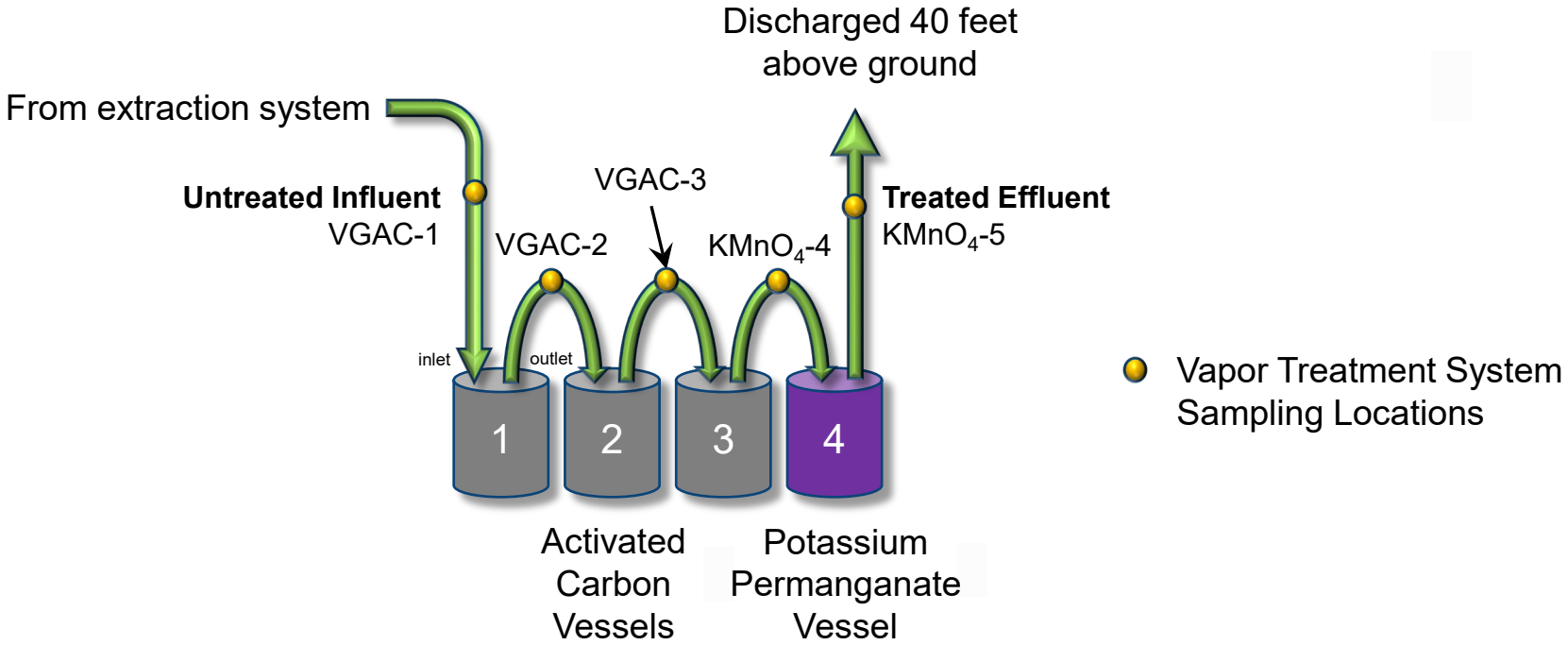
Vapor Treatment System



Remedy Progress / Performance Monitoring January 2021

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Vapor Treatment System

Air emissions meet treatment criteria in the RAWP:

- Stack concentrations less than 7.6 mg/m^3 for TCE and 1.9 mg/m^3 design limits for vinyl chloride throughout January.
- TCE and vinyl chloride concentrations in ambient air samples collected in January were all below target screening levels.

Vapor treatment system analytical results for January provided in Table 1

Remedy Progress / Performance Monitoring
January 2021

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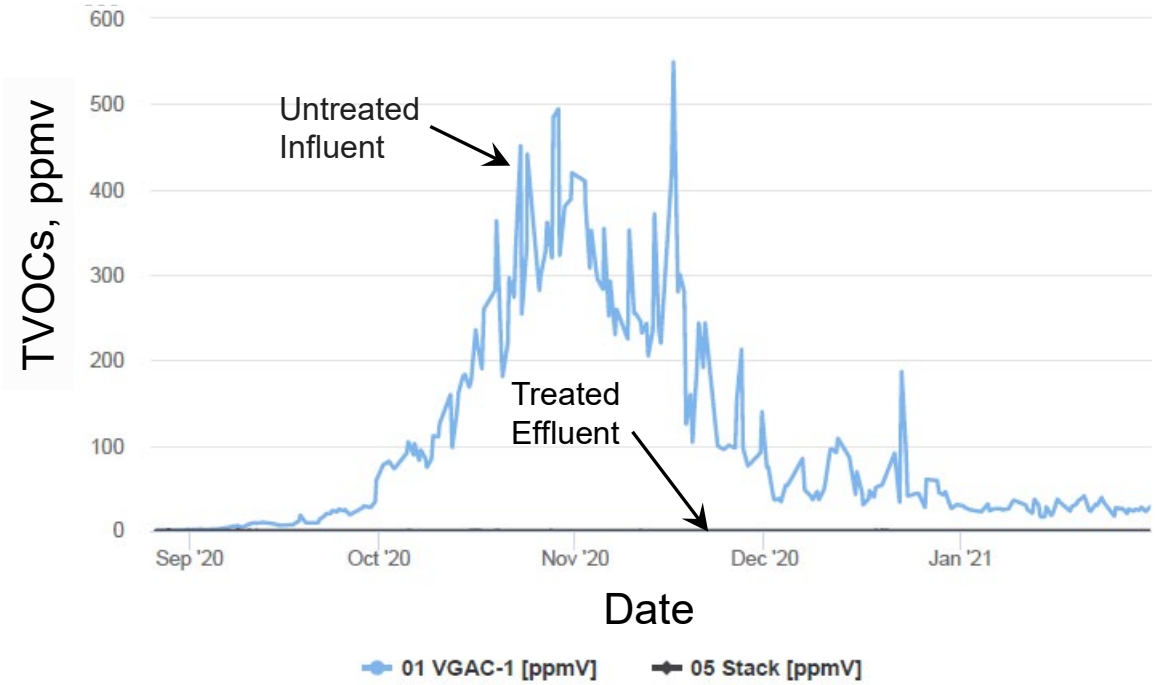
Vapor Treatment System (PID)



TVOC concentrations (PID) on January 30:

- Influent = 25.1 ppmv
- Effluent = 0.0 ppmv

Maximum TVOC concentrations (PID) during reporting period:

- Influent = 41.2 ppmv
- Effluent = max 0.3 ppmv

Remedy Progress / Performance Monitoring January 2021

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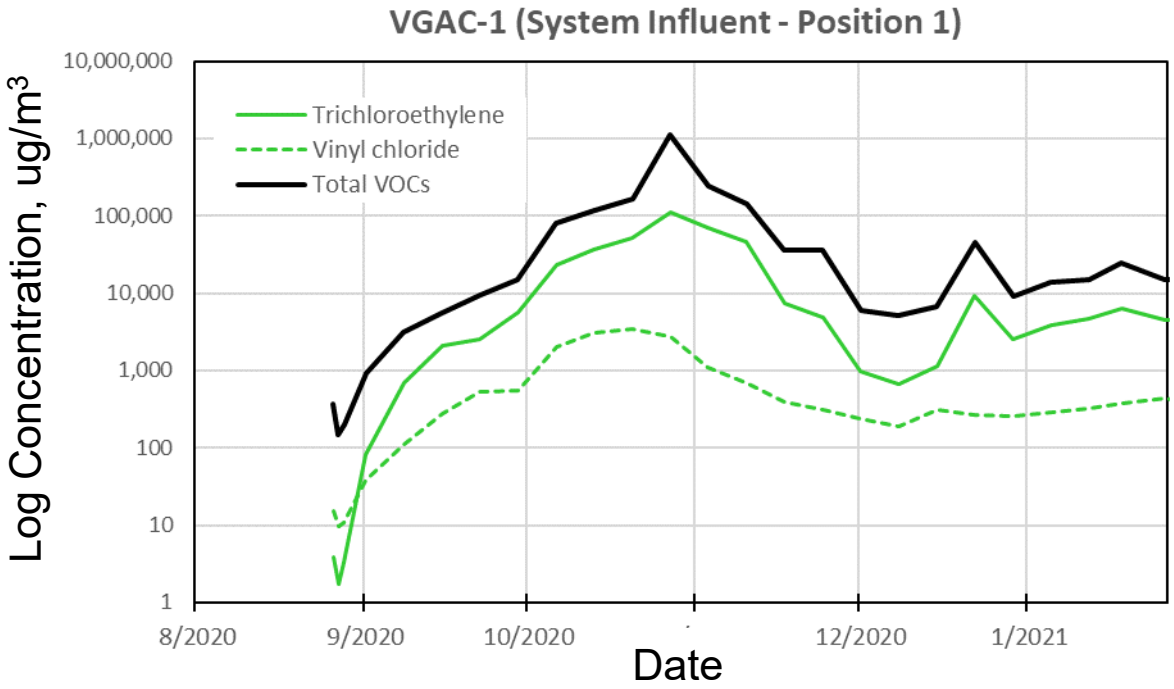
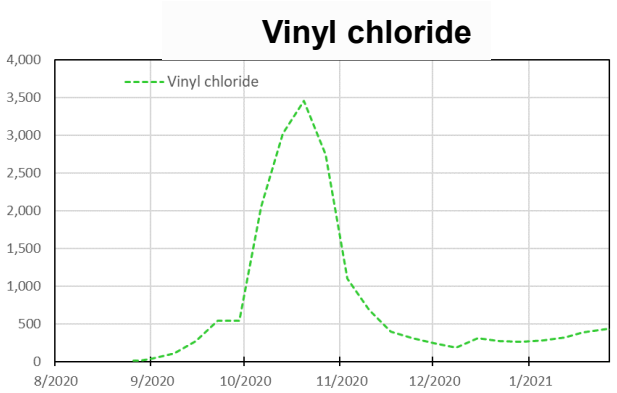
Vapor Treatment System Influent



Influent concentrations (Summa) on 1/26:

- TVOCs = 15,100 ug/m^3
- TCE = 4,500 ug/m^3
- Vinyl chloride = 432 ug/m^3



Remedy Progress / Performance Monitoring
January 2021

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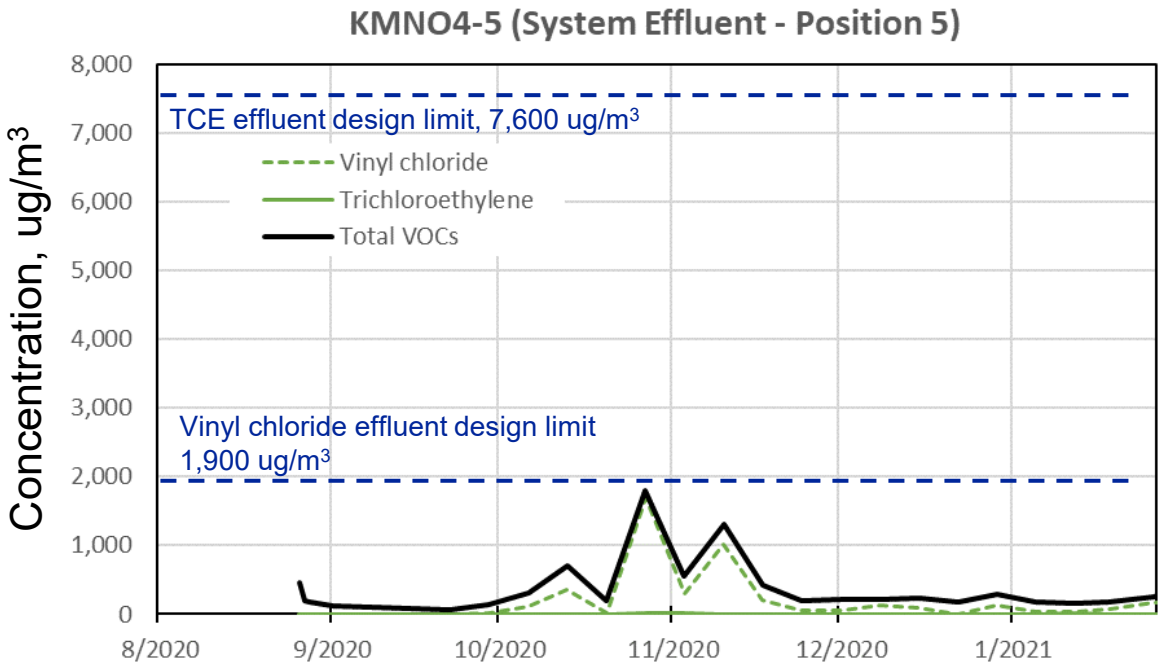
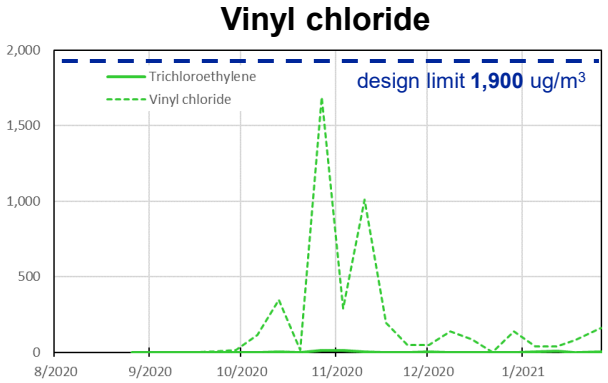
Vapor Treatment System Effluent



Effluent concentrations (Summa) on 1/26:

- TVOCs = 254 ug/m^3
- TCE = 4.5 ug/m^3
- Vinyl chloride = 159 ug/m^3



Remedy Progress / Performance Monitoring
January 2021

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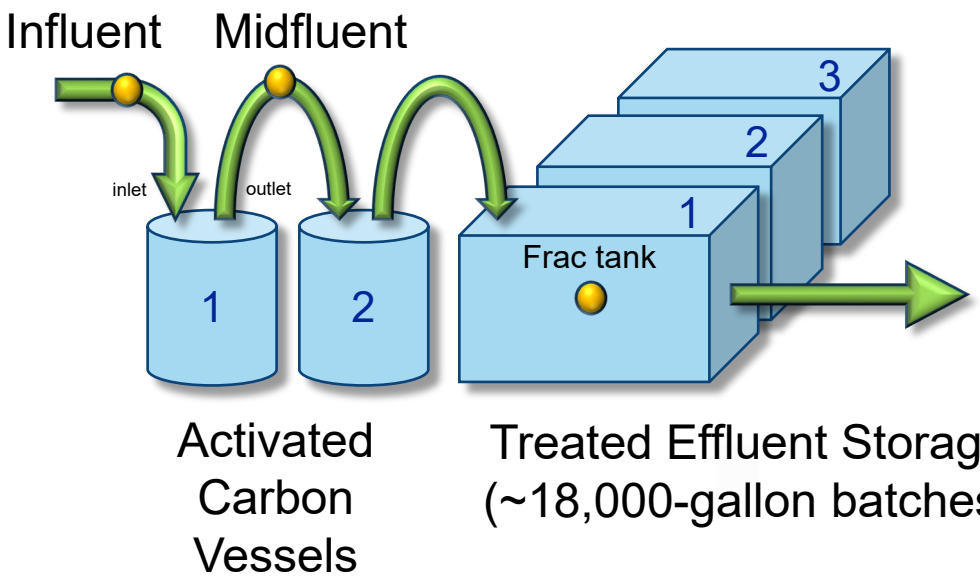
Liquid Treatment System



- Liquid Treatment System Sampling Locations

Treated liquid pumped to OU3 Groundwater Treatment System

Remedy Progress / Performance Monitoring
January 2021

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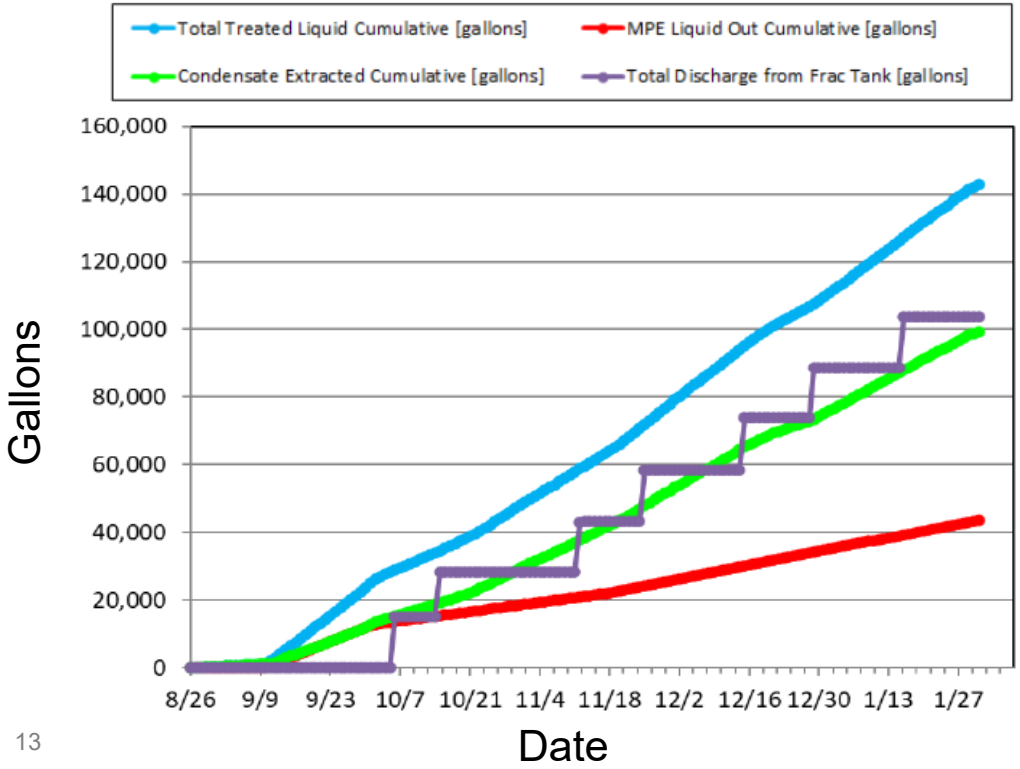
Cumulative Liquid Produced



103,800 gallons treated water discharged to OU3 groundwater treatment system

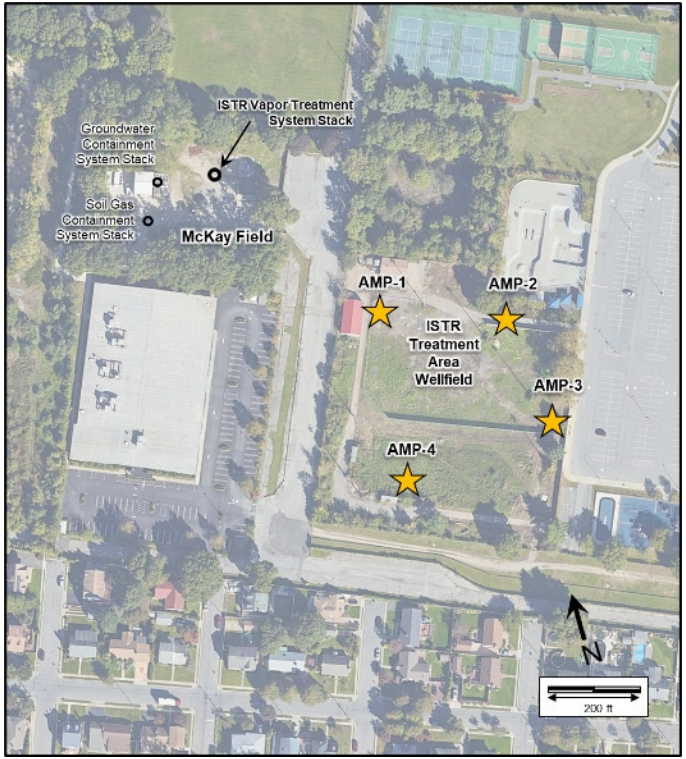
- Frac tank 1 - sampled 1/5, discharged 1/16
- Frac tank 2 – sampled 1/19 (tank discharge will be reported in February)

Liquid treatment system analytical results for January provided in Table 2

Ambient Air PID Monitoring

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

- PID readings recorded continuously at locations AMP-1 through 4
- 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)

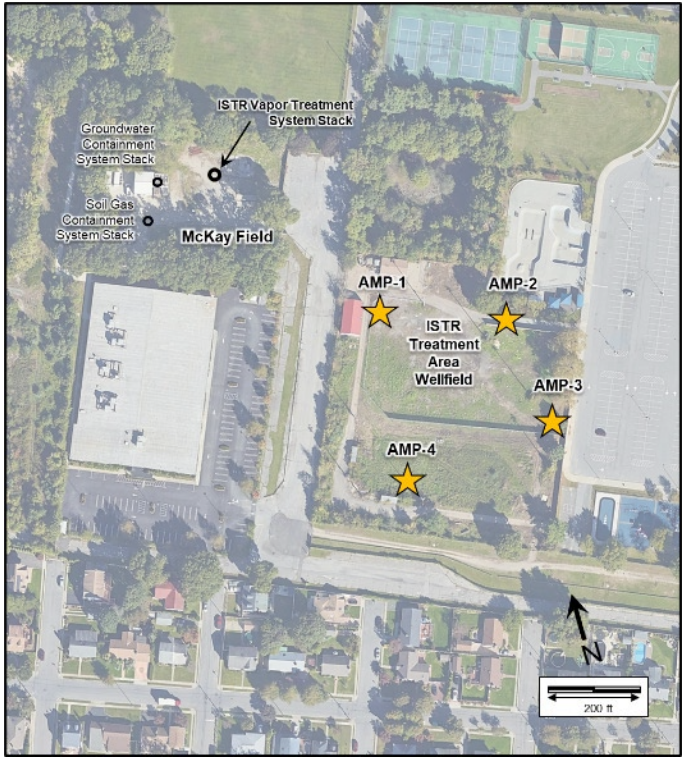


Ambient Air Summa Canister Monitoring

Summa canister levels comply with ambient air criteria in the RAWP:

- Summa canister samples collected 1/4, 1/9, 1/15, 1/21, and 1/27
- Unvalidated results emailed to the State and Town of Oyster Bay
- Summa canister validated results for compounds of interest (COIs) lower than target screening levels in the CAMP
- Summa canister validated results for non-COIs also lower than target screening levels calculated using CAMP-specified protocol

Ambient air analytical results for January provided in Table 3



Note – validated results for samples collected on 1/27 will be provided in the February report

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Significant Activities

Major equipment repairs and significant downtime:

- No major equipment repairs
- Following repairs made in December, heater H-149 brought back online on January 4
- Controlled, short-term shut down of heater wells and vapor extraction wells during confirmation sampling

Other significant Activities: None

Planned Significant Activities During Next Two Months

Continue routine system operations, monitoring, and maintenance

Begin confirmation sampling first week of February

Begin installing new VEW well screens in select boring locations

Schedule

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

No significant delays or corrective actions required

No schedule modifications anticipated

Pending RAWP Modifications

None

Pending RAWP Clarifications

Submitted clarification on 1/27 to change flow controller for ambient air monitoring

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Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring - January 2021

Compound (ug/m^3)	Sample ID:	VGAC-1	VGAC-3	KMNO4-5	DUPLICATE	Percent Removed
	Lab Sample ID:	JD18588-1	JD18588-2	JD18588-3	JD18588-4	
	Date Sampled:	1/5/2021	1/5/2021	1/5/2021	1/5/2021	
1,1,1-Trichloroethane		11 J	< 0.71	< 0.71	< 0.71	
1,1-Dichloroethane		18	< 0.19	< 0.19	< 0.19	
1,1-Dichloroethylene		79.7	< 0.27	< 0.27	< 0.27	
1,2,4-Trimethylbenzene		12 J	< 0.64	< 0.64	< 0.64	
1,2-Dibromoethane		< 5.5	< 0.55	< 0.55	< 0.55	
1,3,5-Trimethylbenzene		< 3.3	< 0.64	< 0.64	< 0.64	
1,4-Dioxane*		< 3.6	< 0.76	< 0.76	< 0.76	
2,2,4-Trimethylpentane		93.9	< 0.41	< 0.41	< 0.41	
2-Hexanone		< 3.0	< 0.61	< 0.61	< 0.61	
4-Ethyltoluene		< 2.9	< 0.59	< 0.59	< 0.59	
Acetone*		1,380	7.6	22	5.7	
Benzene		112	< 0.15	< 0.15	< 0.15	
Bromoform		< 7.8	< 1.6	< 1.6	< 1.6	
Carbon disulfide		23	< 0.29	< 0.29	< 0.29	
Carbon tetrachloride		< 3.0	< 0.59	< 0.59	< 0.59	
Chloroethane		< 2.6	< 0.50	< 0.50	< 0.50	
Chloroform		< 2.0	< 0.39	< 0.39	< 0.39	
Chloromethane*		17	19	18	18	
cis-1,2-Dichloroethylene		3,830	< 0.19	2.5 J	< 0.19	
Cyclohexane		22	< 0.30	< 0.30	< 0.30	
Dichlorodifluoromethane		< 1.6	2.3 J	2.0 J	2.2 J	
Ethanol		47.5	8.9	19	5.3	
Ethyl acetate		< 2.7	7.9	3.2	< 0.54	
Ethylbenzene		66.5	< 0.26	< 0.26	< 0.26	
Heptane		261	< 0.29	< 0.29	< 0.29	
Hexane		25	< 0.15	< 0.15	< 0.15	
Isopropyl alcohol*		56.3	3.4	14	< 0.64	
m,p-Xylene		172	< 0.61	< 0.61	< 0.61	
m-Dichlorobenzene		< 2.3	< 0.46	< 0.46	< 0.46	
Methyl ethyl ketone		219	< 0.50	< 0.50	< 0.50	
Methyl isobutyl ketone		< 3.0	< 0.57	< 0.57	< 0.57	
Methylene chloride*		< 1.0	< 0.20	< 0.20	< 0.20	
o-Xylene		68.6	< 0.30	< 0.30	< 0.30	
Propylene*		340	249	57.0	280	
Styrene		< 1.6	< 0.32	< 0.32	< 0.32	
Tertiary butyl alcohol		< 0.85	< 0.17	2.0 J	< 0.17	
Tetrachloroethylene		11	< 0.81	< 0.81	< 0.81	
Tetrahydrofuran		< 2.9	< 0.59	< 0.59	< 0.59	
Toluene		2,780	< 0.22	< 0.22	< 0.22	
trans-1,2-Dichloroethylene		195	< 0.11	< 0.11	< 0.11	
Trichloroethylene		3,920	1.2	2.6	< 0.41	100%
Trichlorofluoromethane		< 3.1	< 0.62	< 0.62	< 0.62	
Vinyl acetate		< 2.4	< 0.49	< 0.49	< 0.49	
Vinyl chloride*		284	268	41.9	266	
Xylenes (total)		241	< 0.30	< 0.30	< 0.30	
TVOCs		140,445	567	184	577	

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 - January 2021

Compound (ug/m^3)	Sample ID:	VGAC-1	VGAC-3	KMNO4-5	Percent Removed
	Lab Sample ID:	JD18929-1	JD18929-2	JD18929-3	
	Date Sampled:	1/12/2021	1/12/2021	1/12/2021	
1,1,1-Trichloroethane		< 7.1	< 0.71	< 0.71	
1,1-Dichloroethane		< 1.9	< 0.19	< 0.19	
1,1-Dichloroethylene		94.4	< 0.27	< 0.27	
1,2,4-Trimethylbenzene		< 6.4	< 0.64	< 0.64	
1,2-Dibromoethane		< 5.5	< 0.55	< 0.55	
1,3,5-Trimethylbenzene		< 6.4	< 0.64	< 0.64	
1,4-Dioxane*		< 7.6	< 0.76	< 0.76	
2,2,4-Trimethylpentane		101	< 0.41	< 0.41	
2-Hexanone		< 6.1	< 0.61	< 0.61	
4-Ethyltoluene		< 5.9	< 0.59	< 0.59	
Acetone*		1,140	24.5	19	
Benzene		117	1.9 J	< 0.15	
Bromoform		< 16	< 1.6	< 1.6	
Carbon disulfide		25 J	< 0.29	< 0.29	
Carbon tetrachloride		< 5.9	< 0.59	< 0.59	
Chloroethane		< 5.0	< 0.50	< 0.50	
Chloroform		< 3.9	< 0.39	< 0.39	
Chloromethane*		17	13	15	
cis-1,2-Dichloroethylene		5,310	19	2.0 J	
Cyclohexane		< 3.0	< 0.30	< 0.30	
Dichlorodifluoromethane		< 3.3	< 0.33	< 0.33	
Ethanol		86.9	105	53.3	
Ethyl acetate		< 5.4	23	12	
Ethylbenzene		49.5	< 0.26	< 0.26	
Heptane		247	1.7 J	< 0.29	
Hexane		26 J	1.6 J	< 0.15	
Isopropyl alcohol*		46.7	6.1	11	
m,p-Xylene		138	4.8	2.4 J	
m-Dichlorobenzene		< 4.6	< 0.46	< 0.46	
Methyl ethyl ketone		191	2.2 J	1.6 J	
Methyl isobutyl ketone		< 5.7	< 0.57	< 0.57	
Methylene chloride*		< 2.0	< 0.20	< 0.20	
o-Xylene		53.0	2.1 J	< 0.30	
Propylene*		247	261	< 0.11	
Styrene		< 3.2	< 0.32	< 0.32	
Tertiary butyl alcohol		< 1.7	1.3 J	1.6 J	
Tetrachloroethylene		< 8.1	< 0.81	< 0.81	
Tetrahydrofuran		< 5.9	< 0.59	< 0.59	
Toluene		2,210	9.8	3.1	
trans-1,2-Dichloroethylene		198	< 0.11	< 0.11	
Trichloroethylene		4,620	31	7.5	100%
Trichlorofluoromethane		< 6.2	< 0.62	< 0.62	
Vinyl acetate		< 4.9	< 0.49	< 0.49	
Vinyl chloride*		322	175	37.3	
Xylenes (total)		191	6.9	2.4 J	
TVOCs		15,240	683	166	

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 - January 2021

Compound (ug/m^3)	Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD19196-1 1/18/2021	VGAC-3 JD19196-2 1/18/2021	KMNO4-5 JD19196-3 1/18/2021	Percent Removed
1,1,1-Trichloroethane		< 11	< 0.71	< 0.71	
1,1-Dichloroethane		< 3.0	< 0.19	< 0.19	
1,1-Dichloroethylene		97.5	< 0.27	< 0.27	
1,2,4-Trimethylbenzene		< 10	< 0.64	< 0.64	
1,2-Dibromoethane		< 8.5	7.4	< 0.55	
1,3,5-Trimethylbenzene		< 10	< 0.64	< 0.64	
1,4-Dioxane*		< 12	< 0.76	< 0.76	
2,2,4-Trimethylpentane		152	< 0.41	< 0.41	
2-Hexanone		< 9.4	< 0.61	< 0.61	
4-Ethyltoluene		< 9.3	< 0.59	< 0.59	
Acetone*		1,240	9.0	16	
Benzene		145	< 0.15	< 0.15	
Bromoform		< 24	< 1.6	< 1.6	
Carbon disulfide		31.8 J	< 0.29	< 0.29	
Carbon tetrachloride		< 9.4	< 0.59	< 0.59	
Chloroethane		< 7.9	< 0.50	< 0.50	
Chloroform		< 5.9	< 0.39	< 0.39	
Chloromethane*		20.9 J	22.5	22.1	
cis-1,2-Dichloroethylene		5,670	< 0.19	< 0.19	
Cyclohexane		50.9	< 0.30	< 0.30	
Dichlorodifluoromethane		< 4.9	2.0 J	2.0 J	
Ethanol		207	14	12	
Ethyl acetate		< 8.6	< 0.54	1.6 J	
Ethylbenzene		112	< 0.26	< 0.26	
Heptane		434	< 0.29	< 0.29	
Hexane		620	< 0.15	< 0.15	
Isopropyl alcohol*		2,680	2.7	9.8	
m,p-Xylene		270	< 0.61	< 0.61	
m-Dichlorobenzene		< 7.2	< 0.46	< 0.46	
Methyl ethyl ketone		259	< 0.50	1.9 J	
Methyl isobutyl ketone		< 9.4	< 0.57	< 0.57	
Methylene chloride*		389	< 0.20	< 0.20	
o-Xylene		91.6	< 0.30	< 0.30	
Propylene*		244	194	25.6	
Styrene		< 5.1	< 0.32	< 0.32	
Tertiary butyl alcohol		< 2.6	< 0.17	1.5 J	
Tetrachloroethylene		37	< 0.81	< 0.81	
Tetrahydrofuran		< 9.1	< 0.59	< 0.59	
Toluene		4,860	< 0.22	< 0.22	
trans-1,2-Dichloroethylene		186	< 0.11	< 0.11	
Trichloroethylene		6,450	0.97	< 0.41	100%
Trichlorofluoromethane		< 10	< 0.62	< 0.62	
Vinyl acetate		< 7.4	< 0.49	< 0.49	
Vinyl chloride*		383	396	80.8	
Xylenes (total)		362	< 0.30	< 0.30	
TVOCs		24,631	649	173	

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 - January 2021

Compound (ug/m^3)	Sample ID:	VGAC-1		VGAC-3		KMNO4-5		Percent Removed
	Lab Sample ID:	JD19632-1		JD19632-2		JD19632-3		
	Date Sampled:	1/26/2021		1/26/2021		1/26/2021		
1,1,1-Trichloroethane		< 7.1		< 1.5		< 0.71		
1,1-Dichloroethane		31	J	< 0.38		< 0.19		
1,1-Dichloroethylene		92.8		< 0.52		< 0.27		
1,2,4-Trimethylbenzene		< 6.4		< 1.3		< 0.64		
1,2-Dibromoethane		< 5.5		< 1.1		< 0.55		
1,3,5-Trimethylbenzene		< 6.4		< 1.3		< 0.64		
1,4-Dioxane*		< 7.6		< 1.5		< 0.76		
2,2,4-Trimethylpentane		67.7		< 0.79		< 0.41		
2-Hexanone		< 6.1		< 1.2		< 0.61		
4-Ethyltoluene		< 5.9		< 1.2		< 0.59		
Acetone*		1,450		17		21		
Benzene		121		< 0.30		< 0.15		
Bromoform		< 16		< 3.1		< 1.6		
Carbon disulfide		25	J	< 0.59		< 0.29		
Carbon tetrachloride		< 5.9		< 1.2		< 0.59		
Chloroethane		< 5.0		< 1.0		< 0.50		
Chloroform		< 3.9		< 0.78		< 0.39		
Chloromethane*		27.3		27.3		25.6		
cis-1,2-Dichloroethylene		5,790		9.5		1.7	J	
Cyclohexane		< 3.0		< 0.62		< 0.30		
Dichlorodifluoromethane		< 3.3		< 0.64		< 0.33		
Ethanol		60.5		16		11		
Ethyl acetate		< 5.4		4.0	J	3.6		
Ethylbenzene		17	J	< 0.52		1.8	J	
Heptane		142		< 0.57		< 0.29		
Hexane		24	J	< 0.30		< 0.15		
Isopropyl alcohol*		22		< 1.3		8.6		
m,p-Xylene		34	J	3.4	J	6.5		
m-Dichlorobenzene		< 4.6		< 0.90		< 0.46		
Methyl ethyl ketone		206		< 1.0		1.5	J	
Methyl isobutyl ketone		< 5.7		< 1.2		< 0.57		
Methylene chloride*		< 2.0		< 0.42		< 0.20		
o-Xylene		< 3.0		< 0.61		2.3	J	
Propylene*		342		366		< 0.11		
Styrene		< 3.2		< 0.64		< 0.32		
Tertiary butyl alcohol		14	J	< 0.33		1.5	J	
Tetrachloroethylene		< 8.1		< 1.7		< 0.81		
Tetrahydrofuran		< 5.9		< 1.2		< 0.59		
Toluene		1,520		10		5.3		
trans-1,2-Dichloroethylene		222		< 0.23		< 0.11		
Trichloroethylene		4,500		12		4.5		100%
Trichlorofluoromethane		< 6.2		< 1.2		< 0.62		
Vinyl acetate		< 4.9		< 0.95		< 0.49		
Vinyl chloride*		432		652		159		
Xylenes (total)		34	J	3.4	J	9.1		
TVOCs		15,140		1,117		254		

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 - January 2021

EMAGIN

Analyte / Sample ID:	FRAC1-A2949-20210105	LGAC-MID-20210105	LGAC-INF-20210105	OU3 AIR STRIPPER FINAL EFF-20210116	FRAC2-A4272-20210119	LGAC-MID-20210119	LGAC-INF-20210119
Lab Sample ID:	JD18576-1 / 1A	JD18576-2 / 2A	JD18576-3 / 3A	JD19141-1	JD19195-1 / 1A	JD19195-2 / 2A	JD19195-3 / 3A
Date Sampled:	1/5/2021	1/5/2021	1/5/2021	1/16/2021	1/19/2021	1/19/2021	1/19/2021
Volatile Organic Compounds (ug/L, detections only):							
2-Butanone (MEK)	< **6.9**	< **6.9**	**46.8**	-	< 6.9	< 6.9	**58.1**
4-Methyl-2-pentanone (MIBK)	< **1.9**	< **1.9**	**4.5** J	-	< 1.9	< 1.9	**2.7** J
Acetone*	< **6.0**	< **6.0**	**292**	-	< 6.0	< 6.0	**503**
Benzene	< **0.43**	< **0.43**	**0.50**	-	< 0.43	< 0.43	**0.95**
cis-1,2-Dichloroethene	< **0.51**	< **0.51**	**78.3**	-	< 0.51	< 0.51	**68.7**
Ethylbenzene	< **0.60**	< **0.60**	**0.93** J	-	< 0.60	< 0.60	< 0.60
m,p-Xylene	< **0.78**	< **0.78**	**4.2**	-	< 0.78	< 0.78	**1.6**
o-Xylene	< **0.59**	< **0.59**	**2.9**	-	< 0.59	< 0.59	**0.78** J
Styrene	< **0.49**	< **0.49**	**0.62** J	-	< 0.49	< 0.49	< 0.49
Toluene	< **0.53**	< **0.53**	**11.4**	-	< 0.53	< 0.53	**11.2**
trans-1,2-Dichloroethene	< 0.54	< 0.54	0.74 J	-	< 0.54	< 0.54	**1.1**
Trichloroethene	< **0.53**	< **0.53**	**7.7**	-	< 0.53	< 0.53	**14.8**
Xylene (total)	< **0.59**	< **0.59**	**7.1**	-	< 0.59	< 0.59	**2.4**
TVOCs	**0.0**	**0.0**	**451**		**0.0**	**0.0**	**663**
Semivolatile Organic Compounds (ug/L, detections only):							
1,1'-Biphenyl	< 0.21	< 0.24	6.7	-	**0.39** J	**0.24** J	**2.4**
1,4-Dioxane	< **0.66**	< **0.73**	**18.3**	-	< 0.68	< 0.70	**9.1**
2,4-Dimethylphenol	< **2.4**	< **2.7**	**363**	-	< 2.5	< 2.6	**400**
2-Methylnaphthalene	< **0.21**	< **0.23**	**17.9**	-	**4.6**	**16.6**	**4.7**
2-Methylphenol	< **0.89**	< **0.99**	**171**	-	< 0.92	< 0.94	**142**
3&4-Methylphenol	< **0.88**	< **0.98**	**842**	-	< 0.91	**17.1**	**545**
Acenaphthene	< 0.19	< 0.21	2.3	-	< 0.20	< 0.20	**0.73** J
Acenaphthylene	< 0.14	< 0.15	3.2	-	< 0.14	< 0.14	< 0.14
Acetophenone	< **0.21**	< **0.23**	**26.8**	-	< 0.21	**41.8** B	**23.4** B
Anthracene	< **0.21**	< **0.23**	**3.5**	-	< 0.22	< 0.22	**0.65** J
Benzo(a)anthracene	< 0.20	< 0.23	< 0.25	-	**0.35** J	< 0.22	< 0.22
Benzo(b)fluoranthene	< 0.21	< 0.23	< 0.26	-	**0.79** J	< 0.22	< 0.22
Carbazole	< **0.23**	< **0.25**	< **0.29**	-	**0.31** J	< 0.24	**0.43** J
Chrysene	< 0.18	< 0.20	0.26 J	-	**0.29** J	< 0.19	< 0.19
Dibenzofuran	< 0.22	< 0.24	2.5 J	-	< 0.23	< 0.23	**0.81** J
Dimethyl phthalate	< **0.22**	< **0.24**	< **0.27**	-	< 0.22	< 0.23	**6.9**
Fluoranthene	< **0.17**	< **0.19**	**2.5**	-	**0.50** J	< 0.18	**0.48** J
Fluorene	< 0.17	< 0.19	6.8	-	< 0.18	< 0.18	**1.5**
Indeno(1,2,3-cd)pyrene	< 0.33	< 0.37	< 0.42	-	**0.68** J	< 0.35	< 0.35
Naphthalene	< **0.23**	**0.37** J	**15.3**	-	**49.5**	**53.0**	**4.5**
Pentachlorophenol	< 1.4	< 1.5	< 1.7	-	**4.7**	< 1.5	< 1.5
Phenanthrene	< **0.18**	< **0.19**	**21**	-	**0.23** J	< 0.19	**3.4**
Phenol	< **0.39**	< **0.44**	**175**	-	< 0.40	**1.0** J	**102**
Pyrene	< **0.22**	< **0.24**	**2.1**	-	**0.46** J	< 0.23	**0.32** J
Semivolatile Organic Compounds (SIM) (ug/L):							
1,4-Dioxane	< **0.050**	< **0.056**	**15.8**	-	**0.0981** J	< 0.053	**9.32**
Polychlorinated Biphenyls (ug/L):							
Aroclor 1016	< 0.12	< 0.13	< 0.14	-	< 0.13	< 0.13	< 0.13
Aroclor 1221	< 0.26	< 0.27	< 0.29	-	< 0.28	< 0.28	< 0.28
Aroclor 1232	< 0.16	< 0.17	< 0.18	-	< 0.17	< 0.17	< 0.17
Aroclor 1242	< 0.14	< 0.15	< 0.16	-	< 0.15	< 0.15	< 0.15
Aroclor 1248	< **0.079**	< **0.081**	**43.0**	-	< 0.084	< 0.084	**2.2**
Aroclor 1254	< **0.26**	< **0.27**	**20.1**	-	**0.91**	< 0.28	**0.85**
Aroclor 1260	< 0.095	< 0.098	< 0.10	-	< 0.10	< 0.10	< 0.10
Aroclor 1262	< 0.12	< 0.12	< 0.13	-	< 0.13	< 0.13	< 0.13
Aroclor 1268	< 0.11	< 0.11	< 0.12	-	< 0.12	< 0.12	< 0.12
Metals (mg/L):							
Cadmium	< 3.0	< 3.0	< 3.0	-	< 3.0	< 3.0	< 3.0
Chromium	< 10	< 10	< 10	-	< 10	< 10	< 10
Iron	**635**	**780**	**11,600**	**151**	**722**	**203**	**6120**
Manganese	**243**	**269**	**288**	**94.4**	**438**	**153**	**236**
Mercury	< 0.20	< 0.20	0.24	-	< 0.20	< 0.20	< 0.20
General Chemistry (mg/L):							
Nitrogen, Nitrate	0.27	< 0.11	0.17	-	< 0.11	< 0.11	**0.25**
Nitrogen, Nitrate + Nitrite	0.36	< 0.10	0.19	-	< 0.10	< 0.10	**0.26**
Nitrogen, Nitrite	0.093	< 0.010	0.016	-	**0.097**	< 0.010	**0.015**
Nitrogen, Total Kjeldahl	**2.4**	**3.6**	**4.0**	-	**3.6**	**3.1**	**4.8**

Table 3: Ambient Air Laboratory Results (2020-12-29 through 2021-01-04)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04	AMP-01-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.35	< 0.2	< 0.21	< 0.32	< 0.35
1,1-Dichloroethane	45	< 0.25	< 0.26	< 0.15	< 0.16	< 0.24	< 0.26
1,1-Dichloroethene	8	<0.25	< 0.13	< 0.072	< 0.078	< 0.12	< 0.13
1,2-Dichloroethane	3	< 0.25	< 0.26	< 0.15	< 0.16	< 0.24	< 0.26
Benzene	8	5.8	**0.63**	**0.54**	**0.56**	**0.57**	**0.62**
Ethyl-benzene	29	1.9	< 0.28	< 0.16	< 0.17	< 0.26	< 0.28
m,p-Xylene	10	3.1	< 0.56	< 0.32	**0.52**	< 0.52	< 0.56
o-Xylene	10	2.3	< 0.28	< 0.16	**0.25**	< 0.26	< 0.28
Tetrachloroethene	30	1.6	< 0.44	< 0.25	< 0.26	< 0.4	< 0.44
Toluene	521	21	**0.74**	**0.57**	**0.64**	**0.56**	**0.75**
trans-1,2-Dichloroethene	82	NA2	< 1.3	< 0.72	< 0.78	< 1.2	< 1.3
Trichloroethene	2	0.5	< 0.34	< 0.2	< 0.21	< 0.32	< 0.34
Vinyl Chloride	8	< 0.25	< 0.082	< 0.047	< 0.05	< 0.076	< 0.082
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.44	< 0.25	< 0.27	< 0.41	< 0.44
1,1,2-Trichloroethane	0.21	< 0.25	< 0.35	< 0.2	< 0.21	< 0.32	< 0.35
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.49	< 0.28	< 0.3	< 0.46	< 0.49
1,4-Dichlorobenzene	7	0.8	< 0.39	< 0.22	< 0.24	< 0.36	< 0.39
Carbon Tetrachloride	12	1	**0.53**	**0.54**	**0.55**	**0.55**	**0.54**
Chloroethane	417	0.4	< 0.42	< 0.24	< 0.26	< 0.39	< 0.42
Chloroform	3	0.5	< 0.31	< 0.18	< 0.19	< 0.29	< 0.31
Chloromethane	310	4.6	< 3.3 J	< 1.9 J	< 2 J	< 3.1 J	< 3.3 J
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.25	< 0.14	< 0.16	< 0.24	< 0.25
Freon 114	NA1	1.3	< 0.45	< 0.26	< 0.27	< 0.42	< 0.45
Freon 12	100	11	**2.4**	**2.3**	**2.4**	**2.3**	**2.4**
Methyl tert-butyl ether	260	NA2	< 1.2	< 0.66	< 0.71	< 1.1	< 1.2

Notes:

µg/m³ - micrograms per cubic meter

Bold - indicates detections

R - rejected after data validation

< - indicates not detected at or above the indicated value

NA1 - no criteria given in the EPA RSL Calculator

J - indicates sample result is estimated

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Geosyntec consultants

Table 3: Ambient Air Laboratory Results (2021-01-04 through 2021-01-09)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01*	AMP-02	AMP-03	AMP-04	AMP-03-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	--	< 0.27	< 0.25	< 0.14	< 0.25
1,1-Dichloroethane	45	< 0.25	--	< 0.20	< 0.19	< 0.10	< 0.19
1,1-Dichloroethene	8	<0.25	--	< 0.097	< 0.091	< 0.052	< 0.091
1,2-Dichloroethane	3	< 0.25	--	< 0.20	< 0.19	< 0.10	< 0.19
Benzene	8	5.8	--	**0.47**	**0.45**	**0.36**	**0.44**
Ethyl-benzene	29	1.9	--	< 0.21	< 0.20	< 0.11	< 0.20
m,p-Xylene	10	3.1	--	< 0.42	< 0.40	< 0.22	< 0.40
o-Xylene	10	2.3	--	< 0.21	< 0.20	< 0.11	< 0.20
Tetrachloroethene	30	1.6	--	< 0.33	< 0.31	< 0.18	< 0.31
Toluene	521	21	--	< 0.46	< 0.43	**0.29**	< 0.43
trans-1,2-Dichloroethene	82	NA2	--	< 0.97	< 0.91	< 0.52	< 0.91
Trichloroethene	2	0.5	--	< 0.26	< 0.25	< 0.14	< 0.25
Vinyl Chloride	8	< 0.25	--	< 0.062	< 0.059	< 0.033	< 0.059
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	--	< 0.34	< 0.32	< 0.18	< 0.32
1,1,2-Trichloroethane	0.21	< 0.25	--	< 0.27	< 0.25	< 0.14	< 0.25
1,2-Dibromoethane (EDB)	0.12	< 0.25	--	< 0.37	< 0.35	< 0.20	< 0.35
1,4-Dichlorobenzene	7	0.8	--	< 0.29	< 0.28	< 0.16	< 0.28
Carbon Tetrachloride	12	1	--	**0.51**	**0.48**	**0.92**	**0.50**
Chloroethane	417	0.4	--	< 0.32	< 0.30	< 0.17	< 0.30
Chloroform	3	0.5	--	< 0.24	< 0.22	< 0.13	< 0.22
Chloromethane	310	4.6	--	< 2.5	< 2.4	< 1.3	< 2.4
cis-1,2-Dichloroethene	NA1	< 0.25	--	< 0.19	< 0.18	< 0.10	< 0.18
Freon 114	NA1	1.3	--	< 0.34	< 0.32	< 0.18	< 0.32
Freon 12	100	11	--	**2.7**	**2.6**	**2.6**	**2.6**
Methyl tert-butyl ether	260	NA2	--	< 0.88	< 0.83	< 0.47	< 0.83

Notes:

µg/m³ - micrograms per cubic meter

< - indicates not detected at or above the indicated value

J - indicates sample result is estimated

Bold - indicates detections

R - rejected after data validation

NA1 - no criteria given in the EPA RSL Calculator

NA2 - NYSDOH did not include this compound in the guidance document[2]

* - Sample was not submitted for analysis due to high residual vacuum

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 3: Ambient Air Laboratory Results (2021-01-09 through 2021-01-15)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01*	AMP-02	AMP-03	AMP-04	AMP-02-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.14	< 0.21	< 0.14	< 0.16	< 0.21
1,1-Dichloroethane	45	< 0.25	< 0.10	< 0.15	< 0.11	< 0.12	< 0.15
1,1-Dichloroethene	8	<0.25	< 0.050	< 0.076	< 0.052	< 0.058	< 0.076
1,2-Dichloroethane	3	< 0.25	**0.11**	< 0.15	< 0.11	< 0.12	< 0.15
Benzene	8	5.8	**0.85**	**1.0**	**1.1**	**0.87**	**1.0**
Ethyl-benzene	29	1.9	< 0.11	**0.25**	**0.29**	**0.19**	**0.25**
m,p-Xylene	10	3.1	**0.25**	**0.63**	**0.85**	**0.49**	**0.62**
o-Xylene	10	2.3	< 0.11	**0.26**	**0.34**	**0.19**	**0.25**
Tetrachloroethene	30	1.6	< 0.17	**0.40**	**0.43**	**0.31**	**0.40**
Toluene	521	21	**0.82**	**1.6**	**1.7**	**1.3**	**1.6**
trans-1,2-Dichloroethene	82	NA2	< 0.50	< 0.76	< 0.52	< 0.58	< 0.76
Trichloroethene	2	0.5	< 0.14	< 0.20	< 0.14	< 0.16	< 0.20
Vinyl Chloride	8	< 0.25	< 0.032	< 0.049	< 0.034	< 0.037	< 0.049
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.17	< 0.26	< 0.18	< 0.20	< 0.26
1,1,2-Trichloroethane	0.21	< 0.25	< 0.14	< 0.21	< 0.14	< 0.16	< 0.21
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.20	< 0.29	< 0.20	< 0.22	< 0.29
1,4-Dichlorobenzene	7	0.8	< 0.15	< 0.23	< 0.16	< 0.18	< 0.23
Carbon Tetrachloride	12	1	**0.65**	**0.44**	**0.47**	**0.47**	**0.45**
Chloroethane	417	0.4	< 0.17	< 0.25	< 0.17	< 0.19	< 0.25
Chloroform	3	0.5	**0.12**	< 0.19	**0.13**	< 0.14	< 0.19
Chloromethane	310	4.6	**1.6**	< 2.0	< 1.4	< 1.5	< 2.0
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.10	< 0.15	< 0.10	< 0.12	< 0.15
Freon 114	NA1	1.3	< 0.18	< 0.27	< 0.18	< 0.20	< 0.27
Freon 12	100	11	**3.5**	**2.4**	**2.6**	**2.6**	**2.5**
Methyl tert-butyl ether	260	NA2	< 0.46	< 0.69	< 0.48	< 0.53	< 0.69

Notes:

µg/m³ - micrograms per cubic meter

< - indicates not detected at or above the indicated value

J - indicates sample result is estimated

Bold - indicates detections

R - rejected after data validation

NA1 - no criteria given in the EPA RSL Calculator

NA2 - NYSDOH did not include this compound in the guidance document[2]

* - sample collected over a 3-day period due to low vacuum

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan

Table 3: Ambient Air Laboratory Results (2021-01-15 through 2021-01-21)

Analyte	Target Screening Level (µg/m³)[1,3]	95% of Concentration Distribution NYSDOH Background Air (µg/m³)[2]	Ambient Air Concentration (µg/m³)				
			Sample Location				
			AMP-01	AMP-02	AMP-03	AMP-04	AMP-03-DUP
Site-specific Compounds of Interest[1]							
1,1,1-Trichloroethane	520	0.7	< 0.20	< 0.40	< 0.19	< 0.23	< 0.19
1,1-Dichloroethane	45	< 0.25	< 0.15	< 0.30	< 0.14	< 0.17	< 0.14
1,1-Dichloroethene	8	<0.25	< 0.074	< 0.14	< 0.068	< 0.084	< 0.068
1,2-Dichloroethane	3	< 0.25	< 0.15	< 0.30	< 0.14	< 0.17	< 0.14
Benzene	8	5.8	**0.78**	< 0.58	**0.53**	**0.57**	**0.55**
Ethyl-benzene	29	1.9	< 0.16	< 0.32	< 0.15	< 0.18	< 0.15
m,p-Xylene	10	3.1	< 0.32	< 0.63	< 0.30	< 0.37	< 0.30
o-Xylene	10	2.3	< 0.16	< 0.32	< 0.15	< 0.18	< 0.15
Tetrachloroethene	30	1.6	< 0.25	< 0.50	< 0.23	< 0.29	< 0.23
Toluene	521	21	**0.95**	< 0.69	**0.68**	**0.69**	**0.73**
trans-1,2-Dichloroethene	82	NA2	< 0.74	< 1.4	< 0.68	< 0.84	< 0.68
Trichloroethene	2	0.5	< 0.20	< 0.39	< 0.18	< 0.23	< 0.18
Vinyl Chloride	8	< 0.25	< 0.048	< 0.093	< 0.044	< 0.054	< 0.044
Other Compounds[3]							
1,1,2,2-Tetrachloroethane	1.3	< 0.25	< 0.26	< 0.50	< 0.23	< 0.29	< 0.23
1,1,2-Trichloroethane	0.21	< 0.25	< 0.20	< 0.40	< 0.19	< 0.23	< 0.19
1,2-Dibromoethane (EDB)	0.12	< 0.25	< 0.29	< 0.56	< 0.26	< 0.32	< 0.26
1,4-Dichlorobenzene	7	0.8	< 0.22	< 0.44	< 0.20	< 0.25	< 0.20
Carbon Tetrachloride	12	1	**0.66**	< 0.46	**0.47**	**0.48**	**0.49**
Chloroethane	417	0.4	< 0.25	< 0.48	< 0.22	< 0.28	< 0.22
Chloroform	3	0.5	< 0.18	< 0.36	< 0.17	< 0.21	< 0.17
Chloromethane	310	4.6	< 1.9	< 3.8	< 1.8	< 2.2	< 1.8
cis-1,2-Dichloroethene	NA1	< 0.25	< 0.15	< 0.29	< 0.14	< 0.17	< 0.14
Freon 114	NA1	1.3	< 0.26	< 0.51	< 0.24	< 0.30	< 0.24
Freon 12	100	11	**3.7**	**2.5**	**2.6**	**2.7**	**2.7**
Methyl tert-butyl ether	260	NA2	< 0.67	< 1.3	< 0.62	< 0.76	< 0.62

Notes:

µg/m³ - micrograms per cubic meter

Bold - indicates detections

R - rejected after data validation

< - indicates not detected at or above the indicated value

NA1 - no criteria given in the EPA RSL Calculator

J - indicates sample result is estimated

NA2 - NYSDOH did not include this compound in the guidance document[2]

[1] Target Screening Levels for site-specific compounds of interest provided in Bethpage Ambient Air Monitoring Plan and are based on a one-year exposure duration (B&B Engineers & Geologists of New York, P.C., May 2020)

[2] NYSDOH Outdoor Air Background Values from Appendix C (Table C1) of Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006)

[3] Target Screening Levels for other compounds calculated using the EPA RSL calculator with the same inputs as described in the Bethpage Ambient Air Monitoring Plan