NORTHROP GRUMMAN

ISTR Operations Monthly Progress Report

Reporting Period: August 2021

Operable Unit 3 VOC Source Area Remedy
Former Grumman Settling Ponds, Bethpage, NY
NYSDEC Site No. 130003A
September 28, 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 August 2021

NORTHROP GRUMMAN

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*
- Liquid discharges comply with criteria specified in the RAWP

** See slide 12 for additional information*

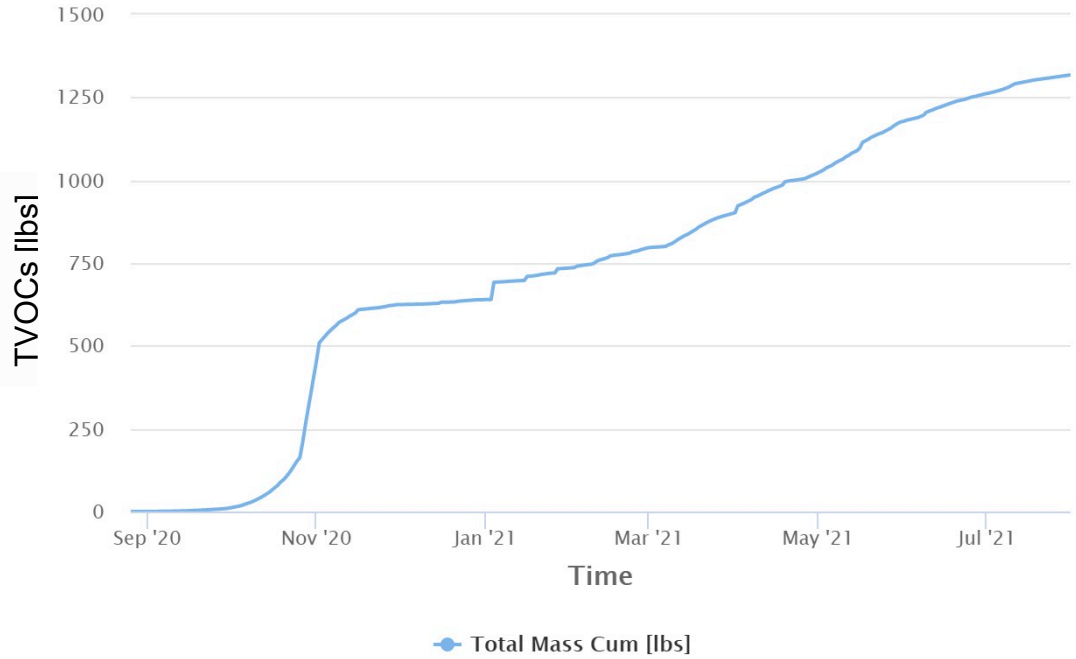
Reporting Period: August 2021

System Startup	8/26/2020
Days of Operation Since Startup	370
Estimated cumulative TVOC Mass Removed, lbs	1,343

Remedy Progress / Performance Monitoring August 2021

NORTHROP GRUMMAN

Cumulative TVOC Mass Removed



Estimated 1,343 lbs of total volatile organic compounds (TVOCs) removed through 8/30

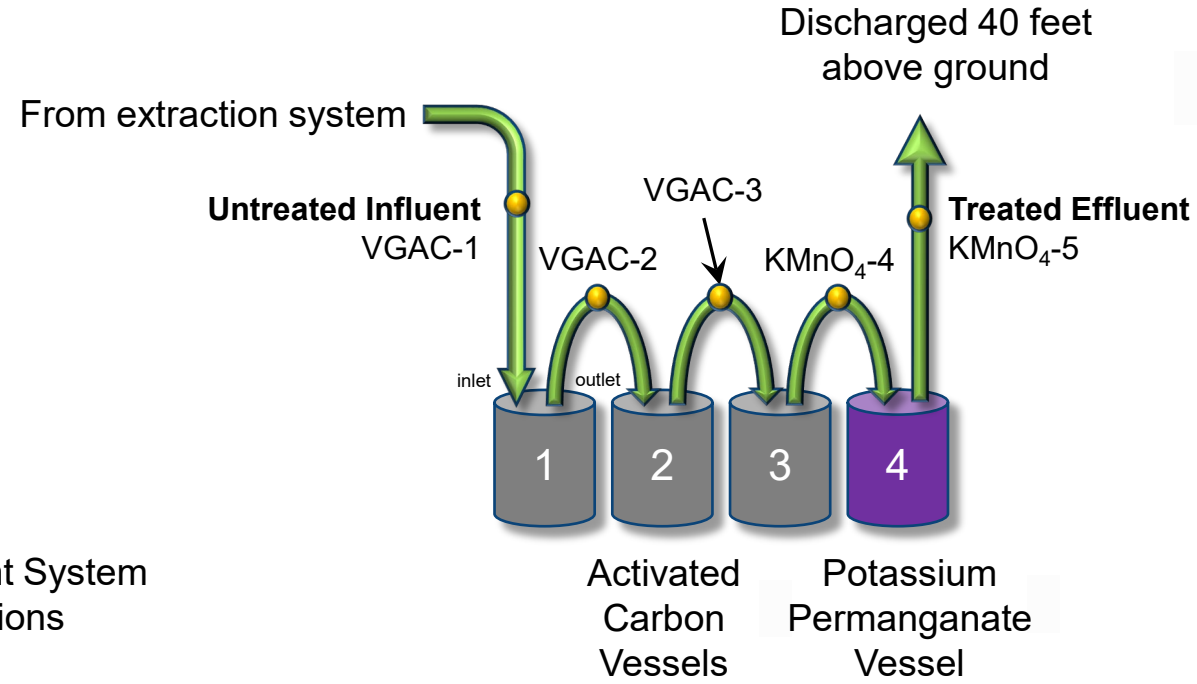
Cumulative TVOC mass is the sum of the following:

- Photoionization detector (PID) TVOC vapor mass
- Liquid TVOC mass
- Condensed non-aqueous phase liquid (NAPL) mass

Remedy Progress / Performance Monitoring
August 2021

NORTHROP GRUMMAN

Vapor Treatment System



- Vapor Treatment System Sampling Locations

Remedy Progress / Performance Monitoring August 2021

NORTHROP GRUMMAN

Vapor Treatment System

Air emissions meet treatment criteria in the RAWP:

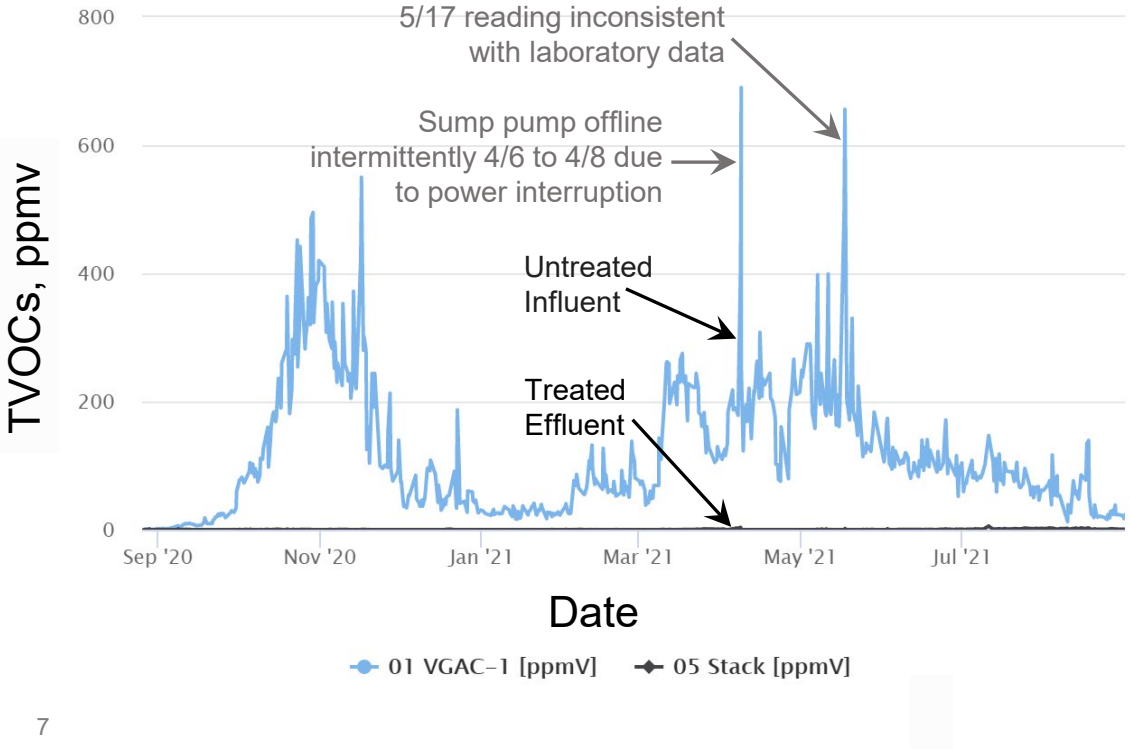
- Stack concentrations less than 7.6 mg/m^3 for TCE and 1.9 mg/m^3 design limits for vinyl chloride throughout August.

Vapor treatment system analytical results for August provided in Table 1

Remedy Progress / Performance Monitoring August 2021

NORTHROP GRUMMAN

Vapor Treatment System (PID)



TVOC concentrations (PID) on August 31:

- Influent = 24 ppmv
- Effluent = 1.1 ppmv

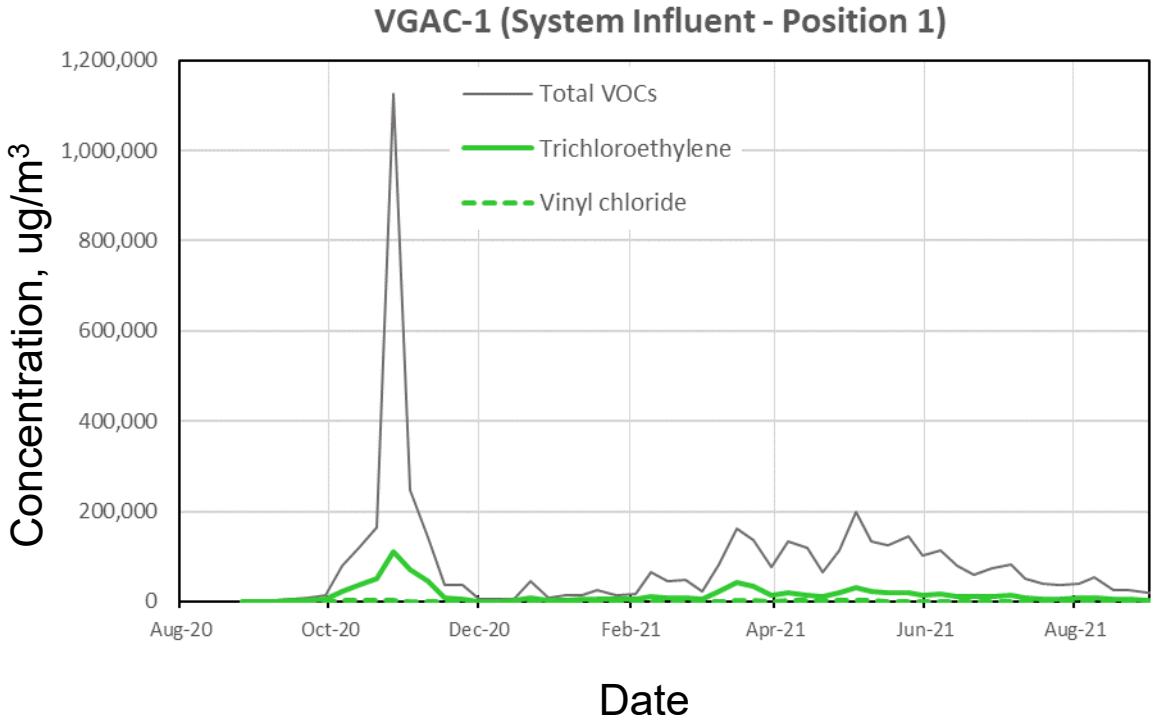
Maximum TVOC concentrations (PID) during August reporting period:

- Influent = 139 ppmv
- Effluent = 2.9 ppmv

Remedy Progress / Performance Monitoring August 2021

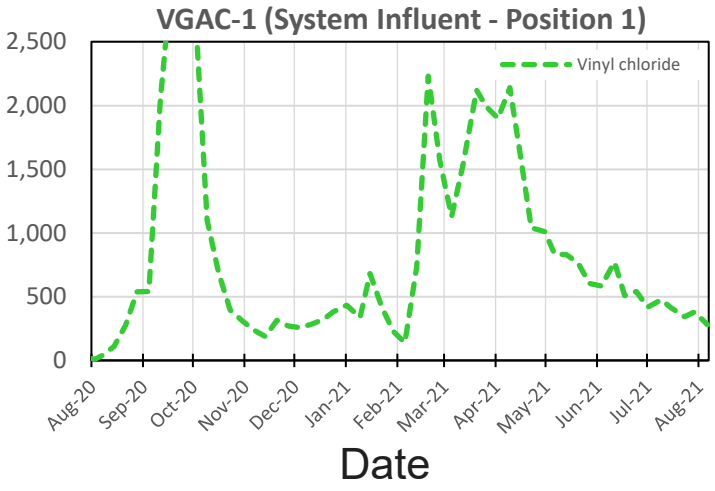
NORTHROP GRUMMAN

Vapor Treatment System Influent



Influent concentrations (Summa) on 8/31:

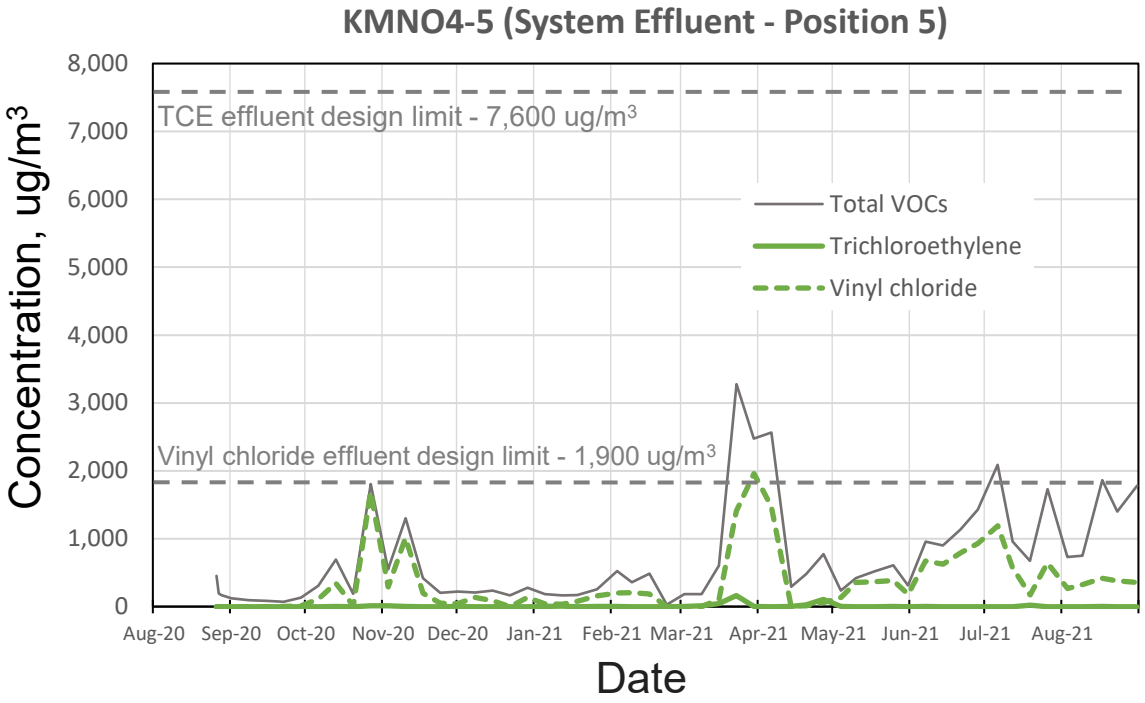
- TVOCs = 20,025 ug/m^3
- TCE = 3,770 ug/m^3
- Vinyl chloride = 279 ug/m^3



Remedy Progress / Performance Monitoring August 2021

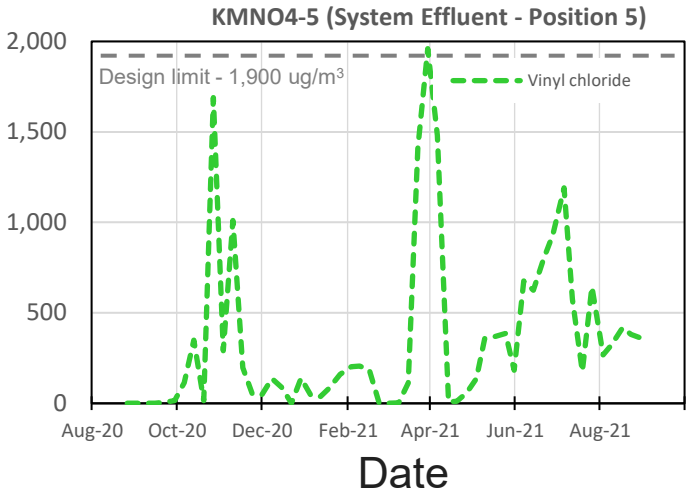
NORTHROP GRUMMAN

Vapor Treatment System Effluent



Effluent concentrations (Summa) on 8/31:

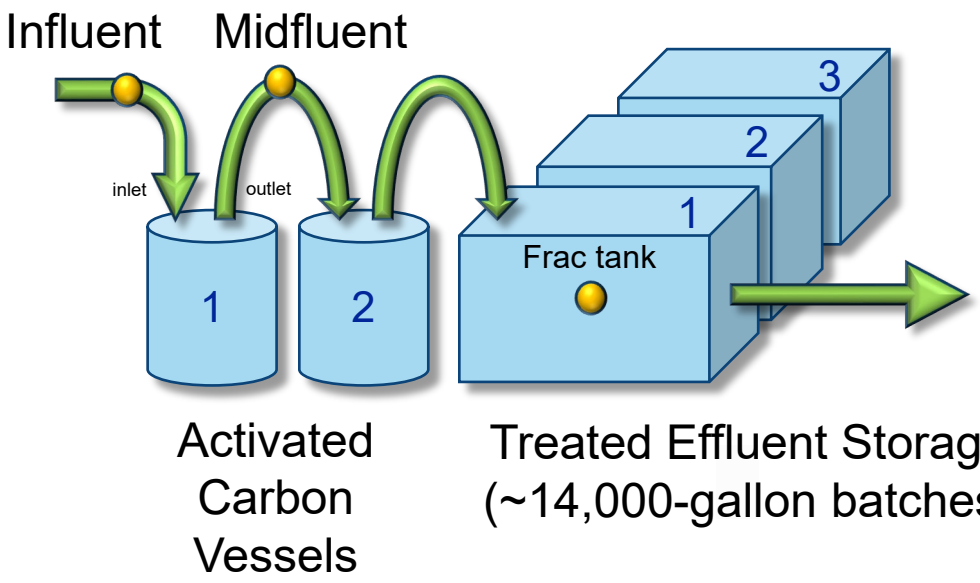
- TVOCs = 1,781 ug/m^3
- TCE = 1.3 ug/m^3
- Vinyl chloride = 358 ug/m^3



Remedy Progress / Performance Monitoring
August 2021

NORTHROP GRUMMAN

Liquid Treatment System



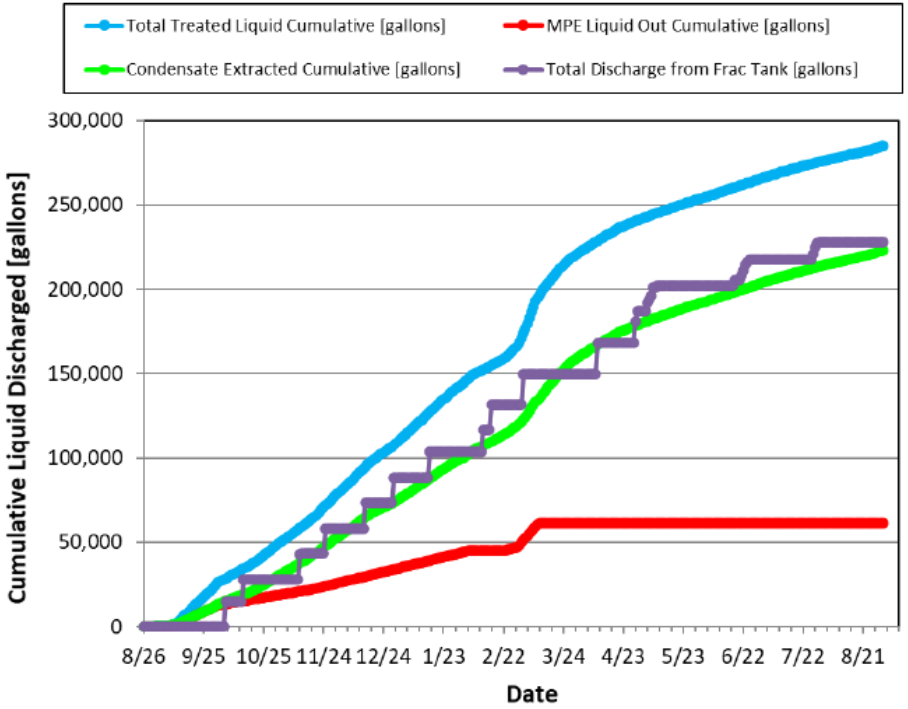
- Liquid Treatment System Sampling Locations

Treated liquid pumped to OU3 Groundwater Treatment System

Remedy Progress / Performance Monitoring August 2021

NORTHROP GRUMMAN

Cumulative Liquid Produced



285,000 total gallons extracted and treated through 8/31

228,140 total gallons treated effluent discharged to OU3 groundwater treatment system through 8/31

Liquid treatment system analytical results for August provided in Table 2

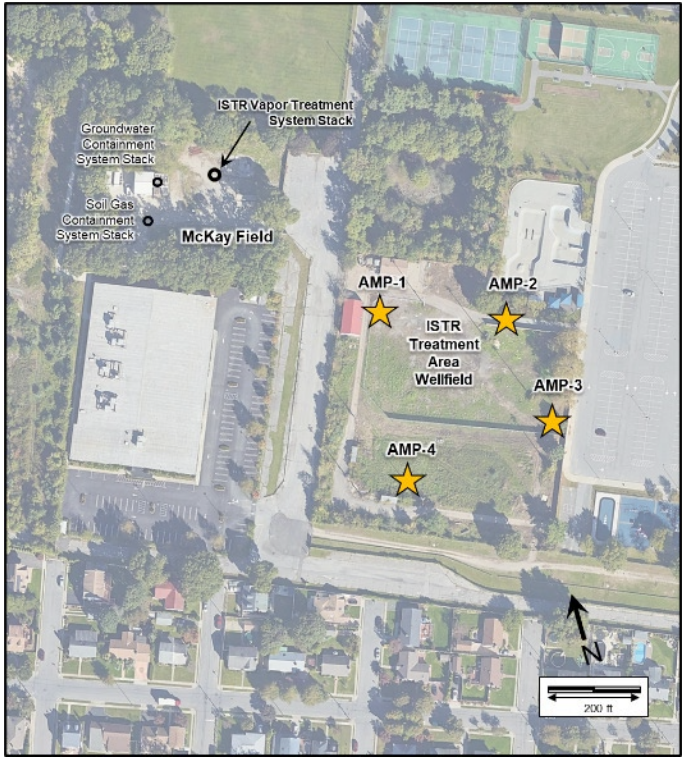
Ambient Air PID Monitoring
August 2021

NORTHROP GRUMMAN

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)*

*As described in daily CAMP monitoring emails, elevated PID readings were recorded 8/6 and 8/19, during periods of high relative humidity. Inspections were conducted on both occasions, and no extraction system issues or ambient vapors were detected. The remote communications modules at AMP-3 and AMP-4 malfunctioned and were offline from 8/6-8/9 and 8/19-8/20, respectively.



Significant Activities
August 2021

NORTHROP GRUMMAN

Major equipment repairs and significant downtime: None

Other significant activities:

- Well field heater circuits de-energized on 8/11 (per NYSDEC 8/11 approval). ISTR vapor extraction and treatment system continues to address well field vapors.
- Submitted 8/12 proposed modifications of the OU3 SGCS to treat ISTR vapors.
- Changed out 1,000 lb. LGAC vessels on 8/16.
- Implemented gauging and removal of LNAPL from 8 VEWs.
- Purged water from shallow VEWs to enhance vapor recovery and installed pumps in 2 VEWs.

Planned Significant Activities During Next Two Months

- Maintain vapor extraction system operation, monitoring, and maintenance in preparation for system shutdown.
- Continue LNAPL gauging and removal from 8 VEWs.
- Continue purging water from shallow VEWs.
- Begin decommissioning of well field ISTR electrical components.

Schedule

Activity	RAWP Schedule	Current Status
Remedial System Operation	Q3/20 – Q1/21	Q3/20 – Q3/21
Post-Treatment Confirmation Sampling	Q1/21	Complete
Remedy Cool-down	Q1/21-Q2-21	Q1/21-Q4/21
Equipment Removal & Site Restoration	Q2/21	Q4/21

ISTR vapor extraction and treatment system continues to operate.

Pending RAWP Modifications

None

RE US ENGINEERS

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

Compound (ug/m^3) / Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD29355-1 8/3/2021		VGAC-3 JD29355-2 8/3/2021		KMNO4-5 JD29355-3 8/3/2021		DUPLICATE JD29355-4 8/3/2021		
1,1,1-Trichloroethane	< 7.1		< 7.1		< 0.71		< 7.1		
1,1-Dichloroethane	**80.5**		< 1.9		< 0.19		< 1.9		
1,1-Dichloroethylene	**45.6**		**99.9**		< 0.27		**121**		
1,2,4-Trimethylbenzene	**35**	J	< 6.4		< 0.64		< 6.4		
1,2-Dibromoethane	< 5.5		< 5.5		< 0.55		< 5.5		
1,3,5-Trimethylbenzene	**28**	J	< 6.4		< 0.64		< 6.4		
1,3-Butadiene	< 4.0		< 4.0		< 0.40		< 4.0		
1,4-Dioxane*	< 7.6		< 7.6		< 0.76		< 7.6		
2,2,4-Trimethylpentane	**106**		< 4.1		< 0.41		< 4.1		
2-Hexanone	**101**		< 6.1		< 0.61		< 6.1		
4-Ethyltoluene	**33**	J	< 5.9		< 0.59		< 5.9		
Acetone*	**7,340**		**4,060**		**24**		**5,770**		
Benzene	**39.0**		< 1.5		< 0.15		< 1.5		
Bromoform	< 16		< 16		< 1.6		< 16		
Carbon disulfide	**172**		**112**		**13**		**135**		
Carbon tetrachloride	< 5.9		< 5.9		< 0.59		< 5.9		
Chloroethane	**14**	J	**17**	J	**3.2**		**20**	J	
Chloroform	< 3.9		< 3.9		< 0.39		< 3.9		
Chloromethane*	**20**		**18**		**10**		**24.8**		
cis-1,2-Dichloroethylene	**5,830**		< 1.9		< 0.19		< 1.9		
Cyclohexane	**27**	J	< 3.0		< 0.30		< 3.0		
Dichlorodifluoromethane	< 3.3		< 3.3		**2.6**	J	< 3.3		
Ethanol	**309**		**93.5**		**249**		**132**		
Ethyl acetate	**125**		**48.6**		**32**		**28**	J	
Ethylbenzene	**617**		< 2.6		< 0.26		< 2.6		
Heptane	**229**		< 2.9		< 0.29		< 2.9		
Hexane	**21**	J	< 1.5		< 0.15		< 1.5		
Isopropyl alcohol*	**173**		< 6.4		**9.1**		< 6.4		
m,p-Xylene	**1,850**		< 6.1		**3.6**		< 6.1		
m-Dichlorobenzene	< 4.6		< 4.6		< 0.46		< 4.6		
Methyl ethyl ketone	**1,780**		< 5.0		**1.4**	J	< 5.0		
Methyl isobutyl ketone	**76.2**		< 5.7		< 0.57		< 5.7		
Methylene chloride*	< 2.0		< 2.0		**7.3**		< 2.0		
o-Dichlorobenzene	< 5.2		< 5.2		< 0.52		< 5.2		
o-Xylene	**621**		< 3.0		< 0.30		< 3.0		
Propylene*	**215**		**146**		**108**		**192**		
Styrene	< 3.2		< 3.2		< 0.32		< 3.2		
Tertiary butyl alcohol	**103**		< 1.7		< 0.17		< 1.7		
Tetrachloroethylene	**44**		< 8.1		< 0.81		< 8.1		
Tetrahydrofuran	< 5.9		< 5.9		< 0.59		< 5.9		
Toluene	**11,200**		**18**	J	**2.1**	J	**4.1**	J	
trans-1,2-Dichloroethylene	**138**		< 1.1		< 0.11		< 1.1		
Trichloroethylene	**7,310**		**9.1**		< 0.41		< 4.1		100%
Trichlorofluoromethane	< 6.2		< 6.2		< 0.62		< 6.2		
Vinyl acetate	**230**		< 4.9		< 0.49		< 4.9		
Vinyl chloride*	**475**		**401**		**268**		**473**		
Xylenes (total)	**2,470**		< 3.0		**3.6**		< 3.0		
TVOCs	**39,400**		**5,020**		**733**		**6,900**		
TVOCs less poor adsorbers*	**31,200**		**400**		**300**		**400**		

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

HSW

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

Compound (ug/m^3) / Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD29625-1 8/9/2021		VGAC-3 JD29625-2 8/9/2021		KMNO4-5 JD29625-3 8/9/2021		
1,1,1-Trichloroethane	< 7.1		< 0.71		< 0.71		
1,1-Dichloroethane	**72.0**		< 0.19		< 0.19		
1,1-Dichloroethylene	**48.4**		< 0.27		< 0.27		
1,2,4-Trimethylbenzene	**381**		< 0.64		< 0.64		
1,2-Dibromoethane	< 5.5		< 0.55		< 0.55		
1,3,5-Trimethylbenzene	**223**		< 0.64		< 0.64		
1,3-Butadiene	< 4.0		< 0.40		< 0.40		
1,4-Dioxane*	< 7.6		< 0.76		< 0.76		
2,2,4-Trimethylpentane	**97.6**		< 0.41		< 0.41		
2-Hexanone	**193**		< 0.61		< 0.61		
4-Ethyltoluene	**112**		< 0.59		< 0.59		
Acetone*	**7,550**		**78.6**		**44.7**		
Benzene	**43.8**		< 0.15		< 0.15		
Bromoform	< 16		< 1.6		< 1.6		
Carbon disulfide	**164**		< 0.29		**33.3**		
Carbon tetrachloride	< 5.9		< 0.59		< 0.59		
Chloroethane	**14**	J	< 0.50		**8.7**		
Chloroform	< 3.9		< 0.39		< 0.39		
Chloromethane*	**15**	J	**1.6**	J	**13**		
cis-1,2-Dichloroethylene	**5,790**		**3.3**		< 0.19		
Cyclohexane	**24**	J	< 0.30		< 0.30		
Dichlorodifluoromethane	< 3.3		**2.7**	J	**2.2**	J	
Ethanol	**194**		**16**		**190**		
Ethyl acetate	< 5.4		**7.9**		**6.8**		
Ethylbenzene	**1,580**		< 0.26		< 0.26		
Heptane	**240**		**1.6**	J	< 0.29		
Hexane	**20**	J	< 0.15		< 0.15		
Isopropyl alcohol*	**147**		**3.7**		**8.4**		
m,p-Xylene	**5,390**		**3.7**		**2.3**	J	
m-Dichlorobenzene	< 4.6		< 0.46		< 0.46		
Methyl ethyl ketone	**1,820**		**3.2**		**1.7**	J	
Methyl isobutyl ketone	**86.1**		< 0.57		< 0.57		
Methylene chloride*	< 2.0		**4.9**		**8.0**		
o-Dichlorobenzene	< 5.2		< 0.52		< 0.52		
o-Xylene	**2,060**		< 0.30		< 0.30		
Propylene*	**173**		**1.7**	J	**107**		
Styrene	< 3.2		< 0.32		< 0.32		
Tertiary butyl alcohol	**79.1**		**2.9**		< 0.17		
Tetrachloroethylene	**70.5**		< 0.81		< 0.81		
Tetrahydrofuran	< 5.9		< 0.59		< 0.59		
Toluene	**18,500**		**9.8**		**4.5**		
trans-1,2-Dichloroethylene	**138**		< 0.11		< 0.11		
Trichloroethylene	**9,030**		**4.8**		< 0.41		100%
Trichlorofluoromethane	< 6.2		< 0.62		< 0.62		
Vinyl acetate	**250**		< 0.49		< 0.49		
Vinyl chloride*	**412**		**1.9**		**322**		
Xylenes (total)	**7470**		**3.7**		**2.3**	J	
TVOCs	**54,900**		**148**		**753**		
TVOCs less poor adsorbers*	**46,600**		**100**		**200**		

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

HSW

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

Compound (ug/m^3) / Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD30052-1 8/17/2021		VGAC-3 JD30052-2 8/17/2021		KMNO4-5 JD30052-3 8/17/2021		
1,1,1-Trichloroethane	< 3.6		< 1.8		< 0.93		
1,1-Dichloroethane	**63.9**		< 0.49		< 0.23		
1,1-Dichloroethylene	**39**		**103**		< 0.33		
1,2,4-Trimethylbenzene	**41**		< 1.6		< 0.84		
1,2-Dibromoethane	< 2.8		< 1.4		< 0.68		
1,3,5-Trimethylbenzene	**35**		< 1.7		< 0.84		
1,3-Butadiene	< 2.0		< 1.0		< 0.51		
1,4-Dioxane*	< 3.6		< 1.9		< 0.94		
2,2,4-Trimethylpentane	**97.2**		< 1.0		< 0.51		
2-Hexanone	**176**		< 1.5		< 0.74		
4-Ethyltoluene	**58.5**		< 1.5		< 0.74		
Acetone*	**4,040**		**2,640**		**287**		
Benzene	**37.4**		< 0.38		< 0.19		
Bromoform	< 7.8		< 3.8		< 2.0		
Carbon disulfide	**135**		**56.7**		**163**		
Carbon tetrachloride	< 3.0		< 1.5		< 0.75		
Chloroethane	**7.9**	J	**18**		**19**		
Chloroform	**13**	J	< 0.98		< 0.49		
Chloromethane*	**12**		**17**		**16**		
cis-1,2-Dichloroethylene	**3,180**		**63.0**		**3.1**		
Cyclohexane	< 1.5		< 0.76		< 0.38		
Dichlorodifluoromethane	< 1.6		< 0.84		< 0.41		
Ethanol	**554**		**582**		**718**	E	
Ethyl acetate	< 2.7		< 1.4		**6.1**		
Ethylbenzene	**639**		< 0.65		< 0.33		
Heptane	**231**		< 0.74		< 0.36		
Hexane	< 0.74		< 0.39		< 0.19		
Isopropyl alcohol*	< 3.2		< 1.6		**19**		
m,p-Xylene	**1,830**		**10**		**6.1**		
m-Dichlorobenzene	< 2.3		< 1.1		< 0.57		
Methyl ethyl ketone	**1,450**		< 1.2		**2.8**	J	
Methyl isobutyl ketone	**91.8**		< 1.5		**2.5**	J	
Methylene chloride*	< 1.0		< 0.52		**8.3**		
o-Dichlorobenzene	< 2.6		< 1.3		< 0.66		
o-Xylene	**647**		**4.1**	J	**2.6**	J	
Propylene*	**156**		**191**		**172**		
Styrene	< 1.6		< 0.81		< 0.40		
Tertiary butyl alcohol	**63.7**		< 0.42		**2.3**	J	
Tetrachloroethylene	**45**		< 2.1		< 1.0		
Tetrahydrofuran	< 2.9		< 1.5		< 0.74		
Toluene	**7,310**		**22**		**10**		
trans-1,2-Dichloroethylene	**121**		**8.3**		**2.3**	J	
Trichloroethylene	**4,410**		**12**		**5.0**		100%
Trichlorofluoromethane	< 3.1		< 1.6		< 0.79		
Vinyl acetate	< 2.4		< 1.2		< 0.60		
Vinyl chloride*	**343**		**440**		**417**		
Xylenes (total)	**2,480**		**14**		**8.7**		
TVOCs	**25,800**		**4,170**		**1,862**		
TVOCs less poor adsorbers*	**21,200**		**900**		**900**		

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 concentrati E Detected concentration is off-scale (high) an

TVOCs Total volatile organic compounds

Detections are highlighted.

RE US ENGINEERS

HSW

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

Compound (ug/m^3) / Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD30422-1 8/23/2021		VGAC-3 JD30422-2 8/23/2021		KMNO4-5 JD30422-3 8/23/2021		
1,1,1-Trichloroethane	< 7.1		< 3.6		< 0.71		
1,1-Dichloroethane	**71.2**		< 0.93		< 0.19		
1,1-Dichloroethylene	**40.4**		**92.4**		< 0.27		
1,2,4-Trimethylbenzene	**28**	J	< 3.2		< 0.64		
1,2-Dibromoethane	< 5.5		< 2.8		**12**		
1,3,5-Trimethylbenzene	< 6.4		< 3.3		< 0.64		
1,3-Butadiene	< 4.0		< 2.0		< 0.40		
1,4-Dioxane*	< 7.6		< 3.6		< 0.76		
2,2,4-Trimethylpentane	**68.7**		< 2.1		< 0.41		
2-Hexanone	**33**		< 3.0		< 0.61		
4-Ethyltoluene	< 5.9		< 2.9		< 0.59		
Acetone*	**6,820**		**1,420**		**378**		
Benzene	**30**		< 0.77		< 0.15		
Bromoform	< 16		< 7.8		< 1.6		
Carbon disulfide	**147**		**35.8**		**200**		
Carbon tetrachloride	< 5.9		< 3.0		< 0.59		
Chloroethane	< 5.0		**14**		**15**		
Chloroform	< 3.9		< 2.0		< 0.39		
Chloromethane*	**13**	J	**17**		**14**		
cis-1,2-Dichloroethylene	**4,520**		**62.6**		< 0.19		
Cyclohexane	**19**	J	< 1.5		< 0.30		
Dichlorodifluoromethane	< 3.3		< 1.6		**2.7**	J	
Ethanol	**205**		**109**		**211**		
Ethyl acetate	< 5.4		**18**		**11**		
Ethylbenzene	**149**		< 1.3		< 0.26		
Heptane	**127**		< 1.4		< 0.29		
Hexane	**14**	J	< 0.74		< 0.15		
Isopropyl alcohol*	**124**		< 3.2		**13**		
m,p-Xylene	**434**		< 3.0		< 0.61		
m-Dichlorobenzene	< 4.6		< 2.3		< 0.46		
Methyl ethyl ketone	**1,040**		< 2.5		**2.1**	J	
Methyl isobutyl ketone	**38**		< 3.0		< 0.57		
Methylene chloride*	**17**	J	**14**		**4.2**		
o-Dichlorobenzene	< 5.2		< 2.6		< 0.52		
o-Xylene	**141**		< 1.5		< 0.30		
Propylene*	**152**		**166**		**152**		
Styrene	< 3.2		< 1.6		< 0.32		
Tertiary butyl alcohol	**77.0**		< 0.85		< 0.17		
Tetrachloroethylene	**16**		< 4.2		< 0.81		
Tetrahydrofuran	< 5.9		< 2.9		< 0.59		
Toluene	**5,160**		**8.7**	J	**1.7**	J	
trans-1,2-Dichloroethylene	**119**		**11**	J	**2.5**	J	
Trichloroethylene	**5,130**		**5.0**		< 0.41		100%
Trichlorofluoromethane	< 6.2		< 3.1		< 0.62		
Vinyl acetate	**180**		< 2.4		< 0.49		
Vinyl chloride*	**381**		**391**		**381**		
Xylenes (total)	**573**		< 1.5		< 0.30		
TVOCs	**25,300**		**2,360**		**1,400**		
TVOCs less poor adsorbers*	**17,800**		**400**		**500**		

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

HSW

Table 1. Vapor Treatment System Air Sampling Results
Routine Monitoring

Compound (ug/m^3) / Sample ID: / Lab Sample ID: / Date Sampled:	VGAC-1 JD30785-1 8/31/2021	VGAC-3 JD30785-2 8/31/2021	KMNO4-5 JD30785-3 8/31/2021	
1,1,1-Trichloroethane	< 5.3	< 1.5	< 0.71	
1,1-Dichloroethane	**50.2**	**9.7**	< 0.19	
1,1-Dichloroethylene	**26**	**101**	< 0.27	
1,2,4-Trimethylbenzene	**58.0**	< 1.3	< 0.64	
1,2-Dibromoethane	< 4.1	< 1.1	< 0.55	
1,3,5-Trimethylbenzene	**32**	< 1.3	< 0.64	
1,3-Butadiene	< 3.1	< 0.82	< 0.40	
1,4-Dioxane*	< 5.4	< 1.5	< 0.76	
2,2,4-Trimethylpentane	**54.6**	< 0.79	< 0.41	
2-Hexanone	< 4.5	< 1.2	< 0.61	
4-Ethyltoluene	**45**	< 1.2	< 0.59	
Acetone*	**4,420**	**1,070**	**722**	
Benzene	**19**	< 0.30	< 0.15	
Bromoform	< 11	< 3.1	< 1.6	
Carbon disulfide	**96.5**	**40.8**	**309**	
Carbon tetrachloride	< 4.4	< 1.2	< 0.59	
Chloroethane	< 3.7	**11**	**14**	
Chloroform	< 2.9	< 0.78	< 0.39	
Chloromethane*	**9.7 J**	**12**	**12**	
cis-1,2-Dichloroethylene	**3,150**	**389**	**1.4**	
Cyclohexane	**20**	< 0.62	< 0.30	
Dichlorodifluoromethane	< 2.4	< 0.64	**2.4 J**	
Ethanol	**134**	**247**	**167**	
Ethyl acetate	< 4.0	**7.9**	< 0.54	
Ethylbenzene	**243**	< 0.52	< 0.26	
Heptane	**117**	< 0.57	< 0.29	
Hexane	**54.6**	< 0.30	< 0.15	
Isopropyl alcohol*	**102**	< 1.3	**16**	
m,p-Xylene	**730**	**8.7**	**3.0 J**	
m-Dichlorobenzene	< 3.4	< 0.90	< 0.46	
Methyl ethyl ketone	**1,060**	**5.3**	**2.9**	
Methyl isobutyl ketone	**47.1**	< 1.2	< 0.57	
Methylene chloride*	< 1.5	**10**	**3.1**	
o-Dichlorobenzene	< 3.9	< 1.0	< 0.52	
o-Xylene	**268**	**3.6 J**	< 0.30	
Propylene*	**126**	**129**	**160**	
Styrene	< 2.4	< 0.64	< 0.32	
Tertiary butyl alcohol	**60.3**	< 0.33	**1.8 J**	
Tetrachloroethylene	**30**	< 1.7	< 0.81	
Tetrahydrofuran	< 4.4	< 1.2	< 0.59	
Toluene	**4,940**	**30**	**4.5**	
trans-1,2-Dichloroethylene	**82.5**	**45.6**	**2.7 J**	
Trichloroethylene	**3,770**	**18**	**1.3**	100%
Trichlorofluoromethane	< 4.7	< 1.2	< 0.62	
Vinyl acetate	< 3.5	< 0.95	< 0.49	
Vinyl chloride*	**279**	**358**	**358**	
Xylenes (total)	**999**	**12**	**3.0 J**	
TVOCs	**20,030**	**2,500**	**1,781**	
TVOCs less poor adsorbers*	**15,100**	**900**	**500**	

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 2. Liquid Treatment System Sampling Results

HSW

Analyte	TOGS 111 Effluent Limitations (GA)	SPDES Permit Equivalent Daily Maximum Discharge Limitations	Sample ID: / Lab Sample ID: / Date Sampled:	LGAC-INF-20210819 / JD30262-1 / 1A / 8/19/2021	LGAC-MID-20210819 / JD30262-2 / 2A / 8/19/2021	LGAC-EFF-20210819 / JD30262-3 / 3A / 8/19/2021	FRAC1-A2949-20210826 / JD30612-1 / 1A / 8/26/2021
Volatile Organic Compounds (ug/L, detections only):							
2-Butanone (MEK)	50			**654**	< 6.9	< 6.9	< 6.9
2-Hexanone	50			**68.5**	< 2.0	< 2.0	< 2.0
4-Methyl-2-pentanone (MIBK)	--			**15.1**	< 1.9	< 1.9	< 1.9
Acetone*	50			**2,810**	**20.1**	< 3.1	< 3.1
Chloromethane				**1.4**	< 0.76	< 0.76	< 0.76
cis-1,2-Dichloroethene	5	5		**8.2**	< 0.51	< 0.51	< 0.51
Ethylbenzene	5			**0.96 J**	< 0.60	< 0.60	< 0.60
m,p-Xylene	5			**3.9**	< 0.78	< 0.78	< 0.78
o-Xylene	5			**2.6**	< 0.59	< 0.59	< 0.59
Toluene	5			**12.9**	< 0.53	< 0.53	< 0.53
Trichloroethene	5	5		**2.8**	< 0.53	< 0.53	< 0.53
Xylene (total)	5			**6.5**	< 0.59	< 0.59	< 0.59
TVOCs	--			**3,580**	**20.1**	0	0
TVOCs less poor adsorbers*	--			**770**	0	0	0
Semivolatile Organic Compounds (ug/L, detections only):							
1,1'-Biphenyl	5			**1.1**	< 0.21	< 0.21	< 0.21
1,4-Dioxane	--			**9.9**	< 0.66	< 0.64	< 0.64
2,4-Dimethylphenol	1			**28.5**	< 2.4	< 2.4	< 2.4
2-Methylphenol	2**			**23.2**	< 0.89	< 0.86	< 0.87
3&4-Methylphenol	2**			**107**	< 0.88	< 0.85	< 0.86
Acetophenone	--			**130 B**	< 0.21	< 0.20	< 0.20
Benzaldehyde	--			**115**	< 0.29	< 0.28	< 0.28
Dimethyl phthalate	50			**4.3**	< 0.22	< 0.21	< 0.21
Fluoranthene	50			**0.36 J**	< 0.17	< 0.17	< 0.17
Phenanthrene	50			**1.8**	< 0.18	< 0.17	< 0.17
Phenol	1			**88.4**	< 0.39	< 0.38	< 0.38
Pyrene	50			**0.34 J**	< 0.22	< 0.21	< 0.21
Semivolatile Organic Compounds (SIM) (ug/L):							
1,4-Dioxane	--			**9.23**	**0.0633 J**	< 0.049	< 0.049
Polychlorinated Biphenyls (ug/L):							
Aroclor 1016				< 0.16	< 0.16	< 0.16	< 0.14
Aroclor 1221				< 0.34	< 0.34	< 0.34	< 0.30
Aroclor 1232				< 0.21	< 0.21	< 0.21	< 0.19
Aroclor 1242				< 0.19	< 0.19	< 0.18	< 0.16
Aroclor 1248	0.09			< 0.10	< 0.10	< 0.10	< 0.090
Aroclor 1254	0.09			**5.1**	< 0.34	< 0.33	< 0.30
Aroclor 1260				< 0.12	< 0.12	< 0.12	< 0.11
Aroclor 1262				< 0.16	< 0.16	< 0.15	< 0.14
Aroclor 1268				< 0.14	< 0.14	< 0.14	< 0.12
Metals (ug/L):							
Cadmium				< 3.0	< 3.0	< 3.0	< 3.0
Chromium				< 10	< 10	< 10	< 10
Iron	300	600		**6,920**	< 100	< 100	**694**
Manganese	300	600		**164**	< 15	< 15	< 15
Sum of total iron and manganese		1000		**7,084**	**ND**	**ND**	**709**
Mercury				< 0.20	< 0.20	< 0.20	< 0.20
General Chemistry (mg/L):							
Nitrogen, Nitrate	10	10		< 0.11	< 0.11	< 0.11	< 0.11
Nitrogen, Nitrate + Nitrite	10			< 0.10	< 0.10	< 0.10	**0.18**
Nitrogen, Nitrite	1			< 0.010	< 0.010	< 0.010	**0.12**
Nitrogen, Total Kjeldahl	-			**2.3**	**4.5**	**6.2**	**0.61**

Footnotes:

ug/L	micrograms per liter
mg/L	milligrams per liter
TOGS 111	Technical and Operational Guidance Series 1.1.1., Groundwater Effluent Limitations, Class GA, New York State.
*	Poorly adsorbed on activated carbon.
**	Applies to sum of phenolic compounds.
***	Generated by Method 6010D; all other metals results generated by Method 200.7.
<	Analyte was not detected at or above the indicated value.
J	Detected concentration is less than the laboratory quantitation limit.
J1	Low recovery reported for the matrix spike duplicate.
B	Analyte was detected in a laboratory method blank.
ND	Not Determined
TVOCs	Total volatile organic compounds
	Detections are highlighted.


NORTHROP
GRUMMAN