

## FRANKLIN CLEANERS GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

Latitude 40.688°, Longitude 73.627°

### REPORT TITLE

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### REPORTING PERIOD

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2017

### CLIENT

New York State Department of  
Environmental Conservation

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**MAY 2017**



## NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation

625 Broadway, 12th Floor, Albany, New York 12233

### Site

**NYSDEC Site No. 130050**, Franklin Cleaners Site  
Groundwater Extraction and Treatment System  
Village of Rockville Centre, Town of Hempstead,  
Nassau County, New York



### Project Background and Site Description

The Franklin Cleaners groundwater extraction and treatment system (GWE&TS) is actively recovering and treating the “leading edge” of a chlorinated solvent-contaminated groundwater plume emanating from the former Franklin Cleaners dry cleaner site, located approximately one mile upgradient of the GWE&TS, in the Village of Hempstead, Nassau County, New York. The groundwater plume is primarily composed of tetrachloroethene (PCE). The Franklin Cleaners GWE&TS has been in operation since September 2004. Refer to [Figure 1](#) for a site location map depicting the treatment system location.

### Groundwater Extraction and Treatment System Overview



The GWE&TS consists of two 6-inch diameter wells screened approximately 75 to 90 feet below grade. Extracted groundwater is conveyed via underground piping to a low-profile stacked-tray air stripper located in the GWE&TS building. The treated groundwater is discharged from the air stripper to a wet well equipped with two series-configured submersible pumps, which convey the treated water via underground piping to a Nassau County Department of Public Works storm sewer manhole in accordance with all applicable discharge standards. Exhaust gas from the air stripper was treated utilizing two series-configured granular activated carbon (GAC) vessels; however, based on historic low contaminant concentrations detected in the air stripper exhaust gas, the air stripper exhaust piping was reconfigured to bypass the GAC vessels

and discharge exhaust gas directly to the atmosphere in June 2011, per the direction of the NYSDEC. The GWE&TS is equipped with instrumentation and controls which allow for automated startup and operation, and an auto dial alarm notification system. Refer to [Figure 2](#) for an “as-built” treatment system layout diagram.

### Regulatory Requirements/Cleanup Goals

Site-specific remedial goals have been established through the remedy selection process as defined in 6 NYCRR Part 375-1.10, and are documented in the Record of Decision (ROD), dated March 1998. The site-specific remedial goals outlined in the March 1998 ROD are provided in [Attachment A](#). The overall goal is to meet all appropriate Standards, Criteria, and Guidance (SCGs) and to be protective of human health and the environment. Implementation of the GWE&TS is specifically focused on the following goals:

- Reduce, control, or eliminate contaminated media to the extent practicable.



- Eliminate the potential for exposure to contaminated groundwater.
- Provide for attainment of SCGs for groundwater, soil and indoor air within the limits of the affected area, to the extent practical.

### **Remedial System Optimization (RSO) Plume Redelineation**

A plume redelineation program was completed in June and July 2014 as part of an overall larger and ongoing Remedial System Optimization (RSO) evaluation undertaken to improve the efficiency, effectiveness and net environmental benefit of the current GWE&TS. The plume redelineation program was completed in order to identify the current horizontal and vertical extents of the remaining groundwater plume associated with the Site.

The results of the plume redelineation program were documented in the July 2015 Plume Redelineation Summary Report. Based on the plume redelineation program and given that the greatest current PCE exceedances were identified upgradient of the Site, the groundwater plume currently being captured by the GWE&TS may have, in part, resulted from an off-site "source area" located upgradient of the site. It should be noted that the November 1998 RI/FS identified at least three former dry cleaners known to have existed in an upgradient arrangement with respect to the Site. Once the upgradient "source areas" are identified and addressed, it may be warranted to pursue alternate remedial actions, such as a chemical injection program, to address any residual contamination at that time.

### **Treatment System Operational Status**

Throughout this reporting period the NYSDEC Remedial Services Contractor reported one low-level alarm condition occurred at EW-2, two low air flow alarms and one failure at EW-1 resulting in occasional downtime throughout this reporting period. In addition, it should be noted the runtime meter for EW-2 was not functioning throughout most of this reporting period; however, the NYSDEC Remedial Services Contractor replaced the meter in February of this reporting period.

### **Treatment System Performance Summary**

The GWE&TS performance during the current reporting period and since inception in September 2004 is summarized below. System monitoring and sampling results are further detailed below in the following subsection.





### Treatment System Performance Summary<sup>(2)</sup>

<i>Parameter</i>	<i>Quarter 50 (December 1, 2016 through February 28, 2017)</i>	<i>Quarter 49 (September 1, 2016 through November 30, 2016)</i>	<i>Totals to Date (2004 through current Quarter)</i>
<b>Influent</b>			
EW-1 Average Pumping Rate (gal per min)	21.4	23.8	33.9
EW-1 Total Flow Volume (gal) <sup>(1)</sup>	2,754,674	2,915,322	198,636,886
EW-1 Maximum Influent PCE Concentration (ug/l)	4.5	5.0	44
EW-2 Average Pumping Rate (gal per min)	4.4	4.6	5.3
EW-2 Total Flow Volume (gal)	463,056	467,400	31,083,329
EW-2 Maximum Influent PCE Concentration (ug/l)	100	130	370
Influent Total Flow Volume (gal)	3,217,730	3,382,722	229,720,215
<b>Effluent</b>			
Effluent Total Flow Volume (gal) <sup>(1)</sup>	3,744,757	4,117,380	276,041,331
Maximum Effluent PCE Concentration (ug/l)	Nondetect	Nondetect	1.0
<b>VOC Removal Summary</b>			
Total PCE Removal (lbs)	0.47	0.46	58.10
Average PCE Removal Rate (lbs/hr)	2.66 E-04	2.96 E-04	4.51E-04
PCE Removal Efficiency Range (%)	99.34-99.42	99.35-99.51	90.00-99.84

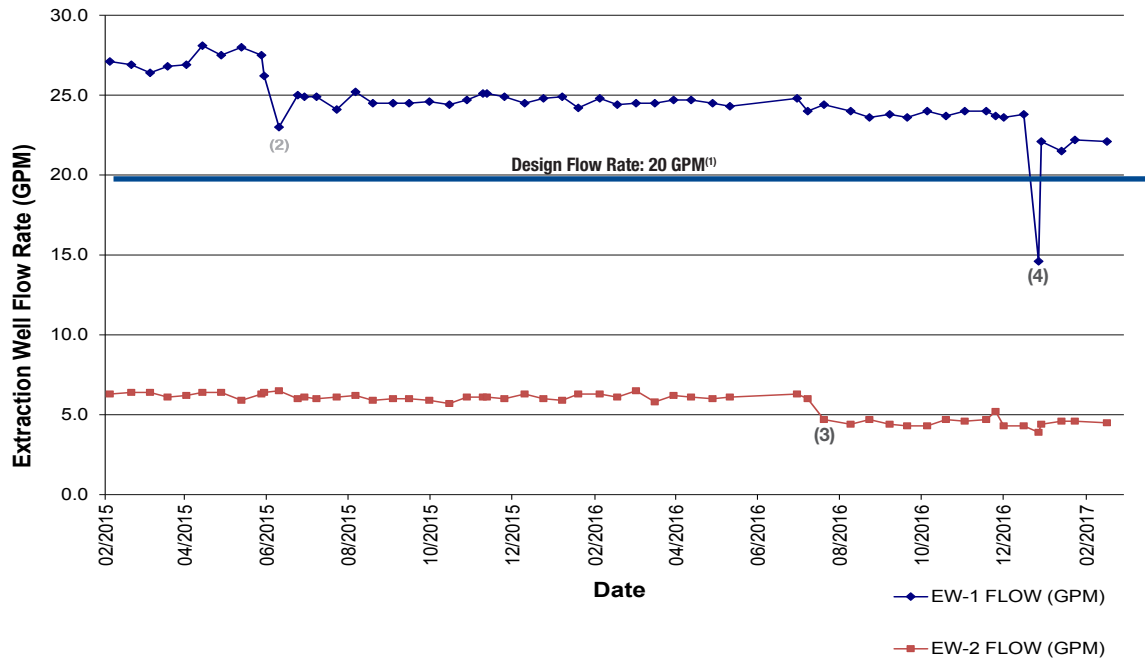
Notes:

1. System influent and effluent pumping rates and volumes are monitored on a bi-weekly basis. Due to total flow volume inconsistencies, replacement of the influent flow meters was performed on June 23, 2011. Total flow volume inconsistencies remained with respect to influent/effluent flow; therefore, the effluent flow meter was replaced on May 2, 2012. Although the system influent and effluent total flow volumes have been more consistent since the effluent flow meter replacement, system influent and effluent total flow volumes remain dissimilar.
2. More detailed contaminant concentration information is provided below.

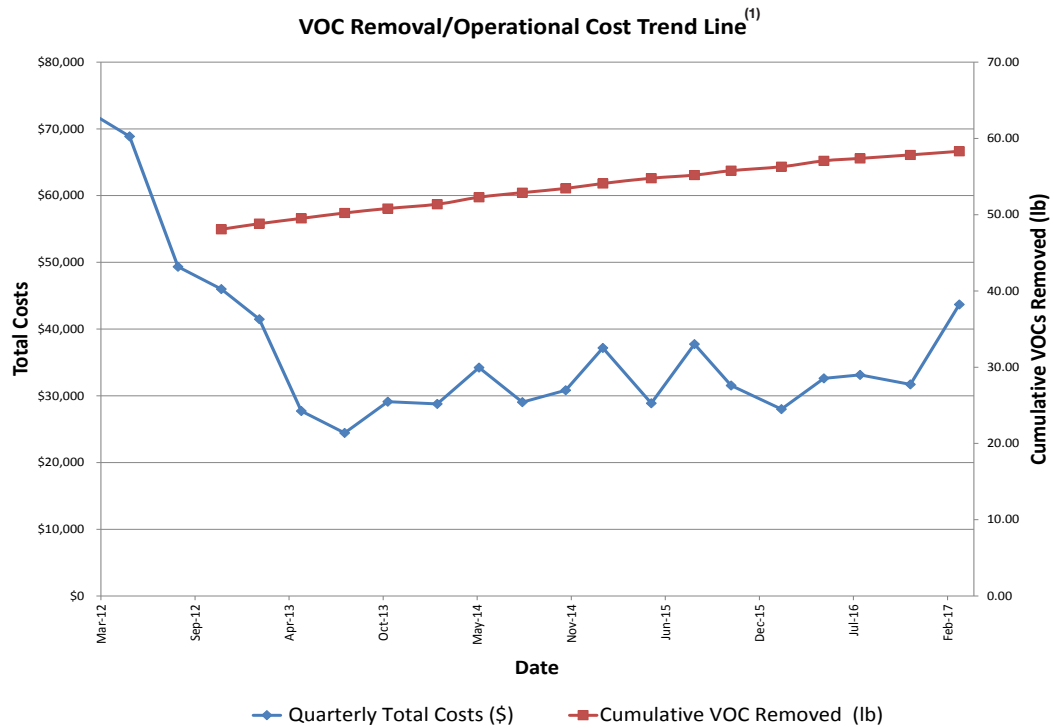




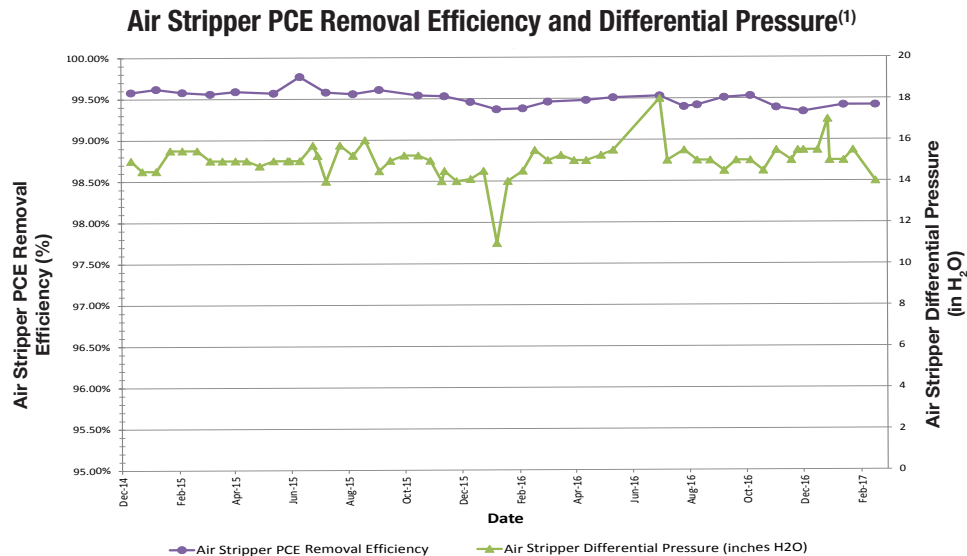
### Extraction Well Flow Rate Trends



1. Based on the results of capture zone design modeling, containment of the Franklin Cleaners chlorinated plume (at an approximate 450-foot width) would be achieved with the GWE&TS operating at a minimum required pumping rate of 20 gpm, in a one or two extraction well scenario. Extraction well EW-1 has been operating at an average flow rate of approximately 35 gpm since system start-up to provide for a greater factor of safety and ensure the full width of the plume is captured. Extraction well EW-2 has been operating at an average flow rate of approximately 5 gpm since system start-up due to the elevated VOC concentrations present within this well. It should be noted that the maximum yield for EW-2 has historically been limited to a range of 5 to 7 gpm due to a high silty/clay component in the screened interval of this extraction well.
2. After a system shut down that occurred on May 31, 2015, the system was restarted by the NYSDEC Remedial Services Contractor on June 10, 2015 at a slightly lower VFD frequency setting (approximately 60 to 63 Hz.) than prior to the shut down (approximately 66 to 68 Hz.)
3. The flow rate for EW-2 was slightly decreased during the previous reporting period and remained at this level throughout this reporting period due to several low-level alarm conditions reported throughout several reporting periods. EW-2 is slated to be re-developed in an effort to increase the yield of the well.
4. After a system shut down that occurred on December 24, 2016, the system was restarted by the NYSDEC Remedial Services Contractor on December 27, 2016 at a slightly lower VFD frequency setting (approximately 50 Hz.) than prior to the shut down (approximately 60 to 63 Hz.)



1. A plume redelineation program was completed in June and July, 2014, per recommendations of the RSO evaluation of the Site. Costs associated with the RSO and associated plume redelineation program, including subcontractor, engineering costs and sample analyses have been excluded from the routine operational costs to date, and total approximately \$205,000, based on the cost information provided by the NYSDEC. As a detailed breakdown of the NYSDEC Remedial Services Contractor's RSO-related costs are not available to D&B, the total VOC removal costs during the associated reporting period were calculated utilizing an average of the monthly subcontractor costs from January 2013 to December 2013, prior to the beginning of the RSO evaluation activities.



1. The approximate PCE removal efficiency for the low-profile stacked-tray air stripper ranged from 99.34% to 99.42% during this reporting period. Additionally, the average differential pressure across the low-profile air stripper was well below 45 inches of water (manufacturer's recommended threshold for equipment maintenance) during this reporting period.



### Treatment System Operation and Maintenance

Routine and non-routine system maintenance activities are discussed below. A table summarizing the required routine equipment maintenance, as well as a summary of the alarm conditions and associated system runtime/downtime for this reporting period, are provided below. Refer to [Attachment B](#) for operation and maintenance logs, as prepared by the NYSDEC Remedial Services Contractor for this reporting period.

Routine Treatment System Monitoring and Equipment Maintenance Schedule Summary									
Inspection/ Maintenance Item	Manufacturer	Model Number	Frequency	Maintenance Summary					
				Current Reporting Period			Next Reporting Period		
				Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17
System Monitoring	--	--	Bi-Weekly	12/1/16 12/16/16 12/27/16 <sup>(2)</sup> 12/29/16	1/13/17 1/23/17	2/16/17 <sup>(3)</sup>			
Extraction Well Pumps	Grundfos Pump Corp.	Redi-Flo-4 Model 25E3	As needed based on flow trends						
Air Stripper	Carbonair	STAT Model 180	As needed based on differential pressure readings						
Pressure Blower Maintenance	New York Blower Company	Model 2506A	Bi-Monthly	12/1/16 12/16/16 12/29/16	1/13/17 1/23/17	2/16/17			
Vapor Carbon Vessels	Tetrasolv Filtration Inc.	Model VF-1000	As needed based on PID screening results						
Wet Well Submersible Pump Maintenance <sup>(1)</sup>	Flygt Corporation	Model CP3085	Annual						
Sump Pump	Grundfos Pump Corp.	Model KP-350	As needed						
Blower Vent Screen Cleaning/Maintenance	--	--	As needed	12/1/16 12/16/16 12/29/16	1/13/17 1/23/17	2/16/17			
Flow Meter Vault Effluent Screen Cleaning/Maintenance	--	--	Annually						
Wet Well Strainer Cleaning/ Maintenance <sup>(1)</sup>	--	--	Annually						

: Planned activity

**Notes:**

1. As per NYSDEC direction annual wet well submersible pump and strainer cleaning was completed on October 19, 2016.
2. An additional system monitoring event was completed after a non-routine shut-down occurred, all essential readings were recorded.
3. Due to inclement weather the NYSDEC Remedial Services Contractor conducted only one system monitoring event in February 2017.

### Non-Routine Treatment System Maintenance

On February 16, 2017, the NYSDEC Remedial Services Contractor was on-site to replace the runtime meter at EW-2.

### Facility Maintenance

Facility maintenance activities were not completed during this reporting period.



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### Alarm Conditions

The following alarm conditions occurred during this reporting period:

- On December 22, 2016, the GWE&TS shut down due to a “low-air flow” condition. The NYSDEC Remedial Services Contractor reset and restarted the GWE&TS on December 23, 2016.
- On December 24, 2016, the GWE&TS shut down due to a “low-air flow” condition at Air Stripper and a “low flow” alarm condition at EW-1. The NYSDEC Remedial Services Contractor reset and restarted the GWE&TS on December 27, 2016.
- On January 24, 2017, the GWE&TS shut down due to a low flow alarm condition. The NYSDEC Remedial Services Contractor reset and restarted the GWE&TS on the same day.

### Treatment System Runtime/Downtime Summary

Runtime - Current Reporting Period <sup>(1)</sup>	2,051 hours	94.9%
Downtime - Current Reporting Period <sup>(1)</sup>	109 hours	5.1%
Total Runtime to Date <sup>(2)</sup>	96,870 hours	90.8%
Total Downtime to Date	10,031 hours	9.2%

1. Total elapsed time for current reporting period, 2,160 hours (December 1, 2016 through February 28, 2017).

2. Based on a system start-up date of September 20, 2004.

### Treatment System Monitoring and Sampling Results

Per the requirements of the NYSDEC-approved schedule, monthly, quarterly and semi-annual system sampling was completed by the NYSDEC Remedial Services Contractor, as follows:

### Treatment System and Groundwater Sampling Summary

Sampling Location	Monthly VOC (EPA Method 8260)	Semi-Annual VOC (EPA Method TO-15)	Monthly Iron & Manganese (EPA Methods 6010)	Semi-Monthly Effluent pH (Field Screening)
Extraction Well EW-1 and EW-2 Influent	12/1/16, 1/13/17, 2/16/17	NA	NA	NA
Air Stripper Aqueous-phase Effluent	12/1/16, 1/13/17, 2/16/17	NA	12/1/16, 2/16/17 <sup>(1)</sup>	12/1/16, 12/16/16, 12/29/16, 2/16/2017 <sup>(2)</sup>
Air Stripper Vapor-phase Effluent	NA	NA	NA	NA

NA: Not a routine sample collection location.

- As directed by the NYSDEC in December 2016, effluent samples will be analyzed for total Iron and Manganese once on a quarterly basis. However, the NYSDEC Remedial Services Contractor inadvertently completed effluent sampling with analysis of total Iron and Manganese in February 2017.
- pH readings were not recorded in January 2017 due to equipment malfunctions.





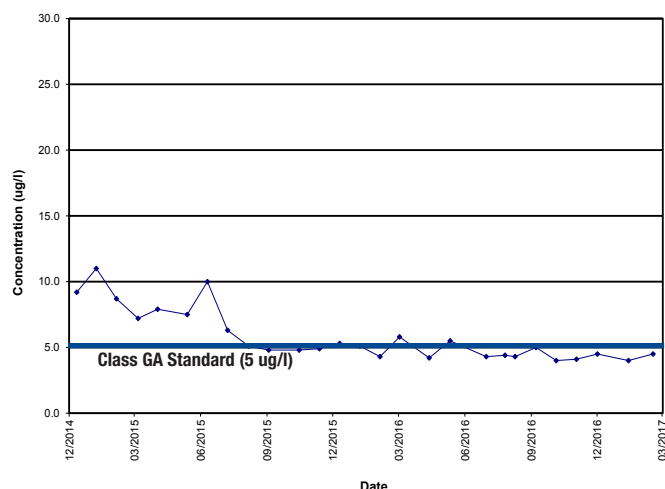


### Extraction Wells - Treatment System Influent PCE Concentration Ranges/Averages<sup>(1)</sup>

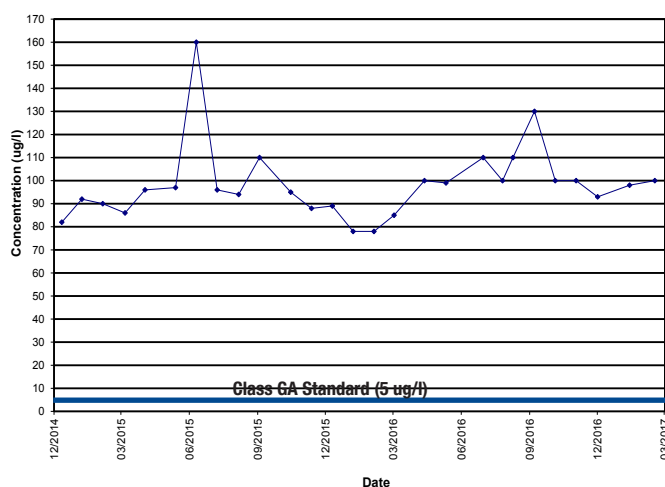
Sample Location	Current Reporting Period	Previous Reporting Period	Average for Most Recent 1-year Period	Average to Date	Groundwater Standard
Extraction Well EW-1	4.0 ug/l - 4.5 ug/l	4.0 ug/l - 5.0 ug/l	4.6 ug/l	16 ug/l	5.0 ug/l (Class GA)
Extraction Well EW-2	93 ug/l - 100 ug/l	100 ug/l - 130 ug/l	102.1 ug/l	91 ug/l	5.0 ug/l (Class GA)

1. It should be noted that methylene chloride was detected in one influent sample collected from extraction well EW-1 and chloroform, methyl tert-butyl ether (MTBE), and/or methylene chloride were detected in one or more influent samples collected from extraction well EW-2; however, these compounds were detected at concentrations well below their respective Class GA Groundwater Standards.

Extraction Well EW-1 Influent PCE Concentration Trend Line



Extraction Well EW-2 Influent PCE Concentration Trend Line



### Aqueous-Phase Air Stripper Effluent Concentration Ranges

Discharge Permit Parameters	Current Reporting Period	Previous Reporting Period	Site-Specific Effluent Limit
PCE	ND	ND	5.0 ug/l
TCE	ND	ND	10.0 ug/l
1,1-DCE	ND	ND	10.0 ug/l
Cis-1,2-DCE	ND	ND	10.0 ug/l
1,1,1-TCA	ND	ND	10.0 ug/l
Iron	214 - 843 ug/l	394 ug/l - 649 ug/l	1,000 ug/l
Manganese	22.4 - 60.7 ug/l	29.1 ug/l - 46.6 ug/l	1,000 ug/l
pH (Field Screening Results) <sup>(1)</sup>	6.05 - 8.39	6.32 - 7.82	6.5 - 8.5

**Notes:**

ND: Constituent concentration below the analytical detection limit.

Site-specific effluent limits, per the SPDES permit equivalency. Red font denotes an exceedance of the site-specific effluent limits.

1. In addition to the pH readings collected on a monthly basis, as provided on the analytical data tables in [Attachment C](#), the NYSDEC Remedial Services Contractor collects pH readings on a semi-monthly basis during routine system monitoring events. The provided pH screening results incorporate both sets of data.





### Treatment System Vapor-Phase Discharge

	Current Reporting Period	Site-Specific Discharge Limit
Total VOC Concentrations (field screening with PID) <sup>(1)</sup>	0.0 - 0.4 ppm	NA
Total VOC Concentrations (laboratory analysis) <sup>(2)</sup>	--	NA
Average Pressure Blower Flow Rate	652 cfm	NA
Maximum Total VOC Emissions <sup>(3)</sup>	0.001 lbs/hr	0.5 lbs/hr <sup>(4)</sup>

--: Not analyzed

NA: Not applicable

ppm: parts per million

1. The PID screening is utilized as a means to instantaneously monitor total vapor-phase VOC discharge concentrations.

2. Vapor-phase discharge samples for laboratory analysis via Method TO-15 are collected on a semi-annual basis and were not collected during this reporting period. Vapor-phase effluent samples for laboratory analysis were last collected on October 5, 2016.

3. Total VOC emissions were calculated utilizing the "worst-case" scenario data obtained with a PID.

4. The site-specific effluent limit of 0.5 lbs/hr was developed in consultation with the NYSDEC as a means to monitor the vapor-phase VOCs discharged by the GWE&TS.

### Groundwater Monitoring Summary

As per the NYSDEC-approved sampling frequency, all seven groundwater monitoring wells were sampled during this reporting period. Groundwater monitoring wells ASMW-1 through ASMW-6 were sampled on January 4, 2017 and ASMW-7 was sampled on January 10, 2017. These groundwater monitoring wells were sampled to determine groundwater quality at and in the vicinity of the leading edge of the groundwater contaminant plume associated with the Site. Groundwater samples were collected from three groundwater monitoring wells located in close proximity to the leading edge of the Franklin Cleaners plume (ASMW-1 through ASMW-3), and four groundwater monitoring well located downgradient of the leading edge of the plume (ASMW-4 through ASMW-7).

Note that groundwater monitoring well ASMW-4 acts as an early warning or "sentinel" well for a cluster of Village of Rockville Centre public supply wells located downgradient of the treatment system building. The locations of the groundwater monitoring wells are depicted on [Figure 3](#).

#### Groundwater Monitoring Well Condition Summary:

All of the sampled groundwater monitoring wells were found to be accessible during the groundwater monitoring/sampling event conducted on January 4 and 10, 2017. All groundwater monitoring wells were located as indicated on the site map and the concrete well pads (where applicable), protective casings, surface seals, well IDs, PVC well risers, well plugs and locks were observed to be present and in good condition with the exception of:

- A lock is not present at monitoring well ASMW-4 and ASMW-5.
- The bolts are missing from ASMW-1.
- The well ID for ASMW-5 is not visible.

Please note that the NYSDEC Remedial Services Contractor inadvertently did not complete a monitoring well log for ASMW-7. Field inspection logs for all remaining groundwater monitoring wells assessed during this period are provided in [Attachment D](#).

#### Groundwater Monitoring Results Summary:

A headspace reading was collected at each of the sampled groundwater monitoring wells immediately after the removal of the well plugs utilizing a PID. VOCs were not detected in the headspace of any monitoring wells.

Below is a detailed summary of PCE concentrations in site groundwater. Refer to [Attachment C](#) for analytical data results.





### Groundwater Monitoring Wells - PCE Concentrations

Monitoring Well <sup>(1)</sup>	Leading Edge Monitoring Wells			Sentinel Monitoring Wells				Class GA Groundwater Standard
	ASMW-1	ASMW-2	ASMW-3	ASMW-4	ASMW-5	ASMW-6	ASMW-7	
Current Reporting Period	36 ug/l	0.51 ug/l	ND	ND	ND	ND	ND	5.0 ug/l
Previous Reporting Period	21 ug/l	0.59 ug/l	NS	ND	NS	NS	NS	5.0 ug/l
2-Year PCE Trend Analysis <sup>(2)</sup>	Stable	Stable	Stable	Stable	Stable	Stable	Stable	

ND: Constituent concentration below the analytical detection limit.

NS: Not sampled

Red font denotes an exceedances of the Class GA Groundwater Standard.

In addition to PCE, trans-1,2-Dichloroethene, 4-Methyl-2-Pentanone and MTBE were detected in one or more groundwater monitoring well during this reporting period; however, these compounds were detected at concentrations well below their respective Class GA Standards.

1. Click on monitoring well IDs with blue text for graphs depicting PCE concentrations over the last 2 years in wells exhibiting exceedances of the Class GA Groundwater Standard for this and the previous reporting period.

2. Trend analysis is calculated based on an increase or decrease of 5.0 ug/l over a 2-year time frame.

A figure depicting the current PCE concentrations in groundwater is provided as [Figure 4](#).

#### Data Validation:

All sample results have been reviewed by D&B and deemed valid and usable for environmental assessment purposes. Data Validation Checklists are presented in [Attachment E](#). Based on D&B's review, qualification of the data was necessary for the following analyses:

- The percent recoveries (%Rs) for dichlorodifluoromethane and trichlorofluoromethane were below the quality control (QC) limits in the lab control sample (LCS) for samples taken on January 10, 2017 (Quarter 50). Dichlorodifluoromethane and trichlorofluoromethane were qualified as an estimated detection limit (UJ) in sample ASMW-7.
- The percent recovery (%R) for ethyl benzene, m&p-xylenes and o-xylene were below the QC limits in the matrix spike (MS) and MS duplicate for samples taken on January 10, 2017 (Quarter 50). The %R for 1,1,2-trichloroethane was above the QC limits in the MS and MS duplicate. Ethylbenzene, m&p-xylenes and o-xylene were qualified as an estimated detection limit (UJ) in sample ASMW-7.

All analytical data have been submitted to the NYSDEC in the required EQulS format upon receipt of the data from the NYSDEC Remedial Services Contractor.



## Treatment System Operational Costs

The total cost of operation of the GWE&TS from December 1, 2016 through February 28, 2017 was approximately \$43,623. This total includes engineering and subcontractor costs, as well as utility costs associated with the operation of the GWE&TS (electric and telephone). It should be noted that this total does not include any administrative costs incurred by the NYSDEC in support of this project throughout this reporting period. A review of these costs is provided below.

<b>Reporting Period Cost Summary<sup>(1)</sup></b>		
<b>COST ITEM</b>	<b>CURRENT REPORTING PERIOD BUDGET EXPENDED (December 1, 2016 through February 28, 2017)</b>	<b>PREVIOUS REPORTING PERIOD BUDGET EXPENDED (September 1, 2016 through November 30, 2016)</b>
<b>ENGINEERING SUPPORT</b>		
D&B Engineers and Architects, P.C.	\$ 27,985	\$16,227
<b>SUBCONTRACTORS</b>		
NYSDEC Remedial Services Contractor <sup>(2)</sup> (Routine/Non-Routine Maintenance Activities)	\$9,084	\$8,855
Test America (Analytical Laboratory)	\$869	\$1,177
<b>SUB-TOTAL</b>	<b>\$9,953</b>	<b>\$10,032</b>
<b>UTILITIES</b>		
Electric	\$5,738	\$5,455
<b>SUB-TOTAL</b>	<b>\$5,738</b>	<b>\$5,455</b>
<b>TOTAL COSTS</b>	<b>\$43,676</b>	<b>\$31,714</b>
<b>AVERAGE COST/MONTH</b>	<b>\$14,559</b>	<b>\$10,571</b>
<b>COST/POUND OF VOC REMOVED</b>	<b>\$92,928<sup>(3)</sup></b>	<b>\$68,943<sup>(4)</sup></b>

1. The treatment system costs include monthly utility charges, maintenance costs and engineering costs. Capital construction costs and NYSDEC project management effort are not included in this evaluation. Total costs to date since July 2006 are approximately \$1,772,422.
2. All expenses and labor are incorporated into the NYSDEC Remedial Services Contractor overall costs, excluding electric and telephone costs.
3. Based on a total of approximately 0.47 lbs of total VOCs removed during this reporting period.
4. Based on a total of approximately 0.46 lbs of total VOCs removed during the previous reporting period.

## Findings and Recommendations

### Findings:

- General: Routine monitoring is conducted on a bi-weekly basis per the NYSDEC-approved schedule.
- Extraction Well Contaminants and Flow: The analytical results of the system influent samples demonstrate that groundwater extraction wells EW-1 and EW-2 continue to capture VOC-contaminated groundwater. Extraction well EW-1 operated at an average flow rate of 21.4 gpm and extraction well EW-2 operated at an average flow rate of 4.4 gpm throughout this reporting period. It should be noted that the flow rate at EW-2 was slightly decreased during the previous reporting period and remained so throughout this reporting period due to several low-level alarm conditions reported throughout the previous reporting period. EW-2 is slated for re-development in an effort to increase the yield of the well.



- GWE&TS Routine Maintenance and Monitoring: Routine monitoring during this reporting period was conducted in accordance with the bi-monthly schedule with the addition of an extra system monitoring event due to a system shut-down on December 27, 2016. Maintenance of the pressure blower during this monitoring period was also not completed in accordance with the routine bi-monthly schedule. This item was completed on six occasions during this reporting period, rather than the one required time. The NYSDEC Remedial Services Contractor indicated that maintenance of the pressure blower is being conducted more frequently than the NYSDEC-approved schedule as the “maintenance is critical, not time consuming and ensures that the task is not overlooked.”
- Non-Routine Maintenance: Non-routine maintenance was completed this reporting period due to equipment failure for the runtime meter at EW-2. On February 3, 2017, the NYSDEC Remedial Services Contractor was on-site to troubleshoot issues causing the equipment malfunctions. On February 16, 2017, the NYSDEC Remedial Services Contractor returned to Site to replace the runtime meter at EW-2.
- Treatment System Runtime: The treatment system was operational for approximately 94.9% of this reporting period (approximately 2,051 hours). The downtime observed during this reporting period (109 hours or 5.1%) was primarily due to “low-flow” conditions.
- Low Level in EW-2: As previously discussed, “low-level” alarm conditions occurred at well EW-2 during this reporting period resulting in system downtime.
- Air Stripper: The air stripper continues to operate efficiently and within its design specifications.
- Air Stripper Discharge Parameters (Aqueous-phase): All aqueous-phase discharge analytes were non-detect or detected at concentrations below their respective site-specific effluent limits.
- Air Stripper Discharge Parameters (Vapor-phase): The vapor-phase discharge piping outlet exhibited VOC concentrations ranging from non-detect to a max of 0.4 ppm, as detected utilizing a PID. Total VOC concentrations were well below the site-specific total VOC effluent limit of 0.5 lbs/hr.
- Groundwater Monitoring Well Inspection/Sampling Summary:
  - All of the sampled groundwater monitoring wells were found to be accessible during the groundwater monitoring/sampling event conducted on January 4, 2017 and January 10, 2017. All groundwater monitoring wells were located as indicated on the site map and the concrete well pads (where applicable), protective casings, surface seals, well IDs, PVC well risers, well plugs and locks were observed to be present and in good condition with the exception of:
  - A lock is not present at monitoring well ASMW-4 and ASMW-5.
  - The well ID for ASMW-5 is not visible.
  - Bolts missing from monitoring well ASMW-1.
  - The NYSDEC Remedial Services Contractor inadvertently did not complete a monitoring well log for ASMW-7.
- Monitoring Well PCE Exceedances: PCE was detected at a concentration of 36 ug/l in groundwater monitoring well ASMW-1, exceeding the Class GA Standard of 5.0 ug/l. PCE concentrations in ASMW-1 have been slightly irregular, over the last 2 years (ranging from a minimum of 19 ug/l in October, 2015 to a maximum of 57 ug/l, detected in July 2015). Additionally, PCE concentrations are exhibiting a stable trend over the last two years.

#### **Recommendations:**

- General Treatment System:
  - The operational and performance data set for the GWE&TS indicates that the system, as configured, may be approaching asymptotic conditions. As such it is recommended that continued operation of the GWE&TS be evaluated in accordance with the Site Management Plan. The evaluation should consist of “pulsing” of the system and monitoring of contaminant concentrations within the existing monitoring well network located in the vicinity and downgradient of the GWE&TS. Pulsing would involve the periodic shutdown and startup of the system to allow for the subsurface environment to come to equilibrium prior to resuming groundwater extraction, as necessary.
  - D&B recommends that the NYSDEC Remedial Services Contractor record more clear and detailed descriptions of completed field activities and issues encountered, as well as alarm triggers, downtime dates and times and the



steps taken to bring the GWE&TS back online on the Site Activities and System Operation Logs, as appropriate. In addition, logs received over the last several quarters have included multiple copies of logs, including some differing information. Furthermore, it is recommended that the NYSDEC Remedial Services Contractor provide more detail regarding which screens are being inspected and cleaned (i.e. blower vent screen, flow meter vault effluent screen and wet well strainer). As such, D&B further recommends that the NYSDEC Remedial Services Contractor make an effort to provide one set of logs with all descriptions and dates of activities clearly indicated. These steps will help enable D&B to better understand the current status of the GWE&TS and facilitate more efficient preparation of the Site Management Quarterly Reports.

- GWE&TS Routine Maintenance and Monitoring: Based on the requirements of the NYSDEC-approved schedule, routine maintenance of the pressure blower should be completed on a bi-monthly frequency and routine system monitoring should be completed on a semi-monthly basis. It is recommended that the NYSDEC Remedial Services Contractor conduct routine maintenance and monitoring as per the approved schedule in order to limit the completion of unnecessary work and associated costs.
- Low Level EW-2: It is recommended that the NYSDEC Remedial Services Contractor redevelop EW-2 to ensure it is able to provide sufficient yield to prevent a low groundwater level in the well during operations of the submersible pump.
- Groundwater Monitoring Well Repairs: All of the sampled groundwater monitoring wells were found to be accessible during the groundwater monitoring/sampling events conducted on January 4, 2017. All groundwater monitoring wells were located as indicated on the site map and the concrete well pads (where applicable), protective casings, surface seals, well IDs, PVC well risers, well plugs and locks were observed to be present and in good condition with the exception of:
  - A lock is not present at monitoring well ASMW-4 and ASMW-5. Replace locks for ASMW-4 and ASMW-5.
  - The well ID for ASMW-5 is not visible. Make the well ID for ASMW-5 visible on well cap.
  - Complete monitoring well inspection logs for ASMW-7 when sampled.
  - Replace missing bolts at ASMW-1.
  - Re-survey any wells where the casing elevation has changed as a result of the completed well repair activities.

#### **Reclassification/Delisting Evaluation**

The Site was originally listed as a Class 2 Inactive Hazardous Waste Site by the NYSDEC on June 17, 1993. Since this time, completion of the following project phases has occurred, as summarized below:

<b><i>Project Phases and Completion Dates</i></b>	
<b><i>Project Phase</i></b>	<b><i>Completion Date</i></b>
<b>Remedial Investigation</b>	03/1998
<b>Remedial Design</b>	02/2001
<b>Groundwater Extraction and Treatment System Construction</b>	07/2003 <sup>(2)</sup>
<b>Remedial Action (Source Area Remediation)</b>	03/2007 <sup>(1)</sup>

1. Source area contaminated soil and groundwater were remediated with the Air Sparge/Soil Vapor Extraction (AS/SVE) system beginning in September 2003. The on-site AS/SVE system has successfully removed the contaminants from the vadose zone and greatly diminished groundwater contaminants to below detectable limits. Although confirmation soil samples met the required remedial goals, a subslab depressurization system replaced the on-site AS/SVE system in 2006 due to the detection of elevated vapor phase VOC concentrations in the basement level and below the basement floor slab.
2. Construction of the GWE&TS was completed in July 2003. The GWE&TS was placed into routine operation in September 2004 and currently continues to meet remedial objectives as originally designed.



**NYSDEC Site No. 130050, Franklin Cleaners Site  
Groundwater Extraction and Treatment System**

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Given the above, NYSDEC reclassified the Franklin Cleaners GWE&TS Site on December 11, 2012, pursuant to the requirements identified in 6 NYCRR §375-2.7, as a Class 4 Site since the NYSDEC determined that the site no longer presents a significant threat to public health and/or the environment based on remedial efforts performed to date and implementation of the July 2012 Site Management Plan (SMP). In addition, the NYSDEC has implemented a post-remedial indoor air study within the source area structures/buildings to verify current site conditions. Site delisting is not feasible at this time, as all remediation and post-remediation activities have not been satisfactorily completed.

**Report Certification:**

I have personally examined and am familiar with the information submitted in the referenced report. To the best of my knowledge and belief, and based upon my inquiry of those individuals immediately responsible for obtaining the information reported therein, I certify that the submitted information is true, accurate, and complete.

**Project Director:**

**Richard M. Walka**  
Senior Vice President

**5.24.17**

**Date**

**Project Manager:**

**James Van Horn**  
Project Manager

**5/25/2017**

**Date**



**D&B ENGINEERS  
AND  
ARCHITECTS, PC.**