

## **FRANKLIN CLEANERS GROUNDWATER EXTRACTION AND TREATMENT SYSTEM**

Latitude 40.688°, Longitude -73.627°

### **REPORT TITLE**

Site Management Quarterly  
Report No. 34

### **REPORTING PERIOD**

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### **CLIENT**

New York State Department of  
Environmental Conservation

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## **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, it should be noted that, 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 autodial 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; and
- Provide for attainment of SCGs for groundwater, soil and indoor air within the limits of the affected area, to the extent practical.

### **Treatment System Performance Summary**

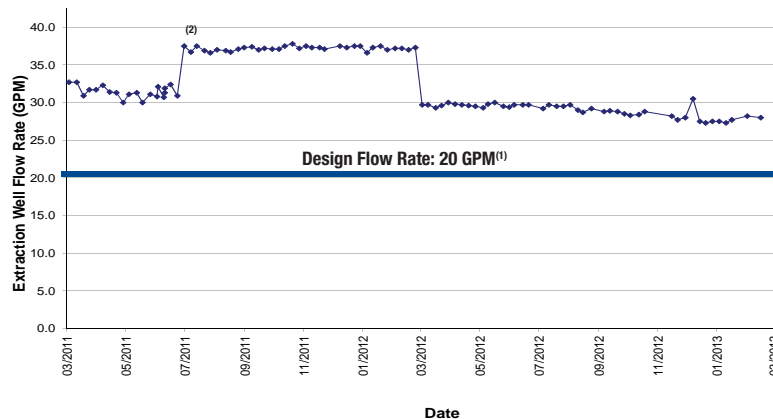
The GWE&TS performance during the current reporting period and since inception in September 2004 is summarized below:

<b>System Extraction Rates and Total Flow Volumes</b>				
	<b>EW-1</b>	<b>EW-2 <sup>(1,2)</sup></b>	<b>System Influent</b>	<b>System Effluent <sup>(2)</sup></b>
<b>Average Pumping Rate - Current Reporting Period</b>	27.9 gpm	6.3 gpm	34.2 gpm	44.1 gpm
<b>Average Pumping Rate - Previous Reporting Period</b>	28.4 gpm	6.4 gpm	34.8 gpm	43.5 gpm
<b>Average Pumping Rate to Date</b>	36.0 gpm	5.2 gpm	37.3 gpm	67.2 gpm
<b>Total Flow Volume - Current Reporting Period</b>	3,587,307 gal.	805,281 gal.	4,392,588 gal.	4,163,021 gal.
<b>Total Flow Volume to Date</b>	148,332,696 gal.	20,005,225 gal.	168,337,921 gal.	209,759,641 gal.

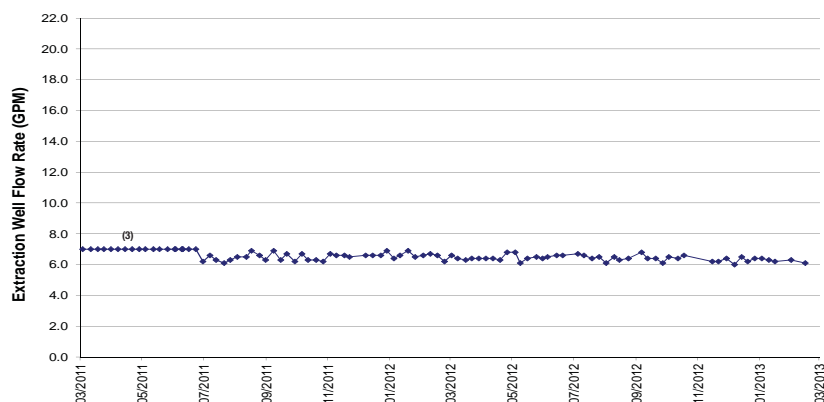
1. Extraction EW-2 flow meter consistently malfunctioned from approximately January 2010 to June 2011. Based on previously recorded flow data, it has been assumed that EW-2 was operating at an average flow rate of 7 gpm during this time period.
2. System influent and effluent pumping rates and volumes are monitored on a bi-weekly basis. Following replacement of the influent flow meters on June 23, 2011, total flow inconsistencies remained with respect to influent/effluent flow. As such, the effluent flow meter was replaced on May 2, 2012. Although the system influent and effluent flows are more consistent following the effluent meter change, system influent and effluent flows remain dissimilar.



### Extraction Well EW-1 Flow Rate Trend Line



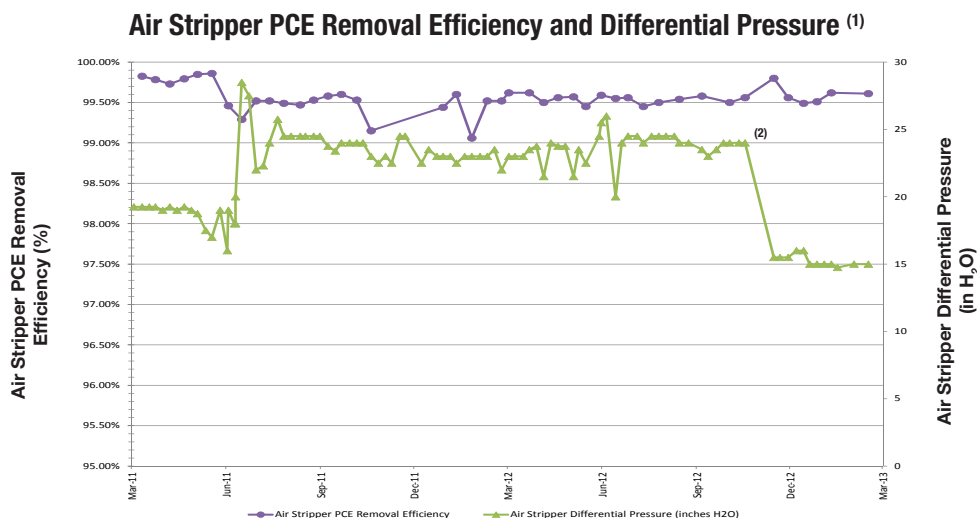
### Extraction Well EW-2 Flow Rate Trend Line



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 36 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 been historically limited to a range of 5-7 gpm due to a high silty/clay component in the screened interval of this extraction well.
2. Extraction well EW-1 was set at approximately 37 gpm following replacement of the influent flow meters. Based on recommendations presented in the RSO Report the flow at extraction well EW-1 was reduced to approximately 30 gpm in February 2012.
3. As detailed above, it is assumed that extraction well EW-2 was operating at an average of 7 gpm during this time period.



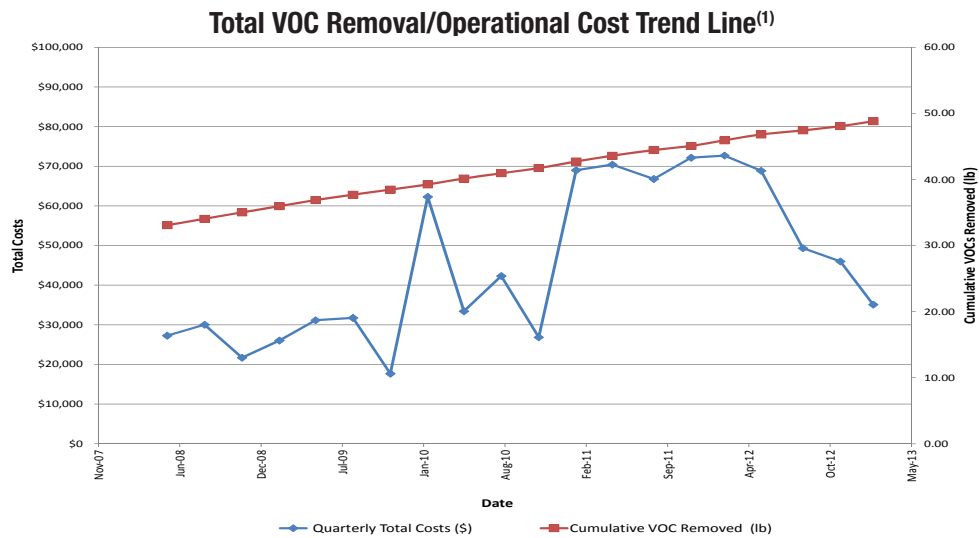
## Treatment System Performance Summary (cont.)



<b>Total VOC Removal Assessment<sup>(5)</sup></b>	
<b>VOC Removal - Current Reporting Period</b>	0.74 lbs.
<b>VOC Removal - Previous Reporting Period</b>	0.64 lbs.
<b>Average VOC Removal to Date (per period)</b>	0.92 lbs.
<b>Total VOC Removal to Date</b>	48.8 lbs.

<b>Total VOC Removal Costs <sup>(3)/(6)</sup></b>	
<b>VOC Removal Cost - Current Reporting Period</b>	\$47,428 per lb.
<b>VOC Removal Cost - Previous Reporting Period <sup>(6)</sup></b>	\$71,862 per lb.
<b>Average VOC Removal Cost to Date <sup>(4)/(6)</sup></b>	\$40,083 per lb.

1. The approximate PCE removal efficiency for the low-profile stacked-tray air stripper ranged from 99.49% to 99.62% during this reporting period. Additionally, it should be noted that 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.
2. This change in the air stripper differential pressure is the result of the deletion of two air stripper trays from the modular air stripper on October 22, 2012, performed as recommended in the May 2012 RSO Report.
3. The VOC removal costs include monthly utility charges, maintenance costs and engineering costs. Capital construction costs and NYSDEC project management effort are not included in this evaluation. Due to the relatively high VOC removal costs, a RSO evaluation has been performed for the Franklin Cleaners Site in order to improve the efficiency and effectiveness of the GWE&TS, while at the same time, reducing the overall associated operating costs. A plume re-delineation program based on recommendations presented in the RSO is planned to be implemented in the near future.
4. Average calculated from system start-up (September 2004) through the previous reporting period.
5. As detailed on Page 7, laboratory analytical results for samples collected on February 15, 2013 from the EW-1 influent and the AS-1 effluent exhibited PCE concentrations that were inconsistent with historical PCE trends at the site. Based on review of historic PCE concentrations, it is likely that these samples were inadvertently switched either in the field or at the analytical laboratory. As a result, these sample data have been switched for purposes of accurately evaluating the operation of the GWE&TS.
6. VOC removal costs for the previous reporting period and the average VOC removal costs to date are based on more current cost information provided by the NYSDEC.



### 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 summarized below. Refer to [Attachment B](#) for operation and maintenance logs, as prepared by NYSDEC "call out" contractor for this reporting period.

Routine maintenance of the pressure blower, wet well pumps, utility sink screen and wet well strainer were not completed as per the frequency specified in the Routine Equipment Maintenance Schedule shown below or the July 2012 SMP during this reporting period.



Routine Equipment Maintenance Schedule Summary									
Major System Component	Manufacturer	Model Number	Maintenance Frequency	Maintenance Summary					
				Current Reporting Period			Next Reporting Period		
				Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13
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	New York Blower Company	Model 2506A	Bi-Monthly						
Vapor Carbon Vessels	Tetrasolv Filtration Inc.	Model VF-1000	As needed based on PID screening results						
Wet Well Pumps	Flygt Corporation	Model CP3085	Annual						
Sump Pump	Grundfos Pump Corp.	Model KP-350	As needed						
Flow Meter Vault Effluent Screen	--	--	Annually						
Wet Well Strainer	--	--	Annually						

 : Planned activity

#### **Non-Routine System Maintenance:**

Non-routine system maintenance was not conducted during this reporting period.

#### **General Facility Maintenance:**

General facility maintenance was not conducted during this reporting period.

#### **Alarm Conditions:**

The following alarm conditions occurred during this reporting period:

- A low flow alarm condition caused by VFD low voltage occurred on December 17, 2012 and the system was restarted on the same day;
- The GWE&TS triggered an alarm on December 31, 2012; however, upon arrival at the Site, the NYSDEC "call-out" contractor noted that the GWE&TS was operating normally and there were no apparent issues.



<b>System Runtime/Downtime Summary</b>		
<b>Runtime - Current Reporting Period <sup>(1)</sup></b>	2,155 hours	99.8%
<b>Downtime - Current Reporting Period <sup>(1)</sup></b>	5 hours <sup>(3)</sup>	0.2%
<b>Total Runtime to Date <sup>(2)</sup></b>	73,838 hours	90.3%
<b>Total Downtime to Date</b>	7,128 hours	9.7%

1. Total elapsed time for current reporting period, 2,160 hours (December 1, 2012 through February 28, 2013).

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

3. Downtime for this reporting period is the result of the alarm conditions discussed above.

### System Monitoring and Sampling Results

Laboratory analytical results for samples collected on February 15, 2013 from the EW-1 influent and the AS-1 effluent exhibited PCE concentrations that were inconsistent with historical PCE trends at the site. Non-detectable concentrations of PCE were reported for the sample collected from the EW-1 influent, while a PCE concentration of 15 ug/l was reported for the sample collected from the air stripper effluent. Based on review of historic PCE concentrations, it is likely that these samples were inadvertently switched either in the field or at the analytical laboratory. The analytical laboratory was contacted and they found no issues with the analysis of these samples. As a result, these sample data have been switched for purposes of accurately evaluating the operation of the GWE&TS. These sample analyses will be closely monitored during the following sampling event.

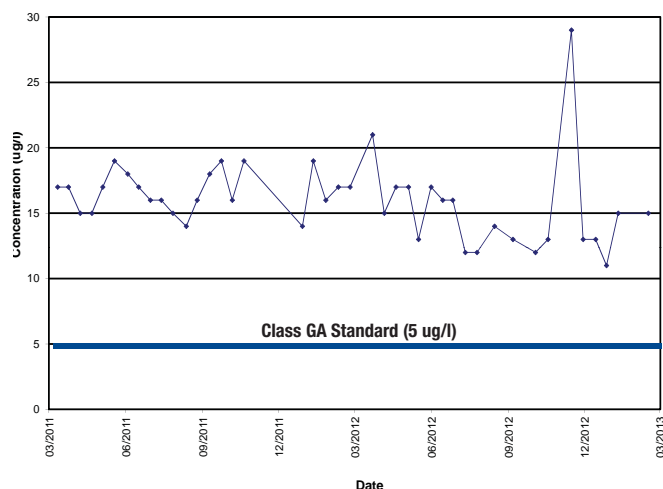
A summary of the pertinent routine system monitoring and sampling results are provided below. Refer to [Attachment C](#) for tabulated analytical results.

<b>Extraction Wells - System Influent PCE Concentration Ranges/Averages <sup>(1)</sup></b>				
<b>Sample Location</b>	<b>Current Reporting Period</b>	<b>Previous Reporting Period</b>	<b>Average to Date</b>	<b>Groundwater Standard</b>
<b>Extraction Well EW-1</b>	11 ug/l - 15 ug/l	12 ug/l - 29 ug/l	18 ug/l	5.0 ug/l (Class GA)
<b>Extraction Well EW-2</b>	48 ug/l - 75 ug/l	55 ug/l - 140 ug/l	91 ug/l	5.0 ug/l (Class GA)

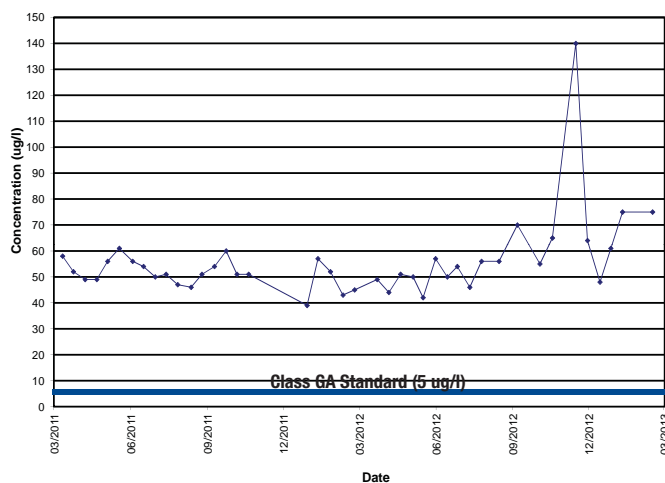
1. In addition to the PCE concentrations presented in this table, chloroform and trichloroethene were detected in one or more system influent samples collected from EW-2; however, these compounds were detected at concentrations well below their respective Class GA Groundwater Standards.



### Extraction Well EW-1 PCE Concentration Trend Line



### Extraction Well EW-2 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	90.9 - 1,630	ND - 2,350	1,000 ug/l
Manganese	11.4 - 27 ug/l	11.8 ug/l - 221 ug/l	1,000 ug/l
pH (Field Screening Results)	6.68 - 7.52	6.95 - 7.18	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.

### Vapor-Phase Discharge

	System Vapor Discharge	Site-Specific Discharge Limit
Total VOC Concentrations (field screening with PID) <sup>(1)</sup>	0.0 - 4.5 ppm	NA
Total VOC Concentrations (laboratory analysis)	95.4 ug/m <sup>3</sup>	NA
Average Pressure Blower Flow Rate	648 cfm	NA
Maximum Total VOC Emissions <sup>(2)</sup>	0.07 lbs/hr	0.5 lbs/hr <sup>(3)</sup>

--: Not analyzed

NA: Not applicable

- The PID screening is utilized as a means to instantaneously monitor total vapor-phase VOC discharge concentrations.
- Total VOC emissions were calculated utilizing the laboratory analyzed data.
- 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 modified sampling frequency, only three groundwater monitoring wells were sampled during this reporting period. These groundwater monitoring wells were sampled to determine groundwater quality at, and in the vicinity of, the Site. Groundwater samples were collected from two groundwater monitoring wells located in close proximity to the leading edge of the Franklin Cleaners plume (ASMW-1 and ASMW-2), and one groundwater monitoring well located downgradient of the leading edge of the plume (ASMW-4). 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 three of the sampled groundwater monitoring wells were found to be accessible during the groundwater monitoring/sampling event conducted on January 29, 2013. 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; however, the well locks are not functional at groundwater monitoring wells ASMW-1 and ASMW-2, and need to be replaced.

Field inspection logs for all 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 caps utilizing a PID. VOCs were non-detect in the headspace of all three of the sampled 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>	Treatment System Effectiveness Monitoring Wells			Sentinel Monitoring Wells				Class GA Groundwater Standard
	<a href="#">ASMW-1</a>	ASMW-2	ASMW-3	ASMW-4	ASMW-5	ASMW-6	ASMW-7	
Current Reporting Period	31 ug/l	0.77 ug/l	--	ND	--	--	--	5.0 ug/l
Previous Reporting Period	21 ug/l	1.6 ug/l	0.15 ug/l	0.19 ug/l	ND	ND	--	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.

--: Not sampled.

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

In addition to PCE, the following containments were detected below their respective Class GA standards in one or more monitoring well during this reporting period: chloroform, 1,1,1-trichloroethane and 1,1-dichloroethene.

1. Click on monitoring well IDs 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 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](#). In comparison with the previous reporting period, PCE concentrations have remained stable in all of the sampled groundwater monitoring wells. Although downgradient “sentinel” monitoring wells ASMW-5 and ASMW-6 were not sampled during this reporting period, PCE concentrations have historically remained non-detect in these wells.



Note that, groundwater contaminant data is limited to the west and south of ASMW-1 and the treatment system building, as the current monitoring well network does not include wells in these areas.

#### **Data Validation:**

All sample results have been reviewed by D&B and are deemed valid and usable for environmental assessment purposes. Laboratory analytical results for samples collected on February 15, 2013 from the EW-1 influent and the AS-1 effluent exhibited PCE concentrations that were inconsistent with historical PCE trends at the site. Non-detectable concentrations of PCE were reported for the sample collected from the EW-1 influent, while a PCE concentration of 15 ug/l was reported for the sample collected from the air stripper effluent. Based on review of historic PCE concentrations, it is likely that these samples were inadvertently switched either in the field or at the analytical laboratory. The analytical laboratory was contacted and they found no issues with the analysis of these samples. As a result, these sample data have been switched for purposes of accurately evaluating the operation of the GWE&TS. These sample analyses will be closely monitored during the following sampling event.

No qualification of the data was necessary based on D&B's review. Data Validation Checklists are presented in [Attachment E](#).

All analytical data associated with the Franklin Cleaners GWE&TS project have been submitted to the NYSDEC in the required EQUIS format and within 30 days of receipt of the data from the NYSDEC "call-out" contractor.

### **Findings and Recommendations**

#### **Findings:**

- Extraction Well 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 27.9 gpm throughout this reporting period and extraction well EW-2 operated at an average flow rate of 6.3 gpm throughout this reporting period;
- Treatment System Runtime: The treatment system was operational for approximately 99.8% of this reporting period (approximately 2,155 hours);
- GWE&TS Routine Maintenance: The required maintenance items were not completed per the requirements of the routine maintenance schedule;
- 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 detected at concentrations below their respective site-specific effluent limits, with the exception of iron at a concentration of 1,630 ug/l (detected on December 27, 2012), exceeding the site-specific effluent limit of 1,000 ug/l;
- Air Stripper Discharge Parameters (Vapor-phase): The vapor-phase discharge piping outlet exhibited laboratory-analyzed total VOCs at concentrations well below the site-specific total VOC effluent limit;
- Groundwater Monitoring Well Inspection/Sampling Summary:
  - Monitoring Well Conditions: All three of the sampled groundwater monitoring wells had visible well IDs and were sealed at the surface and competent; however, the well locks need to be replaced at groundwater monitoring wells ASMW-1 and ASMW-2.
  - Monitoring Well PCE Exceedances: Concentrations of PCE detected in groundwater monitoring well ASMW-1 exceeded the Class GA Standard of 5.0 ug/l, at a concentration of 31 ug/l;
  - Sentinel Monitoring Well (ASMW-4): With the exception of a trace detection of chloroform, downgradient early warning "sentinel" groundwater monitoring well ASMW-4 exhibited non-detect VOC concentrations.

#### **Recommendations:**

- General Treatment System: Continue operation of the GWE&TS;



- Routine Maintenance of the GWE&TS: In order to reduce the likelihood of premature equipment failure and associated system downtime, D&B recommends that the NYSDEC “call-out” contractor perform maintenance of the pressure blower and wet well pumps, and all other system components, in accordance with their respective manufacturer’s specifications and per the requirements of the October 2003 O&M Plan. In addition, the NYSDEC “call-out” contractor did not complete the routine maintenance and cleaning of the pressure blower as per the July 2012 SMP;
- RSO Evaluation: A RSO evaluation of the GWE&TS has been completed in order to improve the efficiency, effectiveness and net environmental benefit of the GWE&TS which included several recommendations for plume re-delineation, as well as the monitoring well repairs and resurvey recommendations discussed below:
  - Groundwater Plume Re-delineation: Based on the fairly consistent and elevated PCE concentrations detected in groundwater monitoring well ASMW-1, D&B will re-delineate the groundwater plume via installing and sampling several temporary geoprobe wells along the leading edge, length and up/sidegradient areas of the plume to more accurately define its current location and extent. Based on the results of the plume re-delineation, it may be warranted to install additional permanent monitoring wells and/or modify the current extraction well configuration in order to optimize and accelerate the recovery and treatment of the entire groundwater plume. D&B will provide a plume re-delineation scope of work for review and approval in the near future.
  - Groundwater Monitoring Well Repairs: Based on the recommendations presented in the May 2012 RSO Report, the following items have not yet been addressed and should be repaired:
    1. The well IDs on all of the groundwater monitoring wells should be replaced;
    2. Re-survey any wells where the casing elevation has changed as a result of the completed well repair activities; and
    3. Ensure that Molloy College installs a valve within the ASMW-7 piping to allow for the continued routine collection of groundwater samples from this well.
  - In addition, based on the damage previously noted at monitoring wells ASMW-4 through ASMW-7, D&B recommends that the total depths of each monitoring well be evaluated in order to ensure debris has not entered these wells. Based on the results of this evaluation, it may be warranted to re-develop or re-condition some or all of these monitoring wells.

### **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>Project Phases and Completion Dates</b>	
<b>Project Phase</b>	<b>Completion Date</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 subsurface 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.

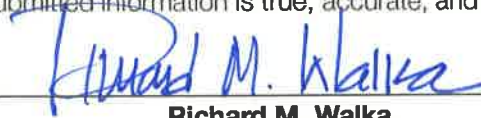


Given the above, NYSDEC reclassified the Franklin Cleaners GWE&TS Site on December 11, 2012, pursuant to the requirements identified in 6 NYCRR §375-2.7, as a Class 4 Site since the NYSDEC determined that the site no longer presents a significant threat to public health and/or the environment based on 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

7.29.13

**Date**

**Project Manager:**



**Stephen E. Tauss**  
Geologist II

7/23/13

**Date**