

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

Latitude 40.688°, Longitude -73.627°

### **REPORT TITLE**

Site Management Quarterly  
Report No. 29

### **REPORTING PERIOD**

September 2011 through  
November 2011

### **CLIENT**

New York State Department of  
Environmental Conservation

David Gardner, Project Manager  
email: drgardne@gw.dec.state.ny.us

### **CONSULTANT**

Dvirka and Bartilucci  
Consulting Engineers

Stephen Tauss, Project Manager  
email: stauss@db-eng.com



## **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 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 submersible pumps, which conveys 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 granular activated carbon (GAC) vessels in series during the operating period. 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 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.

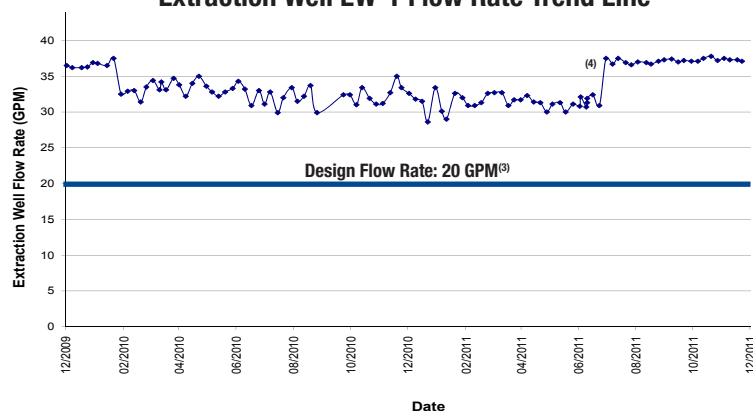


## Treatment System Performance Summary

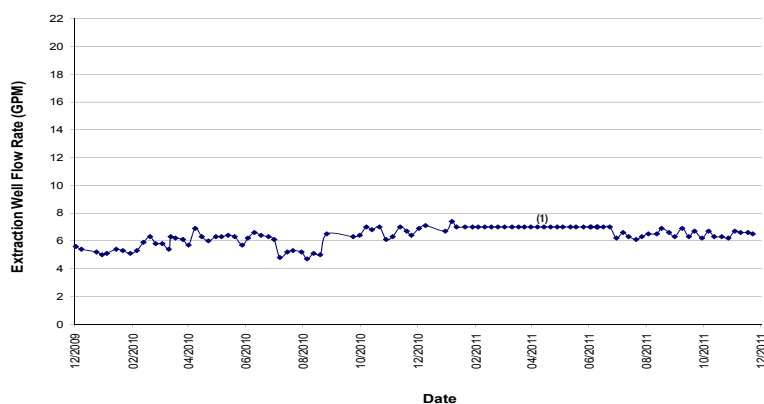
The GWE&TS performance during the current reporting period and since inception in September 2004 is summarized below:

System Extraction Rates and Total Flow Volumes				
	EW-1	EW-2 <sup>(1,2)</sup>	System Influent	System Effluent <sup>(2)</sup>
Average Pumping Rate - Current Reporting Period	37.3 gpm	6.5 gpm	43.8 gpm	62.0 gpm
Average Pumping Rate - Previous Reporting Period	34.7 gpm	6.5 gpm	41.2 gpm	62.8 gpm
Average Pumping Rate to Date	36.8 gpm	4.8 gpm	37.3 gpm	70.3 gpm
Total Flow Volume - Current Reporting Period	4,819,896 gal.	840,840 gal.	5,660,736 gal.	7,916,009 gal.
Total Flow Volume to Date	129,883,900 gal.	16,125,285 gal.	146,009,185 gal.	186,069,198 gal.

Extraction Well EW-1 Flow Rate Trend Line



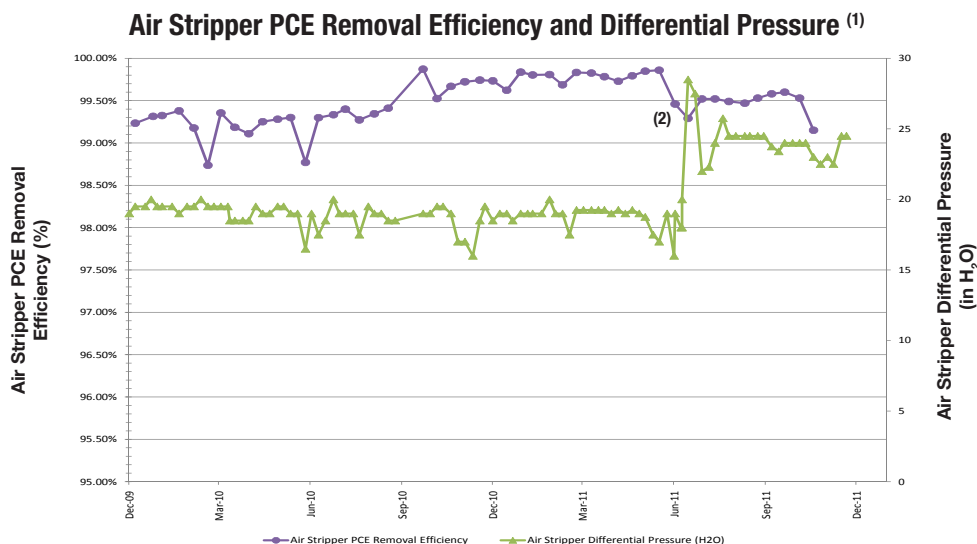
Extraction Well EW-2 Flow Rate Trend Line



1. Extraction EW-2 flow meter has consistently malfunctioned during the past several quarters. 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 remain with respect to influent/effluent flow. As such, it may be warranted to replace the effluent flow meter.
3. Based on the results of the capture zone design modeling, containment of the Franklin Cleaners chlorinated plume (at a minimum 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 37 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 as a result of 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 silt/clay component in the screened interval of this extraction well.
4. Extraction well EW-1 was set at approximately 37 GPM following system shutdown to perform a pump test of extraction wells EW-1 and EW-2 as part of a Remedial System Optimization (RSO) in November and December 2011.



### Treatment System Performance Summary (cont.)



1. The approximate PCE removal efficiency for the low-profile stacked-tray air stripper ranged from 99.15% to 99.60% 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. Increase in differential pressure was likely caused by a decrease in static pressure in the vapor-phase effluent piping, following the bypassing of the GAC vessels in June 2011.

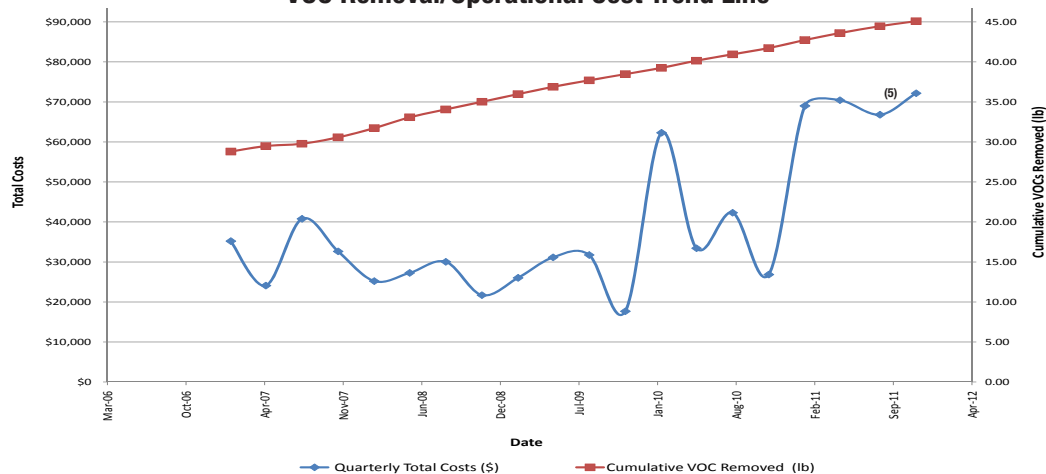
#### VOC Removal Assessment

VOC Removal - Current Reporting Period	0.60 lbs.
VOC Removal - Previous Reporting Period	0.85 lbs.
Average VOC Removal to Date (per period)	0.95 lbs.
Total VOC Removal to Date	45.1 lbs.

#### VOC Removal Costs <sup>(3)</sup>

VOC Removal Cost - Current Reporting Period	\$121,196 per lb.
VOC Removal Cost - Previous Reporting Period	\$77,671 per lb.
Average VOC Removal Cost to Date <sup>(4)</sup>	\$35,653 per lb.

#### VOC Removal/Operational Cost Trend Line



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 increasing VOC removal costs, a Remedial System Optimization (RSO) evaluation is being 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.
4. Average calculated from system start-up (September 2004) through current reporting period.
5. These costs reflect higher than typical NYSDEC "call-out" contractor and engineering costs associated with completion of field and reporting activities for a RSO evaluation of the GWE&TS.



## System Operation and Maintenance

Routine and non-routine system maintenance completed during this reporting period, as well as a summary of the alarm conditions and associated system runtime/downtime for this reporting period, are summarized below. Refer to [Attachment A](#) for operation and maintenance logs, as prepared by NYSDEC "call out" contractor for this reporting period.

Routine Equipment Maintenance Schedule Summary									
Major System Component	Manufacturer	Model Number	Maintenance Frequency	Maintenance Summary					
				Current Reporting Period			Next Reporting Period		
				Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12
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 <sup>(1)</sup>			11/17/12			
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						

1. Note that the pressure blower maintenance was not completed on a bi-monthly schedule this reporting period.

### Non-Routine System Maintenance:

- Cut weeds within treatment system property on October 6 and November 17, 2011.

### Alarm Conditions:

No alarm conditions occurred during this reporting period.

System Runtime/Downtime Summary		
Runtime - Current Reporting Period <sup>(2)</sup>	2,156 hours	98.7%
Downtime - Current Reporting Period <sup>(2)</sup>	29 hours <sup>(4)</sup>	1.3%
Total Runtime to Date <sup>(3)</sup>	62,894 hours	90.0%
Total Downtime to Date	6,258 hours	10.0%

2. Total elapsed time for current reporting period, 2,185 hours (September 1, 2011 through November 30, 2011, including an adjustment for daylight savings time).

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

4. Downtime for this reporting period is the result of the pump test of extraction wells EW-1 and EW-2 for the RSO evaluation.



## System Monitoring and Sampling Results

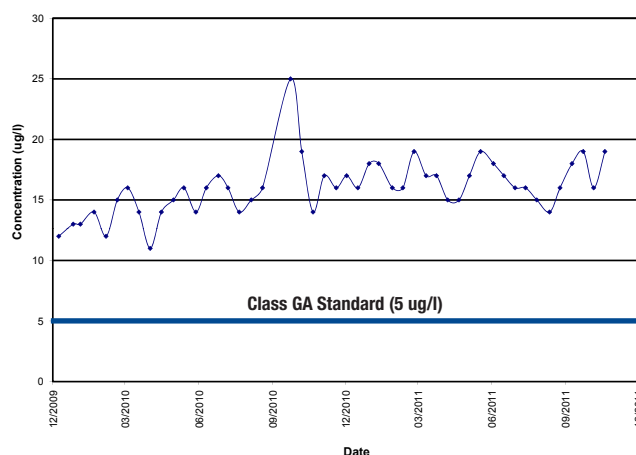
A summary of the pertinent routine system monitoring and sampling results are provided below. Refer to [Attachment B](#) for tabulated analytical results.

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

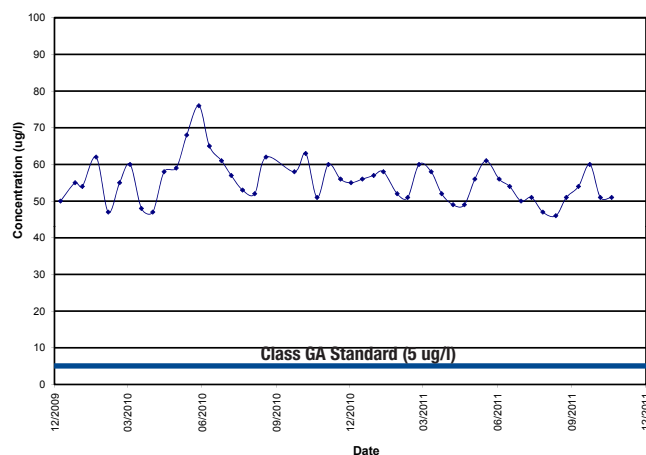
Sample Point	Current Reporting Period	Previous Reporting Period	Average to Date	Groundwater Standard
Extraction Well EW-1	16 ug/l - 19 ug/l	14 ug/l - 18 ug/l	18 ug/l	5.0 ug/l (Class GA)
Extraction Well EW-2	51 ug/l - 60 ug/l	46 ug/l - 56 ug/l	97 ug/l	5.0 ug/l (Class GA)

1. In addition to the PCE concentrations presented in this table, bromomethane, chloroform, chloromethane and 1,1-dichloroethene were detected in one or more system influent samples collected during this reporting period; however, these VOCs 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 <sup>(1)</sup>

Discharge Permit Parameters	Current Reporting Period	Previous Reporting Period	Site-Specific Effluent Limit
PCE	ND	ND - 0.13 ug/l	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	ND - 40.4 ug/l	ND - 195 ug/l	1,000 ug/l
Manganese	15.0 - 17.4 ug/l	17.6 ug/l - 50.3 ug/l	1,000 ug/l
pH (Laboratory Results)	7.08 - 7.51	7.15 - 7.42	6.5 - 8.5
pH (Field Screening Results)	6.72 - 6.98	6.50 - 8.26	6.5 - 8.5

ND - Constituent concentration below the analytical detection limit.

1. In addition, bromoethane and chloromethane were detected at very low concentrations in the aqueous-phase system effluent sample collected on September 8, 2011; however, as these VOCs are not site-specific contaminants of concern, a site-specific effluent limit has not been established for these compounds.



Vapor-Phase Discharge		
	System Vapor Discharge	Site-Specific Discharge Limit
Total VOC Concentrations (field screening with PID) <sup>(2)</sup>	0.0 - 1.8 ppm	NA
Total VOC Concentrations (laboratory analysis) <sup>(3)</sup>	NA <sup>(3)</sup>	0.5 lbs/hr <sup>(5)</sup>
Average Pressure Blower Flow Rate	961 cfm	NA
Maximum Total VOC Emissions <sup>(4)</sup>	0.04 lbs/hr	0.5 lbs/hr <sup>(5)</sup>

2. The PID screening is utilized as a means to instantaneously monitor total vapor-phase VOC discharge concentrations and to gauge the need to possibly reconnect the GAC units in the event sampling warrants such.
3. Vapor-phase discharge samples for laboratory analysis via Method TO-15 are collected on a semi-annual basis and were not collected during this monitoring period.
4. Total VOC emissions were calculated utilizing the maximum VOC concentrations collected with a PID.
5. 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 the NYSDEC's "call-out" laboratory contract had expired during this monitoring period, and as per the direction of NYSDEC, the network of groundwater monitoring wells was not sampled during this reporting period while the NYSDEC evaluated options for renewing their "call-out" laboratory contract. Note that provisions were made to allow for the sampling of the monitoring well network in the beginning of the following reporting period (December 1, 2011), which will be summarized in the following quarterly report.

#### Data Validation:

All sample results have been reviewed by D&B and are deemed valid and usable for environmental assessment purposes. No qualification of the data was necessary based on D&B's review. Data Validation Checklists are presented in [Attachment C](#).

All analytical data associated with the Franklin Cleaners GWE&TS project have been submitted to the NYSDEC in the required EQulS format and within 30 days of receipt of the data from the analytical laboratory.





## Findings and Recommendations

### **Findings:**

- Extraction Well Flow: The analytical results of the system influent samples demonstrate that extraction wells EW-1 and EW-2 continue to capture VOC-contaminated groundwater. Extraction well EW-1 operated at an approximate flow rate of 37.3 GPM and extraction well EW-2 operated at an approximate flow rate of 6.5 GPM throughout this reporting period;
- System Runtime: The GWE&TS was operational for approximately 98.7% of this reporting period (approximately 2,156 hours);
- Air Stripper: The air stripper continues to operate efficiently and below its differential pressure maintenance threshold of 45 inches of water;
- Air Stripper Discharge Parameters (Aqueous-phase): All aqueous-phase discharge analytes were not detected within the aqueous-phase discharge. However, trace concentrations of bromomethane and chloromethane were detected within the aqueous-phase discharge. These compounds do not have a site-specific effluent limit;
- Air Stripper Discharge Parameters (Vapor-phase): PID readings collected at the outlet of the air stripper exhibited VOCs well below the site-specific effluent limit of 0.5 lbs/hr;

### **Recommendations:**

- General: Continue operation of the GWE&TS;
- GWE&TS Routine Maintenance: As bi-monthly maintenance was not completed as per the requirements of the routine maintenance schedule, D&B recommends the NYSDEC "call-out" contractor adhere to the routine maintenance schedule in order to prevent premature equipment failure;
- Effluent Flow Meter: Based on the total flow differences noted with respect to total aqueous-phase system influent and effluent and the fact that the influent flow meters were recently replaced, D&B recommends that the effluent flow meter be further evaluated and replaced, if necessary;
- Air Stripper Discharge pH Exceedances (Aqueous Phase): As noted in previous quarterly reports, in the vast majority of recent reporting periods, field screening of pH values has provided more consistent results than the laboratory-analyzed pH samples. Based on current and historical pH results, it is recommended that laboratory analysis for aqueous-phase effluent pH be discontinued. It is also recommended that effluent pH values be obtained through field monitoring procedures in the future, provided proper instrument calibration and sampling procedures are followed;
- Monitoring Well Improvements: Based on the observed damage at monitoring wells ASMW-4 through ASMW-7 during the previous reporting period, D&B recommends restoring these wells so they may be adequately accessed and protected. In addition, D&B recommends the NYSDEC coordinate with Molloy College to remove the drainage structure and discharge piping observed in the immediate vicinity of ASMW-7, and to ensure that runoff water is not discharged in the immediate vicinity of this or any other monitoring well in the future;
- RSO Evaluation: As previously recommended, a RSO evaluation of the GWE&TS is currently being completed in order to improve the efficiency, effectiveness and net environmental benefit of the GWE&TS which will include several recommendations such as the plume re-delineation recommendation discussed below;
  - Groundwater Plume Re-delineation: Based on the PCE concentrations detected in groundwater monitoring well ASMW-1 during the previous reporting period, D&B recommends re-delineation of the groundwater plume via installing and sampling several temporary geoprobe wells along the leading edge and length 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. With the approval of the NYSDEC, D&B will provide a plume re-delineation scope of work for review and approval.



### 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>
Remedial Investigation	03/1998
Remedial Design	02/2001
Groundwater Extraction and Treatment System Construction	07/2003 <sup>(2)</sup>
Remedial Action (Source Area Remediation)	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.

Given the above, NYSDEC should consider potentially reclassifying the Franklin Cleaners GWE&TS Site pursuant to the requirements identified in 6 NYCRR §375-2.7 as a Class 4 Site since the "source area" contamination does not appear to constitute a significant threat to public health or the environment based on remedial efforts performed to date. In doing so, however, D&B suggests the NYSDEC also consider implementing a post-remedial indoor air study within the source area structures/buildings to verify current site conditions, in support of the proposed Site reclassification. 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

6.6.12  
Date

Project Manager:

  
Stephen E. Tauss  
Geologist II

6/5/12  
Date