

May 25, 2018

Ms. Alicia Barraza
NYSDEC Remedial Bureau Section A
625 Broadway
12th Floor
Albany, New York 12233

**Re: Short-term Contaminant Rebound Test Results
Former Watermark Site (BCP Site No. No. C224139)
491 Wortman Avenue, Brooklyn, New York 11208
Langan Project No.: 170329301**

Dear Ms. Barraza:

As you are aware, J&H Holding Co. retained Langan Engineering, Environmental, Surveying, Landscape Architecture, and Geology, D.P.C. (Langan) to remediate the New York State Brownfield Cleanup Program (NYSBCP) Site located at 491 Wortman Avenue in Brooklyn, New York (the Site). As communicated in the monthly inspection reports prepared pursuant to the Site Management Plan (SMP), the air sparging/soil vapor extraction system (AS/SVE) was shut down on February 24, 2018 to perform a short-term contaminant rebound test. The purpose of this letter is to provide the results of the short-term contaminant rebound test and to request the continuation of rebound testing.

SITE BACKGROUND

The Site is located at 491 Wortman Avenue in Brooklyn, New York and identified as Block 4384, Lots 31 and 36 on the New York City Tax Map. During previous environmental subsurface investigations and the supplemental remedial investigation, tetrachloroethene and trichloroethene associated with a known historical chlorinated solvent release were detected in soil and groundwater samples collected from borings and monitoring wells in the western portion of the site (i.e., the warehouse). The Site was entered into the NYSBCP as a Participant in October 2012.

REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs), as listed in the June 2017 SMP, are as follows:

Groundwater

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of, volatiles from contaminated groundwater.
- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.

- Remove the source of ground or surface water contamination.

Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

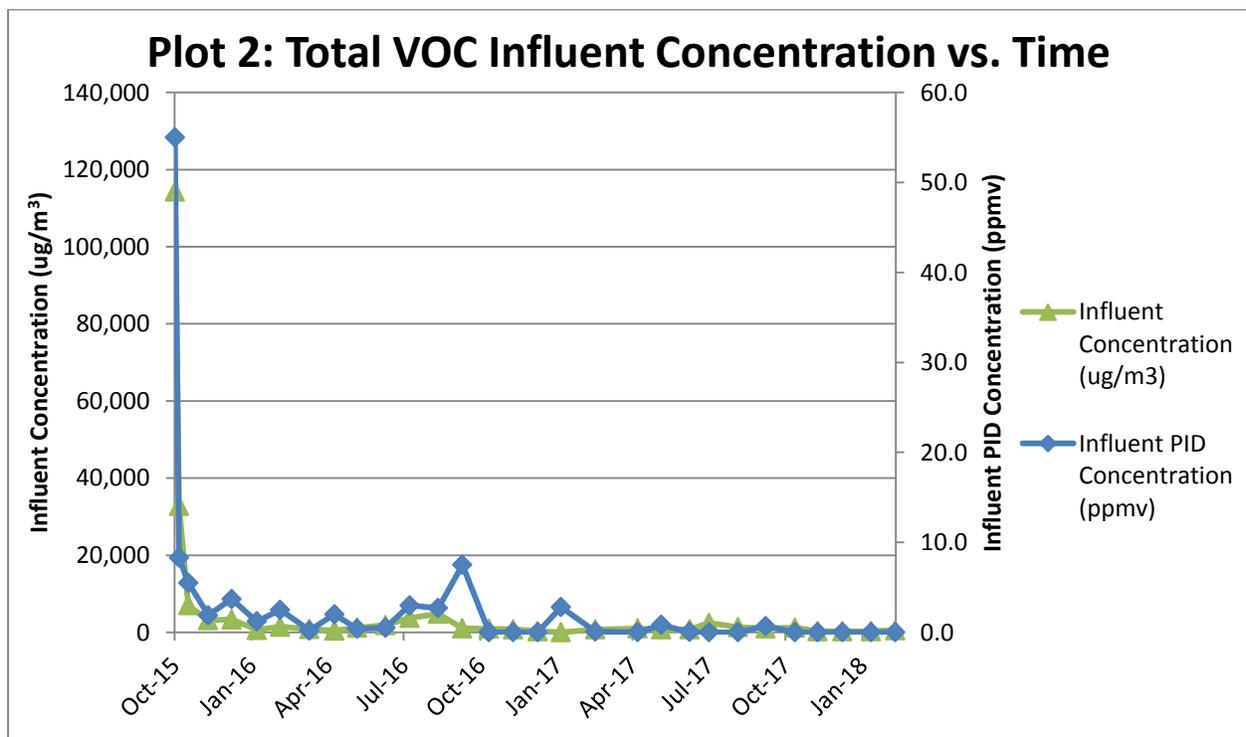
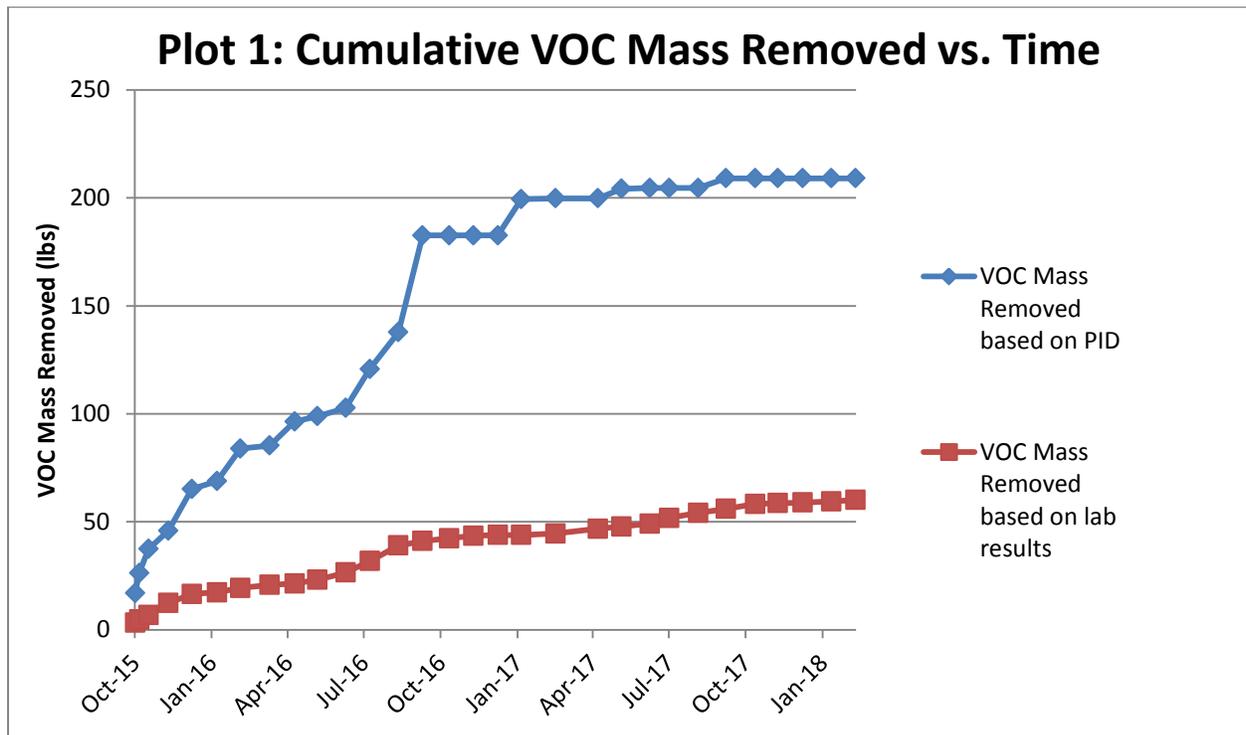
Soil

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

REMEDIAL ACTION PERFORMANCE

From the time that the AS/SVE was first initiated on October 20, 2015 through March 7, 2018, the SVE system operated for 18,967 hours (92% uptime), and the AS system operated for 18,497 hours (90% uptime). The concentration of chlorinated volatile organic compounds (CVOCs) in groundwater has been reduced by 12% to 100% in on-site wells and by 29% to 67% in three of four off-site wells when compared to baseline concentrations. In the most recent 10th quarter groundwater sampling event, sample results indicate that CVOC concentrations continue to be stable below the NYSDEC Technical & Operational Guidance Series (TOGS) Water Quality Standards and Guidance Values in 6 of 13 on-site wells. When compared to last quarter's sampling results after which the AS/SVE system was temporarily deactivated to measure contaminant rebound, CVOC concentrations increased in all but one of the on-site wells and in three of the four off-site wells. The increased CVOC concentrations can be attributed to the temporary deactivation of the AS/SVE system and the area-wide groundwater quality. The magnitude of concentration increase in each well is within expected ranges, as they are still below baseline concentrations in all on-site wells. Table 1 and Table 2 provide quarterly groundwater sampling results collected since the baseline sampling event in on-site and off-site wells, respectively.

In soil vapor, the untreated influent concentration of total volatile organic compounds (VOCs) has been reduced by over 99% (from 114,348 $\mu\text{g}/\text{m}^3$ to 534 $\mu\text{g}/\text{m}^3$) when compared to baseline sampling concentrations. Monthly photoionization detector (PID) monitoring of the influent soil vapor has shown 0.0 parts per million by volume (ppmv) since November 1, 2017. The plots below illustrate the overall efficacy of the AS/SVE versus time. Plot 1 presents the cumulative VOC mass removed based on laboratory results and PID readings and Plot 2 presents the influent concentration of total VOCs.



These plots show asymptotic trends in both the cumulative VOC mass removed and total VOC influent concentration reduction, with the majority of mass removal occurring in the first year of operation and the majority of influent concentration reduction occurring in the first month of

operation. Table 3 and Table 4 provide VOC mass removal data collected since October 2015 based on PID concentrations and laboratory results, respectively.

PROPOSED EXTENSION OF REBOUND TESTING

Based on the groundwater sample results and VOC mass removal data, the short-term contaminant rebound test results indicate that the RAOs established in the SMP for groundwater and soil vapor have been achieved, subsurface conditions have been restored to the extent practicable and the RAOs for soil have been achieved through the implementation of a site-wide cap. The AS/SVE system has not been operating since February 24, 2018 while the contaminant rebound test was performed and an expected increase in CVOC concentrations in groundwater was observed within expected ranges. We propose to extend the rebound test until the next scheduled groundwater sampling event to observe the rebound effect while the AS/SVE system remains shut down.

SCHEDULE

Pending NYSDEC approval of the proposed rebound test extension, we plan to keep the AS/SVE system shutdown until the next quarterly monitoring event (Eleventh Quarter – July 2018). In the meantime, we will drain the SVE tank and confirm the system is operable in the event it must be restarted.

CLOSING

Please call us at 212.479.5559 if you have any questions and if necessary, for further discussion.

Sincerely,
**Langan Engineering, Environmental, Surveying,
Landscape Architecture, and Geology, D.P.C.**



Gerald Nicholls, PE, CHMM
Senior Project Engineer



Michael Burke, PG, CHMM
Principal/Vice President

Enclosure(s): Table 1 – Quarterly Groundwater Sampling Results Summary
Table 2 – Semi-Annual, Near-Field, Off-Site Groundwater Sampling Results
Summary
Table 3 – AS/SVE System Mass Removal – PID Data
Table 4 – AS/SVE System Mass Removal – Laboratory Data (Total VOCs)
Proposed Remediation Schedule

cc: J. Abel (J&H Holding Co.)
M. Komoroske (NYSDEC)
J. Deming (NYSDOH)
S. Abrams and O. Uppal (Langan)

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Test_491 Wortman Ave.docx

**TABLE 1: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139**

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Baseline Sampling Results Summary (µg/L) - August 2015														
CVOCs	~	1274.9	2314	873.3	23.4	27.8	653	175	1236.3	1272	458	602	903.6	438.2
PCE	5	750	480	380	14	8.3	79	110	710	460	180	400	310	230
TCE	5	500	1800	480	5.9	16	540	55	500	780	240	190	580	200
cis-1,2- DCE	5	19	14	8.3	2.5	2.5	29	9	22	27	36	10	8.6	6.2
vinyl chloride	2	5.9	20	5	1	1	5	1	4.3	5	2	2	5	2
First Quarter Sampling Results Summary (µg/L) - January 2016														
CVOCs	~	12.8	2.14	7.6	23.4	16.13	14.8	1.87	676	11.41	184.56	5.8	10	2.6
PCE	5	6	1	2	20	14	3	1	240	2	15	4	3	1
TCE	5	5.3	0.74	5.2	3	1.7	11	0.37	400	9	130	1.4	5.4	1.2
cis-1,2- DCE	5	1.3	0.2	0.2	0.2	0.23	0.6	0.3	35	0.21	39	0.2	1.4	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1	0.2	0.56	0.2	0.2	0.2
Q1 Percent CVOC Reduction		99%	99.9%	99%	0%	42%	98%	99%	45%	99%	60%	99%	99%	99%
Second Quarter Sampling Results Summary (µg/L) - April 2016														
CVOCs	~	3.8	1.99	4.3	18.5	9.3	3.28	1.64	401	2.46	71.96	0.91	1.45	1.79
PCE	5	1.7	0.87	1.2	16	7.6	0.48	0.67	160	0.26	5.7	0.31	0.3	0.61
TCE	5	1.7	0.72	2.7	2.1	1.3	2.4	0.38	220	1.8	43	0.2	0.75	0.78
cis-1,2- DCE	5	0.2	0.2	0.2	0.2	0.2	0.2	0.39	19	0.2	23	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.26	0.2	0.2	0.2
Q2 Percent CVOC Reduction from Last Quarter (Q1)		70%	7%	43%	21%	42%	78%	12%	41%	78%	61%	84%	86%	31%
Q2 Percent CVOC Reduction from Baseline		99.7%	99.9%	99.5%	21%	67%	99.5%	99%	68%	99.8%	84%	99.8%	99.8%	99.6%
Third Quarter Sampling Results Summary (µg/L) - July 2016														
CVOCs	~	1.65	4.26	7.69	24.5	14.01	6.26	3.48	1249.5	4.21	53.5	1.49	1.97	4.15
PCE	5	0.68	2.2	3	22	12	2.2	1.6	570	0.71	5.3	0.76	0.47	2
TCE	5	0.57	1.6	4.2	2.1	1.6	3.5	0.76	640	3.1	27	0.33	1.1	1.6
cis-1,2- DCE	5	0.2	0.26	0.29	0.2	0.21	0.36	0.92	39	0.2	21	0.2	0.2	0.35
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2
Q3 Percent CVOC Reduction from Last Quarter (Q2)		57%	Increased	26%	Increased	Increased	Increased							
Q3 Percent CVOC Reduction from Baseline		99.9%	99.8%	99.1%	Increased	50%	99%	98%	Increased	99.7%	88%	99.8%	99.8%	99.1%

Notes:

- Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
- Results equal to or exceeding the NYSDEC TOGS standards and guidance values are shaded.
- PCE = tetrachloroethylene
- TCE = trichloroethylene

- cis-1,2-DCE = cis-1,2-Dichloroethylene
- µg/L = microgram per liter
- CVOC = chlorinated volatile organic compounds
- * = Monitoring well is located in the sidewalk adjacent to the warehouse.

**TABLE 1: QUARTERLY GROUNDWATER SAMPLING RESULTS SUMMARY
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139**

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Fourth Quarter Sampling Results Summary (µg/L) - October 2016														
CVOCs	~	0.91	8.39	18.59	18.1	11.36	3.38	0.84	158.4	1.1	33.9	0.99	0.81	1.57
PCE	5	0.22	4.6	8.8	16	10	0.98	0.24	67	0.2	2.7	0.39	0.2	0.54
TCE	5	0.29	3.2	9	1.7	0.96	2	0.2	87	0.5	19	0.2	0.21	0.63
cis-1,2- DCE	5	0.2	0.39	0.59	0.2	0.2	0.2	0.2	4.2	0.2	12	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Q4 Percent CVOC Reduction from Last Quarter (Q3)		45%	Increased	Increased	26%	19%	46%	76%	87%	74%	37%	34%	59%	62%
Q4 Percent CVOC Reduction from Baseline		99.9%	100%	98%	23%	59%	99%	100%	87%	99.9%	93%	99.8%	99.9%	99.6%
Fifth Quarter Sampling Results Summary (µg/L) - January 2017														
CVOCs	~	0.8	1.32	20.71	21.1	14.21	1.89	1.02	812.7	0.9	42.4	7.9	0.8	1.49
PCE	5	0.2	0.56	10	19	13	0.52	0.42	380	0.2	3.2	5.5	0.2	0.66
TCE	5	0.2	0.36	10	1.7	0.81	0.97	0.2	410	0.3	20	2	0.2	0.43
cis-1,2- DCE	5	0.2	0.2	0.51	0.2	0.2	0.2	0.2	22	0.2	19	0.2	0.2	0.2
vinyl chloride	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.7	0.2	0.2	0.2	0.2	0.2
Q5 Percent CVOC Reduction from Last Quarter (Q4)		12%	84%	Increased	Increased	Increased	44%	Increased	Increased	18%	Increased	Increased	1%	5%
Q5 Percent CVOC Reduction from Baseline		99.9%	100%	98%	10%	49%	100%	99%	34%	99.9%	91%	98.7%	99.9%	99.7%
Sixth Quarter Sampling Results Summary (µg/L) - April 2017														
CVOCs	~	4.5	11.6	6.4	24.4	16.35	6.8	4.5	57.3	4.4	17.5	4.15	4.5	4.09
PCE	5	0.5	5.5	1.2	19	12	1.5	0.5	26	0.5	2.1	0.4	0.5	0.26
TCE	5	0.5	2.6	1.7	1.9	0.85	1.8	0.5	28	0.4	5.5	0.25	0.5	0.33
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.3	2.5	8.9	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Q6 Percent CVOC Reduction from Last Quarter (Q5)		Increased	Increased	69%	Increased	Increased	Increased	Increased	93%	Increased	59%	47%	Increased	Increased
Q6 Percent CVOC Reduction from Baseline		99.6%	99%	99%	Increased	41%	99%	97%	95%	99.7%	96%	99.3%	99.5%	99.1%
Seventh Quarter Sampling Results Summary (µg/L) - July 2017														
CVOCs	~	4.5	4.61	3.98	16	18.24	4.21	4.5	758	4.32	17.2	4.23	15.1	4.36
PCE	5	0.5	0.67	0.22	11	14	0.33	0.5	490	0.5	1.2	0.23	10	0.54
TCE	5	0.5	0.44	0.26	1.5	0.74	0.38	0.5	240	0.32	5.8	0.5	1.6	0.32
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	26	2.5	9.2	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	2	1	1	1	1	1
Q7 Percent CVOC Reduction from Last Quarter (Q6)		None	60%	38%	34%	Increased	38%	None	Increased	2%	2%	Increased	Increased	Increased
Q7 Percent CVOC Reduction from Baseline		99.6%	100%	100%	32%	34%	99.4%	97%	39%	100%	96%	99.3%	98%	99%

Notes:

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FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139**

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location												
		MW-1	MW-2	MW-3S	MW-3M	MW-3D	MW-4	MW-5	MW-6*	MW-7*	MW-8*	MW-9	PZ-1	PZ-2
Eighth Quarter Sampling Results Summary (µg/L) - October 2017														
CVOCs	~	4.5	4.39	4.5	20.3	19.31	4.27	4.08	276	4.5	10.08	6.18	4.5	4.5
PCE	5	0.5	0.42	0.5	15	15	0.5	0.36	160	0.5	0.78	1.8	0.5	0.5
TCE	5	0.5	0.47	0.5	1.8	0.81	0.27	0.22	93	0.5	3.3	0.88	0.5	0.5
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	21	2.5	5	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	2	1	1	1	1	1
Q8 Percent CVOC Reduction from Last Quarter (Q7)		<i>None</i>	<i>5%</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>9%</i>	<i>64%</i>	<i>Increased</i>	<i>41%</i>	<i>Increased</i>	<i>70%</i>	<i>Increased</i>
Q8 Percent CVOC Reduction from Baseline		<i>99.6%</i>	<i>100%</i>	<i>99%</i>	<i>13%</i>	<i>31%</i>	<i>99.3%</i>	<i>98%</i>	<i>78%</i>	<i>100%</i>	<i>98%</i>	<i>99.0%</i>	<i>100%</i>	<i>99%</i>
Ninth Quarter Sampling Results Summary (µg/L) - January 2018														
CVOCs	~	4.08	4.49	4.5	20.1	18.7	4.32	4.24	623.71	4.5	10.99	6.9	5.86	4.5
PCE	5	0.26	0.63	0.5	15	14	0.2	0.48	430	0.5	0.99	2	1.7	0.5
TCE	5	0.32	0.36	0.5	1.6	1.2	0.62	0.26	180	0.5	3.5	1.4	0.66	0.5
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	13	2.5	5.5	2.5	2.5	2.5
vinyl chloride	2	1	1	1	1	1	1	1	0.71	1	1	1	1	1
Q9 Percent CVOC Reduction from Last Quarter (Q8)		<i>9%</i>	<i>Increased</i>	<i>0%</i>	<i>1%</i>	<i>3%</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>0%</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>0%</i>
Q9 Percent CVOC Reduction from Baseline		<i>99.7%</i>	<i>100%</i>	<i>99%</i>	<i>14%</i>	<i>33%</i>	<i>99.3%</i>	<i>98%</i>	<i>50%</i>	<i>100%</i>	<i>98%</i>	<i>98.9%</i>	<i>99%</i>	<i>99%</i>
Tenth Quarter Sampling Results Summary (µg/L) - April 2018														
CVOCs	~	6.1	15	10	20.6	19.5	5.62	19.3	357.5	5.72	12	8.6	11.6	26.1
PCE	5	1.4	9.1	4	15	15	1.2	14	240	1.4	3.9	3.8	5.7	14
TCE	5	1.2	2.4	2.5	2.1	1	0.92	3	100	0.82	3.6	1.3	2.6	4.4
cis-1,2- DCE	5	2.5	2.5	2.5	2.5	2.5	2.5	1.3	15	2.5	3.5	2.5	2.3	6.7
vinyl chloride	2	1	1	1	1	1	1	1	2.5	1	1	1	1	1
Q10 Percent CVOC Reduction from Last Quarter (Q9)		<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>43%</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>
Q10 Percent CVOC Reduction from Baseline		<i>99.5%</i>	<i>99%</i>	<i>99%</i>	<i>12%</i>	<i>30%</i>	<i>99.1%</i>	<i>89%</i>	<i>71%</i>	<i>100%</i>	<i>97%</i>	<i>98.6%</i>	<i>99%</i>	<i>94%</i>

Notes:

- Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
- Results equal to or exceeding the NYSDEC TOGS standards and guidance values are shaded.
- PCE = tetrachloroethylene
- TCE = trichloroethylene

- cis-1,2-DCE = cis-1,2-Dichloroethylene
- µg/L = microgram per liter
- CVOC = chlorinated volatile organic compounds
- * = Monitoring well is located in the sidewalk adjacent to the warehouse.

**TABLE 2: SEMI-ANNUAL, NEAR-FIELD, OFF-SITE GROUNDWATER SAMPLING RESULTS SUMMARY
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139**

Compound	NYSDEC TOGS STANDARDS AND GUIDANCE VALUES	Sampling Location				
		ML002S	ML002M	ML002D	MW10	MW11
NYSDEC-Requested Sample Results Summary (µg/L) - July 2016 (Baseline)						
CVOCs	~	38.17	16.54	--	188.2	2.9
PCE	5	17	14	NS	120	1.50
TCE	5	20	2.10	NS	57	1
cis-1,2- DCE	5	0.97	0.24	NS	11	0.20
vinyl chloride	2	0.20	0.20	NS	0.20	0.20
Round 1 Sampling Results Summary (µg/L) - April 2017						
CVOCs	~	5.49	19.9	14.1	12.23	4.58
PCE	5	1.4	14	9.5	5.6	0.56
TCE	5	0.59	2.4	1.1	4.7	0.52
cis-1,2- DCE	5	2.5	2.5	2.5	0.93	2.5
vinyl chloride	2	1	1	1	1	1
Round 1 Percent CVOC Reduction		86%	<i>Increased</i>	--	94%	<i>Increased</i>
Round 2 Sampling Results Summary (µg/L) - October 2017						
CVOCs	~	4.91	26.1	14.5	14.93	10.7
PCE	5	1.1	17	10	8.8	5.6
TCE	5	0.31	5.6	1	4.2	1.6
cis-1,2- DCE	5	2.5	2.5	2.5	0.93	2.5
vinyl chloride	2	1	1	1	1	1
Round 2 Percent CVOC Reduction from Round 1		11%	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>	<i>Increased</i>
Round 2 Percent CVOC Reduction from Baseline		87%	<i>Increased</i>	--	92%	<i>Increased</i>
Round 3 Sampling Results Summary (µg/L) - April 2018						
CVOCs	~	27.1	5.44	15.5	93	10
PCE	5	20	1.5	11	44	4.7
TCE	5	3.6	0.44	1	22	1.8
cis-1,2- DCE	5	2.5	2.5	2.5	26	2.5
vinyl chloride	2	1	1	1	1	1
Round 3 Percent CVOC Reduction from Round 2		<i>Increased</i>	79%	<i>Increased</i>	<i>Increased</i>	7%
Round 3 Percent CVOC Reduction from Baseline		29%	67%	--	51%	<i>Increased</i>

Notes:

- Groundwater sample analytical results are compared to New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values for Class GA water.
- Results exceeding the NYSDEC TOGS standards and guidance values are shaded.
- PCE = tetrachloroethylene
- TCE = trichloroethylene
- cis-1,2-DCE = cis-1,2-Dichloroethylene
- µg/L = microgram per liter
- CVOC = chlorinated volatile organic compound
- NS = not sampled

**TABLE 3: AS/SVE SYSTEM MASS REMOVAL - PID DATA
FORMER WATERMARK DESIGNS FACILITY
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139**

DATE	INFLUENT CONCENTRATION (ppmv)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ppmv)	TOTAL OPERATIONAL HOURS	AVERAGE MOLECULAR WEIGHT	MASS REMOVAL RATE (lbs/hr)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	CUMULATIVE MASS REMOVED FROM SUBSURFACE (lbs)
10/21/2015	55.0	688	1.8	30	100	0.57	17.02	17.02
10/26/2015	8.3	650	0.6	150	100	0.08	9.31	26.34
11/6/2015	5.5	560	0.0	383	100	0.05	11.13	37.46
11/30/2015	1.9	593	0.3	958	100	0.01	8.46	45.92
12/28/2015	3.7	570	0.0	1,548	100	0.03	19.29	65.21
1/27/2016	1.2	525	0.5	2,180	100	0.01	3.60	68.81
2/24/2016	2.5	578	0.0	2,854	100	0.02	15.10	83.91
3/30/2016	0.2	550	0.0	3,693	100	0.002	1.43	85.34
4/29/2016	2.0	571	0.0	4,322	100	0.018	11.14	96.48
5/26/2016	0.4	600	0.0	4,972	100	0.004	2.42	98.90
6/29/2016	0.5	600	0.0	5,784	100	0.005	3.78	102.68
7/28/2016	3.0	600	0.0	6,431	100	0.028	18.06	120.73
8/31/2016	2.7	600	0.0	7,110	100	0.025	17.05	137.79
9/29/2016	7.5	760	2.0	7,802	100	0.065	44.85	182.63
10/31/2016	0.0	520	0.0	8,516	100	0.000	0.00	182.63
11/29/2016	0.0	560	0.0	9,211	100	0.000	0.00	182.63
12/28/2016	0.0	520	0.0	9,884	100	0.000	0.00	182.63
1/25/2017	2.8	600	0.0	10,530	100	0.026	16.83	199.46
3/7/2017	0.1	360	0.0	11,186	100	0.001	0.37	199.82
4/27/2017	0.0	600	0.0	12,185	100	0.000	0.00	199.82
5/25/2017	0.8	600	0.0	12,760	100	0.008	4.42	204.24
6/28/2017	0.04	600	0.0	13,575	100	0.000	0.33	204.57
7/21/2017	0.0	600	0.0	14,060	100	0.000	0.00	204.57
8/25/2017	0.0	600	0.0	14,852	100	0.000	0.00	204.57
9/27/2017	0.7	600	0.08	15,641	100	0.006	4.55	209.12
11/1/2017	0.0	640	0.00	16,422	100	0.000	0.00	209.12
11/28/2017	0.0	600	0.00	17,069	100	0.000	0.00	209.12
12/28/2017	0.0	560	0.00	17,618	100	0.000	0.00	209.12
1/31/2018	0.0	600	0.00	18,382	100	0.000	0.00	209.12
3/1/2018	0.0	580	0.00	18,961	100	0.000	0.00	209.12

NOTES:

- Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
- The influent and effluent concentrations are based on the PID readings.
- Mass Removal rate (lb/hr) = ((Conc in ppmv)(flowrate scfm)(MW)(60 min/hr)) / ((387)(1,000,000)).
- PID = photoionization detector
- ppmv = parts per million volume
- scfm = standard cubic feet per minute
- lbs/hr = pounds per hour
- lbs = pounds
- SVE = soil vapor extraction

TABLE 4: AS/SVE SYSTEM MASS REMOVAL - LABORATORY DATA (TOTAL VOCs)
491 WORTMAN AVENUE
BROOKLYN, NEW YORK
LANGAN PROJECT NO. 170329301
BROWNFIELD CLEANUP PROGRAM SITE NO. C224139

DATE	INFLUENT CONCENTRATION (ug/m3)	SVE BLOWER FLOWRATE (scfm)	EFFLUENT CONCENTRATION (ug/m3)	TOTAL OPERATIONAL HOURS	INFLUENT RATE (mg/min)	EFFLUENT RATE (mg/min)	REMOVAL RATE (mg/min)	MASS REMOVED FROM SUBSURFACE (lbs)	TOTAL MASS REMOVED FROM SUBSURFACE (lbs)	MASS REMOVED BY CARBON (lbs)	TOTAL MASS REMOVED BY CARBON (lbs)
10/20/2015	114,348	640	9,241	12	2049.12	165.60	1883.52	3.25	3.25	2.99	2.99
10/21/2015	32,758	688	1,129	30	631.05	21.75	609.30	1.50	4.76	1.45	4.44
10/26/2015	7,027	650	383	150	127.89	6.97	120.92	2.03	6.79	1.92	6.36
11/30/2015	3,144	593	426	958	52.20	7.07	45.13	5.58	12.36	4.82	11.18
12/28/2015	3,357	570	230	1,548	53.58	3.67	49.91	4.18	16.55	3.89	15.08
1/27/2016	621	525	183	2,180	9.13	2.69	6.44	0.76	17.31	0.54	15.62
2/24/2016	1,454	578	283	2,854	23.53	4.58	18.94	2.10	19.41	1.69	17.31
3/30/2016	825	550	75	3,693	12.71	1.16	11.55	1.41	20.82	1.28	18.59
4/29/2016	482	571	112	4,322	7.70	1.79	5.91	0.64	21.46	0.49	19.08
5/26/2016	1,169	600	162	4,972	19.64	2.73	16.91	1.69	23.15	1.45	20.53
6/29/2016	1,865	600	190	5,784	31.33	3.19	28.14	3.37	26.51	3.02	23.56
7/28/2016	3,706	600	232	6,431	62.26	3.90	58.36	5.33	31.84	4.99	28.55
8/31/2016	4,798	600	135	7,110	80.61	2.26	78.35	7.24	39.08	7.04	35.59
9/29/2016	1,045	760	179	7,802	22.24	3.81	18.43	2.04	41.12	1.69	37.27
10/31/2016	922	520	91	8,516	13.42	1.32	12.10	1.27	42.38	1.14	38.42
11/29/2016	790	560	167	9,211	12.38	2.62	9.76	1.14	43.52	0.90	39.31
12/28/2016	282	520	123	9,884	4.11	1.79	2.32	0.37	43.89	0.21	39.52
1/25/2017	4.7	600	5.6	10,530	0.08	0.09	-0.02	0.01	43.89	0.00	39.52
3/7/2017	762	360	120	11,186	7.68	1.21	6.47	0.67	44.56	0.56	40.08
4/27/2017	1,008	600	86	12,185	16.93	1.44	15.49	2.24	46.80	2.05	42.13
5/25/2017	771	600	48	12,760	12.95	0.81	12.15	0.99	47.78	0.92	43.05
6/28/2017	754	600	69	13,575	12.66	1.16	11.50	1.36	49.15	1.24	44.29
7/21/2017	2,434	600	235	14,060	40.89	3.95	36.94	2.62	51.77	2.37	46.66
8/25/2017	1,334	600	246	14,852	22.41	4.13	18.28	2.35	54.12	1.91	48.58
9/27/2017	1,059	600	83	15,641	17.79	1.39	16.40	1.86	55.98	1.71	50.29
11/1/2017	1,227	640	85	16,422	21.99	1.52	20.47	2.27	58.25	2.11	52.40
11/28/2017	295	600	64	17,069	4.96	1.08	3.88	0.42	58.67	0.33	52.73
12/28/2017	258	560	29	17,618	4.05	0.45	3.59	0.29	58.97	0.26	53.00
1/31/2018	289	600	13	18,382	4.85	0.23	4.62	0.49	59.46	0.47	53.46
3/1/2018	534	580	68	18,961	8.67	1.11	7.57	0.66	60.12	0.58	54.04

NOTES:

1. Blower flowrate is recorded from PDI-701 pitot tube flow indicator located on the blower discharge line.
2. The influent and effluent concentrations are based on the lab analytical data and not the PID readings.
3. ug/m3 = micrograms per cubic meter
4. scfm = standard cubic feet per minute
5. mg/min = milligrams per minute
6. lbs = pounds
7. SVE = soil vapor extraction