ENGINEERING REPORT AND OPERATION, MONITORING AND MAINTENANCE PLAN FOR WIN-HOLT EQUIPMENT CORPORATION SITE

592 BROOK STREET, GARDEN CITY, NEW YORK

NYSDEC VCP SITE #V00243-1

PREPARED FOR

WIN-HOLT EQUIPMENT CORPORATION

FOR SUBMITTAL TO THE

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PREPARED BY

FPM group

909 MARCONI AVENUE
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JULY 2009

ENGINEERING REPORT AND
OPERATION, MONITORING AND MAINTENANCE PLAN

Prepared for

Facility:	Win-Holt Equipment Corporation 592 Brook Street Garden City, New York NYSDEC VCP # V00243-1
FPM File No:	562-08-09

I certify that the remediation activities described herein were implemented and completed in substantial accordance with the New York State Department of Environmental Conservation-approved Remedial Action Work Plan and associated documents, as described herein.

KEVIN F. LOYST
76321

New York State Professional Engineer # 76321

Signature

It is a violation of Article 130 of the New York State Education Law for any person to alter this document in any way without the express written verification or adoption by a New York State licensed land surveyor or engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

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APPENDICES

SECTION 1.0
INTRODUCTION

This Engineering Report and Operation, Monitoring and Maintenance (OM&M) Plan has been prepared by FPM Group (FPM) to document the installation of the soil vapor extraction (SVE) and air sparging (AS) system at New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Program (VCP) Site #V00243-1, identified as Win-Holt Equipment Corporation (Win-Holt) Site, located at 592 Brook Street in Garden City, New York (Site). This report also documents the injection of Hydrogen-Releasing Compound (HRC) and Oxygen-Releasing Compound (ORC) as remedial measures, and recent groundwater monitoring procedures and results. Procedures to operate, monitor and maintain the remedial measures are also provided herein. The Site location is shown on Figure 1.1.

The AS/SVE system was installed between November 2007 and January 2008 in accordance with the NYSDEC-approved Pilot Test Report for the Win-Holt Equipment Corporation Site dated October 2006. Figure 1.2 depicts the site and remediation system layouts.

The AS/SVE system was installed in a former drywell area at the Site. Drywell remediation by soil removal was performed in 1997. Subsequent soil investigations determined that minor to moderate soil contamination remained present in the vicinity of the former drywell area between 14 and 24 feet below grade.

Groundwater sampling had detected concentrations of several volatile organic compounds (VOCs), including total xylenes, toluene and ethylbenzene, in the vicinity and slightly downgradient of the former drywell area. Several chlorinated solvent VOCs, including 1,1,1-trichloroethane (1,1,1-TCA), trichloroethylene (TCE), and tetrachloroethylene (PCE), were detected in groundwater further downgradient of the former drywell area.

Based on these findings, the NYSDEC required that remediation of the impacted soil and groundwater be performed. A Remedial Action Work Plan (RAWP) for the site was submitted by FPM in June 2005. The selected remedy for the site included the installation of an AS/SVE system to remediate onsite groundwater and soil in conjunction with the injection of ORC onsite (FPM, January 24, 2007 letter, NYSDEC February 26, 2007 letter). Injection of HRC at downgradient locations was selected to aid in the remediation of offsite groundwater. Groundwater sampling of select onsite and offsite monitoring wells prior to and following system startup was recommended to evaluate the effectiveness of the AS/SVE system.

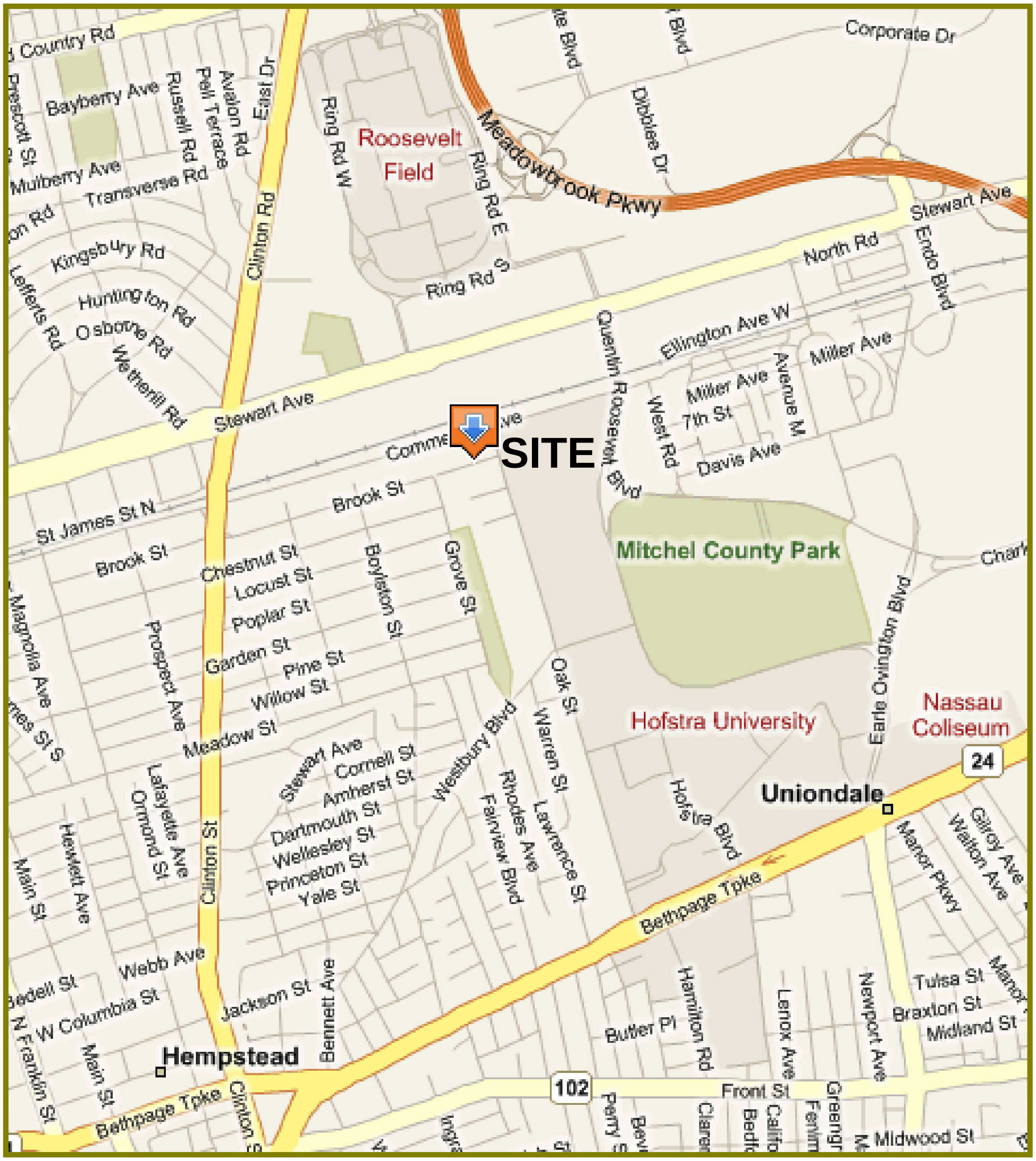

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FIGURE 1.1

SITE LOCATION
WIN-HOLT EQUIPMENT CORPORATION
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn by: TAC	Checked By: JSB	Date: 5/7/08

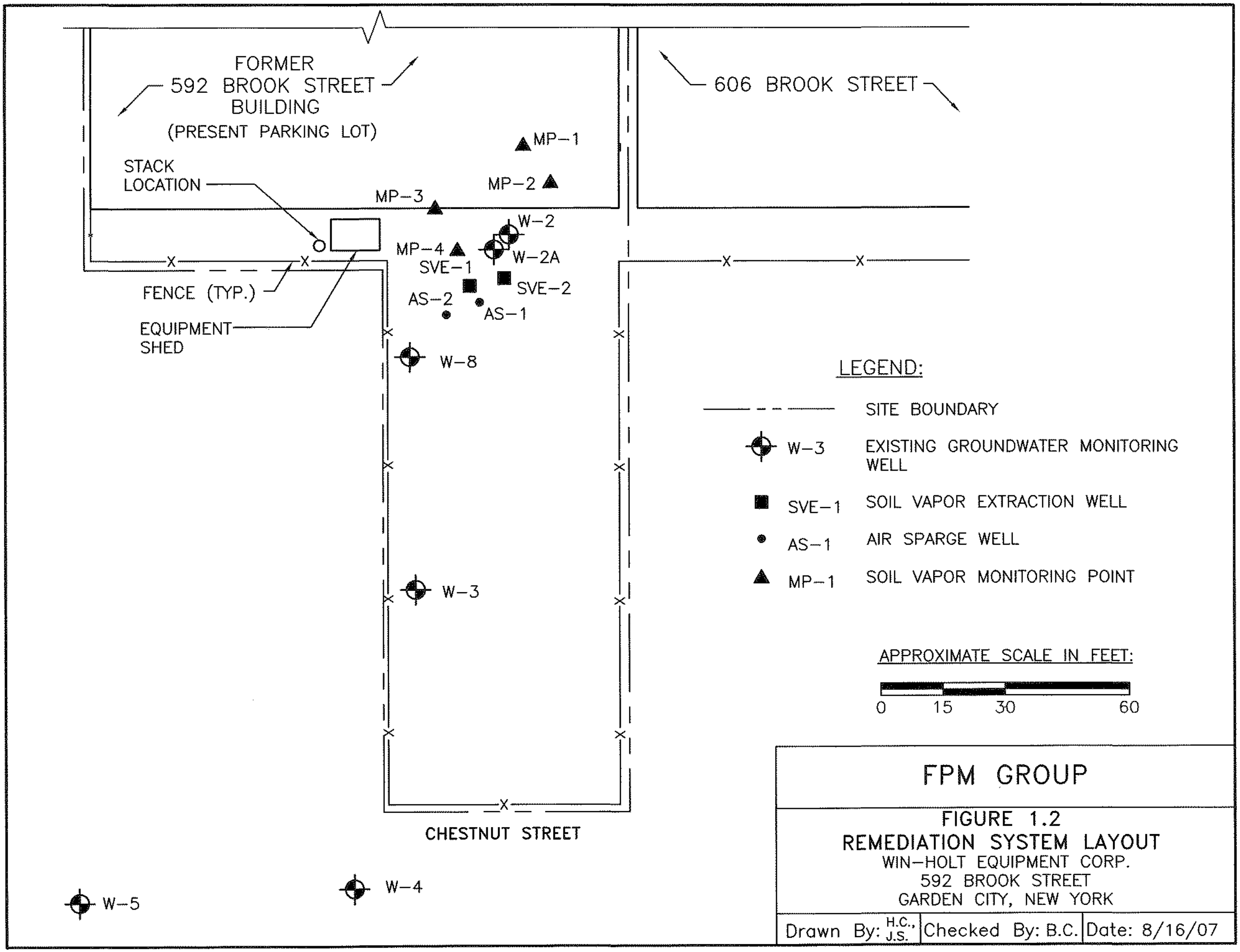

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FIGURE 1.2
REMEDIATION SYSTEM LAYOUT
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C., J.S. | Checked By: B.C. | Date: 8/16/07

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SECTION 2.0
AIR SPARGING/SOIL VAPOR EXTRACTION REMEDIATION SYSTEM

The following section details the installation of the AS/SVE remediation system approved by the NYSDEC. This section also includes information concerning the system startup, performance, emissions monitoring, and operation and maintenance. The remediation system layout is shown on previously-presented Figure 1.2.

2.1 AS/SVE System Installation

The components of the AS/SVE system were installed by subcontractors to FPM between 2005 and 2008. FPM provided oversight of system installation and subsequent operation, monitoring and maintenance.

2.1.1 AS/SVE Well Installation

Installation of the AS and SVE wells was performed by Associated Environmental Services, Inc. under the supervision of FPM personnel. The well installation was conducted in April 2005 and the wells were subsequently used for pilot-testing purposes.

The AS and SVE wells were constructed of two-inch diameter Schedule 80 PVC. Well AS-1 was screened from 40 to 42 feet below grade and well AS-2 was screened from 56 to 58 feet below grade. Well SVE-1 was screened from 17 to 22 feet below grade and well SVE-2 was screened from 5 to 8 feet below grade. The well construction diagrams for the AS and SVE wells are included in Appendix A.

2.1.2 AS/SVE System Description

Installation of the AS/SVE system was performed by EnviroTrac, Ltd (EnviroTrac) of Ronkonkoma, New York and was overseen by FPM. EnviroTrac coordinated the procurement and installation of the remediation system equipment. Installation of the remediation system, including the construction of well manways, subsurface piping, and the above-grade components, was conducted between November 2007 and January 2008.

The installation of the subsurface system piping was accomplished by the emplacement of Schedule 80 PVC piping in subsurface trenches extending from each individual well to the remediation system enclosure. The piping diameter for the AS and SVE systems was two inches and was selected based upon the specifications of the operating equipment. Galvanized two-inch pipe was utilized in the construction of the aboveground portion of the AS manifolds due to the anticipated heat associated with compressed air flow.

The operating equipment utilized for the AS system includes a Becker model KDT 3.60 5.0-horsepower 208-volt 3-phase totally-enclosed fan-cooled (TEFC) rotary-vane compressor, a high-temperature shut off switch, air flow gauges, pressure gauges, a galvanized metal manifold, and an associated control panel with timer.

The equipment utilized for the SVE system includes a 5-horsepower, 208-volt, single-phase regenerative blower (Rotron model EN757F72XL), a moisture separator equipped with an explosion-proof high water safety switch, an air filter, a manifold, an air flow meter, vacuum gauges, an effluent stack, and an associated control panel. The control panel is also equipped with an electrical interlock that prevents the AS system from operating when the SVE system is offline. The system's effluent stack was completed to a height of approximately 20 feet above grade, and is outfitted to allow the use of carbon treatment, if required.

Process instrumentation diagrams and equipment specifications are included in Appendices B and C, respectively. As-built system drawings showing the equipment layout in the shed, the piping layout from the wells to the equipment shed, and the AS and SVE wells and appurtenances are also included in Appendix B.

2.2 AS/SVE System Startup

On February 12, 2008, the remediation system was placed online by FPM and EnviroTrac. The system was monitored until system vacuums, pressures, and airflow stabilized. A calibrated photoionization detector (PID) was also utilized to monitor effluent emissions. Slight modifications (valve adjustments) were made to both the AS and SVE operating parameters to optimize system performance.

2.2.1 AS/SVE System Performance Measurements

The remediation system is equipped with several airflow, pressure, and vacuum gauges. These gauges have been installed to assist in optimizing system performance and also to monitor system component operation. The process instrumentation diagrams prepared for the system (included in Appendix B) show a schematic layout of all gauges and associated valves.

A system logbook has been prepared and is kept at the site for operator reference. The logbook contains operating logs for recording system parameters from the various gauges and includes figures showing the system wells and equipment configuration.

AS/SVE system monitoring has generally been conducted on a monthly basis. Information summarizing the monitored system parameters to date is included in Table 2.2.1.1. These data indicate that the minimum air flows for the AS wells (10 standard cubic feet per minute, or scfm, based on the pilot test) are being exceeded, with actual airflows ranging from 12 to 14.5 scfm. In addition, the air pressure applied to the AS wells (6.5 to 20 pounds per square inch, or psi) exceeds the pilot test pressure (5 psi). These data indicate that the AS optimum radius of influence (ROI) for both the shallow and deep zones (17 feet and 10 feet, respectively) is likely exceeded, resulting in a larger AS treatment zone than designed.

To further evaluate the AS ROI, pressure readings were recorded at monitoring wells W-2, W-2A, W-3, and W-8 during operation of the AS/SVE system. The following positive pressures were noted: 28 inches of water at W-2 and W-2A, 30 inches of water at W-8, and 0.5 inches of water at W-3. Based on the pressures noted in these wells, the AS system appears to be providing a sufficient ROI to cover the area to at least well W-8 and some influence is observed as far away as well W-3. The AS ROI will be further evaluated during subsequent monitoring events.

The SVE monitoring data indicate that the applied vacuums at the two SVE wells range from 28 to 38 inches of water ("H2O), which exceed the optimum applied vacuums of 10 to 20 inches of water determined in the pilot test to result in the ROIs of 17 to 24 feet. Therefore, the actual ROIs for these SVE wells are likely larger than observed in the pilot test.

Vacuum measurements have been recorded at monitoring points MP-1 through MP-4 during operation of the AS/SVE system to further evaluate the SVE ROI. These data are shown graphically on Figure 2.2.1.1 and indicate that induced vacuum has been observed at all four monitoring points, which are located up to 34 feet from the shallow SVE well (SVE-2) and up to 35 feet from the deep SVE well (SVE-1). These observations confirm that an SVE ROI of at least 35 feet is observed.

Please note that the primary purpose of the shallow-depth SVE well was to induce a vacuum beneath the former Site building. However, the building was destroyed by fire in July 2006 and the location of the former building is now utilized as an open parking lot. There are no plans to redevelop a building on the Site at this time and, therefore, vapor intrusion at the Site building is not a concern at this time.

TABLE 2.2.1.1
SOIL-VAPOR EXTRACTION/AIR SPARGE SYSTEM OPERATING LOG
WIN-HOLT EQUIPMENT CORPORATION SITE
592 BROOK STREET, GARDEN CITY, NEW YORK

Date	SVE/AIR SPARGE MONITORING DATA												Comments/ Observations
	SVE System						Air Sparge System						
	Vacuum Before Air Filter ("H2O)	Vacuum After Air Filter ("H2O)	Vacuum @ Well SVE-1 ("H2O)	Vacuum @ Well SVE-2 ("H2O)	Total System Flowrate (scfm)	Discharge Analysis w/PID (ppm)	Compressor Discharge Pressure (psi)	Pressure @ Well AS-2 (psi)	Pressure @ Well AS-1 (psi)	Flow To Well AS-2 (scfm)	Flow To Well AS-1 (scfm)	Compressor Discharge Temperature (oF)	
2/12/2008	42	45	36	34	135	5.5	15	15.5	15.5	12	12	100	
2/25/2008	46	48	37	36	140	5.3	14	15.5	16	12	14	115	
4/18/2008	45	47	37	35	138	2.9	15	16	16	13	12	120	
5/23/2008	49	55	38	36	140	3.6	15	16.5	16	12	12	120	
7/24/2008	48	40	26	28	155	2.1	10.5	11	12	12	14	125	
6/24/2008	46	43	34	30	138	2.9	14	12	14	13	12	120	
7/24/2008	46	42	35	30	140	3.2	15	14.5	15	12	12	125	
9/19/2008	48	44	30	32	140	2.8	12.5	12	14	12	14	115	
10/9/2008	46	48	30	30	155	1.9	15	15	12	13	12	90	
11/21/2008	45	50	32	32	145	2.2	14	16	14	12	12	95	
12/11/2008	-	-	-	-	-	-	-	-	-	-	-	-	System off upon arrival. Appears to be an issue with the water knockout drum. Possible frozen parts.
1/7/2009	44	52	28	28	170	1.9	16	20	6.5	14.5	12.5	50	System repaired and restarted. Effluent air monitoring and sampled after operated system for 20 hours.
2/18/2009	45	45	30	30	155	2.1	14	18	12	12	12	90	
3/19/2009	46	48	32	28	160	1.4	14	16	14	14	12	95	
4/5/2009	45	46	30	30	165	1.8	14.5	15	12	13	12	95	
5/7/2009	44	48	30	28	155	1.7	15	14.5	14	14	13	110	
6/22/2009	44	46	30	28	150	1.6	14	14	12	13	12	115	

Notes:

"H_2O = inches of water

scfm = standard cubic feet per minute

ppm = parts per million

psi = pounds per square inch

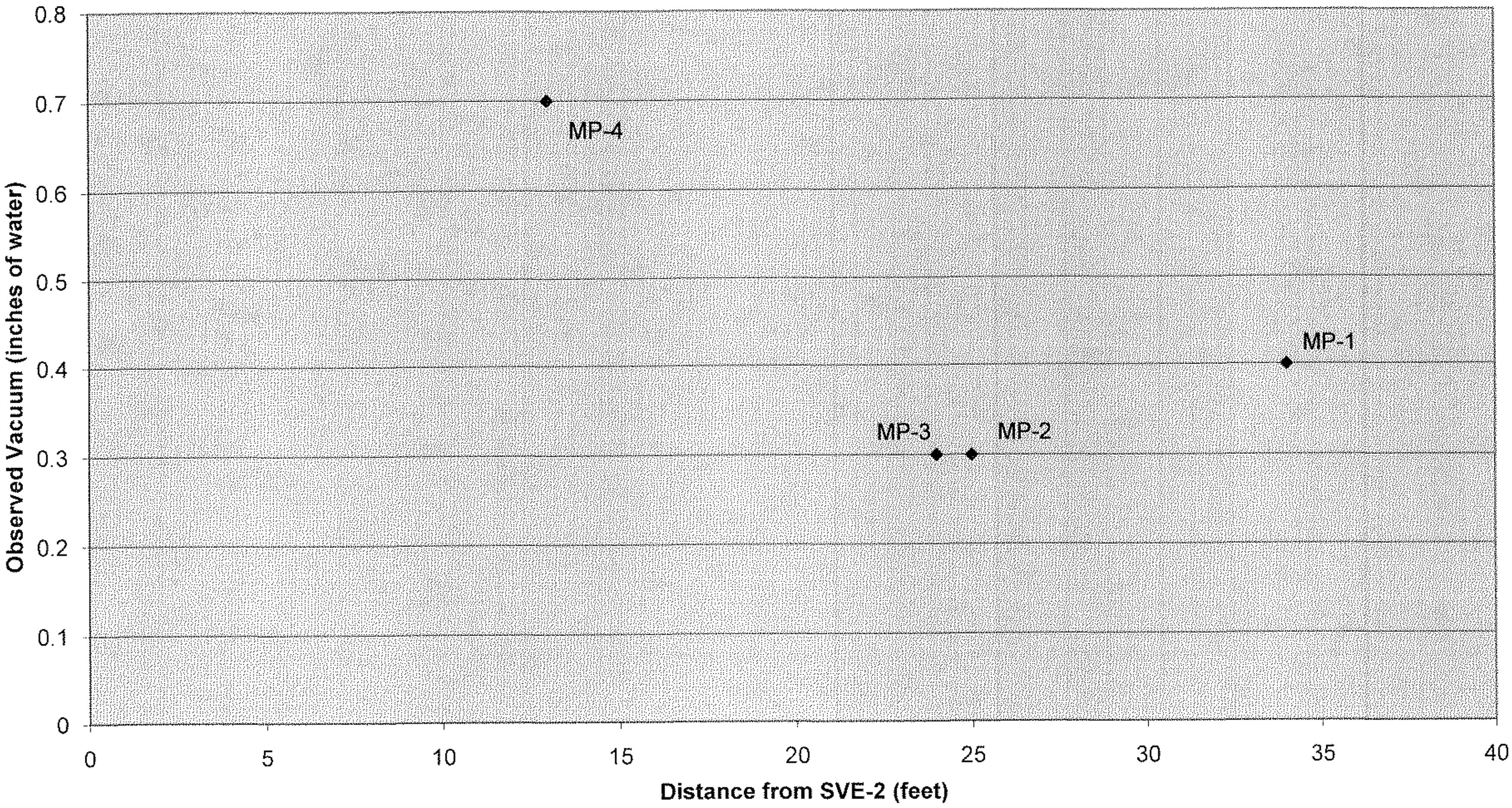
AS-1 = Shallow well, screened 40 to 42 feet

AS-2 = Deep well, screened 56 to 58 feet

SVE-1 = Deep well, screened 17 to 22 feet

SVE-2 = Shallow well, screened 5 to 8 feet

Figure 2.2.1.1
Monitoring Point Vacuum Measurements
Win-Holt Equipment Corporation Site
592 Brook Street, Garden City, New York



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Based on the AS/SVE system monitoring data and other measurements described above, the estimated extents of the AS and SVE ROIs are shown on Figure 2.2.1.2. Both the AS and SVE ROIs completely overlap the area of the Site that had been impacted with non-chlorinated VOCs prior to remediation; therefore, the AS/SVE system is anticipated to be capable of remediating the identified onsite groundwater impact.

2.2.2 SVE Emissions Monitoring

An evaluation of the anticipated SVE effluent emissions was initially performed during the remediation system pilot test conducted in 2006. Emissions data were evaluated in accordance with the NYSDEC Division of Air Resources (DAR) Program Policy (DAR-1) entitled, "Guidelines for the Control of Toxic Ambient Air Contaminants" (NYSDEC, 1997). The effluent data were used to calculate the various potential impacts, as described in DAR-1, which were then compared with the corresponding Annual Guideline Concentration (AGC) or Short-Term Guideline Concentration (SGC) values, as applicable. The results of the initial emissions testing are documented in the Pilot Test Report. Based upon the SVE effluent emissions data collected during the pilot test, xylenes, TCE, and 1,1,1-TCA were detected at the highest concentrations. Other VOCs were also detected, but at much lower concentrations. The total xylenes concentration was noted to be the most elevated contaminant and was, therefore, utilized to evaluate if vapor treatment may be required. The maximum TCE concentration was also evaluated due to its low DAR-1 AGC. The calculated impacts for xylenes and TCE were both found to be less than their respective AGCs and SGCs. Therefore, based on the pilot test emissions results, SVE emissions treatment was not deemed necessary.

To confirm SVE emissions compliance following the installation of the system, FPM performed effluent sampling of the SVE system on February 25, 2008, October 9, 2008, January 7, 2009, and May 7, 2009. An effluent sample was collected on each occasion from the effluent sampling port located between the blower and the effluent stack pipe utilizing a Tedlar air sampling bag. Each sample was transported via overnight courier to a New York State Department of Health-approved laboratory for analysis of VOCs by EPA Method T0-14. Table 2.2.2.1 summarizes the laboratory data and the complete laboratory analytical reports are included in Appendix D. The analytical data from the pilot test are included for comparison. The analytical data indicate that only relatively low concentrations of several VOCs are generally detected. Xylenes, which were detected at elevated concentrations during the pilot test, have generally not been detected during subsequent effluent sampling events. TCE was initially detected at a concentration of 472 parts per billion by volume (ppbv), which was lower than the concentration previously evaluated during the pilot test; TCE levels have continued to decrease. The

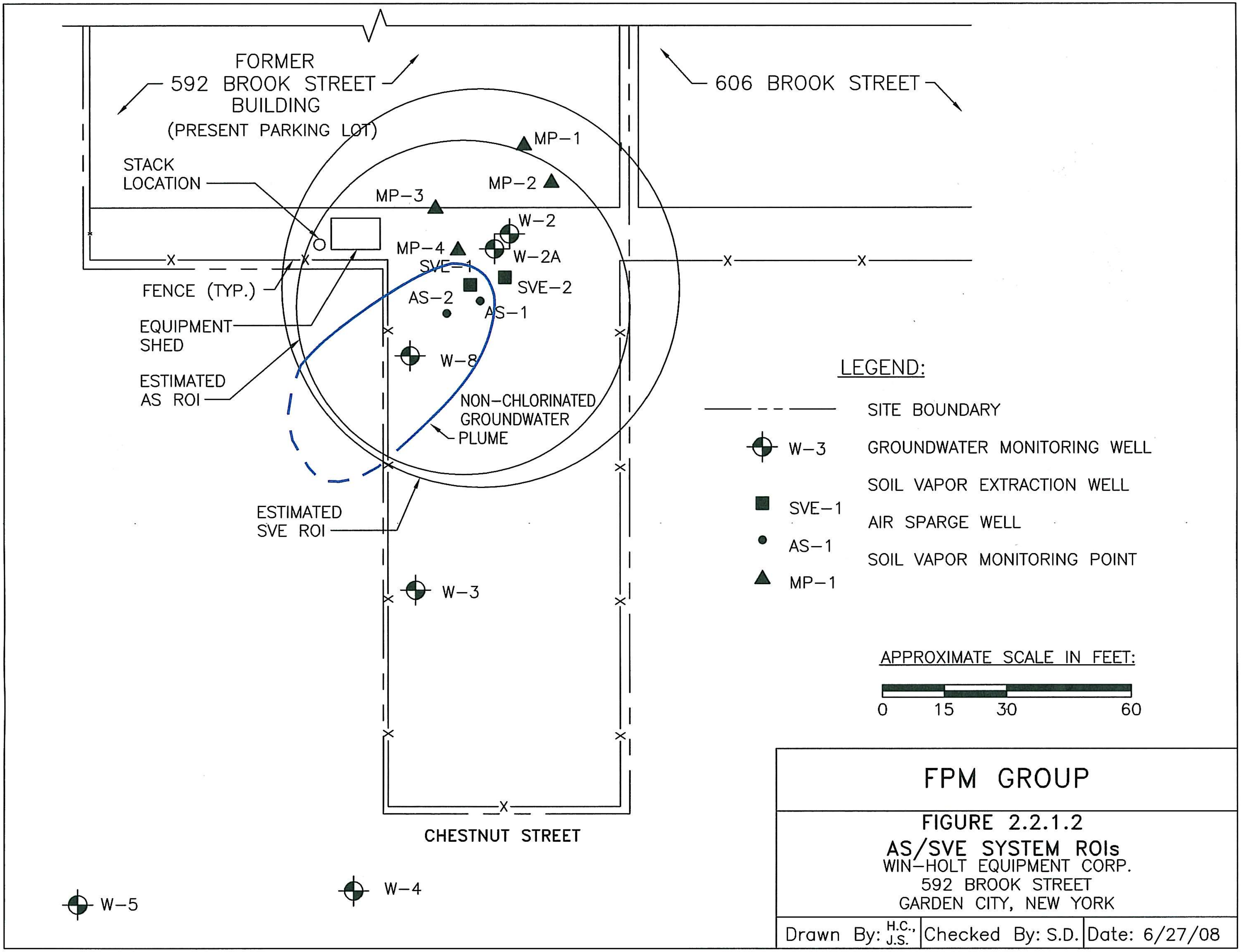

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FIGURE 2.2.1.2

AS/SVE SYSTEM ROIs

WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C., J.S.	Checked By: S.D.	Date: 6/27/08

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TABLE 2.2.2.1
REMEDIATION SYSTEM EFFLUENT VOLATILE ORGANIC COMPOUND DATA
WIN-HOLT EQUIPMENT CORPORATION SITE
592 BROOK STREET, GARDEN CITY, NEW YORK

Sample Name	**Pilot Test***	**Effluent**	**Effluent 1009**	**Effluent 0107**	**Effluent 0507**	**AGC**	**SGC**
SVE Flow Rate (SCFM)	**200**	**140**	**155**	**170**	**155**		
Sample Date	**5/25-26/06**	**2/25/08**	**10/09/08**	**1/07/09**	**5/07/09**		
Volatile Organic Compounds in ppbv							
1,1,1-Trichloroethane	36	63.0	230	850	860	183	12,461
Acetone	ND	ND	95.0	ND	ND	11,787	75,775
Benzene	ND	10.0	ND	5.8	ND	0.04	407
cis-1,2-Dichloroethylene	19	7.0	ND	ND	ND	15.9	-
Isopropanol	ND	ND	8.6	ND	ND	2,848	39,875
Methyl Ethyl ketone	ND	ND	43	ND	ND	1,695	4,408
Tetrachloroethylene	19	29	ND	18	26	0.15	147
Trichloroethylene	940	472	70	70	160	0.09	2,605
Trichlorofluoromethane	ND	ND	8.4	ND	ND	178	12,102
Toluene	ND	ND	ND	9	ND	1,327	9,819
Xylenes	6,000	ND	ND	ND	11	23	990

Notes:

Only analytes detected in the sample are included in this table. See laboratory report in Appendix D for complete data.

* = Maximum value observed during the pilot test
ND = Not Detected.
SCFM = Standard cubic feet per minute.
ppbv = parts per billion by volume.
AGC = Annual Guideline Concentration, as of 9/10/07.
SGC = Short-Term Guideline Concentration, as of 9/10/07.

Please note that effluent data cannot be compared directly with the AGC or SGC values. The effluent data must be used to calculate the various potential impacts, as described in DAR-1, which are then compared with the AGCs and SGCs.

concentration of 1,1,1-TCA has increased throughout the operation of the SVE system and appears to have recently stabilized.

As requested in the NYSDEC's June 18, 2008 comment letter to the original Engineering Report submittal, the AGC and SGC for each detected VOC have been added to Table 2.2.2.1. However, it should be noted that the effluent data cannot be compared directly with the AGC or SGC values. To evaluate whether the effluent data present a concern, the data are used to calculate the various potential impacts, as described in DAR-1, which are then compared with the AGCs and SGCs. The SVE effluent data were evaluated in this manner. With the exception of 1,1,1-TCA, the effluent concentrations are all comparable to or lower than those observed during the pilot test. In addition, the system flow rate is lower than that of the pilot test. An evaluation of the pilot test data showed that the effluent levels at that time did not present a concern. Therefore, the only VOC for which an evaluation was indicated is 1,1,1-TCA.

1,1,1-TCA loading rates and air concentrations in pounds per hour and micrograms per cubic meter were calculated in accordance with the NYSDEC DAR Program Policy entitled, "Guidelines for the Control of Toxic Ambient Air Contaminants" (NYSDEC, 1997), as shown below. The calculations presented in Appendix B of the DAR policy document were made to evaluate the anticipated impacts using analytical data collected during the May 7, 2009 sampling event, as this was the most elevated 1,1,1-TCA concentration detected. These impacts were then compared with the DAR-1 AGC (183 ppbv or 1,000 ug/m^3) and SGC (12,461 ppb or 68,000 ug/m^3) for 1,1,1-TCA published in the NYSDEC's DAR-1 AGC/SGC Tables (NYSDEC, 2007).

The calculated loading rate based on this effluent concentration is as follows:

1. The volume (Equation 1) of one mole of 1,1,1-TCA at a maximum effluent temperature of 35 °C (308° K) is:

$$\boxed{V(L) = \frac{nRT}{P} = \frac{(1.0mol)(0.08206L \cdot atm / K \cdot mol)(308K)}{1.0atm} = 25.27L}$$

2. The loading rate (Equation 2) given the measured flow rate (Q = 155 scfm from multiple wells) and effluent 1,1,1-TCA concentration (C_{max}= 860 ppbv)) can be calculated using:

$$L(lbs/hr) = Q(ft^3/\min)\cdot C(ppbv)\cdot\frac{1}{25.27}(mol/L)\cdot 133.40(g/mol)\cdot 60(\min/hr)\cdot 28.32(L/ft^3)\cdot$$
$$2.205*10^{-3}(lbs/g) = 155ft^3/\min\cdot 860ppbv\cdot\frac{1}{1*10^9}\cdot 19.78(lbs\cdot\min/hr) = 2.64*10^{-3}lbs/hr$$

This loading rate was used to calculate the anticipated impacts from the effluent discharge as shown on Table 2.2.2.2. These impacts were then compared to the AGC and SGC for 1,1,1-TCA. These calculations were based on the configuration of the remaining neighboring structures (the former 592 Brook Street building has been removed due to fire damage), which have elevations similar to that of the former site building (an approximate 20 foot building height with a stack extending 5 feet above the roof line). All of the calculated impacts for 1,1,1-TCA based on these dimensions were found to be well below the AGC and SGC, as shown on Table 2.2.2.2. Therefore, based upon the calculations performed for the maximum 1,1,1-TCA concentration observed in the effluent, emissions generated from remediation activities do not require treatment. Therefore, no effluent treatment measures are necessary at this time. FPM will continue effluent monitoring of the system on a quarterly basis to ensure compliance.

2.3 AS/SVE System Operation and Maintenance

System operation and maintenance will be performed by FPM personnel on a quarterly basis to ensure proper system operation and emissions compliance. In addition, routine system operation checks will be performed monthly. The following is a summary of tasks to be performed to maintain the remediation system components and monitor the system operation:

Monthly Tasks:

- Perform system check and service moisture separator if needed;
- Read and record all system airflow rates, pressures, and vacuums.

Quarterly Tasks

- Collect effluent sample for laboratory analysis by EPA method T0-14 and PID screen to ensure emissions compliance.

TABLE 2.2.2.2
DAR-1 APPENDIX B CALCULATION FOR 1,1,1-TCA

II. Cavity Impact Evaluation Procedure

II.A. Basic cavity impact method

h_b = height of building = 20 feet

II.A.I.

$3h_b$ = 60 feet

D_{pl} = distance to property line = 10 feet

$D_{pl} < 3h_b$, therefore, cavity impacts are not confined to on-site receptors. Therefore, calculate cavity impacts.

II.A.2

h_c = building cavity height equals $1.5h_b$ = 30 feet

h_s = stack height = 25 feet

$h_s < h_c$, therefore, calculate worst-case cavity impacts.

II.A.3.

Q_a = L (lbs/hr)*24 hrs/day*365 days/yr = 23.13 lbs/yr

C_c = Worst case annual cavity impact (ug/m^3) $= \frac{1.72Q_a}{h_b^2}$ = **0.10 ug/m^3 << AGC** (1,000 ug/m^3)

II.A.4.

$$C_{CST} = \frac{904{,}000 * L}{h_b^2} = 5.97 \text{ ug/m}^3$$

II.C. Cavity impact evaluation method

C_{CST}= 5.97 << SGC (68,000 ug/m^3)

III.A. Standard point source method

III.A.1

h_s/h_b = 25/20 = 1.25, stack height to building height ratio for vertical stacks

Ratio is less then 1.5, therefore, assume no plume rise occurs and $h_e=h_s$

III.A.2

C_a = Maximum actual annual impact = $\frac{6.0 * Q_a}{h_e^{2.25}}$ = **0.16 ug/m^3 << AGC** (1,000 ug/m^3)

because Qa is based on continuous operation, $C_a=C_p$.

III.A.3.

C_p = Maximum annual potential impact = $\frac{52{,}500 * L}{h_e^{2.25}}$ = **0.16 ug/m^3 << AGC** (1,000 ug/m^3)

III.A.4 Does not apply

III.A.5

C_{ST} = Maximum short term impact = C_p * 65 = **10.4 ug/m^3 << SGC** (68,000 ug/m^3)

Semi-Annual Tasks:

- Perform groundwater monitoring at Site monitoring wells.

Remediation system performance and progress will continue to be evaluated on the basis of the SVE system emissions data and the semi-annual groundwater sampling results. Reporting will be performed as described in Section 4.3.

SECTION 3.0
HYDROGEN-RELEASING COMPOUND AND OXYGEN-RELEASING COMPOUND INJECTION

3.1 Offsite Hydrogen-Releasing Compound Injection

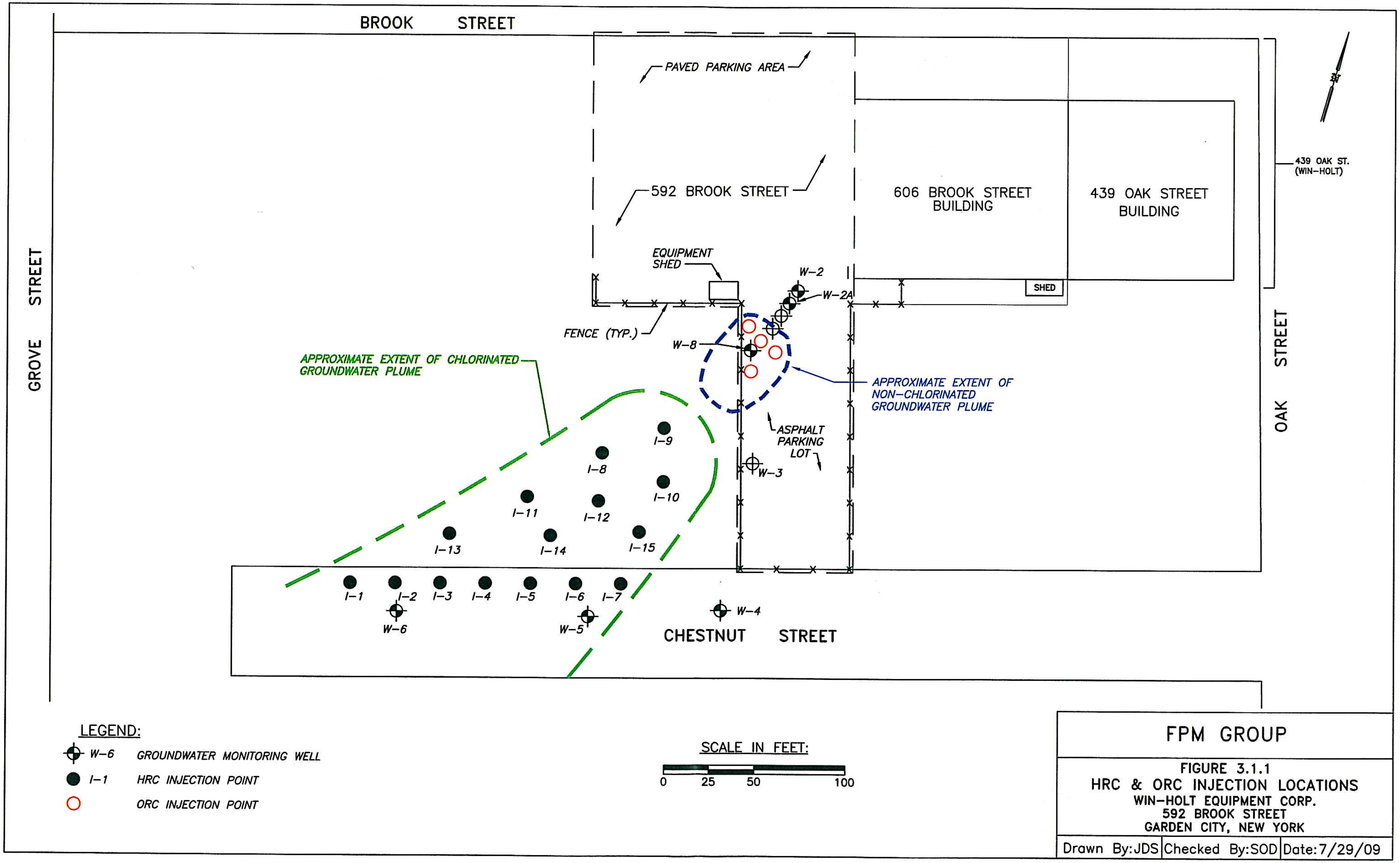
A plume of chlorinated VOCs in groundwater is present offsite and extends southwest from near the southwest boundary of the Site, as shown on Figure 3.1.1. Based on the historic groundwater monitoring data, the greatest concentrations of chlorinated VOCs were found in well W-6 located on Chestnut Street immediately southwest of the Site. Only low concentrations of chlorinated VOCs were noted further downgradient in well W-7 on Grove Street. Chlorinated VOCs were very low to non-detect in the onsite wells. Injection of Hydrogen-Releasing Compound-Advanced (HRC) was selected as the remedial method to address the offsite plume of chlorinated VOCs in groundwater.

Injection of HRC was performed in April 2007 in the area and upgradient of well W-6, as shown in Figure 3.1.1. HRC was injected via a direct-push rig from 4 to 14 feet below the water table surface (25 to 35 feet below grade) at 15 locations, I-1 through I-15. At each location, the probe was installed to a depth of 35 feet below grade and the HRC was pumped into the subsurface using a grout pump. The probe was gradually pulled up during pumping so as to evenly distribute the HRC throughout the target interval. A total of 1,405 pounds (approximately 90 pounds per location) of HRC was injected, which was the maximum amount that could be injected given the subsurface conditions. This is somewhat less than the 1,530 pounds of HRC targeted for injection, as described in the RAWP. The data from the ongoing groundwater monitoring were used to evaluate if additional HRC injection is necessary, as discussed in Sections 4 and 5 herein.

3.2 Onsite Oxygen-Releasing Compound Injection

Oxygen-Releasing Compound-Advanced (ORC) was injected onsite in the vicinity of well W-8 to provide for supplemental treatment of the onsite non-chlorinated VOC groundwater plume. This injection was performed in accordance with the January 24, 2007 ORC Injection Work Plan, as approved by the NYSDEC on February 26, 2007.

Injection of ORC was performed in April 2007 under NYSDEC supervision at four onsite locations in the immediate vicinity of well W-8, as shown on Figure 3.1.1. At each location, approximately 44 pounds of ORC was injected from 0 to 8 feet below the water table surface (21 to 29 feet below grade) using a direct-push rig. The probe was installed to a depth of 29 feet below grade at each location. The ORC was mixed with the appropriate amount of water and pumped into the



FPM GROUP

FIGURE 3.1.1
HRC & ORC INJECTION LOCATIONS
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By:JDS	Checked By:SOD	Date:7/29/09

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formation using a grout pump. The probe was then gradually pulled up during pumping so as to evenly distribute the ORC throughout the target interval. The amount of ORC injected was somewhat more than the 40 pounds per injection point targeted in the ORC Injection Work Plan, but less than the total amount of ORC calculated to be needed to address the targeted onsite area of impacted groundwater. However, as discussed above, the ROI of the onsite AS wells is greater than calculated during the pilot test and completely overlaps the area of the onsite plume, which eliminates the need for additional ORC. The results of the ongoing groundwater monitoring were used to evaluate the progress of onsite groundwater remediation.

SECTION 4.0
GROUNDWATER MONITORING AND QUALITY ASSURANCE PROCEDURES

Groundwater monitoring was performed in late January 2008 immediately prior to the startup of the AS/SVE system and after the April 2007 injections of HRC and ORC. An additional round of groundwater monitoring was performed in October 2008. Groundwater monitoring and quality assurance/quality control (QA/QC) procedures and results from January 2008 and October 2008 are documented in this section. A site plan showing the groundwater monitoring well locations is presented on Figure 4.1.

Groundwater monitoring will continue to be performed on a semi-annual basis at this Site to evaluate the performance of the remedial measures. Groundwater monitoring and QA/QC procedures will be performed as described in this section.

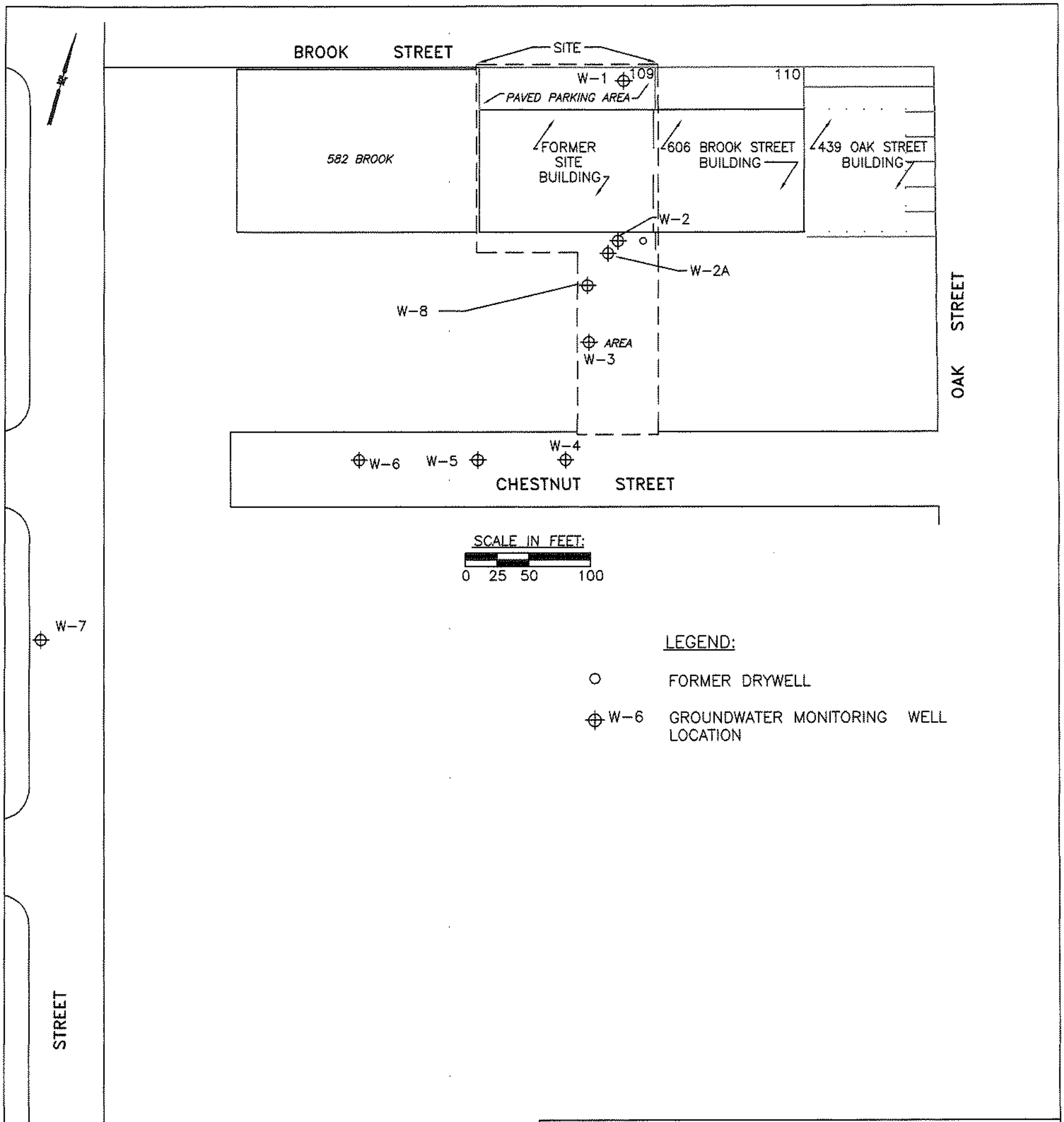
4.1 Groundwater Monitoring Procedures and Results

Groundwater sampling was performed on January 30, 2008 and October 10, 2008. Eight wells were sampled during each sampling event, including MW-2, MW-2A, and MW-3 through MW-8. Upgradient well W-1 was not sampled as previous sampling events have showed very low or no detections of VOCs.

4.1.1 Groundwater Monitoring Procedures

The sampling procedures were in accordance with the RAWP. The depth to water was measured at each well with a water level indicator and recorded to the nearest 0.01 foot. A decontaminated submersible pump with dedicated polyethylene tubing was used to purge a minimum of three casing volumes of water from each well. All non-disposable equipment that entered the well was decontaminated with a low-phosphate detergent and potable water wash followed by a distilled water rinse prior to use.

Following the removal of each casing volume, field parameters, including pH, turbidity, specific conductivity, and temperature were monitored. Stability was achieved when all stability parameters varied less than 10 percent between the removal of successive casing volumes and after at least three casing volumes have been removed. Upon achievement of stability, a water sample was obtained from each well using a dedicated disposable bailer.



FPM GROUP

FIGURE 4.1
GROUNDWATER MONITORING LOCATIONS
JANUARY AND OCTOBER 2008
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 07/15/09

H:\WIN-HOLT\ENGINEERING REPORT\FIG 4-1 GW _REV_ DATA.dwg, 7/29/2009 3:19:26 PM, 1:200

Samples were placed into laboratory-provided sample containers. Each sample container was labeled with the location, well number, date and time of sampling, and analysis to be performed. The labeled sample containers were then placed in laboratory-supplied coolers with ice to depress the temperature to four degrees Celsius. A chain-of-custody form was filled out and kept with the samples in the coolers to document the sequence of sample possession. The sample coolers were delivered by an overnight courier to the selected laboratory, TestAmerica Laboratories, Inc. of Connecticut. The groundwater samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) using EPA SW846 Method 8260B.

4.1.2 Groundwater Monitoring Results

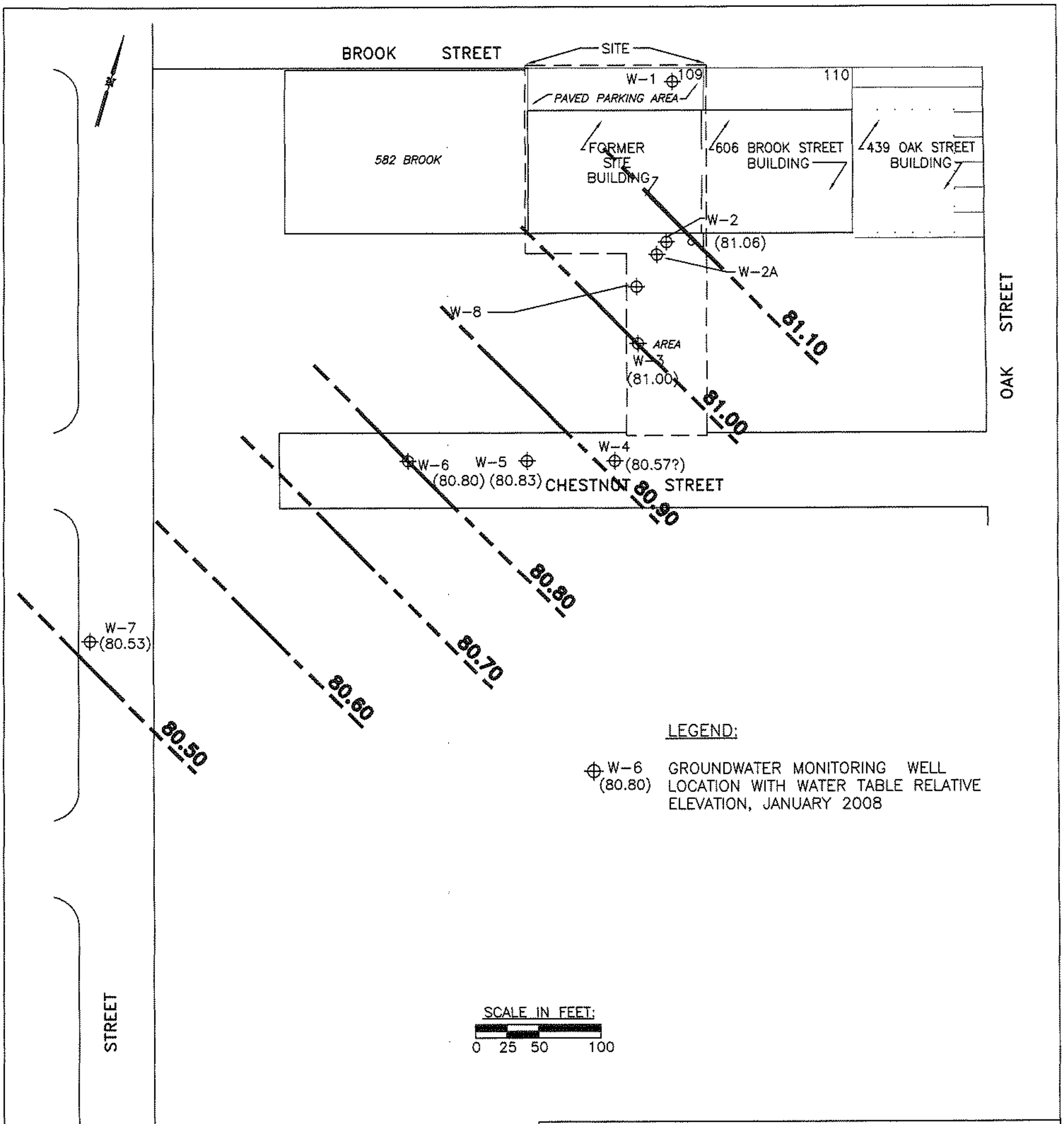
The depth-to-water measurements for each sampling event were integrated with the top-of-casing relative elevation data to evaluate the groundwater flow direction. Figure 4.1.2.1 shows the data for January 30, 2008 and Figure 4.1.2.2 shows the data for October 10, 2008. The groundwater flow direction during the pre-AS/SVE system monitoring (January 2008) and post-AS/SVE system monitoring (October 2008) is consistently to the southwest. This flow direction is also consistent with historic groundwater flow direction information and with the shape of the groundwater plumes, as shown on Figure 4.1.2.3 (January 2008 data) and Figure 4.1.2.4 (October 2008 data). Groundwater flow directions will continue to be evaluated during future monitoring events, as discussed in Section 4.3.

Table 4.1.2.1 shows the summarized current and historic groundwater data. The laboratory reports for both sampling events are included in Attachment D. The results from each monitoring event are as follows:

January 2008 Groundwater Monitoring Results

Well W-8, located in close downgradient proximity to the source area, contained concentrations of non-chlorinated VOCs (primarily xylenes) exceeding the NYSDEC Class GA Ambient Water Quality Standards (Standards). Total non-chlorinated VOC concentrations in all of the other sampled wells were either very low or non-detect; no exceedances of the NYSDEC Standards for any non-chlorinated VOCs were noted in any of the other Site wells. The distribution of non-chlorinated VOCs in groundwater in January 2008 is shown in blue on Figure 4.1.2.3.

Total chlorinated VOCs were found at low concentrations (non-detect to 21.31 micrograms per liter, or ug/l) in proximal wells W-8, W-2 and W-2A. None of the VOC detections exceeded their NYSDEC Standard except for TCE at well W-2. Low concentrations (28 to 33.71 ug/l) of total



FPM GROUP

FIGURE 4.1.2.1
GROUNDWATER RELATIVE ELEVATION CONTOURS
JANUARY 2008
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C., J.S.	Checked By: J.B.	Date: 05/01/06

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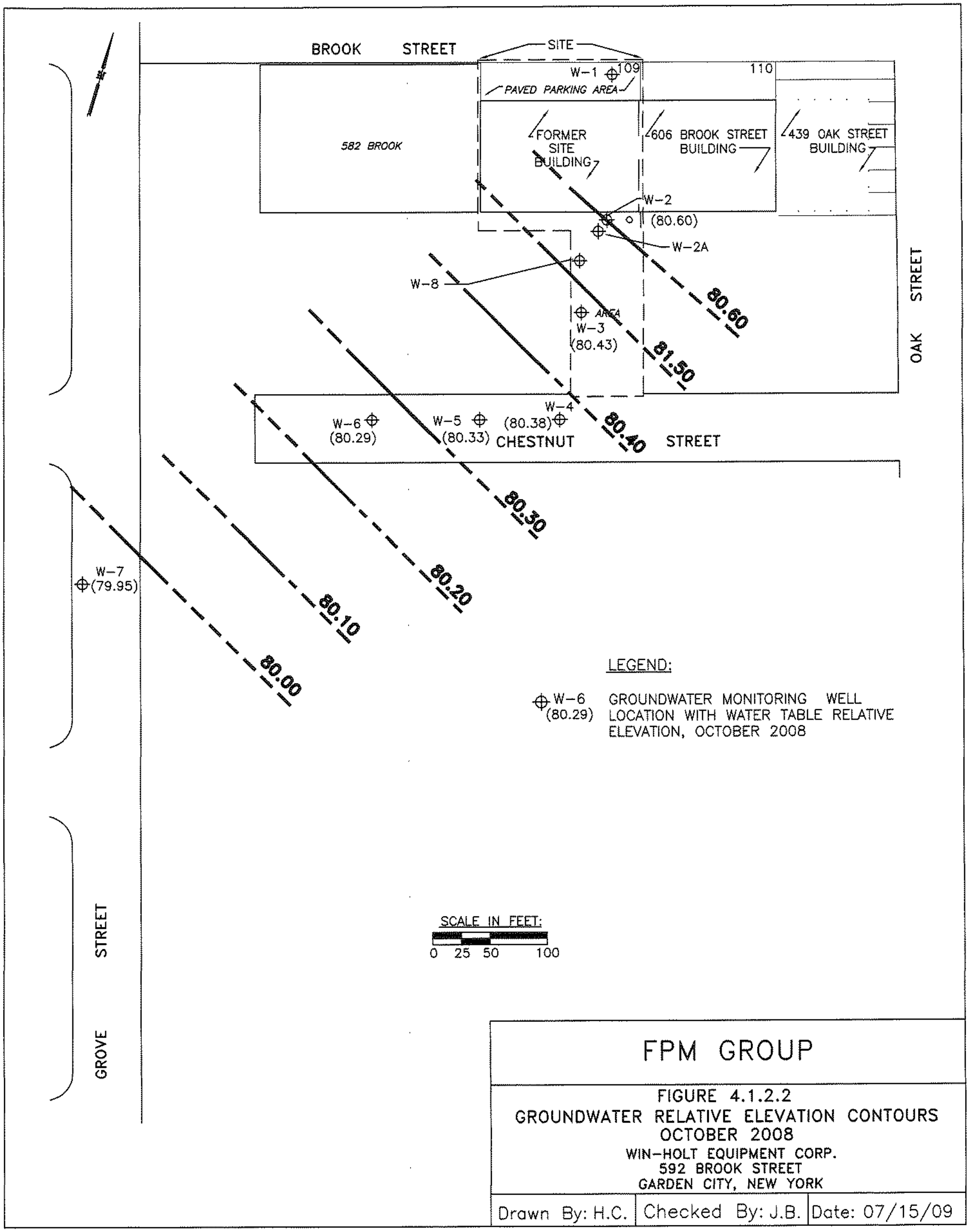

FPM GROUP

FIGURE 4.1.2.2
GROUNDWATER RELATIVE ELEVATION CONTOURS
OCTOBER 2008
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 07/15/09

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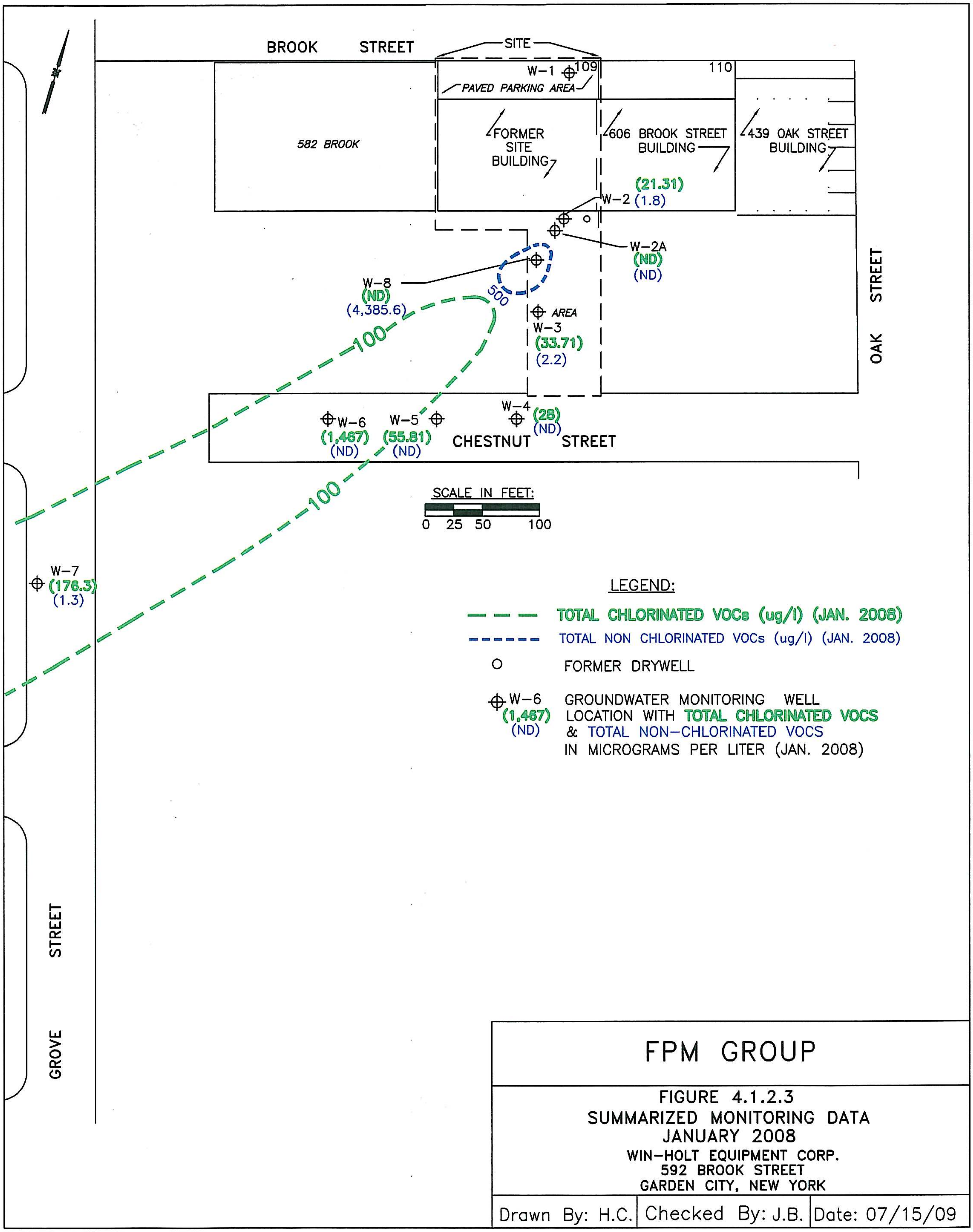
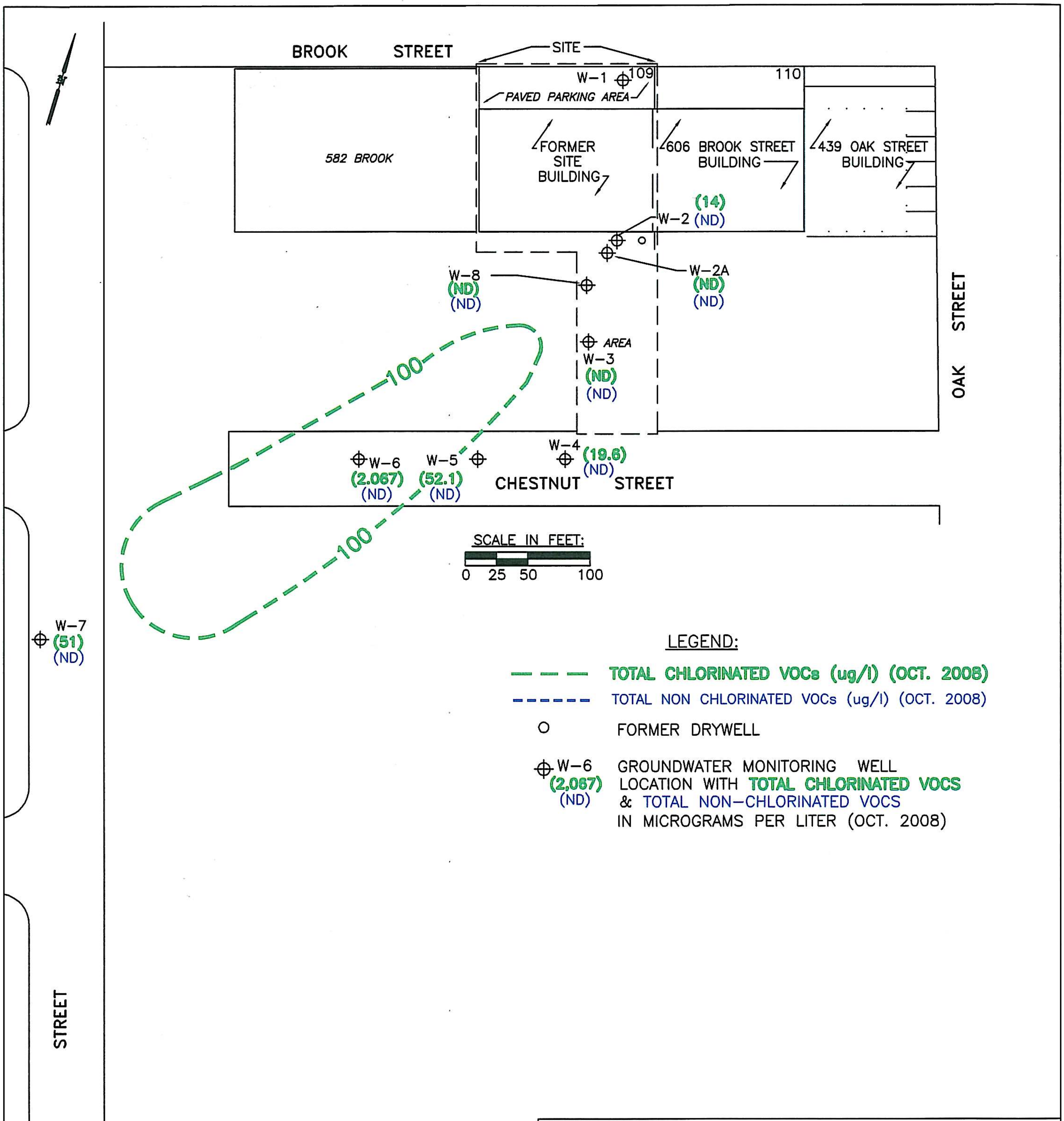


FPM GROUP

FIGURE 4.1.2.3
SUMMARIZED MONITORING DATA
JANUARY 2008
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 07/15/09

H:\WIN-HOLT\ENGINEERING REPORT\FIG 4-1-2-3 GW DATA.dwg, 7/29/2009 3:23:50 PM, 1:200



FPM GROUP

FIGURE 4.1.2.4
SUMMARIZED MONITORING DATA
OCTOBER 2008
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

Drawn By: H.C.	Checked By: J.B.	Date: 07/15/09

H:\WIN-HOLT\ENGINEERING REPORT\FIG 4-1-2-4 GW DATA.dwg, 7/29/2009 3:39:09 PM, 1:200

TABLE 4.1.2.1
SUMMARY OF GROUNDWATER SAMPLING RESULTS
WIN-HOLT EQUIPMENT CORPORATION
592 AND 606 BROOK STREET, GARDEN CITY, NEW YORK

Sample Location	**W-2**									**W-2A**				**W-3**								**W-4**								**NYSDEC Class GA Ambient Water Quality Standards**
Sample Depth (in feet)	**24-34**									**55-60**				**24-34**								**24-34**								
Sample Date	**2/3/99**	**2/12/01**	**6/12/01**	**4/17/03**	**10/1/03**	**12/8/05**	**8/24/06**	**1/30/08**	**10/10/08**	**12/8/05**	**8/24/06**	**1/30/08**	**10/10/08**	**2/3/99**	**6/18/01**	**4/17/03**	**10/1/03**	**12/8/05**	**8/24/06**	**1/30/08**	**10/10/08**	**2/3/99**	**2/12/01**	**4/17/03**	**10/1/03**	**12/8/05**	**8/24/06**	**1/30/08**	**10/10/08**	
Volatile Organic Compounds in micrograms per liter																														
Carbon Tetrachloride	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	5
1,1,1-Trichloroethane	NA	**170**	**110**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	3	**11**	4 J	ND	ND	ND	ND	NA	5	**12**	**6**	3.6 J	ND	ND	**8.6**	5
1,1-Dichloroethane	NA	**290**	**200**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	1	**13**	5 J	ND	ND	ND	ND	NA	ND	1 J	ND	ND	ND	ND	ND	5
1,1-Dichloroethylene	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	5
1,2,4-Trimethylbenzene	NA	**94**	**140**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
1,2-Dichloroethylene (total)	NA	**23(cis)**	**35(cis)**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	2(cis)	4 J(cis)	3 J(cis)	ND	ND	ND	ND	NA	ND	3 J(cis)	ND	ND	ND	2 J	ND	5
1,3,5-Trimethylbenzene	NA	**28**	**80**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
1,2-Dichloroethane	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	0.6
Chloroethane	NA	5	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	ND	5
Ethylbenzene	**9,000**	**5,600**	**4,700**	**210**	**1,100**	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	**9**	ND	ND	ND	ND	ND	ND	ND	5
Isopropylbenzene	NA	**13**	**17**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
Methylene Chloride	NA	NA	NA	**21 JB**	**240 JB**	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND B	ND	ND	ND	ND	NA	NA	ND	ND B	ND	ND	ND	ND	5
Naphthalene	NA	1	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	10
n-Butylbenzene	NA	1	3	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
n-Propylbenzene	NA	**15**	**19**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
Xylenes (total)	**47,000**	**31,100**	**38,000**	**7,100**	**47,000**	**29**	**6.3**	1.8 J	ND	**160**	3.5 J	ND	ND	**12**	ND	**7**	ND	ND	**7.4**	2.2 J	ND	**56**	ND	ND	ND	ND	**5.2**	ND	ND	5
sec-Butylbenzene	NA	1	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
tert-Butylbenzene	NA	**12**	**23**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND	ND	ND	5
Tetrachloroethylene	NA	**11**	**8**	ND	ND	0.57 J	ND	0.31 JM	ND	0.84 J	0.54 J	ND	ND	NA	ND	2 J	1 J	ND	ND	0.71 J	ND	NA	1	2 J	0.9 J	ND	ND	ND	ND	5
Toluene	**51,000**	**12,000**	**12,000**	**180**	**440 J**	0.65 J	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	**17**	ND	ND	ND	ND	ND	ND	ND	5
Trichloroethylene	NA	**100**	ND	**21 J**	ND	**22**	**8.3**	**21.0**	**14**	1.5 J	1.1 J	ND	ND	NA	**28**	**22**	**16**	2.6 J	**19**	**33**	ND	NA	**52**	**42**	**16**	**16**	**6.1**	**26**	**11**	5
Total Chlorinated VOCs	NA	599	353	21	ND	22.57	8.3	21.31	14	2.34	1.64	ND	ND	NA	34	52	29	2.6	19	33.71	ND	NA	58	60	22.9	19.6	6.1	28	19.6	-
Total *Non-Chlorinated VOCs	107,000	48,865	54,982	7,490	48540	29.65	6.3	1.8	ND	160	3.5	ND	ND	17	ND	7	ND	ND	7.4	2.2	ND	82	ND	ND	ND	ND	5.2	ND	ND	-

Notes:

ND = Not detected.
NA = Not analyzed.
J = Result is an estimated value below the reporting limit.
H = Alternate peak selection upon analytical review.

B = Compound was detected in an associated blank sample.
*Includes petroleum VOCs only.
Bold and shaded values indicate exceedance of NYSDEC Class GA Ambient Water Quality Standard.
Totals omit suspected lab contaminants.

TABLE 4.1.2.1 (CONTINUED)
SUMMARY OF GROUNDWATER SAMPLING RESULTS
WIN-HOLT EQUIPMENT CORPORATION
592 AND 606 BROOK STREET, GARDEN CITY, NEW YORK

Sample Location	W-5								W-6								W-7						W-8				NYSDEC Class GA Ambient Water Quality Standards
Sample Depth (in feet)	24-34								24-34								37-47						24-34				
Sample Date	2/3/99	2/12/01	4/17/03	10/1/03	12/8/05	8/24/06	1/30/08	10/10/08	2/12/01	6/12/01	4/17/03	10/1/03	12/8/05	8/24/06	1/30/08	10/10/08	4/17/03	10/1/03	12/8/05	8/24/06	1/30/08	10/10/08	12/8/05	8/24/06	1/30/08	10/10/08	
Volatile Organic Compounds in micrograms per liter																											
Carbon Tetrachloride	NA	NA	ND	**39**	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
1,1,1-Trichloroethane	NA	**140**	**320**	**190**	**31**	**14**	**55**	**50**	**3,400**	**5,400**	**1,700**	**2,900**	**750**	**1,800**	**1,400**	**2,000**	**250**	**20**	**80**	**62**	**170**	**48**	ND	ND	ND	ND	5
1,1-Dichloroethane	NA	5	5 J	3 J	ND	ND	ND	ND	**76**	**97**	**53**	**70 J**	**10 J**	ND	**35 J**	**36 J**	**6 J**	**10**	3.3 J	2.9 J	ND	ND	ND	ND	ND	ND	5
1,1-Dichloroethylene	NA	ND	4 J	2 J	ND	ND	ND	ND	**52**	**34**	**26 J**	**35 J**	**8.6 JH**	**17 J**	**32 J**	**31 J**	**10**	0.9 J	3.5 J	1.9 J	**6.3 J**	1.6 J	ND	ND	ND	ND	5
1,2,4-Trimethylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dichloroethylene (total)	NA	ND	ND	ND	ND	ND	ND	ND	2(cis)	ND	ND	ND	ND	ND	ND	ND	2 J(cis)	4 J(cis)	ND	ND	ND	ND	ND	ND	ND	ND	5
1,3,5-Trimethylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dichloroethane	NA	ND	ND	ND	ND	ND	ND	ND	**1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6
Chloroethane	NA	ND	NA	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	5
Ethylbenzene	**241**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1,200**	**1,700**	**380**	ND	5
Isopropylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
Methylene Chloride	NA	NA	2 JB	ND B	ND	ND	ND	ND	NA	NA	**20 JB**	**54 JB**	**10 JB**	**12 JB**	ND	ND B	1 JB	ND	ND	ND	ND	ND	**370 JB**	**20 J**	ND	ND	5
Naphthalene	NA	ND	NA	NA	ND	ND	ND	ND	2	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	10
n-Butylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
n-Propylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
Xylenes (total)	**777**	ND	ND	5 J	ND	3.0 J	ND	ND	1	**79**	ND	ND	ND	ND	ND	ND	2 J	ND	ND	2.1 J	1.3 J	ND	**17,000**	**18,000**	**4,000**	ND	5
sec-Butylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
tert-Butylbenzene	NA	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	5
Tetrachloroethylene	NA	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0 J	0.56 J	ND	ND	ND	ND	ND	ND	5
Toluene	**164**	ND	ND	ND	ND	ND	ND	ND	1	**26**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**490 J**	**220**	**5.6 J**	ND	5
Trichloroethylene	NA	**20**	3 J	2 J	1.8 J	2.1 J	0.81 J	2.1 J	**32**	**31**	**11 J**	ND	ND	ND	ND	ND	5 J	**9**	1.1 J	ND	ND	ND	ND	ND	ND	ND	5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4 J	ND	ND	ND	ND	5
Total Chlorinated VOCs	NA	165	332	236	32.8	16.1	55.81	52.1	3,565	5,531	1,790	3,005	768.6	1,817	1,467	2,067	273	43.9	88.9	67.36	176.3	51.0	ND	ND	ND	ND	-
Total *Non-Chlorinated VOCs	1,182	ND	ND	5	ND	3.0	ND	ND	4	105	ND	ND	ND	ND	ND	ND	2	ND	ND	2.1	1.3	ND	18,690	19,920	4,385.6	ND	-

Notes:

ND = Not detected.
NA = Not analyzed.
J = Result is an estimated value below the reporting limit.
H = Alternate peak selection upon analytical review.

B = Compound was detected in an associated blank sample.
*Includes petroleum VOCs only.
Bold and shaded values indicate exceedance of NYSDEC Class GA Ambient Water Quality Standard.
Totals omit suspected lab contaminants.

chlorinated VOCs were detected in crossgradient wells W-3 and W-4; none of these detections exceeded their NYSDEC Standard except for TCE (at a level somewhat exceeding the NYSDEC Standard) in both wells. Total chlorinated VOCs were detected at 1,467 ug/l in downgradient well W-6; three chlorinated VOCs (primarily 1,1,1-TCA) were noted to exceed their NYSDEC Standards. Further downgradient, at well W-7 the total chlorinated VOC concentration was significantly lower (176.3 ug/l); two chlorinated VOCs (primarily 1,1,1-TCA) were noted to exceed their Standards. The distribution of chlorinated VOCs in groundwater in January 2008 is shown in green on Figure 4.1.2.3.

October 2008 Groundwater Monitoring

Non-chlorinated VOCs for the October 2008 monitoring event were non-detect at all of the wells sampled.

No chlorinated VOCs were detected in any of the onsite wells (W-2, W-2A, W-3, and W-8) with the exception of a low concentration of TCE (14 ug/l) in well W-2, which slightly exceeds the Standard.

A low concentration (19.6 ug/l) of total chlorinated VOCs was detected in crossgradient well W-4; the concentrations of 1,1,1-TCA (8.6 ug/l) and TCE (11 ug/l) slightly exceeded their NYSDEC Standards. A low concentration (52.1 ug/l) of total chlorinated VOCs was detected in downgradient well W-5; the concentration of 1,1,1-TCA (50 ug/l) was noted to exceed its NYSDEC Standard. Total chlorinated VOCs were detected at 2,067 ug/l in downgradient well W-6; three chlorinated VOCs (primarily 1,1,1-TCA) were noted to exceed their NYSDEC Standards. Further downgradient, at well W-7 the total chlorinated VOC concentration was significantly lower (51.0 ug/l); the concentration of 1,1,1-TCA was noted to exceed its NYSDEC Standard. The distribution of chlorinated VOCs in groundwater in January 2008 is shown in green on Figure 4.1.2.4.

4.1.3 Groundwater Monitoring Discussion

The January and October 2008 groundwater data were compared to the historic groundwater data, as shown in Table 4.1.2.1.

In proximity to the source area, both wells W-2 and W-2A show significantly declining levels of non-chlorinated VOC concentrations since December 2005. Non-chlorinated VOCs in these two wells are presently non-detect. Chlorinated VOCs in these wells are also non-detect or generally low, with the only exception being TCE in well W-2, which has fluctuated at a low level (up to 22 ug/l) since 2005. It is anticipated that continued operation of the AS/SVE system will further reduce the remaining TCE at well W-2.

At well W-8, slightly downgradient of the source area and within the treatment zone for the ORC injections, total chlorinated VOCs have not been detected during the past three monitoring events. Total non-chlorinated VOC concentrations in well W-8 have shown a significant decline from 19,920 ug/l in August 2006 to non-detect in October 2008. Based on these data, non-chlorinated VOCs in this well appear to have been eliminated by the ORC injections and are no longer a concern.

At crossgradient wells W-3 and W-4, both chlorinated and non-chlorinated VOCs have generally remained low to non-detect since at least 2003. The only exception is TCE, which has fluctuated at a level somewhat exceeding its NYSDEC Standard. However, the concentration of TCE at well W-3 was non-detect during the most recent sampling.

At downgradient well W-5, total chlorinated VOC concentrations have generally remained low since 2005, with the only VOC continuing to exceed its NYSDEC Standard being 1,1,1-TCA. At downgradient well W-6, near the centerline of the plume, total chlorinated VOC concentrations have shown little change since 2006. Both of these wells are just south (downgradient) of the area of HRC injections. However, the HRC does not appear to have yet made a significant impact on chlorinated VOC concentrations. Additional HRC injections are planned for the area upgradient of wells W-5 and W-6, as outlined in Section 5.0.

At the furthest downgradient well (W-7), total chlorinated VOC concentrations have declined since remediation began. Non-chlorinated VOC concentrations at well W-7 have remained low to non-detect since sampling began at this well in 2003 and were most recently non-detect.

4.1.4 Groundwater Monitoring Conclusions

The most recent groundwater monitoring data indicate that non-chlorinated VOC concentrations are non-detect at all of the wells sampled and, therefore, the non-chlorinated VOC plume has been eliminated. This improvement is most likely in response to ORC injections in this area and the operation of the remediation system. Based on these data, non-chlorinated VOC-impacted groundwater is no longer a concern. The ongoing groundwater monitoring program will continue to assess this condition.

A plume of chlorinated VOC-impacted groundwater remains present downgradient of the site. With the exception of a very low concentration of TCE in well W-2, exceedances of the NYSDEC Standards for chlorinated VOCs were noted only in downgradient wells W-4 through W-7 in October 2008. The most concentrated portion of the plume exists in the vicinity of well W-6. Concentrations further downgradient at well W-7 have remained relatively low and have decreased somewhat since remediation was initiated. It is anticipated that additional HRC injections planned for the area upgradient of wells W-5 and W-6 will further reduce chlorinated VOCs in the vicinity of wells W-5 and W-6.

Groundwater monitoring will continue to be performed at the Site on a semi-annual basis in accordance with the procedures described in this section.

4.2 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) protocols included several types of procedures to assure the quality of the analytical data collected. The QA/QC procedures utilized during groundwater monitoring activities at the Site are described in the following sections.

4.2.1 Sampling Equipment Decontamination Procedures

All non-disposable equipment (i.e., water level indicator and pump) used during the groundwater purging activities was decontaminated prior to use at each location to prevent cross contamination. For groundwater sampling, dedicated disposable bailers were used. All non-disposable equipment was decontaminated according to the procedures outlined in the RAWP.

4.2.2 Chain-of-Custody Procedures

For each day of sampling, a chain-of-custody form was completed and submitted to the laboratory. A copy of the chain-of-custody form was also retained by FPM for sample tracking purposes. The chain-of-custody form included the project name, the sampler's signature, the types and sizes of sample bottles and preservatives used, the sampling locations, intervals, and the analytical parameters and methods requested.

4.2.3 QA/QC Samples

Several types of QA/QC samples were obtained during the groundwater sampling performed in January and October 2008. The results were utilized to evaluate the accuracy and precision of the laboratory data.

Equipment blank samples were collected each day to evaluate the effectiveness of decontamination procedures. Sample FB was collected on January 30, 2008 and sample W-6E was collected on October 10, 2008. The samples consisted of an aliquot of laboratory-supplied water poured over the dedicated or decontaminated sampling equipment and then submitted to the laboratory for analysis. The laboratory results indicate that only a low estimated concentration of methylene chloride was detected in sample FB, and only a low estimated concentration of acetone was detected in sample W-6E. These analytes are common laboratory contaminants and the low detections are likely laboratory-related. Neither analyte was detected in any of the primary environmental samples. Therefore, equipment decontamination procedures appeared to be effective.

A trip blank sample was included with the samples during each event to evaluate the potential for VOC cross-contamination between samples in the same cooler. Each trip blank sample consisted of an aliquot of laboratory water sealed in sample bottles at the laboratory transported to the field with the empty sample bottles. The laboratory results indicate that only a very low concentration of methylene chloride was detected in the trip blank sample for January 30, 2008; as discussed above, the methylene chloride is likely a laboratory containment. Methylene chloride was not detected in any of the primary samples. Therefore, cross-contamination is not a concern.

A duplicate groundwater sample (W-8D) was collected from well W-8 during each monitoring event to attest to the precision of the laboratory. The duplicate samples consisted of a separate aliquot of sample collected at the same time, in the same manner, and analyzed for the same parameters as the primary environmental sample. The laboratory results for both samples on each date are comparable and, therefore, laboratory analyses appear to be sufficiently precise.

Method blank samples were analyzed by the lab in association with the groundwater samples to assess the potential for laboratory contamination. Acetone and methylene chloride, both common laboratory contaminants, were detected at low estimated concentrations. However, neither one of these analytes were detected in any of the primary samples. Therefore, these detections do not present a concern.

Matrix spike/matrix spike duplicate (MS/MSD) groundwater samples were collected at well W-6 on January 30, 2008 and at well W-2A on October 10, 2008 to confirm the accuracy and precision of laboratory results based on a particular matrix. The following observations are noted for each sampling event:

- The MS/MSD results for January 2008 indicate that the compound percent recoveries (%R) were within acceptable guidelines with the exception of bromomethane, 1,1,1-TCA and vinyl chloride in the MS and MSD samples. The 1,1,1-TCA %R was low in both the MS and MSD samples. Therefore, the associated sample results may be biased low. However, the laboratory control spike (LCS) %R results for 1,1,1-TCA were within control limits and, therefore, any variation in the 1,1,1-TCA results may be matrix-related rather than lab-related. The 1,1,1-

TCA results for the primary samples did not appear unusually low relative to historic results and, therefore, this may not be a concern. The bromomethane and vinyl chloride %R were high in both the MS and MSD samples and, therefore, the sample results for the associated primary samples may be biased high. However, since these two VOCs were not detected in any of the primary samples, the dataset should not be affected.

- The MS/MSD results for October 2008 indicate that the compound percent recoveries (%R) were within acceptable guidelines with the exception of chloroethane in the MS and MSD samples. The %R was low in both the MS and MSD samples. Therefore, the associated sample results may be biased low. However, since this analyte is typically not detected at this site, the dataset should not be affected.

4.3 Groundwater Monitoring and Reporting Schedule

In general, groundwater monitoring will be performed during the first quarter and in the third quarter of each calendar year until the AS/SVE system is shut down (following shutdown approval by the NYSDEC). Following system shutdown, FPM will increase the groundwater sampling to quarterly. If, after four quarters of ground water monitoring, no increase in downgradient groundwater VOC concentrations is noted relative to the VOC concentrations at system shutdown, then a request for termination of system operation and groundwater monitoring may be made.

Groundwater monitoring will generally be performed at all Site-related monitoring wells during each monitoring event with the exception of well MW-1. Well MW-1 is located upgradient of the Site and has been used periodically to evaluate whether potential upgradient sources affect onsite groundwater. However, no upgradient impacts have been identified to date. Well MW-1 may be monitored in the future if needed to assess potential impacts from upgradient offsite sources. Reductions in the number of wells monitored may be made as groundwater conditions improve. Any proposed changes in the groundwater program will be requested in the periodic groundwater monitoring reports, as described below.

All groundwater samples will be analyzed for TCL VOCs using EPA SW846 Method 8260B. The analytical laboratory will be NYSDOH-certified and reporting will include Category B deliverables. QA/QC protocols will be as described in Section 4.2 above.

Groundwater monitoring and remediation system performance reports will prepared on an annual basis. It is anticipated that these reports will be submitted during the fourth quarter of each calendar year. An interim system performance report will be prepared each quarter after the system analytical data are received and verified. These interim reports will include the system performance and analytical data and a brief assessment of the results.

SECTION 5.0
ASSESSMENT OF REMEDIAL ACTION OBJECTIVES AND ADDITIONAL REMEDIAL ACTION

5.1 Remedial Action Objectives Evaluation

As discussed in Section 4.3.1 of the RAWP (FPM, June 1995), several remedial action objectives (RAOs) have been established for this Site. The remedial measures, as currently implemented, have been evaluated with respect to their potential for achieving the RAOs, as discussed below. Activities to be conducted to meet the RAOs are also discussed. Progress towards achieving each of the RAOs is evaluated as follows:

- **Eliminate or reduce, to the extent practicable, VOC contamination in onsite and offsite groundwater.** The AS/SVE system, as designed and installed, and the ORC injections, appear to have sufficiently reduced impacts to onsite groundwater. Groundwater monitoring performed since the ORC injections in April 2007 and the startup of the remediation system has shown a significant decrease in onsite VOC contamination; groundwater VOC impacts are no longer present in the onsite wells based on the most recent groundwater data, with the exception of a low concentration of one chlorinated VOC in one well. Therefore, this RAO has been achieved for the onsite groundwater.

  The HRC injections performed in April 2007 were intended to reduce impacts to offsite groundwater. As discussed in Section 4.1.4, groundwater monitoring downgradient of the HRC injection area in the centerline of the plume has not yet shown a significant effect on offsite groundwater quality, although reductions in chlorinated VOC concentrations have been observed in more peripheral areas of the plume. Additional HRC injections are planned for the area upgradient of wells W-5 and W-6, as discussed below. It is anticipated that the additional HRC injections will further reduce the chlorinated VOC plume. Achievements of this RAO for the offsite groundwater will be further evaluated following the additional injection of HRC and completion of additional groundwater monitoring.

- **Eliminate or reduce, to the extent practicable, offsite migration of contaminants in groundwater.** Well MW-8 was installed specifically to assess the effectiveness of the AS/SVE system at addressing potential offsite migration of groundwater contaminants. As discussed above, monitoring results from well MW-8 have shown nearly complete elimination of onsite groundwater contamination following the ORC injections and the startup of the AS/SVE system.

The most recent groundwater monitoring results indicate that no VOCs were detected in the onsite wells with the exception of a low concentration of TCE in well W-2. Operation of the AS/SVE system is anticipated to further reduce or eliminate the potential for offsite contamination migration; therefore, this RAO is considered to be achieved. Groundwater monitoring will be continued to confirm that VOC concentrations in onsite groundwater remain low to non-detect to further document the achievement of this RAO.

- **Attain, to the extent practicable, ambient groundwater quality standards.** With respect to the remaining residual onsite groundwater impacts, the AS/SVE system is designed to treat the remaining source material as well as the impacted groundwater. The ORC injections were successful in supplementing the treatment of the onsite impacted groundwater. Groundwater monitoring performed following the ORC injections and startup of the AS/SVE system has indicated that the treatment has been successful; only one chlorinated VOC was detected slightly above the NYSDEC Standard in one onsite well during the most recent monitoring event. No non-chlorinated VOCs were detected onsite or offsite. Continued operation of the AS/SVE system is anticipated to further reduce the remaining minor groundwater impact onsite and achieve this RAO. Groundwater monitoring will be continued, as described herein, to continue to monitor achievement of this RAO.

  With respect to the offsite groundwater plume, as described in the RAWP the approved remedy (HRC injection) is intended to address the portion of the plume exhibiting the highest concentrations of VOCs. Groundwater monitoring performed following HRC injection indicates that groundwater impacts at the centerline of the plume have remained relatively unchanged. It appears that an additional HRC injection is necessary to further treat offsite chlorinated VOC-impacted groundwater and achieve this RAO to the extent practicable. Additional groundwater monitoring will be performed following the additional HRC injection to further evaluate the anticipated reduction in offsite groundwater impacts.

- **Evaluate the potential for vapor intrusion beneath the Site building and mitigate identified impacts.** Two sub-slab monitoring points (MP-1 and MP-2) were installed beneath the Site building and sampled in February 2006. Indoor air sampling was performed at the same time. The results were documented in our February 7, 2007 report and indicated that mitigation would be required for TCE. The Site building was subsequently destroyed by a lightning-triggered fire on July 4, 2006 and has not been reconstructed. The location of the former Site building is now used as a parking area and there are no plans for development of a building at the Site. Therefore, mitigation is not warranted at this time. Nevertheless, operation of the SVE portion of the remediation system has resulted in development of an ROI that extends to at least MP-1 (see Section 2.2.1 herein). Therefore, soil vapors in this area are being mitigated and this RAO is being addressed.

- **Delineate the extent of the soil gas plume downgradient of the Site.** Soil gas sampling was conducted downgradient of the Site in March 2006 and is documented in our February 7, 2007 report. Sub-slab soil vapor, indoor air and outdoor air sampling was performed in July 2008 at two downgradient residences, as documented in our March 4, 2009 report (resubmitted on July 27, 2009). The results indicate that there is a possibility of vapor intrusion for 1,1,1-TCA at one residence. Further monitoring will be conducted at the downgradient residences during the next heating season. This RAO will continue to be addressed during this program to the extent feasible given access constraints.

5.2 Additional Remedial Action

As discussed in Section 4, groundwater monitoring performed following the HRC injection event showed improvements in chlorinated VOC concentrations on the periphery of the offsite chlorinated VOC plume, but did not show an improvement in the concentrations in the centerline of the plume (well W-6, and, to a lesser extent, well W-5). An additional injection of HRC is proposed in the area and upgradient of wells W-5 and W-6 to remediate the chlorinated VOC plume. HRC will be injected at approximately 13 locations, I-16 through I-28, in the vicinity and upgradient of well W-5 and W-6, as shown on Figure 5.2.1. HRC will be injected from 4 to 14 feet below the water table surface (27 to 37 feet below grade) at each location using a direct-push rig.

A groundwater monitoring event will be performed prior to the injection and again approximately six months following the injection. Groundwater monitoring procedures are described in Section 4.3 herein. Based on the total chlorinated VOC concentrations in the injection area (October 2008 data) and using standard assumptions concerning aquifer properties, it is estimated that approximately 1,500 pounds of HRC will be necessary to treat the chlorinated VOCs in the wells W-5 and W-6 area and downgradient vicinity. Calculations showing the HRC volume estimate for the area to be treated are included in Appendix E. The HRC will be injected during one injection event. The actual number of injection points, based on the pounds of HRC to be injected, will be determined in consultation with the injection contractor. The follow-up groundwater monitoring results will be reviewed to evaluate the effectiveness of this treatment.

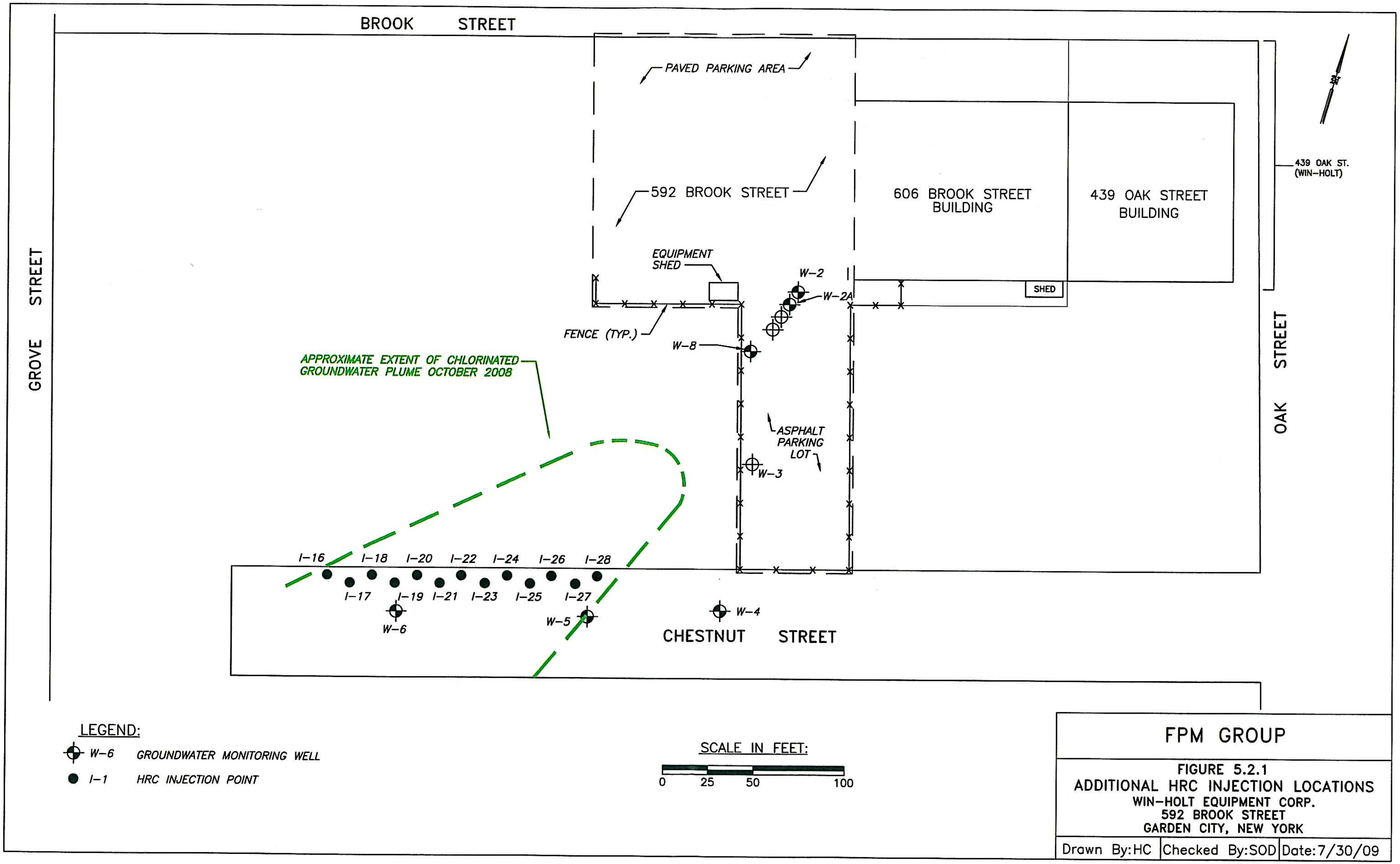


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FIGURE 5.2.1
ADDITIONAL HRC INJECTION LOCATIONS
WIN-HOLT EQUIPMENT CORP.
592 BROOK STREET
GARDEN CITY, NEW YORK

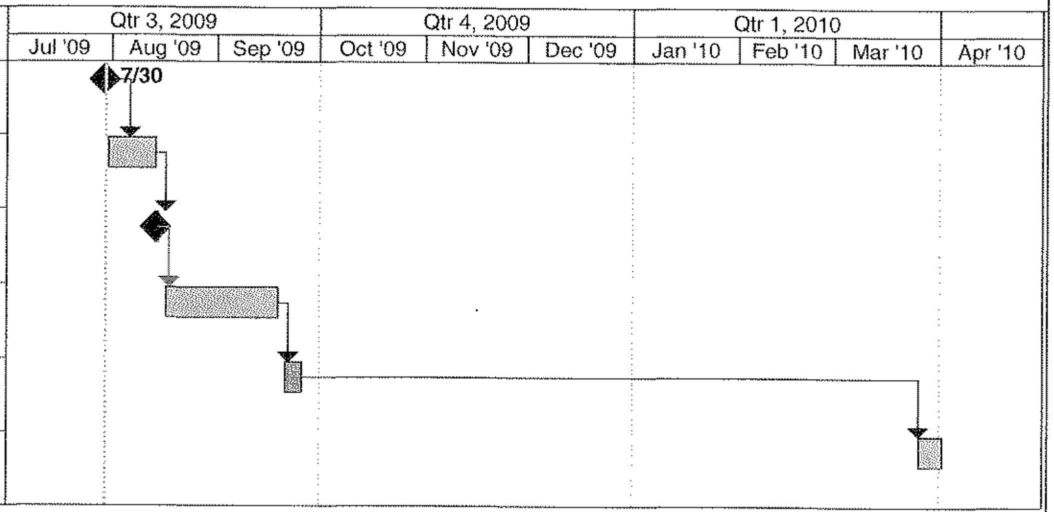
Drawn By:HC	Checked By:SOD	Date:7/30/09

H:\WIN-HOLT\ENGINEERING PLAN\5.2.1.dwg, 7/30/2009 10:47:02 AM, 1:50

A schedule for implementation of the additional HRC injection is provided in Figure 5.2.2. This schedule takes into account the review and approval of this Engineering Report, road-opening permit requirements, and the groundwater monitoring schedule.

FIGURE 5.2.2
SCHEDULE FOR ADDITIONAL HRC INJECTION
WIN-HOLT EQUIPMENT CORPORATION SITE
GARDEN CITY, NEW YORK

ID	Task Name
1	Submit revised Engineering Report to NYSDEC
2	NYSDEC review of Engineeirng Report
3	NYSDEC approves revised Engineering Report
4	Obtain Road-Opening Permits, conduct 3Q-2009 groundwater monitoring
5	Conduct additional HRC Injection
6	Conduct 1Q-2010 groundwater monitoring



Project: Figure 5.2.2
Date: Thu 7/30/09

Task	▨	Milestone	◆	External Tasks	▨
Split	┆┆┆┆┆┆┆┆┆┆┆┆┆┆┆┆┆	Summary	■	External Milestone	◆
Progress	■	Project Summary	▨	Deadline	⇩

SECTION 6.0
REFERENCES

FPM Group, June 2005. *Remedial Action Work Plan for Win-Holt Equipment Corporation Site, 592 Brook Street Garden City, New York*

FPM Group, October 2006. *Pilot Test Report for Win-Holt Equipment Corporation Site, 592 Brook Street Garden City, New York*

New York State Department of Environmental Conservation, May 10, 2002. *Voluntary Cleanup Agreement for 592 Brook Street, Garden City, Nassau County, New York, Site # V00243-1.*

New York State Department of Environmental Conservation, September 10, 2007, July 12, 2000 and November 12, 1997. *DAR-1.*

New York State Department of Environmental Conservation, March 8, 1998. *Water Quality Regulations for Surface Waters and Groundwaters.*