ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Cornwall Plaza

Remedial Work Plan

Cornwall Plaza
19-45 Quaker Avenue
Cornwall, New York
BCP Site ID No. C336070

April 3, 2012

ARCADIS

Paul J. Crosby
Task Manager

Steven D. Caretsky
Vice President

I, Brian S. Pederson, PE, certify that I am currently a New York State registered Professional Engineer and that this Remedial Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Brian S. Pederson, PE
Senior Engineer
New York Professional Engineer No. 084149

STATE OF NEW YORK
BRIAN S. PEDERSEN
084149
LICENSED PROFESSIONAL ENGINEER

Remedial Work Plan

Cornwall Plaza
19-45 Quaker Avenue
Cornwall, New York
BCP Site ID No. C336070

Prepared for:
Cornwall Shopping, LLC c/o Philips International Holding Corp.
295 Madison Avenue
New York, New York

Prepared by:
ARCADIS of New York, Inc.
35 Columbia Road
Branchburg, New Jersey 08876

Tel: 908.526.1000
Fax: 908.526.7886

Our Ref.:
BB014949.0000.00005

Date:
April 3, 2012

ARCADIS

Table of Contents

Tables

Figures

ARCADIS

Cornwall Plaza
19-45 Quaker Avenue
Cornwall, New York

1. Introduction

This Remedial Work Plan (RWP) for the Cornwall Plaza (the Site) located at 19-45 Quaker Avenue, Cornwall, New York (Figure 1) has been prepared on behalf of Cornwall Shopping, LLC, c/o Philips International Holding Corp. (Cornwall Shopping). Cornwall Shopping entered into a Brownfield Cleanup Agreement (BCA) as an innocent volunteer in November 2006. This RWP details the proposed remedial actions that were selected in the Revised Alternatives Analysis Report (AAR) dated November 29, 2011 and approved by the New York State Department of Environmental Conservation (NYSDEC) in a letter dated January 3, 2012. The RWP also addresses the modification from a Track 2 cleanup to a Track 4 cleanup, as requested by the NYSDEC in the letter dated January 3, 2012.

The RWP details the selected remedial strategy which includes in-situ remediation through enhanced reductive dechlorination (ERD) to address chlorinated solvent impacts in saturated soil and groundwater, and an active sub-slab depressurization (SSD) system to mitigate sub-slab soil vapors. The selected remedial actions were determined to be appropriate for the Site-specific conditions and satisfy the criteria set forth in NYSDEC standards and guidance to implement a remedial action that is (1) protective of human health and the environment; (2) consistent with the proposed future Site use and remedial objectives for the site; and (3) most effective in reducing the Site contaminants of concern relative to cost.

The selection of the remedial action was based upon the findings of the Phase II Environmental Site Assessment (ESA) completed by LFR Levine Fricke (LFR – currently ARCADIS) in November 2005, the Remedial Investigation (RI) completed by Leggette, Brashears & Graham (LBG) between October 2007 and June 2009, and soil characterization sampling completed by ARCADIS U.S., Inc. (ARCADIS f/k/a LFR) in August 2010.

Previous investigations identified chlorinated volatile organic compounds (VOCs) in soil, groundwater and soil vapor. Specifically, tetrachloroethene (PCE) has been detected above 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCO) and the NYS Ambient Water Quality Standards and Guidance Values (AWQS & GV). PCE also has been detected at elevated concentrations in sub-slab soil vapor beneath two Site leaseholds. Trichloroethene (TCE), cis-1, 2 dichloroethene (DCE) and vinyl chloride have been detected in groundwater above the AWQS & GV.

ARCADIS

1.1 Regulatory Framework

Cornwall Shopping entered into the BCA with the NYSDEC in November 2006 to investigate and; as necessary, remediate the soil and groundwater impacts at the Site resulting from a dry cleaning operation that formerly operated at the Site. Cornwall Shopping completed an RI consisting of soil and groundwater sampling and a vapor intrusion investigation. The results of the RI were submitted in a Draft Remedial Investigation Report (RIR) dated December 2009. The NYSDEC requested modifications to the report in an April 7, 2010 correspondence, to address concerns that they noted. Additionally, the NYSDEC requested the completion of soil characterization sampling during a June 2010 Site meeting. The Revised RIR/RIR Addendum submitted in January 2011 by ARCADIS addressed the NYSDEC concerns expressed in the April 2010 correspondence and documented the completion of the soil characterization sampling. The Revised RIR/RIR Addendum was approved by the NYSDEC in correspondence dated February 18, 2011, with the exception that NYSDEC has reserved decision on whether the Site poses a significant threat to public health and/or the environment. During a telephone conversation with Cornwall Shopping's legal counsel on July 13, 2011, the NYSDEC case manager confirmed that a determination had been made that the Site did not pose a significant threat, with the exception of the soil vapor impacts below the Key Foods and Chan's Restaurant leaseholds.

ARCADIS submitted an AAR to the NYSDEC in July 2011. A Revised AAR dated November 29, 2011 addressed the concerns outlined in the NYSDEC letter dated August 17, 2011. In a letter dated January 3, 2012, The NYSDEC wrote that the Revised AAR substantially satisfies the requirements of the Brownfield Cleanup Program (BCP); however, the NYDEC determined that a Track 4 Cleanup would be more appropriate for the Site as opposed to the Track 2 Cleanup proposed in the AAR. The NYSDEC stated the Track 4 cleanup, with a long-term institutional control, was preferred due to the lack of soil data below the footprint of the building and groundwater data indicating the likely presence of a source of contamination below the building. This modification to the proposed remediation is discussed in Section 2 of this report.

This RWP has been prepared in general accordance with the following guidance, agreement, and regulations:

- The BCA between Cornwall Shopping LLC and the NYSDEC, dated November 2006.
- Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) part 375-3.8(f) and (g), effective December 14, 2006.
- The NYSDEC "Draft Brownfield Cleanup Program Guide," dated May 2004.
- The NYSDEC Technical and Administrative Guidance Memorandum titled "Selection of Remedial Actions at Inactive Hazardous Waste Sites," HWR-90-4030, dated May 15, 1990 (TAGM 4030).
- The NYSDEC "DER-15 Presumptive Remedy/Proven Remedial Technologies," dated February 27, 2007 (DER-15).
- The NYSDEC "DER-10 Technical Guidance for Site Investigation and Remediation," dated May 3, 2010 (DER-10).
- The Revised AAR prepared by ARCADIS, dated November 29, 2011.
- The NYSDEC letter to ARCADIS, dated January 3, 2012.

1.2 Report Organization

This RWP has been organized into the following sections:

Section	Purpose
Section 1 – Introduction	Provides background information relevant to the development of the AAR.
Section 2 – Remedial Work Plan	Presents conceptual work plan for implementing the preferred remedial alternative.
Section 3 – References	Presents a lists of the references cited in this AAR.

1.3 Background Information

This section presents relevant background information used for evaluating potential remedial alternatives and developing the approach for implementing the preferred alternative. A description of the Site is presented below, followed by a summary of relevant historical information, a discussion of proposed future Site use, and a summary of previous Site investigations.

1.3.1 Site Description

The Site is located at 19-45 Quaker Avenue in the Town of Cornwall, Orange County, New York and is described as Tax Parcel Section 23, Block 3, Lot 4.

The Site is a portion of Cornwall Plaza, a 5-building, multi-tenant strip mall occupying approximately 4.2 acres in area. The Site is bordered to the north by Quaker Avenue, beyond which are residential dwellings and home-based businesses, on the east by the Cornwall Fire Department and Angola Street, on the south by Warren Court and residential dwellings, and on the west by Cedar Lane and residential dwellings. Approximately 500 feet east of the Site is a small stream locally referred to as Idlewile (or Indelible) Creek. This creek originates in the highlands south of the Site and flows north through Cornwall to its confluence with Moodna Creek and the Hudson River. There are no surface-water bodies on the Site. Figure 1 is a Site Location Map showing the topography, drainage patterns, and surrounding areas.

The Site is used for retail and commercial business. Approximately 19 percent of the total area is occupied by two separate buildings, with the remainder comprised of associated paved parking and driveway areas. The Site buildings are one-story buildings with slab-on-grade construction. There are no basements or subgrade accessible areas. The easternmost Site building is occupied by the following businesses (from west to east): Bank of America, Leo's Pizzeria, Cornwall Wash n' Dry, Chan's Peking House (Chan's) and a Cornwall Farms Grocery Store (formerly occupied by Key Foods). A Site Plan and Surrounding Properties Map is provided as Figure 2 and a Site Plan is provided as Figure 3.

The Site is served by a municipal sanitary sewer and potable water is provided by the Town of Cornwall.

1.3.2 Historic Site Operations

According to a Phase I Environmental Site Assessment (ESA) completed by LFR in November 2005, the Site was developed with one residential dwelling from at least 1902 through 1966 when the easternmost structure was developed and occupied by a grocery store (Grand Union). The second existing structure was developed by 1970. A dry cleaning business, Cornwall Cleaners, operated at the site from approximately 1967 through 1994. Cornwall Cleaners was located in the leasehold space currently occupied by Chan's. There currently are no dry cleaning operations at the Site.

1.3.3 Future Land Use

Proposed future land use of the Site is for the continued commercial and retail operations within the existing Site structures. No major structural renovations are proposed.

1.3.4 Summary of Previous Investigations and Remedial Activities

Previous investigations conducted at the Site include the following:

- Phase I/Phase II Environmental Site Assessment performed by LFR in November 2005.
- RI activities completed by LBG in multiple phases between November 2007 and May 2009.
- Soil characterization sampling completed by ARCADIS in August 2010.

Previous Site investigations are summarized below:

<u>Phase I/Phase II Site Assessment</u>

LFR identified the historic presence of a dry cleaning business at the Site during the completion of the Phase I ESA. The dry cleaner occupied the tenant space currently occupied by Chan's from approximately 1967 through 1994. During a Phase II investigation in August and October 2005, LFR collected soil and groundwater samples from borings and monitoring wells installed around the perimeter of the eastern Site building. PCE, TCE and cis-1, 2-DCE were detected in soil and

groundwater. PCE was detected at concentrations exceeding the NYSDEC Groundwater Standards.

The findings of the Phase I and Phase II investigations were documented in a Phase I/II Environmental Site Assessment report dated November 11, 2005.

Remedial Investigation – October 2007 through January 2008

RI activities completed by LBG between October 2007 and January 2008 included groundwater sampling, installation of monitoring wells, soil sampling, soil vapor and sub-slab vapor sampling, and indoor air sampling. The investigations were conducted to determine the extent of chlorinated solvent impacts in soil, groundwater, soil vapor, and indoor air.

The findings of the LBG investigation were documented in a Remedial Investigation Report (RIR) dated December 2009. ARCADIS revised the RIR in accordance with NYSDEC comments and re-submitted the report in January 2011. The revised RIR also documented soil characterization sampling accepted by NYSDEC. See Section 1.4.4.1 for additional details.

Soil Characterization Sampling – August 2010

During a June 10, 2010 site meeting and in a correspondence dated June 14, 2010, the NYSDEC directed Cornwall Shopping to collect soil samples to characterize the environmental quality of the soils that will remain below the paved parking areas and Site buildings. ARCADIS completed the soil characterization sampling in August 2010 and reported the findings in the Revised RIR/RIR Addendum submitted to the NYSDEC in January 2011.

The findings of the Site investigations are discussed in the following sections.

1.4 Site Characterization/Nature and Extent of Impacts

1.4.1 Site Topography and Drainage

The Site lies at an elevation of approximately 280 feet above mean sea level and is relatively flat. Surrounding land slopes topographically very gradually downward toward the north and east and upward toward the south. An approximately 10-foot

cliff face is located to the south of the Site dividing the area between the Site and the residential properties located along Warren Court.

Storm water is conveyed to storm water catch basins located in the Site parking lot via sheet flow. The outlets of the catch basins flow to storm water piping running west to east across the Site, and then off site toward the Cornwall Fire Department property to the east. The discharge point of the stormwater drainage system is not known but is presumed to be Idlewile Creek located to the east of the Site.

1.4.2 Geologic/Hydrogeologic Setting

Overburden soil consists of gray to brown silt with some sand and gravel from grade to between 8.5 and 15 ft below ground surface (bgs). The gravel is mostly angular pieces of gray shale although some rounded gravel of other lithologies were observed. Local bedrock consisting of gray shale was encountered between 16 ft below ground surface (bgs) and 20 ft bgs.

Groundwater is encountered between 6 and 11 ft bgs in the overburden above the bedrock. Groundwater flows in the overburden to the north and northeast at a gradient of 0.005 ft/ft.

1.4.3 Groundwater Usage

Groundwater is not used as a potable water source at the Site. The Site is served with potable water by the Town of Cornwall. The municipal water source is a combination of water from the New York City aqueduct system and from groundwater production wells located approximately 2.8 miles west of the Site.

1.4.4 Nature and Extent of Chlorinated Solvent Impacts

Site investigations consisted of subsurface soil sampling, groundwater sampling, soil vapor and sub-slab soil vapor sampling, and indoor air sampling. These investigations have identified chlorinated solvent impacts in soil, groundwater, and sub-slab soil vapor. Indoor air sampling completed within Site leaseholds and the adjoining Cornwall Fire Department confirms that the indoor air quality has not been impacted by chlorinated solvents. The nature and extent of the impacts in each media are discussed in the following sections.

1.4.4.1 Soil

The findings of soil sampling completed at the Site are summarized in the following subsections. Figure 4 shows the location of all soil samples collected at the Site and notes the exceedances of NYSDEC cleanup objectives/standards.

Phase I/Phase II Site Assessment

LFR collected a total of eight (8) soil samples from six (6) boring locations during Phase II Site Investigation activities completed in August and October 2005. PCE was detected at a concentration of 6.9 milligrams per kilogram (mg/kg) in soil sample S-3 collected from the MW-2 boring location at a depth of 21 feet bgs. The concentration of PCE in sample S-3 exceeded the Technical and Administrative Guidance Memorandum /4046 (TAGM 4046) and the currently applicable 6 NYCRR Part 375 UUSCO.

PCE was detected below NYSDEC TAGM 4046 in samples S-5 (B-5 15-20 feet bgs) and S-4 (MW-3 22 feet bgs). TCE, cis-1, 2-DCE, toluene and 1, 1, 2, 2-tetrachloroethane were detected below NYSDEC TAGM 4046 in soil samples collected during the Phase II investigation.

Remedial Investigation – Completed in Multiple Phases between November 2007 and May 2009

LBG collected 16 soil samples from 11 soil boring locations during RI activities completed in November 2007 and May 2009. All samples were analyzed for VOC via USEPA method 8260.

No TCE, cis-1, 2 DCE or vinyl chloride was detected in soil samples collected by LBG. PCE was detected at a concentration of 2.1 ppm in soil sample MW-3B (15-17 bgs) which exceeds the following standards:

- 6 NYCRR Part 375 UUSCO standard of 1.3 ppm
- Restricted Use Protection of Groundwater (RUPG) standard of 1.3 ppm.
- TAGM 4046 standard of 1.4 ppm.

PCE was detected in soil samples MW-2B (13-15 feet bgs), MW-4 (11-13 feet bgs), MW-4 (13-15 feet bgs) at concentrations below the UUSCO, RUPG, and TAGM.

Soil Characterization Sampling – August 2010

ARCADIS collected a total of ten soil samples from nine boring locations (SB-1 through SB-9) on August 19, 2010. Borings were located throughout the Site to achieve general site coverage. All samples were analyzed for Priority Pollutant (PP) Metals via USEPA Methods 6010 and 7471, polychlorinated biphenyls (PCB) via USEPA Method 8082, semi-volatile organic compounds (SVOC) via USEPA Method 8270 and pesticides via USEPA Method 8081.

The following SVOCs were detected above the TAGM SCO:

- Benzo(a)anthracene in sample SB-2(4-4.5)
- Benzo(a)pyrene in samples SB-2(1-1.5) and SB-2(4-4.5)
- Dibenzo(a,h)anthracene in sample SB-2(1-1.5)

Beryllium, chromium, nickel and zinc were detected at concentrations above the New York TAGM SCO in all soil samples collected August 19, 2010; however, the concentrations detected in all the soil samples are within the typical Eastern United States background ranges for the beryllium (0mg/kg - 1.75 mg/kg), chromium (1.5 mg/kg - 40 mg/kg) and nickel (0.5 mg/kg – 25 mg/kg).

The TAGM SCO were rescinded on December 3, 2010 and replaced with the SCO listed in NYCRR Part 375. The concentrations of SVOCs and metals exceeding the TAGM SCO were below the NYCRR Part 375 UUSCO. Additionally, no pesticides, PCB, or other metals and SVOCs were detected above the NYCRR Part 375 UUSCO, RSCO or RUPG.

1.4.4.2 Groundwater

The findings of groundwater sampling events completed at the Site by LFR in August and October 2005 and LBG in January 2008 and June 2009 are summarized in the following subsections. The results of the January 2008 and June 2009 sampling events are summarized on Figures 5 and 7. Isopleth maps showing the distribution of total chlorinated VOC concentrations detected during the January 2008 and June 2009 are shown on Figures 6 and 8.

Phase I/Phase II Site Assessment

LFR collected a total of three groundwater samples from boreholes that were converted into temporary groundwater sampling points in August 2005 and installed and sampled monitoring wells MW-1 through MW-3.

PCE was detected at concentrations above the NYSDEC Groundwater Standards (Part 703) in groundwater samples S-7 (B-5), S-8 (B-6) and S-10 (B-1) at concentrations of 410 micrograms per liter (ug/l), 21 ug/l and 165 ug/l, respectively. TCE was detected above NYSDEC Groundwater Standards in sample S-10 (B-1) at a concentration of 8.57 ug/l. The concentrations of cis-1, 2 DCE detected in S-9 (B-2), S-10 (B-1), and S-11 (B-4) also exceeded NYSDEC Groundwater Standards.

Remedial Investigation – November 2007 and May 2009

A total of 13 overburden groundwater monitoring wells (MW-1R, MW-2 through MW-13) and 6 bedrock monitoring wells (MW-1B, MW-2B, MW-3B, MW-6B, MW-11B and MW-12B) have been installed to investigate the extent of the chlorinated solvent impacts in groundwater. The Cornwall Fire Department property is located downgradient of the Site on the adjoining property to the east. Monitoring wells MW-10, MW-11, MW-11B, MW-12 and MW-12B are located on the Cornwall Fire Department property. Monitoring well MW-13 is located off-site to the north within the Oak Street right-of-way.

Groundwater samples were collected from MW-1R, MW-2, MW-2B, MW-3, MW-4, MW-5, MW-6, MW-6B, MW-7, MW-8 and MW-9 on January 11-12, 2008. Groundwater samples were collected from all 13 monitoring wells on June 4-5, 2009. Findings of the groundwater investigation are summarized below.

- PCE was detected at concentrations exceeding the 5 ug/l NYS AWQS & GV in monitoring wells MW-2, MW-3, MW-4, MW-6, MW-7, MW-8, MW-10, MW-11, and MW-12.
- TCE was detected above the 5 ug/l AWQS & GV in MW-2, MW-3, MW-4, MW-6, MW-10, MW-11 and MW-12.
- Cis-1, 2 DCE was detected at concentrations above the 5 ug/l AWQS & GV in MW-2, MW-3, MW-4, MW-6, MW-10, MW-11, and MW-12.

- The concentrations of PCE, TCE and cis-1, 2 DCE detected in MW-6 during the January 2008 exceeded the AWQS & GV; however, the concentrations of these contaminants were below the AWQS & GV in samples collected during the June 2009 event.
- Vinyl chloride was detected at concentrations exceeding the AWQS & GV in samples collected from MW-2 and MW-4. The concentrations of vinyl chloride detected in samples from MW-2 exceeded the AWQS & GV during the January 2008 event only.

Groundwater Sampling – March 22-23, 2011

ARCADIS collected groundwater samples from the 13 overburden monitoring wells and 6 bedrock monitoring wells on March 22-23, 2011. The data obtained from the March 2011 sampling event will serve as a baseline for groundwater quality prior to the implementation of the Site remedy.

The depth to water measurements collected during the March 2011 event ranged between 5 feet bgs (MW-1R) and 10.63 feet bgs (MW-8). A groundwater contour map for the March 2011 event is provided as Figure 9. The contour map indicates a groundwater flow direction toward the northeast. The analytical results are summarized in Table 2 and shown on Figure 10. A Total Chlorinated VOC Isopleth map is provided as Figure 11. The groundwater analytical results are summarized below:

- No chlorinated VOCs were detected above laboratory reporting limits in the bedrock monitoring wells MW-1B, MW-2B, MW-3B, MW-6B, MW-11B and MW-12B.
- No chlorinated VOCs were detected above the laboratory reporting limits in overburden monitoring wells MW-5, MW-9 and MW-13.
- PCE and cis-1, 2 DCE were detected at concentrations below the AWQS and GV in monitoring well MW-12.
- PCE was detected in the samples collected from monitoring wells MW-2, MW-3, MW-4, MW-6, MW-7, MW-8, MW-10, MW-11 and MW-12. With the exception of the concentration of PCE detected in MW-12, all PCE detections exceeded the 5 ug/l AWQS and GV. The concentrations of PCE exceeding the AWQS and GV ranged between 16 ug/l (MW-6) and 1,600 ug/l (MW-3).

- TCE was detected in the samples collected from monitoring wells, MW-1R, MW-2, MW-3, MW-4, MW-6, MW-7, MW-8, MW-10 and MW-11. The concentrations of TCE detected in MW-2, MW-3, MW-4, MW-6, MW-7, MW-8, MW-10 and MW-11 exceeded the AWQS and GV. The concentrations of TCE exceeding the AWQS and GV ranged between 6.4 ug/l (MW-10) and 120 ug/l (MW-4).
- Cis-1, 2 DCE was detected in the groundwater samples collected from MW-1R, MW-2, MW-4, MW-6, MW-7, MW-8, MW-10, MW-11 and MW-12. The concentrations of cis-1, 2 DCE detected in samples MW-1R, MW-2, MW-4, MW-6, MW-8, MW-10 and MW-11 exceeded the 5 ug/l AWQS and GV. The concentrations of cis-1, 2 DCE detected above the AWQS and GV ranged between 10 ug/l (MW-8) and 570 ug/l (MW-6).
- Vinyl chloride was detected in monitoring wells MW-1R, MW-4 and MW-6 at concentrations exceeding the AWQS and GV. Vinyl chloride was not detected in any other samples collected during the March 2011 sampling event.

Summary of Groundwater Impacts

- The highest concentrations of PCE, TCE, and cis-1, 2 DCE have been detected in monitoring wells MW-2, MW-3 and MW-4, located adjacent to the Site building and downgradient of the former dry cleaning operation.
- The contaminant plume extends off-site to the Cornwall Fire Department property adjoining the Site to the east.
- Based upon the results of the March 2011 groundwater sampling event, off-site concentrations of PCE range between 1.2 ug/l (MW-12) to 49 ug/l (MW-10). The concentrations of TCE detected in off-site monitoring wells range between 6.4 ug/l (MW-10) and 8.2 ug/l (MW-11). The off-site concentrations of cis-1,2 DCE are between 0.88 ug/l (MW-12) and 14 ug/l (MW-11).
- No chlorinated VOC have been detected in monitoring well MW-13 located off-site to the north.
- No PCE, TCE, cis-1, 2 DCE or vinyl chloride have been detected above the AWQS & GV in the bedrock monitoring wells indicating the soil-bedrock interface is preventing vertical migration of the chlorinated VOC impacts and the contaminant plume is delineated to depth of approximately 20 feet bgs.

1.4.4.3 Soil Vapor, Sub-Slab Vapor and Indoor Air

Two soil vapor samples were collected from the exterior areas adjacent to the Chan's leasehold space in October 2007. The sample labeled as Soil Vapor Front was collected to the north of the Chan's leasehold, and the sample labeled as Soil Vapor Rear was collected to the south. PCE and vinyl chloride were detected in sample Soil Vapor Rear at concentrations of 28 ug/m^3 and 7.5 ug/m^3, respectively; however, PCE was not detected in sample Soil Vapor Front. TCE and cis-1, 2 DCE were not detected in the Chan's soil vapor samples. One soil vapor sample was collected from the Cornwall Fire Department property in October 2009. PCE, TCE, cis-1, 2 DCE, and vinyl chloride were not detected in the soil vapor sample collected from the Cornwall Fire Department property.

Sub-slab soil vapor samples were collected from below the Chan's Restaurant, former Key Foods, Leo's Pizza leaseholds and the Cornwall Fire Department building. The highest concentrations of PCE in sub-slab soil vapor were detected below the Chan's Restaurant and former Key Foods leaseholds. PCE was detected at concentrations of 4,700 ug/m^3, 1,800 ug/m^3 and 3,300 ug/m^3 in CPHSS1 (Chan's), CPHSS2 (Chan's), KFSS1 (Key Foods), respectively. The maximum concentration of PCE in all other sub-slab soil vapor samples was 51 ug/m^3. Detections of TCE in sub-slab soil vapor ranged between 24 ug/m^3 and 54 ug/m^3. Vinyl chloride and cis-1, 2 DCE were not detected in sub-slab soil vapor.

Indoor air samples were collected from the Chan's Restaurant, former Key Foods, and Leo's Pizza leaseholds in October 2007 and April 2009. Indoor air samples also were collected from the basement and first floor of the Cornwall Fire Department during the April 2009 indoor air sampling event. The highest concentrations of PCE were detected in the former Key Foods leasehold and the first floor of the Cornwall Fire Department indoor air at concentrations of 1.4 ug/m^3 and 1.52 ug/m^3, respectively. Detections of TCE detected in indoor air ranged between 0.16 ug/m^3 (former Key Foods) and 1.26 ug/m^3 (Cornwall Fire Department – First Floor). As described in the RIR, the detection of TCE inside the Cornwall Fire Department is presumed to be from an indoor source and not related to the groundwater impacts. Detections of cis-1, 2 DCE and vinyl chloride did not exceed 1 ug/m^3.

Despite the detection of PCE at elevated concentrations in the sub-slab soil vapor below the Chan's and Key Foods leaseholds, the concentrations of PCE in the

indoor air of these two leaseholds was non-detect (Chan's) to 1.4 ug/m^3 indicating an incomplete pathway between the sub-slab soil and the indoor air and/or a high attenuation factor within the building. The analytical results for the October 2007 and April 2009 indoor air sampling, soil vapor and sub-slab soil gas sampling events are summarized on Tables 3, 4 and 5.

2. Remedial Work Plan

The RWP presents the work plan for implementing the remedial alternative recommended in the Revised AAR dated November 29, 2011. The selected remedial alternative includes in-situ groundwater remediation through ERD and the installation of an active sub-slab depressurization (SSD) system.

In a letter dated January 3, 2012, the NYSDEC approved the Revised AAR; however, the NYSDEC also stated that a Track 4 cleanup would be more appropriate than the Track 2 cleanup selected in the AAR due to the need for a long-term institutional control to address suspected soil impacts below the building footprint. The change to a Track 4 cleanup does not change the selected remedial alternative; however, the following changes will be implemented:

- The use of site-specific soil cleanup objectives as opposed to the generic soil cleanup objectives applied under a Track 2 cleanup. As per subpart 375-3.8(e)(4)(i)(*a*) of 6 NYCRR Part 375, the SCOs set forth in subpart 375-6 will be used to develop the site-specific SCOs. The SCOs for the Site contaminants of concern are outlined in Section 2.1.
- A long-term institutional control to address exceedances of the SCO. This is discussed in Section 2.5.

The selected remedial alternative involves the following field activities:

- Completion of a subsurface geophysical survey to identify subsurface utilities within the proposed injection area.
- Installation of an active SSD system below the former Key Foods and the Chan's Restaurant leasehold.
- Injection of a carbon substrate to the subsurface through direct-push points or temporary wells. Based on site access, the carbon substrate injections may be

performed in two phases (interior and exterior locations). The total duration is anticipated to be approximately 30 work days.

- Performing quarterly groundwater monitoring to evaluate the effectiveness of the ERD.
- Performing quarterly sub-slab vapor and indoor air sampling to monitor the effectiveness of the active SSD system.

The remainder of this section is organized as follows:

Section	Purpose
Section 2.1 – Remedial Objectives	Presents the objectives of the proposed remedial activities.
Section 2.2 – Remedial Design	Identifies the design elements of the approved remediation strategy.
Section 2.3 – Contractor Procurement	Identifies the work to be performed in connection with contractor procurement and identifies contractor requirements.
Section 2.4 – Remedial Work Activities	Presents a detailed description of the proposed remedial activities, including the field activities, reporting, and institutional controls.
Section 2.5 – Institutional Controls	Describes the institutional controls to be used to address residual impacts at the Site following completion of the remedial activities.
Section 2.6 – Final Engineering Report	Identifies the information to be included in the Final Engineering Report to document completion of the site investigation and remedial activities.

Section 2.7 – Schedule	Presents the anticipated schedule for implementing the remedial activities.

2.1 Remedial Objectives

The overall objective of the remedial activities is to reduce the concentrations of chlorinated hydrocarbons in groundwater and saturated soil to prevent the migration of sub-slab vapor to indoor air and to support the continued commercial use of the Site. The objectives of the remediation are based upon the NYSDEC Generic Remedial Action Objectives (RAOs) summarized below:

- Prevent direct contact with contaminated soil and inhalation of contaminants volatilizing from the soil.
- Prevent the migration of contaminants from the soil that would result in an impact to groundwater and/ surface water, or biota ingesting or coming in direct contact with the soil.
- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards and contact with, or inhalation of volatiles from contaminated groundwater.
- Prevent the migration of VOCs in the sub-slab vapor to indoor air.

The Track 4 cleanup involves the use of site-specific SCOs which can be based upon the SCOs set forth in subpart 375-6. The SCOs for the Site contaminants of concern are summarized below:

Contaminant	UUSCO	Commercial SCO	Protection of Groundwater SCO
PCE	1.3 mg/kg	150 mg/kg	1.3 mg/kg
TCE	0.47 mg/kg	200 mg/kg	0.47 mg/kg
Cis-1,2-DCE	0.25 mg/kg	500 mg/kg	0.25 mg/kg

Vinyl chloride	0.02 mg/kg	13 mg/kg	0.02 mg/kg

2.2 Remedial Design

This RWP will constitute the Remedial Design. In addition, ARCADIS will prepare a Health and Safety Plan (HASP) for the protection of persons at and in the vicinity of the Site during remediation activities. This plan will be prepared in accordance with 29 CFR 1910 by a certified health and safety professional.

In accordance with the NYSDEC Division of Environmental Remediation document titled "Citizen Participation Handbook for Remedial Programs," (DER-23) dated January 21, 2010, a Fact Sheet will be distributed prior to NYSDEC approval of the RWP.

An Environmental Easement (EE) and Site Management Plan (SMP) will be prepared and included in the Final Engineering Report (FER) for the Site. Reports documenting the quarterly groundwater and VI monitoring and the active SSD system maintenance will be submitted separately on a quarterly basis.

2.3 Contractor Procurement

The following remediation tasks will be completed by ARCADIS subcontractors:

- Geophysical survey of injection area and SSD vent pipe locations.
- Operation of direct-push drilling equipment and carbon substrate injection process.
- Installation of active SSD system.

All work will be performed in accordance with the specifications outlined in this RWP and will be overseen by ARCADIS field personnel. The contractors will provide HASPs that meet the requirements of 29 CFR 1910 and 29 CFR 1926 and cover all personnel who will be employed by the contractor to perform work at the Site, including direct employees and any subcontractors.

2.4 Remedial Work Activities

This subsection describes the individual work activities to be performed in connection with the remedial action for the Site. Details of the work activities are discussed under the following subsections:

- 2.4.1 - Site Preparation/Mobilization
- 2.4.2 – Site Security, Control and Access
- 2.4.3 – SSD System Installation
- 2.4.4 – Carbon Substrate Injections
- 2.4.5 – Remedial Action Monitoring Plan
- 2.4.6 – Material Handling
- 2.4.7 – Site Restoration/Demobilization

Details of the above-identified activities are presented below:

2.4.1 Mobilization and Site Preparation

Mobilization and site preparation work to be performed by ARCADIS or its subcontractors at the start of the remedial activities include the following:

- Contact Dig Safely New York to initiate a utility clearance request a minimum of three business days prior to the start of the remedial activities, to identify and mark out the locations of underground utilities (e.g., electricity, natural gas, water, sewer, telephone, etc.) and structures, at and near the work areas.
- Complete a geophysical survey including the use of a magnetometer, ground penetrating radar (GPR) and radio frequency (RF) induction techniques within the proposed injection area and locations where the building slab will be penetrated for the active SSD system vents to further identify subsurface utilities.
- Adjust proposed injection point locations based upon utility mark outs and geophysical survey findings and mark all locations with spray paint.
- Mobilize labor, equipment, materials and supplies needed to implement the remedial activities.

- Install a temporary fence or storage trailer to provide a secure storage location for injection materials and equipment to be used during remedial activities.

2.4.2 Site Security, Control and Access

The Site is an active commercial strip mall. The remediation activities will be performed within the Cornwall Wash and Dry, Chan's Peking House, the former Key Foods leaseholds and the asphalt parking lot.

All interior activities, including injections and installation of the active SSD system will be performed after business hours to avoid impacting business operations and exposing employees and patrons to the work activities. All slab penetrations, trenches and boring locations will be restored on a daily basis to avoid tripping hazards and potential vapor exposure to employees and customers.

The exterior injections will be located within the driveway/parking areas to the southwest and north/northeast of the Site building. All exterior work will be completed during business hours; therefore, the Site specific HASP will address traffic control and safety. The traffic control plan will be based upon the Department of Transportation Recommended Best Practices for Multiple Business and Large Facility Parking Area. All exterior boring locations will be restored on a daily basis to avoid tripping hazards in the parking lot.

2.4.3 SSD System Installation

PCE has been detected in sub-slab soil vapor at concentrations of 4,700 ug/m^3 and 1,800 ug/m^3 beneath the Chan's Restaurant leasehold and 3,300 ug/m^3 beneath the former Key Foods leasehold. According to the NYSDOH soil vapor intrusion decision matrix, the concentrations of PCE in the sub-slab soil vapor beneath the Chan's and former Key Foods leaseholds requires mitigation. The Revised AAR dated October 31, 2011 proposed an active SSD system as requested in the NYSDEC letter dated August 17, 2011. The SSD system will be designed by an ARCADIS licensed professional engineer (PE) and will be installed by a mechanical contractor experienced in SSD system installation. All electrical work will be performed by a New York licensed electrical contractor. The necessary permit(s) will be obtained from the Township of Cornwall prior to initiating the installation of the SSD system.

The SSD vent pipes will be constructed with two-inch or three-inch diameter PVC piping. The concrete floor will be cored at each of the proposed vent pipe locations and the soil below the slab will be removed to facilitate the installation of the vent pipe. Gravel will be used to backfill to the bottom of the slab around the vent pipe and the slab will be patched with concrete. The SSD system installation activities will be performed after the operating hours of the current leasehold occupants to minimize disruptions to the businesses. Air quality will be monitored with a PID during the installation of the SSD system.

The proposed SSD system details for the former Key Foods and Chan's Restaurant leaseholds are provided in the following sections. The area that will be influenced by the SSD system is shown on Figure 12. The proposed SSD vent pipe locations are subject to change based upon tenant access agreements, tenant operations and the location of large interior features including coolers, shelving, cooking equipment, etc. within the grocery store and restaurant leaseholds.

2.4.3.1 Former Key Foods Leasehold

The former Key Foods leasehold consists of the original 6,400 square foot section and an approximate 9,700 square foot addition that expanded the leasehold to the east and south. The addition was built on a separate footing; therefore, the original building section and the addition may be addressed separately.

Up to four SSD vent pipes connected to one wall- or roof-mounted centrifugal blower are proposed for the original 6,400 square foot section. Up to seven SSD vent pipes connected to a separate wall- or roof-mounted blower will be installed within the 9,700 square foot addition.

2.4.3.2 Chan's Restaurant Leasehold

The Chan's Restaurant leasehold is approximately 2,700 square feet. Based upon the size of the leasehold, up to three SSD vent pipes located on the east wall of the leasehold are proposed. The vent pipes will be connected to a wall- or roof-mounted centrifugal blower. The blower will discharge to the exterior of the building. If this leasehold can be influenced by vents installed within the former Key Foods leasehold, these additional vents may be eliminated.

2.4.4 Carbon Substrate Injections

The approved remedy is in-situ treatment of chlorinated VOCs via ERD. The objective of ERD treatment is to break down the chlorinated hydrocarbons by the addition of a carbon substrate, which enhances the natural process of reductive dechlorination. The carbon substrate is initially metabolized by microbes to produce hydrogen, which is then substituted for the chlorine atoms on the chlorinated hydrocarbon molecules. The reductive dechlorination process breaks down PCE to TCE; TCE to cis-1,2 DCE; cis-1,2 DCE to vinyl chloride; and vinyl chloride to ethene, which is non-toxic. The

presence of cis-1,2 DCE and vinyl chloride in groundwater at the Site indicates this process is occurring naturally.

The following specifications for the remedial design are based upon the chlorinated hydrocarbon concentrations and the hydrogeologic conditions at the Site:

Depth Interval	~10 to 22 ft bgs
Injection Network	Temporary wells (0.75 or 1-inch PVC), up to 120 temporary wells Permanent injection points will be used within the building to facilitate additional injection events.
Point Spacing	10-ft centers (may be adjusted based on site access)
Injection rate	1 gpm (estimated)
Quantity	Up to 400 injection points
Treatment Area	Up to 48,000 square feet
Rig	Direct-Push Geoprobe
Time	Approximately 30-days per round of injections

Two separate injection areas have been established. The two proposed injection areas are shown on Figure 13. The first injection event will target the suspected source area, which includes the former Cornwall Cleaners leasehold (currently Chan's), upgradient and sidegradient of the leaseholds and the locations of soil samples S-3 (21 feet bgs at MW-2 location) and MW-3B (15-17 feet bgs). The second injection event will target the

area downgradient of the suspected source area. The spacing of the injection points will be determined by Site conditions. The locations of interior injection points will be subject to tenant access agreements and limited by the tenant operations and locations of equipment and permanent interior building features.

It is anticipated that the injection event will take up to 30 days to complete. The first injection event will be completed in the third quarter of 2012 and the second event will be completed in the second quarter of 2013. A contingency injection event will be performed if warranted by the results of the groundwater monitoring events.

The injection area is shown on Figure 13. The effectiveness of the ERD treatment will be monitored through quarterly groundwater sampling as discussed in Section 2.4.5. The SMP will include provisions for future injections if warranted by performance monitoring results.

2.4.5 Remedial Action Monitoring Plan

The effectiveness of the proposed remedial actions will be monitored as described in the following sections.

2.4.5.1 Soil Vapor and Indoor Air Monitoring

Following the installation of the active SSD system, sub-slab soil vapor and indoor air samples will be collected on a quarterly basis. The soil vapor and indoor air sampling will be completed in accordance with the NYSDOH “Guidance for Evaluating Soil Vapor Intrusion in the State of New York” (October 2006).

The sub-slab soil vapor samples will be collected near the locations of previous sub-slab soil vapor samples collected from the former Key Foods (KFSS1) and Chan’s leaseholds (CPHSS1 and CPHSS2). The sub-slab soil vapor samples will be collected using 6-liter laboratory-certified Summa canisters with flow controllers calibrated to fill the canisters over a one-hour period (0.1 liters per minute). The sub-slab soil vapor samples will be analyzed for VOCs by USEPA Method TO-15 by a State of New York certified laboratory.

During each quarterly event, indoor air samples will be collected within the former Key Foods and the Chan’s Restaurant leaseholds. Ambient air samples will be collected simultaneously with the indoor air samples. The indoor air samples will

be collected with 6-liter Summa canisters with flow controllers calibrated to collect the sample over an 8-hour period (0.75 liters per hour). The indoor air samples will be analyzed for VOCs by USEPA method TO-15 with selected ion monitoring (SIM) by a State of New York certified laboratory.

2.4.5.2 Groundwater Monitoring

Following the completion of the carbon substrate injections, groundwater samples will be collected from the on-Site monitoring wells on a quarterly basis to evaluate the effectiveness of ERD treatment. Based upon the results of previous groundwater sampling events, the following sampling plan is proposed:

- During the initial quarterly sampling event, and on an annual basis thereafter, all on-Site groundwater monitoring wells will be sampled.
- During the remaining three quarterly groundwater sampling events, groundwater samples will be collected from monitoring wells MW-1R, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8.
- Historically, chlorinated solvents have not been detected in monitoring wells MW-1B, MW-2B, MW-3B, MW-5, MW-6B and MW-9; therefore, a reduced sampling frequency is proposed for these monitoring wells.

Prior to the collection of groundwater samples, depth to water measurements will be collected from all on-Site and off-Site monitoring wells. All groundwater samples will be collected using the low-flow sampling procedures in accordance with the USEPA Low-Flow Sampling Techniques document dated April 1996. Overburden monitoring wells will be sampled using a peristaltic pump with the tubing intake set at the middle of the screened intervals of each well. Bedrock monitoring wells will be sampled using a submersible pump with the pump intake set at the middle of the screened interval of each well.

The pump discharge will be directed through a flow-through cell containing a Horiba U-22 multi-parameter instrument. The water-quality parameters of pH, conductivity, turbidity, dissolved oxygen, temperature and oxygen-reduction potential as well as water depth will be monitored and recorded every 5 minutes. Groundwater samples will be collected directly from the pump discharge when groundwater quality readings stabilize within the limits set forth in the USEPA guidance document.

All groundwater samples will be analyzed for VOCs via USEPA Method 8260 with a 10 compound library search by a State of New York certified laboratory. In addition to the VOC analysis, select wells (MW-1R, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8) in the immediate injection and downgradient areas will be analyzed for, dissolved organic carbon (DOC), dissolved iron, sulfate, alkalinity, and dissolved gases (ethene, ethane and methane). The analytical program may be modified based on the performance monitoring results.

Purge water generated during the quarterly groundwater monitoring events will be passed through liquid-phase granular activated carbon (LPGAC) and discharged to the ground surface on-Site. The LPGAC will be dedicated to use at the Site and will be changed after six groundwater sampling events. The spent LPGAC will be containerized and disposed as a hazardous waste by a licensed waste transportation and disposal contractor.

2.4.5.3 Reporting

The findings of the sub-slab soil vapor, indoor air and groundwater monitoring events will be provided to the NYSDEC in a letter-report format on a quarterly basis. The report will include summary tables of the analytical results, sample location figures and groundwater contour maps. The laboratory analytical results will be reported in the Category B deliverable format.

2.5 Institutional Control

Due to groundwater data suggesting that soil SCOs are exceeded beneath the building, long-term institutional controls will be implemented to address the soils there. The long-term institutional controls will be outlined in EE and SMP that will be developed to address the residual impacts remaining at the completion of the remediation activities. The EE will:

- Restrict future use of the Site to commercial. The commercial use will be permitted as long as the designated long-term institutional controls are employed.
- Notify future property owners of residual chlorinated solvent impacts in soil and groundwater.

- Prohibit the use of groundwater underlying the Site without treatment rendering it safe for the intended us and require the approval by the NYSDOH prior to such intended use.
- Require compliance with the approved SMP.
- Require the property owner to complete and submit to the NYSDEC an annual certification.

In addition, the SMP will also provide a detailed description of all procedures required to manage any remaining contamination at the Site after the completion of the Remedial Action including:

- Identify the area below the building, including the Chan's Restaurant leasehold and the former Key Foods leasehold, as a suspected location of soil with chlorinated solvent concentrations exceeding the SCOs.
- Require the operation and maintenance of an active SSD system below Chan's Restaurant and Key Foods leaseholds, until threshold levels are achieved.
- Set forth groundwater, soil vapor and indoor air monitoring requirements.
- Address potential future intrusive subsurface activities and outline appropriate controls and measures for completing such activities, if necessary.
- Implementation and management of all Institutional Controls.
- Outline the requirements for the performance of periodic inspections, certification of results and submittal of Periodic Review Reports.
- Provisions for future injection if warranted based upon post-injection sampling results.
- Defining the criteria for termination of the SSD system.

2.6 Final Engineering Report

Following completion of the remedial activities, a FER will be prepared in accordance with Section 5.8 of DER-10. The FER will include the following:

- Site location description, site history and summary of previous investigations.
- A summary of all remedial actions completed, including:

- A description of any problems encountered during remediation and their resolutions.
- A description of changes to the design documents and the basis for the changes.
- Boundaries of the real property subject to the EE or other institutional controls.
- A description of Site restoration activities.

- A list of the remedial action objectives applied to the remedial activities.
- Tables and figures containing all pre- and post-remedial data so that completion of the remedial action is documented. The figures will show the area treated in-situ, the layout of the active SSD system and the area subject to the EE and SMP.
- A description of the institutional controls
- A detailed report of actual costs.
- A certification statement with the signature and seal of a PE licensed to practice in New York State.

The FER will include a compact disc (CD) containing the following:

- Results of all analyses, including laboratory analytical data reports and data validation reports.
- Key project documents summarizing previous investigations and remedial activities.

2.7 Schedule

Task	Estimated Completion Date
Submit Remedial Work Plan	April 4, 2012
45-Day Public Comment Period	April 15, 2012 – May 30, 2012
NYSDEC Approval of Remedial Design	June 5, 2012
Subcontractor/Equipment Procurement	June 20, 2012
Preparation of Contractor Plans/Submittals	June 20, 2012

ARCADIS

Cornwall Plaza
19-45 Quaker Avenue
Cornwall, New York

Task	Estimated Completion Date
Vapor Intrusion Mitigation - Interim Remedial Measure	Second Quarter 2012
Perform First Injection Event	Third Quarter 2012
Perform Second Injection Event	Second Quarter 2013
Prepare Final Engineering Report	First Quarter 2014
Quarterly Air Monitoring	Third Quarter 2012 – Fourth Quarter 2014
Quarterly Groundwater Monitoring	Fourth Quarter 2012 – Fourth Quarter 2014
Quarterly Groundwater Reporting	First Quarter 2013 – Fourth Quarter 2014

ARCADIS

3. References

ARCADIS, January 2011. *Remedial Investigation Report, Cornwall Plaza, Cornwall, New York, prepared for Cornwall Shopping, LLC c/o Philips Holding Corp.*

ARCADIS, November 2011. *Revised Alternatives Analysis Report, Cornwall Plaza, Cornwall, New York, prepared for Cornwall Shopping, LLC c/o Philips Holding Corp.*

Cornwall Shopping LLC and NYSDEC. 2006 Brownfield Cleanup Agreement between Cornwall Shopping LLC and NYSDEC (Index #A3-0564-0906, Site #C336070). December 2006.

Leggette, Brashears & Graham, Inc. December 2009. *Remedial Investigation Report, Cornwall Plaza, Cornwall, New York*, prepared for Cornwall Shopping LLC, c/o Philips Holding Corp.

LFR, November 2005. *Phase I/Phase II Environmental Site Assessment, Cornwall Plaza, 15-45 Quaker Avenue, Cornwall, New York*, prepared for Philips Project – 15-45 Quaker Avenue, Cornwall, New York c/o Philips International Holding Corp.

NYSDEC, 2004. Draft Brownfield Cleanup Program Guide. May 2004.

NYSDEC, December 2006. 6 NYCRR Part 375 Environmental Remediation Programs, Subparts 375-1 to 375-4 & 375-6.

NYSDEC, 2010. DER-10: Technical Guidance for Site Investigation and Remediation. May 2010.

NYSDEC, 2007. DER-15: Presumptive/Proven Remedial Technologies. February 2007.

ARCADIS

Tables

Table 1
Former Cornwall Cleaners
Cornwall Plaza
Quaker Avenue
Cornwall, New York
Summary of Groundwater Elevations

Well ID	Total Depth (feet)	Well Elevation (feet)	January 10, 2008		June 4, 2009		March 22-23, 2011	
			Depth to Water (feet)	Groundwater Elevation (fbsd)	Depth to Water (feet)	Groundwater Elevation (fbsd)	Depth to Water (feet)	Groundwater Elevation (fbsd)
MW-1R	20	49.69	5.92	43.77	7.23	42.46	5	49.69
MW-1B	35	49.79	NA	-	8.72	41.07	5.63	49.79
MW-2	20	47.62	10.45	37.17	11.64	35.98	9.64	47.62
MW-2B	42	47.98	10.67	37.31	12.82	35.16	10	47.98
MW-3	21	48.22	10.68	37.54	13.43	34.79	10.31	48.22
MW-3B	37	48.27	11.1	37.17	12.15	36.12	10.45	48.27
MW-4	20	48.48	10.92	37.56	11.75	36.73	9.11	48.48
MW-5	20	49.92	7.82	42.1	9.91	40.01	6.55	49.92
MW-6	16	47.2	10.52	36.68	11.65	35.55	9.65	47.2
MW-6B	45	46.8	9.9	36.9	11.55	35.25	9.51	46.8
MW-7	20	47.29	10.65	36.64	11.07	36.22	10.35	47.29
MW-8	20	48.24	10.97	37.27	11.6	36.64	10.63	48.24
MW-9	19	47.98	10.21	37.77	11.31	36.67	10.1	47.98
MW-10	20	45.75	NA	-	10.55	35.2	9.48	45.75
MW-11	15.5	44.23	NA	-	8.93	35.3	6.8	44.23
MW-11B	37	44.25	NA	-	8.6	35.65	6.75	44.25
MW-12	15	44.62	NA	-	10.24	34.38	7.34	44.62
MW-12B	40	44.4	NA	-	12.4	32	7.4	44.4
MW-13	20	47.68	NA	-	10.9	36.78	10	47.68

fsbd - Feet Below Site Datum

Table 2
Former Cornwall Cleaners
Groundwater Analytical Results - March 22-23, 2011
Cornwall Plaza
Quaker Avenue
Cornwall, New York
BCP Site No. C336070

Compound	Sample ID																			AWQS&GV [1]
	MW-1R	MW-1B	MW-2	MW-2B	MW-3	MW-3B	MW-4	MW-5	MW-6	MW-6B	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11B	MW-12	MW-12B	MW-13	
Dichlorodifluoromethane	<5.0	<5.0	<100	<5	<250	<5	<50	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5
Chloromethane	<2.5	<2.5	<50	<5	<120	<2.5	<25	<2.5	<25	<2.5	<2.5	<2.5	<5	<5	<5	<5	<5	<5	<5	NS [4]
Vinyl chloride	**17**	<1.0	<20	<1	<50	<1	**11 D**	<1	**87 D**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2
Chloroethane	<1.0	<1.0	<20	<1	<50	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	5
Trichlorofluoromethane	<2.5	<2.5	<50	<2.5	<120	<2.5	<25	<2.5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	5
Acetone	<5.0	<5.0	<100	<5	<250	<5	**190 D**	**5.4**	**220 D**	**9.2**	<5	<5	<5	<5	<5.0	**17**	<5.0	**31**	<5	50
1 ,1-Dichloroethene	<0.50	<0.50	<10	<5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<5	<5	<5	<5	<5	<5	<5	5
Carbon disulfide	<5.0	<5.0	<100	<5	<250	<5	<50	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NS
Methylene chloride	<5.0	<5.0	<100	<5	<250	<5	<50	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5
MTBE	<1.0	<1.0	<20	<1	<50	<1	<10	**3.6**	<10	<1	**3.6**	<1	<1	<1.0	4.5	<1	<1	<1	<1	10
trans-1,2-Dichloroethene	<0.75	<0.75	<15	<0.75	<38	<0.75	<7.5	<0.75	<7.5	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	5
1 ,1-Dichloroethane	<0.75	<0.75	<15	<0.75	<38	<0.75	<7.5	<0.75	<5	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	5
2-Butanone	<5.0	<5.0	<100	<0.5	<250	<5	<50	<5	<50	<5	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	50
cis-1,2-Dichloroethene	**64**	<0.50	**43 D**	<0.5	<25	<0.5	**95 D**	<0.5	**570 D**	<0.50	**2.7**	**10**	<0.5	**26**	**14**	<0.5	**0.88**	<0.5	<0.5	5
Chloroform	<0.75	<0.75	<15	<0.75	<38	<0.75	<7.5	<0.75	<7.5	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	7
1,1,1-Trichloroethane	<0.50	<0.50	<10	<0.5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Carbon tetrachloride	<0.50	<0.50	<10	<0.5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
1,2-Dichloroethane	<0.50	<0.50	<10	<0.5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Benzene	<0.50	<0.50	<10	<0.5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1
Trichloroethene (TCE)	**0.52**	<0.50	**19 D**	<5	**30 D**	<0.5	**120 D**	<0.5	**37 D**	<0.5	**1**	**2.9**	<0.5	**6.4**	**8.2**	<0.5	<0.5	<0.5	<0.5	5
Toluene	<0.75	<0.75	<15	<0.75	<38	<0.75	<7.5	<0.5	<7.5	<0.5	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	5
1,1,2-Trichloroethane	<0.75	<0.75	<15	<0.75	<38	<0.75	<7.5	<0.75	<7.5	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	NS [4]
Tetrachloroethene (PCE)	<0.50	<0.50	**1,000 D**	<0.5	**1,600 D**	<0.5	**320 D**	<0.5	**16 D**	<0.5	**18**	**49**	<0.5	**49**	**27**	<0.5	**1.2**	<0.5	<0.5	5
Chlorobenzene	<0.50	<0.50	<10	<0.5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Ethylbenzene	<0.50	<0.50	<10	<0.5	<25	<0.5	<5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
m,p-Xylene	<1.0	<1.0	<20	<1	<50	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	5
o-Xylene	<1.0	<1.0	<20	<1	<50	<1	<10	<1	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	5
1,3 ,5-Trimethylbenzene	<2.5	<2.5	<50	<2.5	<120	<2.5	<25	<2.5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	5
1,2,4-Trimethylbenzene	<2.5	<2.5	<50	<2.5	<120	<2.5	<25	<2.5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	5
Naphthalene	<2.5	<2.5	<50	<2.5	<120	<2.5	<25	<2.5	<25	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	10
Total Chlorinated VOCs	**81.52**	ND	**1,062**	ND	**1,630**	ND	**546**	ND	**710**	ND	**21.7**	**61.9**	ND	**81.4**	**49.2**	ND	**2.08**	ND	ND	NS [4]
TICS	**16 J**	ND	ND	**4.3 J**	ND	ND	ND	**27 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS [4]

All results are in ug/l
Concentrations in BOLD are above the laboratory detectection limit
1) - Ambient Water Quality Standards & Guidance Values, Class GA Groundwater as per Division of Water Technical & Operational Guidance Series (1.1.1)
2) - Not Analyzed
3) - J qualifier = estimated value less than the reporting limit, B qualifier = analyte detected in associated method blank
4) - No Standard
1,000 Exceeds AWQS for Class GA groundwater
MTBE - Methyl Tertiary Butyl Ether

TABLE 3

FORMER CORNWALL CLEANERS
CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

Indoor Air / Soil Vapor / Sub-slab Vapor Analytical Results, VOCs by EPA Method TO-15
Collected October 25, 2007

Compound	ug/m^3											
	Chan's Subslab 1 (CPHSS1)	Chan's Subslab 2 (CPHSS2)	Chan's Indoor Air 1 (CIA1)	Key Foods Subslab 1 (KFSS1)	Key Foods Indoor Air 1 (KFIA1)	Leos Pizza Subslab 1 (LPSS1)	Leo's Pizza Indoor Air 1 (LPIA1)	Soil Vapor Front (SVF)	Outdoor Air Front (OAF)	Soil Vapor Rear (SVR)	Outdoor Air Rear (OAR)	NYSDOH Indoor Air Guidance Values
1,2,4-Trimethylbenzene	ND (13)	4.8 (3.5)	ND (0.86)	ND (6.9)	ND (0.76)	6.1 (3.6)	ND (0.79)	ND (3.6)	3.5 (0.78)	6.4 (3.7)	4.1 (0.84)	NE [3]
2-Butanone (Methyl Ethyl Ketone)	33 (8.0)	5.3 (2.1)	1 8 (0.52)	ND (4.2)	3.9 (0.46)	3.5 (2.2)	3.3 (0.47)	47 (2.2)	5.2 (0.46)	56 (2.2)	5.6 (0.50)	NE
Benzene	ND (8.7)	ND (2.2)	1.6 (0.56)	ND (4.5)	0.66 (0.50)	ND (2.3)	3.7 (0.51)	12 (2.3)	0.99 (0.50)	14 (2.4)	1.0 (0.55)	NE
Chloroform	20 (13)	18 (3.4)	ND (0.85)	ND (6.9)	0.92 (0.76)	ND (3.6)	ND (0.79)	ND (3.6)	ND (0.77)	ND (3.6)	ND (0.83	NE
Cyclohexane	ND (9.4)	ND (2.4)	ND (0.60)	ND (4.8)	ND (0.53)	ND (2.5)	1.5 (0.55)	ND (2.5)	ND (0.54)	2.9 (2.6)	ND (0.59)	NE
Ethanol	2,800E **3** (20)	270 (5.3)	240 **E[4] (1.6)**	11 (11)	350E (1.5)	150 (5.5)	3900E (1.5)	10 (5.5)	11 (1.5)	110 (5.6)	12 (1.6)	NE
Ethylbenzene	ND (12)	3.4 (3.1)	ND (0.76)	ND (6.1)	ND (0.67)	4.0 (3.2)	ND (0.70)	5.3 (3.2)	4 (0.69)	3.4 (3.2)	3.6 (0.74)	NE
Freon 11	ND (15)	ND (4.0)	1.2 (0.49)	8.4 (7.9)	10 (0.44)	ND (4.1)	1.2 (0.45)	ND (4.1)	1.4 (0.44)	ND (4.2)	1.2 (0.48)	NE
Freon 12	ND (13)	ND (3.5)	2.2 (0.43)	ND (7.0)	3 (0.38)	5.6 (3.6)	2.8 (0.40)	ND (3.6)	2 (0.39)	ND (3.7)	2.2 (0.42)	NE
Hexane	12 (9.6)	5.4 (2.5)	ND (0.62)	ND (5.0)	0.85 (0.55)	ND (2.6)	4.8 (0.57)	7 (2.6)	ND (0.56)	ND (2.6)	ND (0.60)	NE
m,p-Xylenes	14 (12)	13 (3.1)	ND (0.76)	8.1 (6.1)	ND (0.67)	18 (3.2)	1.1 (0.70)	20 (3.2)	22 (0.69)	12 (3.2)	17 (0.74)	NE
o-Xylenes	ND (12)	4.4 (3.1)	ND (0.76)	ND (6.1)	ND (0.67)	6.2 (3.2)	ND (0.70)	6.7 (3.2)	6.3 (0.69)	4.9 (3.2)	5.1 (0.74)	NE
Styrene	22 (12)	4.1 (3.0)	ND (0.74)	ND (6.0)	ND (0.66)	4.6 (3.1)	ND (0.68)	ND (3.1)	0.79 (0.67)	ND (3.2)	ND (0.73)	NE
Tetrachloroethene	4700 (18)	1800 (4.8)	ND (0.59)	3300 (9.6)	1.4 (0.52)	51 (5.0)	ND (0.55)	ND (5.0)	ND (0.54)	28 (5.0)	ND (0.58)	100
Toluene	44 (10)	12 (2.6)	1.6 (0.66)	15 (5.3)	5.6 (0.58)	12 (2.8)	3.4 (0.61)	16 (2.8)	18 (0.60)	12 (2.8)	12 (0.64)	NE
1,3,5-Trimethylbenzene	ND (13)	ND (3.5)	ND (0.86)	ND (6.9)	ND (0.76)	ND (3.6)	ND (0.79)	ND (3.6)	1.3 (0.78)	ND (3.7)	1.2 (0.84)	NE
1,4-Dichlorobenzene	ND (16)	ND (4.2)	ND (0.53)	ND (8.5)	6.4 (0.46)	ND (4.4)	ND (0.48)	ND (4.4)	ND (0.48)	ND (4.5)	ND (0.51)	NE
Carbon Tetrachloride	ND (17)	ND (4.4)	0.81 (0.55)	ND (8.9)	0.76 (0.49)	ND (4.6)	0.6 (0.51)	ND (4.6)	0.46 J	ND (4.7)	0.72 (0.54)	NE
Chloromethane	ND (22)	ND (5.8)	0.94 (0.36)	ND (12)	0.80 (0.32)	ND (6.0)	1.5 (0.33)	ND (6.0)	0.63 (0.60)	ND (6.2)	1.0 (0.35)	NE
Freon 113	ND (21)	ND (5.4)	ND (0.67)	ND (11)	0.76 (0.59)	ND (5.6)	ND (0.62)	ND (5.6)	0.62 (0.60)	ND (5.7)	ND (0.66)	NE
tert-Butyl alcohol	NA	NA	ND (2.6)	NA	30.0 (2.3)	NA	ND (2.4)	NA	5.0 (2.4)	NA	6.0 (2.6)	NE
1,3-Butadiene	ND (6.0)	ND (1.6)	---	ND (3.1)	---	ND (1.6)	---	6.3 (1.6)	---	ND (4.5)	---	NE
2,2,4-Trimethylpentane	ND (13)	ND (3.3)	ND (0.82)	ND (6.6)	ND (0.72)	ND (3.4)	ND (0.75)	ND (3.4)	ND (0.74)	4 (3.5)	ND (0.80)	NE
2-Propanol	ND (27)	ND (6.9)	---	ND (14)	---	8.3 (7.2)	---	12 (7.2)	---	ND (7.3)	---	NE
4-Ethyltoluene	ND (13)	ND (3.5)	---	ND (6.9)	---	ND (3.6)	---	ND (3.6)	---	3.8 (3.7)	---	NE
Acetone	500 (26)	49 (6.7)	---	24 ((13)	---	21 (6.9)	---	230 (6.9)	---	350 (7.1)	---	NE
Carbon disulfide	ND (8.5)	2.7 (2.2)	---	ND (4.4)	---	ND (2.3)	---	73 (2.3)	---	14 (2.3)	---	NE
Heptane	61 (11)	47 (2.9)	---	ND (5.8)	---	8.2 (3.0)	---	29 (3.0)	---	10 (3.0)	---	NE
Tetrahydrofuran	110 (8.0)	17 (2.1)	---	ND (4.2)	---	4.4 (2.2)	---	100 (2.2)	---	14 (2.2)	---	NE
Trichloroethene	54 (15)	37 (3.8)	ND (0.47)	24 (7.6)	ND (0.42)	ND (3.9)	ND (0.43)	ND (3.9)	0.30 J (0.42)	ND (4.0)	ND (0.46)	5
Vinyl chloride	ND (7.0)	ND (1.8)	ND (0.45)	ND (3.6)	ND (0.40)	ND (1.9)	ND (0.41)	ND (1.9)	ND (0.40)	7.5 (1.9)	ND (0.44)	NE

Compounds on BOLD are primary Site contaminants
1 - micrograms per cubic meter
2 - not detected above the laboratory detection limit
3 - not established
4 - exceeds instrument calibration range

Compound detected in both ambient air and soil vapor
Compound detected in ambient air only
Compound detected in soil vapor only

TABLE 4

FORMER CORNWALL CLEANERS CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

Soil Vapor Sub-slab Vapor Analytical Results, VOCs by EPA Method TO-15
Collected April 30, 2009

Compound	ug/m^3	
	Cornwall Fire Dept Subslab 1 (Basement) (CFDSS1)	Cornwall Fire Dept Soil Vapor 1 (Parking lot) (CFDSV1)
1,2,4-Trimethylbenzene	13.5 (7.08)	22.5 (4.65)
1,3,5-Trimethylbenzene	4.70 (4.52)	25.5 (4.65)
2-Butanone (Methyl Ethyl Ketone)	26.4 (2.71)	23.7 (2.79)
4-Ethyltoluene	4.84 (4.52)	25.5 (4.65)
Benzene	390 D [3] (73.1)	9.75 (3.01)
Ethylbenzene	9.27 (4.00)	15.5 (4.11)
Heptane	7.07 (3.76)	12.9 (3.87)
Hexane	5.01 (3.24)	10 (3.33)
m,p-Xylenes	44.2 (4.00)	75.1 (4.11)
o-Xylenes	14.6 (4.00)	26.1 (4.11)
Tetrachloroethene	22.8 (6.24)	ND (6.42)
Toluene	349 D (86.7)	72.8 (3.57)
1,1,1-Trichloroethane	ND (5.01)	ND (5.15)
1,1-Dichloroethene	ND (3.66)	ND (3.76)
1,2-Dichloroethane	ND (3.73)	ND (3.83)
2,2,4-Trimethylpentane	ND (4.34)	ND (4.43)
Carbon Tetrachloride	ND (5.79)	ND (5.95)
cis-1,2-Dichloroethene	ND (3.66)	ND (3.76)
Methylene chloride	ND (3.20)	ND (3.29)
Trichloroethene	ND (4.94)	ND (5.08)
Trichlorofluoromethane	ND (5.18)	ND (5.32)
Vinyl chloride	ND (2.35)	ND (2.42)
Carbon disulfide	ND (2.86)	2.31 J [4] (2.94)
Chloroform	18.4 (4.49)	ND (4.61)
Ethyl acetate	2,590 D (84.4)	5.62 (3.48)
MIBK	ND (3.76)	62.5 (3.87)
Tetrahydrofuran	33 (2.71)	6.3 (2.79)

Compounds on **BOLD** *are* primary Site contaminants
- micrograms per cubic meter

2 - not detected above the laboratory detection limit
3 - result reported based on a diluted sample. due either to high concentration or matrix interference
4 - indicates an estimated value

Compound detected in both ambient air and soil vapor
Compound detected in ambient air only
Compound detected in soil vapor only

TABLE 5

FORMER CORNWALL CLEANERS
CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

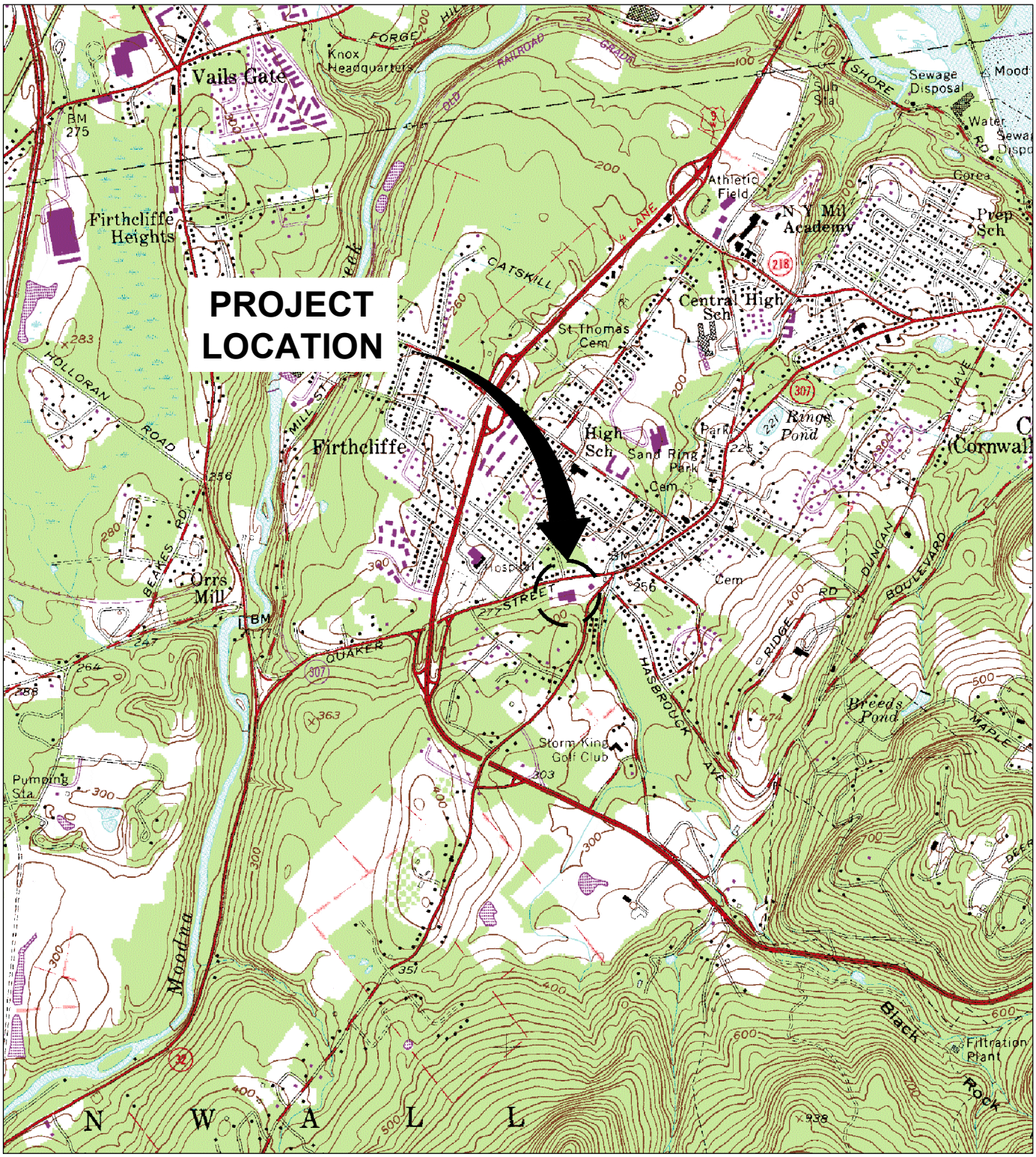
Ambient Air Analytical Results, VOCs by EPA Method TO-15
Collected April 30, 2009

Compound	ug/m^3					
	Chan's Indoor Air 2	Key Foods Indoor Air 2	Leo's Indoor Air 2 (LPIA2)	Cornwall Fire Dept Indoor Air 1 (Basement)	Cornwall Fire Dept Indoor Air 2 (Upstairs)	NYSDOB Indoor Air Guidance Values
1,2,4-Trimethylbenzene	ND (4.45)	ND (4.40)	ND (4.52)	ND	12.5	NE [3]
1,3,5-Trimethylbenzene	ND	ND (4.40)	ND (4.52)	ND	11.5 (4.95)	NE
2-Butanone (Methyl Ethyl	ND	3.3 (2.64)	1.53 J	6.0	6 (2.97)	NE
4-Ethyltoluene	ND	ND (4.40)	ND (4.52)	ND	3.69 J	NE
Benzene	2.63 J	ND (2.85)	ND (2.93)	ND	3.57	NE
Ethylbenzene	ND	ND (3.89)	ND (4.00)	2.21 J	6.18	NE
Heptane	ND	ND (3.66)	1.87 J (3.76)	ND	3.45 J	NE
Hexane	2.90 J	ND (3.15)	1.93 J (3.24)	3.00 J	5.37	NE
m,p-Xylenes	ND	ND (3.89)	ND (4.00)	8.83	24.3	NE
o-Xylenes	ND	ND (3.89)	ND (4.00)	3.09	8.83	NE
Tetrachloroethene	1.52 (0.61)	0.90 (0.60)	0.62 (SIM)	1.03 (0.60)	1.52	100
Toluene	ND	ND (3.38)	ND (3.48)	12.3	31.1	NE
1,1,1-Trichloroethane	0.50 (0.50)	0.11 J (0.49)	0.22 J (0.51) (SIM)	1.55 (0.49)	1.55 (0.55)	NE
1,1-Dichloroethene	0.24	ND (3.56)	0.12J (0.36) (SIM)	ND	ND	NE
1,2-Dichloroethane	0.45	0.16 J	0.25 J (0.38) (SIM)	0.16 J (0.37)	0.161 (0.42)	NE
2,2,4-Trimethylpentane	ND	ND (4.19)	ND (4.31)	ND	4.13 J	NE
Carbon Tetrachloride	1.22 (0.57)	0.90 (0.56)	0.83 (0.58)	0.83 (0.56)	0.77	NE
cis-1,2-Dichloroethene	0.32 J (0.36)	0.08 J (0.35)	0.16 J (0.36)	0.08 J (0.35)	0.08 J (0.40)	NE
Methylene chloride	4.95	ND (3.12)	ND (3.20)	4.24	ND	NE
Trichloroethene	0.60 (0.48)	0.16 J (0.48)	0.27 [1] (0.49) (SIM)	0.38 J (0.47)	1.26 (0.53) (SIM)	5
Trichlorofluoromethane	ND	ND (5.03)	ND (5.18)	6.29	ND	NE
Vinyl chloride	0.13 J (0.23)	ND (2.29)	0.08 [1] (0.24) (SIM)	ND	ND	NE
Carbon disulfide	ND (2.81)	ND (2.29)	ND (2.86)	ND	ND	NE
Chloroform	ND	ND (4.36)	ND (4.49)	ND	ND	NE
Ethyl acetate	ND	ND (3.29)	ND (3.38)	ND	ND	NE
MIBK	ND	ND (3.66)	ND (3.76)	ND	ND	NE
Tetrahydrofuran	ND	ND (2.64)	ND (2.71)	ND	ND	NE

Compounds on BOLD are primary Site contaminants
Reporting limit provided in parenthesis (4.40)
1 - micrograms per cubic meter
2 - not detected above the laboratory detection limit
3 - not established
4 - indicates an estimated value
5 - selected ion monitoring
Compound detected in both ambient air and soil vapor
Compound detected in ambient air only
Compound detected in soil vapor only

ARCADIS

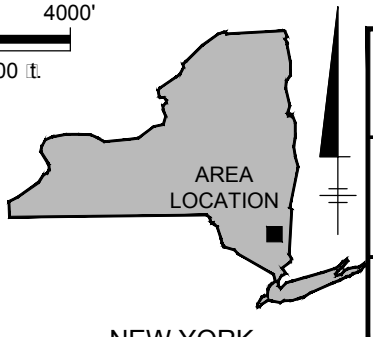
Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD.,CORNWALL, NY, 1957, PHOTOREVISED 1981.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

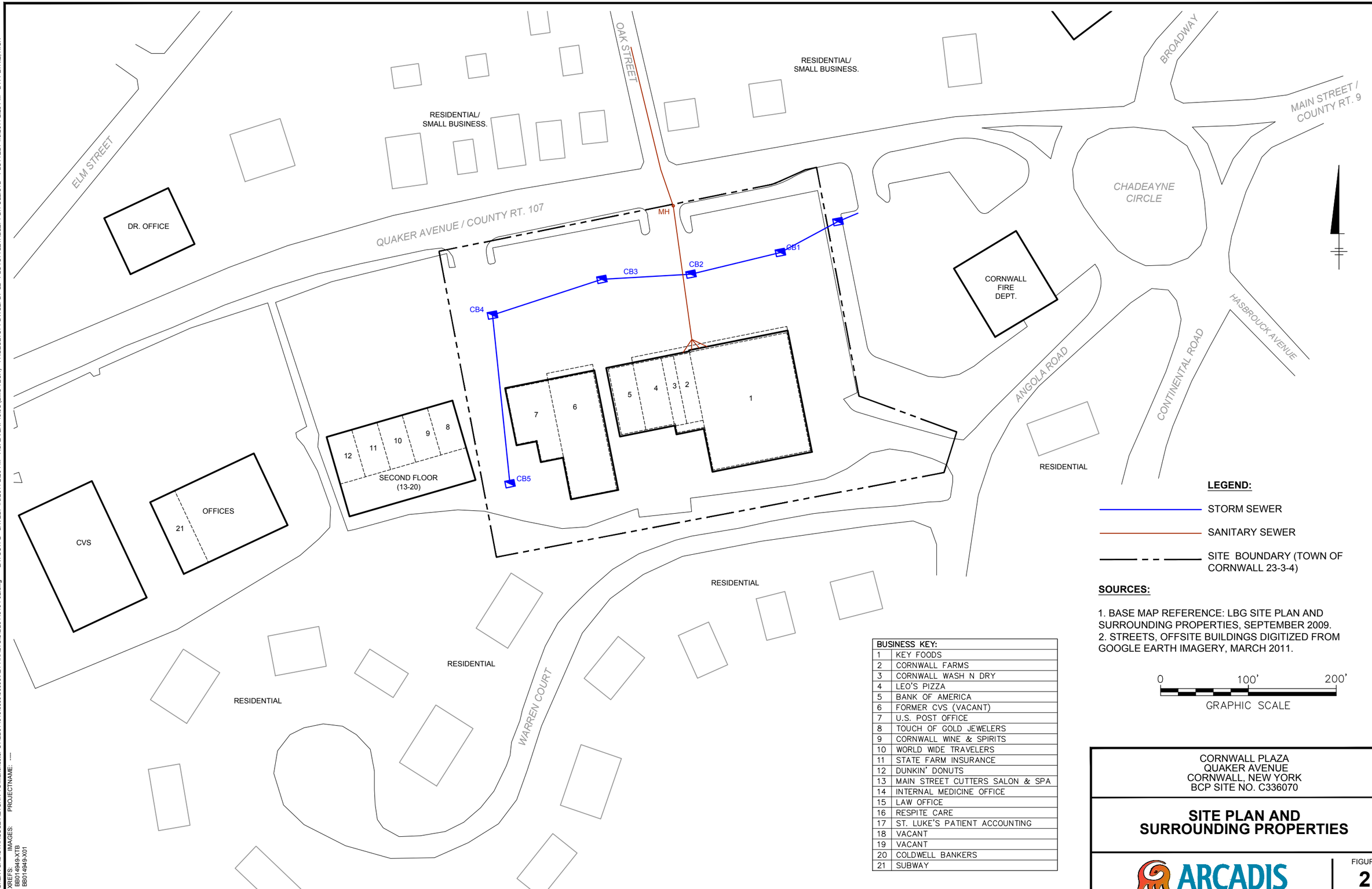


CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

SITE LOCATION MAP

ARCADIS

FIGURE 1



BUSINESS KEY:	
1	KEY FOODS
2	CORNWALL FARMS
3	CORNWALL WASH N DRY
4	LEO'S PIZZA
5	BANK OF AMERICA
6	FORMER CVS (VACANT)
7	U.S. POST OFFICE
8	TOUCH OF GOLD JEWELERS
9	CORNWALL WINE & SPIRITS
10	WORLD WIDE TRAVELERS
11	STATE FARM INSURANCE
12	DUNKIN' DONUTS
13	MAIN STREET CUTTERS SALON & SPA
14	INTERNAL MEDICINE OFFICE
15	LAW OFFICE
16	RESPITE CARE
17	ST. LUKE'S PATIENT ACCOUNTING
18	VACANT
19	VACANT
20	COLDWELL BANKERS
21	SUBWAY

LEGEND:

- STORM SEWER
- SANITARY SEWER
- SITE BOUNDARY (TOWN OF CORNWALL 23-3-4)

SOURCES:

1. BASE MAP REFERENCE: LBG SITE PLAN AND SURROUNDING PROPERTIES, SEPTEMBER 2009.
2. STREETS, OFFSITE BUILDINGS DIGITIZED FROM GOOGLE EARTH IMAGERY, MARCH 2011.

0 100' 200'

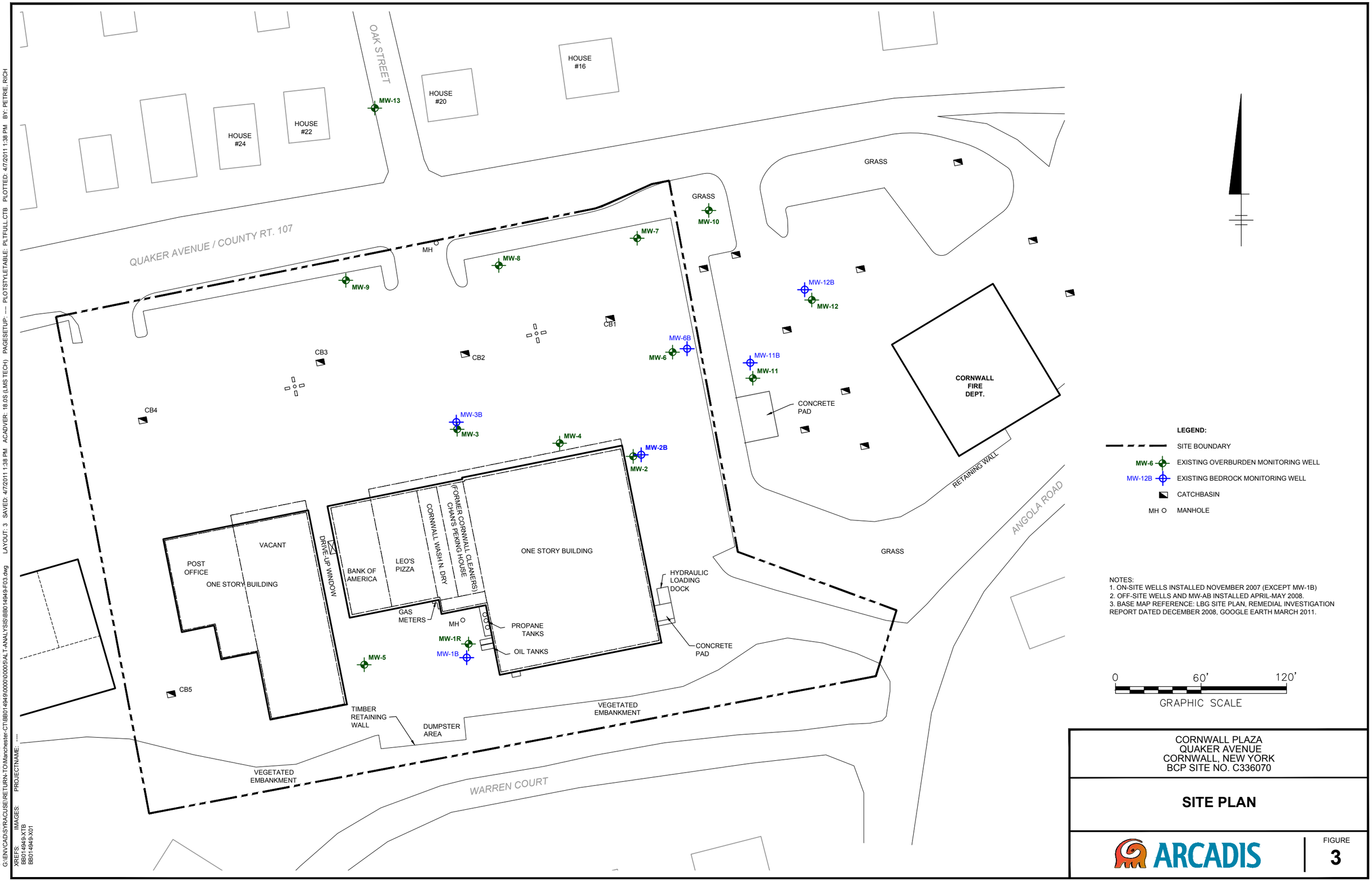
GRAPHIC SCALE

CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

SITE PLAN AND SURROUNDING PROPERTIES

ARCADIS

FIGURE 2



LEGEND:

- SITE BOUNDARY
- MW-6 — EXISTING OVERBURDEN MONITORING WELL
- MW-12B — EXISTING BEDROCK MONITORING WELL
- CATCHBASIN
- MH — MANHOLE

NOTES:
1. ON-SITE WELLS INSTALLED NOVEMBER 2007 (EXCEPT MW-1B)
2. OFF-SITE WELLS AND MW-AB INSTALLED APRIL-MAY 2008.
3. BASE MAP REFERENCE: LBG SITE PLAN, REMEDIAL INVESTIGATION REPORT DATED DECEMBER 2008, GOOGLE EARTH MARCH 2011.

0 60’ 120’

GRAPHIC SCALE

CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

SITE PLAN

ARCADIS

FIGURE 3

OAK STREET

QUAKER AVENUE / COUNTY RT. 107

ANGOLA ROAD

WARREN COURT

HOUSE #16

HOUSE #20

HOUSE #22

HOUSE #24

GRASS

MW-13

MW-10

MW-7

MW-8

MW-9

SB-4

MH

MW-12B

MW-12

SB-5

CB1

CB2

CB3

MW-6B

MW-6

SB-3

SB-7

MW-11B

MW-11

CB4

CONCRETE PAD

CORNWALL FIRE DEPT.

MW-3B

MW-3

(PCE□2.1□□□/15-17'□gs)

B-5

MW-4

B-1

S-3
(6.9□□□/21'□gs)

MW-2B

MW-2

SB-6

SB-2

RETAINING WALL

(FORMER CORNWALL CLEANERS)

CHAN'S PEKING HOUSE

CORNWALL WASH N. DRY

DRIVE-UP WINDOW

VACANT

POST OFFICE

ONE STORY BUILDING

BANK OF AMERICA

LEO'S PIZZA

ONE STORY BUILDING

B-6

B-4

HYDRAULIC LOADING DOCK

GAS METERS

MH

PROPANE TANKS

OIL TANKS

B-2

MW-1R

MW-1B

SB-1

CONCRETE PAD

MW-5

B-3

CB5

TIMBER RETAINING WALL

SB-9

DUMPSTER AREA

VEGETATED EMBANKMENT

SB-8

VEGETATED EMBANKMENT

GRASS

LEGEND:

- SITE BOUNDARY
- MW-6 — EXISTING OVERBURDEN MONITORING WELL
- MW-12B — EXISTING BEDROCK MONITORING WELL
- CATCHBASIN
- MH — MANHOLE
- SB-1 — SOIL CHARACTERIZATION BORING LOCATION (AUGUST 2010)
- B-1 — LFR BORING LOCATION (AUGUST/OCTOBER 2005)

NOTES:
1. ON-SITE WELLS INSTALLED NOVEMBER 2007 (EXCEPT MW-1B)
2. OFF-SITE WELLS AND MW-AB INSTALLED APRIL-MAY 2008.
3. BASE MAP REFERENCE: LBG SITE PLAN, REMEDIAL INVESTIGATION REPORT DATED DECEMBER 2008, GOOGLE EARTH MARCH 2011.

0 60' 120'

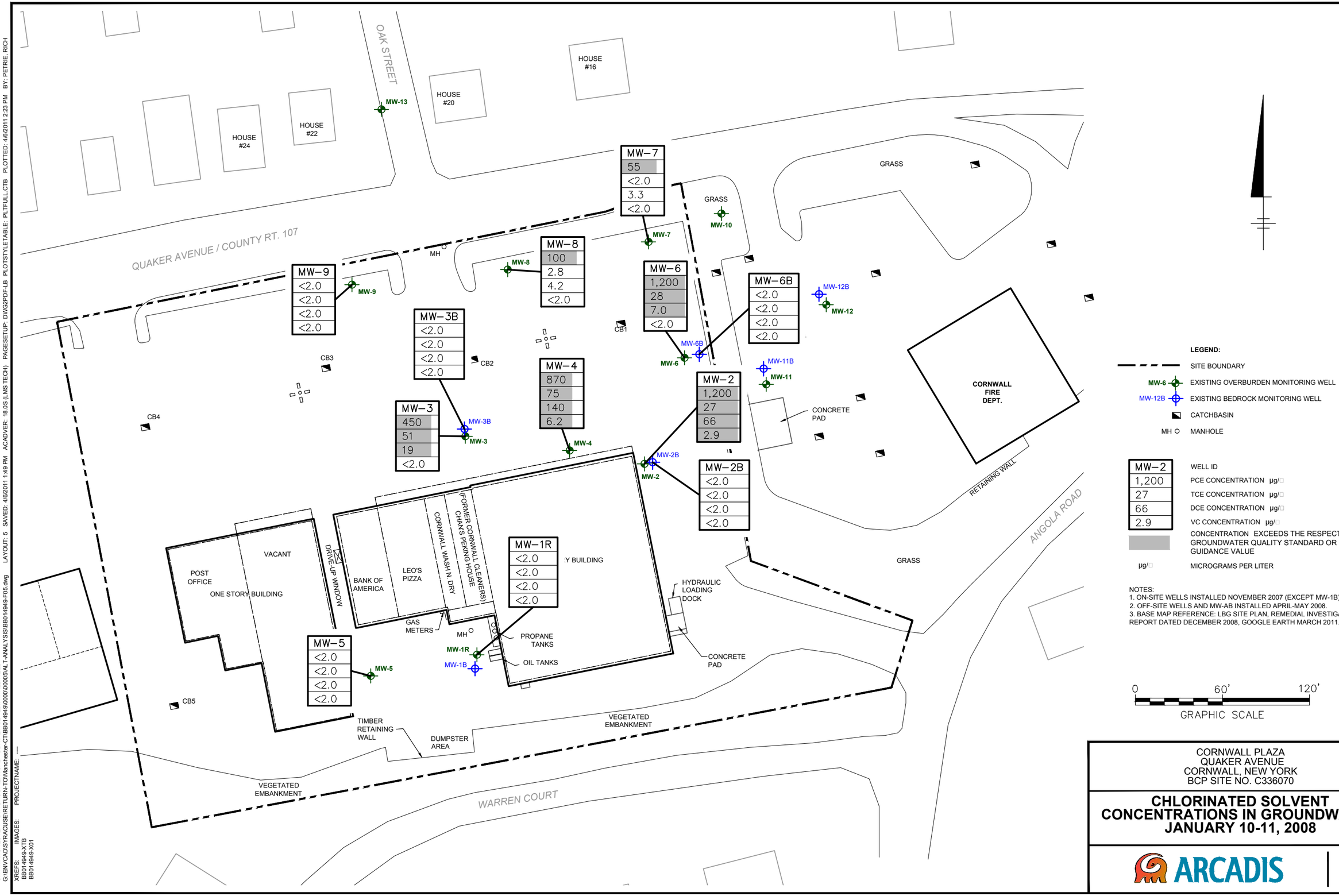
GRAPHIC SCALE

CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

SOIL BORING LOCATION MAP

ARCADIS

FIGURE
4



LEGEND:

- SITE BOUNDARY
- MW-6 — EXISTING OVERBURDEN MONITORING WELL
- MW-12B — EXISTING BEDROCK MONITORING WELL
- CATCHBASIN
- MH — MANHOLE

MW-2	
1,200	PCE CONCENTRATION µg/□
27	TCE CONCENTRATION µg/□
66	DCE CONCENTRATION µg/□
2.9	VC CONCENTRATION µg/□

CONCENTRATION EXCEEDS THE RESPECTIVE GROUNDWATER QUALITY STANDARD OR GUIDANCE VALUE

µg/□ — MICROGRAMS PER LITER

NOTES:
1. ON-SITE WELLS INSTALLED NOVEMBER 2007 (EXCEPT MW-1B)
2. OFF-SITE WELLS AND MW-AB INSTALLED APRIL-MAY 2008.
3. BASE MAP REFERENCE: LBG SITE PLAN, REMEDIAL INVESTIGATION REPORT DATED DECEMBER 2008, GOOGLE EARTH MARCH 2011.

0 60' 120'

GRAPHIC SCALE

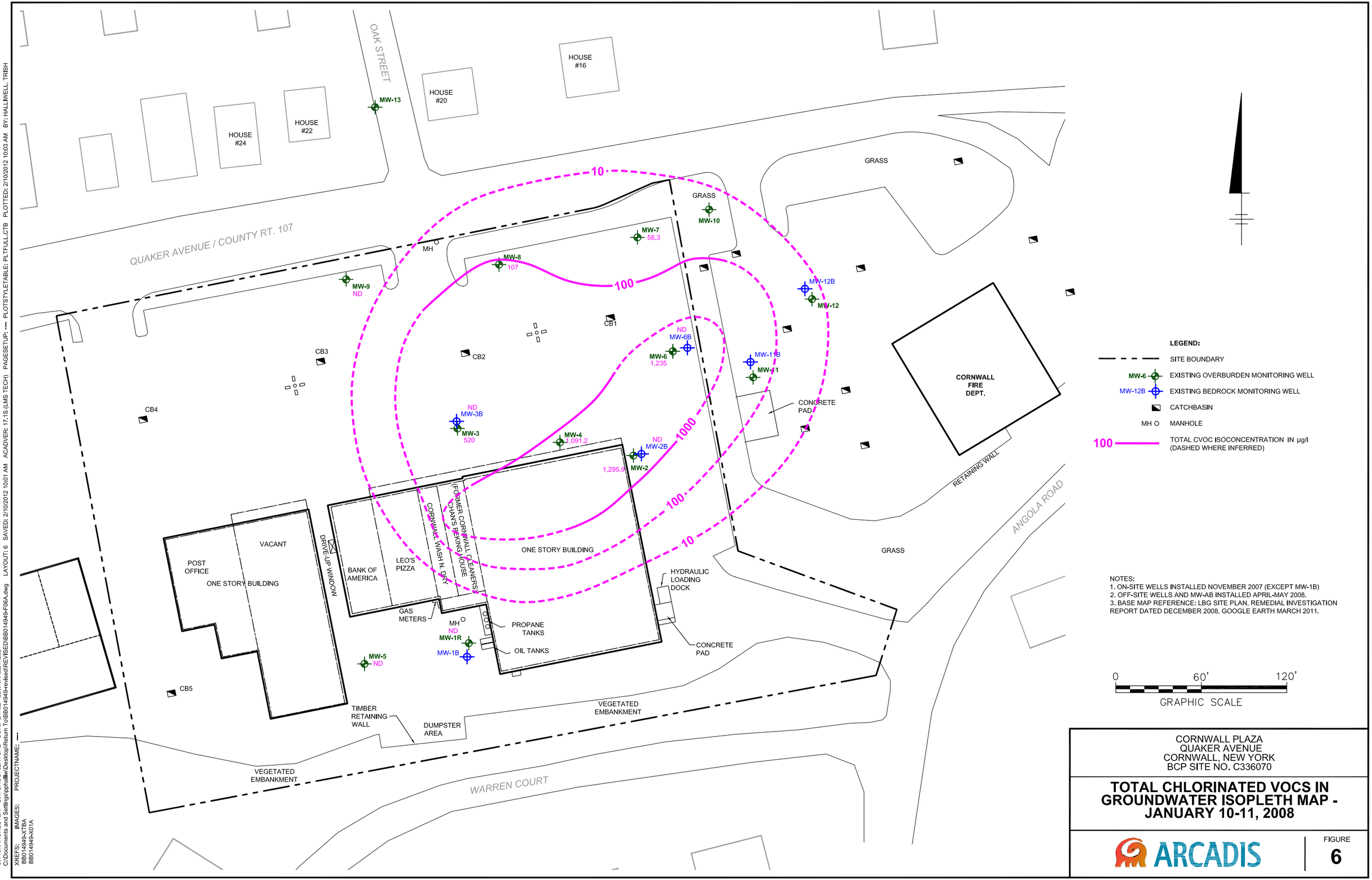
CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

CHLORINATED SOLVENT CONCENTRATIONS IN GROUNDWATER JANUARY 10-11, 2008

ARCADIS

FIGURE 5

CITY:MANCHESTER DIV/GROUP:ENVCAD DBR:PETRIE LD::THALLIWELL
G:\ENVCAD\SYRACUSE\RETURN-TO\Manchester-CT\BB014949\6000\0\0005\ALT-ANALYSIS\BB014949-F05.dwg LAYOUT: 5 SAVED: 4/6/2011 1:49 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: DWG2PDF-LB PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/6/2011 2:23 PM BY: PETRIE, RICH
PROJECTNAME: ----
XREFS: IMAGES:
BB014949-XTB
BB014949-X01

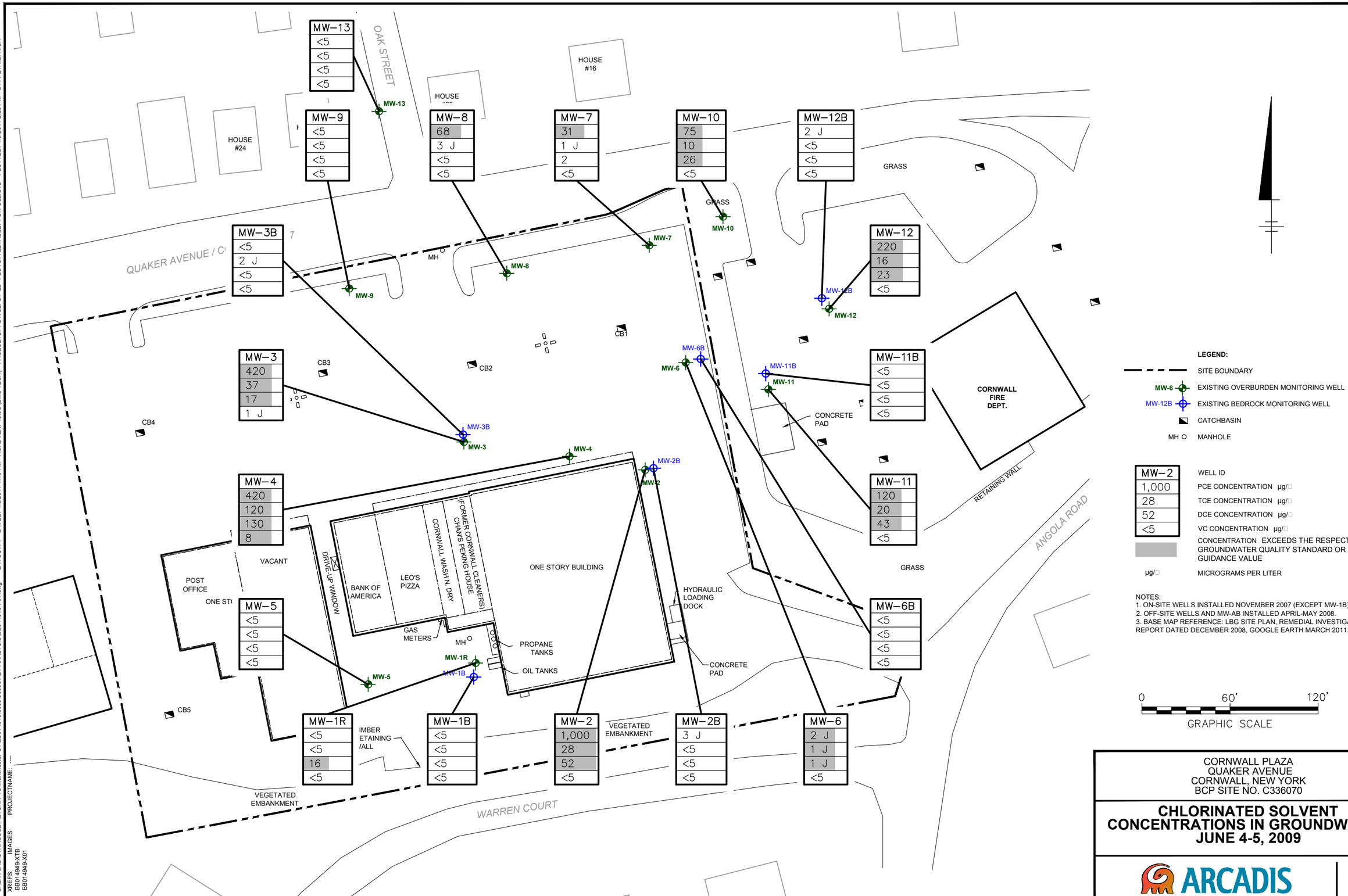


CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

TOTAL CHLORINATED VOCS IN GROUNDWATER ISOPLETH MAP - JANUARY 10-11, 2008

ARCADIS

FIGURE 6



CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

CHLORINATED SOLVENT CONCENTRATIONS IN GROUNDWATER JUNE 4-5, 2009

ARCADIS

FIGURE 7

CITY:MANCHESTER DIV/GROUP:ENVCAD DBR:PETRIE LD::T.HALLIWELL
G:\ENVCAD\SYRACUSE\RETURN-TO\Manchester-C\1BB014949\0000\0000\5\ALT-ANALYSIS\BB014949-F07.dwg LAYOUT: 7 SAVED: 4/6/2011 1:49 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: DWG2PDF-LB PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/6/2011 2:23 PM BY: PETRIE, RICH
XREFS: IMAGES: PROJECTNAME: ---
BB014949-XTB
BB014949-X01

LEGEND:

- SITE BOUNDARY
- MW-6 — EXISTING OVERBURDEN MONITORING WELL
- MW-12B — EXISTING BEDROCK MONITORING WELL
- CATCHBASIN
- MH O — MANHOLE
- 100 — TOTAL CVOC ISOCONCENTRATION IN µg/l (DASHED WHERE INFERRED)

NOTES:
1. ON-SITE WELLS INSTALLED NOVEMBER 2007 (EXCEPT MW-1B)
2. OFF-SITE WELLS AND MW-AB INSTALLED APRIL-MAY 2008.
3. BASE MAP REFERENCE: LBG SITE PLAN, REMEDIAL INVESTIGATION REPORT DATED DECEMBER 2008, GOOGLE EARTH MARCH 2011.

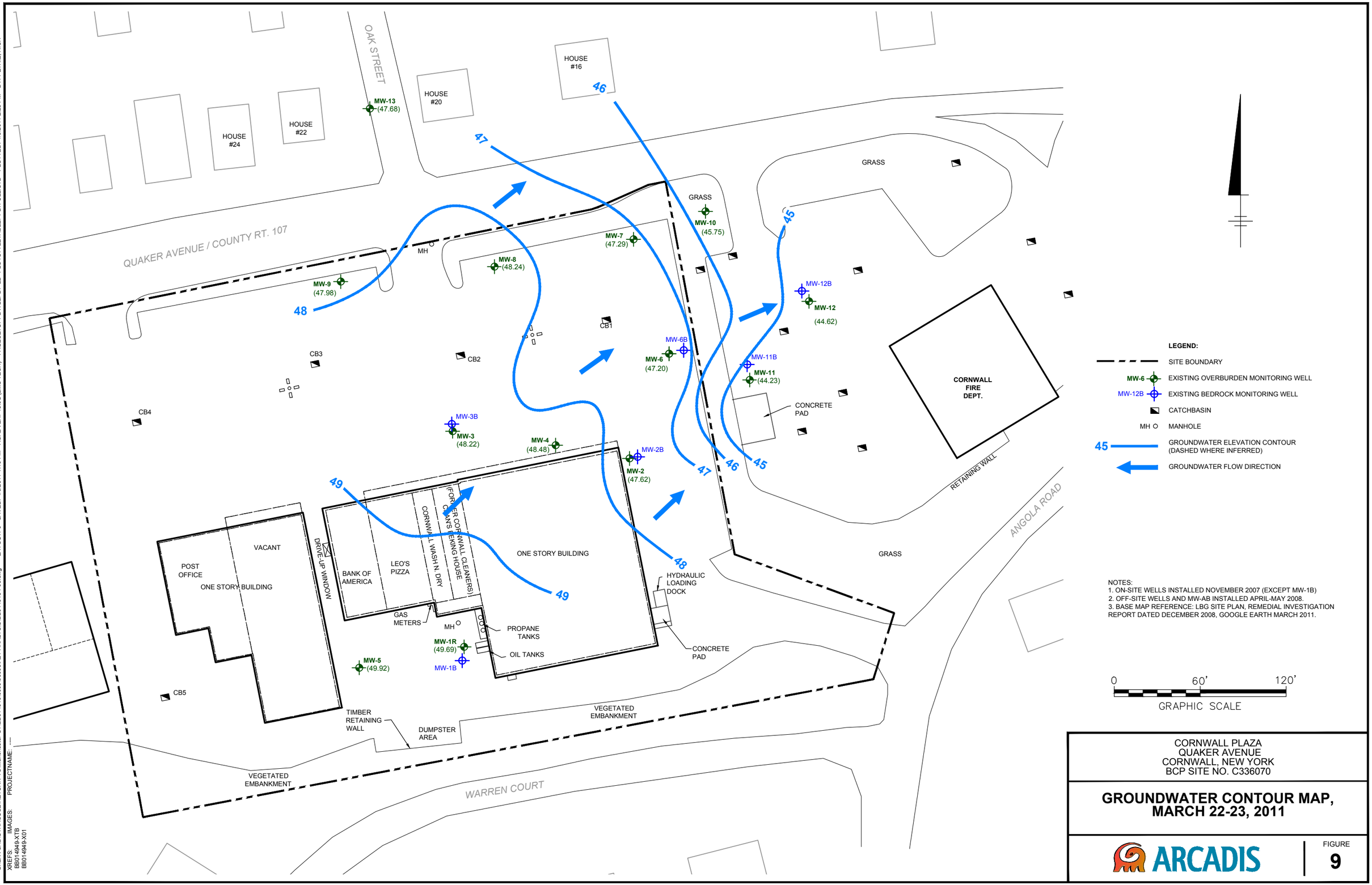
0 60' 120'
GRAPHIC SCALE

CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

TOTAL CHLORINATED VOCS IN GROUNDWATER ISOPLETH MAP - JUNE4-5, 2009

ARCADIS

FIGURE 8



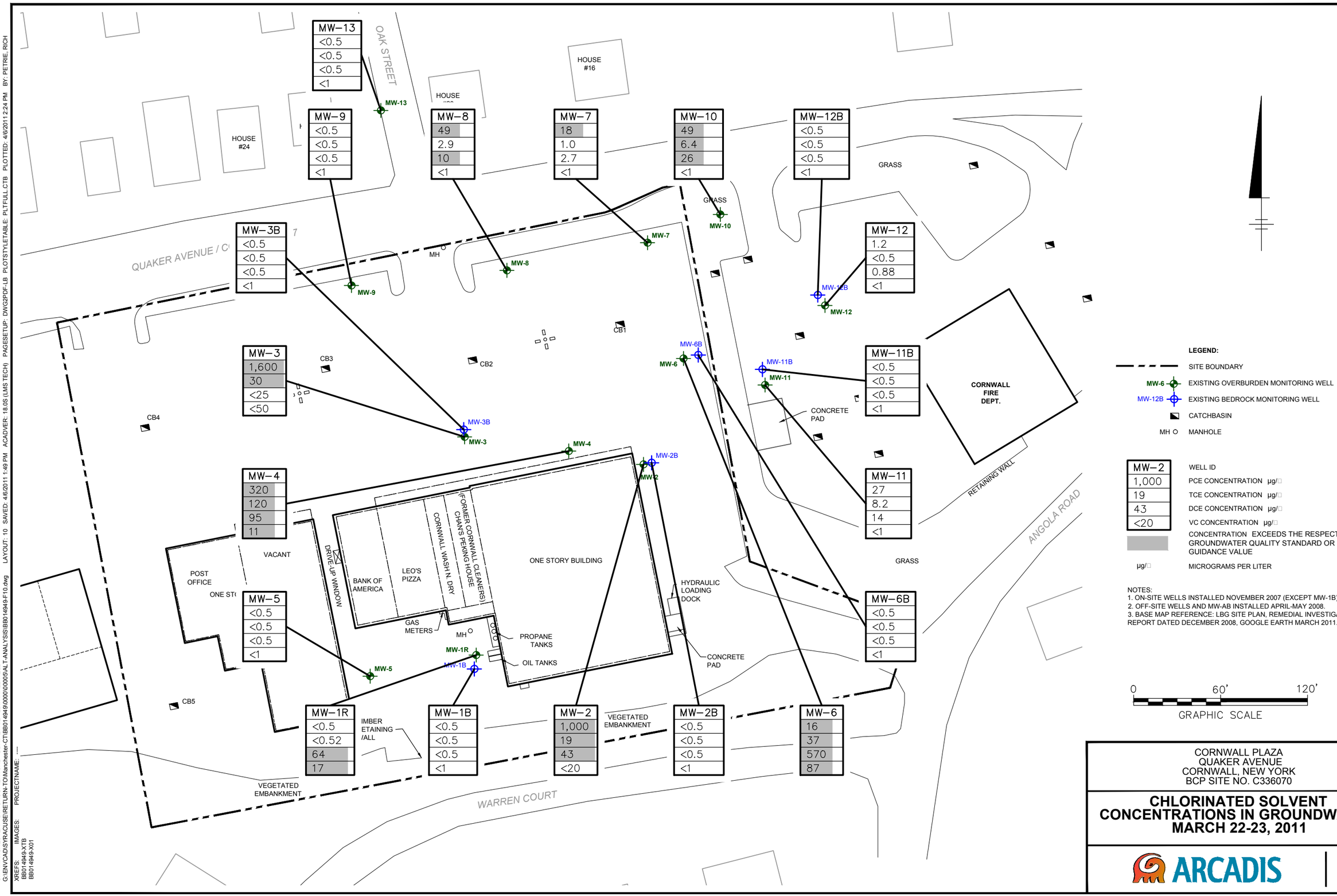
CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

GROUNDWATER CONTOUR MAP, MARCH 22-23, 2011

ARCADIS

FIGURE 9

CITY:MANCHESTER DIV/GROUP:ENVCAD DBR:PETRIE LD:T:HALLIWELL
G:\ENVCAD\SYRACUSE\RETURN-TO\Manchester-CTB\BB014949\000\000005\ALT-ANALYSIS\BB014949-F09.dwg LAYOUT: 9 SAVED: 4/6/2011 1:49 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: DWG2PDF-LB PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/6/2011 2:23 PM BY: PETRIE, RICH
PROJECTNAME: ---
IMAGES:
XREFS:
BB014949-XTB
BB014949-X01



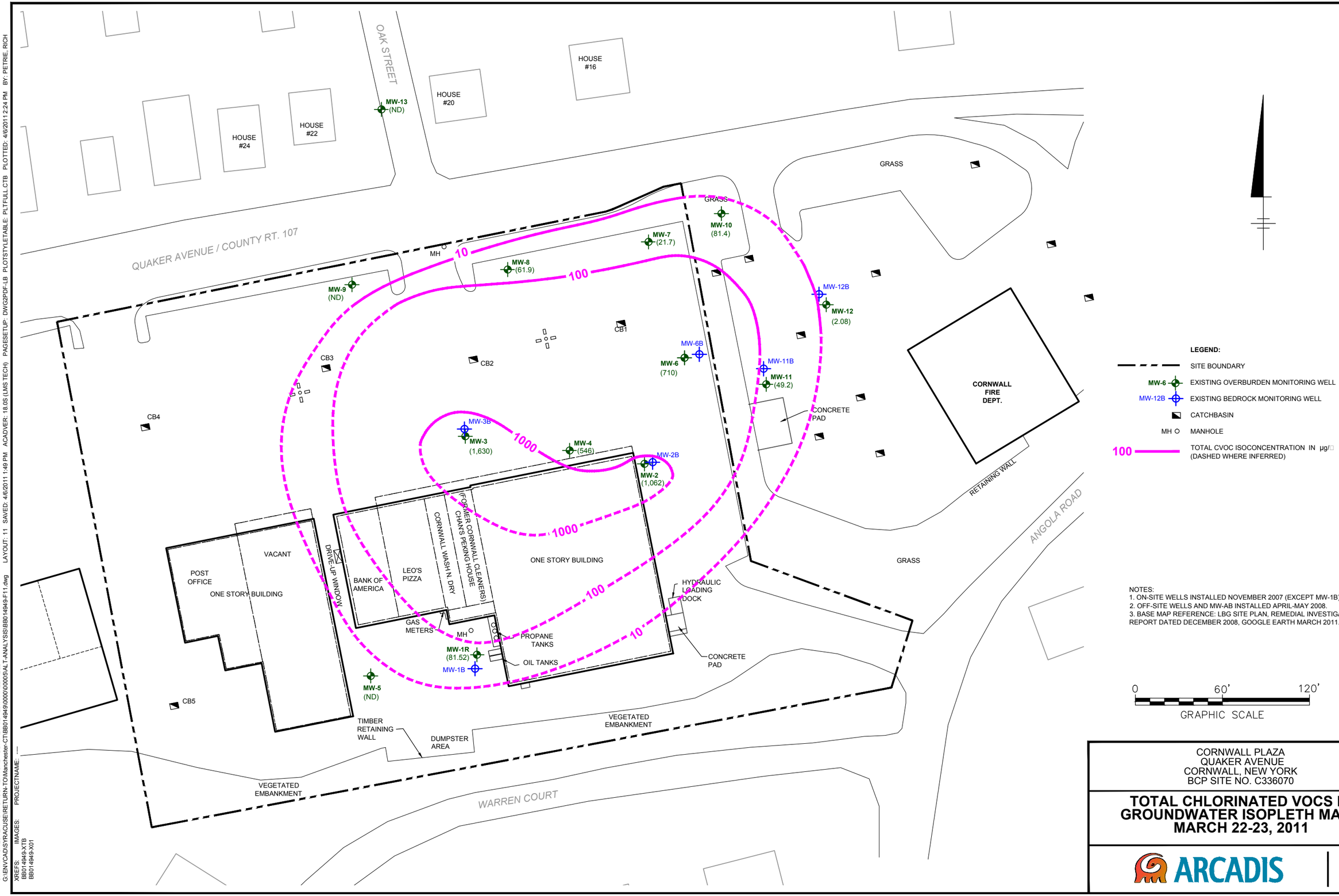
CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

CHLORINATED SOLVENT CONCENTRATIONS IN GROUNDWATER MARCH 22-23, 2011

ARCADIS

FIGURE 10

CITY:MANCHESTER DIV/GROUP:ENVCAD DBR:PETRIE LD:THALLIWELL
G:\ENVCAD\SYRACUSE\RETURN-TO\Manchester-CT\BB014949\0000\0000\5\ALT-ANALYSIS\BB014949-F10.dwg LAYOUT: 10 SAVED: 4/6/2011 1:49 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: DWG2PDF-LB PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/6/2011 2:24 PM BY: PETRIE, RICH
XREFS: IMAGES: PROJECTNAME: ---
BB014949-XTB
BB014949-X01



CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

TOTAL CHLORINATED VOCS IN GROUNDWATER ISOPLETH MAP - MARCH 22-23, 2011

ARCADIS

FIGURE 11

CITY:MANCHESTER DIV/GROUP:ENVCAD DBR:PETRIE LD:T:HALLIWELL
G:\ENVCAD\SYRACUSE\RETURN-TO\Manchester-CTB\BB014949\000\000005\ALT-ANALYSIS\BB014949-F11.dwg LAYOUT: 11 SAVED: 4/6/2011 1:49 PM ACADVER: 18.0S (LMS TECH) PAGESETUP: DWG2PDF-LB PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/6/2011 2:24 PM BY: PETRIE, RICH
PROJECTNAME: ---
IMAGES:
XREFS:
BB014949-XTB
BB014949-X01

AREA OF SUB-SLAB DEPRESSURIZATION SYSTEM INFLUENCE (UP TO 14 EXTRACTION POINTS. LOCATIONS TO BE FIELD VERIFIED BASED ON TENANT OPERATIONS / BUILDING RESTRICTIONS)

ORIGINAL 6,400 SQUARE FOOT SECTION

MW-3B
MW-3
MW-4
MW-2B
MW-2
MW-1R
MW-1B
MW-5

(FORMER CORNWALL CLEANERS)
CHAN'S PEKING HOUSE
FORMER KEY FOODS
CORNWALL WASH N. DRY
LEO'S PIZZA
BANK OF AMERICA
DRIVE-UP WINDOW
JT

HYDRAULIC LOADING DOCK
GAS METERS
MH
PROPANE TANKS
OIL TANKS
CONCRETE PAD
9,700 SQUARE FOOT ADDITION
TIMBER RETAINING WALL
DUMPSTER AREA
VEGETATED EMBANKMENT

LEGEND:

- SITE BOUNDARY
- MW-6 EXISTING OVERBURDEN MONITORING WELL
- MW-12B EXISTING BEDROCK MONITORING WELL
- CATCHBASIN
- MH MANHOLE
- COLUMN AND FOOTING

NOTES:
1. ON-SITE WELLS INSTALLED NOVEMBER 2007 (EXCEPT MW-1B)
2. OFF-SITE WELLS AND MW-AB INSTALLED APRIL-MAY 2008.
3. BASE MAP REFERENCE: LBG SITE PLAN, REMEDIAL INVESTIGATION REPORT DATED DECEMBER 2008, GOOGLE EARTH MARCH 2011.

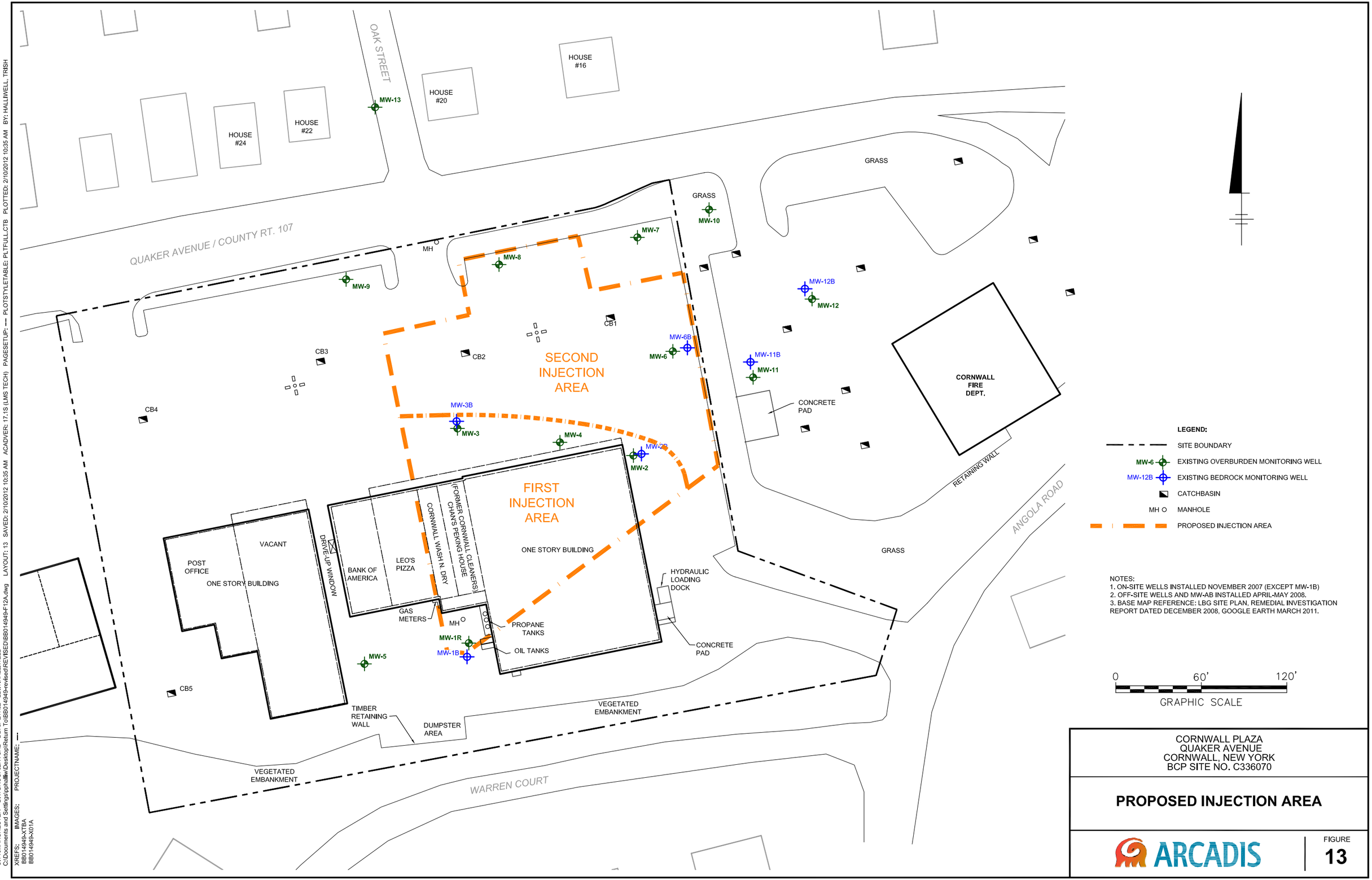
0 30' 60'
GRAPHIC SCALE

CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

SUB-SLAB DEPRESSURIZATION SYSTEM AREA OF INFLUENCE

ARCADIS

FIGURE
12



LEGEND:

- SITE BOUNDARY
- MW-6 — EXISTING OVERBURDEN MONITORING WELL
- MW-12B — EXISTING BEDROCK MONITORING WELL
- CATCHBASIN
- MH — MANHOLE
- PROPOSED INJECTION AREA

NOTES:
1. ON-SITE WELLS INSTALLED NOVEMBER 2007 (EXCEPT MW-1B)
2. OFF-SITE WELLS AND MW-AB INSTALLED APRIL-MAY 2008.
3. BASE MAP REFERENCE: LBG SITE PLAN, REMEDIAL INVESTIGATION REPORT DATED DECEMBER 2008, GOOGLE EARTH MARCH 2011.

0 60' 120'
GRAPHIC SCALE

CORNWALL PLAZA
QUAKER AVENUE
CORNWALL, NEW YORK
BCP SITE NO. C336070

PROPOSED INJECTION AREA

ARCADIS

FIGURE
13