VAPOR INTRUSION STUDY
WORK PLAN

ANDERSON CLEANERS SITE
5 HUNT ROAD
JAMESTOWN, NEW YORK
NYSDEC BROWNFIELD CLEANUP PROGRAM
SITE #C907027

Prepared for: Anderson Cleaners
5 Hunt Road
Jamestown, New York

Prepared by: Day Environmental, Inc.
1563 Lyell Ave
Rochester, New York 14606

Project No.: 3563S-04

Date: April 2014

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1.0 INTRODUCTION

Anderson Cleaners, Inc. (Anderson Cleaners) and Mr. Michael K. Lyons entered the Brownfield Cleanup Program (BCP) administered by the New York State Department of Environmental Conservation (NYSDEC) in 2005.

Anderson Cleaners is located at 5 Hunt Road, Jamestown, New York (the Site) and the Site is identified as BCP Site #C907027. Anderson Cleaners retained Day Environmental, Inc. (DAY) to prepare this Vapor Intrusion Study Work Plan (Work Plan), which describes the methods proposed for assessing potential impacts to indoor air in portions of the existing building at the Site

1.1 Background

The Site consists of approximately 2.4 acres of land located partially in the City of Jamestown and partially in the Town of Ellicott, New York. The Site is designated as Section Block and Lot numbers 504-01-001, 504-01-002, and 504-01-003 (Jamestown); and 32-1-1 and 32-1-11 (Ellicott). A Project Locus Map is presented as Figure 1, and a plan of the existing building layout is presented as Figure 2.

The Site is currently improved by an approximate 11,400-square foot, one-story brick and concrete block building with a slab-on-grade foundation system. The portions of the building identified as the "Garage Area" and the "Rug Cleaning Area" on Figure 2 are lower in elevation that the remainder of the building. The building was constructed in phases with the southwest portion of the building constructed in the 1930s (i.e., the current "Finishing Area" of the building) and the northern portion constructed in 1985 (i.e., the current "Office/Showroom" portion of the building). [Note: A fire destroyed the pre-existing northern and eastern portions of the building and the reconstruction/remodeling operations undertaken subsequent to the fire resulted in the current structure.] As such, the portions of the Anderson Cleaners building designated the "Finishing Area" and the "Office/Showroom Area" have separate foundation systems.

DAY completed a report titled *Remedial Investigation/Remedial Alternatives Analysis Report* dated March 2011, revised July 2011 (the RI/AAR report). This report summarizes studies previously conducted at the Site, presents the results of Remedial Investigation (RI), soil removal Interim Remedial Measure (IRM), and various remedial alternatives proposed to address contaminant impact identified at the Site. The RI/AAR report also identified the contaminants of concern (COC) at the Site, and these include:

- Dense Non-Aqueous Phase Liquid (DNAPL), or undissolved PCE, that acts as a source material for the following breakdown products detected within the groundwater at the Site:

    - PCE;
    - trichloroethene (TCE);

- 1,1-dichloroethene (1,1 DCE);
- trans-1, 2-dichloroethene (trans-1, 2 DCE);
- cis-1, 2-dichloroethene (cis-1,2 DCE); and
- vinyl chloride (VC).

1.2 Purpose

The purpose of this Work Plan is to provide guidelines to evaluate vapor intrusion into portions of the Anderson Cleaners building. The results of the studies completed will be used to evaluate the need for, and the extent of a vapor mitigation system required at the Site. If necessary, addendums to this Work Plan will be developed and submitted as the level of effort for additional vapor intrusion studies, and/or mitigation, are determined.

1.3 Health and Safety Plan

A site-specific Health and Safety Plan (HASP) was developed for, and is included in, the document titled *Draft Remedial Action Work Plan, Anderson Cleaners, 5 Hunt Road, Jamestown, New York NYSDEC Brownfield Cleanup Program Site #C907027* dated March 2013. Applicable provisions of this HASP will be implemented during completion of work outlined herein.

2.0 VAPOR INTRUSION EVALUATION

The sections below describe the procedures proposed to evaluate potential vapor intrusion issues within the "Finishing Area" and "Office/Showroom Area" portions of the Anderson Cleaners building.

2.1 Inspection and Inventory

Prior to the collection of samples, a vapor intrusion pre-sampling building inspection and product inventory will be completed within the "Finishing Area" and "Office/Showroom Area" portions of the Anderson Cleaners building. This inspection and inventory will be undertaken in general accordance with the NYSDOH document titled, "*Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*", dated October 2006 (NYSDOH Guidance Document). This task will include the completion of the NYSDOH Indoor Air Quality Questionnaire and Building Inventory including a chemical inventory of the indoor areas of the buildings. A Photoionization detector (PID) capable of sensing VOCs in the part per billion (ppb) range will be utilized to scan chemical containers for volatile emissions. Should materials be identified during the inventory that would potentially be detected during the indoor air testing, they will be removed from the building and stored in a secure location during the testing.

2.2 Sample Collection

To assess the impact of COC present in the subsurface on indoor air quality, paired sub-slab and indoor air samples will be collected from the "Finishing Area" and "Office/Showroom Area" portions of the Anderson Cleaners building in the locations depicted on Figure 2. In conjunction with this testing an outdoor (background) sample will be collected from a location positioned upwind of the Site.

Subsequent to the pre-sampling building inspection and product inventory, sub-slab vapor sampling probes will be inserted though the floor slabs in the approximate locations depicted on Figure 2. Specifically, small diameter holes (approximately 0.25-inches in diameter) will be advanced through the floor slabs and approximately 2-inches into the subsurface. Polyethylene tubing, slotted at the bottom will be placed in the holes and extend to the ground surface. The annulus around the slotted tubing will be backfilled with sand and a bentonite seal will be installed above the sand pack to the floor surfaces. Prior to collecting the sub-slab vapor samples, a minimum of three vapor probe volumes will be purged from each sub-slab vapor sampling locations.

The sub-slab and indoor air samples will be collected concurrently over an 8-hour period (i.e., to replicate the typical period of occupancy of the building) using Summa Canisters. The Summa Canisters designated to collect sub-slab samples will be connected to the tubing associated with the vapor probe. The indoor air samples will be collected from a location adjacent to the sub-slab vapor samples and at a height equivalent to breathing space (i.e., approximately 5 ft. above the floor surface). In addition, one outdoor background air sample will be collected over the

same approximate 8-hour period from an upwind exterior location positioned approximately five feet above the ground surface.

The Suma Canister air/vapor intake rates will be controlled with pre-calibrated regulators supplied by the analytical laboratory. In addition, vacuum gauges will be connected to the regulators in order to monitor the Summa Canister for proper operation (i.e., slow changes in vacuum) on an hourly basis. The installed location of the indoor, sub-slab and background air samples collected during this study will be located via tape measure by reference to existing site features. At the conclusion of the sampling, the tubing associated with the sub-slab vapor probes will be removed and the resulting annulus will be backfilled and capped with concrete.

2.3 Analytical Laboratory Testing

The Summa Canister samples collected will be delivered under chain-of-custody control to Spectrum Analytical, Inc. (Spectrum) for analysis of Chlorinated Solvents using Method TO-15. Spectrum is a NYSDOH ELAP-certified laboratory. The target compound list, which includes the laboratory reporting limit for each compound is included as Attachment A.

3.0 DELIVERABLES

Following receipt of the analytical laboratory test results (i.e., anticipated within 10 business days or less from the date of submittal to the laboratory), a report will be submitted that includes a narrative describing the work completed, a copy of the completed NYSDOH Indoor Air Quality Questionnaire and Building Inventory form, copies of the analytical laboratory results, and conclusions and recommendations, as warranted. The test results will be compared to applicable guideline values that are outlined in the NYSDOH Guidance Document, and a summary table will be prepared, and included in the report. This table will summarize the detected VOCs (if any) and corresponding NYSDOH guidance values for the constituents detected.

4.0 SCHEDULE

The proposed schedule for the activities described in this work plan is as follows:

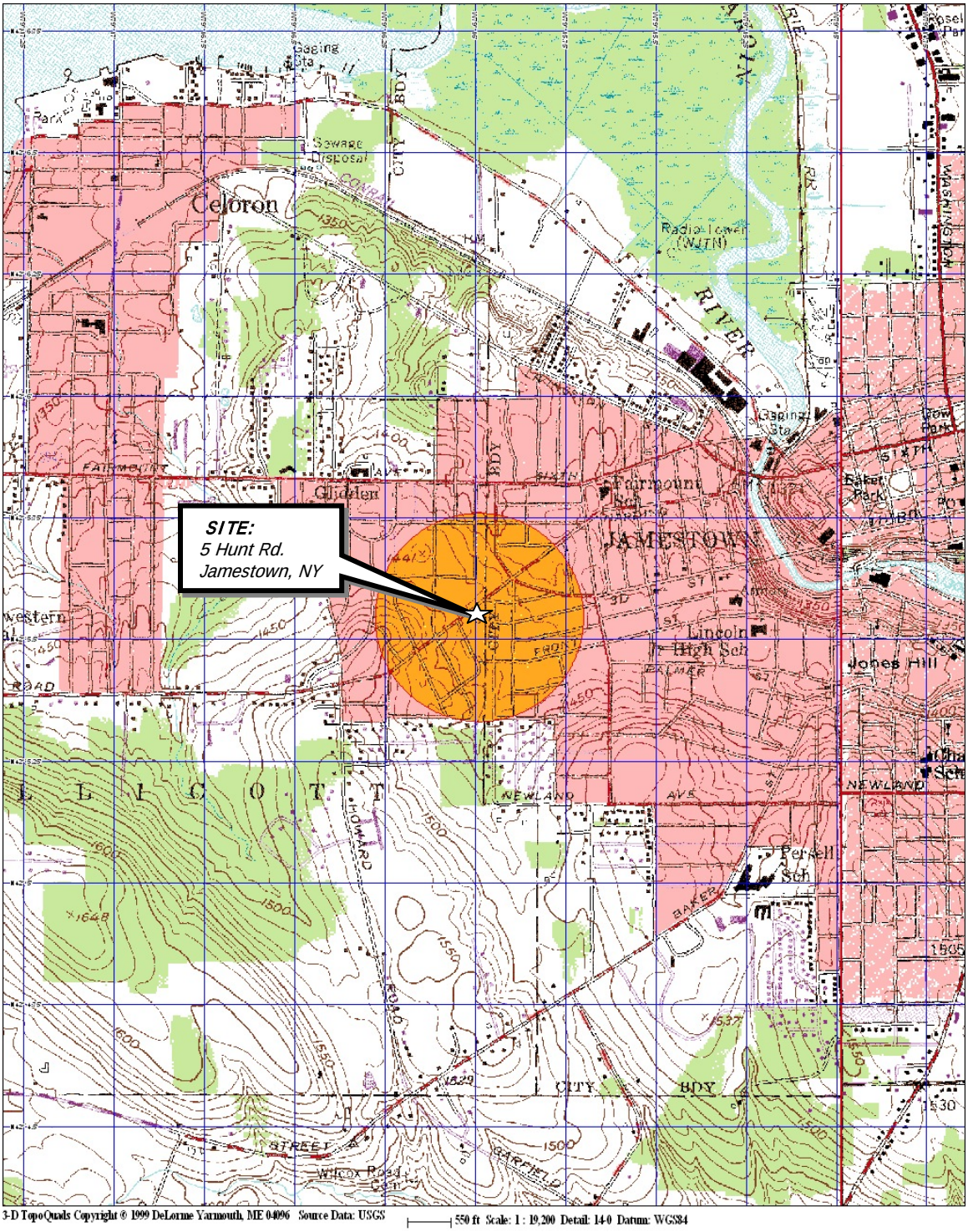
Pre-Sampling Building Inspection and Product Inventory: Work currently anticipated for April 2014.

Sample Collection: The samples will be collected within four days of the completion of the pre-sampling building inspection and product inventory.

Laboratory Testing: A report of the results of laboratory testing is anticipated within 10 days of sample submittal.

Report of Findings: Anticipated within three weeks of the receipt of laboratory testing.

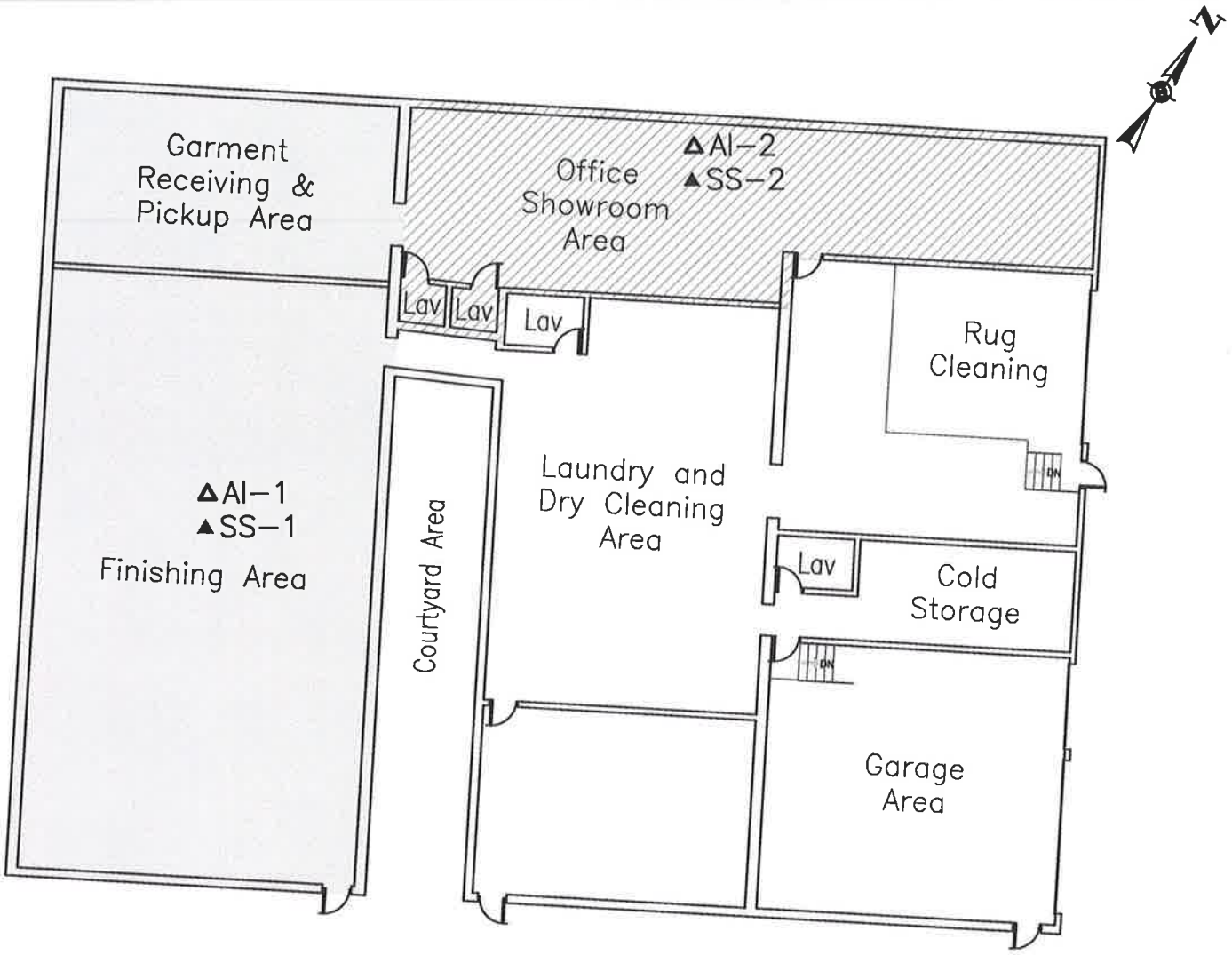
FIGURES



N

Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad map Lakewood (NY) 1979 and Jamestown (NY) 1979. Site Lat/Long: N42°05.55'– W79°16.00'

DATE **04-02-2014** DRAWN BY **RJM** SCALE **1" = 2000'**	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14606	PROJECT TITLE **5 HUNT ROAD** **JAMESTOWN, NEW YORK** **VAPOR INTRUSION STUDY WORK PLAN** **BCP #C907027** DRAWING TITLE **PROJECT LOCUS MAP**	PROJECT NO. **3563S-04** **FIGURE 1**



FLOOR PLAN
1" = 20'

LEGEND:

▲AI–1	Proposed Indoor Air Sample Location		Construction Circa 1930's
▲SS–1	Proposed Sub–Slab Vapor Sample Location		Construction Circa 1985

NOTES:

1. Site Plan produced from drawings by Habiterra Associates, Thorsell, Kennedy, Casker, Arnone & Hedin. P.C. entitled "Addition and Renovations, Anderson Cleaners, Inc", drawings A–1 Floor Plan dated October 22, 1985 and L–1 Grading Plan and from notes of site visits by representatives of Day Environmental, Inc.
2. DNAPL extraction well locations were obtained by tape measurement from existing site structure. Locations should be considered accurate to the degree implied by the method used.

DATE 4-3-2014 DRAWN BY RJM SCALE As Noted	day DAY ENVIRONMENTAL, INC. ENVIRONMENTAL CONSULTANTS ROCHESTER, NEW YORK 14606 NEW YORK, NEW YORK 10170	PROJECT TITLE 5 HUNT ROAD JAMESTOWN, NEW YORK VAPOR INTRUSION STUDY WORK PLAN DRAWING TITLE Proposed Sample Locations	PROJECT NO. 3563S-04 FIGURE 2

ATTACHMENT A

ANALYTICAL LABORATORY TARGET COMPOUND LIST

TO-15 CHLORINATED SOLVENTS

Spectrum Analytical, Inc. - Agawam, MA

Analytical Method Information

Analyte	MDL ppbv	LOD ppbv	MRL ppbv	MDL ug/m3	LOD ug/m3	MRL ug/m3	Duplicate RPD	Matrix Spike %R	R
TO-15 (Chlorinated) in Air (EPA TO-15)									
Preservation: Store at STP									
Container: Summa canister 6 liter			**Amount Required:**				**Hold Time:** 30 days		
Chloromethane	0.375	0.500	0.500	0.77	1.03	1.03	25		
Vinyl chloride	0.394	0.500	0.500	1.01	1.28	1.28	25		
Chloroethane	0.448	0.500	0.500	1.18	1.32	1.32	25		
1,1-Dichloroethene	0.373	0.500	0.500	1.48	1.98	1.98	25		
Methylene chloride	0.443	0.500	0.500	1.54	1.74	1.74	25		
trans-1,2-Dichloroethene	0.213	0.500	0.500	0.84	1.98	1.98	25		
1,1-Dichloroethane	0.200	0.500	0.500	0.81	2.02	2.02	25		
cis-1,2-Dichloroethene	0.163	0.500	0.500	0.65	1.98	1.98	25		
Chloroform	0.284	0.500	0.500	1.38	2.43	2.43	25		
1,2-Dichloroethane	0.254	0.500	0.500	1.03	2.02	2.02	25		
1,1,1-Trichloroethane	0.196	0.500	0.500	1.07	2.73	2.73	25		
Carbon tetrachloride	0.208	0.500	0.500	1.31	3.15	3.15	25		
1,2-Dichloropropane	0.196	0.500	0.500	0.91	2.31	2.31	25		
Trichloroethene	0.178	0.500	0.500	0.96	2.69	2.69	25		
1,4-Dioxane	0.265	0.500	0.500	0.95	1.80	1.80	25		
cis-1,3-Dichloropropene	0.170	0.500	0.500	0.77	2.27	2.27	25		
trans-1,3-Dichloropropene	0.149	0.500	0.500	0.68	2.27	2.27	25		
1,1,2-Trichloroethane	0.262	0.500	0.500	1.43	2.73	2.73	25		
Tetrachloroethene	0.201	0.500	0.500	1.36	3.39	3.39	25		
Chlorobenzene	0.290	0.500	0.500	1.34	2.30	2.30	25		
1,1,2,2-Tetrachloroethane	0.273	0.500	0.500	1.87	3.43	3.43	25		
1,3-Dichlorobenzene	0.273	0.500	0.500	1.64	3.01	3.01	25		
1,4-Dichlorobenzene	0.215	0.500	0.500	1.29	3.01	3.01	25		
1,2-Dichlorobenzene	0.232	0.500	0.500	1.39	3.01	3.01	25		
Hexachlorobutadiene	0.234	0.500	0.500	2.50	5.33	5.33	25		
Surrogate: 4-Bromofluorobenzene							25		
Bromochloromethane									
1,4-Difluorobenzene									
Chlorobenzene-d5									